



Preparation of best practices on the protection of animals at the time of killing

Final Report

Written by ICF in association with
SAFOSO and AETS

9 November 2017



EUROPEAN COMMISSION

Directorate-General for Health and Food Safety

Directorate G — Crisis management in food, animals and plants

Unit G2 — Animal Health and Welfare

Contact: Stanislav Ralchev

E-mail: SANTE-CONSULT-G2@ec.europa.eu

European Commission

B-1049 Brussels

Acknowledgments

This report was co-authored by ICF (Stefania Chirico, Julien Etienne, Andrew Jarvis, Kate McEntaggart, Priya Shah) seconded by a core team of experts (Haluk Anil, Jane Downes, Jean-Louis Duby, David Pritchard, Katharina Stärk, Heleen van de Weerd). Illustrations were produced by ICF Mostra. Relevant documentation was collected in 10 Member States by a team of subject matter experts, whose contribution is gratefully acknowledged. They are: Lotta Berg, Beniamino Cenci-Goga, Daniel Cuca, Przemyslaw Cwynar, Xenia Moles Caselles, Manon Schuppers, Evangelia Sossidou, Katharina Stärk, and Antonio Velarde. The contribution of stakeholders who responded to the consultation on the documents produced is also gratefully acknowledged. Their names are listed in Annex 8 to this report.

***EUROPE DIRECT is a service to help you find answers
to your questions about the European Union***

Freephone number (*):
00 800 6 7 8 9 10 11

(*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you)

LEGAL NOTICE

This document has been prepared for the European Commission however it reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

More information on the European Union is available on the Internet (<http://www.europa.eu>).

Luxembourg: Publications Office of the European Union, 2017

PDF ISBN 978-92-79-75331-2 doi: 10.2875/15243 EW-05-17-161-EN-N

© European Union, 2017

Reproduction is authorised provided the source is acknowledged.

Table of Contents

Acknowledgments.....	3
Executive summary	i
Deliverable 1 – Methodology and work plan	i
Deliverable 2 – State of play	ii
Deliverable 4 – Consultation and elements for best practices.....	ii
1 Introduction	5
2 Methodology and work plan (Deliverable 1)	5
2.1 Task 1: update of methodology and work plan	5
2.2 Task 2: collecting data and observations	5
2.3 Task 3: drafting elements of best practice	7
2.4 Task 4: consulting stakeholders on the elements of best practice	8
3 Deliverable 2 – State of play	13
3.1 Overview.....	13
3.2 State of play for slaughterhouses	15
3.3 State of play for on-farm killing.....	37
3.4 Conclusions	47
4 Deliverable 4 (1): Consultation results.....	49
4.1 Descriptive results.....	49
4.2 Overall views on the drafts	51
4.3 Assessment of the drafts through closed questions	52
4.4 Comments on pictures	53
4.5 Conflicting views	53
5 Deliverable 4(2): Elements of best practices – Slaughterhouse operations	55
5.1 Introduction	55
5.2 Shared section for all mammals	56
5.3 Equids and Cattle	65
5.4 Pigs	82
5.5 Sheep and goats	96
5.6 Poultry (chicken and turkeys)	105
6 Deliverable 4(3): Elements of best practices – Slaughter without stunning prescribed by religious rites	120
6.1 Introduction	120
6.2 Basic rules applicable to all species.....	121
6.3 Cattle	122
6.4 Sheep and Goats.....	129
6.5 Poultry.....	133
7 Deliverable 4(4): Elements of best practices – On-farm killing	136
7.1 Introduction	136
7.2 Basic rules for all species.....	137
7.3 Equine animals or Equidae.....	138
7.4 Cattle	139
7.5 Pigs	141
7.6 Sheep and Goats.....	147
7.7 Poultry.....	151
7.8 Rabbits	159
Annex 1 Terms of Reference	166

Annex 2 Deliverable 4 – Control procedures	175
A2.1 Slaughterhouse operations	175
A2.2 Slaughter without stunning	197
A2.3 On-farm killing	209
Annex 3 Assessment of the drafts through closed questions – detailed results	219
A3.1 Slaughterhouse operations	219
A3.2 Slaughter without stunning	226
A3.3 On-Farm Killing	237
Annex 4 Substantive comments received – detailed results	245
A4.1 Comments on the consultation drafts	245
A4.2 Comments on pictures - summary	365
Annex 5 Table of Acronyms and Abbreviations	369
Annex 6 Sources collected and reviewed for Deliverable 2	371
A6.2 Denmark	373
A6.3 France	373
A6.4 Germany	373
A6.5 Greece	374
A6.6 Italy	375
A6.7 Netherlands	376
A6.8 Poland	376
A6.9 Romania	377
A6.10 Spain	377
A6.11 Sweden	377
A6.12 International organisations	378
A6.13 Third countries	384
A6.14 Religious slaughter	385
Annex 7 References used for the completion of Deliverable 4	385
A7.1 Slaughterhouse operations – Equids and cattle	385
A7.2 Slaughterhouse operations – pigs	386
A7.4 Slaughterhouse operations -poultry	388
A7.5 Slaughter without stunning - Cattle	388
A7.6 Slaughter without stunning – sheep and goats	389
A7.7 Slaughter without stunning – poultry	390
A7.8 On-farm killing – Equids	391
A7.9 On-farm killing – sheep and goats	391
A7.10 On-farm killing – rabbits	391
Annex 8 Contributors to the consultation	392

Table of Tables	Page Number
Table 1 Main milestones of the consultations	9
Table 2 Response rates	49
Table 3 Responses per stakeholder group – On-farm killing	50
Table 4 Responses per stakeholder group – Slaughter without stunning	50
Table 5 Responses per stakeholder group – Slaughterhouse operations	50
Table 6 Lairage density recommendations for cattle and equids (various sources)	70
Table 7 Recommended parameters for the stunning of cattle and horses (various sources)	78
Table 8 Lairage density recommendations for pigs (various sources)	86
Table 9 Suggested group sizes as a function of the speed of slaughter for pigs	93
Table 10 Recommended parameters for head-only electrical stunning of pigs (various sources)	94
Table 11 Recommended lairage density for sheep and goats (various sources)	97
Table 12 Recommended parameters for head-only electrical stunning of sheep and goats (various sources)	103
Table 13 Recommended space allowance in crates/modules	108
Table 14 Recommended parameters for head-only electrical stunning of poultry (various sources)	115
Table 15 Parameters for electric waterbath (from Regulation 1099/2009)	116
Table 16 Recommended parameters for head-to-body stunning of pigs (various sources)	146
Table 17 Recommended parameters for head-to-body stunning of sheep/goats (various sources)	150
Table A1 – Terms of reference: Subject matters and issues for slaughterhouses	167
Table A2 – Terms of reference: Subject matters and issues for on-	168

farm killing	
Table A2.1.1.1 Control procedure, slaughterhouse operations, equids and cattle: <i>Layout, construction and equipment of slaughterhouses</i>	175
Table A2.1.1.2 Control procedure, slaughterhouse operations, equids and cattle: <i>Ventilation systems</i>	176
Table A2.1.1.3 Control procedure, slaughterhouse operations, equids and cattle: <i>Restraining equipment and facilities</i>	177
Table A2.1.1.4 Control procedure, slaughterhouse operations, equids and cattle: <i>Stunning – Penetrative captive bolt</i>	179
Table A2.1.1.5 Control procedure, slaughterhouse operations, equids and cattle: <i>Verification of stunning</i>	180
Table A2.1.2.1 Control procedure, slaughterhouse operations, pigs: <i>Layout, construction and equipment of slaughterhouses</i>	181
Table A2.1.2.2. Control procedure, slaughterhouse operations, pigs: <i>Ventilation systems</i>	183
Table A2.1.2.3 Control procedure, slaughterhouse operations, pigs: <i>Maximum capacity for the lairage</i>	183
Table A2.1.2.4 Control procedure, slaughterhouse operations, pigs: <i>Handling and restraining</i>	184
Table A2.1.2.5 Control procedure, slaughterhouse operations, pigs: <i>Stunning</i>	186
Table A2.1.2.6 Control procedure, slaughterhouse operations, pigs: <i>Verification of stunning</i>	187
Table A2.1.3.1 Control procedure, slaughterhouse operations, sheep and goats: <i>Layout, construction and equipment of slaughterhouses</i>	188
Table A2.1.3.2 Control procedure, slaughterhouse operations, sheep and goats: <i>Maximum capacity in the lairage</i>	189
Table A2.1.3.3 Control procedure, slaughterhouse operations, sheep and goats: <i>Handling and restraining</i>	190
Table A2.1.3.4 Control procedure, slaughterhouse operations, sheep and goats: <i>Head only electrical stunning</i>	192
Table A2.1.3.5 Control procedure, slaughterhouse operations, sheep and goats: <i>Verification of stunning</i>	193
Table A2.1.4.2 Control procedure, slaughterhouse operations, poultry: <i>Restraining methods</i>	194
Table A2.1.4.3 Control procedure, slaughterhouse operations, poultry: <i>All stunning methods</i>	195

Table A2.1.4.4 Control procedure, slaughterhouse operations, poultry: <i>Verification of stunning</i>	196
Table A2.2.1.1 Control procedure, slaughter without stunning, cattle: <i>Mechanical restraining systems</i>	197
Table A2.2.1.2 Control procedure, slaughter without stunning, cattle: <i>Use of non-authorised methods of stunning – non-penetrative captive bolt</i>	200
Table A2.2.1.3 Control procedure, slaughter without stunning, cattle: <i>Bleeding operations</i>	200
Table A2.2.2.1 Control procedure, slaughter without stunning, sheep and goats: <i>Mechanical restraining systems</i>	202
Table A2.2.2.2. Control procedure, slaughter without stunning, sheep and goats: <i>Bleeding operations</i>	204
Table A2.2.3.1 Control procedure, slaughter without stunning, poultry: <i>Electrical waterbath</i>	206
Table A2.2.3.2 Control procedure, slaughter without stunning, poultry: <i>Manual bleeding operations</i>	208
Table A2.3.1.1 Control procedure, on-farm killing, equids: <i>Stunning</i>	209
Table A2.3.1.2. Control procedure, on-farm killing, equids: <i>Verification of stunning</i>	210
Table A2.3.2.1 Control procedure, on-farm killing, cattle: <i>Stunning</i>	211
Table A2.3.2.2 Control procedure, on-farm killing, cattle: <i>Verification of stunning</i>	212
Table A2.3.3.1 Control procedure, on-farm killing, pigs: <i>Stunning</i>	212
Table A2.3.3.2 Control procedure, on-farm killing, pigs: <i>Verification of stunning</i>	213
Table A2.3.4.1 Control procedure, on-farm killing, sheep and goats: <i>Stunning</i>	214
Table A2.3.4.2 Control procedure, on-farm killing, sheep and goats: <i>Verification of stunning</i>	215
Table A2.3.5.1 Control procedure, on-farm killing, poultry: <i>Restraining methods</i>	215
Table A2.3.5.2 Control procedure, on-farm killing, poultry: <i>All stunning methods</i>	216
Table A2.3.5.3 Control procedure, on-farm killing, poultry: <i>Verification of stunning</i>	217
Table A2.3.6.1 Control procedure, on-farm killing, rabbits: <i>All stunning</i>	217

<i>methods</i>	
Table A2.3.6.2 Control procedure, on-farm killing, rabbits: <i>Verification of stunning</i>	218
Table A3.1 Responses to closed questions on the Slaughterhouse Operations – Equids and Cattle draft	220
Table A3.2 Responses to closed questions on the Slaughterhouse Operations – Pigs draft	221
Table A3.3 Responses to closed questions on the Slaughterhouse Operations – Sheep and Goats draft	223
Table A3.4 Responses to closed questions on the Slaughterhouse Operations – Chicken and Turkeys draft	225
Table A3.5 Responses to closed questions on the Slaughter without Stunning of Cattle draft	227
Table A3.6 Responses to closed questions on the Slaughter without Stunning of Sheep and Goats draft	231
Table A3.7 Responses to closed questions on the Slaughter without Stunning of Poultry draft	234
Table A3.8 Responses to closed questions on the On Farm Killing of Horses draft	237
Table A3.9 Responses to closed questions on the On Farm Killing of Cattle draft	238
Table A3.10 Responses to closed questions on the On Farm Killing of Horses draft	239
Table A3.11 Responses to closed questions on the On Farm Killing of Sheep and goats draft	240
Table A3.12 Responses to closed questions on the On Farm Killing of Rabbits draft	242
Table A3.13 Responses to closed questions on the On Farm Killing of Poultry draft	243
Table A4.14 Comments on pictures – slaughterhouse operations	367
Table A4.15 Comments on pictures – slaughter without stunning	367
Table A4.16 Comments on pictures and suggested response – on-farm killing	368
Table A6.1 Number of documents identified for the different subject matters and issues for slaughterhouses	373
Table A6.2 Number of documents identified for the different subject matters and issues specific to on-farm slaughter	373

Preparation of best practices on the protection of animals at the time of killing

Table A6.3 Summary of number and type of Member State documents (by species). Several documents covered more than one species.	373
Table A8.1 Individuals and organisations who responded to the consultation exercise	395

Table of Figures	Page Number
Figure 1 Work plan	12
Figure 2 Handler movement to move animals forward into a single raceway	62
Figure 3 Crowd pen design with cattle	66
Figure 4 Example of layout for individual pens with cattle (layout 1)	68
Figure 5 Example of layout for individual pens with cattle (layout 2)	68
Figure 6 Example of layout for collective pen with cattle	69
Figure 7 Central track conveyor entrance with calves	72
Figure 8 Central track conveyor: calf in restrained position	72
Figure 9 Example of chin-lift for restraining cattle	74
Figure 10 Principle of a neck-yoke for restraining cattle	74
Figure 11 Possible design for a restraining box for cattle	75
Figure 12 Flight zone with cattle	77
Figure 13 Recommended position of penetrative captive bolt gun for stunning cattle	79
Figure 14 Recommended positioning of captive bolt gun for stunning horses	80
Figure 15 Signs of unconsciousness in cattle	81
Figure 16 Signs of unconsciousness in equids	82
Figure 17 Labyrinth design with pigs	83
Figure 18 Crowd pen design with pigs	84
Figure 19 Offset step design with pigs	85
Figure 20 Example of a stun pen design with pigs	87
Figure 21 Pig entry into central track restrainer	88
Figure 22 Pig restrained in central track restrainer	89
Figure 23 Pig entry into V-shape conveyor	89
Figure 24 Pig restrained in V-shape conveyor	90

Figure 25 Flight zone of pig	91
Figure 26 Recommended position of electrodes for electrical head stun of pig	93
Figure 27 Signs of loss of consciousness in pigs	96
Figure 28 Example of a stunning pen design with sheep	98
Figure 29 Sheep entry into central track restrainer	99
Figure 30 Goat restrained in central track restrainer	100
Figure 31 Sheep entry into V-shape conveyor	101
Figure 32 Sheep restrained in V-shape conveyor	101
Figure 33 Recommended position of electrodes for electrical head-only stunning of sheep	103
Figure 34 Signs of loss of consciousness in sheep and goats	105
Figure 35 Carrying and restraining of poultry upright	110
Figure 36 Diagram of a chicken in a cone	112
Figure 37 Appropriate position of electrodes on a bird's head	114
Figure 38 Design principle of an electrical waterbath	116
Figure 39 Signs of unconsciousness in a bird stunned electrically	118
Figure 40 Illustrative design for rotating pen	124
Figure 41 Position of a non-penetrative captive bolt stunning on cattle	126
Figure 42 Recommended cut location and inclination in cattle	127
Figure 43 Recommended cut location and inclination in sheep and goats	132
Figure 44 Diagram of recommended cut location for poultry	134
Figure 45 Recommended position of captive bolt gun for stunning pigs	143
Figure 46 Recommended position of electrodes for heart stun on pig	145
Figure 47 Recommended position of the electrodes for chest stunning of sheep/goat	150
Figure 48 Recommended position of captive bolt gun for captive bolt stunning of poultry birds	154
Figure 49 Diagram of cervical dislocation in poultry	156

Figure 50 Signs of unconsciousness in a bird stunned by concussion or cervical dislocation	159
Figure 51 Recommended restraining for captive bolt stunning of rabbit	161
Figure 52 Recommended positioning for captive bolt stunning of rabbit	161
Figure 53 Restraining and positioning for head-only electrical stunning of a rabbit	163
Figure 54 Signs of unconsciousness for a stunned rabbit	165

Executive summary

This report summarizes the work carried out on the study "Preparation of best practices on the protection of animals at the time of killing", on behalf of the European Commission (DG SANTE). The study has provided, assessed and evaluated the necessary information to elaborate elements for best practices on the protection of animals at the time of killing. It has focused on areas identified as problematic during recent Commission audits carried out in various Member States. These areas include: the slaughter in small slaughterhouses (poultry and mammals) and the elaboration of the respective standard operating procedures; the slaughter of poultry using electrical waterbath stunning; the slaughter of animal without stunning in the context of ritual slaughter; and the killing of animals on farm (culled animals, emergency killing and slaughter for direct supply of small quantities of poultry, rabbits and hares). The report presents the three main deliverables for the study, namely deliverable 1 (methodology), deliverable 2 (state of play) and deliverable 4 (consultation and final elements for best practice).

Deliverable 1 – Methodology and work plan

The study team collected data looking at sources of good practice information across ten Member States of the European Union. This entailed a coordinated search for documentation by a team of country experts, as well as collection and review of international sources. An additional survey of country experts assessed the range of options described in the sources identified for complying with the requirements of Council Regulation 1099/2009 on the protection of animals at the time of killing¹. This evidence compiled and analysed led to the completion of Deliverable 2 – State of Play.

The study team then used the information that had been amassed to begin drafting "elements for best practice" on the matters and for the species identified in the TOR. The draft elements for best practice have drawn from good practices identified in national or sectoral guides, as well as voluntary standards, summarizing information on good practices that may be observed in commercial conditions in countries of the European Union. This work proceeded in several stages, with ICF drafting first drafts, and experts reviewing them and providing edits and advice for editing. This included legal review to ensure that the drafts were compliant with the EU legislation. The drafting and review process was framed by an approach designed by ICF to achieve documents of a high standard, namely a set of seven criteria: accuracy, economy, sufficiency, communicability, scope, and amenability to improvement. The approach has also involved developing a rating scale for qualifying the practices, from "unacceptable" to "acceptable", "good" and "best", and listing of their advantages and disadvantages when applicable. This has led to the production of Deliverable 3 – Draft Elements for Best Practice.

The study team developed a consultation tool, which used an online platform to enable consultees to visualise or download draft elements for best practice. The online tool included a set of questions on each section of each draft, which aimed to obtain consultee feedback according to the set of criteria used for developing the guides. Consultees could provide additional information, and were invited to complete their answers in targeted follow-ups, by email or telephone. The consultation on the drafts was launched in three phases, one for each of the three sets of drafts produced (on-farm, slaughter without stunning prescribed by religious rites, and slaughterhouse operations). This was to prevent overload as some consultees were invited to review and comment on all three sets of drafts. The consultation responses were collated and analysed. On the basis of these comments, the first element of Deliverable 4 – Consultation has been drafted, summarizing the key points of feedback received, and

¹ Council Regulation (EC) No 1099/2009 on the protection of animals at the time of killing (OJ L 303, 18.11.2009, p. 1-30)

indicating how the study team as assessed the comments and, when relevant, responded to them.

On the basis of these comments and those received from the Commission, the study team revised the draft elements for best practice in order to finalize them. This also involved the finalization of a set of visuals that have been added to the main text.

Deliverable 2 – State of play

Among the sources collected and reviewed, many national guides used only text but others used some combination of text, drawings and photographs. While some of the examples of guides and training material were very good in many respects, only a few were in the most easily readable or engaging format. Much best practice material provided poor combinations of diagrams and photographs of variable quality and style. These may not be readily assimilated by operatives and animal welfare officers.

The majority of these documents were written or commissioned by the national Competent Authority or Provincial Authorities. They tended to cover all the farmed species in a single guide. Some MS/Provinces have published separate guides for each species. Some national guides utilised recommendations from EFSA opinions and the EUWELNET and DIALREL projects. The scope of documents was similar across countries and followed the requirements of Regulation 1099/2009, with variations due to reference to national legislation. However, they varied in the detail of the advice provided (in the form of added figures, photos or template for checklists, standard operating procedures and forms). Some guides contained more detailed guidance on compliance with the EU rules.

A number of guides to good practice produced by national industry organisations were also reviewed. These tended to be more user-friendly and better illustrated, and sometimes went beyond requirements of the Regulation as they sought to meet additional requirements of quality assurance schemes.

Some third countries (such as Australia, Brazil, Canada and New Zealand) have produced easily readable and comprehensive official guidance and codes that are accompanied by industry guides supporting quality assurance schemes. They contained useful information on strategies for improving and maintaining welfare and/or different ways of monitoring handling and stunning performance.

Less guidance was available in Member States for killing on farm, including emergency killing, killing for local supply, or depopulation for disease control. On-farm killing guidance was frequently included in guides to slaughterhouses as many principles of handling, restraint and stunning are common to both. Details of welfare guidance on killing for disease control in Members States were usually contained in contingency plans for exotic diseases rather than separate guidance and these contingency plans were not assessed. Some third country guides relied on specific practical guidance from the OIE on methods of killing for disease control.

A comparative analysis of the range of solutions contained in the guidance on slaughterhouses provided by the ten target Members States, international sources and information from third countries provided very similar elements of guidance. It was therefore often not possible to find a wide range of solutions with individual elements, for comparison. Furthermore, for most elements of best practice there was limited information on differing good practices for on-farm killing from the various sources. There was also limited information available on slaughter without stunning for cattle, sheep and goats and poultry especially with regard to methods of restraint and actions to deal with failure of the methods used.

Deliverable 4 – Consultation and elements for best practices

The set of elements for best practice has been designed as a portfolio of resource documents, which are separable and can be assessed and used independently from one another. The text is

supported by a number of illustrations. Three sets of elements for best practice were produced and are included in this report:

- Slaughterhouse operations
- Slaughter without stunning prescribed by religious rites
- On-farm killing

In total 326 different organisations and individuals were invited to review and comment on these documents. Of these, 50 different organisations and individuals submitted 84 contributions to all three consultations. Additionally, 12 contributions were also submitted via e-mail, some of which were complementary to on-line submissions.

The review of comments showed that documents have been well received overall. With the exception of the drafts on slaughter without stunning prescribed by religious rites, all drafts were judged to be of good quality by a majority of the respondents in terms of how accurate the information was, the economy of the documents, their communicability, whether they provide sufficient information, and their scope. At the same time, the comments received, even when positive, highlighted how the hybrid nature of the documents may have caused some confusion among consultees. A number of comments and concerns signalled that consultees understood the documents as guides to good practice. Seen from that perspective, consultees made three sets of comments, depending on their point of view and interests:

- Some consultees raised questions on the apparent inconsistencies and contradictions present in the text, resulting from the inclusion of various alternative and mutually inconsistent “options” to comply with the requirements from Regulation 1099/2009.
- Similarly, a number of consultees questioned why the “guide” was selective in the issues it covered (this reflected the particular focus of the study as defined by the European Commission). Consultees thought that the documents were missing important information that end users would need.
- Some consultees expressed concern that this “guide” would generate new obligations for operators, as it would likely be used by enforcers as well as end users. To better address this concern a disclaimer² has been inserted in the documents.

The comments collected indicate also that the consultees saw opportunities to improve the drafts by:

- Revising their structure;
- Simplifying the text;
- Increasing the consistency between the drafts; and
- Clarifying the status of the documents.

The consultation identified areas of substantial disagreement between some consultees and the study team, or between different groups of consultees, on the following issues:

² “Elements of best practices are not of legally binding nature and do not affect the requirements of the EU legislation on protection of animals at the time of killing or other relevant pieces of legislation. Nor do they commit the European Commission. Only the Court of Justice of the European Union is competent to authoritatively interpret Union law. The reader is therefore invited to consult this section in connection with the relevant provisions of the legislation and refer, when necessary, to the relevant competent authorities.”

- Use of stunning methods in the context of slaughter without stunning prescribed by religious rites (including waterbath stunning for poultry);
- Use of upright or rotating mechanical restraint devices in the context of slaughter prescribed by religious right;
- Qualifiers of certain methods of stunning, in particular waterbath and percussive blow to the head / cervical dislocation.

The comments have provided useful indications for revising the drafts, including comments on the visuals that have been inserted in the drafts, and advice on communicability.

1 Introduction

This is the Final Report for the project "Preparation of best practices on the protection of animals at the time of killing". The report contains an update on Deliverables 1 (work plan), 2 (state of play), and 4 (consultation process and final best practices in English).

Material previously supplied to the Commission in earlier deliverables has been omitted from this final report but is available on request. This material comprises:

- Species tables (part of Deliverable 2)
- Data collection tools (part of Deliverable 2)

2 Methodology and work plan (Deliverable 1)

This section presents a summary of the methodology, covering: Task 1 (update of methodology and work plan), Task 2 (collecting data and observations), Task 3 (drafting elements of best practice), and Task 4 (consulting stakeholders).

2.1 Task 1: update of methodology and work plan

2.1.1 Purpose

Task 1 was intended to set up the methodology and work plan, as well as to finalise the list of experts and consultees. The finalised work plan was delivered as part of the Inception Report and detailed the steps and timeline for the remaining tasks. This then served as a monitoring tool over the course of the study, ensuring research and consultations were carried out in line with the proposed methodology and protocols.

2.2 Task 2: collecting data and observations

2.2.1 Purpose

Task 2 was designed to generate "a synthesis of the current state of knowledge on all subject matters based on key references and a comparative analysis of the range of solutions used by the different sources" and to "identify the gaps in information for each subject matter." The approach to the task involved two sub-tasks: data collection and analysis.

2.2.2 Task 2.1: data collection

The data collection phase took place in the ten countries selected at the inception stage (DE, DK, EL, ES, FR, IT, NL, PL, RO, SE). It involved a combination of:

- Desk research by country experts
- Consultation with Member State experts and stakeholders
- Field visits

To organise this task, the research team elaborated data collection tools, including a data collection protocol that was circulated to all members of the team. The elaboration of data collection tools required thorough unpacking of the subject matters and issues from Regulation 1099/2009 that are within scope of this project.

Conference calls were undertaken with all data collectors to ensure a common understanding of the project's objectives, of their role in fulfilling those objectives, and of the operational aspects of the task.

Additional guidance and support was provided to country experts with regard to the data storage and the use of the SharePoint platform. Official letters were also provided in coordination with the Commission to facilitate access to documentation in the Member States.

Country experts were tasked with contacting their National Contact Point and / or Scientific Support Centre, if any, as well as key sources of information (expert,

industry, or NGO) in their country, relying on their professional network for that matter. Besides, when the headquarters of a manufacturer of animal killing equipment were located in the country, the relevant expert was tasked with approaching the manufacturer to gather all relevant documentation.

Some language support was provided by ICF when needed to facilitate the task.

The documents received from the country experts were reviewed. To obtain further information on the variety of "solutions" used by country sources for addressing requirements from the Regulation 1099/2009, a survey was drawn up to elicit feedback which solutions were available in each of the Member States' documents, and to assess how much of a range of solutions was available across. To develop the survey, the project core team elaborated long lists of known or potential "solutions" to the requirements from Regulation 1099/2009, including solutions *to achieve* compliance, and solutions (ways of monitoring and indicators that may be monitored) in order *to assess* compliance with the requirement. These long lists of solutions were informed by the expert knowledge of the core team and their review of key references. The lists were then turned into checklists and sent to the country experts for completion.

Due to excellent cooperation by the country experts, complete useful data were received from nine countries and four species. This information contributed to the report, particularly to identify the range of solutions available and the gaps in information. It provided also a very useful guide to those elements which are common to all countries' sources. As such, it enabled distinguishing between those elements with guidance on solutions and there where there is a paucity of guidance

Besides documentation collected by country experts in the 10 MS, additional sources were obtained from international organisations and a selection of third countries. The information contained in these sources was reviewed by the core team and included in Deliverable 2.

2.2.3 Task 2.2: Analysis of the data collected

The information gathered by country experts was qualified after they had performed an initial review of the documentation. The analysis proceeded in three stages. The core team reviewed and analysed the documents, each person taking responsibility for one species.

2.2.3.1 Mapping

To generate findings on the "state of knowledge" the documents were reviewed to identify the breadth of information they provided across the subject matters and species within scope of this study.

2.2.3.2 Comparative analysis of range of solutions

To generate findings on the "range of solutions" used in the sources, the core team generated a large range of solutions per legal requirement (derived from the subject matters within scope). They then compared this "long list" with the actual solutions that could be identified from the review of the documents and the responses provided by country experts on this aspect.

The range of solutions introduced in the long list was expanded when additional solutions were identified in the sources collected. Solutions from the long list that could not be documented in the sources collected were excluded. The outcome of this assessment was the range of solutions that has been reported into Chapter 3 of this report.

2.2.3.3 Gap analysis

To generate findings on "information gaps" the core team reviewed the breadth of information listed in the state of knowledge against the full list of subject matters and

species within scope for the study. This highlighted areas for which very few or no sources (and, therefore, solutions) could be found.

2.3 Task 3: drafting elements of best practice

2.3.1 Purpose

The purpose of this task was to develop a draft set of best practices based on the findings from desk research, contacts with Member State experts and on-site visits. Draft best practices were later discussed and further developed through consultations with stakeholders (Task 4).

2.3.2 Understanding of the task

Practices cover all the issues and subject matters identified in the terms of reference. They are based on existing knowledge of best practices as recorded in national or sectoral guides and voluntary standards, and evidence of their advantages.

2.3.3 Method

The drafting of best practices proceeded as follows:

- Initial drafts of elements of best practices for each subject matter were developed by ICF building on the Species tables put together for , and using the template format agreed with the Steering group³;
- Technical experts from the core team then reviewed the drafts and amended them if necessary;
- Draft elements of best practice were assessed for compliance against the provisions of Regulation (EC) No 1099/2009 by the legal expert on the team (Jean-Louis Duby);
- Specifications for sketches to be included in the drafts were passed to the illustrators (Mostra);
- Draft elements of best practice were then reviewed by the project management team.

When relevant, the team associated solutions with a code (gradation) indicating when solutions:

- Are not compliant with EU rules (unacceptable practices) – “Unacceptable”;
- Are authorised or required by law and provide limited animal protection – “Acceptable”;
- Are authorised or required by law and provide good animal protection – “Good”;
- Are authorised or required by law and (a) provide enhanced animal protection, or (b) they provide other benefits (for instance: they are more practical, or more cost-effective). – “Best”

Nuances between “Acceptable”, “Good” and “Best” were informed by the review of advantages and disadvantages of the practices.

The quality of the draft guidance was assessed against the following set of criteria:

- Accuracy – does it describe well the practice it is meant to represent?
- Economy – does it enable the end user to think of the practice easily?
- Sufficiency – does it cover all the important aspects without assuming much implicit knowledge or leading users to look for clarification elsewhere?

³ As per the videoconference held on 15/02/2017.

- Scope – is it as widely applicable as possible?
- Communicability – is it transmittable and interpretable by the people doing the job?
- Amenability to improvement – can it accommodate changes easily?

A preliminary assessment of the draft elements against each criterion was done by the core team and the project management team. Each reviewer assessed the elements of draft guidance prepared and amended by earlier contributors. Some criteria (such as accuracy and economy) were assessed based on the judgement of the experts, while standard measurements were used to assess other criteria. Readability was assessed by applying the Flesch reading ease test⁴. Accuracy was assessed by comparing the relevant sub-section of the draft to the original source document for the practice.

2.4 Task 4: consulting stakeholders on the elements of best practice

2.4.1 Purpose

The purpose of the consultation phase was to provide stakeholders with an opportunity to review and comment on the material prepared during Task 3 and to use the comments to improve the text and graphics.

2.4.2 Method

This section outlines the main sub-tasks of the stakeholder consultation.

2.4.2.1 Task 4.1: Design of consultation tools

The consultation's purpose was achieved through tools designed to:

- Target thematic elements of best practices to those stakeholders with the most interest in each element as end users or interested third parties (e.g. religious authorities for ritual slaughter, small slaughterhouses); and
- Enable consultees to provide feedback that would allow the research team to improve the draft best practices' (i) accuracy, (ii) economy, (iii) sufficiency, (iv) scope, (v) communicability, (vi) amenability to improvement (as discussed in section 2.1.3).

The online consultation engaged with: official veterinarians; Member State competent authorities; farmers; animal traders; slaughterhouse operators; animal welfare organisations; religious authorities involved in slaughter without stunning; representation of third countries exporting meat to the EU; scientific supports in some Member States; other animal welfare experts in some Member States and at EU level; national contact points from all Member States; and selected animal stunning equipment manufacturers in some Member States.

A number of face to face consultations were also conducted with consultees who provided information in their responses to the online consultation that justifies a follow up discussion.

Online consultation

The online consultation tool enabled coherent, robust and economical access to a wide variety of stakeholders across multiple countries, including third countries. Respondents were asked to comment or answer questions about specific sections of the draft elements of best practice.

Questionnaires were adapted to the specific theme and element of best practice. While some consultees provided comments on almost all the elements of best practice produced in Task 3, others were specifically consulted on one particular theme /

⁴ The test is used to measure text readability based on factors such as word length and sentence length.

element of best practice. For instance, religious authorities were consulted on elements of best practice bearing on ritual slaughter.

Questionnaires included both open and closed questions. Consultees were invited to provide general, open comments on the element of best practice presented. They were prompted to voice relevant considerations, in particular in terms of feasibility / comprehension. Consultees were also requested to answer closed questions on specific elements of the elements of best practice. These closed questions solicited consultees' views on the elements': (i) accuracy, (ii) economy, (iii) sufficiency, (iv) scope, (v) communicability, (vi) amenability to improvement (as discussed in section 2.1.3).

The questions used as little conceptual vocabulary as possible (and did not refer explicitly to "economy", "sufficiency", "scope", or "communicability") to achieve good response rates.

Three consultations were undertaken, one for each best practice document, namely:

- On-farm killing
- Slaughter without stunning
- Slaughterhouse operations

The consultations were conducted in a sequential manner with partial overlap between one consultation and the next. All consultations remained opened for at least three weeks. Extensions were granted to a few stakeholders on a case-by-case basis. A reminder was sent to non-responding stakeholders approximately half-way between the date the first invite was sent and the date the survey was planned to be closed. These main milestones are depicted in Table 1.

Table 1. Main milestones of the consultations

Consultation	Date the first invite was sent	Date the reminder was sent	Date closed	Extension to selected stakeholders
On farm killing	28 April 2017 (NCPs) 5 May 2017 (non-NCPs)	24 May 2017	5 June 2017	23 June 2017
Slaughter without stunning	25 May 2017	6 June 2017	16 June 2017	7 July 2017
Slaughterhouse operations	1 June 2017	14 June 2017	23 June 2017	7 July 2017

Note: Four stakeholders for the consultation on the document on Slaughter without stunning received the first invite on the 12th and 15th of June, due to them having been identified in a later stage only. This was because of a need for additional perspectives from religious communities.

Follow up calls and telephone interviews

Follow up calls were conducted to address specific points raised by consultees in their responses to the online consultation. The structure of the calls was dependent on the nature of the information to be collected and conducted with a view to ensure that the information could be integrated into the final deliverable.

2.4.2.2 Task 4.2: Launch & management

Targeted groups of stakeholders were invited to contribute. Emails were sent in advance to invite consultees to confirm their willingness and ability to contribute. Email invitations were then sent to all consultees except those who would have

explicitly indicated that they would not be willing or able to contribute. Reminders were sent two weeks afterwards.

2.4.2.3 Task 4.3: Review and synthesis of consultation responses

The material supplied was subject to a rapid initial scan to establish: who contributed; what stakeholder category/ country they were representing; what aspects they addressed; what their views and concerns are.

Closed question responses were collated and analysed separately for each element of best practice, in the interest of generating comparisons between the views expressed by different stakeholders on the same exact issue or aspect of the elements of best practice. This comparison was conducted to establish whether there were conflicts of opinions on some aspects, and how broad a consensus there was on other aspects.

Follow up calls and emails

Additional information obtained through follow-up phone calls (and emails) was integrated into the main database of consultation responses, so that all the relevant information for each specific element of best practice can be readily accessible.

Review of comments and responses

ICF carefully reviewed all stakeholders' comments. In some cases (e.g. in situation of generic comments) follow-up with consultees were needed to gather additional information and clarify their requests. Comments were classified and addressed them as follows:

- **Comments requiring simple text edits:** these included requests to streamline the text (for example, by removing repetitions), or to correct typos. These comments have been addressed in the guidance documents presented in this report.
- **Substantial comments on the content or clarity of the guidance, which did not require expert review:** these comments included suggestions to modify the content of consultation drafts, for example by providing additional information or modifying the legal/scientific terminology used. When possible, these comments have been directly addressed by ICF.
- **Substantial comments requiring expert review:** in some cases, comments required review by ICF's experts, including legal review. ICF submitted these comments to the relevant experts and considered their feedback in order to revise the consultation documents.
- **Comments on pictures:** see section 0.
- **Comments out of scope:** these included, for example, requests to describe stunning methods outside of the scope of this project. These comments have not been addressed.
- This final report includes an overview of the comments and responses received, indicating possible conflicts of opinions recorded during the consultation, pros and cons of alternative options, and suggestions for revision when warranted.

2.4.2.4 Task 4.4: Revision of the drafts and consultation process (Deliverable 4)

The elements for best practice have been updated for inclusion in the final report.

The comments informed revisions of the drafts on several levels:

- Factual and typographical errors
- Structure of the drafts
- Substantive changes (addition or revision of good practice information)

These revisions have all been included in this final report, including those that required review of new sources communicated by consultees and/or further consultation.

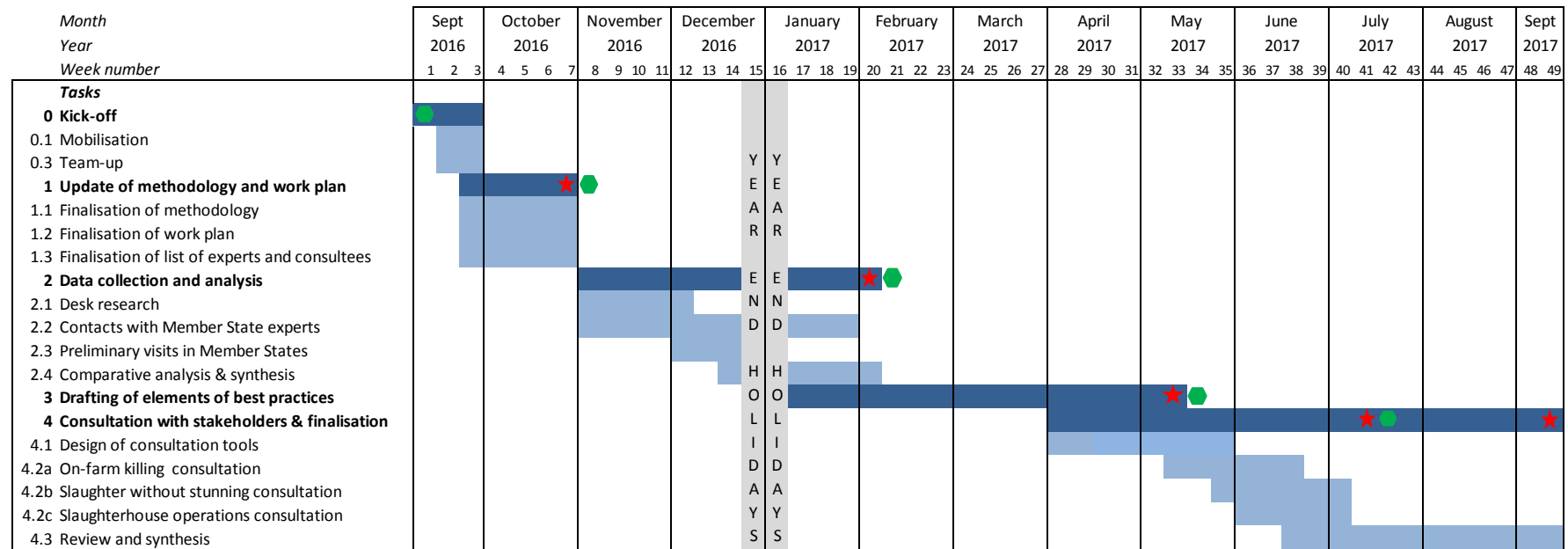
2.4.3 Finalization of Deliverable 4



Following the Steering Group and discussion on the comments and status of the drafts completed, the texts were finalised. This entailed:

- Revisions to the text by ICF based on the strategy agreed with the Commission at the Steering Group meeting;
- Confirmation of the specifications of the visuals and instruction of the illustrators to ensure final versions were available for deliverable 4;
- Review of the final elements by the project management team;
- A revised structure consolidating guidance common to mammals.

The project workplan is provided at Figure 1.

Figure 1. Project Workplan



-  Meeting
-  Report

Deliverables dates	
Inception report – Deliverables 1 & 2	3-Feb-17 (revised)
Interim report – Deliverables 1, 2 & 3	11-May-17 (revised)
Draft final report – Deliverables 1, 2, and 4	10-Jul-17
Final report (DFR approved)	14-Sep-17

3 Deliverable 2 – State of play

This section summarizes the findings from Task 2 of the study: collecting data and observations. The chapter presents an overview of the data collected (3.1), findings for killing in slaughterhouses (3.2), findings for on farm killing (3.3), and conclusions (3.4).

Sections 3.2 and 3.3 are organised in sub-sections, one for each species or group of species. The species sub-sections are based on the information contained in the documents reviewed (full list provided at 0 of this report). Each one of those sub-sections is structured in three parts, as follows:

- *Part 1: State of knowledge* – summarizes the information available in the documents reviewed per subject matter or issue, all of which relate to specific sections of Regulation 1099/2009. This part of the sub-sections includes also key references in which good practice information for the said species can be found.
- *Part 2: Comparative range of solutions* – summarizes findings from a comparative analysis of the range of “solutions” (ways of complying with the requirements of Regulation 1099/2009) contained in the documents. This range of solutions was taken forward for further assessment and for developing the menu of existing good practices that became Deliverable 4.
- *Part 3: Information gaps* – summarizes the key gaps in information revealed by the review of the documentation and the comparative analysis of the range of solutions.

3.1 Overview

3.1.1 Member States’ documentation for all farmed species

Member State documentation consisted mainly of national guides to good practice, aimed at a food business operators, and instructions to veterinary services on the approval, operation, monitoring and auditing of slaughterhouses.

The majority of these documents covered all the farmed species in a single guide. Some Member States / Provinces have published separate guides for each species (examples are poultry in France and the Netherlands, pigs in France, rabbits in Catalonia and France, and red meat in Andalucía). Such guides contained more detailed guidance on compliance with Regulation 1099/2009.

Guides to good practice were sometimes produced by national industry organisations such as the Dutch professional independent butchers’ organisation, the British Meat Producers Association (BPMA) (both covering human safety and animal welfare) and the British Poultry Council (BPC).

National guides have been written or commissioned by the Competent Authority or Provincial Authorities. Their scope is similar and follows the requirements of Regulation 1099/2009 with variations due to reference to national legislation. There were different levels of detail in the advice provided, including the use of supporting visuals (in the form of added figures, photos) or templates (for checklists, standard operating procedures (SOPs) and forms).

National guides generally contained the following sections:

- Responsibilities (focusing on the animal welfare officer)
- Layout, construction and equipment of slaughterhouses
- Handling and restraining guidance
- Planning and processes, welfare risk analysis and SOPs
- Stunning methods

- Monitoring of stunning and killing
- Competency and training of staff
- Model forms and checklists

Guides to good practice produced by national industry organisations tended to contain more elements of good practice, some of which went beyond the requirements of EU rules. These guides may have been written by slaughter specialists for the species and aim to meet quality assurance standards.

3.1.2 International organisations' documentation for all farmed species

International guidance reviewed for this study included the OIE guidelines for slaughter; the OIE guidelines for killing for disease control; the FAO Guidelines for humane handling transport and slaughter; the European Convention for the protection of animals for slaughter (1979; ETS 102). Council of Europe (COE Code of practice 1991; various Humane Slaughter Association (HSA) guidance documents and the recommendations produced by EUWELNET and EU DIALREL projects and the European Animal Welfare platform.

Fact sheets on other sources of information reviewed included those provided by the American Meat Institute (AMI), Compassion in World Farming (CIWF), Eyes on Animals (EoA), Global GAP Assurance, International Horse Meat Federation (HoMeFe), Royal Society for the Protection of Animals (RSPCA Australia), and World Animal Protection.

These sources typically provide detailed information that went beyond the national guides to good practice. They also often contained good supporting material in the form of figures, photos and drawings. In the cases where there was a good link between industry and an organisation (e.g. European Animal Welfare Platform,⁵ Humane Slaughter Association, World Animal Protection), the detailed guidance was practically applicable and welfare focussed. This information will be further analysed and assessed for each species, in the next phase of the project.

3.1.3 Third country sources

Third country information, such as the relevant legislation and guidance produced by governments of Australia, Brazil, Canada and New Zealand, United States of America, Uruguay and some supporting information was also considered.

Third country guidance contained some examples of more detailed guidance integrating advice on facilities, operation with monitoring and auditing. For example, the American Meat Institute guidance is included in American, Canadian and Australian national guidance and used in training for the whole food chain (from farm, in transport and for slaughter) in some South-American countries (EUWELNET and World Animal Protection).

⁵ <http://www.animalwelfareplatform.eu/>

3.2 State of play for slaughterhouses

Many Member State and international sources on good practices for killing in slaughterhouses were found and reviewed. The information they contain is presented in the following sub-sections, organised per species.

3.2.1 Equids

3.2.1.1 State of knowledge

Member State documents include the following information for each subject matter.

- Handling and restraining operations at slaughterhouses

Although there are many examples of where to aim the shot when stunning horses, the selection of a stunning method (captive bolt or free bullet) and assessment of unconsciousness in line with other ungulates, there are few, if any, specific references to the unloading, lairaging, handling and restraint of horses.

- **Stunning methods for slaughterhouses**

- Guidance on types of captive bolt, and the size of charge for each category of equids
- Guidance on placement of the gun and direction of fire
- Guidance on indicators of consciousness and unconsciousness
- Guidance on use of EFSA indicators to check efficiency of stunning process
- Guidance on stun to stick intervals
- Guidance on assessment of welfare by animal welfare officer

- **Monitoring procedures at slaughterhouses** – Member State information includes the following, which is generic but sufficient to meet compliance for equids:

- Hazard analysis for each process step/critical control point with indication on how to manage the hazard, definition of how to monitor, frequency of monitoring, threshold values, how to document, measures in case of non-compliance.
- Guidance on recommended indicators for monitoring of successful stunning, examples of criteria for indicators, frequency of monitoring, number of animals to be monitored, measures in case of non-compliance, documentation.
- Recommendations that checks at least 3 indicators of unconsciousness and consciousness at the time between stunning and death of the animal.
- Guidance on monitoring procedures and the role of the animal welfare officer who controls all of the aspects related to animal welfare.
- Adoption and implementation of appropriate monitoring procedures in slaughterhouses.
- Naming of the responsible person, indicators designed to detect signs of consciousness or present, when the monitoring must take place, the number of animals sampled, frequency of the checks.
- Checks on the efficiency of stunning, implementation of monitoring procedures describing how checks are assisting stunning efficiency.

- Procedure for monitoring the measures taken in order to ensure the welfare of the animals at the slaughterhouse.
- **Standard Operating Procedures for small slaughterhouses** – Member State information includes generic information for all ungulates, and SOPs describing in details the following procedures:
 - Assessment of risk factors and their management at unloading
 - Lairaging restraint
 - Stunning and back up stunning, including maintenance of the guns
 - Bleeding
 - Emergency killing
 - Frequency of checks
 - Contingency plans in case of emergency monitoring and record keeping.
- Any other category
 - Evaluation of animal welfare at slaughterhouses in relation to problems arising at the farm or during transport, but detected at the slaughterhouse.

Key references with good guidance on practical solutions for equids include:

- Alberta Equestrian Federation, 2015. Humane handling Guidelines for horses. Available at: http://media.wix.com/ugd/6af32a_82a3515f7be94d749eb7eb4a488f33ad.pdf
- International Horse Meat Federation, 2015. Manual for the Animal Welfare of horses during transport and slaughtering.
- SIVeMP (Sindacato Italiano Veterinari Sanità Pubblica), 2013. Procedure operative standard per il monitoraggio del benessere animale al macello.
- Vereniging van Zelfslachtende Slagers/Koninklijke Nederlandse Slagersorganisatie, 2014. (Dutch Butchers professional organisations). Module Dierenwelzijn in het slachthuis.

3.2.1.2 Comparative analysis of range of solutions

A summary of the range of solutions, where there is a good or more limited range of information available, is provided below.

- **Structure and layout** – There is a limited range of solutions on:
 - How lairages should be constructed and used for horses. The appropriate heights of walls, types, materials, flooring structure, ventilation system, race widths and stun box construction especially suitable for horses some of which may be halter trained, and some may not (feral equids).
 - How to manage horses of very different size, weight and behaviour in a lairage situation.
- **Stunning methods for slaughterhouses** – Solutions include:
 - Guidance on types of bolt guns and proper use of captive bolt for horse (bolt length of 12 cm), appropriate speed off less than 100 m/s.
 - Placement of the gun [*example solution: correct captive bolt placement: a cross between two imaginary lines drawn from the middle of each eye to the base of the opposite ear; the gun is placed approximately 2cm above the point where the lines cross. The muzzle of the firearm should be slightly tilted so that the shot is directed through the cerebral cortex towards the*

brain stem; the device must be held in contact against the head at the correct anatomical site].

- Bleeding [*example solution: bleeding should be carried out by an incision made with a sharp knife in the jugular furrow at the base of the neck, the knife being directed towards the entrance of the chest to sever all the major blood vessels arising from the heart. Bleeding may be carried out by making a deep transverse cut across the animal's throat at the angle of the jaw, severing the blood vessels, trachea and oesophagus, until the blade of the knife touches the spine There should be two powerful jets of blood from the carotid arteries, and a flow of blood from the jugular veins*].
- Assessment of stun by the competent person and the AWO in line with EFSA guidance.
- **Monitoring procedures at slaughterhouses** – Member State information is generic to all ungulates and includes a range of solutions on:
 - Hazard analysis for each process step/critical control point with indication on how to manage the hazard, definition of how to monitor, frequency of monitoring, threshold values, how to document, measures in case of non-compliance.
 - Guidance on recommended indicators for monitoring of successful stunning, examples of criteria for indicators, frequency of monitoring, number of animals to be monitored, measures in case of non-compliance, documentation.
 - Recommendations that checks detect at least 3 indicators of unconsciousness and consciousness at the time between stunning and death of the animal.
 - Guidance on monitoring procedures and the role of the animal welfare officer who controls all of the aspects related to animal welfare.
 - Adoption and implementation of appropriate monitoring procedures in slaughterhouses.
 - Naming of the responsible person, indicators designed to detect signs of consciousness or present, when the monitoring must take place, the number of animals sampled, frequency of the checks.
 - Checks on the efficiency of stunning, implementation of monitoring procedures describing how checks are assisting stunning efficiency.
 - Procedure for monitoring the measures taken in order to ensure the welfare of the animals at the slaughterhouse.

3.2.1.3 Information gaps

The following gaps in information were identified.

- **Monitoring procedures in slaughterhouses**
 - The handling of fetuses, although this is addressed generically in OIE documentation.
- **Stunning methods for slaughterhouses**
 - The length and velocity of the bolt for different categories of equids.
 - Methods of measuring these parameters are being met.
 - Point of intervention for poor stun outcomes.
- **Slaughter without stunning**

- There is no information on slaughter without stunning in a slaughterhouse although horsemeat is not haram.
- **Standard Operating Procedures for small slaughterhouses**
 - SOPs for small slaughterhouses should follow the same design as for large slaughterhouses. There are no references specific to horse slaughter.

3.2.2 Cattle

3.2.2.1 State of knowledge

Member State documents include the following information for each subject matter:

- **Layout, construction and equipment of slaughterhouses**
 - Guidance on lairage layout and management.
 - Checklist for compliance of the existing layout and construction and stunning equipment.
 - Animal welfare officer planning for investment on constructions, equipment or other in order to comply with future amendments of the Regulation.
 - Guidance on standard operating procedures (incl. stunning methods).
 - Guidance on veterinary inspections in slaughterhouses according to animal welfare.
 - Instructions covering all of the aspects of the requirement equipment in the slaughterhouses, aspects of the corridors and lairages construction, ventilation systems, minimal surfaces for each animal species (in different age groups).
 - Guidance on supervision of veterinary inspectors before the stunning and culling methods. Part of this instruction is related to check animal's documentation, animal health and welfare in slaughterhouses as well as the health status when the animals are arriving to the slaughterhouses (and conditions in the means of transport).
 - Guidance on facility and equipment design, ventilation systems, fixed or portable lighting for inspection.
 - Unloading checks on welfare conditions of transport.
 - Online training portal on welfare at slaughter and killing (with illustrations and video clips).
- **Handling and restraining operations at slaughterhouses**
 - Guidance on limitation of injuries and stress.
 - Standard operating procedures for process steps from unloading to bleeding.
 - Guidance on behavioural and physiological needs of cattle.
 - Guidance on standard operating procedures (incl. loading, lairage, resting before slaughtering, movement through lairage identification checks).
 - Guidance on stunning pens and their use.
 - Guidance on equipment for optimized stunning.
 - Online training portal on welfare at slaughter and killing (with illustrations and video clips).
- **Stunning methods for slaughterhouses**

- Guidance on types of captive bolt, and the size of charge of each category of cattle.
- Guidance on placement of the gun and direction of fire.
- Guidance on consciousness and unconsciousness indicators.
- Guidance on use of EFSA indicators to check efficiency of stunning process.
- Guidance on stun to stick intervals.
- Assessment of welfare by animal welfare officer (AWO).
- **Slaughter without stunning**
 - Guidance on restraining pens for non-stun including rotating pens and angle of rotation.
 - Stunning that meets Halal slaughter regulations.
- **Monitoring procedures at slaughterhouses**
 - Hazard analysis for each process step/critical control point with indication on how to manage the hazard, definition of how to monitor, frequency of monitoring, threshold values, how to document, measures in case of non-compliance.
 - Guidance on recommended indicators for monitoring of successful stunning, examples of criteria for indicators, frequency of monitoring, number of animals to be specific monitored, measures in case of non-compliance, documentation.
 - Recommendations that checks detect at least three indicators of unconsciousness and consciousness at the time between stunning and death of the animal.
 - Guidance on monitoring procedures and the role of the animal welfare officer who controls all of the aspects related to animal welfare.
 - Adoption and implementation of appropriate monitoring procedures in slaughterhouses.
 - Naming of the responsible person, indicators designed to detect signs of consciousness or present, when the monitoring must take place, the number of animals of each sampled, frequency of the checks.
 - Checks on the efficiency of stunning, implementation of monitoring procedures describing how checks are assisting stunning efficiency.
 - Procedure for monitoring the measures taken in order to ensure the welfare of the birds at the slaughterhouse.
- **Standard Operating Procedures for small slaughterhouses**
 - Standard operating procedures describing in details the following procedures: assessment of risk factors and their management in unloading, lairaging restraint, stunning and back up stunning, including maintenance of the guns, bleeding, emergency killing, frequency of checks, contingency plans in case of emergency monitoring and record keeping.
 - Guidance on animal welfare in small slaughterhouses SOPs on assessment of the operation including corrective actions in decision trees for AWO and operator.
- Any other category

- Evaluation of animal welfare at slaughterhouses (in relation to problems arising at the farm or during transport but detected at the slaughterhouse).

Documents from international organisations that provided information on cattle were focussed on the handling of animals from farm to point of death and included information required for making correct decisions in slaughterhouses in respect of layout, handling, stunning and bleeding.

The international guidance for monitoring cattle in slaughterhouses often contained target standards of performance and actions to be taken when not reached. They also often required a quality assurance programme with written animal welfare plan aimed at improving the motivation and performance of the staff in relation to their roles in maintaining animal welfare.

Key references with good guidance on practical solutions for the aforementioned issues for cattle include:

- BSI-Schwarzenbek. 2013. Gute fachliche Praxis der tierschutzgerechten Schlachtung von Rind und Schwein. [ONLINE] Available at: http://www.bsi-schwarzenbek.de/Dokumente/bsi_gute_Praxis_4_13.pdf. [Accessed 23 January 2017].
- Candotti, P., 2007. Metodi e procedure operative per l'eutanasia degli animali appartenenti alla specie equina, bovina, ovi-caprina e suina. Centro di Referenza Nazionale per il Benessere degli Animali, IZLER. [ONLINE] Available at: http://www.izsler.it/izs_bs/allegati/2250/EUTANASIA.pdf. [Accessed 23 January 2017].
- Chief Veterinary Officer, 2013b. Instruction of Chief Veterinary Officer (no. GIWbž-500-1/2013) related to supervision over the culling methods in pigs, cattle, chickens and turkeys in slaughterhouses. Warsaw, 03.04.2013
- DVFA, 2014. Order on the slaughtering and killing of animals. Ref. Ares (22014)489369. 25/02/2014
- Danish Crown, n.d. At the slaughterhouse. [online] Available at: <http://slaughterhouse.danishcrown.com/>
- EFSA Panel on Animal Health and Welfare, 2013a. Scientific Opinion on monitoring procedures at slaughterhouses for bovines. EFSA Journal, 11(12). Available at: <https://www.efsa.europa.eu/en/efsajournal/pub/3460>
- Grandin, T., 2012b. Developing measures to audit welfare of cattle and pigs at slaughter. Animal Welfare, Vol. 21(3), pp.351-356. Available at: <http://www.ingentaconnect.com/content/ufaw/aw/2012/00000021/00000003/art00007>
- HSA, 2010. Prevent slips and falls by managing concrete floors. [pdf] Available at: <http://www.hsa.org.uk/downloads/publications/prevent-slips-and-falls.pdf>
- INTERBEV, 2013. Guide de bonnes pratiques pour la maîtrise de la protection animale des bovins à l'abattoir.
- LGL, 2014. Schulungsfilm zu wesentlichen Aspekten der schonenden und tierschutzkonformen Schlachtung bei Rind, Schwein und Schaf. [ONLINE] Available at: http://www.lgl.bayern.de/aus_fort_weiterbildung/fortbildung/schulungsfilm_schlachten.htm . [Accessed 23 January 2017].
- Secretaría General de Salud Pública y Participación, 2012. Programa de Control Oficial de Bienestar Animal en Mataderos de Andalucía. [ONLINE] Available at: <https://www.uclm.es/profesorado/produccionanimal/PADR/BAMATADEROS2012.pdf> . [Accessed 23 January 2017]

- TVT, 2015b. Tierschutzgerechtes Schlachten von Rindern, Schweinen, Schafen und Ziegen. [ONLINE] Available at: <http://tierschutz-tvt.de/fileadmin/tvtdownloads/merkblatt89.pdf> . [Accessed 23 January 2017].
- World Animal Protection, 2011. Steps cattle (training dvd for slaughterhouse staff).
- von Wenzlawowicz, M., von Holleben, K., and Eser, E., 2012. Identifying reasons for stun failures in slaughterhouses for cattle and pigs: a field study. *Animal Welfare*, Vol. 21(S2), pp. 51-60. [pdf] Available at: <http://www.ufaw.org.uk/downloads/awj-abstracts/v21-s2-wenzlawowicz.pdf> .

3.2.2.2 Comparative analysis of range of solutions

A summary of the range of solutions, where there is a good or more limited range of information available, is provided below.

- **Layout, construction and equipment of slaughterhouses** – There is a limited range of solutions available on:
 - Monitoring ventilation systems in lairage, parameters to be monitored and acceptable air quality.
 - Establishing lairage and slaughter line capacity.
- **Stunning methods for slaughterhouses** – There is a limited range of solutions available on:
 - Types of captive bolt (powered by an explosive propellant or by compressed air, with energy supplied via a high-pressure compressor).
 - Use of captive bolt: the velocity of the bolt should be assessed for the different categories of animals [*example solutions: technical information: cartridges vary in strength and are classified according to the amount of propellant they contain, measured in grains. They range from 1.25 grain for calves to 3.0 grain and 4.0 grain for large cattle and mature bulls (1 grain = 0.0648 grams). The manufacturers' instructions must be followed so that the correct cartridges are used for each model of stunner; they are identified by calibre (0.22 or 0.25), colour and headstamp*].
- **Slaughter without stunning** – There is limited information in national guidance, but there is information available in international documents on:
 - Guidance on assessment of a good incision, single or multiple cuts, length on knife.
 - Guidance on assessment of severance of both carotids and jugulars without damaging the bones of the neck.
 - Guidance on time to alternative intervention [*example solution: Spain gives 150 seconds of bleed out time before stun*].
 - Guidance on post-cut stunning.
- **Monitoring procedures at slaughterhouses** – There is a limited range of solutions available on:
 - Point of intervention for poor stun outcomes [*example solution: when the animal fails to lose consciousness within 1 .5 min the animal should be immediately stunned with a mechanical device*].
- Standard Operating Procedures for small slaughterhouses – See next section on information gaps.

3.2.2.3 Information gaps

The following gaps in information were identified.

- **Layout, construction and equipment of slaughterhouses**
 - Optimising environmental conditions in the lairage, especially with regards to ventilation.
- **Handling and restraining operations at slaughterhouses**
 - The handling and restraint of calves.
- **Standard Operating Procedures for small slaughterhouses**
 - Examples of SOPs specific for small slaughterhouses.
 - Examples of SOPs on avoiding pain, distress or suffering during their killing procedures and related operations for small slaughterhouses.
 - Guidance on stunning methods, back up methods, key parameters for effectiveness of stun (based on EFSA guidance).
- **Slaughter without stunning**
 - Guidance on mechanical restraint for non-stun slaughter
- **Other**
 - Specific guidance for species of cattle other than beef cattle and dairy cows (such as buffalo)

3.2.3 Pigs

3.2.3.1 State of knowledge

Member State documents include the following information for each subject matter.

- **Layout, construction and equipment of slaughterhouses**
 - Guidance on lairage layout and management.
 - Checklist for compliance of the existing layout and construction and stunning equipment.
 - Animal welfare officer planning for investment on constructions, equipment or other in order to comply with future amendments of the Regulation.
 - Guidance on standard operating procedures (including stunning methods).
 - Guidance on veterinary inspections in slaughterhouses according to animal welfare.
 - Instructions covering all of the aspects of the requirement equipment in the slaughterhouses, aspects of the corridors and lairage construction, ventilation systems, minimal surfaces for each animal species (in different age groups).
 - Guidance on supervision of veterinary inspectors before the stunning and killing methods. Part of this instruction is related to check animal's documentation, animal health and welfare in slaughterhouses as well as the health status when the animals are arriving to the slaughterhouses (and conditions in the means of transport).
 - Guidance on facility and equipment design, ventilation systems, fixed or portable lighting for inspection.
 - Guidance on unloading checks on welfare conditions of transport.

- Online training portal on welfare at slaughter and killing (with illustrations and video clips).
- **Handling and restraining operations at slaughterhouses**
 - Guidance on behavioural and physiological needs of pigs.
 - Guidance on limitation of injuries and stress.
 - Standard operating procedures for process steps from unloading to bleeding.
 - Guidance on standard operating procedures (incl. unloading, lairage, resting before slaughtering, movement through lairage).
 - Guidance on use of V-restrainer, stun pens and group pens.
 - Guidance on equipment for optimizing electric head-only stun.
 - Online training portal on welfare at slaughter and killing (with illustrations and video clips).
- **Stunning methods for slaughterhouses**
 - Guidance on functioning of electrical equipment and parameters required for weight of pig.
 - Guidance on use of tongs and correct placement of the electrodes to span the brain of the pig for head-only stunning.
 - Guidance on indicators of consciousness and unconsciousness after electrical stun.
 - Guidance on use of EFSA indicators to check efficiency of stunning process.
 - Guidance on stun to stick intervals.
 - Assessment of welfare by animal welfare officer.
- **Monitoring procedures at slaughterhouses**
 - Hazard analysis for each process step/critical control point with indication on how to manage the hazard, definition of how to monitor, frequency of monitoring, threshold values, how to document, measures in case of non-compliance.
 - Guidance on recommended indicators for monitoring of successful stunning, examples of criteria for indicators, frequency of monitoring, number of animals to be monitored, measures in case of non-compliance, documentation.
 - Recommendations that checks detect at least three indicators of unconsciousness and consciousness at the time between stunning and death of the animal.
 - Guidance on monitoring procedures and the role of the animal welfare officer who controls all of the aspects related to animal welfare.
 - Adoption and implementation of appropriate monitoring procedures in slaughterhouses.
 - Naming of the responsible person, indicators designed to detect signs of consciousness or present, when the monitoring must take place, the number of animals of each sampled, frequency of the checks.
 - Checks on the efficiency of stunning, implementation of monitoring procedures describing how checks are assisting stunning efficiency.

- Procedure for monitoring the measures taken in order to ensure the welfare of the pigs at the slaughterhouse.
- **Standard operating procedures for small slaughterhouses**
 - Standard operating procedures describing in detail the following procedures: assessment of risk factors and their management in unloading, lairaging, restraint, stunning and back up stunning, including maintenance of the guns, stunning tongs, bleeding, emergency killing, frequency of checks, contingency plans in case of emergency, monitoring and record keeping.
 - Guidance on animal welfare in small slaughterhouses.
 - SOPs on assessment of the operation, including corrective actions in decision trees for animal welfare officer and operator.
- **Any other category**
 - Evaluation of animal welfare at slaughterhouses (including problems arising at the farm or during transport), with a focus mainly on animal welfare problems originating on the farm or during transport, but detected at the slaughterhouse.
 - Feedback of post-mortem information relevant to animal health and welfare to the farm of origin.

Among the Member State references consulted, there are some examples of good practice for stunning, monitoring stunning, corrective actions and standard operating procedures. Key references with good guidance on practical solutions for the aforementioned issues for pigs are:

- British Meat Processors Association, 2014. Guide to good practice: welfare at slaughter. Available at: www.bmpa.com
- Guide de bonne Pratiques de la protection animale en l'abattoir de porc [FR].
- European Animal Welfare Platform, 2012. Pork Production Strategic Approach Documents.
- HSA, 2013. Captive-Bolt Stunning of Livestock.
- HSA, 2016. Electrical stunning of red meat animals.
- Pig Veterinary Society, 2013. THE CASUALTY PIG. Interim Update April 2013
- Vereniging van Zelfslachtende Slagers/Koninklijke Nederlandse Slagersorganisatie (Dutch Butchers professional organisations) 2014. Module Dierenwelzijn in het slachthuis / Module animal welfare in the slaughterhouse [NL].
- World Animal Protection, 2015. *Steps pigs* (training dvd for slaughterhouse staff).

3.2.3.2 Comparative analysis of range of solutions

A summary of the range of solutions, where there is a good or a more limited range of information available, is provided below.⁶

- **Layout, construction and equipment of slaughterhouses** – A range of solutions was identified for this subject matter, including:

⁶ The distribution of information on different processes for pigs found in national Guidance was as follows: Layout from FR, DE, NL, EL, IT, PL, RO, ES, SE, handling from FR, NL, EL, IT, PL, RO, ES, SE, monitoring from NL, EL, PL, RO, ES and small slaughterhouse SOPs from EL, IT, PL, RO, ES, SE.

- Layout, positioning of unloading bays, pen shapes, personnel movement.
- Ventilation system can be natural or may include additional air exchange mechanisms.
- Floor construction, non-slip, hatched, matted or bedded [*example solution: floors are even and have solid sides and are designed so that animals cannot get trapped or trampled*].
- Noise reduction strategies such as use of plastics for barriers, rubber flooring, ceiling construction.
- Calming system such as use of back bars to prevent mounting, moving-gate race systems, dry floors to reduce reflected light, light control for resting times.

However, only a limited range of solutions was found on:

- Monitoring ventilation systems in lairage, parameters to be monitored and acceptable air quality, and temperature ranges.
- Establishing lairage and slaughter line capacity. Transport regulations and on farm guidance are used for these measurements.
- **Handling and restraining operations at slaughterhouses** – A range of solutions could be identified for this subject matter, including:
 - Use of V-restrainer with single pig delivery, single crate or group stun.
 - Methods for moving pigs by mechanical gates, pig boards use of natural behaviours such as inquisitiveness [*example solution: as pigs do not have good vision, but do have a good sense of smell, keep floors clean so that pigs do not stop to investigate and walk them from dark to light areas*].
 - Options other than use of goads for moving animal such as boards, paddles, bags.
 - Positioning of pen with options to encourage entry such as with pictures, lights.
 - Handling casualty animals, assessment and options for major and minor injury.

However, only a limited range of solutions was found on:

- Handling of foetuses although this can be found in COE documents.
- **Stunning methods for slaughterhouses** – This subject matter is well documented by all countries and in international documents and training resources. A range of solutions could be found for:
 - Monitoring systems, which must be visible and audible to the user [example solution: monitoring sheets with guidance on limits for an acceptable number of animals that are ineffectively stunned and at what level remedial actions should be taken].

However, only a limited range of solutions was available on:

- Adjustment of electrodes when incorrectly positioned.
- Use of re-stun with electrodes in the case of concerns on the effectiveness of stun.
- How to re-stun using a captive bolt in an animal which is recumbent or in boars.

It should also be noted that, for electrical head-only stunning there can be only limited options, linked to the choice of equipment manufacturer.

- **Monitoring procedures at slaughterhouses** – A range of solutions could be identified for this subject matter, including:
 - Monitoring processes.
 - Description of the role of the competent persons and the animal welfare officer.
- **Standard operating procedures for small slaughterhouses** – SOPs for small slaughterhouses follow the same design as for large slaughterhouses and guidance has been identified.
- However, only a limited range of solutions was found on how very small slaughterhouses with fewer than five operatives should carry out the checks required when the animal welfare officer is the same individual that handles, stuns and bleeds the animals.

3.2.3.3 Information gaps

The following gaps in information were identified.

While there is a good range of Member State documentation available, the majority of documents are national guides to good practice/veterinary instructions, which re-iterate the requirements of the regulation. This meets the needs of operators where the legislation explicitly prohibits specific practices, such as dragging animals, and when it requires specific practices, such as ensuring that the current achieved for electrical stunning is visible to the operator.

However, whenever the legislation is not so specific, guidance is needed. In that respect, there is a clear gap in specific guidance on (i) layout, construction and equipment and (ii) standard operating procedures for small slaughterhouses.

3.2.4 Sheep and goats

3.2.4.1 State of knowledge

Member State documents include the following information for each subject matter:

- **Handling and restraining operations at slaughterhouses**
 - Advice on how to avoid slips and falls during unloading and movement on concrete floors
 - Description of equipment of electrical stunning and restraint
 - Instructions for developing SOPs
 - Recommendations on loading procedures, stock rooms, etc.
- **Monitoring procedures at slaughterhouses**
 - Sample size calculation tool for monitoring stunning
 - Welfare risks related to electrical stunning
 - Control devices and monitors
 - Diagram for troubleshooting
 - Description of the role of AWO in SOPs
- **Stunning methods for slaughterhouses**
 - Indicators to assess the welfare outcomes
 - Indications on stunning duration recommended currents resistance

- Electrical stunning equipment
- Instructions for head-only electrical stunning
- **Slaughter without stunning**
 - General principles and instructions for restraint and bleeding-out of sheep and goats
 - General principles for inspection of unconsciousness
 - Registration form for recording emergency stunning
- **Monitoring procedures at slaughterhouses**
 - Recommendations on handling during emergency slaughter
 - Recommendations for small slaughterhouses with up to 30 LSU per week
 - Guidance on emergency killing
 - Guidance on euthanasia
 - Guidance on physiological perceptions of environmental factors (noise, eyesight, stress, fear, etc.)
- **Standard operating procedures for small slaughterhouses**
 - Recommendations for small slaughterhouses with up to 30 LSU per week
 - SOPs under veterinary inspections

Documents from international sources with relevance for sheep provide good supporting material. Some third countries such as Australia, Canada, New Zealand and the United States, also provide extensive guidance on killing sheep. Guidance on halal slaughter with stunning comes from the European Halal organisation. These guidelines will be further analysed and assessed in the next phase of the project

Key references with good guidance on practical solutions for sheep and goats are:

- Anil, M.H., Fisher, A.V. (Eds.), 2004. A Manual, Good Practices for the Meat Industry. Published by the Food and Agriculture Organisation (FAO) of the United Nations and Carrefour (see www.fao.org).
- Anil, M.H., Yesildere, T., Aksu, H., Matur, E., McKinstry, J.L., Erdogan, O., Hughes, S., Mason, C., 2006. Comparison of Halal slaughter with captive bolt stunning and neck cutting in cattle: exsanguination and quality parameters. *Animal Welfare*, 15, 325-330.
- Anil, M.H., 2012. Religious slaughter: A current controversial animal welfare issue. *Animal Frontiers* 2: 64-67; doi:10.2527/af.2012-0051. Available at: www.Dialrel.eu
- British Meat Processors Association, 2014. Guide to good practice: welfare at slaughter. Available from: www.bmpa.com
- Grandin, T., 2012. Auditing animal welfare and making practical improvements in beef-, pork- and sheep-slaughter plants, <http://www.ingentaconnect.com/content/ufaw/aw/2012/00000021/A00201s2/art00005>
- Halal Standards, Appendix I: Animal welfare regulations for the slaughter of poultry, sheep and cattle, <http://www.eurohalal.de/images/Dokumente/11%20-%20EHZ%20Halal%20Standards.pdf>

- HSA, 2004. Guidelines on the management, lairage handling, stunning/killing and bleeding of sheep and goats in commercial abattoirs. HSA 2004. ISBN 1 871561 39 2
- HSA, 2006. Best Practice Guidelines for Group-Stunning Systems <http://www.hsa.org.uk/downloads/publications/group-stunning.pdf>
- HSA, 2013. Captive-Bolt Stunning of Livestock.
- HSA, 2016. Electrical stunning of red meat animals.
- New Zealand Meat Industry, 2013. Health and safety Guidelines Meat Industry Association www.mia.co.nz/...S%20Guidelines/MIA%20H%20&%20S%20Guidelines%20FINAL
- Plevraki E. 2016. Οδηγός Ορθής Πρακτικής για την Προστασία των Ζώων κατά τη Σφαγή.
- Società Italiana di Medicina Veterinaria Preventiva, 2013: 'PROCEDURE OPERATIVE STANDARD PER IL MONITORAGGIO DEL BENESSERE ANIMALE AL MACELLO'.
- TVT, 2011. Tierärztliche Vereinigung für Tierschutz e.V.: 'Töten größerer Tiergruppen im Seuchenfall (Schwein, Rind, Schaf, Geflügel)'.

3.2.4.2 Comparative analysis of range of solutions

A summary of the range of solutions, where there is a good or more limited range of information available, is provided below.

- **Layout construction and equipment of slaughterhouses** – A range of solutions have been identified on:
 - Layout, positioning of unloading bays, pen shapes, personnel movement.
 - Ventilation system can be natural or may include additional air exchange mechanisms.
 - Floor construction, non-slip, hatched, matted or bedded [*example solution: floors are even and have solid sides and are designed so that animals cannot get trapped or trampled*].
 - Noise reduction strategies such as use of plastics for barriers, rubber flooring, ceiling construction.
 - Calming system such as use of back bars to prevent mounting, moving-gate race systems, dry floors to reduce reflected light, light control for resting times.
- **Handling and restraining operations at slaughterhouses** – Solutions include:
 - Electrical stunning in groups for a maximum of eight individuals.
- **Monitoring procedures at slaughterhouses** – Solutions include:
 - Tool to calculate the sample size for monitoring procedures regarding slaughter with stunning.
- **Stunning methods for slaughterhouses** – A range of solutions was found, including:
 - Toolboxes for monitoring procedures regarding head-only electrical stunning.

- Recommendation on indicators of consciousness during bleeding, e.g. corneal reflex and rhythmic breathing, and recording the number and percentage of animals that show signs of recovering consciousness.
- Recommendation that the efficacy of the procedures should be continuously recorded and in case signs of consciousness are seen, animals must be immediately re-stunned or stunned with an alternative method.
- Electrical stunning: measurements to assure that minimum currents for stunning the head and the body is 1A for sheep and goats is achieved through displaying requirements and recording of current and duration of application of the electrodes; tongs must be applied to achieve an electroplectic fit and indicators such as limb extension, head arched followed by relaxation must be achieved before electrodes are released.
- Accurate location for placement of electrical tongs, use of correct type of tongs that penetrate the wool for long-haired breeds.

There was a limited range of solutions available on:

- Reporting the appearance of electrodes.
- Maximum and minimum frequencies to be applied to the animal.
- Reporting the occurrence of ineffective stun.
- **Slaughter without stunning** – Solutions include:
 - Guidance on how to make the correct neck cut.
- **Monitoring procedures at slaughterhouses** – Solutions include:
 - Monitoring procedures [example solution: alarm systems when target current is not reached, checklists or SOPs listing signs of unconsciousness and signs of ineffective stun].

3.2.4.3 Information gaps

The following gaps have been identified:

- **Monitoring procedures at slaughterhouses**
 - Reliable indicators for loss of consciousness and sensibility monitoring procedures.
 - Lack of guidance on assessment of recovery and actions to be taken in case of ineffective cutting of the neck.
 - Frequency of checks of equipment and the effectiveness in operation.
- **Slaughter without stunning**
 - Mechanical restraint for non-stun slaughter.
 - Lack of guidance on assessment of recovery and actions to be taken in case of ineffective cutting of the neck. Some guidance on non-stun slaughter of sheep and goats appears to lack clear guidance on actions to be taken in case of failure of animals to lose consciousness or in case of recovery of consciousness post-neck cut. To prevent further suffering it should be required that the animal is immediately stunned and the reason for recovery of consciousness investigated, recorded and remedial measures taken before another animal has its neck cut.
 - Lack of guidance on remedial action in case of ineffective stun, i.e. immediate shooting with captive bolt and meat not used for Halal or Kosher market).

- **Standard Operating Procedures for small slaughterhouses**

- Examples of SOPs specific for small slaughterhouses.
- Examples of SOPs on avoiding pain, distress or suffering during their killing procedures and related operations.
- Guidance on stunning methods, back up methods, key parameters for effectiveness of stun (based on EFSA guidance).

3.2.5 Poultry (Chickens and Turkeys)

The following sections have not been separated into chickens and turkeys as all the information sources are aimed at poultry in general, with only some occasional mention of specific poultry categories.

3.2.5.1 State of knowledge

Member State documents include the following information for each subject matter:

- **Layout, construction and equipment of slaughterhouses:**

- Guidance on lairage layout and management.
- Checklist for compliance of the existing layout and construction and stunning equipment.
- Guidance for Animal welfare officer on planning for investment on constructions, equipment or other in order to comply with future amendments of the Regulation.
- Guidance on standard operating procedures (incl. stunning methods and electrical stunning equipment).
- Guidance on veterinary inspections in slaughterhouses according to animal welfare.
- Instructions covering all of the aspects of the requirement equipment in the slaughterhouses, aspects of the corridors and lairages construction, ventilation systems, minimal surfaces for each animal species (in different age groups).
- Guidance on the supervision over the emergency killing methods in slaughterhouses.
- Guidance on supervision of veterinary inspectors before the stunning and culling methods. Part of this instruction is related to check animal's documentation, animal health and welfare in slaughterhouses as well as the health status when the animals are arriving to the slaughterhouses (and conditions in the means of transport).
- Practical guide for welfare officer, on the protection and welfare of farmed birds for slaughter.
- Guidance on facility and equipment design, ventilation systems, fixed or portable lighting for inspection.
- Unloading, protection during waiting times, checks on welfare conditions of transport.
- Online training portal on welfare at slaughter and killing (with illustrations and video clips).

- **Handling and restraining operations at slaughterhouses:**

- Guidance on limitation of injuries and stress, good practice for hanging birds.
- Standard operating procedures for process steps from reception of poultry to cutting/bleeding.
- Example of an emergency plan for phases: poultry on the truck, poultry between hanging and stunning, poultry between stunning and cutting.
- Guidance on behavioural and physiological needs of chicken when handling them (flying behaviour, sensitivity to heat stress, etc.).
- Guidance on standard operating procedures (incl. loading, lairage, rules for animal rest before slaughtering, raceways).
- Guidance on protection of poultry during slaughter.
- Guidance on immobilization according to the method used for stunning, equipment constructed to optimize the method of stunning.
- Online training portal on welfare at slaughter and killing (with illustrations and video clips).
- **Stunning methods at slaughterhouses:**
 - Guidance on outage management, optimisation of passage of current, stress limitation, positioning of birds when they enter in the waterbath.
 - Guidance on consciousness and unconsciousness indicators, recording for stunning control.
 - Systems for individual adaptation of necessary current for stunning each chicken using an automatic shackling system, supporting the weight of the chicken in a cone (industry novel solution).
 - Guidance on use of EFSA indicators to check efficiency of stunning process.
 - Instructions related to electric head-only stunning, electrical waterbath.
 - Guidance on presentation and positioning of the suspension lines. Shackle lines, water bath entry ramps, stunning backup.
 - Assessments of unconsciousness in poultry after electrical waterbath stunning, including control measures, corrective actions, and decision trees for AWO and back up operator.
- **Slaughter without stunning:**
 - Systems with automatic shackling, supporting the weight of the chicken in a cone (industry novel solution).
 - Guidance on stunning technology that meets Halal slaughter regulations.
- **Monitoring procedures at slaughterhouses:**
 - Guidance on hazard analysis for each process step/critical control point with indication on how to manage the hazard, definition of how to monitor, frequency of monitoring, threshold values, how to document, measures in case of non-compliance.
 - Guidance on recommended indicators for monitoring of successful stunning, examples of criteria for indicators, frequency of monitoring, number of animals to be monitored, measures in case of non-compliance, documentation.

- Recommendations that checks detect at least two indicators of unconsciousness and consciousness at the time between stunning and death of the animal.
- Guidance on monitoring procedures and the role of the animal welfare officer who controls all of the aspects related to animal welfare.
- Guidance on adoption and implementation of appropriate monitoring procedures in slaughterhouses.
- Guidance on naming of the responsible person, indicators designed to detect signs of consciousness or present, when the monitoring must take place, the number of animals of each sampled, frequency of the checks.
- Guidance on checks on the efficiency of stunning, implementation of monitoring procedures describing how checks are assisting stunning efficiency.
- Procedures for monitoring the measures taken in order to ensure the welfare of the birds at the slaughterhouse.
- **Standard Operating Procedures for small slaughterhouses**
 - Standard operating procedures describing in details the following procedures: uploading, housing, immobilization, stunning, lairage, emergency killing, risk factors, frequency of checks, contingency plans in case of emergency.
 - Operative procedures to guide the farmer during the slaughtering process from an animal welfare point of view.
 - Guidance on developing SOPs on the controls during veterinary inspections.
 - Guidance on animal welfare in slaughterhouses and small capacity operators. SOPs on: ensuring that killing and related operations do not negatively affect birds, on discharge, handling, suspension birds, on stunning and bleeding, stunning efficiency, on verification, on verification inspection and maintenance of immobilization and stunning equipment, on the stunning use of equipment reserve, on emergency operations killing wounded or injured birds, immediate review imperfections.
 - Guidance on assessment of the operation of a poultry electrical waterbath stunner, including control measures, assessment of effectiveness, and decision trees for animal welfare officer and operator.
- Any other category
 - Standard operating procedures for poultry that must be killed immediately for welfare reasons or are unsuitable for hanging or cannot be cut in time after stunning and in case of emergency
 - Guidance on evaluation of animal welfare at slaughterhouses (including problems arising at the farm or during transport), Focus mainly on animal welfare problems originating on the farm or during transport, but detected at the slaughterhouse.

Key references with good guidance on practical solutions for poultry include:

- NEPLUVI, 2014. Welzijnsgids pluimveeslachterijen gids voor goede praktijken ter bescherming van het welzijn van pluimvee op de pluimveeslachterij vanaf de aankomst op het terrein van de slachterij tot en met het doden. [NL].
- FIA and CNADEV, 2016. Guide de bonnes pratiques de Protection animale à l'abattoir de volailles 2016. [FR].

- Griffiths R 2015. The Protection of Animals at the Time of Killing (PATK). Guidance for Poultry British Poultry Council.
- HSA, 2016. Electrical waterbath stunning of poultry, guidance notes 2016.
- World Animal Protection, 2015. Steps poultry (training dvd for slaughterhouse staff).

3.2.5.2 Comparative analysis of range of solutions

A summary of the range of solutions, where there is a good or more limited range of information available, is provided below.⁷

- **Layout, construction and equipment of slaughterhouses** Solutions include:
 - Optimising environmental conditions in the lairage (temperature, ventilation, humidity), with a strong focus on managing heat stress in poultry [*example solution: graphs of various temperature and relative humidity, indicating those climate conditions in which a bird's welfare is safe or in danger, such as with a combination of >30°C combined with >50% RH, information of heat loss in birds*].
 - Good design of shackling facilities, including how to minimise handling stress for poultry [*example solution: containers with birds are presented near shackling line and at the level of the shackler and close to the line to minimise distance bird is lifted with, low noise levels* and low light levels or blue light*].
 - Optimal shackle line design, including the line itself, its route through the slaughterhouse and the optimal design of shackles and breast comforters, taking into account different sizes of chickens [*example solution: Are the shape, type and size of shackles suitable for the type of poultry processed?*].
 - Optimal design of waterbath design such as adjustable height and water levels and ensuring proper entry (ramp design) for the immersion of birds [*example solution: several figures are available which demonstrate correct position of birds for waterbath immersion*].
 - Access to birds on slaughter line in case of emergencies [*example solution: easily removable panels alongside waterbath*].

**Sweden national legislation limits the noise levels in lairages to 75dB.*

There is a limited range of solutions available on:

- Establishing lairage and slaughter line capacity.
 - Optimal layout for single container handling and movement through lairage (although this may come as part of manufacturer instructions).
 - Design of breast comforters for poultry species other than chickens.
 - Monitoring ventilation systems in lairage, parameters to be monitored and acceptable air quality.
- **Handling and restraining operations at slaughterhouses** - Solutions include:

⁷ The distribution of information on different processes for poultry found in national Guidance was as follows: layout from FR, DE, NL, EL, IT, PL, RO, ES, SE, handling from FR, DE, NL, EL, IT, PL, RO, ES, SE, slaughter without stun from NL, IT, ES, monitoring from NL, EL, PL, RO, ES, small slaughterhouse SOPs from EL, IT, PL, RO, ES, SE, other from NL, EL, SE

- Proper scheduling of consignment arrivals [example solution: good communication between farm catching teams, transporters, lairage and slaughter line staff].
- Welfare checks on arrival and emergency slaughter arrangements.
- Ensuring birds are stunned properly before neck cutting/bleeding (including back up stunning procedures).
- Guidance on proper neck cut and bleeding (including back up killing procedures) [example solution: graphical illustration and photo of correct veins to cut and location of incision].
- Clear description on how to execute monitoring for signs of unconsciousness.

There is a limited range of solutions available on:

- Positioning birds for proper neck cut (especially limited for poultry other than chickens).
- **Stunning methods for slaughterhouses** - Solutions include:
 - Optimal preparation of shackles [example solution: water jets available for cleaning and wetting shackles].
 - Handling for shackling (suitability of birds, hanging on birds) [example solution: graphical illustrations of correct and incorrect handling for shackling and for using the emergency killing equipment present in shackling area].
 - Preparation of water in waterbath to ensure correct conductivity.

There is a limited range of solutions available on:

- Optimisation of current flow (including positioning and optimal state of electrodes) for head-only stunning.
- **Slaughter without stunning** – There is a limited range of solutions available on:
 - Guidance on manual bleeding for slaughter without stunning, especially for species other than chickens.
 - Guidance on monitoring for signs of absence of life (e.g. time before signs appear).
- **Monitoring procedures at slaughterhouses** – Solutions include:
 - Monitoring procedures [example solution: checklists or SOPs listing signs of unconsciousness and signs of ineffective stun].

There is a limited range of solutions available on:

- What are acceptable rates of successful stunning and neck cutting/bleeding.
- **Standard Operating Procedures for small slaughterhouses** – See next section on information gaps.

3.2.5.3 Information gaps

The following gaps in information were identified.

- **Layout, construction and equipment of slaughterhouses**
 - How to provide drinking water to poultry in containers in cases where legal lairage time is exceeded.

- Lairage design and handling of poultry that walks through a lairage (e.g. geese and ducks not in containers).
- **Handling and restraining operations at slaughterhouses**
 - How to provide feed to poultry in containers in cases where legal lairage time is exceeded.
- **Stunning methods for slaughterhouses**
 - Guidance on suitability of this method for a numbers of birds (optimal numbers).
 - Minimum current for head-only stunning for ducks and geese.
- **Slaughter without stunning**
 - Using the water bath for killing (slaughter without stunning).
- **Standard Operating Procedures for small slaughterhouses**
 - Examples of SOPs specific for small slaughterhouses.
 - Examples of SOPs on avoiding pain, distress or suffering during their killing and related operations for small slaughterhouses.
 - Guidance on stunning methods, back up methods, key parameters for effectiveness of stun (based on EFSA guidance).
- Other
 - Specific information for species of poultry other than chickens

3.2.6 Rabbits

The TOR did not require review of information of the killing rabbits in slaughterhouses but rather covered killing on farm for consumption, culling for illness or poor production or for depopulation for disease control. Rabbits for human consumption may be killed on farm or taken to slaughterhouses and the national guidelines contained information applicable to all of these situations. Therefore a section on slaughterhouses has been added. This is mostly based on the content of the national (or regional) guides to good practice and industry guidance. This information has been used to collate elements of practice to provide a range of solutions for comparison.

3.2.6.1 State of knowledge

Member State documents include the following information for each subject matter:

- **Handling and restraining operations at slaughterhouses**
 - Animal Welfare Operator: training plan, certificate of competence, and registration of the actions to be taken.
 - Guidelines on unloading of animals.
- **Stunning methods for slaughterhouses**
 - Guidance on the application of electrical stunning.
 - Guidance on use of indicators to assess the efficiency of stunning process.
- Any other category
 - Animal welfare plan to improve both production and health
 - Guidance on the methods of emergency killing to be used in case of on-farm disease.
 - Guidance on the application of anaesthetic drugs.

Key references with good guidance on practical solutions for rabbits include:

- Generalitat de Catalunya. Departament de Salut: 'Guia de Practiques Correctes d' higiene per a escorxadors de Conills a Catalunya', 2014
- Federation des Industries Avicoles: 'Guide de Bonnes Pratiques de protection animale en abattoir de lagomorphes', 2016
- Boniecki A., and Szymborski J., 2012. *Postępowanie ze zwierzętami przed i w czasie uboju (Proceedings with animals before and during slaughtering)*. Warsaw: Wieś Jutra Sp. z o.o. (pp.11-21, 22-44, 69-78)

3.2.6.2 Comparative analysis of range of solutions

A summary of the range of solutions, where there is a good or more limited range of information available, is provided below.⁸

- **Handling and restraining operations at slaughterhouses** – Solutions in this section include:
 - AWO training plan, communication with all staff involved in animal welfare, registration of Annual Plan.
 - Scheduling of consignment arrivals.
 - Welfare checks on arrival and emergency slaughter arrangements
 - Protection of animals from inclement weather conditions. (*Reducing stocking densities in crate from 75Kg/M² to 64 75Kg/M² in hot weather*)
 - Handling containers carrying animals (*containers should be handled carefully and not dropped or thrown and when moved mechanically unloaded horizontally; Ensuring the handling of the animals efficiently, calmly and expertly, using techniques and facilities and recommended taking steps to avoid the pain and reduce the stress of accidental injury animals and prevent deficiencies in the quality of meat and products*)
 - Developing contingency plans (for outages due loss of power and also for unforeseen delays in transport)

There was a limited range of solutions available on:

- Animal welfare indicators at unloading.
- Indicators for the efficiency of Annual Plans and AWO communication strategy.
- **Stunning methods for slaughterhouses** – Solutions in this section include:
 - No animal is stunned if it cannot be immediately bled.
 - How to do a sampling system to assess the efficacy of stunning (*determining a minimum number of animals to check every day each work shift; recording deviations: what happens in the case of detecting non-stun; Complete the registration form for the control of stunning, forms incidents, if any, and attach the results of the calibration apparatus; use EFSA's statistical model*).
 - How to optimize functionality of the electrical equipment (*e.g. wetting the skin of the animal, there is prevention of electrical shocks before application of stun; records the amperage (mA) and that an alarm if target amperage*

⁸ Information of various processes were found in national Guidance as follows: layout, handling, stunning methods and monitoring from IT and ES, other from ES

is not met; calibration of the minimum current (A, mA) and the minimum exposure time; the frequency of calibration equipment)

- Control of bleeding (*Bleeding during 5-10 seconds later, while on the tonic phase. Estimated bleeding, 10-12 seconds After bleeding check for numbness / death*)
- Positioning of the animal
- Checking unconsciousness (*In the electric stun, check that : First phase tonic muscular contraction (1-15 seconds): Animal rigid lifted his head and legs first bowed and then stretched No signs of respiration No Corneal reflex, no sensitivity to pain Second phase sudden movements and involuntary movement of limbs (15-45 seconds) Check for recovery using indicators: recovery of respiratory rate, corneal reflex and recovery unconsciousness voluntary movements*)
- **Monitoring procedures at slaughterhouses** – Solutions in this section include:
 - Monitoring procedures [example solution: checklists or SOPS listing signs of unconsciousness and signs of ineffective stun]

There is a limited range of solutions available on:

- What are acceptable rates of successful stunning /bleeding

3.2.6.3 Information gaps

Taking account of the elements of practice for rabbits and information from the target Member States, the following gaps in information for solutions were identified.

- **Layout, construction and equipment of slaughterhouses**
 - How the slaughterhouse layout, construction and equipment meets physiological and behavioural needs of the rabbit
- **Handling and restraining operations at slaughterhouses**
 - How to provide feed and water to rabbits in containers where legal lairage time of 12 hours is exceeded
- **Stunning methods for slaughterhouses**
 - Guidance on suitability of mechanical percussions devices

3.3 State of play for on-farm killing

Member State documentation for on-farm slaughter is scarce. The information assessed did not include any information on emergency killing for disease as there generally is detailed guidance from the competent authority as part of contingency planning. The documents and practices assessed related to culling of individual animals (for disease or injury), to depopulation at end of production, or to slaughter for direct supply for farm businesses.

Two international organisations provided specific information for on-farm killing, although not all of their guidance are compliant with the provisions of Regulation (EC) N° 1099/2009, in particular with Annex I. Firstly, the OIE provided specific information for on-farm killing (for disease control purposes) that could be applied on-farm. The OIE guide specified when restraint was necessary, based on the animal's age and killing procedures and positioning of method and the advantages and disadvantages of different killing methods. It further described different stunning methods the different species. Secondly, the Humane Slaughter Association, an NGO, provided information for on-farm slaughter for all species and has a dedicated guide to on-farm slaughter of poultry, aimed at smallholders and small scale producers.

The information these sources contain is presented in the following sub-sections, organised per species.

3.3.1 Equids

3.3.1.1 State of knowledge

Slaughter of horses and donkeys for human consumption is limited to a few Member States and information on humane killing of horse on farms is often included in advice from NGOs, such as in advice on "end of life" decisions (i.e. euthanasia). Only two EU countries refer to information for on-farm slaughter of horses. There is guidance available in Canadian and New Zealand literature.

Member State documents include the following information for each subject matter:

- Handling and restraining operations for on-farm killing
 - Guidance on technical and practical aspects of handling animals.
 - Guidance on protection of animals the time of killing.
- Stunning methods and checks for on-farm killing
 - Use of captive bolt.
 - Positioning of captive bolt.
 - Methods of pithing.
 - Assessment of unconsciousness.

Documents from international organisations and third countries include guidance on humane handling of horses and the care of compromised and unfit horses, available from the Alberta Equestrian federation. The documents from the Humane Slaughter Association provide good guidance on background physiology, equipment, techniques and safety.

Both the Equine Industry Welfare Guidelines Compendium for Horses, Ponies and Donkeys (NEWC 2011) and Ontario Care booklet on horse euthanasia on-farm provide good summaries of the issues involved in Horse euthanasia. Dealing with destruction of wild or feral horses can be difficult and a guide to humane killing from helicopters is available based on Australian experience.

Key references with good guidance on practical solutions for equids:

- Alberta Farm Animal Care / Equestrian Federation 2015. Humane handling of horses and the care of compromised and unfit horses
http://media.wix.com/ugd/6af32a_82a3515f7be94d749eb7eb4a488f33ad.pdf
- HSA humane killing of livestock using firearms. www.hsa.org.uk/humane-killing-of-livestock-using-firearms-positioning/horses-1 ;
www.hsa.org.uk/downloads/publications/captiveboltstunningdownload.pdf
- NEWC 2011. Equine Industry Welfare Guidelines Compendium for Horses, Ponies and Donkeys (Third Edition). <http://www.newc.co.uk/wp-content/uploads/2011/10/Equine-Brochure-09.pdf>
- Farm & Food Care Ontario, 2013. Horse Euthanasia – On Farm Options. Available at: www.livestockwelfare.com/wp-content/uploads/Horse.pdf
- Pestsmart 2009. Control method: Aerial shooting of feral horses Humaneness Assessment Panel. www.pestsmart.org.au/wp-content/uploads/2013/08/HOR002_aerial_shooting.pdf

3.3.1.2 Comparative analysis of range of solutions

A summary of the range of solutions, where there is a good or more limited range of information available, is provided below.

- Stunning methods for on-farm killing – Solutions include:
 - Stunning and killing methods for equids on farm [example solution: captive bolt, .25 calibre with an extended bolt for single-step euthanasia, followed by bleeding within 15 seconds].
 - Bleeding horses with a chest stick which severs all the major blood vessels as they arise from the heart [example solution: bleeding within 15 seconds with a deep transverse cut across the throat at the angle of the jaw, severing the blood vessels, trachea and oesophagus, until the blade of the knife touches the neck bones. There should be two powerful jets of blood from the carotid arteries, and a flow of blood from both the jugular veins].

3.3.1.3 Information gaps

The study found gaps in specific guidance on handling or groups of horses and restraint in un-broken (non-tamed) animals for on-farm killing.

3.3.2 Cattle

3.3.2.1 State of knowledge

Member State documents include the following information for each subject matter.

- Handling and restraining operations for on-farm killing
 - Guidance on technical and practical aspects of operating a culling procedure on farm, tips for management.
 - Guidance on permitted techniques.
 - Guidance for farmers on how and when the farmer is obligated to call for veterinary help, what kind of conditions should be provided to make animal killing fast without unnecessary pain and stress, etc.
 - Guidance on protection of animals the time of killing: planning the operation: identifying birds that will be killed, the number of infected birds, ages, and methods of killing.
 - Guidance on on-farm killing of calves and older cattle and bulls.
- Stunning methods for on-farm killing
 - Guidance on protection of animals at the time of killing with guidance on permitted methods.
- Check on stunning for on-farm killing
 - Guidance on stunning checks (e.g. absence of regular breathing, lack of corneal reflex, no reaction to external stimuli, loss of muscle tone).

International organisations such the OIE and HAS have produced a wide range of sources on handling cattle and killing on-farm. There is also useful third country guidance, such as national guidance from Australian, Canadian and New Zealand codes of cattle welfare and provincial and industry guidance, such as that produced by Dairy NZ. Having a written policy for killing animals on-farm is often part of an assurance scheme. The international standards of Global GAP make this a requirement but provide no technical guidance on how these requirements may be met. Use of captive bolt with pithing and firearms by trained personnel or lethal injection by veterinarians are the most used methods and there is good guidance available for these methods.

Key references with good guidance on practical solutions for cattle killing on-farm include:

- BCVA, 2010. *Guidance for Veterinary Surgeons on the Emergency Slaughter of Cattle*. [pdf] Available at: https://www.food.gov.uk/sites/default/files/multimedia/pdfs/publication/emergency_slaughter_cattle.pdf
- Bergh, C., 2012. *The need for monitoring farm animal welfare during mass killing for disease eradication purposes*. *Animal Welfare*, vol. 21, pp.357-361. [pdf] Available at: <http://www.ufaw.org.uk/downloads/awj-abstracts/v21-3-bergh.pdf>
- DairyNZ, *Humane slaughter. On-farm guidelines*. [ONLINE] Available at: <https://www.dairynz.co.nz/media/1805311/animal-pub-humane-slaughter-guidelines.pdf>
- DAWR, 2011. *Guidance on Meeting OIE Code Animal Welfare Outcomes for Cattle and Buffalo*.
- HSA, 2013b. *Emergency Slaughter*. [pdf] Available at: <http://www.hsa.org.uk/downloads/publications/emergencyslaughterdownload-updated-2016-logo.pdf>
- HSA humane killing of livestock using firearms.
- Jordbruksverket (The Swedish Board of Agriculture), 2009. *Official (CCA) brochures about on-farm killing of cattle*. Available at: <http://webbutiken.jordbruksverket.se/sv/artiklar/hantering-vid-avlivning-av-notkreatur.html>
- Ministry of Agriculture and Rural Development, 2013. *Practical hints for breeders in case of an urgent need for slaughter in livestock animals*. Date: 13 September 2013.

3.3.2.2 Comparative analysis of range of solutions

A summary of the range of solutions, where there is a good or more limited range of information available, is provided below.

- **Handling and restraining operations for on-farm killing** – solutions identified for this subject matter, include:
 - Animal handling in cattle crushes with easy access for immediate bleeding.
 - Animal handling [example solution: fixation with a halter or confinement in a narrow (temporary) pen].
- **Stunning methods for on-farm killing** – Solutions identified for this subject included:
 - Guidance on position and direction of captive bolt shots with appropriate charge or air pressure (including ammunition velocity).
 - Guidance on checks on how often there are mis-stuns (number of second shots).
 - Guidance on ammunition velocity, stock keeping of range of charges.
 - Guidance on of back-up equipment close to killing box and usable condition.
 - Guidance on how to minimize time from stun to stick/kill.⁹

⁹ See also section on stunning methods for slaughterhouses.

3.3.2.3 Information gaps

The following gaps in information were identified.

- Checks on stunning for on-farm killing
 - Examples of SOPs specific for on-farm killing including protocols for assessing effective stunning and killing.
 - Best methods of restraint for the different categories of animals (calves, cows, bulls) and other bovines (e.g. buffalos).

3.3.3 Pigs

3.3.3.1 State of knowledge

There is very limited specific information providing guidance for on-farm slaughter of pigs. The following sources provide some elements:

- TVT Tierärztliche Vereinigung für Tierschutz e.V. Töten größerer Tiergruppen im Seuchenfall [DE].
- Hand book for outbreaks of epizootic disease [SE].
- HSA, 2016. Emergency slaughter.

3.3.3.2 Comparative analysis of range of solutions

A summary of the range of solutions, where there is a good or more limited range of information available, is provided below.¹⁰

- Stunning methods for on-farm killing

Options for solutions in this section include:

- Stunning and killing methods for pigs on-farm [example solution: several detailed drawings of correct location and placement of captive bolt – from slaughterhouse guidance].
- Advice on proper operation of captive bolt (from slaughterhouse guidance).

There is limited information available on:

- Methods of restraint.
- Stun to stick intervals.
- Electrical stunning methods for use on-farm.

3.3.3.3 Information gaps

The following gaps in information were identified.

There is very limited specific information available that provides guidance for on-farm slaughter of pigs. Guidance on handling, restraint and killing can be extrapolated from the slaughterhouse guidance, to a certain extent (see section 3.2.3.2). Checks on stunning are not specific for an on-farm situation.

The guidance for pigs is limited in the area of on-farm killing for consumption, and for culling of small numbers of animals for welfare purposes (disease, injury).

¹⁰ The distribution of information on different processes for killing pigs on farm found in national Guidance was as follows: handling from DE and SE, monitoring from DE, IT, RO, and SE, checks on stunning (as slaughterhouse source) RO.

3.3.4 Sheep and goats

3.3.4.1 State of knowledge

Guidance on killing of sheep and goats on farm from the target Member States was provided by generic documents provided by Germany, Italy, Poland but Sweden provided guidance separately for sheep.

Member State documents include the following information

- Recommendations on handling during emergency slaughter
- Recommendations for small slaughterhouses with up to 30 LSU per week
- Guidance on emergency killing
- Guidance on euthanasia
- Guidance on behavioural characteristics and sensory perceptions of environmental factors (i.e. noise, eyesight, stress, fear, etc.) to assist handling and movement through lairage.

International documents (international organisations and third countries) include booklets provided by the Humane Slaughter Association on the Practical Slaughter of sheep and goats and on emergency killing and of killing on farm for disease. Several third countries, including Australian and USA also provide information on emergency killing on farm and also provide support for detailed guidance on killing for disease control to support contingency plans. Ontario provides a useful summary of options for killing sheep and goats on-farm. This information will be examined in detail in the next stage of the project.

Key references for the on farm killing of sheep and goats on farm and depopulation include:

- AUSVETPLAN 2015 Livestock destruction DEST 3.2 19 Jan 15
- AUSVETPLAN 2015 livestock welfare and management 12 Mar 07
- Candotti, P., 2007. Metodi e procedure operative per l'eutanasia degli animali appartenenti alla specie equina, bovina, ovi-caprina e suina. Centro di Referenza Nazionale per il Benessere degli Animali, IZSLER. [ONLINE] Available at: http://www.izsler.it/izs_bs/allegati/2250/EUTANASIA.pdf. [Accessed 23 January 2017]
- NAHMS Emergency Management System NAHEMS GUIDELINES: MASS DEPOPULATION AND EUTHANASIA USDA
- HSA 2016 Emergency Slaughter
- Ministry of Agriculture and Rural Development, Poland 2013. Practical hints for breeders in case of an urgent need for slaughter in livestock animals. Date: 13 September 2013.
- Farm & Food Care Ontario, 2015. Sheep & Goat Euthanasia – On Farm Options. Available at: <https://www.livestockwelfare.com/wp-content/uploads/Sheep-goat.pdf>
- Sutherland M, Watson T Johnson C and Millman S 2016 Evaluation of the efficacy of a non-penetrating captive bolt to euthanase neonatal goats up to 48 hours of age *Animal Welfare*, Volume 25,
- Sutherland M, T Watson, CB Johnson and S Millman (2015). Evaluation of a non-penetrating captive bolt to euthanase neonatal goat kids. Proceedings of the International Symposium of the Humane Slaughter Association, Zagreb, Croatia.

- TVT, 2015b. Tierschutzgerechtes Schlachten von Rindern, Schweinen, Schafen und Ziegen. [ONLINE] Available at: <http://tierschutz-tvt.de/fileadmin/tvtdownloads/merkblatt89.pdf>. [Accessed 23 January 2017].
- USDA 2015 Foreign Animal Disease FAD Preparedness & Response Plan National Animal Health

3.3.4.2 Comparative analysis of range of solutions

A summary of the range of solutions, where there is a good or more limited range of information available, is provided below.

- Handling and restraining operations for on-farm killing – Solutions include:
 - Handling guidance based on advice from slaughterhouse documents [example solution: extra restraint when animals are held in a group pen will improve stunning accuracy].
- Stunning methods for on-farm killing– Solutions include:
 - Stunning guidance based on advice from slaughterhouse documents [example solution: accurate location for placement of electrical tongs, correct type of tongs that penetrate the wool for long-haired breeds].

3.3.4.3 Information gaps

The following gaps in information were identified.

There is very limited specific guidance for on-farm slaughter of sheep and goats. Guidance on handling and killing can be extrapolated from the slaughterhouse guidance, to a certain extent (see section 3.2.5.2), although information on mechanical restraint on-farm is lacking and checks on stunning are not specific for an on-farm situation. There is a gap in information on culling of ill sheep and goats.

3.3.5 Poultry (Chickens, Turkeys, Ducks, Geese)

The following sections have not been separated for the different poultry species as all the information sources are aimed at poultry in general, with some occasional mention of specific poultry categories. These technical details for chickens, turkeys, ducks and geese will be assessed in the next phase of the project.

3.3.5.1 State of knowledge

Member State documents include the following information for each subject matter

- Handling and restraining operations for on-farm killing
 - Guidance on technical and practical aspects of operating a culling procedure on farm, tips for management, permitted techniques.
 - Guidance for farmers on decisions when to cull and when the farmer is obligated to call for veterinary help, what kind of conditions should be provided to make animal killing rapid without unnecessary pain and stress, etc.
 - Guidance on protection of animals the time of killing: planning the operation: identifying birds that will be killed, the number of infected birds, ages, expected growth and methods of killing.
 - Guidance on on-farm killing of poultry.
- Stunning methods for on-farm killing
 - Guidance on protection of animals at the time of killing with guidance on permitted methods.
- Check on stunning for on-farm killing

- Guidance on checks on effectiveness of stunning (e.g. absence of regular breathing, lack of corneal reflex, no reaction to external stimuli, loss of muscle tone) and assessment of death.

Among **international sources**, the booklet Practical Slaughter of Poultry from the Humane Slaughter Association provides extensive guidance on killing chickens, turkeys, ducks and geese.

Key references with good guidance on practical solutions for poultry are:

- HSA 2013, Practical Slaughter of Poultry - A guide for the smallholder and small-scale producer (<http://www.hsa.org.uk/downloads/publications/hsa-practical-slaughter-of-poultry.pdf>)
- Istituto Zooprofilattico Sperimentale delle Venezie, IZSV: Piccole Produzioni Locali, 2015.
- Martin JE, McKeegan DEF, Sparrey J and V Sandilands 2016 Comparison of novel mechanical cervical dislocation and a modified captive bolt for on-farm killing of poultry on behavioural reflex responses and anatomical pathology Animal Welfare 2016, 25: 227-241 ISSN 0962-7286 doi: 10.7120/09627286.25.2.227

3.3.5.2 Comparative analysis of range of solutions

A summary of the range of solutions, where there is a good or more limited range of information available, is provided below.¹¹

- Handling and restraining operations for on-farm killing – There is a limited range of solutions available on:
 - Handling and minimising stress for poultry for direct supply on-farm
 - Stunning and killing of poultry (especially turkeys, geese and ducks) for direct supply on farm
- Stunning methods for on-farm killing – Solutions include:
 - Cervical dislocation of poultry [example solution: graphical illustration and photo of correct position of bird and hands for this method]

There is a limited range of solutions available on:

- Use of penetrative captive bolt for different poultry species on-farm
- Stun to stick/kill intervals

3.3.5.3 Information gaps

The following gaps in information were identified.

- Checks on stunning for on-farm killing
 - Examples of SOPs specific for on-farm killing including protocols for assessing effective stunning and killing

3.3.6 Rabbits

3.3.6.1 State of knowledge

Member State documents include the following information for each subject matter:

- Handling and restraining operations for on-farm killing

¹¹ The distribution of information on different processes for killing poultry on farm found in national guidance was as follows: handling from DE, IT, PL, RO, SE, stunning methods from IT, PL, RO, and checks on stunning from RO.

- Guidance on catching and restraint for culling, depopulation or slaughter for direct supply.
- Stunning methods for on-farm killing
 - Guidance to meet and assess compliance with the requirements laid down in Annex I of Regulation 1099/2009.
 - Key parameters for stunning method: penetrative captive bolt.
 - Key parameters for stunning method: non-penetrative captive bolt.
 - Key parameters for stunning method: head-only electrical stunning.
 - Key parameters for stunning method: cervical dislocation.
 - Key parameters for stunning method: percussive blow to the head.

Key references for good practices for the killing of rabbits on farm include:

- Generalitat de Catalunya. Departament de Salut: 'Guia de Practiques Correctes d'hygiene per a escorxadors de Conills a Catalunya', 2014
- Federation des Industries Avicoles: 'Guide de Bonnes Pratiques de protection animale en abattoir de lagomorphes', 2016
- Humans Slaughter Association 2013 Emergency Slaughter (<http://www.hsa.org.uk/downloads/publications/emergencyslaughterdownload-updated-2016-logo.pdf>)

3.3.6.2 Comparative analysis of range of solutions

Distribution of information on different processes for killing rabbits on farm found in national guidance was as follows: guidance from both France and Spain had information on rabbit handling, stunning methods and checks on stunning.

A summary of the range of solutions, where there is a good or more limited range of information available, is provided below.

- Handling and restraining operations for on-farm killing – Solutions in this section include:
 - Gentle handling of the animals to avoid : (a) strike (b) exerting pressure on places particularly sensitive to the body of the animals in a way that causes them avoidable pain or suffering (c) to lift the animals by the head, ears, tail or fleece or manipulate in a way that causes them pain or suffering (d) to use stings or other sharp instruments (e) twisting, crashing, or breaking the tail of the animals or seize them on the eyes
- Stunning methods for on-farm killing – Solutions include:
 - Presence of back-up equipment close to killing site and in usable condition
 - Check unconsciousness
 - Regular checking of number of second shots (for captive bolt)
 - Check appropriate charge or air pressure
 - Guidance on how to minimize time from stun to stick/kill

3.3.6.3 Information gaps

The following gaps in information were identified.

- Handling and restraining operations for on-farm killing
 - Assess injuries and damages in animal's body and assess the pain

- Stunning methods for on-farm killing
 - SOP: The actions to be taken when there is an indication that rabbits show a risk of recovery of consciousness (alert threshold exceeded).
 - The recovery of rabbits should be monitored and threshold level set when further action is to be taken. There is lack of information on the threshold level to be set and the actions to be taken.
 - Examples of SOPs specific for on-farm killing including protocols for assessing effective stunning and killing.

3.4 Conclusions

The effort to identify and collect laws, national, provincial, industry and NGO guidance and information from competent authorities and stakeholders of the ten target Member States was very effective. It risked the omission of information present in other Member States. However, this is likely to be minimal as the scope of all these guides was similar across countries and followed the requirements of Regulation 1099/2009.

There were some variations relating to references to national legislation e.g. lairage stocking densities in Sweden and testing of novel systems in Germany.

There were considerable differences in style and detail. Sometimes, advice was provided in the form of added figures, photos or template for checklists, SOPs and forms. The content often reflected OIE advice and also used or made reference to the well-illustrated HSA guidelines. Some Member States/Provinces have published separate guides dedicated to a species (poultry, pigs, rabbits, ungulates). Such guides contained more detailed guidance on compliance with EU rules. The team has noted a wide-ranging source of (online) training material that has been available in Sweden.

Available guides to good practice produced by national industry organisations tended to contain more elements of good practice, some of which went beyond the requirements of EU rules. These guides may aim to meet additional elements in quality assurance standards.

Guidance from (international) organisations was variable in the extent to which it provided practical guidance. These sources tended to give the better range of good practices when they were dedicated to a species or a type of killing method (e.g. HSA guides to waterbath stunning of poultry, captive bolt stunning). Many of these sources provided good visual guidance in the form of figures, diagrams photos and videos, especially when there had been a good link between industry and the organisation.

There were only a few target Member State guidelines to killing on farm for injury, poor production of local consumption and depopulation. Rather, when discussed, these issues were presented in technical terms and as part of slaughterhouse guides. Therefore, there was no presentation of information targeted at farm staff. International guides such as those published by the OIE, HSA and third countries (e.g. AVMA, DairyNZ) tended to address techniques, advice on decision making, and advice for the care of the operators conducting challenging tasks. Some third country industry guidance contained useful information on strategies for improving and maintaining welfare and/ or different ways of monitoring handling and stunning performance (e.g. CCTV with assessment audit by an independent reviewer).

There was limited information from the Member States on slaughter without stunning for cattle, sheep and goats and poultry, especially with regard to methods of restraint and actions to deal with failure of the methods used. However, some third countries had detailed information. Some Member States and some third countries described systems of electrical pre-stunning which were acceptable for Halal production.

Some guides to health and safety in slaughterhouses also contained useful advice on animal welfare (BPMA and MIA), especially with regard to design and specification of lairage and restraint equipment for both ease of use and safety of operators and the comfort and security of the animals.

There was a broad range of very good source material in some third countries.

3.4.1 Equids

Only a few of the target Member States had national guides dedicated to good practice for **equids**. There was a good range of solutions on design, operation and management of captive bolt stunning and assessment of unconsciousness, and on stun-to-stick intervals. Gaps included a lack of specific guidance on slaughter without stunning, dealing with foetuses, handling of groups of horses and restraint in un-broken animals.

Very little species-specific guidance on good practice for on-farm killing of **equids** was found, although guidance on killing in slaughterhouses could also be applied to on-farm slaughter. Most guidance available was on handling and technical parameters for stunning. A lack of specific guidance on handling of groups of horses and restraint in un-broken animals for on-farm killing was identified.

3.4.2 Cattle

With regards to information on good practices for **cattle**, there was a good range of solutions for design, operation and management of design of facilities and handling cattle, captive bolt stunning and electrical stunning. However, a lack of specific guidance on ventilation in lairage, on slaughter without stunning, on handling and restraint of calves and on guidance for small slaughterhouses was identified. These were not the only gaps identified: the review also identified a lack of specific guidance for species of cattle other than beef cattle and dairy cows (such as buffalo), and guidance on actions to be taken in case of failure to loss of consciousness or recovery of consciousness post-neck cut and on mechanical restraint for non-stun slaughter.

With regards to information on good practice for on-farm killing of **cattle**, there was very limited species-specific guidance, although guidance on killing in slaughterhouses could also be applied to on-farm slaughter. Most guidance available was on handling and technical parameters for stunning. There was limited specific guidance for on-farm protocols for assessing effective stuns and kills, and on methods of restraint for different categories of cattle.

3.4.3 Pigs

The team located a good range of solutions for design of lairage suitable for **pigs** as well as good practice on operation and management of captive bolt stunning, functioning of electrical equipment and assessment of unconsciousness. However, there were gaps in specific guidance on ventilation in lairage, on dealing with foetuses and on guidance for small slaughterhouses.

There was very limited species-specific guidance on good practice in on-farm killing of **pigs** although guidance on killing in slaughterhouses could also be applied to on-farm slaughter. Most guidance available was dealing with handling and technical parameters for stunning. There is a paucity of guidance specifically designed for small farm businesses that kill pigs for consumption and for culling of small numbers of animals for welfare purposes (disease, injury).

3.4.4 Sheep and goats

A good range of solutions for most elements of killing **sheep and goats** in slaughterhouses was found, on lairage and mechanical restrainer including bleeding for non-stun slaughter. There was some good practice information related to the use of computers to ensure correct current is provided during head stunning, but less guidance on setting target failure rates and providing actions required in case of failure. The research identified a lack of guidance on actions to be taken in case of failure to loss of consciousness or recovery of consciousness post-neck cut and on mechanical restraint for non-stun slaughter.

With regards to information on good practice for on-farm killing of **sheep and goats**, there was very limited species-specific guidance, although guidance on killing in slaughterhouses could also be applied to on-farm slaughter. There was also a lack of specific guidance for on farm culling of moribund, ill sheep and goats.

3.4.5 Poultry

The guides for good practices for **poultry** had a good range of solutions for design, operation and management of waterbath stunning, including handling and shackling of poultry and monitoring of stun and back-up procedures. There was a lack of specific guidance for species of poultry other than chickens, a lack of information on slaughter without stunning and a lack of guidance for small slaughterhouses.

There was very limited species-specific guidance for on-farm killing of **poultry**, although guidance on killing in slaughterhouses could also be applied to on-farm slaughter. Most guidance available focused on handling and technical parameters for stunning, while there was a lack of guidance for small farm businesses and specific information for species of poultry other than chicken.

3.4.6 Rabbits

Only a few of the ten Member States had national guides dedicated to good practice for **rabbits**, and there was a paucity in guidance for rabbits from industry sources, NGOs and international organisations. The information was assessed as applicable to killing in slaughterhouses as well as to on-farm culling and/or killing for production for human consumption.

There was a good range of solutions on operation and use of captive bolt and electrical methods, but less information on the additional methods used on-farm, such as penetrating percussion, cervical dislocation and percussive blow to head.

4 Deliverable 4 (1): Consultation results

4.1 Descriptive results

326 organisations were invited to participate in the three consultations. Of these, 50 organisations submitted 84 contributions to all three consultations using the online survey software. Additionally, 12 contributions were also submitted via e-mail, some of which were complementary to on-line submissions. Table 2 depicts the response rates for each consultation.

Table 2. Response rates

Consultation	Stakeholders invited	Responses submitted	Response rate
On-farm killing	146	47	32%
Slaughter without stunning	119	30	25%
Slaughterhouse operations	223	32	14%
Total	491¹²	101	21%

Table 3, Table 4 and Table 5 provide the breakdown of responses per stakeholder group, for each of the consultations. These numbers represent both the submissions under the online survey software and the responses received via e-mail. The full list of respondents is provided in 0.

¹² 491 invited were sent to 326 different organisations.

Table 3. Responses per stakeholder group – On-farm killing

Stakeholder	Responses	Not started	Total
Animal welfare organisations	6	5	11
Farmer organisations	9	60	69
Industry	0	2	2
NCP	21	17	38
Official veterinarians	5	9	14
Scientific support and experts	6	6	12
Total	47	99	146

Table 4. Responses per stakeholder group – Slaughter without stunning

Stakeholder group	Responses	Not started	Total
Animal welfare organisations	5	6	11
Equipment manufacturer	1	9	10
Industry	2	35	37
NCP	10	5	15
Official veterinarians	2	7	9
Religious organisations	5	20	25
Scientific support and experts	5	7	12
Total	30	89	119

Table 5. Responses per stakeholder group – Slaughterhouse operations

Stakeholder group	Responses	Not started	Total
Animal welfare organisations	5	22	27
Equipment manufacturer	1	7	8
Industry	2	114	116
NCP	15	22	37
Official veterinarians	1	12	13
Scientific support and experts	5	9	14
Third countries	3	5	8
Total	32	191	223

The comments received from these consultees were substantial, as presented in Annex 7. Very few industry organisations and farmers' organisations contributed, in spite of the efforts made to encourage their participation into the process. This was partially mitigated by the fact that some consultees in scientific support centres have very strong links to industry and have contributed to the production of national or sectoral guides to good practice.

The difficulties encountered in reaching out to industry can be linked to the size of the task. Some consultees indicated to ICF that they considered the task to be unreasonably large. A number of people that ICF contacted indicated that they would not participate to the consultation unless compensated for their time. This feedback suggests that similar concerns could have resulted in non-participation by a larger

pool of people. It was clear also from the data collected that a number of consultees started responding to the consultation but did not finish their submission. The process illustrates the challenge of collecting feedback on such material.

Another obstacle, also inherent to the task, was language. Whilst it might reasonably be expected that experts from some of the target organisations would be able to engage with a consultation designed completely in English, language might have been an obstacle for many of those contacted, and particularly slaughterhouse operators and farmers. ICF identified and invited more than 180 contact persons and organisations from these groups across the EU-28.

Timing has likely played a role, in that the timeframe for the consultation was more constrained than would have been desirable.

One last element might have contributed to limiting the number of responses obtained. A couple of consultees indicated that they were concerned that the drafts might encourage practices in their Member State or their sector that they see as undesirable and refused to participate as a result. Other consultees might have made the same decision for similar reasons, although feedback was not provided by most of those consultees who did not agree to contribute.

ICF conducted a number of follow-up calls and email requests for additional information and asked for additional information from 11 consultees from various stakeholder groups: official veterinarians, religious organisations, and scientific support and experts. Consultees were contacted by email to clarify their comments and, where possible, to indicate references to any guidance documents supporting their views. Follow-ups helped identifying additional information that has been considered for the revision of the consultation drafts.

4.2 Overall views on the drafts

The documents were well received overall. With the exception of the drafts on slaughter without stunning prescribed by religious rites, all drafts were judged to be of good quality by a majority of the respondents in terms of how accurate the information was, the economy of the documents, their communicability, whether they provide sufficient information, and their scope (see following sub-section). At the same time, the comments received, even when positive, highlighted how the hybrid nature of the documents may have caused some confusion among consultees. A number of comments and concerns signalled that consultees understood the documents as guides to good practice. Seen from that perspective, consultees made three sets of comments, depending on their point of view and interests:

- Some consultees raised questions on the apparent inconsistencies and contradictions present in the text. A guide would not include numerous "options" for, for example, intervals between stunning and sticking. It would not offer various options for electrical parameters of stunning either, especially in areas where there is scientific evidence that certain parameters work better than others.
- Similarly, a number of consultees questioned why the "guide" was selective in the issues it covered. Although the rationale for addressing only certain issues and techniques was explained at the inception of the consultation, consultees wondered why there were no sections on use of a firearm on farm, or CO₂ stunning in slaughterhouses, or pithing and bleeding on farm and in slaughterhouses. As they are designed, the documents would be poor guides as they are missing important information that end users would need.
- Some consultees expressed concern that this "guide" would generate new obligations for operators, as it would likely be used by enforcers as well as end users. This included concerns from religious authorities that a guide including information on stunning methods for slaughter without stunning prescribed by

religious rites would effectively run against practices accepted in certain religious communities.

These concerns have been reflected in the revision of the drafts and the manner in which they are presented to end users. A disclaimer has been added to all documents, indicating that they are not a guide nor are legally binding.

The comments also indicate that consultees saw opportunities to improve the drafts by:

- Revising their structure: for example by: separating the slaughterhouse cattle and horse document into two separate documents; producing a shared section for all mammals where common information could be stored; distinguishing clearly good practice information for birds in containers and birds that are loose housed;
- Simplifying them: for example, reducing the length of text; removing control tables; increasing the number of images;
- Increasing the consistency between the drafts by relying on a single source for some sections (in particular the sections on monitoring signs of unconsciousness)
- These comments have been taken into account for revising the elements for best practices, particularly to reduce repetition across the documents.

4.3 Assessment of the drafts through closed questions

Basic rules for on-farm killing of cattle and responses to the closed questions from the consultation provided indications of consultees' perceptions on the main criteria used by ICF to develop the drafts.

Only a very small minority of respondents were able to indicate additional good practice to be included in the documents on on-farm killing and slaughterhouse operations. This suggests that the documents put to consultation provided a good coverage of existing EU practices. Almost half the respondents indicated that additional guidance is available on the various practices for religious slaughter: this included provisions not related to animal welfare, and non-EU sources. One consultee brought to the team's attention international and third country Halal standards used for reference by operators exporting their products to Muslim third countries. Unfortunately these sources were not made available to the study team by their authors, and they could not be reviewed.

In most instances, respondents gave positive feedback on text and images, and indicated that they provided an accurate description of good practices. There were cases of more mixed feedback, in particular for text and pictures about:

- On-farm killing, and specifically pig handling and restraining and verification of stunning; stunning of rabbits, and poultry handling and restraining and stunning.
- Slaughter without stunning prescribed by religious rites
- Slaughterhouse operations, specifically handling and restraining of cattle and horses.

Respondents tended to agree with how practices had been qualified as either "Unacceptable", "Acceptable", "Good", or "Best". They gave positive feedback on most documents, although there were mixed to negative views about the classification of:

- Handling and restraining practices for on-farm killing of pigs and poultry; and
- All religious slaughter practices (with the exception of bleeding operations for sheep and goat, which received positive feedback)

Sufficiency

Respondents thought most documents provide enough information for end users to understand and implement the good practices, although consultees for the religious slaughter drafts had mixed views on all documents.

Scope

Respondents gave positive feedback on the level of detail of consultation of most documents, but expressed mixed views about some sections on religious slaughter. Specifically, consultees had mixed views on practices for mechanical restraining, pre-cut and post-cut stunning of cattle and stunning of poultry in the context of religious slaughter. Some consultees were concerned about the animal welfare disadvantages of electrical waterbath using derogatory parameters and non-penetrating captive bolt stunning. Others were concerned about the contradiction between religious laws and stunning.

Economy

Across all documents and sections, a majority of respondents indicated that none of the information was unnecessary or made the documents more complicated than they could be.

Communicability

Overall, respondents believed that documents were fit to be shared and interpreted by those doing the job (business operators, animal welfare officers), although there were mixed views about some sections:

- sheep and goats;
- Specific rules on on-farm stunning of horses; and
- Specific rules on non-stun killing of all species.

Detailed feedback on the different consultation drafts is provided in A4.1. This includes also information on the manner in which those comments were responded to by the study team.

4.4 Comments on pictures

Detailed comments were received on the pictures presented in consultation drafts. This included recommendations for revisions of existing pictures, and requests for additional pictures. Many comments were generic requests for additional pictures, while other were more specific requests. A detailed list of comments is provided in A4.2

4.5 Conflicting views

There was significant disagreement between consultees and the study team who drafted the documents, or among consultees themselves, on some sections of the drafts.

Documents on slaughter without stunning prescribed by religious rites were the most disputed. In many cases, religious organisations disagreed with the content of the consultation drafts and indicated that some of the practices contradict religious requirements. However, the requirements cited by consultees were often specific to some religious communities. For example, some mentioned the requirements for the ritual cut to include the oesophagus and trachea. The poultry industry expressed also concerns that such a document would create new obligations to the industry, which themselves would be based on a very limited number of sources (given that the team could only identify and review very few good practice documents to inform the drafting of the slaughter without stunning documents).

Many conflicting comments concerned **pre-cut** and **post-cut stunning**. On pre-cut stunning, respondents who disagreed with the content of consultation drafts (including religious organisations) indicated that this practice is not accepted by some religious communities.

Some consultees agreed with the draft text on post-cut stunning, while others raised concerns on animal welfare issues associated with the technique or other related aspects of ritual slaughter. For example, a consultee indicated that prolonged consciousness shown by animals is often due to animal welfare issues before the cut (such as the incompetence of the religious slaughterer), which should be tackled rather than resolved with post-cut stunning. Similarly, another consultee stated that a well-performed bleeding ensures that the animal collapses quickly, without the need for a post-cut stun.

NCPs, animal welfare organisations and scientific support institutes referred to the risks of poor stunning associated with the use of non-penetrative captive bolt as a method for pre-cut and post-cut stunning of bovines. These respondents proposed to revise the classification of this practice as "acceptable" (or "unacceptable"), instead of "good". For example, a respondent cited the high percentage of ineffective stuns associated with the use of a non-penetrative captive bolt. These concerns were widespread.

There were also views on mechanical restraining methods, and particularly on the relative merits of upright and rotating stunning pens, which reflect the broader debate in the field on these methods.

There was also disagreement on the electric parameters for waterbath stunning of poultry. For example, two NCPs indicated concerns that, in reality, the parameters used for ritual slaughter differ from those presented in the consultation drafts, and that they often result in poor stun quality. Since the parameters provided in the drafts originated from existing voluntary standards rather than the regulation, there were concerns that those would be inadequate to achieve an effective stun.

The poultry on-farm document was another cause of disagreement among consultees. Feedback on the qualification given for **percussive blow to the head** (currently rated as "acceptable") varied significantly between respondents. Some wrote that it should be considered a "good" practice as it renders a bird immediately insensible, or that it should be considered a "good" practice in certain circumstances i.e. in smaller herds or for bigger birds. Other comments deemed it to be "unacceptable" as currently described, citing the need for a great deal of skill and experience to execute it correctly and national regulation (WATOK in the UK) that specifically bans the practice in poultry.

5 Deliverable 4(2): Elements of best practices – Slaughterhouse operations

This section provides text for Deliverable 4 – Elements of best practices.

Elements of best practices are not of legally binding nature and do not affect the requirements of the EU legislation on protection of animals at the time of killing or other relevant pieces of legislation. Nor do they commit the European Commission. Only the Court of Justice of the European Union is competent to authoritatively interpret Union law. The reader is therefore invited to consult this section in connection with the relevant provisions of the legislation and refer, when necessary, to the relevant competent authorities.

5.1 Introduction

The welfare of animals is recognised as an important issue by the European Union and the Member States. **Animals should not experience avoidable pain, stress, or suffering.** The welfare of animals should be ensured at all times, but especially at the time of killing. Good welfare standards contribute also to the quality of the meat and to the safety of all who work in slaughterhouses. When animals are subject to minimum stress, the quality of the meat is enhanced. There is also a better and safer relationship between animals and people.

In 2009, the European Union adopted Regulation (EC) N°1099/2009 on the protection of animals at the time of killing. The Regulation aims to achieve good standards of animal protection at the time of killing and related operations. The Regulation lists a number of principles and rules that **business operators, animal welfare officers, and slaughtermen** need to understand and apply. In recent years, controls in Europe have found some slaughterhouse practices that are in breach of the Regulation. As a result, the European Commission has produced this guide to better inform **business operators, animal welfare officers** and **slaughtermen** about their obligations and how to comply with them. The recent Commission audits have indicated that information on best practices is particularly needed in certain areas such as the slaughter of animals in small slaughterhouses (poultry and mammals), the development of the respective animal welfare standard operating procedures and the slaughter of poultry using electrical waterbath stunning.

What you will find in this document

This document covers specific areas where the European Commission identified the need for good practice guidance: (a) **layout, construction and equipment**, (b) **handling and restraining operations**, (c) **stunning methods**, (d) **monitoring procedures**, and (e) **standard operating procedures for small slaughterhouses**. For each of these areas, the document discusses what the legislation requires. It includes good practice examples that can be found in existing national or sectoral guides, voluntary standards, and in slaughterhouses operating under commercial conditions. When applicable the guide presents the advantages and disadvantages of the practice. This will help you to choose what practice suits you most.

In this document,

- **UNACCEPTABLE** practices are forbidden by law.



- **ACCEPTABLE** practices are authorised or required by law and provide **limited animal protection**.



- **GOOD** practices are authorised or required by law and provide **good animal protection**.



- **BEST** practices are authorised or required by law **and** (a) provide **enhanced animal protection**, or (b) they provide **other benefits** (for instance: they are more practical, or more cost-effective).



This document is structured by species (equids and cattle, sheep and goats, pigs, and poultry), with a first section containing text applicable to all mammals. For each species, the document is structured into 5 sections: layout, construction and equipment of slaughterhouses; handling and restraining practices; stunning; monitoring procedures at slaughterhouses; and SOPs for small slaughterhouses.

5.2 Shared section for all mammals (equids, cattle, sheep and goats, pigs).

This section includes information applicable to all mammals discussed. For details specific to individual species, please refer to each species' section.

5.2.1 Layout, construction and equipment of slaughterhouses

The design of pens, passageways, ramps and bridges contributes significantly to animal welfare. Animals can move independently in well-designed slaughterhouses. As a result, they experience reduced stress. They are also easier to handle. The work of operators is greatly facilitated and made safer. Well-designed facilities also prevent animal injuries. Various good practices are discussed in national or sectoral guides, and voluntary standards.

5.2.1.1 Flooring

Flooring must be **non-slippery, easily cleanable** and **kept clean**, in order to prevent injuries.

Appropriate flooring materials include: roughened concrete; concrete with abrasive additives, such as laser inserted metal studs; non-slip metal floors, for example with durbar pattern of tread or with laser inserted metal studs; resin screeds covering the floor in at least a 1cm thick layer to prevent break up; rubberised flooring materials.

You should ensure that floors have an **effective drainage system**. As a result, there will be no pools of water on the floor, which might distract the animals. Drains can be situated on the sides of the passageways and pens to reduce balking. You should ensure that drains have appropriate covers: this prevents animals from trapping their feet into the drains and injuring themselves.

5.2.1.2 Slopes

Steep slopes can slow down the movement of animals. They can lead to falls and injuries. Flooring should be **as flat and as even as possible** across the whole lairage or slaughterhouse. Recommendations on maximum slope inclination vary by species (please refer to the species section). For slopes with an inclination of more than 10° you should include foot battens (raised transversal bars running across the width of the ramp) to prevent slipping. At unloading bays the ramps should be at the same level as the trucks to achieve minimal slopes. There should be as few steps or interruptions in the path as possible.

5.2.1.3 Width and design of passageways

You should ensure that passageways are wide enough for the animals to move in them following their natural behaviour. Passageways should allow animals to move in groups and have no sharp turns. Animals will stop moving if there is a sharp corner or a dead-end in a passageway. Curved passageways in an S shape help prevent this issue: these work well with cattle, as well as for horses and pigs. There should be as few sharp curves as possible in passageways, and no right angles.

Animals will move more willingly if they can see each other. You should design passageways that have a constant width. Single races should be covered by anti-mounting bars.

5.2.1.4 Gates

Gates should be designed to facilitate the movement of the animals and to secure them in a given area. Therefore, it is important that gates do not allow animals to escape, or to become trapped. Gates should be properly maintained and kept in good condition.

5.2.1.5 Avoidance of sharp and pointed objects

No sharp ends or pointed objects should intrude into passageways, ramps, or pens, because they could cause injuries to the animals. Drinkers can cause injuries unless they are incorporated into sides and walls.

5.2.1.6 Prevention of sudden noises in the slaughterhouse

Animals dislike sudden noise. Sudden noises may cause them to panic: as a result they may not move easily or quickly. They may also injure themselves. Noise in lairage areas can be due to vocalisation of animals and people or equipment (air compressor, air curtain). You should keep animals calm. Do not allow any shouting or banging of paddles. Use flags instead.

There are a variety of options to prevent or reduce sudden noises from the movement of animals and closing gates.

Prevention of metal to metal contacts

You should identify metal to metal contact points in ramps, passageways, bridges and pens. You may then use rubber or another synthetic material on one of the surfaces.

Use of sound reducing designs and materials

You may use plastic for the sides of ramps and gates to prevent noises. Ceilings can also be designed to prevent noises. Low ceilings are better than high ceilings in that respect, however low ceilings also mean reduced air flow and poor ventilation.

Location of noisy activities and separations

Where possible activities that make a lot of noise, such a truck washing, should be conducted at sufficient distance from the animals.

Shape of the roof

The shape of the roof may contribute to the noise level, particularly in the lairage. A gable roof (inverted V shape) will contribute to more noise in the lairage than a saw-tooth shaped roof. Saw tooth roofs can also be used to increase natural lighting.

5.2.1.7 Light

Animals will move more easily from dark areas to lighter ones. They dislike bright lights, however, and these should be avoided. Direct sunlight should be avoided as it creates dark shadows and scares the animals. You should pay attention to this notably for the unloading of animals.

In the lairage, you should ensure that lighting is **uniform** and **diffuse**. Overall lighting level should be sufficient to enable inspection (for example, at 200 lux). You should have suitable artificial lighting as a replacement should natural lighting prove insufficient. During the night, you should dim lighting to facilitate sleep patterns. Dimming should be done with a dusk/dawn approach in order to minimise stress when the lighting is changed. You should prevent light from being reflected, either by walls, pools of water, metal objects, or the clothes and caps of operators. You should preferably use dark colours for all structures and equipment, including for protective clothing. If you use glass in the slaughterhouse, it should be frosted glass. **Emergency lighting should be available in case of power failure.**

5.2.1.8 Distractions

Animals may not move calmly if they are distracted by people, noise or objects. Distractions may stop the movement of the animals. Their nervousness may increase. They might turn back and push. To avoid distractions and facilitate animal movement: passageways should have high solid sides; flooring in the lairage and in passageways should be made from the same material; drains should not be placed across passageways but at the side; shadows and reflections on the floor should be avoided; draughts blowing in the faces of the animals should be avoided; people should not blocking passage or within the field of vision of the animals. The layout of the slaughterhouse should allow operators to move without interrupting the animals. You can detect distractions by viewing the passageway at animal level.

5.2.1.9 Facilitation of inspections and response to emergency

In waiting pens, it should be possible to inspect all animals, even when pens are full. For this purpose, you should have corridors between pens or overhead walkways. You should provide sufficient natural or artificial light to enable inspection of all animals. At unloading, you may plan to keep animals on the unloading bay long enough for inspection of each animal (for example, for 10 seconds or more). However, you may also inspect animals as they move or rest. It should be possible for people to enter pens and remove animals easily and quickly in case of emergencies.

5.2.1.10 Water supply

Animals in slaughterhouses should not suffer from thirst. You should house animals only in pens where water can be provided. When animals have been transported long distances sufficient drinkers should be available to allow all of the animals to drink on entering the pen. In areas where a drinker system is not available, you should provide water in buckets. Water should be available at all times.

Watering systems should not injure the animals or limit their movements. Water supply system in pens should take account of: the behaviour of the animals; the hydration state of the animals; the number of animals; and the animal species.

You should allow for a maximum peak flow of water consumption for the pens. You should maintain the water system. Bowl and drinkers should be rust-free and easy to clean. You should regularly check the functionality of the drinker before the pen is filled with animals.

5.2.1.11 Layouts for waiting pens

The lairage should be divided into the appropriate number of pens and pen sizes for the category of animals being delivered. You should keep together animals raised in groups on farm and transported together. This will help reducing aggressive behaviours.

Your lairage should enable you to separate animals from different categories.

The layout should take account of the animals' physiology, behaviour and field of vision. Animals should each have the space to stand, lie, and turn around.

You should construct pens with **level floor**. Animals should not risk being trampled or trapped. Pens should be easily cleaned and disinfected. They should be equipped for water and feed. If the animals are housed outside, they should be protected from weather (shelter or shade). If there are no protections those spaces should not be used when the weather is bad.

Different layouts for waiting pens exist, such as **square** or **narrow long** pens, **individual** or **collective** pens. Pens that have at least two opening sides are easier to use for the operators. When pens have two gates they can be emptied rapidly by one operator entering the pen at one gate and use the second gate for animals to exit. Pens that open in a continuous line and avoid sharp turns are easier on the animals, as they provide a simple route to follow from arrival to the stunning area. Passageways in between the pens should allow for operators to inspect the pen from at least two sides. Overhead inspection walkways can also be useful.

5.2.1.12 Ventilation systems

A common problem for animals in lairage is heat or cold stress. To address this issue you must ensure adequate ventilation in the lairage. Ventilation is used to adjust temperature, humidity, and the concentration of harmful gases (ammonia, CO₂) in the space where animals are resting. You may ventilate the lairage by: **mechanical** means: fans, air conditioning system, heating system; or **natural** means: opening and closing doors and windows and air vents in walls or roofs. **You should monitor air quality, when necessary measuring and recording levels of temperature, humidity and ammonia.** Values should appear on readable screens for **frequent monitoring**. You may usefully program **alarms** (sound, or light, or both) in case the ventilation system fails or air quality deteriorates. The alarm system should be able to function even if there is a power failure (an emergency generator should be provided). You should have a **contingency plan** in place to respond if air quality deteriorates. You may, for example, rapidly change the stocking density in the lairage. Should mechanical ventilation equipment fail, alternative (natural) means of providing ventilation must be available. You must ensure the frequent maintenance of equipment and facilities following supplier instructions and manuals. This includes fixing the ventilation systems to function with minimum levels of noise and to keep minimum levels of dust.

5.2.1.13 Maximum capacity for the lairage

You should ensure that animal density in the lairage is compatible with the well-being of the animals.

- Assess what the maximum density of the lairage may be; and
- Ensure that the maximum density is not exceeded at any time.
- Assess the stocking density of each pen during operations and during rest period.

The maximum stock density in the lairage will vary with the category of animal and the length of time the animals will be held. Existing good practice recommendations vary depending on whether animals stay for more than 3, 6 or 12 hours in the lairage. To assess the maximum density of the lairage, you should consider the need for animals to stand, lie down, turn around and access drinkers easily. National and sectoral guides to good practice provide various recommendations on the space that should be allowed for different categories of animals (see species section).

To estimate the maximum capacity in the lairage you should **also** take into account:

- The categories of animals to be housed
- The floor area of the holding pens in the lairage
- The environmental conditions and ventilation available in the lairage

- The type and number of drinkers available in the lairage
- The type of flooring in the lairage for sleeping arrangements
- The behaviour of the animals

You should establish lairage capacity by category/weight and sex of animal for each and every pen. You should set rules for the daytime and the nighttime. Once established you should label each pen with maximum and minimum stocking rates taking into account the following space allowances, as well as the date and time of arrival. Pens for the segregation of animals must be available when needed.

5.2.1.14 Maximum speed of the slaughter line

You can establish the maximum capacity of the slaughter line by considering: the number of ramps; the way the delivery of animals (unloading) is organised; the capacity of the waiting pens; the capacity and abilities of the operators who drive the animals to stunning; the speed of animals that can be achieved with acceptable methods (limited goading); the type of restraining used; the capacity of the stunning systems.

5.2.1.15 Restraining equipment and facilities

You should closely restrain animals for stunning. You must not under any circumstance restrain a conscious animal by: suspending or hoisting it; clamping or tying its legs or feet; severing its spinal cord; immobilising it with an electric shock.

These practices are forbidden and unacceptable.



The method of restraining depends on the speed of the slaughter line. You should consult the manufacturer's instructions to ensure that the restraining and stunning equipment is used for the right categories of animals and weights. No animal should be placed in the restraining equipment unless the slaughterman is ready to stun it. The team for monitoring stunning, hoisting, and bleeding should also be ready before the animal is restrained. All restraining facilities should allow the operators to: have good access to the animal for stunning; monitor the animal after they are stunned; remove the animal in case of emergency. You should not leave an animal in the restraining system during breaks or shut-down periods. Different options exist for restraining animals before stunning them. These can be found in the sections specific to different species.

5.2.1.16 Electrical stunning equipment

You should purchase only stunning equipment that includes instructions for use and maintenance. This equipment should be intended for use on the animal you are stunning.

You must ensure: display and record of the details of the electric parameters for each animal stunned (amperage, duration of the stun); Clearly visible and audible warning if the duration of exposure falls **above** or **below** the required level; Automatic electric stunning equipment associated to a restrainer shall deliver a constant current.

The equipment should be maintained so that: all cables and insulation show no signs of external damage; electrodes are clean and sharp, and both sides are uniformly worn. Hand held electrodes have sturdy handles and firmly fixed electrode holders. The devices are stored in a safe and dry location. Transformers should be waterproof. The equipment for emergency slaughter should have sufficiently long cables to be taken to animals that need to be stunned and killed in an emergency. All animals can be reached, including in transport vehicles. There is always well-maintained back-up equipment available.

5.2.2 Handling and restraining

Poor handling of animals will increase levels of stress, making animals more difficult to handle, and can cause bruises and bone breaks. Poor restraining can also lead to inefficient stunning and killing. As a result, animals may experience avoidable pain, distress and suffering. Poor handling also puts handlers at risk.

5.2.2.1 Handling

You should not under any circumstance attempt to move an animal by: striking it; kicking it; putting pressure on sensitive parts of the body; lifting the animal by the head, ears, legs, tail, or fleece; handling animals in such a way as to cause them pain or suffering; using an electric shock or sharp instrument to encourage the animal to move (except for adult bovine animals and adult pigs); twisting, crushing or breaking the tail of the animal; or holding the animal by the eyes.

These practices are **forbidden and unacceptable**.



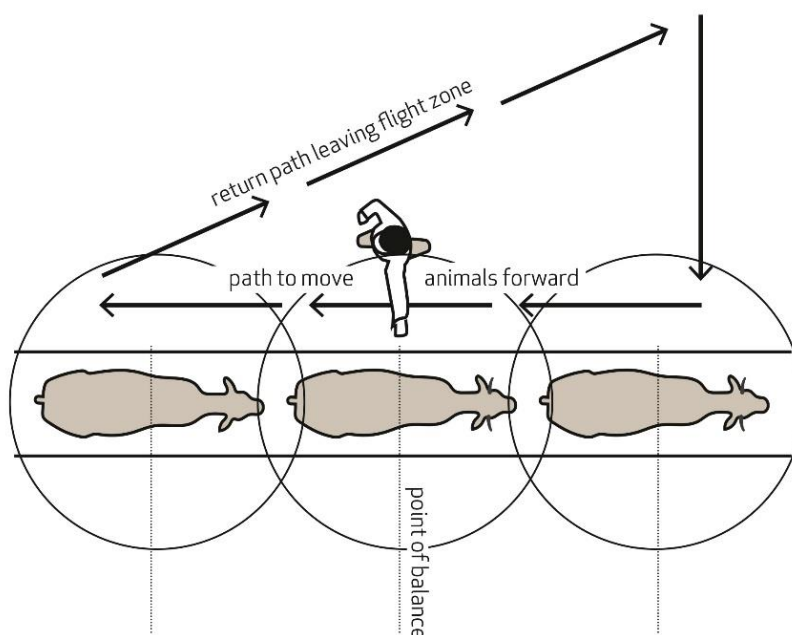
Effective, sympathetic handling of animals avoiding undue noise is essential. You should handle animals with calm, patience, confidence and vigilance. Where possible, you should keep the animal with the rest of the group, and separate them only for restraining. Operators should be dressed in dark clothing when moving the animals.

Before you try moving the animal, you should always ask yourself: **“Is the animal able to bear its own weight on all four feet? Can it move without pain or walk unassisted?”**

Injured animals may not be able to move easily or without pain. **You should not try to move them.** Stun and kill them where they are as quickly as possible. Animals that are **able to move** can be encouraged to walk if you enter their **flight zone**: a circle of space around the animal. If you enter into the animal’s flight zone it will move away from you. The animal will go where you want it to go if you enter the flight zone at the right point and at the right distance from the animal. You should make slow but deliberate moves.

The point of balance is the point at which the animal does not move. It is usually at the animal’s shoulder. The animal will move forward if you stand behind the point of balance. It will go backward if you stand in front of the point of balance. An operator can encourage animals in a single raceway to move forward by moving rapidly in the opposite direction (Figure 2).

Figure 2. Handler movement to move animals forward into a single raceway¹³



The flight zone varies also from animal to animal. It depends on how much the animal is used to being with people. Dairy or halter trained animals may have no flight zone at all. Meat animals or unbroken horses may react at several metres or a considerable larger distance.

Some animals may need to be guided individually.

You may use Closed Circuit Television (CCTV) at unloading, in the passageways and in the lairage to monitor operator behaviour and encourage correct practices. This is not a requirement from the Regulation.

5.2.2.2 Good practices specific to unloading

When animals are unloaded, the main problems observed are due to rushing the process, a poor design of unloading areas, or to the skills, behaviours and attitudes of operators. The unloading phase is critical for animal welfare. This is a good time to inspect and assess the immediate needs of the animals (are they lame, sick, or weak?). It is also a good time to assess whether they can be slaughtered (are they clean or dirty?).

You should consider how long it takes to unload the animals. Animals should not wait too long before they are unloaded. You can minimize the waiting time by planning deliveries through agreements with suppliers and other hauliers. Animals that cannot be unloaded immediately should be protected from bad weather conditions. This includes weather that is too hot, too cold, too wet, too dry, or other extreme conditions. You should also ensure that they receive adequate ventilation. The animals could have been exposed to heat stress from high temperatures, and/ or high levels of humidity during transport. If that is the case, you should cool them with showers and/or fans. You should also give them access to water. All animals should be able to drink at the same time.

¹³ Image drawn from original material published by AVMA. Source: "AVMA Guidelines for the Humane Slaughter of Animals: 2016 Edition" Link: <https://www.avma.org/KB/Resources/Reference/AnimalWelfare/Documents/Humane-Slaughter-Guidelines.pdf> Produced with permission from AVMA (July 2017).

Each batch of animals / consignment should be inspected by the Animal Welfare Officer, or another competent person in small slaughterhouses, to assess their welfare and take the appropriate action to prevent sick or injured animals from suffering. Sick or injured animals that are suffering from severe pain, or have large, deep wounds, severe bleeding, or a severely disturbed general condition are slaughtered immediately. All other weak, sick or injured animals are put aside and either killed and disposed of or slaughtered rapidly. They can be moved to an emergency slaughter area using a suitable mobile platform. However, you should do so only if that does not involve any unnecessary suffering. You may also bring sick animals to a **hospital pen** in the lairage for a longer period of time, only on the instruction of a veterinarian, and if they are not visibly in pain, and no deterioration of their condition is expected. Animals should only be brought to the hospital pen if they will receive appropriate treatment there.

Animals that are not weaned, lactating animals, pregnant animals, animals born during transport or delivered in containers should have priority for slaughter. If it not possible to do so, then suffering should be minimised by: milking dairy animals at least every 12 hours; providing adequate conditions for young animals and welfare of new-borns; providing water to animals in containers (e.g. with buckets). Animals that appear or are likely to be aggressive should be identified. They should then be lairaged separately. Different groups should not be mixed up.

With view to **pregnant animals**, EFSA Panel on Animal Health and Animal Welfare has published in May 2017 a scientific opinion on the "Welfare aspects of the slaughter or killing of pregnant livestock animals (cattle, pigs, sheep, goats, horses)"¹⁴. The opinion includes actions to be taken when a pregnant animals is delivered at slaughter depending on the various points in time when pregnancy is detected i.e. i) in the lairage area, when the dam is still alive; ii) during evisceration, before uterus is opened, iii) during evisceration, after the uterus is accidentally opened within 30 minutes of killing of the dam and iv) in the lairage area, when the dam gives birth there.

5.2.2.3 Good practices specific to lairaging

All animals that are not directly taken to slaughter should be taken to the lairage for rest. When animals do not rest well, they become excited, or aggressive. As a result, they may harm one another. Excited animals are also more difficult to move to stunning, and might require additional restraint before they can be stunned. By contrast, a good resting phase contributes to keeping the animals calm. Animals can then be taken to stunning easily and quietly, with minimum stress and effort for both animals and staff.

In this phase: you should be attentive to the behaviour of the animal; you should understand the principles of caring for animals and how they may apply in the slaughterhouse you are working in; you should put in practice your training on how to handle animals humanely. Animals must be given food and bedding if they stay for more than 12h in the lairage. It is good practice to evaluate the needs of the animals taking account of their last opportunity to feed and to provide feed and bedding. Some Member States require **all animals** to be fed if they spend more than 6 hours in the lairage.

You should: plan feeding schedule in relation to slaughter time; have emergency supplies of fodder and bedding available. For animals that remain in the lairage, you should leave them where they have been housed. Do not move them from one location to another within the lairage. **You must not tie animals by:** nose rings; animals should not have their legs tied together.

These practices are forbidden and unacceptable.

¹⁴ <https://www.efsa.europa.eu/it/efsajournal/pub/4782>



When tied, ties should: be strong enough not to break; allow animals to lie down, eat, and drink; be designed so as to avoid any danger of strangulation or injury; be designed so as to allow quick release.

The welfare of animals in the lairage should be assessed at least twice every 24h. The animal welfare officer (> 1000 Livestock units U / year) or a person who has appropriate competence (at ≤ 1 000 livestock units / year) should carry out the inspection.

5.2.3 SOPs for small slaughterhouses¹⁵

The Regulation (EC N°1099/2009) requires that business operators carry out the killing of animals and related operations in accordance with Standard Operating Procedures (SOPs). SOPs should be written so as to spare animals any avoidable pain, distress or suffering during their killing and related operations. SOPs are written instructions. Their **purpose** is to ensure that practices are **consistently good across the slaughterhouse**. They should allow you to **monitor the performance** of the plant. They allow you also to **identify areas where improvement is required**. As such they are **an aid to improving your business**.

They should contain information **specific to your plant**. For example, a generic SOP may advise that a back-up captive bolt gun is kept close to the killing box. An SOP for your plant will state exactly where it is kept. SOPs should contain a step-by-step description of each activity. You should make them available to the Competent Authority upon request. SOPs should cover all of the themes from the Regulation and the different operations from unloading to bleeding. In particular, you may provide SOPs for the following themes: Unloading; Lairaging; Movement of animals to stunning; Restraining of animals for stunning; Stunning and monitoring of signs of consciousness; Shackling / hoisting; Sticking / bleeding and monitoring of signs of life; Maintenance of the equipment (restraining and stunning); Emergency procedures; Records.

SOPs should contain information on: Who is the person carrying out the task; Who is the person reviewing practices and ensuring that necessary improvements are implemented; What is the task (in sufficient detail); What should be checked; How often the checks should be carried out; What should be done in case a problem appears; What records should be kept.

For stunning, the Regulation requires that your SOP should: Take into account the manufacturers' recommendations; Define for each stunning method used the key parameters to ensure effective stunning; Specify which measures are to be taken when the animal has not been properly stunned and presents signs of consciousness, or life. SOPs should be up to date and regularly reviewed. Existing national or sectoral good practices provide different models for SOPs. Some SOPs present in a single document all the elements for a single species. For example, an SOP might indicate key issues under the following headings: Scope and objectives; List of the staff involved; Scheduling of slaughter ; Unloading; Lairaging; Movement to stunning; Restraining; Stunning (Key parameters / Verification of stunning / Response to inefficient stunning / Back-up stunning); Sticking/bleeding; Maintenance of the equipment (restraining and stunning); Emergency procedures. Other SOPs are defined specifically for one of the phases or themes listed above. SOPs may be presented only as text, or a combination of text, pictures, and decision trees. SOPs that include pictures and decision trees are more accessible than SOPs relying only on text, and should be preferred. SOPs often contain checklists. These can be used to record key

¹⁵ Small slaughterhouses are defined as slaughterhouses that kill less than 1000 livestock units of mammals per year (article 17.6 of Regulation (EC) N°1099/2009).

welfare indicators and allow a review of the plant's performance. It can provide **good evidence of how well you have protected the welfare of animals in your care.**

5.3 Equids and Cattle

This section should be read jointly with section 5.2, shared section for all mammals.

5.3.1 Layout, construction and equipment of slaughterhouses

This section provides good practice information for layout, construction and equipment of slaughterhouses. It should be read in conjunction with text applicable to all mammals, at section 5.2.

5.3.1.1 Slopes

Recommendations on maximum slope inclination vary, from a maximum of 10°, to a maximum of 20°, or, alternatively, 26° for the unloading ramp. Cattle are more willing to move up a gentle incline.

5.3.1.2 Width and design of passageways

At unloading cattle can be led into a passageway where they may walk side by side. Passageways should preferably have constant width. Raceways may be fitted with backstop gates positioned every 5 or 6 animals. When using backstop gates, it is important that they are positioned and operated so as not to trap, injure, or put pressure on the animals. The end of the race must have a stop gate before the stun box.

You may use **solid, smooth** and **opaque** sides in passageways and raceways, to avoid injuries and distraction. The sides of ramps, pens and passageways should be high enough: from a minimum of 1.30-1.50m high for cattle, to more than 1.60m, and ideally 2m, for shy animals not used to handling. The sides of the last section of the race to the stunning box should be solid to limit the view of the animal: from 1.20m for races used for calves to 1.80m for large bovines or mixed slaughter lines.

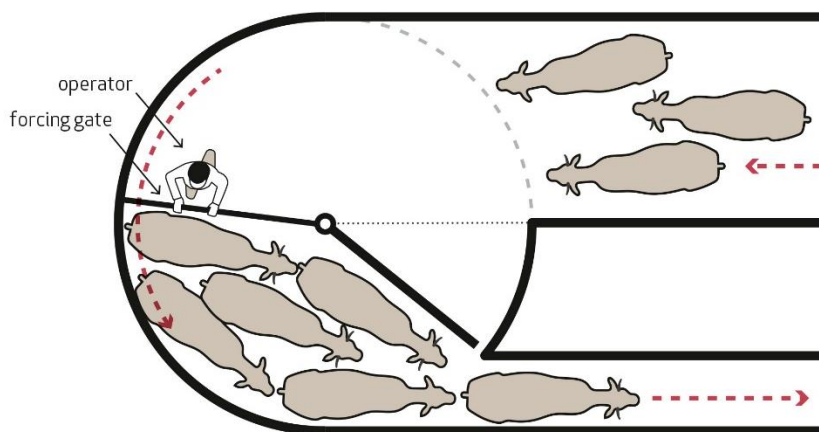
In passageways you may use **lighting** to **facilitate animal movement**. In the race leading to the stunning area, you may keep the last metres (at least 7m) slightly uphill and dark. The strongest source of light should be next to the stunning box. Thus, when the box's gate will open, the animal will be attracted to the light and will enter more willingly into the box.

Well-designed passageways can facilitate the transition from a large passageway into a single row before restraining and stunning. Different options exist.

Crowd pen

A crowd pen, also known as a "forcing pen", consists in a circular space, generally a full half-circle. It has two solid gates: one remains static while the other is moved by an operator to push animals into the single race / the entrance to the restrainer. In order to be effective, the race should not appear as a dead-end. It should be straight or bend only after a sufficient length of race. Otherwise the animals will not enter willingly into the single race.

Figure 3. Crowd pen design with cattle



Advantages

- A crowd pen facilitates movement by relying on the natural behaviour of the animals.
- This system reduces stress by keeping a group of animals together.
- It requires only minimal operator intervention.
- This design is easy to install and maintain.

Disadvantages

- Animals may get crushed or mount each other if the gate is moved too quickly.

This design constitutes **good practice**.



Curved raceway

A curved raceway works well with cattle, to encourage them to move into a single row. This design relies on the natural behaviour of cattle to move back toward where they came from. You can encourage the animals to move into the race by using flags.

Advantages

- A curved raceway facilitates movement by relying on the natural behaviour of the animals.
- This system reduces stress by keeping a group of animals together.
- It requires only minimal operator intervention.
- This design is easy to install and maintain.
- Animals do not risk getting crushed or mount each other.

Disadvantages

- You need to allow sufficient space for a sufficiently long curved raceway.

This design constitutes **best practice**.



5.3.1.3 Layouts and design of waiting pens

For cattle, the sides of pens are preferably **open**. This allows animals to see each other. As a result, animals will be calmer in the lairage, and for moving to the stun

pen. Sides may be fully open, with bars spaced every 0.20m, and 0.35 between the ground and the first bar: this prevents animals from passing their head or limbs through. Bars enable natural ventilation, which is preferable in warmer countries. For cows, beef steers, heifers and veal calves, you may also use a solid section up until 1.20m, and horizontal bars above.

Solid sides are preferable for horses.

The lairage should be divided into the appropriate number of pens and pen sizes for the category of animals being delivered. You should keep together animals raised in groups on farm and transported together. This will help reducing aggressive behaviours. Your lairage should enable you to separate animals from different categories: bulls – in individual pens; young bovines – in individual pens or together in a collective pen; cows and calves – in collective pens; stallions – in individual pens; injured or sick animals – in a “sick pen” or “hospital pen”, ideally situated in a quiet area.

Different layouts for waiting pens exist, such as individual pens or collective pens.

Individual pens:

You may house animals in individual pens equipped for water and feed supply. This is notably recommended for bulls and stallions and to prevent fighting between the animals. Some national guides recommend the following sizes for pens. However, **bigger pens may be preferable depending on the size of the animal**. The recommended sizes are: a generic sized pen for all animals (0.85m x 2.65m / alternatively 0.8-0.9m x 2.2-2.3m) and a larger size for large animals that weigh more than 700kg (1m x 2.65m). The larger pens should not be used for animals of less than 700kg weight, as they might turn around in them. Passageways leading to the individual pens should be wide enough (for example, 2m). Both passageways and pens should have a slight slope (for example, 2%). This will enable urine to flow away and facilitate cleaning.

Animals should exit the pens into a single passageway (indicative width of 0.85-0.9m). The gate of the pen is usually opened from outside the pen for the safety of operators. Closing the gate behind the animal can be a risky operation. For cattle (but not horses), you may include **backstop gates** that will close automatically behind the animal after it has entered the pen. The exit gate of the individual pens should be solid (up until 1.40m) to prevent distractions between the animals exiting the pens and those that are in them.

Various designs of individual pens can be observed in slaughterhouses. The following pictures provide examples of two layouts. In this instance layout 1 is preferable: the entry and exit from the pen is easier, as **curves are less sharp**.

Figure 4. Example of layout for individual pens with cattle (layout 1)¹⁶

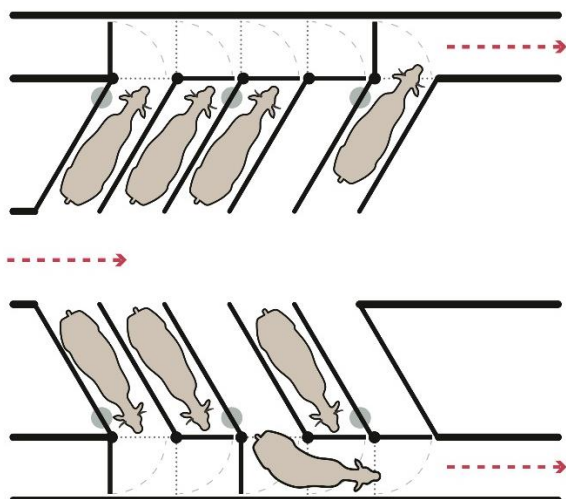
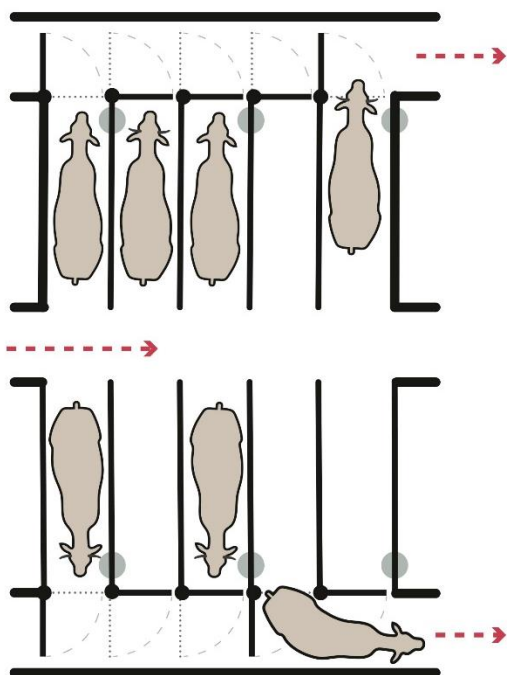


Figure 5. Example of layout for individual pens with cattle (layout 2)¹⁷



Advantages

- Animals are separated and cannot fight
- Animals can see each other

¹⁶ Image drawn from original material published by Interbev. Source: "GUIDE DE BONNES PRATIQUES. Maîtrise de la protection animale des bovins à l'abattoir. Version 3.0 – Novembre 2013" Link: http://www.interbev.fr/wp-content/uploads/2014/04/GBP_maitrise-protection-bovins-abattoir.pdf. Produced with permission from Interbev (June 2017).

¹⁷ Image drawn from original material published by Interbev. Source: "GUIDE DE BONNES PRATIQUES. Maîtrise de la protection animale des bovins à l'abattoir. Version 3.0 – Novembre 2013" Link: http://www.interbev.fr/wp-content/uploads/2014/04/GBP_maitrise-protection-bovins-abattoir.pdf. Produced with permission from Interbev (June 2017).

Disadvantages

- Animals cannot move
- This design constitutes **good practice**.



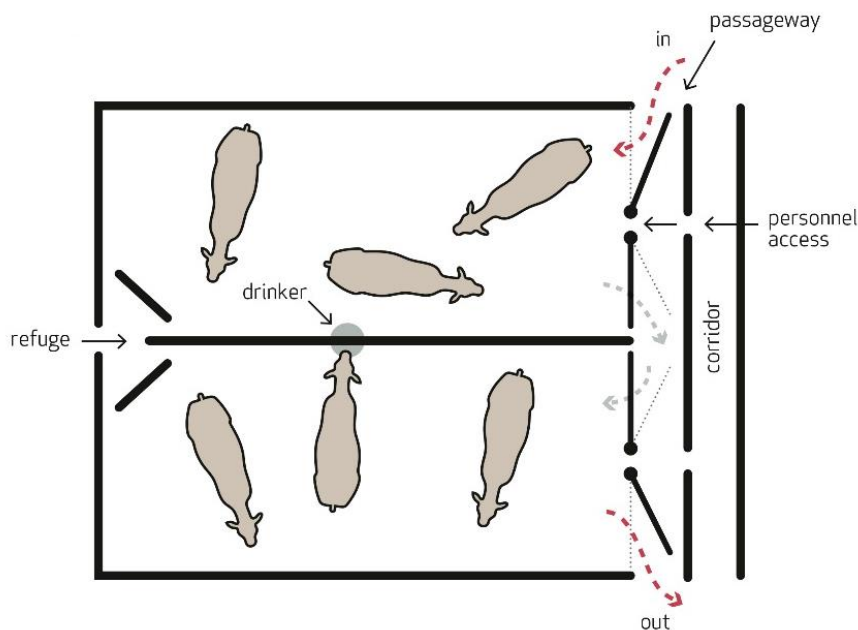
Collective pens

Collective pens are used principally for cows, beef steers and heifers and veal calves. They may be used for groups of bulls, which have been raised together in a pen and transported together. Calves less than 8 weeks may be penned individually. A slight slope will enable urine to flow away and facilitate cleaning.

The pens should be equipped with refuges for operators to protect themselves from the animals. Each pen should be equipped with two drinkers. The drinkers should be situated at appropriate heights (for example, a height of 0.55m for calves and 0.65m for cows). Alternatively, there should be at least one drinker per 6 animals.

Various designs of collective pens can be observed in slaughterhouses. The following pictures provide an example of square pens. Collective pens organised in a "fishbone" layout may also work well as they have no right angles.

Figure 6. Example of layout for collective pen with cattle¹⁸



Advantages

- Animals stay together as a group
- Animals can move freely

Disadvantages

- Animals from different rearing groups may fight if mixed together in a collective pen.
- This design constitutes **good practice**.



¹⁸ Image drawn from original material published by Interbev. Source: "GUIDE DE BONNES PRATIQUES. Maîtrise de la protection animale des bovins à l'abattoir. Version 3.0 – Novembre 2013" Link: http://www.interbev.fr/wp-content/uploads/2014/04/GBP_maitrise-protection-bovins-abattoir.pdf. Produced with permission from Interbev (June 2017).

Control Procedure: See Annex Table A2.1.1.1

5.3.1.4 Ventilation systems

Control procedure: see Annex Table A2.1.1.2

5.3.1.5 Maximum capacity for the lairage

Table 6. Lairage density recommendations for cattle and equids (various sources)

Bovine	Density
Adult bovine	550kg: 1.4-1.5 m ² (<3h); 1.8-1.9 m ² (>3h) 700kg: 1.6-1.7 m ² (<3h); 2.0-2.2 m ² (>3h) Alternatively: ≥2 m ² per animal ≥2.3m ² if horned ≥1.5 m ² per animal <150kg ≥1.7 m ² per animal <220kg ≥1.8 m ² per animal >220kg
Horses	≥1 m ²
Calves	200kg: 0.7-0.8 m ² (<3h); 0.9-1 m ² (>3h)

5.3.1.6 Restraining equipment and facilities

You should closely restrain horses and cattle for stunning. This is especially the case for use of a penetrative captive bolt gun. That is because the gun must be in contact with the animal's head.

Different options exist for restraining cattle and horses before stunning them. **This section discusses options used for captive bolt stunning only.**

Crush or narrow pen

You can confine animals that can be moved in a crush or narrow pen. This will give you easy access to the head.

Advantages

- The animal is confined.
- There is minimal discomfort for the animal.

Disadvantages

- This may not prove sufficient to restrain some animals.
- The head needs also to be restrained for stunning.

This restraining method constitutes **good practice**.



Head collar and lead rope, halter, or bridle

You may use a head collar and lead rope, halter or bridle, which is secured to restrict movement of the head of both cattle and horses. This method may not be sufficient for unbroken horses. All halters, head collars and other equipment used to restrain or handle horses should be fitted with a method of quick release in case the animal becomes entangled in the equipment.

Advantages

- This enables stabilizing the head of the animal for stunning, including that of animal that cannot be moved and need to be stunned were they are.
- There is minimal discomfort for the animal.

Disadvantages

- This would not be sufficient to restrain a difficult animal.

This restraining method constitutes **good practice**.



Twitch

You may also add a twitch for very difficult horses.

Advantages

- This may prove effective for stabilizing the head of very difficult animals.

Disadvantages

- This causes discomfort to the animal.

This restraining method constitutes **acceptable practice**.



Conveyor systems

You may use a conveyor system to restrain **calves** progressively as they are moved forward to stunning. **This system is not suitable for other categories of cattle or for horses.** Conveyor systems are automated and require minimal handling. Conveyor systems include a solid hold down rack to ensure that animals cannot see in front of them until they are fully restrained. This helps keeping animals calm. Animals can be moved to the foot of the restrainer as a group, or individually. The former is preferable: animals are less anxious when not separated from the group. However, there should be sufficient space between the animals so that one animal's head does not rest on another animal's back.

Different kinds of conveyor systems exist: V-shape with two belts, which grip the animal from both sides, and central track conveyor, which supports the belly of the animal.

V-shape restrainer

A V-shape moving restrainer consists of two conveyor belts that are set in a V shape. The animal is held between each belt. The belts support and press on the animal at the same time.

Central track restrainer

A central track restrainer supports the animal belly, between two vertical solid slides or rails. As animals move down into the chute, a smooth track passes between their legs and supports their weight. They are carried gently on the central conveyor. As the conveyor takes them forward, slides are adjusted to press on each side of the body.

Figure 7. Central track conveyor entrance with calves¹⁹

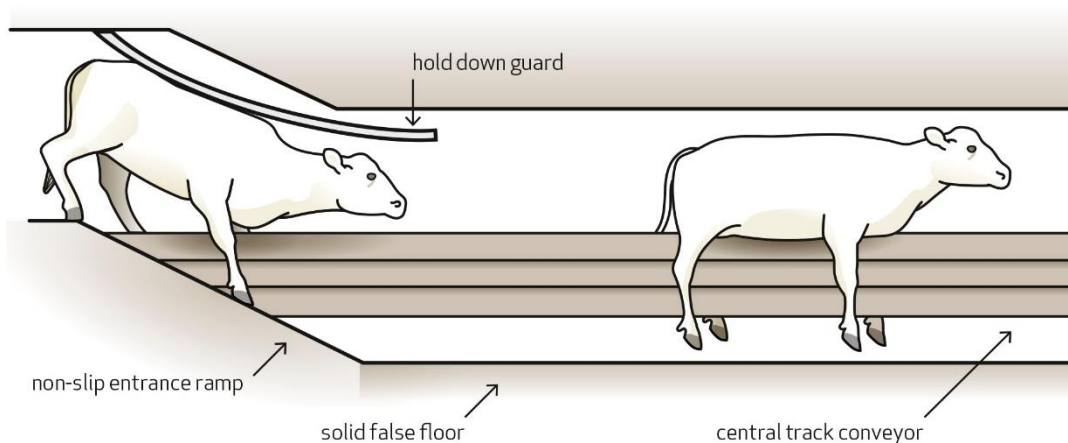
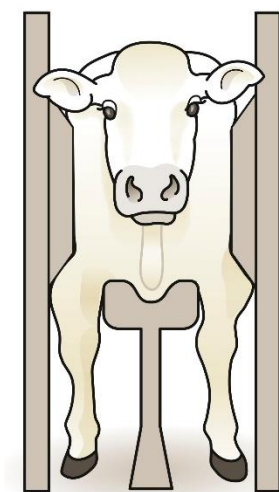


Figure 8. Central track conveyor: calf in restrained position²⁰



Advantages

- Animals are more comfortable in conveyor belt restrainers than in static restrainers.
- Conveyor belt systems require little handling of the animals. They are safer for workers than boxes.
- Conveyor belt systems require only short restraint until stunning.
- Animals can be loaded as a group into a conveyor system. This is less stressful for the animal than individual loading.
- The animal cannot move forward or backward.
- This enables a high rate of slaughter.
- The speed of the conveyor can be adjusted to the method of stunning.

¹⁹ Image drawn from original material published by Temple Grandin. Source: "Central Track Conveyor Restraint for Beef Cattle" Link: <http://www.grandin.com/restrain/new.conv.rest.html>. Produced with permission from Temple Grandin (July 2017).

²⁰ Image drawn from original material published by Temple Grandin. Source: "Central Track Conveyor Restraint for Beef Cattle" Link: <http://www.grandin.com/restrain/new.conv.rest.html>. Produced with permission from Temple Grandin (July 2017).

Disadvantages:

- Animals have to be restricted to single file before entering the conveyor;
- The handler must be able to assist moving the animal onto the conveyor;
- Both handler and stunner operator must have access to emergency stop button;
- Small animals could risk injuries from falling through in a V-shaped system;
- Separating animals from the group can be challenging;
- Slaughter operation can be slowed down affecting throughput;
- Conveyor systems are costly to purchase and maintain;

This restraining system constitutes **good practice**.



Individual restraining box

Individual restraining boxes are suitable for both cattle and horses.

The box must restrain the animal in an upright, standing position. It should accommodate and/or be adjusted to fit the size of the animal, and prevent the animal from turning. This may have a single restraint bar to provide greater control. You should put only one animal at a time in the box.

The animal may enter the box at the end of a ramp or corridor. There should be no need to push or prod the animal. Instead, **the animal should enter the box willingly**. Animals will **not** enter willingly if:

- It is dark – there should be light in the box.
- It is noisy – noise around the box should be limited.
- The floor looks suddenly different – a false floor similar to the box's floor can be installed 1.5m before the entrance.
- It looks like a dead end – empty space can be left beyond the box and is visible from the entrance.
- There are reflections – the box should not have reflective material.
- The entrance is too small for the animal to go through easily – the door should be designed for the category of animals it is used for.
- The operator is visible at the other end – the operator should wait on the side until the animal has been restrained.

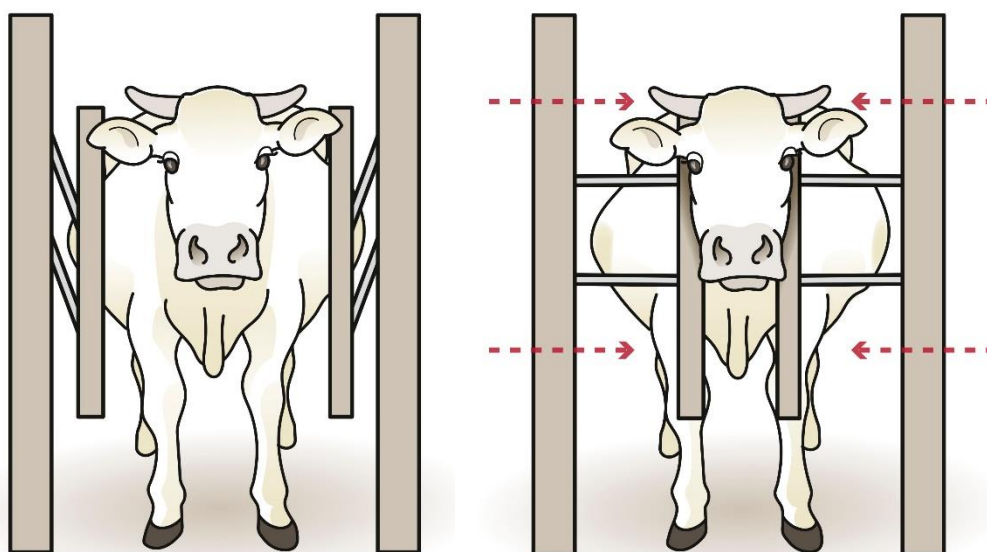
You may lead some horses into the box using a halter. The box should have solid walls and an opening for the animal's head. It should have non-slip flooring.

Various box designs exist. Some include passive or active restraint of the head, including **chin-lift** and **neck-yoke**. **Those work well with cattle but must not be used with horses.** The chin lift can be raised manually, electrically, or using chains until **the head is parallel to the floor**. The chin-lift supports the head. It stretches also the neck for the cutting. Once the animal's head is restrained, the back pusher can be released.

Figure 9. Example of chin-lift for restraining cattle²¹



Figure 10. Principle of a neck-yoke for restraining cattle²²



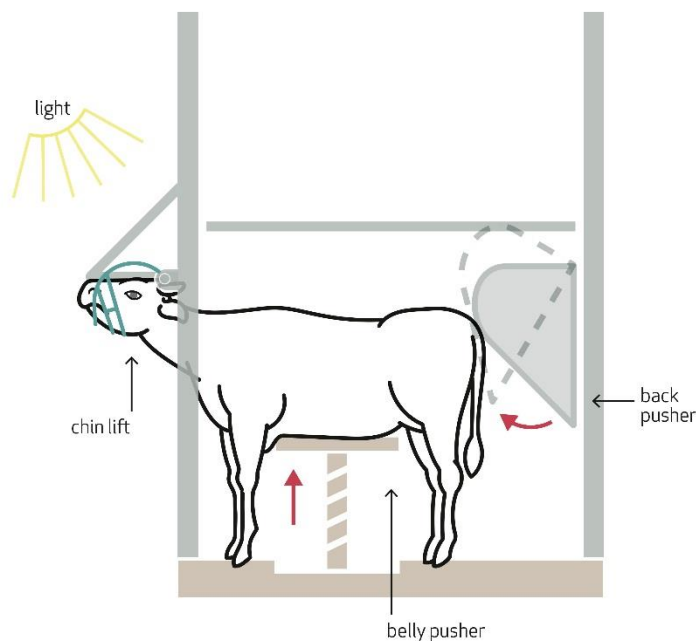
Some include also body restraints. Various **pushers** (depending on the box's design) can be activated to restrain the animal: **back pusher**, **side pusher**, and **belly support**. The **belly support** ensures that the animal does not collapse after stunning.

²¹ Image drawn from original material published by AVMA. Source: "AVMA Guidelines for the Humane Slaughter of Animals: 2016 Edition" Link: <https://www.avma.org/KB/Resources/Reference/AnimalWelfare/Documents/Humane-Slaughter-Guidelines.pdf> Produced with permission from AVMA (July 2017).

²² Image drawn from original material published by HSA. Source: HSA Publication "Head Restraint Equipment" Link: <https://www.hsa.org.uk/downloads/technical-notes/TN3-head-restraint-equipment.pdf> Produced with permission from HSA (July 2017).

Belly supports apply only to cattle, not horses. Depending on the box's design, the different pushers are to be activated in a recommended sequence. Those parts should move slowly and evenly, with no noise. The animal will struggle if the pressure applied is excessive. There should be pressure limiters to prevent excessive pressure on the animal. The dimensions of the box should be sufficient for the animal to fit in and stand upright normally: the box should be high enough for the animal to stand relaxed; and the box should be long enough for the animal to fit in.

Figure 11. Possible design for a restraining box for cattle²³



The gate to the box should be fitted with rubber to ensure it does not hurt the animal when it closes. You should ensure that the passageway for the operator who will stun the animal is high enough (1 to 1.1m). This will help the operator reach the head of the animal without risking of falling into the box. If the box does not include a moving side or a system to expel the animal, a sloped surface can be provided (5-10% inclination).

Advantages:

- The animal cannot move forward or backward;
- (if restraint of the head) the head is stabilised for stunning;
- Operators are protected from the animal's movements;
- The animal cannot fall;
- A stun box is a less expensive tool to acquire and maintain than conveyor systems.

Disadvantages:

- This is more stressful for the animal than conveyor systems;
- Boxes with pushers are more complex to operate and can cause injury if incorrectly used;

²³ Image drawn from original material published by AVMA. Source: "AVMA Guidelines for the Humane Slaughter of Animals: 2016 Edition" Link: <https://www.avma.org/KB/Resources/Reference/AnimalWelfare/Documents/Humane-Slaughter-Guidelines.pdf> Produced with permission from AVMA (July 2017).

- The box requires some handling of the animal;
- The box can only be used for low speed slaughter;

This restraining system constitutes **acceptable practice**.



Control Procedure: See Annex Table A2.1.1.3

5.3.2 Handling and restraining operations

5.3.2.1 Horse²⁴ behaviour

Horses are naturally herd animals. Their first response to danger is to flee rather than fight. When **they have been kept in a group**, they will stay with the group and follow a leader. When separated from their group, they can become anxious. An excited or agitated horse that is alone may be dangerous. Horses dislike: loud noises; yelling; being isolated and cornered; sudden movements; distractions such as bright lights and shadows, slippery floors. All horses do not behave the same way. That means you may have to move or handle them differently.

- **Halter broken horses** may be used to being separated.
- **Unbroken horses** will be distressed if separated from their group.
- **Mares** may become agitated and aggressive if one attempts to separate them from their foals.

5.3.2.2 Cattle behaviour

Cattle are herd animals. They have a good sense of smell and like to stay within their group. They readily follow each other. When separated from their group, they become anxious. As a result they may become dangerous. Cattle dislike: bright lights; shadows; obstacles; sharp ends; sudden movements, slippery floors, and sudden noise. All cattle animals do not behave the same way. That means you may have to move or handle them differently.

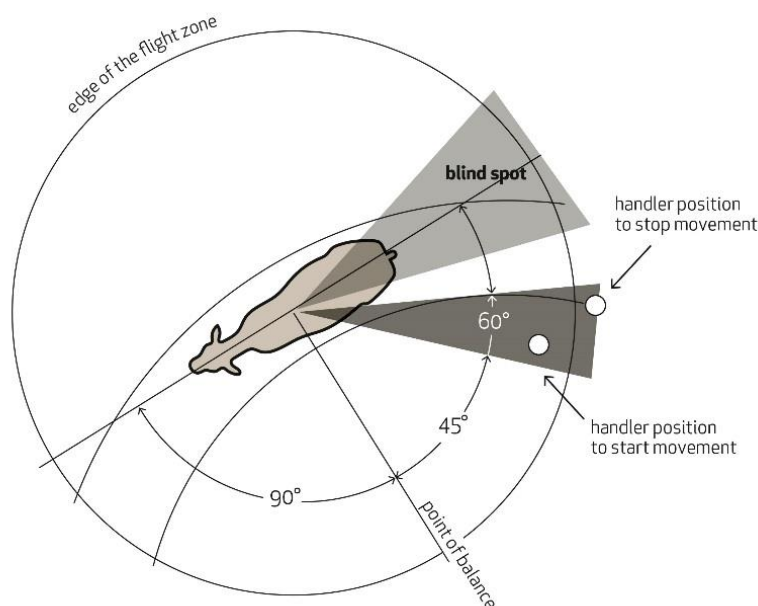
- **Dairy cattle** and veal calves are used to people. They are used to being handled directly.
- **Beef cattle** may not be used to people. They may be more anxious around people.
- **Dairy bulls** and **beef bulls** can be unpredictable. You should be very careful when handling and restraining them.
- **Cows** can be agitated and aggressive if you try to separate them from their calf.
- **Calves** can be agitated if separated from their mother.

5.3.2.3 Moving cattle and equids

Refer to section 5.2.2.1.

²⁴ By "horse" this document means all equine animals or equidae including horses, donkeys, asses and their cross breeds such as mules, hinnies and jennies.

Figure 12. Flight zone with cattle



Different animals may call for different approaches. Dairy cattle can be led easily. A flag, rattle or paper bag can be used to help guide cattle. Cattle move more easily from a dark area to a bright area.

Broken horses are best handled individually. Unbroken animals are best moved with their group, following each other into a passageway and to the restraining pen. As a general rule, you should not mix together horses that do not know one another.

To facilitate moving, you may also use **flags**, **rattles** or **paper bags**. When necessary, horses and cattle may be guided individually.

These handling practices constitute **best practice**.



The use of **electric goads** on **adult cattle** that refuse to move shall be avoided as much as possible. However, when necessary to use them, you must comply with the following conditions:

- Electric goads can be used only when animals have room ahead of them in which to move.
- The shocks shall last no longer than one second.
- They should be adequately spaced.
- They should only be applied to the muscles of the hindquarters of adult animals.
- Shocks shall not be used repeatedly if the animal fails to respond.

Some voluntary standards set limits to the voltage of electric goads (12V, 18V).

You should keep record of each time a goad is used, and at which point in the system (type of animal, single or repeat). Electric goads should not be used routinely.

These practices constitute **acceptable practices**.



5.3.2.4 Good practices specific to unloading

You should allow animals to move at their pace and in small groups of 3-4 animals for large cattle, and 15 to 20 calves.

5.3.2.5 Good practices specific to moving to stun

The regular movement of animals from the lairage to the location of stunning and killing has to be carefully planned. This will ensure a smooth feed to the slaughter line to maintain optimal throughput speed. To ensure animals have minimal stress, allow time for animals to move easily and with minimal coercion and yet not spend too long waiting in line.

Size of the lots: Some national guidelines recommend to move animals in small lots of 4 to 6 large animals, or 15 to 20 calves. It is also good practice to move animals in larger groups if lairage and races are well designed taking into account the slaughter capacity. You may have enough animals in the race for ½ hour of killing. The waiting time of the animals in the race should not be greater than 1 hour.

5.3.3 Stunning – Penetrative captive bolt

You should render bovine or horse unconscious before killing it. You may use a **penetrative captive bolt** gun or “penetrative stunner”. It fires a bolt into the skull. A sufficiently long bolt is required to penetrate into the brain. After firing, the bolt retracts into the gun. The stunner must be powerful enough to be effective. This method may not work with horses, due to the difficulty of applying head restraint. Alternatives, such as firearms, could be considered. Maintenance, handling, and keeping of equipment is fundamental to successful use.

5.3.3.1 Equipment

You should choose a captive bolt gun that is appropriate for the category of animal to be stunned. A too heavy gun will cause operator fatigue. Check the captive bolt is in good working order and has been properly maintained. The manufacturers' instructions describe which model, bolt diameter and length and cartridge is appropriate for use in cattle and horses, and for different categories of animal in each species. Always have spare cartridges. Cartridges should be kept dry. Shots with damp cartridges lack power and can be ineffective. You should also have a back-up stunning option available in case the captive bolt gun fails. It may be a second captive bolt or an alternative permitted method for stun or kill.

5.3.3.2 Parameters

You should ensure that the charge or air pressure is appropriate for the animal. Note that cartridges are identified by the calibre of the gun (e.g. 0.22 or 0.25), colour and the head stamp. Some captive bolt guns use cartridges. There are different types of cartridges. They vary in strength. The amount of propellant they contain is measured in grains (1 grain = 0.0648 grams). The table below presents parameters recommended in different national or sectoral guides to good practices.

Table 7. Recommended parameters for the stunning of cattle and horses (various sources)

Category	Charge	Calibre	Diameter of bolt	Length of bolt	Speed
Calf	1.25- 2.5 grains	.22	7 mm	Calf	1.25- 2.5 grains
Adult cattle	3-4 grains	.22, .25, .33	9 mm	Adult cattle	3-4 grains
Bull	4-6 grains	.25, .33	9 mm	Bull	4-6 grains

Horse	*	*	≥9 mm	≥8 cm	55-70 m/s
-------	---	---	-------	-------	-----------

*In the absence of specific good practice guidance for horses, you may follow that for cattle. You may use the most powerful charge available for the model of stunner used, for both adult horses and ponies.

If using cartridges, you may use two captive bolt guns alternatively to prevent overheating. In that situation the second device is not a back-up option. Some captive bolt guns use compressed air to drive the bolt. They can achieve a higher throughput of animals and require less maintenance.

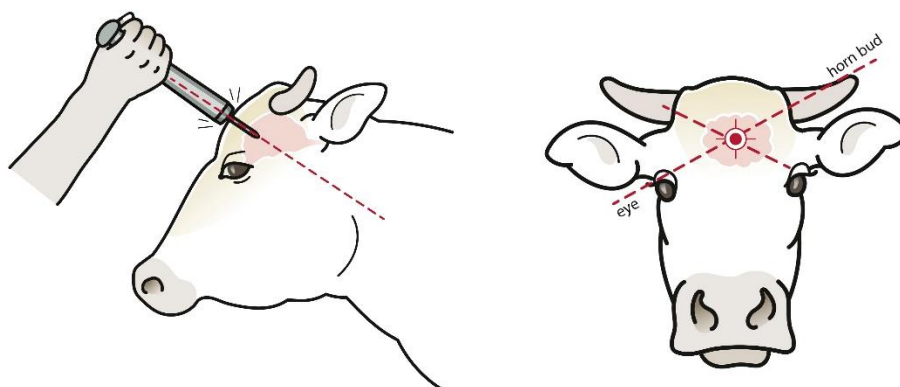
After the shot the pin should retract its entire length. If it does not, the captive bolt gun may not be used until it has been repaired.

5.3.3.3 Positioning

The target of the captive bolt gun is on the forehead of the animal. The gun should be held at a 90° angle to the head.

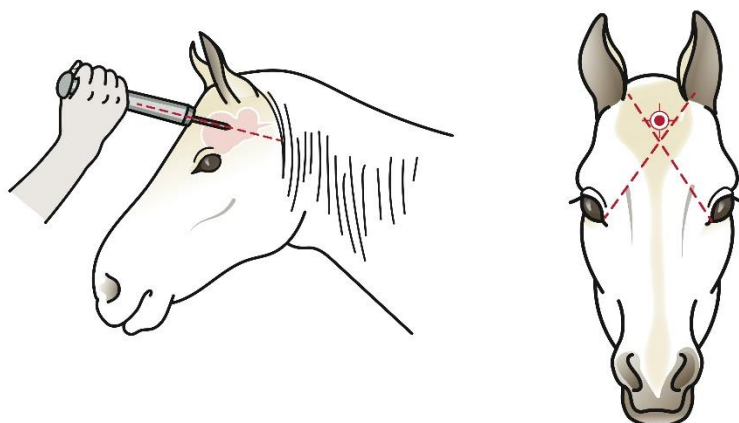
For cattle, you should imagine two lines going from the middle of each horn / horn bud to the top of the opposite eye. The target is the point at which the two lines cross. The captive bolt should be aimed along the line of the spine, in the neck. In **bulls**, the target is 1 centimetre either side of the middle of the head. That way, you avoid the area where the bull's skull is the thickest. For **heavy bulls or water buffalo**, the bolt should be positioned slightly off the middle line.

Figure 13. Recommended position of penetrative captive bolt gun for stunning cattle



For horses, you should imagine two imaginary diagonal lines running from the inner corner of each eye to the upper edge of the attachment of the opposite ear. The target is a point 1-2 cms above where the two lines cross. Align the stunner with the neck of the horse and perpendicular to the skull. Horses are often shot too low.

Figure 14. Recommended positioning of captive bolt gun for stunning horses



5.3.3.4 Maximum stun-to-stick interval

You should kill cattle and horses by bleeding or pithing as soon as possible.

The recommended maximum stun-to-stick interval varies between national and sectoral guides to good practice, at 60 seconds for cattle, and 40, 50, and 60 seconds for horses.

Advantages

- It renders the majority of cattle and horses unconscious.
- Captive bolt guns are safer than using a firearm.

Disadvantages

- This method requires close restraint and contact with the animal's head.
- A horse may kick forward. The person shooting the stunner should stand behind a protective separation.
- There is a cost for the purchase of the captive bolt gun.
- The captive bolt gun requires regular maintenance.

This stunning method constitutes **acceptable practice**.



Control procedure: See Annex Table **A2.1.1.4**

5.3.4 Monitoring procedures at slaughterhouses

5.3.4.1 Verification of stunning

After stunning the animal, you must verify that it is unconscious before releasing it from restraint. You must do so **before** you kill the animal by either cutting/sticking to produce blood loss, or by pithing. In order to confirm that the stun has been effective, you can check the following:

1. the animal has immediately collapsed and does not attempt to right itself or lift its head
2. the animal shows no regular breathing

3. the animal's legs are initially stiff and extended ("tonic phase"), followed by twitching and or kicking ("clonic phase")
4. the animal's eyes do not blink when touched with finger
5. the animal does not make any intentional noise
6. the animal's eyes have a fixed, glazed expression
7. the animal does not respond to any pinch or prick on the nose or ear
8. the animal is relaxed (legs, ears, tail, jaw, tongue)

Indicators 1 to 4 are recommended by EFSA in its Scientific Opinion on monitoring slaughter of bovines.

Figure 15. Signs of unconsciousness in cattle

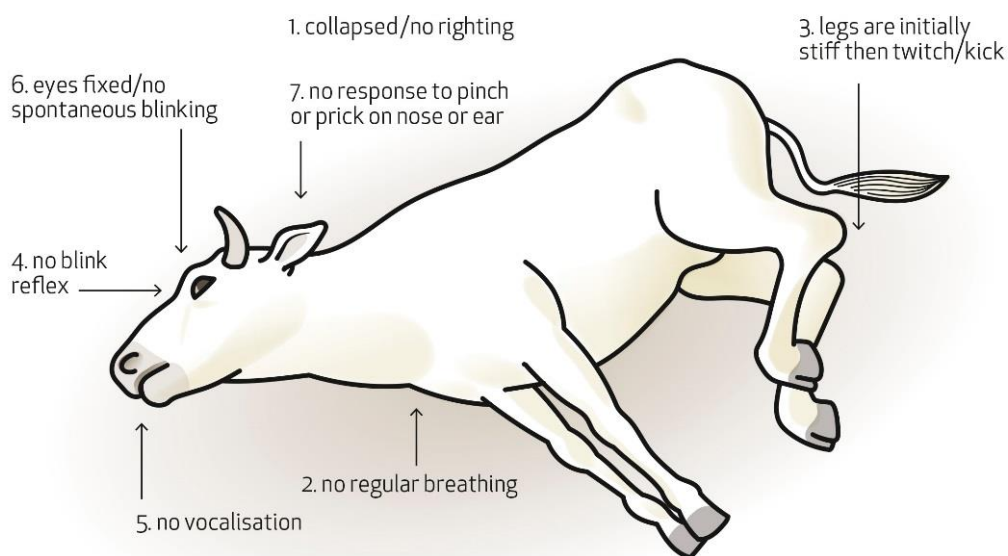
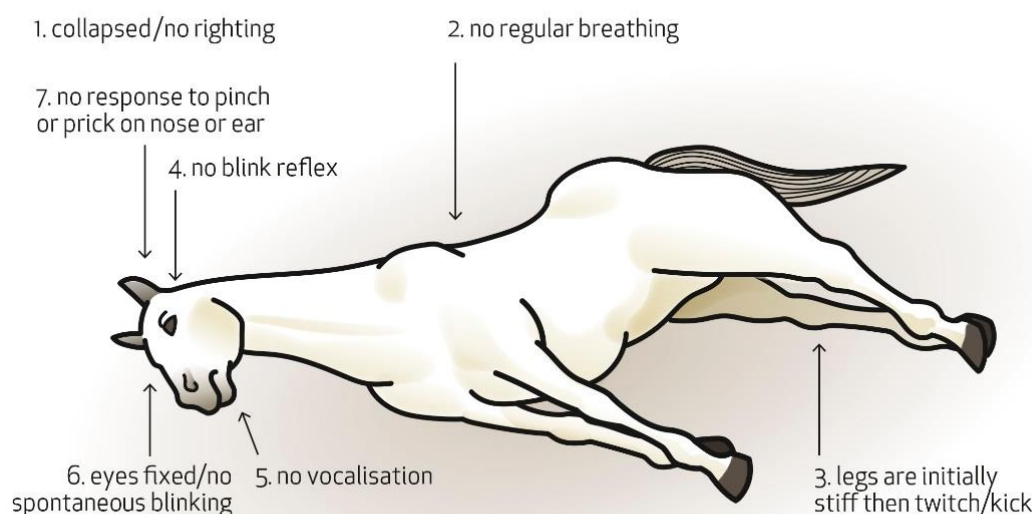


Figure 16. Signs of unconsciousness in equids



Pay attention to your health and safety when verifying unconsciousness in a stunned horse or cattle. **If the animal is not unconscious, you should not bleed it. Immediately apply the procedure for re-stun.** You must stun it again with the same equipment in another position. If the animal is still conscious after the second stun, contact the responsible person and stun with the back-up method. You should review the system and the practice to identify what failed. You should then take corrective action before the stunning process resumes.

Control procedure: See Annex Table A2.1.1.5

5.3.4.2 Verification of death

In order to confirm that the kill has been effective, you should check that: 1. the animal is not breathing regularly – the animal may gasp in the last moments before death; 2. the animal's eyes do not blink when touched with the finger; 3. pupils are dilated; 4. the animal's body is relaxed – there is no righting; 5. the animal is not making any noise; 6. the animal does not respond to any pinch on the nose or ear; 7. the animal's eye is rolled upward; 8. no spontaneous movements; 9. bleeding has stopped; 10. no heartbeat.

5.4 Pigs

This section should be read jointly with section 5.2, shared section for all mammals.

5.4.1 Layout, construction and equipment of slaughterhouses

5.4.1.1 Flooring

You may include an insulating layer in the concrete, particularly in the lairage. That helps prevent cooling, which may cause discomfort in pigs when external temperatures drop.

5.4.1.2 Slopes

The maximum slope inclination should be of 20°.

5.4.1.3 Width and design of passageways

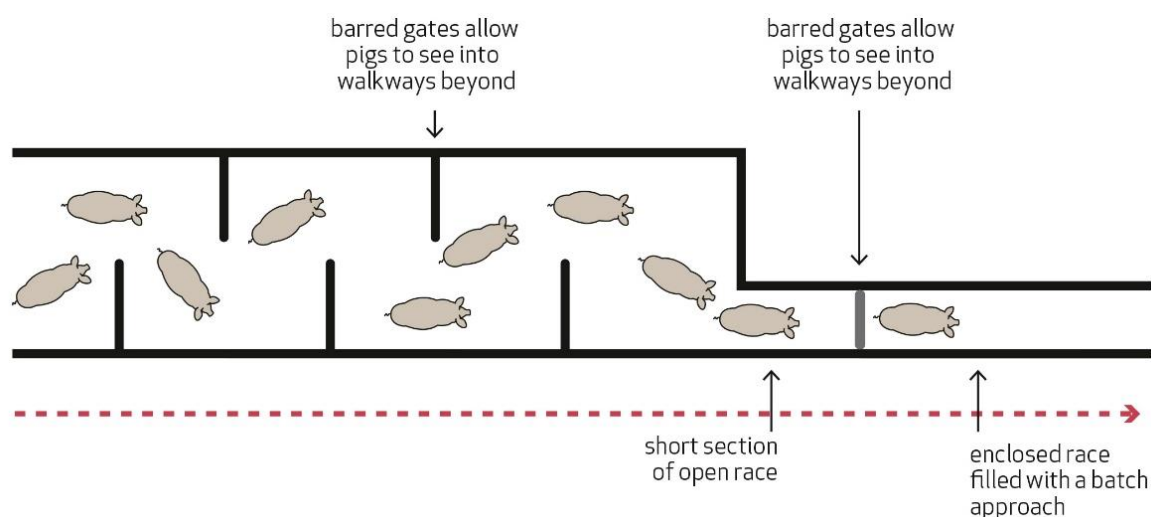
You should design passageways that have a constant width **sufficient for two heavy pigs to move forward side by side** (for example 0.80-0.90m). You may reduce the width of the passageway into a single file if necessary for the stunning equipment. Alternatively, you may design passageways with two single rows separated by a barred, open side in the middle that enables one pig to see the other on its side. For single passageways, you should allow width sufficient even for sows (for example 0.40 to 0.60m).

Well-designed passageways can facilitate the transition from a large passageway into a single row before restraining and stunning. You may consider different options.

Labyrinth

You may design a labyrinth with barred gates, which allow pigs to see into the passageway beyond. A group of pigs can then be brought into a single file without much handling. The race closes with a barred gate and is covered with anti-mounting horizontal bars. Some guides to good practice recommend the width for a labyrinth should be 1.40m.

Figure 17. Labyrinth design with pigs²⁵



Advantages

- This design allows an easy drift from lairage to stun.
- Large groups are broken down into smaller groups by the design of the race, not by handlers.
- It requires minimal operator intervention.

Disadvantages

- Building a long labyrinth to accommodate and break down large groups of pigs requires space.

This design constitutes **best practice**.

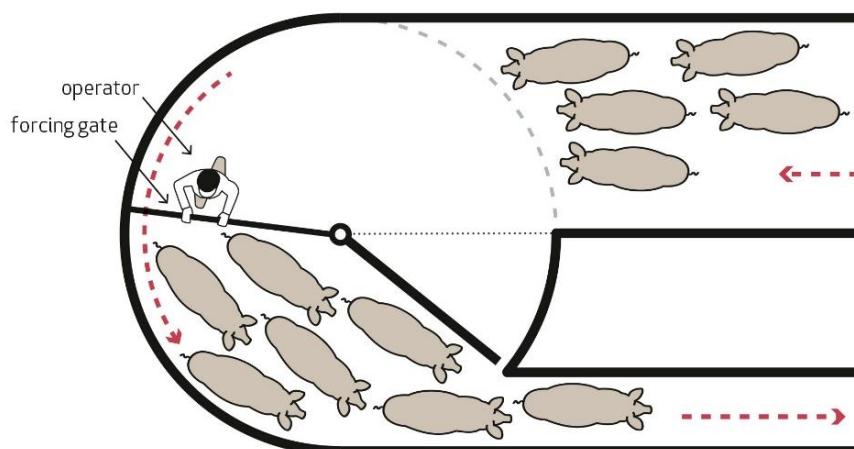


²⁵ Image drawn from original material published by CIWF. Source: "Improved Handling-Systems for Pigs at Slaughter" Link: <https://www.hsa.org.uk/downloads/publications/improved-handling.pdf> . Produced with permission from CIWF (June 2017).

Crowd pen

See section 5.3.1.2.1

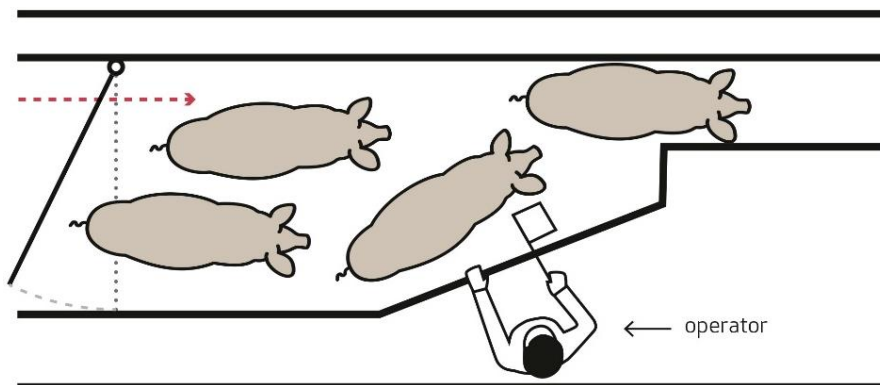
Figure 18. Crowd pen design with pigs



Offset step design

You may implement an offset step design (or "stepped race"). It consists in narrowing down the main passageway in several steps (for example, two, or three). Each passageway is provided with a gate. You may use light to facilitate animal movement into the passageway and into the single race (animals move from dark to light). You may also use tools such as flags.

Figure 19. Offset step design with pigs²⁶



Advantages

- This design is simple to install and maintain.
- It requires minimal handling of the animals.

This design constitutes **good practice**.



5.4.1.4 Sides

Pens and passageways should have solid and opaque sides, to avoid pigs becoming distracted by their surroundings. Sides of pens, ramps and passageways should be

²⁶ Image drawn from original material published by Temple Grandin. Source: "Electric Stunning of Pigs and Sheep" Link: <http://www.grandin.com/humane/elec.stun.html> Produced with permission from Temple Grandin (July 2017).

taller than the length of the pig. They should be at least 0.90m high, and ideally higher than 1.00m (up to 1.20m). You may use plastic walling, which would contribute to reducing noise. Besides, plastic walling can also be mobile. You may use it to alter the arrangements to meet the needs of different categories of animal. If the pigs are housed in a mixed pen with open sides, you may use plastic boards attached to the sides high enough to restrict the view of the pigs.

5.4.1.5 Gates

In pens gates need to be at least 1.00m wide. They should prevent the risk of injuries, lock, and close safely and quietly. In passageways, gates should be at least 0.85m wide, except for any area used for moving pigs in single file. You may include both folding gates and lifting gates. Lifting and automatic gates may cause some stress, therefore folding gates may be preferable. If you use automatic gates, you should ensure that no lame pigs enter these systems. It should include an automatic stop functionality when resistance becomes superior to the weight of 2-3 pigs.

5.4.1.6 Prevention of noise

Some slaughterhouses use music in the slaughterhouse to keep pigs calm. As a result, pigs are less likely to respond to sudden noises.

5.4.1.7 Draughts

Pigs dislike draughts. Draughts contribute to fighting. They can also cause pigs to stop and turn around when the air is blowing in their face. To prevent drafts, use fences and doors that are solid. You should also identify where drafts may occur in the race, or in pens, and use anti-draft curtains or mobile panel to block them.

5.4.1.8 Water supply

You may use either nipple drinkers, automatic troughs or buckets. Nipple drinkers are better than buckets and troughs: in these, water may become stagnant and they can readily be soiled. Nipple drinkers should be situated at appropriate height (0.70m). National and sectoral guides vary on the number of drinking systems per pen. They go from one system per pen (acceptable), to one per 12 pigs (good), or one per 20 pigs (acceptable). Where lairages are at risk of receiving heat stressed pigs then they should increase the number of drinkers to allow most of the animals to drink on arrival into the pen.

5.4.1.9 Alternative layouts for waiting pens

Your lairage should enable you to separate animals from different categories: Sows; Boars (actively reproducing) – in individual pens; Piglets; Injured or sick animals – in a “sick pen” or “hospital pen”, ideally situated in a quiet area and ready for use before animals arrive. The layout should take account of the animals’ physiology, behaviour and field of vision. Animals should each have the space to stand, lie, and turn around.

You should plan for pens to have a maximum capacity of 40 pigs per pen. You should have smaller pens available for small groups of pigs and / or the means to put separations within pens. This way, pigs can be kept in compatible groups efficiently.

Different layouts for waiting pens exist, such as **square** or **narrow long** pens.

Long narrow pens

You may house pigs in long narrow pens that are situated next to one another. Pigs enter on one end of the narrow pen and exit at the other end. Pens are placed one next to the other. To facilitate inspection, a corridor (for example, 1 m wide) can be provided between every two pens.

Advantages

- This layout includes long solid sides on which pigs can lie against. This contributes to better welfare, and notably less fighting between pigs.

- This layout enables the separation between different groups. Additional separations can be put within pens for smaller groups.

This design constitutes **best practice**.



Square pens

You may house pigs in square pens that are situated next to one another. It is common for the pens to be separated by open barred sides. You can add solid boards to limit the pigs' vision. You should also have corridors and gates to facilitate entry and exit of the pigs.

Advantages

- This is a practical design for multi-species slaughterhouses.
- This can be easily combined with passageways between the pens to facilitate inspection.
- Square pens can be easily partitioned or merged to accommodate groups of different sizes.

Disadvantages

- Square angles mean that it may be difficult to make the pigs move within the pen. Such handling issues may lead to the use of electric goads.

This design constitutes **acceptable practice**.



Control procedure: See Annex Table A2.1.2.2

5.4.1.10 Ventilation systems

Sprinkler or misting systems

You may use a **sprinkling** or **misting** system to cool pigs, clean pigs and reduce fighting. You may spray pigs for 5 to 10 minutes after the animals have arrived in the lairage. You may then spray or mist the pigs as and when required and before they are taken to stunning. Pigs are awakened by long period of spraying, or by rapid intermittent sprinkling. This should be avoided if pigs are required to rest. However, under excessive temperature pigs may show signs of overheating and you may decide to sprinkle them on a continuous basis for cooling purposes. Piglets are more sensitive to cold and should therefore not be sprayed if temperatures are less than 10°C. Specific steps should be taken to maintain their temperature to acceptable levels. Other strategies to keep the pigs cool include reduction in stocking density, as well as ventilation control and the use of cooling devices. Sprays should not leave water puddles on the floor.

Control procedure: See Annex Table A2.1.2.3

5.4.1.11 Maximum capacity for the lairage

Table 8. Lairage density recommendations for pigs (various sources)

Category	Density
Adult pig other than sow or boar	≥0.5 m ² (<12 hours) or 0.65 m ² (>12 hours) per 115kg pig
Boar	Individual boxes
Sow	>1m ²

Piglet

25kg: 7 piglets per m²

Control procedure: See Annex Table **A2.1.2.3**

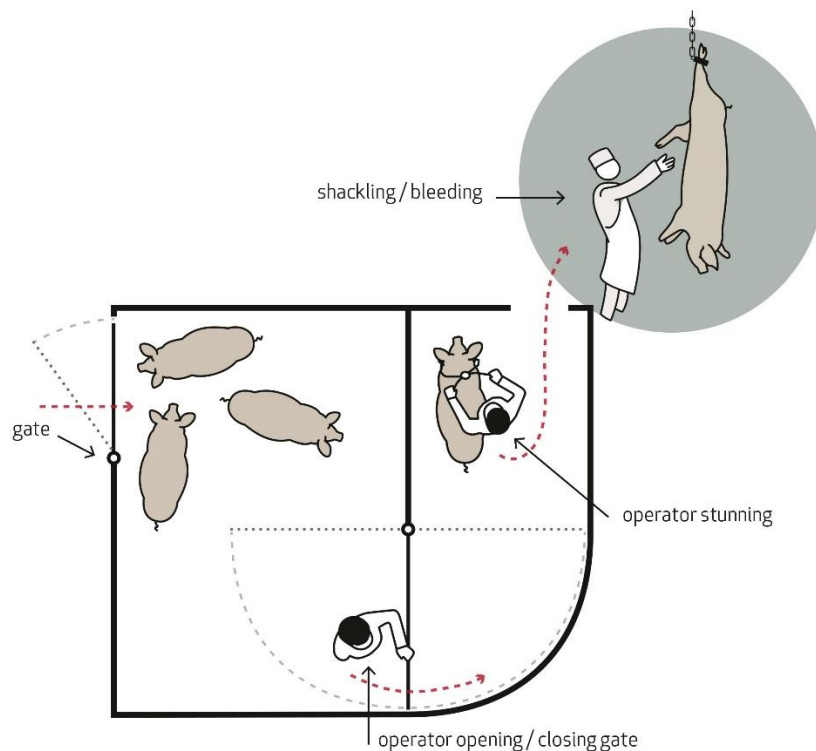
5.4.1.12 Restraining equipment and facilities

This section discusses options used for electrical stunning only.

Stun pen – group stun

You can stun pigs in a stun pen without restraining them. In a stun pen, operators apply electric tongs manually to the pig's head. The pig is then removed from the stunning pen and transported to the bleeding area. A stun pen works by bringing a small group of pigs into the pen through a gate. It may be operated by 1 to 3 operators. For efficient throughput, it is best operated by at least 2 people. The flow of pigs is managed by gradually narrowing the pen (funnel) with a barred gate at the end. Ensure the stun pen is of a size that allows easy stunning, shackling, and hoisting. You may allow for about 1.2m²/pig in the stun pen.

Figure 20. Example of a stun pen design with pigs



Advantages

- Pigs are confined but not actively restrained. This may be sufficient to stun the animal with a pair of electric tongs.
- Pigs are not alone but together with other pigs.
- This system is flexible and can be applied to animals of different species and sizes.
- This system is cheap and requires little cleaning and maintenance.
- If using a barred gate, animals are calm and turn their back to the operator. This facilitates the application of the tongs.

Disadvantages

- Some pigs may require individual restraining to enable good positioning of the tongs for electrical stunning which requires two operators.
- If you place too many animals in the stunning pen, they can get agitated and make the stunning operation more difficult.
- You need to be skilled in order to accurately stun the pig.

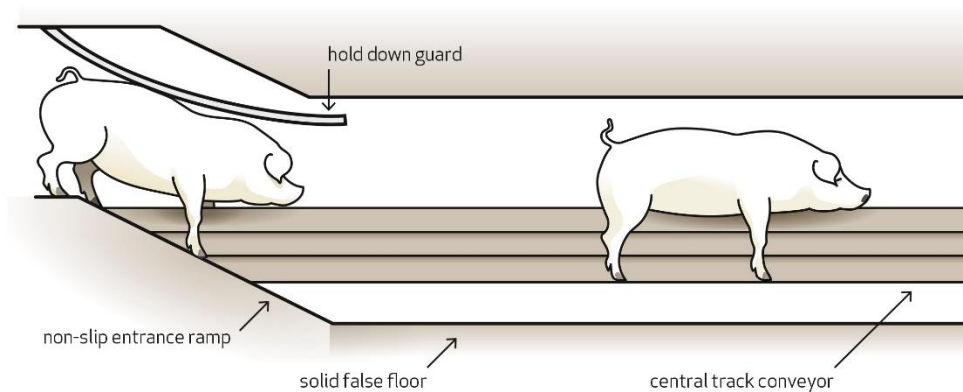
This restraining design constitutes **acceptable practice**.



5.4.1.13 Conveyor systems

Please refer to section 5.3.1.6.4

Figure 21. Pig entry into central track restrainer²⁷



²⁷ Image drawn from original material published by Temple Grandin. Source: "Central Track Conveyor Restraint for Beef Cattle" Link: <http://www.grandin.com/restrain/new.conv.rest.html>. Produced with permission from Temple Grandin (July 2017).

Figure 22. Pig restrained in central track restrainer²⁸

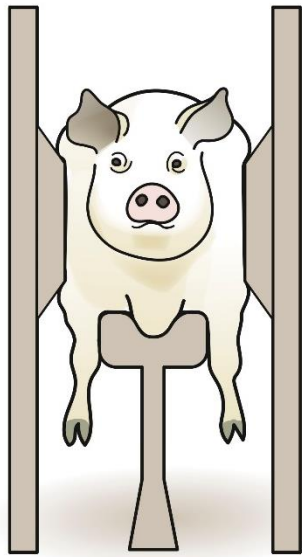
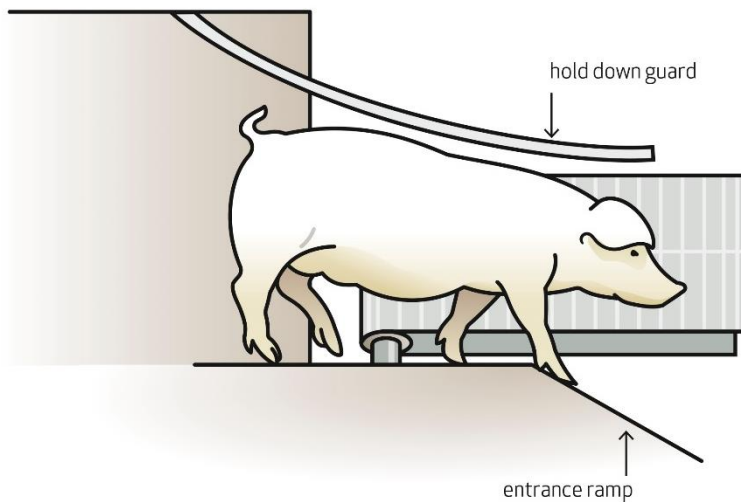


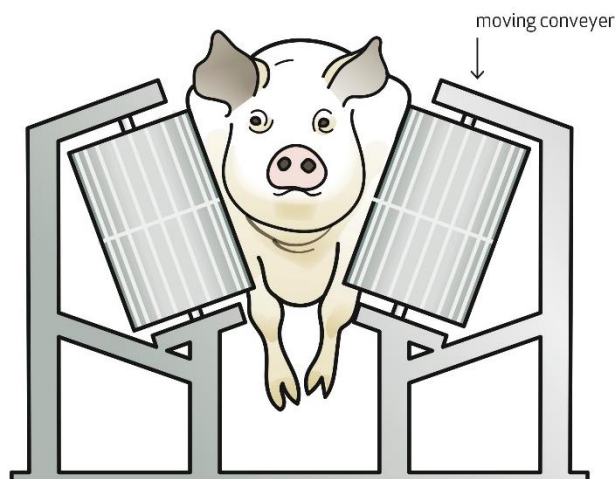
Figure 23. Pig entry into V-shape conveyor²⁹



²⁸ Image drawn from original material published by Temple Grandin. Source: "Central Track Conveyor Restraint for Beef Cattle" Link: <http://www.grandin.com/restrain/new.conv.rest.html>. Produced with permission from Temple Grandin (July 2017).

²⁹ Image drawn from original material published by Temple Grandin. Source: Designs and Specifications for Livestock Handling Equipment in Slaughter Plants, Int J Stud Anim Prob 1(3) 1980, Figure 6, p. 186. Produced with permission from Temple Grandin (July 2017).

Figure 24. Pig restrained in V-shape conveyor³⁰



This restraining system constitutes **good practice**.



5.4.1.14 Individual restraining box

Please refer to text and pictures at 5.3.1.6.5.

You should ensure that the box is long enough (1.50m, up to 2.50m for sows) to prevent pinching of the animal when the box is closed. The box should be high enough (0.75m, at least 1.00m for sows).

This restraining system constitutes **acceptable practice**.



5.4.2 Handling and restraining operations

5.4.2.1 Pig behaviour

Pigs are social animals. They tend to have a relatively stable structure within the group. Removing or adding an individual to an existing group may lead to fighting within the group. Pigs can hear very well. They keep contact with one another through grunts and squeals. However they are less inclined to stay with their group than sheep or goats.

Pigs do not like to be hurried or driven forward. Pigs are very susceptible to hot temperatures, since they are unable to sweat.

Pigs do not have good vision, but are very inquisitive and explore their environment with their noses and mouths. They can cause damage to loose fitting and fixtures. They will escape if the opportunity presents itself.

Pigs like well-lighted areas. They dislike: darkness and shadows; reflections; moving objects; strong drafts; loud noises; sudden moves; being isolated and cornered, slippery floors. All pigs do not behave the same way. That means you may have to move or handle them differently.

- **Sows/ boars** can be aggressive.
- **Sows** move slowly; they can be aggressive during oestrus or at/near farrowing and with piglets at foot

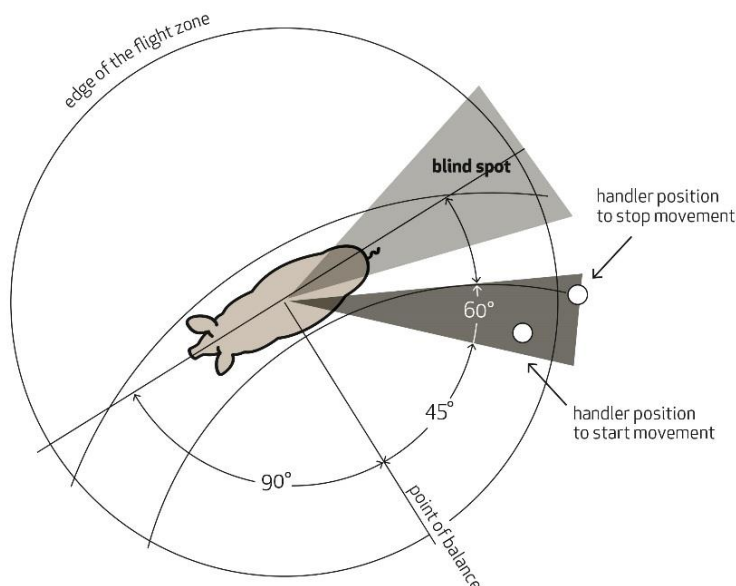
³⁰ Image drawn from original material published by Temple Grandin. Source: Designs and Specifications for Livestock Handling Equipment in Slaughter Plants, Int J Stud Anim Prob 1(3) 1980, Figure 6, p. 186. Produced with permission from Temple Grandin (July 2017).

- **Wild boars** move very quickly. They are slimmer and more agile than production animals and can escape more easily. They can be very aggressive

5.4.2.2 Moving pigs

Refer to text at 5.2.2.1

Figure 25. Flight zone of pig



Certain categories of animals call for specific approaches. **Piglets** can be herded, but they can also be carried from one place to another: Place the piglet on your forearm, with its chest in your palm, with legs hanging on either side. **Adult sows** should be moved in small groups of 3 to 4. Adult **boars** are better moved individually. Pigs will move more easily if they can walk side by side. You may move them into a race where they can walk side by side. You may also move them in two parallel single lines separated by a barrier, which enables them to see one another. Moving pigs is facilitated by ensuring that the way ahead is open and clear of obstacles. Well-designed collecting pens, races and handling crushes greatly facilitate pig movement. They provide also safe working conditions.

Due to natural curiosity pigs will move into a new area when a gate is opened. You can encourage their movement by having a lighted area ahead with no visible stop / no dead end.

To facilitate movement, you may use **flags, plastic paddles, or rattles**. You can use pig boards to gently guide, turn or stop pigs. Choose a pig board of appropriate size: large for sows and boars, medium or small for smaller pigs.

These moving practices constitute **best practices**.



The use of **electric goads** on **pigs** that refuse to move shall be avoided as much as possible. However, when necessary to use them, you must comply with the following conditions:

- Electric goads can be used only when pigs have room ahead of them in which to move.
- The shocks shall last no longer than one second.
- They should be adequately spaced.

- They should only be applied to the muscles of the hindquarters of adult animals.
- Shocks shall not be used repeatedly if the animal fails to respond.
- Goads should not be used on piglets.

Some voluntary standards set limits to the voltage of electric goads (12V, 18V).

You should keep record of each time a goad is used, and at which point in the system (type of animal, single or repeat). Electric goads should not be used routinely.

These practices constitute **acceptable practices**.



5.4.2.3 Good practices specific to unloading

If the design of the truck allows it, you should unload pigs in small groups of 5 to 6 pigs. Pigs in such small groups are calmer and move more easily.

5.4.2.4 Good practices specific to lairaging

Welfare problems during the resting phase are generally due to:

- Pigs being too hot or too cold – bedding as well as ventilation and spraying help regulate the temperature of pigs
- Pigs from different groups being mixed together – pigs from different groups should be kept separate to prevent fighting.

The waiting time for pigs in the lairage should be within 1-2 hours, and preferably not more than 5-6 hours.

Keeping pigs in small groups of up to 15 animals in the lairage has been found to improve animal welfare.

Keeping animals distracted when they enter the lairage helps. You may do so by spreading corn, wood shaving or straw on the floor. You may also hang ropes or provide balls and other 'toys'. Pigs will investigate such toys and fighting is reduced.

Pigs have a strong sense of smell and will respond to it. You may rely on this to reduce fighting in the lairage. Pigs will fight less if:

- They can smell boar. You may spray boar taint in the lairage for that reason.
- They all smell the same. You may spray vinegar on the necks of pigs.

Boars should be ideally lairaged in individual cells.

You should distribute feed on the floor only if no alternative exists, and on a floor that has been cleaned beforehand. Otherwise, you should provide feed in dedicated feeding devices.

You may provide bedding for the animals, such as straw, soft rubber mats, sawdust or other soft materials. However, bedding may contribute to heighten the temperature in the lairage and make the pigs uncomfortable. You should remove it regularly and keep pens clean.

5.4.2.5 Good practices specific to the moving of pigs to stun

After resting in waiting pens, pigs may be moved to the location of stunning and killing. This can be stressful, especially at the point where individual pigs need to be separated from their rearing group.

You should move pigs in small groups, without mixing together pigs from different rearing groups. You may move them in groups of **5 to 15** pigs, depending on the

passageway. You can adjust the size of the group up or down depending on the speed of the slaughter line. In any case, prefer smaller groups to large ones.

Table 9. Suggested group sizes as a function of the speed of slaughter for pigs

Speed of the slaughter line	< 100 pigs / hour	100-300	300-500	500-800
Average size of groups	< 8 pigs / lot	8-10	10-14	14-18

You should drive **boars** to stunning one by one.

You can take **piglets** in groups of a maximum of 30-40 animals depending on the design of the passageways, the speed of the slaughter line and the behaviour of the animals. You should not lift them.

Control procedure: See Annex Table **A2.1.2.4**

5.4.3 Stunning – Head-only electrical stunning

You may use head-only electrical stunning, or “simple stunning”. Simple stunning renders the pig unconscious by the passage of sufficient electric current through the brain. The animal must then be killed by bleeding or sticking without delay. However, piglets may also be killed by head-only electrical stunning. You may apply electrodes manually, or you may use automatic systems for use with conveyors

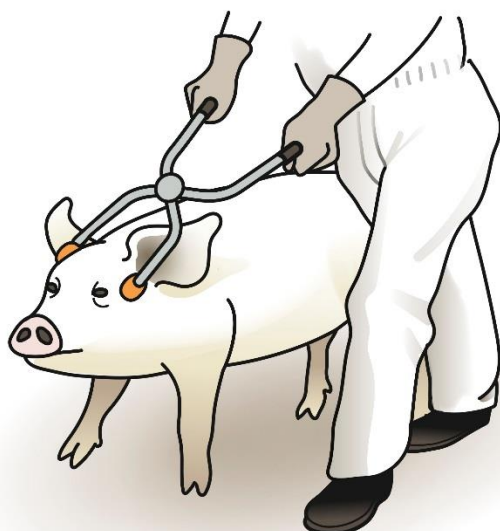
5.4.3.1 Preparation (for manual use)

This method is applicable when you can reach pigs with the cabling of the stunning equipment. Ensure the tongs are the correct size for the animal category. Special tongs exist for piglets. Ensure the tongs are not corroded. Keep them clean at all times. You may wet the electrodes with water to facilitate the flow of electric current. Wear rubber gloves and boots to avoid being electrocuted.

5.4.3.2 Positioning

For manual stunning, the pig should be approached from behind in order to correctly position the stunner. Place the electrode across the head so that the electrical current flows through the brain. Electrodes should be placed **between the outer corners of the eyes and the base of the ears**.

Figure 26. Recommended position of electrodes for electrical head stun of pig



If the shape of the head does not allow placement at these sites you may use two alternative positions for routine stunning: (a) you may place the electrodes just **below** the ears; (b) you may place them diagonally on the head **below** one ear to above the opposite eye. You **should not place the electrodes behind** the ears: the brain may not be shocked. Rather, the pig will experience a painful shock. The electrodes should never be placed in any other place on the pig.

Automatic stunners are used with conveyors. They consist in suspended specially shaped electrodes. It may be difficult to position the electrodes accurately and consistently. Some systems use photo sensors to improve positioning.

5.4.3.3 Parameters

Various parameters for head-stun are recommended in national or sectoral good practices. For manual stunning, the voltage should be **at least 180V**, and optimally **more than 250V**. However this can be switched to **150V, or preferably 180V for piglets**. The frequency should be **50Hz**, and up to **800Hz**. The amperage should be **at least 1.3A**. It can be increased to **1.8A for pigs of more than 150kg**, and **2A for sows and boars**.

Recommendations on the minimum duration of manual stun vary from **1-2 seconds** to **8 seconds**.

Table 10. Recommended parameters for head-only electrical stunning of pigs (various sources)

Category	Minimum voltage	Minimum amperage	Frequency	Minimum duration
Adult pig	>250V	1.3A 1.8A (if >150kg) 2A (sows and boars)	50-800Hz	1-8 sec.
Piglet	>250V	1.3A	50-800Hz	5-8 sec.

For automatic systems, some use high voltages (600 to 1000 volts) for 3 seconds. As a result, most pigs are killed and only few are stunned. Other automatic stunners use a high current (for example, from 1.8A to 2.3A) which can be combined with a shorter duration (for example 2 seconds)

5.4.3.4 Maximum stun-to-stick interval

You should kill the animal by bleeding **as soon as possible**. Recommendations from national guides on maximum stun-to-stick interval vary, at **5 seconds, 15 seconds, and 30 seconds of head-only stunning**.

Advantages

- When hand tongs are used, you may not need to restrain the animal if you can apply tongs by approaching it from the rear in a narrow pen. However, that may not be the case for most animals, who will need to be restrained.
- When tongs are used, the approach is from the rear of the animal. The animal accepts this more easily than the use of a frontal approach.
- When you use a portable electrical generator, the equipment can readily be taken to the animal.
- This method is particularly effective for small pigs. They have softer skulls, which reduces the effectiveness of a captive bolt.

Disadvantages

- Head-only stunning at low electrical current levels is reversible: it will not kill the animal. Animals have to be quickly stuck to ensure death.
- The pig may be exposed to electric shock if the equipment is not used correctly.
- There is a cost for the purchase of electrical stunning equipment.
- The equipment requires regular maintenance.

This stunning method constitutes **good practice**



Control procedure: See Annex Table **A2.1.2.5**

5.4.4 Monitoring procedures at slaughterhouses

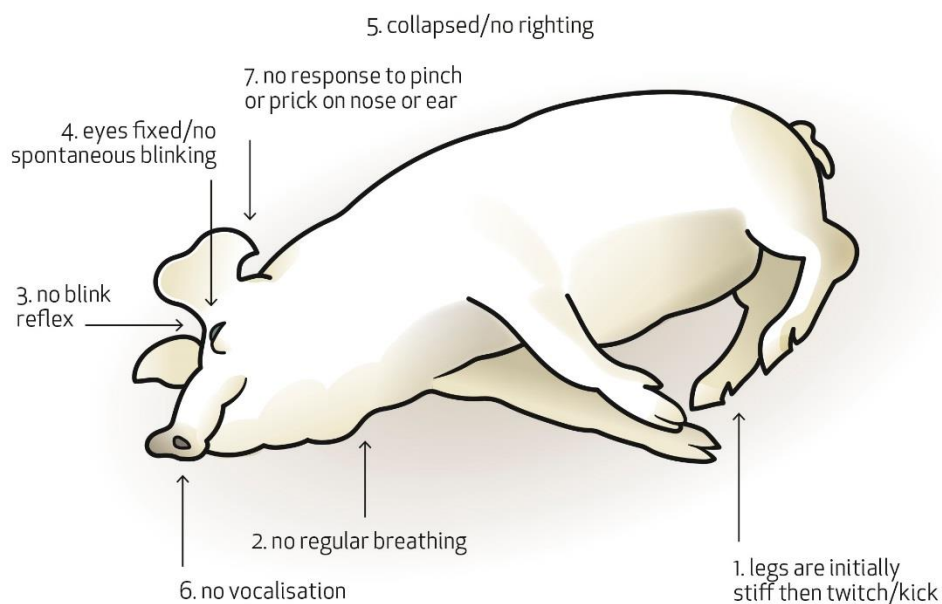
5.4.4.1 Verification of stunning

After stunning the animal, you must verify that it is unconscious before releasing it from restraint. You must do so **before** you kill the animal by either sticking to produce blood loss, or by cardiac arrest. In order to confirm that the stun has been effective, you can check the following:

1. The animal has stiff muscles at first (tonic phase), and then its legs twitch/kick (clonic phase)
2. The animal is not breathing regularly
3. The animal's eyes do not blink when touched with the finger
4. The animal's eyes have a fixed, glazed expression / no spontaneous blinking
5. The animal has collapsed and does not attempt to stand
6. The animal is not making any noise
7. The animal does not respond to any pinch on the nose or ear

Indicators 1 to 3 are recommended by EFSA in its Scientific Opinions on monitoring slaughter.

Figure 27. Signs of loss of consciousness in pigs



If the animal is not unconscious, you should not stick it. Immediately apply the procedure for re-stun. You must stun it again with the back-up method (for example, penetrative captive bolt). You should review the system and the practice to identify what failed. You should then take corrective action before the stunning process resumes.

Control procedure: See Annex Table **A2.1.2.6**

5.4.4.2 Verification of death

In order to confirm that the kill has been effective, you should check that:

1. The animal is not breathing regularly – the animal may gasp (as a fish out of water) in the last moments before death
2. The animal's eyes do not blink when touched with the finger
3. Pupils are dilated
4. The animal's body is relaxed – there is no righting
5. The animal is not making any noise
6. The animal does not respond to any pinch on the nose or ear
7. The animal's eye is rolled upward
8. No spontaneous movements
9. Bleeding has stopped
10. No heartbeat

5.5 Sheep and goats

This section should be read jointly with section 5.2, shared section for all mammals.

5.5.1 Layout, construction and equipment of slaughterhouses

This section presents good practices on matters of layout, construction and equipment.

5.5.1.1 Slopes

Recommendations on maximum slope inclination vary, from a maximum of 10°, to a maximum of 20°, or, alternatively, 26° for the unloading ramp. When animals are walking outside the loading ramp in stairways, the stairs' dimensions should not be beyond the ability of the animals to walk up or down (for example steps rise=5-6 cm and tread length=25cm).

5.5.1.2 Width and design of passageways

You should design passageways that have a constant width sufficient for two animals to move forward side by side. You may reduce the width of the passageway into a single file if necessary for the stunning equipment. Alternatively, you may design passageways with two single rows separated by a barred, open side in the middle that enables one animal to see the other on its side.

Well-designed passageways can facilitate the transition from a large passageway into a single row before restraining and stunning. You may consider using a crowd pen.

Crowd pen

See text and figure at 5.3.1.2.1

Sides

In pens, you may use **solid and open sides**. Open sides allow sheep to see each other. As a result, sheep will be calmer in the lairage, and for the movement to killing area. However, you should avoid cross bars for goats. Goats might climb on them. Higher sides would also be required for goats than for sheep. You may use plastic walling, which would contribute to reducing noise. Besides, plastic walling can also be mobile. You may use it to alter the arrangements to meet the needs of different categories of animal. You may also use **partitions** to keep distinct groups separate, or isolation pens for animals requiring special care.

5.5.1.3 Water supply

You may use either nipple drinkers or buckets. Sheep that are not used to nipple drinkers should receive water from an open bucket or trough. For goats, troughs should be avoided as they might climb on them.

5.5.1.4 Layouts for waiting pens:

Your lairage should enable you to separate animals from different categories:

- Animals with horns
- Animals without horns
- Injured or sick animals – in a “sick pen” or “hospital pen”, ideally situated in a quiet area and ready for use before animals arrive

Control procedure: See Annex Table **A2.1.3.1**

5.5.1.5 Maximum capacity for the lairage

Control procedure: See Annex Table **A2.1.3.2**

Table 11. Recommended lairage density for sheep and goats (various sources)

Category	Density (per animal)	
Adults	≥0.8 m2.	Ewes/ nannies 45-60 kg: 1.1-1.2 m ²
		Ewes/ nannies 60-90 kg: 1.2-1.4 m ²
		Rams/ Billys: 1.5-2.0 m2

Lambs and kids

≥0.25 m²

5.5.1.6 Restraining equipment and facilities

Different options exist for restraining sheep and goats before stunning them. **This section discusses options used for electrical stunning only.**

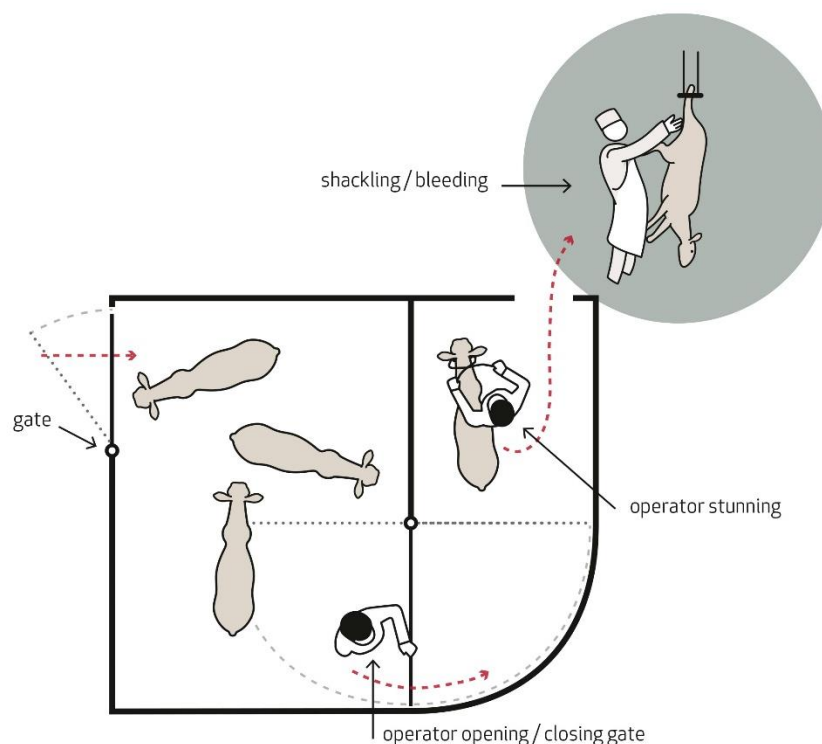
Stunning pen – group stun

You can stun sheep and goats in a stun pen without restraining them. In a stun pen, operators apply electric tongs manually to the animal's head. The animal is then removed from the stunning pen and transported to the bleeding area.

A stunning pen works by bringing a small group of animals into the pen through a gate. It may be operated by 1 to 3 operators. For efficient throughput, it is best operated by at least 2 people. The flow of animals is managed by gradually narrowing the pen (funnel) with a barred gate at the end.

Ensure the stun pen is of a size that allows easy stunning, shackling, and hoisting. You may house 2 sheep in a pen of 3m² or 5-7 sheep in a pen of 6 m².

Figure 28. Example of a stunning pen design with sheep



Advantages

- The animals are confined but not actively restrained. This may be sufficient to stun the animal with a pair of electric tongs.
- The animals are not alone but together with other animals, which reduces stress.
- The system is flexible and can be applied to animals of different species and sizes.
- The system is cheap and requires little cleaning and maintenance.
- If using a barred gate, animals are calm and turn their back to the operator. This facilitates the application of the tongs.

Disadvantages

- If you place too many animals in the stunning pen, they can get agitated and make the stunning operation more difficult.
- You need to be skilled in order to accurately stun the animal.
- Some animals – especially goats – may be too active. They may require individual restraining to enable good positioning of the tongs.
- Sheep tend to group together. They hide their heads under each other. As a result, application of the tongs can be difficult
- Sheep close to the one being stunned risk receiving electric shocks.
- A back-up stunner is necessary in cases of missed stuns.

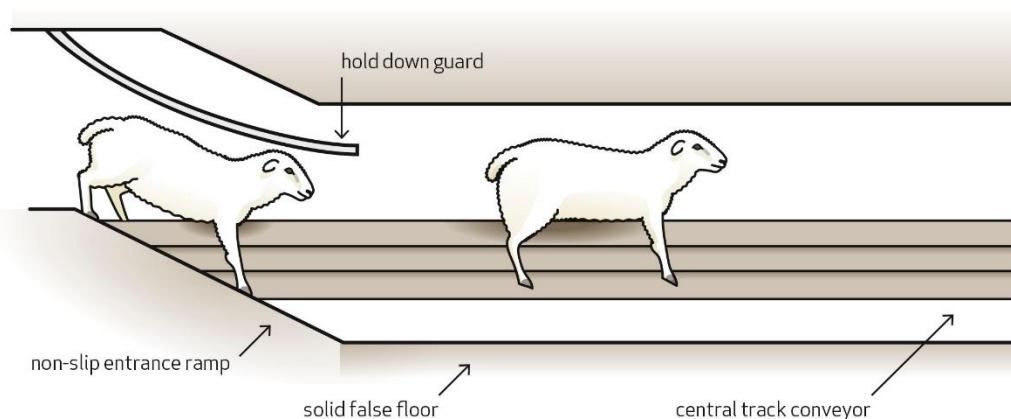
This restraining design constitutes **good practice**.



Conveyor systems

Please refer to text at section 5.3.1.6.4

Figure 29. Sheep entry into central track restrainer³¹



³¹ Image drawn from original material published by Temple Grandin. Source: "Central Track Conveyor Restraint for Beef Cattle" Link: <http://www.grandin.com/restrain/new.conv.rest.html>. Produced with permission from Temple Grandin (July 2017).

Figure 30. Goat restrained in central track restrainer³²

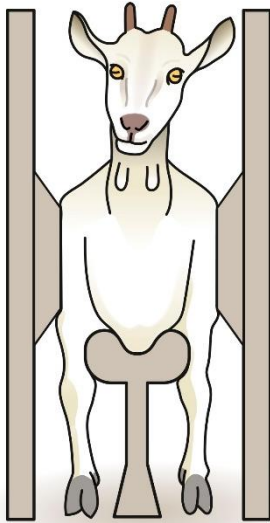
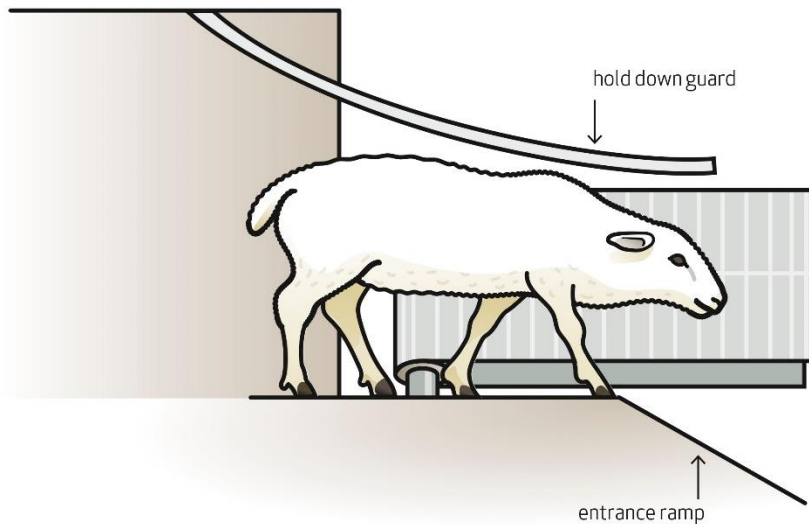


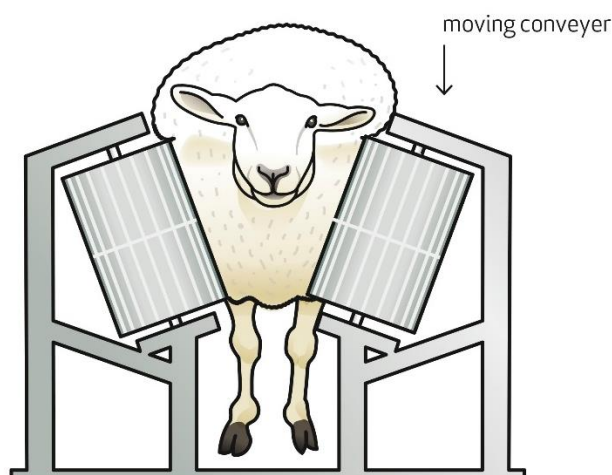
Figure 31. Sheep entry into V-shape conveyor³³



³² Image drawn from original material published by Temple Grandin. Source: "Central Track Conveyor Restraint for Beef Cattle" Link: <http://www.grandin.com/restrain/new.conv.rest.html>. Produced with permission from Temple Grandin (July 2017).

³³ Image drawn from original material published by Temple Grandin. Source: Designs and Specifications for Livestock Handling Equipment in Slaughter Plants, Int J Stud Anim Prob 1(3) 1980, Figure 6, p. 186. Produced with permission from Temple Grandin (July 2017).

Figure 32. Sheep restrained in V-shape conveyor³⁴



This restraining design constitutes **good practice**.



Individual restraining box

Please refer to text and picture at 5.3.1.6.5

This restraining system constitutes **good practice**.



5.5.2 Handling and restraining operations

5.5.2.1 Sheep and goat behaviour

Both sheep and goats are herd animals. They like to stay within their group and to follow one another, and particularly the leader of a group. When separated from their group, they become anxious. They always try to keep at least another sheep or goat in their field of vision. An excited or agitated animal that is alone can behave in an unpredictable way (e.g. run or jump) and knock down handlers. Goats jump more readily than sheep. Sheep and goats dislike: bright lights; reflections (from puddles); shadows; obstacles; sudden movements, slippery floors, noise (particularly high frequency sound). They have a tendency to move from a dimly lit area, to a brighter lit area. Individual sheep and goats do not all behave the same way. That means you may have to move or handle them differently.

- **Dairy sheep and goats** are used to people. They are used to being handled directly and are usually easily led.
- **Sheep and goat kept for meat (and wool)** may not be used to people. They will be more anxious around people.
- **Rams and bucks** can be unpredictable and can knock down handlers. You should be very careful when handling and restraining them.
- **Doe and nanny goats and ewes** can be agitated and aggressive if you try to separate them from their offspring. There is a risk that they knock over their handlers.

³⁴ Image drawn from original material published by Temple Grandin. Source: Designs and Specifications for Livestock Handling Equipment in Slaughter Plants, Int J Stud Anim Prob 1(3) 1980, Figure 6, p. 186. Produced with permission from Temple Grandin (July 2017).

- **Lambs and (to lesser extent) kids** can be agitated if separated from their mother.

5.5.2.2 Moving sheep and goats

Refer to text at 5.2.2.1

Moving sheep and goats is facilitated by ensuring that the way ahead is open and clear of obstacles.

5.5.2.3 Good practices specific to the moving to stun and restraining

After resting in waiting pens, sheep and goats are moved to the location of stunning and killing. This can be a stressful phase, especially at the point where individual animals need to be separated from their rearing group.

Control procedure: See Annex Table **A2.1.3.3**

5.5.3 Stunning – Head-only electrical stunning

You may use head-only electrical stunning, or “simple stunning”. Simple stunning renders the animal unconscious by the passage of sufficient electric current through the brain. You may apply electrodes manually, or you may use automatic systems.

5.5.3.1 Preparation

For manual stunning, this method is applicable when you can reach animals with the cabling of the stunning equipment. Ensure that the sheep’s wool and goats’ hair are dry. If they are wet, the electricity will travel to earth via the body and not through the brain. Good placement of the tongs can be difficult on animals with horns and on sheep with woolly heads. Use electrodes with pins or with wet pins for woolly animals. Alternatively, you can remove wool from the area where you will position the electrode. Wetting the area with water (especially salted water) can also increase electrical contact. Ensure the tongs are the correct size for the animal. Ensure the tongs are not corroded. Keep them clean at all times. Wear rubber gloves and boots to avoid being electrocuted.

5.5.3.2 Positioning

For manual stunning, with the stunning tongs held using both hands, place the electrodes across the head so that the electrical current flows through the brain. Place the electrodes **between the outer corners of the eyes and the base of the ears**. Avoid delivering any electric shock to the animal before it is stunned.

Figure 33. Recommended position of electrodes for electrical head-only stunning of sheep



Alternatively, head-only stunning can be carried out with a head-to-back handset configured for head-only application. The position is **between the ears, with the electrodes applied to the top of the head.**

5.5.3.3 Parameters

Recommended parameters for head-only stunning vary. Recommendations for Amperage vary between 1.0A to 1.3A, and for Voltage between 150 and 400V. Recommendations for the duration of head stun vary between 2 and 8 seconds.

Table 12. Recommended parameters for head-only electrical stunning of sheep and goats (various sources)

Voltage	Amperage	Frequency	Duration
150-400V	1.0-1.3A	50Hz	>2-8 secs

Maximum stun-to-stick interval

Stun to stick should be as short as possible, and not more than **15 seconds.**

Advantages

- When hand tongs are used, you may not need to restrain the animal if you can apply tongs by approaching it from the rear in a stunning pen. However, that may not be the case for most animals, which will need to be restrained.
- When tongs are used, the approach is from the rear of the animal. The animal accepts this more easily than the use of a frontal approach.
- When you use a portable electrical generator, the equipment can readily be taken to the animal.
- If sufficient electrical current is applied to the head of lambs and kids, you can both cause unconsciousness and death by cardiac arrest. This works very reliably in small lambs and kids, but not in larger animals.

Disadvantages

- Head-only stunning at low electrical current levels is reversible: it will not kill the animal. Animals have to be quickly bled to ensure death.

- If the equipment is not easily portable, animals have to be moved to the stunning area.
- Good electrical contact with the skin may be difficult due to hair/fleece.
- Good placement of the tongs can be difficult on animals with horns
- There is a cost for the purchase of electrical stunning equipment.
- The equipment requires regular maintenance.
- The animal may be exposed to pre-stun shocks. This applies especially to goats, which are more active than sheep.

This stunning method constitutes **good practice**.



Control procedure: See Annex Table **A2.1.3.4**

5.5.4 Monitoring procedures at slaughterhouses

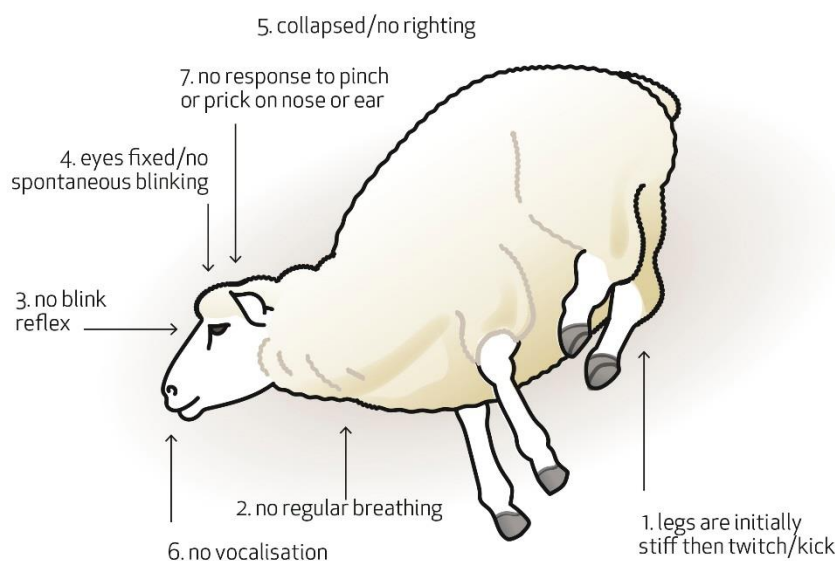
5.5.4.1 Verification of stunning

After stunning the animal, you must verify that it is unconscious before releasing it from restraint. You must do so **before** you kill the animal by either sticking to produce blood loss, or by cardiac arrest. In order to confirm that the stun has been effective, you can check the following factors:

1. The animal's legs are initially stiff and extended ("tonic phase"), followed by twitching and or kicking ("clonic phase")
2. The animal is not breathing regularly
3. The animal's eyes do not blink when touched with a finger
4. The animal's eyes have a fixed, glazed expression / no spontaneous blinking
5. The animal has collapsed and does not attempt to right itself or lift its head
6. The animal is not making any noise
7. The animal does not respond to any pinch or prick on the nose or ear

Indicators 1 to 3 are recommended by EFSA in its Scientific Opinions on monitoring slaughter.

Figure 34. Signs of loss of consciousness in sheep and goats



If the animal is not unconscious, you should not stick it. Immediately apply the procedure for re-stun. You must stun it again with the back-up method. You should review the system and the practice to identify what failed. You should then take corrective action before the stunning process resumes.

Control procedure: See Annex Table **A2.1.3.5**

5.5.4.2 Verification of death

In order to confirm that the kill has been effective, you should check that:

1. pupils are dilated;
2. the animal is not breathing regularly;
3. the animal's body is relaxed;
4. there are no spontaneous movements;
5. the animal does not respond to any pinch or prick on the nose or ear;
6. the animal has collapsed permanently;
7. the animal is not making any noise;
8. there is no heartbeat; there is no pulse;
9. there is no agonizing panting;
10. bleeding has stopped.

5.6 Poultry (chicken and turkeys)

5.6.1 Layout, construction and equipment of slaughterhouses

5.6.1.1 Prevention of sudden noises in the slaughterhouse

Birds dislike sudden noises. Sudden noises may cause them to panic and try to escape. They may also injure themselves. You should ensure that birds are exposed to only low noise levels (under 75 dB). Noise levels above 75 dB should only be temporary. Ventilation fans, compressors, shackling lines and other mechanical equipment often cause noise. You may use sound-absorbing material and install

silencers on compressors. Other activities that cause noise include moving poultry containers, truck driving, or truck washing. You may carry out noisy activities away from the birds, or separate activities from one another so that the noise caused by one does not affect the other.

5.6.1.2 Ventilation and temperature

Birds should not suffer from heat or cold stress. The quality of the air is also important to ensure bird welfare. Heat stress in particular is a major welfare issue for birds in lairage. To achieve these objectives, you must ensure adequate ventilation in the lairage. Ventilation is used to adjust temperature, humidity, and the concentration of harmful gases (ammonia, CO₂) in the space where animals are resting.

You may ventilate the lairage by:

- **Mechanical** means: air conditioning system, heating system
- **Natural** means: opening and closing doors and windows, allowing for openings in walls and roofs, driving trucks on the road in cases where slaughter is delayed

Natural ventilation is generally not sufficient for preventing heat stress of broilers in lairage.

You should **monitor air quality in the lairage and in the containers.** You should be able to see relevant values on readable screens for frequent monitoring. Portable sensors should be used to monitor the temperature and humidity in crates. To avoid excessive temperature differences, you can close doors and use curtains to protect the unloading area. When birds are placed in containers stacked one on top of the other, you must ensure good ventilation both inside and between the containers. Allow enough space (approximately one metre) between containers to allow access to at least one person. This is essential for monitoring. If poultry containers are placed in the lairage area on trailers, then you may ventilate them from their sides with banks of fans.

If containers are unloaded from the trailer and placed in the lairage area, you may also use extractor fans to reduce humidity and heat. It is recommended to place extractor fans at the top of the lairage area, and to move stacked containers below the fans. This way, you will take advantage of the natural flow of hot air towards the ceiling.

Some national guides recommend using a misting system to keep birds cool, while others recommend against it. Misting systems can reduce temperatures by 2 or 3°C. They are useful when the humidity in lairage is low. However, you should avoid using misting systems when humidity is high: misting systems will create excessive humidity levels and reduce birds' ability to lower their body temperature by panting. To improve ventilation, you should leave gaps between stacked containers.

You should monitor bird temperatures at a frequency that avoids any suffering. If body temperatures are above 42°C, then you should keep poultry in the lairage area for a minimum of one hour and a maximum of 2 hours to bring body temperatures back to normal. You should also monitor bird behaviour (panting, signs of distress, birds turning towards the side of the modules to get air).

5.6.1.3 Facilitation of inspections

It should be possible to inspect all the birds in lairage. Ensure that containers are easily accessible for inspection. If there is not enough natural light, then you should have portable artificial light.

5.6.1.4 Specific good practice recommendations for loose housed birds

Light

Birds dislike direct sunlight as they are not used to it. You should avoid it by using artificial light in the lairage. Lighting should be uniform and diffuse in the lairage. You may use "blue light" to keep birds calm. You may use lighting to facilitate the movement of loose turkeys. Lighting in the lairage should be dimmed during the night. Emergency lighting should be available in case of power failure.

Draughts

Poultry raised indoors dislike draughts. To prevent draughts, handle poultry in an area with solid sides.

Flooring

Loose-housed birds should not slip and fall. To prevent accidents, you should ensure that the flooring of ramps, passageways and pens is non-slip. Bedding materials provides a good anti-slip effect. You should also ensure that there are no gaps between, ramps, flooring and sidewalls. You should never push the birds to accelerate the killing line.

Slopes

Slopes can cause birds to hesitate and hurt themselves. You should ensure that the lairage, ramps and passageways are as flat as possible.

Sides

The sides of the ramps, passageways and pens should help prevent distractions and escapes. Use solid and opaque sides for ramps, passageways and pens. The sides should be free of sharp ends and protruding objects, which could injure the birds. Ensure that sides are high enough to prevent the birds from escaping.

Distractions

Birds can become agitated if they are distracted by people or objects.

Distractions may scare them and cause them to hurt themselves, for example by flapping their wings and hitting other birds. To avoid distractions and facilitate animal movement:

- Passageways (when used) should have high solid sides
- Avoid gaps between walls or gates
- People should not be in the way or within the field of vision of the birds

Water supply

Birds should not suffer from thirst. It is difficult to provide water to birds housed in containers. You should slaughter these animals as soon as possible after they arrive in the slaughterhouse. You should provide water to loose housed birds (turkeys) in the lairage. Water can be supplied from **nipples** or **basins**. Use what the birds are used to. Water basins are preferable, as most birds can instinctively drink from them.

5.6.1.5 Maximum capacity for the lairage

You should ensure that the density of **loose-housed birds** in the lairage is compatible with their well-being.

- Assess what the maximum density of the lairage may be; and
- Ensure that the maximum density is not exceeded at any time.

The maximum stock density in the lairage may differ based on how long birds stay in the lairage. To assess the maximum density of the lairage, you should consider the

need for birds to stand, lie down, turn around and access drinkers easily. To estimate the maximum capacity in the lairage you should **also** take into account:

- The categories of birds to be housed
- The floor area of the holding pens in the lairage
- The environmental conditions and ventilation available in the lairage
- The type and number of drinkers available in the lairage
- The type of flooring in the lairage for sleeping arrangements

The maximum number of birds permitted in each waiting pen should be clearly signed and in a place where any person could see it. If birds are kept overnight, there may be a number for day time and another for night time.

Birds in modules/crates should be able to lie down next to each other on the floor. The height of the module/crate should be fit for the species and size of the birds.

Table 13. Recommended space allowance in crates/modules

Type of bird	Minimum space allowance in crates/modules
Dayold chicks	21-25 cm ²
Poultry < 1.6kg	180-200 cm ² /kg
Poultry 1.6 – 3kg	160 cm ² /kg
Poultry 3 – 5 kg	115 cm ² /kg
Poultrt > 5 kg	105 cm ² /kg

The need to stack crates with spaces and alleyways between stacks to facilitate cooling will reduce capacity in hot weather.

Control procedure: See Annex Table **A2.1.4.1**

5.6.2 Handling and restraining operations

5.6.2.1 How poultry/birds behave

Poultry such as chickens and turkeys originate from jungle environments. They are alert and flighty and can panic quickly. Poultry are social animals that prefer to move in groups. Poultry can get stressed from handling, especially if they have not been used to people or handled regularly.

It is important to make sure that birds cannot escape from crates. Crates should be well-maintained and doors should be kept closed.

5.6.2.2 Catching poultry

Injured birds may not be able to move easily or without severe pain. Stun and kill them where they are as quickly as possible. **Birds that are not injured** may be caught and carried to the place where they will be killed. You should remove birds from crates or containers individually by holding them securely with two hands over the wings. You may **catch** birds **individually by hand**. Different categories of poultry require different catching techniques. For **chickens**, you can put one hand above both wings to prevent wing flapping, then put the other hand underneath the body and catch both legs. The bird can then be lifted, while your arm supports its breast and your hand holds the legs.

Turkeys are strong and heavy. You can stop them from moving by catching their legs from behind with one hand, and then gently lowering them unto their breast. Your free arm can then be put around the bird's wings and under its body for support. The turkey can then be lifted and held close to your body.

Adult turkeys can be lifted by grasping the wing at the shoulder furthest away from you with one hand, while the other hand catches its legs. The turkey can then be lifted and held close to your body.

These catching methods constitute **best practice**.



5.6.2.3 Moving loose birds

You can use tools such as boards to help directing birds' movements. However, you should never push the birds with these tools. Birds should not be pushed forward, or else they may run away, walk on each other, get injured and sometimes die. When individual birds are separated from their group, they can become stressed. Bring these birds back in the group before moving birds further.

5.6.2.4 Carrying poultry

You may carry poultry in batches within **crates**, or individually **by hand**.

Carrying poultry in crates

If using a crate to carry and move birds, you should put the birds in head-first to take advantage of the bird's movement away from you when filling the crate. While doing this, avoid squeezing the body as this can cause the bird to stop breathing. You should remove birds from crates individually by holding them securely with two hands over the wings. When unloading and moving poultry crates, it is important to handle them carefully to prevent the birds from being stressed and injured. Sudden movements are transmitted between crates, and can cause poultry to slide and smother other birds. When placing crates close to each other, make sure that birds' heads, legs or wings do not protrude and risk getting caught or breaking. When placing crates one on top of the other:

- Limit faeces falling on the birds placed underneath;
- Ensure stability of the crates; and
- Avoid blockages to ventilation.

Crates must be kept in good condition to prevent birds from escaping.

Do not throw, drop or knock over crates. Where possible, move crates horizontally and mechanically.

These carrying methods constitute **good practice**.



5.6.2.5 Carrying poultry by hand

You can carry poultry **upright**, by supporting their breast with one hand, and covering their wings with the other, as described at 5.6.2.2.

Figure 35. Carrying and restraining of poultry upright³⁵



This carrying method constitutes **best practice**.



Alternatively, you may carry birds by their legs, holding them **upside down**. If you do this with chickens, you should hold both legs (not one leg) and turn them upside down gently. You should not hold more than three chickens in one hand. You should not carry larger birds such as turkeys by the legs. Catching or carrying by the legs can result in hip dislocation, therefore you should not carry birds by hand for too long.

These carrying methods constitute **acceptable practice**. **These methods are only acceptable for chickens.**



You should not under any circumstance attempt to move a bird by: striking it; pressing on sensitive parts of its body; lifting or dragging a bird by the neck, head, wing or tail; causing it pain or suffering; using an electric shock or sharp instrument to encourage the bird to move; holding the bird by the eyes.

These practices are **forbidden and unacceptable**.



5.6.3 Restraining poultry

You should restrain poultry for stunning. A well-restrained bird can be stunned more easily and then killed painlessly. Birds can be contained in a module or crate and restrained by hand, or by using a tool, such as a cone or hanging (shackle) line. Different stunning methods require different restraining methods.

³⁵ Image drawn from original material published by HSA. Source: HSA Online Guide "Practical Slaughter of Poultry" Link: <https://www.hsa.org.uk/catching-and-handling/chickens>. Produced with permission from HSA (July 2017).

5.6.3.1 Manual restraining (1)

You may **restrain a bird by holding its body with both hands**, to make its head accessible for stunning and slaughter. One hand covers both wings to prevent wing flapping, while the other hand and arm hold the legs and support the breast.

See Figure 35

Alternatively the bird can be held manually under the arm holding its wings, allowing the other hand to stun the bird by a blow to the head.

This method is suitable for smaller birds.

Advantages

- This method causes minimal bird discomfort
- No wing flapping

Disadvantages

- For head-only electrical stunning: this method can be more easily applied by a single operator if the stunning equipment is affixed to a wall.
- Not suitable for bigger birds

This handling method constitutes **best practice**.



5.6.3.2 Manual restraining (2)

Alternatively, you may **restrain** a bird by **lifting and holding it by its legs**. You can use this method for emergency stunning by percussive blow to the head.

This method is suitable for smaller birds.

Advantages

- This is a practical way of restraining birds for quick slaughter.
- You can handle the bird on your own and stun/kill it at the same time.

Disadvantages

- Wing flapping
- Bird discomfort
- This method involves inversion.
- Not suitable for bigger birds

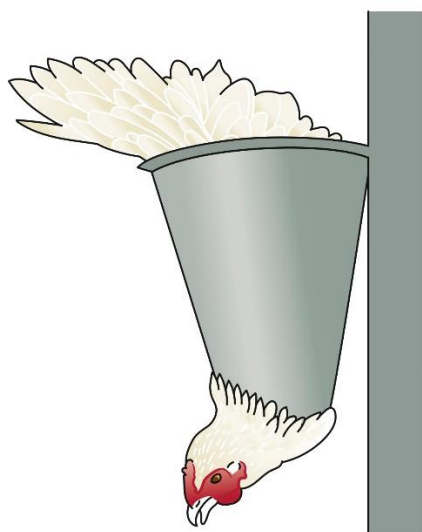
This handling method constitutes **acceptable practice**.



5.6.3.3 Cone

Birds can also be restrained using a cone. A cone is particularly suitable for bigger birds, because they are heavier and more difficult to hold. Ensure the cone is the correct size for the bird. Place the bird with its head downwards in a cone. This immobilises the bird completely. Fold the bird's wings before putting it into the cone. The bird can be comforted by maintaining hand contact after putting it into the cone. The head is accessible for stunning and slaughter as it sticks out from the bottom of the cone. You should not keep a conscious bird in a cone for longer than necessary, and for no more than 1 minute for chickens, and 2 minutes for turkeys.

Figure 36. Diagram of a chicken in a cone



Advantages

- No wing flapping.
- Both your hands are free to stun/kill the bird.

Disadvantages

- This method may cause some discomfort to the bird.
- This method involves inversion.

This handling method constitutes **acceptable practice**.



5.6.3.4 Hanging / shackle line

Correct shackling is important to ensure that stunning is effective. The shackling process should not be stressful or painful for the birds. Stressed birds tend to struggle and flap their wings. If using waterbath, parts of their body, such as their wings, could enter the electrified water before their heads. This may give birds painful electric shocks before they are properly stunned.

Curves and obstacles should be avoided in the shackle line. **Low lighting** levels in the shackle area help keeping birds calm. Lighting levels should be kept uniform. Shackling birds involves the following steps: move the modules close to the shackle line; have the container at a convenient height to facilitate easy removal and shackling; wet the shackle before birds are hung; remove birds from their containers; lift them individually with both hands and shackle them immediately; gently catch the bird's legs in one movement; lift the bird by both legs and lower it onto its breast; make sure to hang the bird by both legs; lower the bird's breast against the breast contact strip.

Shackles **must not place too much pressure on the animal's legs**, as this could cause suffering. You should maintain the shackles. Any damaged shackles should be removed. If the slaughterhouse deals with animals of different species, types, sexes or sizes, shackles should be adjustable to them. Birds of different sizes should be processed separately, where possible.

It is important to allow sufficient time for birds to settle and calm down before they are stunned. This may take up to **12 seconds** for chickens and **20 seconds** for turkeys. However, conscious birds must not be shackled upside-down for too long before they are stunned. More specifically, turkeys must not be held or hung upside-down for more than **2 minutes**, and chickens for no longer than **1 minute**.

The following steps can be followed in order to keep birds calm:

- Move the birds gently and slowly.
- Avoid swinging movements, using an appropriate shackle line speed.
- Ensure that birds are moving along a straight shackle line while conscious.
- Space out birds to avoid that struggling birds beat other nearby birds with their wings.
- Use a belt contact strip that rubs against the birds' breasts. This will comfort the birds and keep them calm. You may use a belting or a rubber bar that runs in parallel with the shackle line and until the bird enters the water.
- Keep low lighting levels in the shackle area. Lighting levels should be kept uniform.

Shackles can be combined with cones.

Advantages

- This is a practical way of restraining birds for quick slaughter.
- You can handle the bird on your own and stun/kill it at the same time.

Disadvantages

- Wing flapping (unless combined with cones)
- Bird discomfort
- This method involves inversion.

This method constitutes **acceptable practice**.



You should not under any circumstance restrain a conscious bird by:

- Immobilising it with an electric shock

This practice is **forbidden and unacceptable**.



Control procedure: See Annex Table **A2.1.4.2**

5.6.4 Stunning

You must render the bird unconscious before killing it. Stunning before killing is a requirement from Council Regulation (EC) No 1099/2009. There are different ways of stunning poultry. All of these methods should render the bird unconscious, or kill it right away. This section presents good practices of head-only electrical stunning and electrical waterbath.

5.6.4.1 Head-only electrical stunning / simple stunning

You may use head-only electrical stunning, or "simple stunning". Simple stunning renders the animal unconscious by the passage of sufficient electric current through the brain. The bird must then be killed by bleeding. You may use a manual method or an automated method for head-only electrical stunning.

Manual method

Preparation

Wear rubber gloves and boots to avoid being electrocuted. Electrodes should be kept clean. Electrodes and the skin/feathers on the bird's head can also be made wet to facilitate the flow of electricity.

Restraining

With the help of a handler who restrains the bird by its body, you may hold the back or underside of its head, while the other hand firmly applies the electrodes. Alternatively, if you use a fixed stunner, you can put both hands around the bird's body and put its head into the stunner. A better option is to put the bird in a cone or shackle.

Positioning

The electrodes are placed around the bird's head, between the eye and the ear. The electrodes should not be placed further down, on the neck, or else the animal will be paralysed but will remain conscious.

Figure 37. Appropriate position of electrodes on a bird's head³⁶



Automated method

You may also use recently developed mechanical systems. Such systems enable to carry out head-only electrical stunning on large numbers of birds placed in cones on a shackle line. Birds are removed from their containers and manually placed in a cone and hung upside down in a shackle line. The head of the bird is then automatically locked between two electrodes. Before birds are stunned, a sensor measures each bird's resistance, to ensure that the machine delivers the correct amount of current. The electrodes then deliver the current.

Parameters

The appropriate current level should be applied given the species and weight of the bird. The current should be applied for at least 7 seconds. The parameters – voltage, amperage, and frequency – should be visible to you on the monitor.

Regulation 1099/2009 requires that the current used is at least **240mA for stunning chicken**, and at least **400mA for turkeys**. Additional recommendations can be found in existing guides to good practice, as detailed in Table 14.

³⁶ Image drawn from original material published by HSA. Source: HSA Online Guide "Practical Slaughter of Poultry" Link: <https://www.hsa.org.uk/stunning-and-slaughter-electrical-stunning/use>. Produced with permission from HSA (September 2017).

Table 14. Recommended parameters for head-only electrical stunning of poultry (various sources)

Species	Minimum voltage	Minimum current	Minimum duration*
Small birds (under 2.5 kg)	>110V	300-400mA	≥7 seconds
Large birds (more than 2.5 kg)	>110V	400-500mA	≥7 seconds

*Apply until wing flapping has stopped and legs are extended

Maximum stun-to-stick interval

Birds stunned by electricity should be bled or killed **as quickly as possible** after stunning and **within 15 seconds**.

Advantages

- This method allows for more accurate stunning parameters than an electric waterbath.
- Mechanical methods of head-stunning allow for a high slaughter speed.

Disadvantages

- Death should be ensured by a killing method such as bleeding or cervical dislocation.
- The skin and feathers on the bird's head may diminish the impact of the electrical current. As a result this technique may not always be effective (unless at high current levels), especially for turkeys.

This stunning method constitutes **good practice**.



5.6.4.2 Electrical waterbath

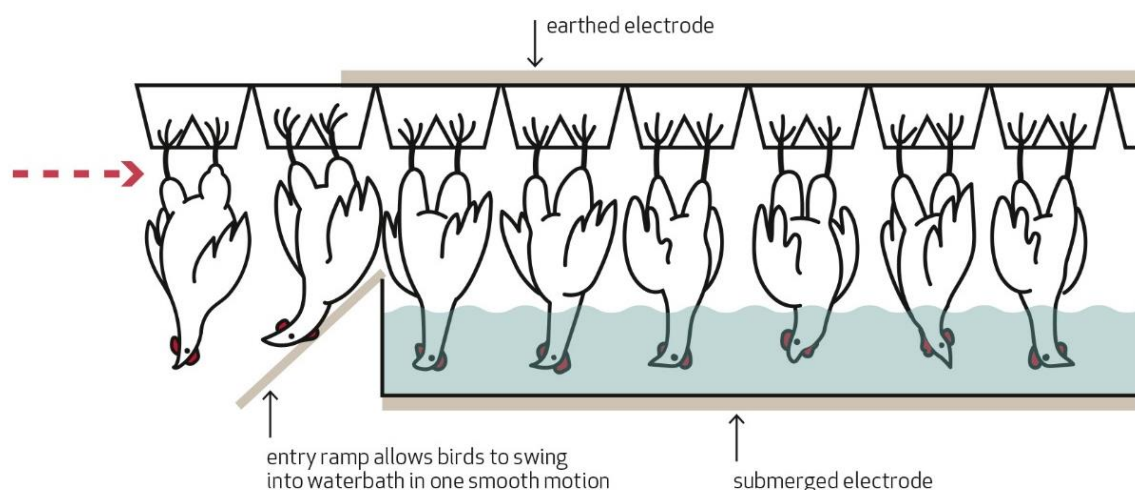
Poultry can be stunned using an electrical waterbath. Their legs are hang on a moving shackle first, then their heads are passed through electrified water.

Design principles

The flow of current through the water and the birds' bodies is created by two electrodes (see Figure 38):

- One electrode is placed in the water. This is the 'live electrode'. It should extend the full length and width of the waterbath. This ensures that all the birds receive the same amount of current.
- One overhead electrode is placed above the shackles. This is the 'earth rubbing bar'. The earth rubbing bar should always be in contact with the shackles. This way electricity can flow through the birds' bodies.

Figure 38. Design principle of an electrical waterbath



The electric current flow is ensured by establishing and maintaining contact and flow between the head, body, water bath and the leg shackle.

You should take steps to prevent pre-stun electric shocks. Shocks can be prevented by using an **ascending ramp** before the entrance to the waterbath, which helps birds enter the electrified water in one smooth motion. The entry ramp should be electrically isolated from the water inside the water bath. The water level in the waterbath should not overflow from the waterbath.

Shackling

Refer to text at 5.6.3.4.

Parameters

The waterbath must have a sufficient level of current to ensure that birds are made unconscious.

The main electrical parameters to obtain an effective stunning are current (measured in amperes: A) and frequency (measured in hertz: Hz). The Amperage for the waterbath should be set for the number of birds that are present at the same time in the waterbath.

The parameters required by EU legislation for chickens and turkeys are presented in the table below.

Table 15. Parameters for electric waterbath (from Regulation 1099/2009)

Frequency	Current for chickens (per bird)	Current for turkeys (per bird)
< 200 Hz	100 milliamperes (mA)	250 mA
From 200 to 400 Hz	150 mA	400 mA
From 400 to 1 500 Hz	200 mA	400 mA

Electrical parameters can be set to

- make the bird temporarily unconscious without killing it: high frequencies are more likely to make the bird unconscious by temporarily disrupting its brain; or
- stun and kill the bird: low frequencies (equal or below 50 Hz) are more likely to both stun and kill the bird by stopping its heart (stunning of chicken at low frequencies with 120mA has been found to be effective).

- Other factors influence the stunning effect, including the time between stunning and bleeding, the conductivity of the water, or the size of the birds.

Operating the waterbath

Generally, several animals are immersed in the waterbath at the same time. You should ensure that heads and necks of all birds are immersed in the water for the whole time they are in the waterbath. You should adjust the height of the waterbath and the water levels according to the different sizes of the birds to be stunned. Shackles can also be swapped for shorter or longer ones.

Monitoring the waterbath

You should monitor the waterbath for welfare issues when animals (a) enter, (b) pass through and (c) exit the waterbath. Transparent plastic windows or a waterbath with plastic walls makes monitoring easier. Alternatively, the waterbath can be monitored from a viewing platform.

One should ensure that:

- The earthed rubbing bar is constantly in contact with the shackles.
- The shackles do not show signs of being worn, as this might create obstacles to current flow.
- The water does not get dirty with faeces, which may affect conductivity.

Advantages

- This approach contributes to meat quality if high frequencies are used.
- The waterbath enables slaughtering many birds rapidly.

Disadvantages

- Shackling causes pain.
- This method involves inversion.
- Pre-stun shocks are likely.
- It is difficult to achieve the required parameters (amperage) for every single bird entering the waterbath.
- Birds might lift their heads when entering the waterbath. As a result they might not be stunned.
- Inaccurate parameters may lead to failure to stun the birds. As a result birds come out of the waterbath shocked but not unconscious.

This stunning method constitutes **acceptable practice**.



Control procedure: See Annex Table **A2.1.4.3**

5.6.5 Monitoring procedures at slaughterhouses

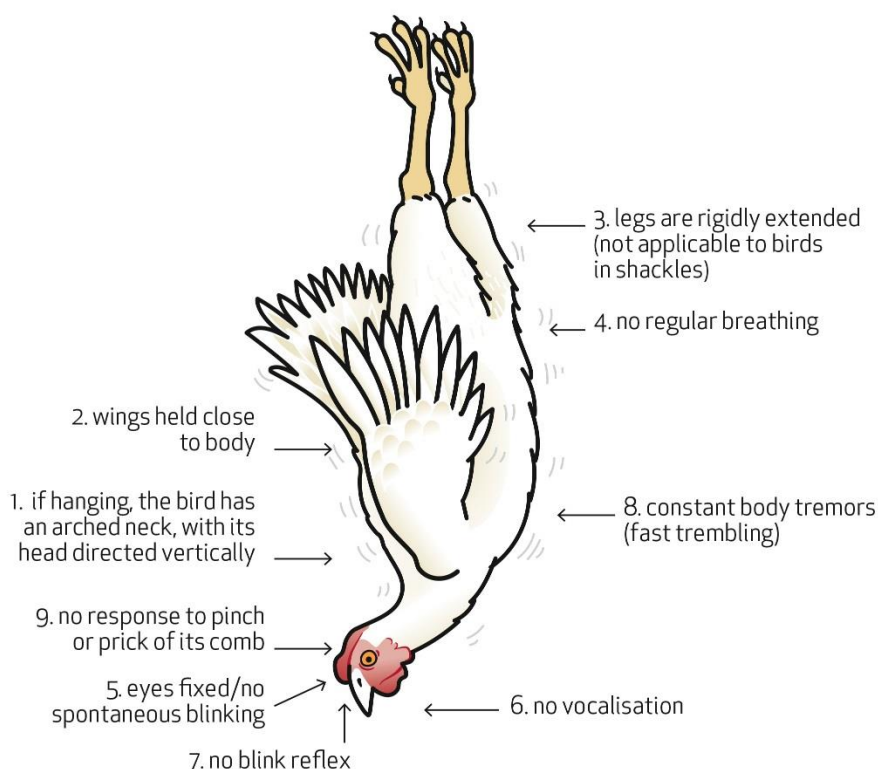
5.6.5.1 Verifying that stunning has worked

After stunning a bird, you must verify that it is unconscious. You must do so **before** you kill the bird. If a bird is **stunned electrically**, you should check that:

1. the bird has an arched neck, with its head directed vertically (however some birds may also exit the waterbath completely limp)
2. the bird's wings are held close to its body

3. the bird's legs are rigidly extended (known as the "tonic phase") – this does not apply to birds in shackles
4. the bird shows no regular breathing – the best place to check for this is between the legs while the bird is shackled
5. the bird is not blinking spontaneously
6. the bird is not making any noise
7. the bird's eyes do not blink when touched with the finger
8. the bird's body has constant body tremors (fast trembling)
9. the bird does not respond to any pinch or prick of its comb

Figure 39. Signs of unconsciousness in a bird stunned electrically



Once you have verified that the bird is unconscious, you should immediately kill it by bleeding. **If the bird is not unconscious, you should not bleed it. Immediately apply the procedure for re-stun.** You must stun it again with the back-up method. You should review the system and the practice to identify what failed. You should then take corrective action before the stunning process resumes.

Control procedure: See Annex Table **A2.1.4.4**

5.6.5.2 Verification of death

Signs of death are:

1. no spontaneous movements;
2. completely limp carcass;
3. wings hanging loose or limp;
4. no discernible breathing;

5. bleeding has stopped.

The absence of signs of life should be verified before the slaughtering can continue (Art. 5.2 of the Regulation).

6 Deliverable 4(3): Elements of best practices – Slaughter without stunning prescribed by religious rites

This section provides text for Deliverable 4 – Elements of best practices.

Elements of best practices are not of legally binding nature and do not affect the requirements of the EU legislation on protection of animals at the time of killing or other relevant pieces of legislation. Nor do they commit the European Commission. Only the Court of Justice of the European Union is competent to authoritatively interpret Union law. The reader is therefore invited to consult this section in connection with the relevant provisions of the legislation and refer, when necessary, to the relevant competent authorities.

Furthermore, **this section does not preclude any religious requirement** that may or may not allow some of the practices presented below. The reader is invited to verify with the religious representatives concerned if a practice is allowed according to their rites.

Similarly, **this section does not preclude any possible stricter national rules** that may forbid or restrict some of the practices presented below. The reader is invited to verify with the competent authorities concerned if a practice is permitted under national rules which may be adopted regarding slaughter without stunning under Article 26 (2) (c) of Regulation (EC) No 1099/2009.

6.1 Introduction

The welfare of animals is recognised as an important issue by the European Union and the Member States. **Animals should not experience avoidable pain, stress, or suffering.** The welfare of animals should be ensured at all times, but especially at the time of killing. There, the protection of animals is not only important as such. It contributes also to the quality of the meat and to the safety of all who work in slaughterhouses. When animals experience minimum stress, the quality of the meat is enhanced. There is also a better and safer relationship between animals and men. In 2009, the European Union has adopted Regulation (EC) N°1099/2009 on the protection of animals at the time of killing. The Regulation aims to achieve good standards of animal protection at the time of killing and in all related operations. The Regulation lists a number of principles and rules that **business operators** need to understand and apply. In recent years, audits in the EU have found some slaughterhouse practices that are in breach of the Regulation. These findings in particular indicate that **business operators** could be better informed of good practices of slaughter without stunning prescribed by religious rites. This document means to address this objective. It provides **elements for best practice**. It has been produced as part of a project funded by the European Commission.

The European Union is required to respect the legislative or administrative provisions and customs of the Member States relating to religious rites, cultural traditions and regional heritage when formulating and implementing the Community's policies on, inter alia, agriculture and the internal market. Regulation (EC) N°1099/2009 takes this into account and makes provisions for particular methods of slaughter without stunning prescribed by religious rites. In any case, **all operations of slaughter without stunning prescribed by religious rites must take place in a slaughterhouse.**

What information does this document provide?

The document covers specific topics of slaughter without stunning, using methods prescribed by religious rites, where the European Commission has identified the need for good practice guidance.

In the context of the EU legislation, slaughter without stunning prescribed by religious rites are defined in Article 4(4) of the Regulation and allows either direct bleeding or the use of non-authorized methods of stunning³⁷. Beyond certain common provisions, Member States are responsible for defining the modalities of how slaughter without stunning should be allowed and performed. These modalities may include particular conditions related to the religious or the technical aspects of slaughter.

Following Article 26 (2) (c) of the Regulation, Member States may also adopt stricter rules to ensure more extensive protection of the animals (for example they may require post-cut stunning).

For each of the topics identified above, the document discusses what the Regulation requires. It then presents good practices on **how to comply** with the requirements from the Regulation. It also presents good practices on **how to assess compliance** (verify that one is indeed compliant) with the requirements from the Regulation. The latter is presented in the form of a "control procedure". The good practices listed in the documents correspond to **actual practices performed under commercial conditions** (including national or sectoral good practices and voluntary standards). When applicable the document presents the **advantages** and **disadvantages** of the good practice.

In this document,

- **UNACCEPTABLE** practices are forbidden by law.



- **ACCEPTABLE** practices are authorised or required by law and provide **limited animal protection**.



- **GOOD** practices are authorised or required by law and provide **good animal protection**.



- **BEST** practices are authorised or required by law **and** (a) provide **enhanced animal protection**, or (b) they provide **other benefits** (for instance: they are more practical, or more cost-effective).



How is this document structured?

This document is structured by species (cattle, sheep and poultry) with for each of them different sections into the chronological order of the different possible procedures (restraining, non-authorized methods of stunning, bleeding and post-cut stunning (for cattle only)).

6.2 Basic rules applicable to all species

Regulation (EC) N° 1099/2009 contains a series of general requirements that apply to all methods of slaughter as well as specific provisions related to slaughter without stunning.

³⁷ Some methods of stunning are not authorised by the EU legislation due to insufficient scientific evidence demonstrating that they can provide a reliable and efficient stunning under commercial conditions. Their use may be however envisaged when prescribed or accepted by religious rites as an alternative to direct bleeding. These practices remain considered as slaughter without stunning and therefore subject to all specific requirements related to such methods of slaughter.

As regards the general requirements applicable to all slaughter methods, it is worth emphasizing here the importance of the need for certificate of competence as well as the Standard Operating Procedures. Business operators must ensure that slaughter operations are carried out by persons holding a **certificate of competence**. The Competent Authority of the Member State must be contacted in order to obtain a certificate for the relevant persons. This involves attending a training course. This certificate differs from the religious recognition which might be also required in some Member States to perform such method of slaughter.

The Regulation requires that business operators **establish Standard Operating Procedures (SOPs)** of the particular methods of slaughter without stunning prescribed by religious rites. While writing the SOPs, the business operator should consider ways of reducing the pain and stress of the animals. SOPs should be written up and displayed in a place where the business operator and others (workers, public authorities) can see them. The business operator should make SOPs available to the Competent Authority.

As regards specific requirements only applicable to slaughter without stunning prescribed by religious rites, it is important to underline the following obligations for business operators:

- slaughter without stunning is only carried out **in a slaughterhouse** (article 4.4 of the Regulation),
- systematic checks are carried out to ensure that animals do not present any sign of consciousness or sensitivity before being released from restraint and do not present any sign of life before undergoing dressing or scalding, (Article 5+16)
- ruminants must be individually mechanically restrained before bleeding (Article 14.2)
- systems restraining bovine animals by inversion or any unnatural position shall respect a number of technical conditions (Article 14.2 see below)

6.3 Cattle

6.3.1 Mechanical restraining methods

For the use of slaughter methods without stunning prescribed by religious rites, each animal must be **individually restrained** before cutting the throat (Article 15.2 of the Regulation). Restraining the animal enables to cut its throat rapidly and precisely. As a result, the animal will bleed and die more quickly. In case the animal is stunned **before** or **after** cutting its throat, restraining facilitates stunning as well. A poorly restrained animal could struggle. Cutting and bleeding will be difficult. It could also be more painful for the animal, and could be dangerous for the slaughtermen.

Some restraining methods are allowed by the Regulation while others are explicitly forbidden. **A conscious animal should not be restrained under any circumstance by:** suspending or hoisting it; clamping or tying its legs or feet; severing its spinal cord; immobilising it with an electric current. These practices are **unacceptable and forbidden**.



The Regulation requires that cattle, sheep and goats shall be mechanically restrained. Mechanical restraining systems include: **Standing systems** – The animal is restrained in a standing position; **Rotating systems** – The animal is restrained by rotating until it is tilted sideways or lies on its back.

All standing and rotating systems for bovines should restrict lateral and vertical movement of the head and be adjustable to the size of the animal. All mechanical restraint methods cause stress. The level of stress varies as a result of a number of

factors: the state of the animal, the breed, previous mixing with other animals and any fighting that might have ensued, and also handling immediately prior to entering. Therefore, efforts and measures are essential to reduce stress caused by mechanical restraint systems. Mechanical restraining systems should also cause no injury and minimum discomfort. Because restraining causes stress, the Regulation requires that restraint starts **only after verification** that the cut can be performed **without any delay**. The following methods are used under commercial conditions in the European Union.

6.3.1.1 Standing system – individual box

Refer to text and pictures at 5.3.1.6.5

Advantages

- The animal cannot move forward or backward.
- The head is stabilised for neck cut.
- Operators are protected from the animal's movements.
- The animal cannot fall.
- The animal is in a natural, standing position for slaughter.
- Carotid ballooning/welling on cut arteries can occur. It can be more easily resolved if the animal is in a standing position.
- Standing systems are cheaper than rotating systems

Disadvantages

- The box requires some handling of the animal.
- Cutting in this position requires more skilled slaughterman.
- The box can only be used for low speed slaughter.

This restraining system constitutes **acceptable practice**.



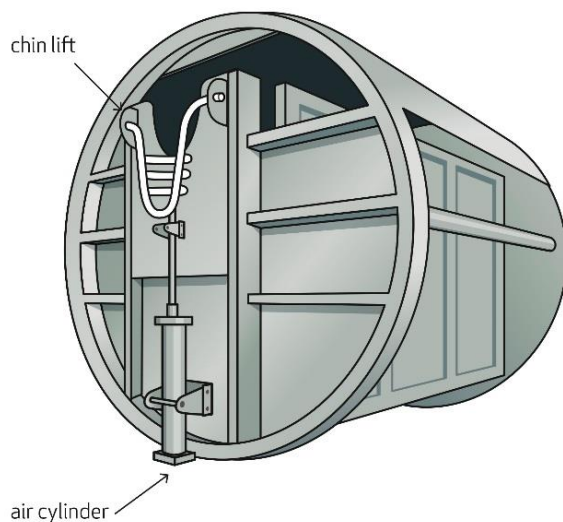
6.3.1.2 Rotating pens

A rotating pen may be used to restrain the animal. Rotating pens allow moving the animal on its side (up to 90° rotating pens), or on its back (180° rotating pens) before cutting. **Rotating pens that turn the animal upside down (180°) may be forbidden due to stricter national rules.**

The animal is loaded into the pen in the same way as for a standing individual box (above). Pens should have adjustable side panels and backrest to ensure full support to the animal during rotation; and to prevent the animal from slipping, twisting, or falling during inversion. The animal's head must be restrained before rotating. The neck can be immobilised with a **neck-yoke** or **head-yoke**. The head can be lifted with a **chin-lift**. The chin lift can be raised manually, electrically, or using chains until **the side of the head is lateral to the floor**. The chin-lift supports the head. It stretches also the neck for the cutting. The head restraint should not obscure the front of the head and allow good access to the eyes. This enables verification of consciousness after the neck has been cut.

Rotation should be smooth and any sudden movements or unnecessary interruptions should be avoided. It should take **no longer than 30 seconds** to fully rotate the animal. The pen should be easily evacuated in case of stoppage of emergency.

Figure 40. Illustrative design for rotating pen³⁸



Advantages

- Rotating pens can facilitate cutting through better exposure of the neck.
- Innovative versions of rotating pens enable restraining of two animals at a time, thus speeding up the slaughtering process.
- The animal cannot move forward or backward.
- The head is stabilised for neck cut.
- Operators are protected from the animal's movements.
- The animal cannot fall.

Disadvantages

- Rotating system affect the comfort of animals, as they are restrained in an unnatural position. The discomfort is greater if the animal is rotated upside down (180°) than laterally (90°).
- Rotating systems are more expensive to purchase than standing systems.
- Rotating pens with double restraining devices are best suited to large abattoirs with a high output of slaughtered animals per year.
- Carotid ballooning/welling on cut arteries can occur. It is difficult to prevent and to resolve if the animal is not standing.
- Some of these devices do not turn fast enough. As a result the time from restraint to cutting can be excessive.

This restraining method constitutes **acceptable practice** in most European Union Member States.

³⁸ Image drawn from original material published by BANSS. Source: BANSS Online Guide "Ritual Slaughtering" Link: <http://www.banss.de/en/#slaughtering-technology-cattle-ritual-slaughtering/> Produced with permission from BANSS (July 2017).



6.3.1.3 Standing system – Conveyor belt

Refer to text and figures at 5.3.1.6.4

The conveyor should be stopped at the time of bleeding.

Advantages

- Animals are more comfortable in conveyor belt restrainers than in static restrainers.
- Conveyor belt systems require little handling of the animals. They are safer for workers than boxes or rotating pens.
- Conveyor belt systems require only short restraint until neck cutting.
- Small animals can be loaded as a group into a conveyor system. This is less stressful for the animal than individual loading.
- The animal cannot move forward or backward.
- The head is stabilised for neck cut.
- Operators are protected from the animal's movements.
- Carotid ballooning/welling on cut arteries can occur. It can be more easily resolved if the animal is in a standing position.

Disadvantages

- Small animals could risk injuries from falling through or crossing their legs in a V-shaped system.
- Cutting in this position requires more skilled slaughterman.
- There is a cost to the purchase and maintenance of conveyor belts that is higher than for static systems.

This restraining system constitutes **good practice**.



Control procedure: See Annex Table **A2.2.1.1**

6.3.2 Use of non-authorized methods of stunning – non-penetrative captive bolt

Provided that the method is allowed by the religious representatives concerned, stunning of cattle can be done with a **non-penetrative captive bolt device**, or non-penetrative "stunner". It strikes the forehead of the animal with great force without penetrating the skull. Maintenance, handling, and keeping of equipment is fundamental to successful use.

Since the method is not authorised under EU rules, it should always be used in the context of slaughter without stunning prescribed by religious rites. The obligation of systematic checks as well as possible additional national provisions apply.

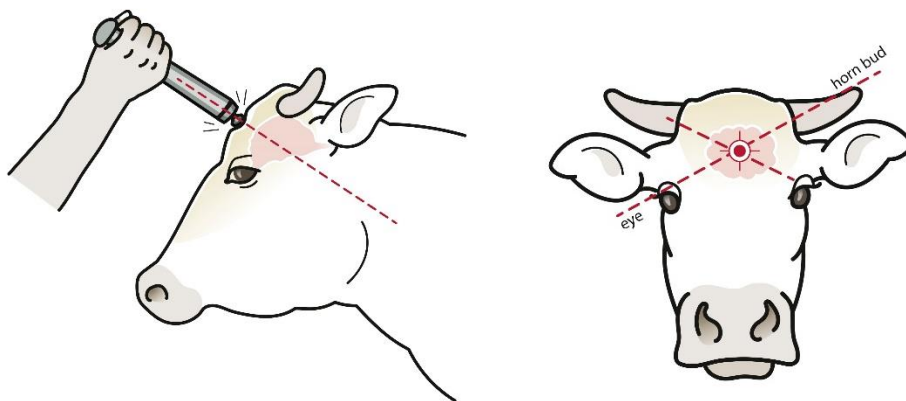
6.3.2.1 Parameters

The charge or air pressure should be appropriate for the animals to be stunned. The stunner's manufacturer instructions contain the necessary information and should be followed.

6.3.2.2 Positioning

When using this method, **the head should be restrained**. The target of the stunner is on the forehead of the animal. Imagining two lines going from the middle of each horn / horn bud to the top of the opposite eye, the target is the intersection point between the two lines, aiming the stunner at right angles. The stunner should be aimed with the line of the spinal column in the neck.

Figure 41. Position of a non-penetrative captive bolt stunning on cattle



Advantages

- The stunner's impact causes concussion, and should make the animal immediately unconscious.
- It is faster than direct bleeding since animals can be released immediately after the procedure.
- This enables a higher slaughter speed.
- This makes the slaughtering process safer for the operators

Disadvantages

- It does not always induce unconsciousness immediately, especially if used on heavy cattle.
- It is likely to break the skull of the animal. If not rendered unconscious, the animal will suffer.
- There is a cost for the purchase of the stunner.
- The stunner requires regular maintenance
- A back-up system should be available, should the stunner fail.

This stunning method constitutes **acceptable practice**.



Control procedure: See Annex Table **A2.2.1.2**

6.3.3 Bleeding operations

The animal should be cut to start bleeding **as soon as possible**. Existing guides to good practice recommend that the cut is performed: within 30 seconds of starting restraining the animal; within 10 seconds of having restrained the head; within 10 seconds after tipping the rotating box. The animal is likely to struggle and vocalize in case of delays. If the animal was stunned (by a non-authorized method, for example non-penetrative captive bolt or electrical stunning), it should be cut immediately after

signs of unconsciousness have been verified. It is important to achieve: a **good cut severing both carotid arteries completely; rapid and maximum blood loss; rapid onset of loss of consciousness** (if the animal was not stunned beforehand).

6.3.3.1 Knife

The knife should be long enough, and at least twice the width of the neck (alternatively, at least 30cm). The knife should be straight and sharp. Otherwise, cutting risks closing the arteries rather than opening them. The animal would not lose blood as rapidly as it should. Death would be delayed. A second knife and sharpening equipment should be available at all times. The slaughterer should be trained to using the sharpening equipment.

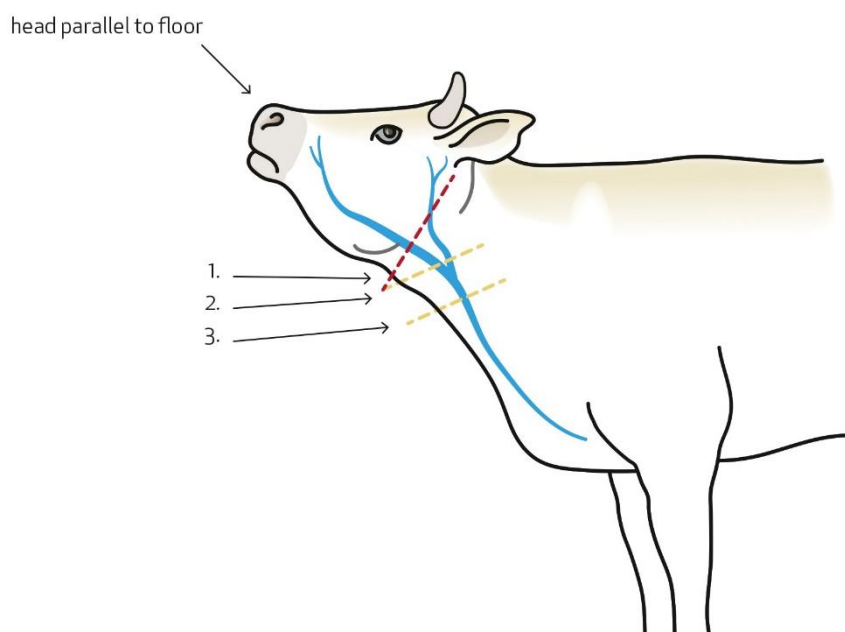
6.3.3.2 Head restraining and support

The neck of the animals should be extended for cutting. The restraint on the neck and the chin should be released partly immediately after the cut. This will facilitate bleeding. It is recommended to continue supporting the head when bleeding. This will facilitate the bleeding by keeping the wound open. The animal could lose consciousness more quickly.

6.3.3.3 Performing the cut

The cut should be performed by appropriately trained, skillful operators. The neck should be cut deeply under the jaw bone. Both carotid arteries and both jugular arteries should be cut. However, the neck bones should not be touched, and the neck should not be broken. The cut should be swift and in **one continuous back and forth movement**, without interruptions. If the cut is not accurate, the animal will take longer to lose consciousness.

Figure 42. Recommended cut location and inclination in cattle³⁹



³⁹ Image drawn from original material published by Interbev. Source: "GUIDE DE BONNES PRATIQUES. Maîtrise de la protection animale des bovins à l'abattoir. Version 3.0 – Novembre 2013" Link: http://www.interbev.fr/wp-content/uploads/2014/04/GBP_maitrise-protection-bovins-abattoir.pdf. Produced with permission from Interbev (June 2017).

Existing good practice guides provide recommendations on the location and inclination of the cut. In Figure 42, cut 1 corresponds to a correct location and inclination of the cut. Positions 2 and 3 correspond respectively to a correct location but wrong inclination, and an incorrect location and incorrect inclination

6.3.3.4 Monitoring the blood flow

The wound should not be interfered with until the animal has lost consciousness. It should not be touched or scraped. It should not be contaminated with stomach content either. There should be no further cuts after the initial single incision. The blood flow should be monitored for restrictions. Sometimes, blood clots form and reduce the flow of bleeding, generally within 5 to 15 seconds after cutting the throat. If that is the case, the animal should be stunned with a back-up stunning method (penetrative captive bolt, electrical stunning).

6.3.3.5 Monitoring signs of unconsciousness

The absence of signs of consciousness **must be monitored systematically** after cutting the animal's neck, during bleeding and while the animal is restrained, before releasing the animal from restraint and before dressing or scalding. A good cut should lead to loss of consciousness within 10-15 seconds.

Signs of unconsciousness are: 1. collapse of the animal (of the behind if restrained in a standing position); 2. no attempt to right itself or its head (if the animal has been restrained in a standing position); 3. no regular breathing; 4. eyes have a fixed, glazed expression, eyes do not follow movements around, they do not blink, there is no response to finger touching the eye – this occurs within 1 to 2 minutes after cutting in cattle; 5. no response to threatening movements (e.g. rushing the hand towards the eyes leading to eyes closing or head moving backwards) – this indicator is not reliable when the animal is in a reversed position in a rotating pen; 6. no response to noise – ears do not move if clapping hands 5 cm from the ear; 7. tongue hanging out of the mouth; 8. uncoordinated leg movements (pedalling).

There should be no signs of consciousness before the animal can be removed from the holding system. It is recommended to wait **at least 45 seconds**, and **up to 90 seconds**, before releasing the animal from restraining. A timer can be used to remove the animal from the restraining system after cutting (this can be incorporated to the restraining system).

Sometimes, animals take too long to lose consciousness. **In case of prolonged consciousness, the animal should be stunned with a suitable method.** A workable back-up solution for stunning is required (penetrative captive bolt, electrical stunning). Existing good practices on this issue vary widely from one Member State to another. Stunning is practiced if the animal is showing signs of consciousness or sensibility **after 45 seconds** in some, and up to **after 150 seconds** in others. Cutting an animal's neck causes pain and distress. Therefore, to stun after a delay of loss of consciousness after 45 seconds may be acceptable practice (150 seconds in one Member State) but any longer would be unacceptable practice.

Causes of prolonged consciousness (e.g. problems with restraining, slaughterer skill) should be investigated and resolved.

Signs of death are: no signs of heartbeat after bleeding has stopped; no breathing; enlarged pupil with no response to light; all muscles relaxed, no movements of the legs. The absence of signs of life must be verified before the slaughter process (dressing) can continue.

Control procedure: See Annex Table **A.2.1.3**

6.3.4 Post-cut stunning

The duration of the pain provoked by the neck cut can be reduced if stunning is performed immediately after the cut (post-cut stunning). Some stricter national rules

may require post-cut stunning. Post-cut stunning should be applied **within 5 seconds** of cutting the neck. Post-cut stunning can be carried out with of a **non-penetrative captive bolt**.

Refer to text and figures at 6.3.2.

6.4 Sheep and Goats

6.4.1 Restraining – Mechanical restraining systems

Refer to text at 6.3.1.

6.4.1.1 Conveyor systems

Refer to text at 5.3.1.6.4 and to figures at 5.5.1.6.2.

The conveyor should be stopped at the time of bleeding.

Advantages

- Animals are more comfortable in conveyor belt restrainers than in static restrainers.
- Sheep appear to be comfortable in V-restraining conveyors if placed together
- Conveyor belt systems require little handling of the animals. They are safer for workers than boxes or rotating pens.
- Conveyor belt systems require only short restraint until neck cutting.
- Animals can be loaded as a group into a conveyor system. This is less stressful for the animal than individual loading.
- The animal cannot move forward or backward.
- Operators are protected from the animal's movements.

Disadvantages

- Small animals could risk injuries from falling through or crossing their legs in a V-shaped system.
- If sheep are separated from their flock-mates, isolation can cause stress.
- Slaughter operation can be slowed down affecting throughput.
- Conveyor systems are costly to purchase and maintain.

This restraining system constitutes **good practice**.



6.4.1.2 Restraining chute

A chute can be used to restrain the animal before it is killed. The animal shall be directed to enter the chute on its own. Alternatively, it can be lead to enter the chute, using a halter. Once in the chute, the animal is lifted by operating a lever. Its belly is supported as in a central track conveyor. Solid walls on each side limit the animal's view.

Advantages

- The animal cannot move forward or backward.
- The operator is protected from the animal's movements.
- The animal cannot fall.
- The cost is low.

Disadvantages

- This requires some handling and manual restraining of the animal.
- This can only be used for low speed slaughter.

This restraining system constitutes **good practice**.



6.4.1.3 Cradle or V restraint

A cradle is a simple device designed to support the body of the animal underneath and from the sides while providing access to the head and neck. Each animal is lifted and placed on their side in a cradle. The neck of the animal can then be stretched manually so that the slaughterman can perform the cut.

A V-restraint applies the same principle as a cradle, however the animal is in an upright position. Contrary to a V-shape conveyor, a V restraint is static, not moving.

Advantages

- Individual placement can insure correct positioning and extension of neck for slaughter
- The cost is low

Disadvantages

- Restrain with cradles can be stressful for sheep, who prefer to be in a group with other sheep. The sheep may struggle
- It is slower than conveyor system.
- There is a risk of carcass damage especially if grabbing fleece causing wool pull.

This restraining system constitutes **good practice**.



6.4.1.4 Individual box

Refer to text and picture at 5.3.1.6.5.

Advantages

- The animal cannot move forward or backward.
- The head is stabilised for neck cut.
- Operators are protected from the animal's movements.
- The animal cannot fall.
- The animal is in a natural, standing position for slaughter.
- Standing systems are cheaper than rotating systems

Disadvantages

- The box requires some handling of the animal.
- The box can only be used for low speed slaughter.

This restraining system constitutes **good practice**.



Control procedure: See Annex Table **A2.2.2.1**

6.4.2 Bleeding operations

The animal should be cut to start bleeding **as soon as possible**. Existing guides to good practice recommend maximum time limits until the cut is performed: within 30 seconds of starting restraining the animal, and within 10 seconds of having restrained the head. The animal is likely to struggle and vocalize in case of delays. If the animal was stunned, it should be cut immediately after signs of unconsciousness have been verified. It is important to achieve: **a good cut severing both carotid arteries completely; rapid and maximum blood loss; rapid onset of loss of consciousness** (if the animal was not stunned beforehand).

6.4.2.1 Knife

The knife should be long enough, and at least twice the width of the neck. The knife should be straight and sharp. Otherwise, cutting risks closing the arteries rather than opening them. The animal would not lose blood as rapidly as it should. Death would be delayed. A second knife and sharpening equipment should be available at all times. The slaughterer needs to be trained to using the sharpening equipment.

6.4.2.2 Head restraining and support

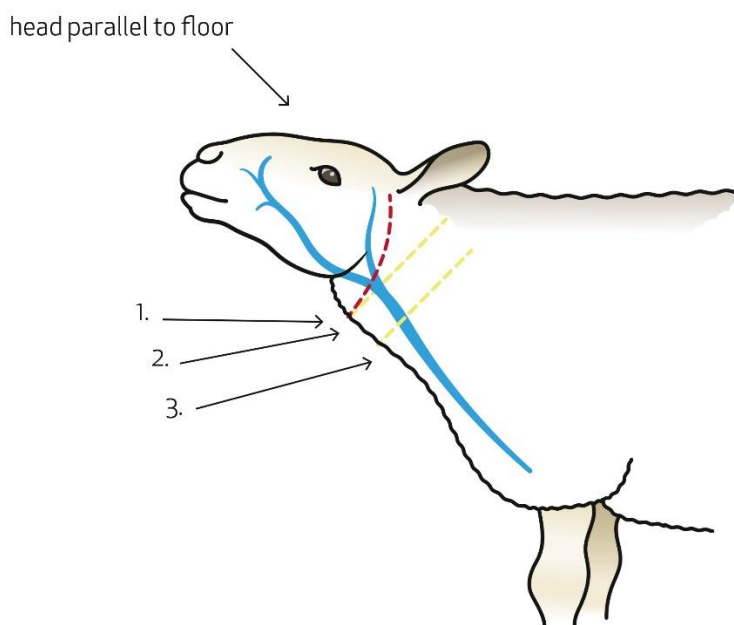
Hold the head with both hands: one hand rests on the top of the head, while the other is placed under the mouth, stretching the neck. One person should restrain the head while the other carries out the cutting. Alternatively one operator carries out both operations.

The neck of the animals can be stretched manually at the moment of cutting. One can continue to support the head after the cut to facilitate the bleeding. The animal could lose consciousness more quickly. The head restraint should be maintained until the animal shows the first signs of loss of consciousness (loss of posture of the head).

6.4.2.3 Performing the cut

The neck should be cut deeply **under the jaw bone**. Both carotid arteries and both jugular arteries should be cut. However, the neck bones should not be touched, and the neck should not be broken. The cut should be swift and in one continuous movement, without interruptions. If the cut is not accurate, the animal will take longer to lose consciousness.

Figure 43. Recommended cut location and inclination in sheep and goats⁴⁰



Existing good practice guides provide recommendations on the location and inclination of the cut. In Figure 42, cut 1 corresponds to a correct location and inclination of the cut. Positions 2 and 3 correspond respectively to a correct location but wrong inclination, and an incorrect location and incorrect inclination

6.4.2.4 Monitoring the blood flow

The wound should not be interfered with until the animal has lost consciousness. It should not be touched or scraped. If any contamination by stomach content occurs, it must be cut or carefully cleaned after the death of the animal. There should be no further cuts after the initial single incision. If bleeding is not effective the animal should be stunned with a back-up stunning method (penetrative captive bolt, electrical stunning).

6.4.2.5 Monitoring signs of unconsciousness

The absence of signs of consciousness should be monitored systematically after cutting the animal's neck, during bleeding and while the animal is restrained, and after releasing the animal from restraint. A good cut should lead to loss of consciousness within 10-15 seconds.

Signs of unconsciousness are: 1. no attempt to right itself or its head (if the animal has been restrained in a standing position); 2. no regular breathing; eyes have a fixed, glazed expression eyes do not follow movements around, they do not blink, and there is no response to finger touching the eye – this occurs within 20-30 seconds; 3. no vocalisation; 4. no response to threatening movements (e.g. rushing the hand towards the eyes leading to eyes closing or head moving backwards); 5. tongue hanging out of the mouth; 6. uncoordinated leg movements (pedalling); 7. relaxed tail.

⁴⁰ Image drawn from original material published by Interbev. Source: "Rédaction d'un Guide de Bonnes Pratiques pour l'optimisation du parage de la plaie de saignée des ovins à l'abattoir" Link: <http://idele.fr/presse/publication/idelesolr/recommends/guide-de-bonnes-pratiques-pour-loptimisation-du-parage-de-la-plaie-de-saignee-des-ovins-a-labatt.html>. Produced with permission from Interbev (September 2017).

There should be no signs of consciousness before the animal can be removed from the holding system. Sometimes, animals take too long to lose consciousness. **In case of prolonged consciousness, the animal should be stunned with a suitable method.** A workable back-up solution for stunning is required (penetrative captive bolt, electrical stunning).

Existing good practices on this issue vary widely from one Member State to another. Stunning is practiced if the animal is showing signs of consciousness or sensibility **after 30 seconds** in some, and up to **after 45 seconds** in others. **Signs of death** are: no signs of heartbeat after bleeding has stopped; no breathing; enlarged pupils with no response to light; all muscles relaxed, no movements of the legs. The absence of signs of life should be verified before the slaughtering (dressing) can continue.

Control procedure: See Annex Table **A2.2.2.2**

6.5 Poultry

6.5.1 Electrical waterbath

Electrical waterbath stunning is an authorised method of stunning if all EU requirements are applied. In this case, the reader should refer to section 5.6.4.2.

Provided that the method is allowed by the religious representatives concerned, the use of electrical waterbath may be used with lower electrical parameters than the requirements of the EU legislation..

In this case the method must be considered as slaughter without stunning and therefore submitted to the corresponding EU and, if any, national obligations.

Birds are first hung by their legs to a moving shackle. Then, their heads are passed through electrified water. The flow of current should make the birds unconscious. The birds should remain unconscious until bleeding is finished.

6.5.1.1 Design principles

Refer to section 5.6.4.2.1

6.5.1.2 Shackling

Refer to Section 5.6.4.2.2

6.5.1.3 Electrical parameters

When electrical parameters are not compliant with the EU requirements, they should at least aim at ensuring that the highest proportion of birds are rendered unconscious, keeping in mind that they present a higher risk of not providing a reliable and complete stun to all animals.

The main electrical parameters to obtain an effective stunning are current (measured in amperes: A) and frequency (measured in hertz: Hz). In addition a number of other factors influence the stunning effect, such as time from the birds leave the stunner and until bleeding, conductivity of the water, uniform size of the birds.

Business operators should aim at using electrical parameters as much as possible close to the figures required by the EU legislation (see section 5.6.4.2.3) while respecting religious requirements. In adjusting electrical parameters they should focus on the outcomes on the animals with a strict monitoring so that no or as few as possible animals show sign of consciousness until the end of bleeding.

6.5.1.4 Operating the waterbath

Refer to text at 5.6.4.2.4

6.5.1.5 Monitoring the waterbath

Refer to text at 5.6.4.2.5.

This stunning method constitutes **acceptable practice**.



Automated systems for head-only stunning have recently been developed which could constitute an alternative to waterbath, provided that the method is allowed by the religious representatives concerned. Refer to text at section 5.6.4.1.2.

Control procedure: See Annex Table **A2.2.3.1**

6.5.2 Manual bleeding operations

Once restrained, the bird should be cut as soon as possible. If stunned, bleeding should start immediately after having verified unconsciousness. Only few sources set a maximum stun-to-stick interval, at **7 seconds** and **20 seconds** of stunning the bird. The speed of the slaughter line should enable slaughterers to perform a good cut; it should take account of the number of slaughterers working on the line. It is important to achieve: a good cut severing both carotid arteries and jugular arteries completely; rapid and maximum blood loss; and rapid onset of loss of consciousness (if the bird was not stunned beforehand).

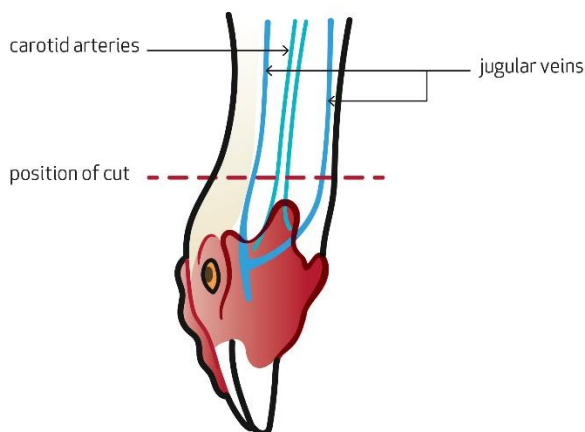
6.5.2.1 Knife

The knife should be long enough, and at least twice the width of the neck. The knife should be straight and sharp. A second knife and sharpening equipment should be available at all times.

6.5.2.2 Performing the cut

The cut must be accurate, or else the bird would take longer to lose consciousness and die. Both carotid arteries and both jugular arteries should be cut. In chickens, carotid arteries are on the surface of the neck muscle, near the head. In turkeys, the arteries are hidden below the muscle: the muscle should be cut as well to ensure reaching the arteries. The neck should be cut with uninterrupted movements. Cut deep into the muscle, across the front and both sides of the throat.

Figure 44. Diagram of recommended cut location for poultry⁴¹



6.5.2.3 Monitoring the blood flow

There should be no interference with the wound until the animal has lost consciousness. You may only do so to check the quality of the cut, if in doubt. Look out for restrictions in the blood flow. When held upside down, the blood flow from the arteries should form an upside-down V-shape for 5-10 seconds. If the blood flow is not appropriate, another cut might be needed to contribute to blood flow and speed up the

⁴¹ Image drawn from original material published by HSA. Source: HSA Online Guide "Electrical Waterbath Stunning of Poultry" Link: <https://www.hsa.org.uk/electrical-waterbath-stunning-of-poultry-bleeding/bleeding-2>. Produced with permission from HSA (September 2017).

loss of consciousness. Alternatively, the animal can be decapitated. Before further processing, birds should be allowed to bleed for at least 2 minutes for turkeys and 1½ minute for chickens.

6.5.2.4 Monitoring the absence of signs of consciousness and signs of life

The absence of signs of consciousness should be monitored systematically, and at least twice within 15 to 25 seconds after the cut.

Signs of unconsciousness are: 1. no regular breathing; 2. no wing flapping; 3. no spontaneous blinking; 4. no righting attempt; 5. neck is arched with head pointing down (for electrical waterbath only); 6. no blink reflex; and 7. no response to pinch or prick of its comb. There should be no signs of consciousness before the bird can be removed from the holding system (art 5.2 of the Regulation). Sometimes, birds take too long to lose consciousness. If the bird is still conscious **after 30 seconds**, it should be stunned immediately with an appropriate back-up method.

Signs of death are: 1. no spontaneous movements; 2. completely limp carcass; 3. wings detached from the body; 4. no discernible breathing; 5. bleeding has stopped. The absence of signs of life should be verified before the slaughtering can continue (Art. 5.2 of the Regulation).

Control procedure: See Annex Table **A2.2.3.2**.

7 Deliverable 4(4): Elements of best practices – On-farm killing

This section provides text for Deliverable 4 – Elements of best practices.

Elements of best practices are not of legally binding nature and do not affect the requirements of the EU legislation on protection of animals at the time of killing or other relevant pieces of legislation. Nor do they commit the European Commission. Only the Court of Justice of the European Union is competent to authoritatively interpret Union law. The reader is therefore invited to consult this section in connection with the relevant provisions of the legislation and refer, when necessary, to the relevant competent authorities.

Furthermore this section does not preclude any possible stricter national rules that may forbid or restrict some of the practices presented below. The reader is invited to verify with the competent authorities concerned if a practice is permitted under national rules which may be adopted regarding slaughter without stunning under Article 26 (2) (a) of Regulation (EC) No 1099/2009.

7.1 Introduction

The welfare of animals is recognised as an important issue by the European Union and the Member States. **Animals should not experience avoidable pain, stress, or suffering.** The welfare of animals should be ensured at all times, but especially at the time of killing. The protection of animals is not only important as such. It contributes also to the quality of the meat and to the safety of those who carry out the killing. When animals experience minimum stress, the quality of the meat is enhanced. There is also a better and safer relationship between animals and men. In 2009, the European Union has adopted Regulation (EC) N°1099/2009 on the protection of animals at the time of killing. The Regulation aims to achieve good standards of animal protection at the time of killing and in all related operations. It lists a number of principles and rules for on-farm killing that **those carrying out the killing** need to understand and apply. In recent years, controls in Europe have found practices of killing on-farm that are in breach of the Regulation. This indicates that **owners** and **keepers** of animals could be better informed of good practices of on-farm killing. This document means to fulfil this objective. It provides **elements for best practice in areas identified during the recent Commission's audits of Member States.** It has been produced as part of a project funded by the European Commission.

What you will find in this document

The document covers specific topics of on-farm killing, where the European Commission has identified the need for good practice guidance. For each of these topics, the document discusses what the Regulation requires. It then presents good practices on **how to comply** with the requirements from the Regulation. It also presents good practices on **how to assess compliance** (verify that one is complying) with the requirements from the Regulation. The latter is presented in the form of a "control procedure". The good practices listed in the documents correspond to **actual practices that can be observed on-farm** (including national or sectoral good practices and voluntary standards). When applicable the document presents the **advantages** and **disadvantages** of the good practice.

In this document,

- **UNACCEPTABLE** practices are forbidden by law.



- **ACCEPTABLE** practices are authorised or required by law and provide **limited animal protection.**



- **GOOD** practices are authorised or required by law and provide **good animal protection**.



- **BEST** practices are authorised or required by law **and** (a) provide **enhanced animal protection**, or (b) they provide **other benefits** (for instance: they are more practical, or more cost-effective).



The intent of the document is to cover all levels of knowledge for all the species included. Therefore, for people with experience in the species/subject, some of the information may appear to be self-evident.

How is this document structured?

This document is structured by species (equids, cattle, sheep and goats, pigs and poultry) with for each of them different sections into the chronological order of the different possible procedures (handling and restraining, stunning, and verification of stunning). It contains information on the general rules applicable to on-farm killing for culling, emergency killing and emergency slaughter, and slaughter for direct supply of small quantities of poultry, rabbits and hare. Culling is defined as killing non-viable animals for commercial reasons and is not the same as emergency killing or depopulation.

7.2 Basic rules for all species

The rules applicable to on-farm killing can be found in Regulation (EC) N°1099/2009 of the European Union. In addition, Member States have their own rules applicable to on-farm killing, which may be stricter. The European legislation (Regulation EC N°1099/2009 and Regulation EC N°853/2004) clarifies **who** is responsible for the welfare of animals killed on-farm, and **when** animals can be killed on-farm. The **owner** or **keeper** of the animal is the person responsible for animal welfare when killing is carried out in the following circumstances:

- To **supply small quantities of meat directly** to the consumer or to local retailers (poultry, rabbits and hares);
- To eliminate animals that have poor conformation or are failing to thrive (**culling**);
- In an **emergency**. **Emergency killing** can be carried out on an animal that is in severe pain or suffering, and it cannot be treated successfully and/or economically. The animal may also put human health or safety at risk. If it cannot be otherwise restrained, then it may be killed. **Emergency slaughter** can be carried out on an animal that suffered an accident that prevented its transport to the slaughterhouse for welfare reasons.

In all of these circumstances, the Regulation prescribes that **the person carrying out the killing shall have the appropriate level of competence** to kill animals without causing them any avoidable pain, distress or suffering. That person should therefore have appropriate knowledge and skills. In the case of **emergency killing**, the Regulation requires also that the **keeper of the animals** shall take all the necessary measures to kill the animal as soon as possible. The European legislation does not require a **Certificate of Competence** to carry out the killing in all these circumstances.

Competent Authorities may also kill animals on-farm to protect public health, animal health, animal welfare or the environment. When such **depopulation** activities

takes place, only personnel holding a **Certificate of Competence** may carry out the killing. The Certificate is issued by the Competent Authority following attendance to a training course. In case of depopulation, the Competent Authority will supervise the killing.

For all methods, it is important to maintain, handle and keep equipment appropriately.

7.3 Equine animals or Equidae

7.3.1 Handling and restraining

Poor handling of horses can cause bruises and bone breaks. Poor restraining can also lead to inefficient stunning and killing. As a result, horses may experience avoidable pain, distress and suffering. Poor handling also puts handlers at risk.

7.3.1.1 Equine behaviour

Refer to text at section 5.3.2.1.

7.3.1.2 Moving horses

Refer to text at sections 5.2.2.1 and 5.3.2.3.

7.3.1.3 Restraining horses

Horses require restraining before stunning with a penetrative captive bolt gun (see section 7.3.2). **For such methods, horses need to be closely and well restrained. That is because the gun must be in contact with the horse's head.** Different methods are used for restraining horses before stunning and killing. The restraint should be suitable for the size, weight and temperament of the horse.

Crush or narrow pen

You can confine animals that can be moved in a crush or narrow pen. This will give you easy access to the head.

Advantages

- The animal is confined.
- There is minimal discomfort for the animal.

Disadvantages

- This may not prove sufficient to restrain some animals.
- The head needs also to be restrained for stunning.

This restraining method constitutes **good practice**.



Head collar and lead rope, halter, or bridle

You may use a head collar and lead rope, halter or bridle, which is secured to restrict movement of the head. This method may not be sufficient for unbroken horses. All halters, head collars and other equipment used to restrain or handle horses should be fitted with a method of quick release in case a horse becomes entangled in the equipment.

Advantages

- This enables stabilizing the head of the animal for stunning, including that of animal that cannot be moved and need to be stunned were they are.
- There is minimal discomfort for the animal.

Disadvantages

- This would not be sufficient to restrain a difficult animal.

This restraining method constitutes **good practice**.



Twitch

You may also add a twitch for very difficult animals.

Advantages

- This may prove effective for stabilizing the head of very difficult animals.

Disadvantages

- This causes discomfort to the animal.

This restraining method constitutes **acceptable practice**.



Sedation

You may use sedation on very difficult horse.

Advantages

- Sedation will ensure stability of the animal for stunning.

Disadvantages

- This should be applied by a veterinary surgeon.
- If you use sedation, there may be consequences for the manner you dispose of the carcasses. This will depend on the withdrawal time for the drug.

This restraining method constitutes **good practice**.



In addition to these restraining methods, you may use a **blindfold** to reduce restlessness. It is recommended that at least one person handles and restrains the horse, while the other stuns it. You should restrain and kill mares before their foal.

You should not under any circumstance restrain a conscious horse by: suspending or hoisting it; clamping or tying its legs or feet; severing its spinal cord; immobilising it with an electric shock. These practices are **forbidden and unacceptable**.



7.3.2 Stunning – Penetrative captive bolt

Refer to text and pictures at 5.3.3

Control procedure: See Annex Table **A2.3.1.1**

7.3.3 Verifying that stunning has worked

Refer to text and picture at 5.3.4.1.

Control procedure: See Annex Table **A2.3.1.2**

7.4 Cattle

7.4.1 Handling and restraining

Poor handling of cattle will increase levels of stress, making the animals more difficult to handle and can cause bruises and bone breaks. Poor restraining can also lead to inefficient stunning and killing. As a result, cattle may experience avoidable pain,

distress and suffering. By contrast, good handling and restraining practices help minimize pain, stress and suffering. They also contribute to better meat quality.

7.4.1.1 Cattle behaviour

Refer to text at section 5.3.2.2.

7.4.1.2 Moving cattle

Refer to text and figures at sections 5.2.2.1 and 5.3.2.3.

7.4.1.3 Restraining cattle

You should closely restrain cattle for stunning or killing.

Crush or narrow pen

You may confine animals that can be moved in a crush or a narrow pen. This will give you easy access to the head.

Advantages

- The animal is confined.
- There is minimal discomfort for the animal.

Disadvantages

- For some animals the head needs also to be restrained for effective stunning.

This restraining method constitutes **good practice**.



Head collar and lead rope, halter, or bridle

You may use a head collar and lead rope, halter or bridle, which is secured to restrict movement of the head. All halters, head collars and other equipment used to restrain or handle cattle should be fitted with a method of quick release in case the animal becomes entangled in the equipment.

Advantages

- This enables stabilizing the head for stunning, including that of cattle that cannot be moved or cannot rise and need to be stunned were they are.
- There is minimal discomfort for the animal.

Disadvantages

- None.

This restraining method constitutes **good practice**.



Manual restraining

You may hold **calves** against a wall or fence.

Advantages

- This enables stabilizing younger animals.

Disadvantages

- This can cause discomfort to the animal.
- You should take care of your own health and safety when doing so.

This restraining method constitutes **good practice**.



You should not under any circumstance restrain a conscious animal by: suspending or hoisting it; clamping or tying its legs or feet; severing its spine; immobilising it with an electric shock.

These practices are **forbidden and unacceptable**.



7.4.2 Stunning – Penetrative captive bolt

Refer to text and figures at 5.3.3.

Control procedure: See Annex Table **A2.3.2.1**

7.4.3 Verifying that stunning has worked

Refer to text and figure at 5.3.4.1. This may not apply to animals stunned by captive bolt, where the tonic phase might be difficult to see and the animal goes straight into the clonic phase.

Control procedure: See Annex Table **A2.3.2.2**

7.5 Pigs

7.5.1 Handling and restraining

Poor handling of pigs will increase levels of stress, making the animals more difficult to handle and can cause bruises and bone breaks. Poor restraining can also lead to inefficient stunning and killing. As a result, pigs may experience avoidable pain, distress and suffering. By contrast, good handling and restraining practices help minimize pain, stress and suffering. They also contribute to better meat quality.

7.5.1.1 Pig behaviour

Refer to text at section 5.4.2.1.

7.5.1.2 Moving pigs

Refer to text and figure at sections 5.2.2.1 and 5.4.2.2.

7.5.1.3 Restraining pigs

You should closely restrain pigs for stunning or killing. You should restrain pigs depending on the manner you will stun them.

Group pen

You may use a pen to contain a group of pigs before electrical stunning. Group penning is not sufficient for captive bolt stunning. The size of the pen may be adjusted and progressively reduced with a swinging gate. See text and figure at 5.4.1.1.2.1.

This restraining method constitutes **acceptable practice** for electrical stunning.



Narrow pen

You can confine pigs into a narrow pen. A narrow pen restricts the pig's ability to move, but allows easy access to the front of the head for stunning and killing. The pen must allow for rapid removal of the body or access to bleed the animal in the pen. A narrow pen restrains pigs more strictly than a group pen. As such it is appropriate for stunning with a captive bolt gun.

Advantages

- The animal is restrained tightly.
- There is minimal discomfort for the animal.

Disadvantages

- Some pigs may require individual restraining to enable good positioning for electrical stunning or use of a captive bolt.

This restraining method constitutes **good practice**.



Mouth snare

You may restrain pigs with a rope passed around the upper jaw and secured by the upper canine teeth. The pig pulls back against the restrainer and this steadies the head. As a result, the pig may squeal, which may increase stress levels in other pigs. This method is usable for pigs that cannot move but require head restraint before stunning.

Advantages

- The head is stabilized for stunning.
- This is effective for more active animals that require individual restraining.

Disadvantages

- Animal discomfort.

This restraining method constitutes **acceptable practice**.



Piglets should be held individually. Restraint should last for only as long as necessary until the animal is stunned.

You should not under any circumstance restrain a conscious animal by: suspending or hoisting it; clamping or tying its legs or feet; severing its spinal cord; immobilising it with an electric shock. These practices are **forbidden and unacceptable**.



7.5.2 Stunning

You should render the animal unconscious before killing it. There are different methods of stunning pigs that are used for **culling** and **depopulation** on-farm. You may choose one of the following methods. Maintenance, handling, and keeping of equipment is fundamental for successful use.

7.5.2.1 Penetrative captive bolt / penetrative stunner

You may use a **penetrative captive bolt** gun or penetrative stunner. It fires a bolt into the skull. A sufficiently long bolt is required to penetrate into the brain. After firing, the bolt retracts into the gun. The stunner must be powerful enough to be effective. Depending on the thickness of the skull and the depth of sinuses, the bolt may also damage the brain itself.

Parameters

You should ensure that the charge or air pressure is appropriate for the pig. Check the captive bolt is in good working order and **has been properly maintained**. The

manufacturers' instructions describe which model, bolt diameter and length and cartridge is appropriate for use in pigs. Note that cartridges are identified by the calibre of the gun (e.g. 0.22 or 0.25), colour and the head stamp. Some captive bolt guns use cartridges. There are different types of cartridges. They vary in strength. The amount of propellant they contain is measured in grains (1 grain = 0.0648 grams). Cartridges range from 1.0 grain for piglets, to 4.0 grain for boars and sows. The captive bolt gun manufacturers' instructions will tell which cartridge is appropriate for each model of stun gun. The sinus system in the pigs skull and the thickness of the skull in large pigs can make it difficult to achieve an effective stun with a captive bolt. You should **always use the largest charge recommended for the gun when handling adult sows and boars.**

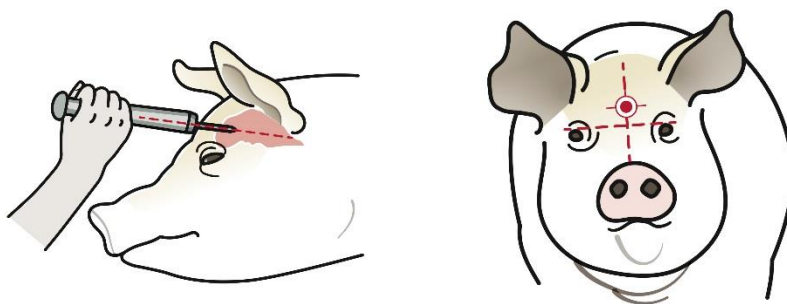
Always have spare cartridges. Cartridges should be kept dry. Shots with damp cartridges lack power and can be ineffective. Some captive bolt guns use compressed air to drive the bolt. They can achieve a higher throughput of animals and require less maintenance. It may be the method of choice in depopulation.

After the shot the pin should retract its entire length. If it does not, the captive bolt gun may not be used until it has been repaired.

Positioning

The target of the captive bolt is on the forehead of the animal. You should imagine a line drawn between the lateral edges of the eyes and a line marking the mid-line of the forehead (picture). The target is 2 centimetres above the point at which the two lines cross. You should position the barrel of the stun gun on that point aiming towards the tail. If using a trigger stunner you should ensure it is in contact with the head prior to firing. You should also have a back-up stunning option available in case the captive bolt gun fails. It may be a second captive bolt or an alternative permitted method for stun or kill.

Figure 45. Recommended position of captive bolt gun for stunning pigs



Maximum stun-to-stick interval

You should kill the pig by bleeding or electrical stunning to the heart **as soon as possible**. Recommendations on the maximum stun-to-stick interval vary between national and sectoral guides, at **15 seconds, or 60 seconds.**

Advantages

- Captive bolt guns are small and easily carried to the animals.
- The charge can be selected to be suitable for the majority of animals.
- Captive bolt guns are safer than using a firearm.

Disadvantages

- The structures within the head of large sows and boar increase the risk of an ineffective stun.
- Pigs must be pithed or bled within 15 seconds of stunning to bring about death.
- Results in severe post-stun convulsions that make it difficult to check effectiveness.
- There is a cost for the purchase of the captive bolt gun.
- A range of charges may be required and charges have to be kept absolutely dry
- The captive bolt gun requires skill for regular maintenance

This stunning method constitutes **good practice**.



7.5.2.2 Head-only electrical stunning / simple stunning

You may use head-only electrical stunning, or “simple stunning”. Simple stunning renders the pig unconscious by the passage of sufficient electric current through the brain. The animal must then be killed, except for piglets which may be killed by this method. Because this method requires heavier equipment than others, it is best suited for depopulation.

Preparation, positioning and parameters

Refer to text and figure at section 5.4.3.

Advantages

- You may not need to restrain the animal if you can apply tongs by approaching it from the rear in a narrow pen. However, that may not be the case for most animals, who will need to be restrained.
- The approach is from the rear of the animal. The animal accepts this more easily than the use of a frontal approach.
- When you use a portable electrical generator, the equipment can readily be taken to the animal.
- The equipment requires less maintenance than captive bolt guns.
- This method is particularly effective for small pigs, which may have softer skulls reducing the effectiveness of a captive bolt. Piglets may be killed.

Disadvantages

- Head-only stunning at low levels of electrical current is reversible: it will not kill the animal. Animals have to be quickly stuck or stunned in the heart to ensure death. If the animal was sick, bleeding or pithing on farm risks contaminating other animals or humans.
- The pig may be exposed to pre-stun shocks.
- If the equipment is not easily portable, animals have to be moved to the stunning area.
- There is a cost for the purchase of electrical stunning equipment. The method is mainly used for depopulation by competent authorities.

This stunning method constitutes **acceptable practice**.



7.5.2.3 Head-to-body electrical stunning / stunning that stops the heart

You may use head-to-body electrical stunning. It makes the animal unconscious first by applying electrodes to the head. Then, and shortly afterwards, electrodes are applied across the heart, to stop the heart. Because this method requires heavier equipment than others, it is best used for depopulation. This type of stunning can overheat and damage equipment. If using it on multiple animals it is therefore important to have a second pair of tongs, allowing the equipment to cool off between batches.

Preparation

Refer to text at section 5.4.3.1

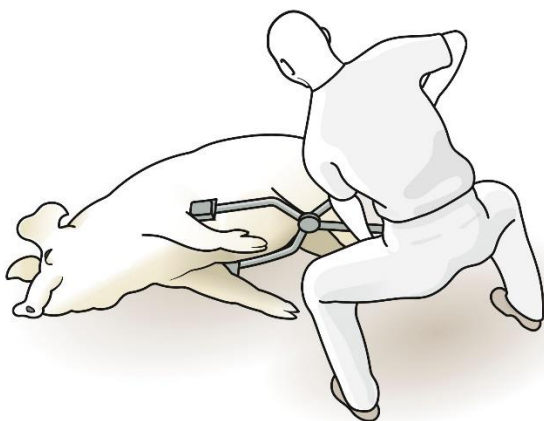
Ensure there is sufficient space to apply the tongs across the chest once the pig is in a collapsed state from the head-only stun.

Positioning

Refer to text and figure at section 5.4.3.2.

Once unconsciousness is observed and monitored, after the head-stun, the electrodes are then positioned across the heart. The electrodes should be placed on either side of the chest, directly behind the front legs. You may need to turn the animal on its back as far as possible to position the electrode. The tongs must never be used to move or re-position pigs.

Figure 46. Recommended position of electrodes for heart stun on pig



Parameters

Various parameters are recommended in national guides for head-to-body stun. The voltage should be **at least 180V**, and optimally **240 to 250V**. However this can be switched to **150V for piglets**. The frequency should be **50Hz**. The amperage should be **at least 1.3A**. It can be increased to **1.8A for pigs of more than 150kg**, and **2A for sows and boars**. The current should be maintained for **at least 3 or 8 seconds** for the head stun and **at least 8 or 15 seconds** for the body/chest stun. The heart stun should be applied as soon as possible and **within 15 seconds after the head stun. Never stun the heart without stunning the head first as it causes very severe pain. That is unacceptable.**



You should have an audible warning if the duration of exposure falls below the required level (if it takes more than 1 second for the current to reach 1.3A, or if there

is less than 1.3A for 4 seconds). You should also have a visible or audible signal to indicate the target current has been reached.

Table 16. Recommended parameters for head-to-body stunning of pigs (various sources)

Category	Voltage	Amperage	Frequency	Duration – head-only stun	Duration – body stun
Adult pig (meat)	≥250V	≥1.3A ≥1.8A (if >150kg) ≥2A (sows and boars)	50Hz	≥3-8 sec.	≥8-15 sec.
Piglet	150V	≥1.3A	50Hz	≥3-8 sec.	≥8-15 sec.

The parameters – voltage, amperage, and frequency – should be visible to you on the monitor.

Advantages

- You may not need to restrain the animal if you can apply tongs by approaching it from the rear in a narrow pen. However, that may not be the case for all animals.
- When you use a portable electrical generator, the equipment can readily be taken to the animal.
- The animal is killed by this method.
- There is no bleeding out on farm.
- The approach is from the rear of the animal. The animal accepts this more easily than the use of a frontal approach.
- The equipment requires less maintenance than captive bolt guns.
- This method is particularly effective for small pigs, which may have softer skulls reducing the effectiveness of a stun gun.

Disadvantages

- You must have sufficient space to apply the tongs across the heart and repositioning may be required.
- Unless the tongs are applied accurately the animal may be immobilised but not stunned (and have heart attack symptoms).
- There is a cost for the purchase of electrical stunning equipment.

This stunning method constitutes **best practice**.



7.5.2.4 Percussive blow to the head

You may stun a pig by striking the back or top of the head with a sudden swift blunt force. A percussive blow to the head is recommended only for use on **piglets under 4 weeks of age and less than 5kgs in weight**.

This method should not be used as a routine method. It should only be used when other methods are not available, for example in an emergency. You should kill with this method **not more than 70 pigs per day**.

Restraining

The piglet can be held by its hind legs.

Positioning

You should strike the top part of the head at the back just behind the ears. You should hit the piglet's head with a suitable object that is heavy enough but easy to handle (club, piece of iron pipe). You must be fully committed and use sufficient force to cause immediate unconsciousness. You should always check that the piglet has died.

Advantages

- This method can be carried out quickly without any specific equipment.
- You do not need to bleed the pig to kill it.
- It requires minimal training, but experience improves effectiveness.
- There is no cost involved in the use of this method.

Disadvantages

- An inaccurate hit or insufficient force used to hit the animal will not make it unconscious nor kill it, but it may cause great suffering.
- You should be skilled and determined to effectively stun piglets that way.
- This method is tiring, especially if large numbers of animals need to be stunned.

This stunning method constitutes **acceptable practice**.



Control procedure: See Annex Table **A2.3.3.1**

7.5.3 Verifying that stunning has worked

Refer to text and figure at section 5.4.4.1.

Control procedure: See Annex Table **A2.3.3.2**

7.6 Sheep and Goats

7.6.1 Handling and restraining

Poor handling of sheep and goats will increase levels of stress, making the animals more difficult to handle and can cause bruises and bone breaks. Poor restraining can also lead to inefficient stunning and killing. As a result, sheep and goats may experience avoidable pain, distress and suffering. By contrast, good handling and restraining practices help minimize pain, stress and suffering. They also contribute to better meat quality.

7.6.1.1 Sheep and goats behaviour

Refer to text at section 5.5.2.1

7.6.1.2 Moving sheep and goats

Refer to text and figures at sections 5.2.2.1 and 5.5.2.2.

7.6.1.3 Restraining sheep and goats

You may need to closely restrain goats and sheep for stunning. For electrical stunning, the tongs of the stunning equipment need to be accurately applied in the correct place.

Group pen

You may use a pen to contain a group of sheep before electrical stunning. The size of the pen may be adjusted and progressively reduced with a swinging gate. See text and figure at 5.5.1.6.1.

This restraining method constitutes **good practice** for electrical stunning.



Crush or narrow pen

You may confine animals that can be moved in a crush or a narrow pen. This will give you easy access to the head.

Advantages

- The animal is confined. This may be sufficient restraining to stun the animal with a pair of electric tongs.
- There is minimal discomfort for the animal.

Disadvantages

- Some animals – especially goats – may be too active. They may require individual restraining to enable good positioning of the tongs.

This restraining method constitutes **good practice**.



Head collar and lead rope, halter, or bridle

You may use a head collar and lead rope, halter or bridle, which is secured to restrict movement of the head. All halters, head collars and other equipment should be adjusted to the size of the animal.

Advantages

- This enables stabilizing the head for stunning.
- This is effective for more active animals that require individual restraining, especially goats.
- There is minimal discomfort for the animal.

Disadvantages

- None.

This restraining method constitutes **good practice**.



You should not under any circumstance restrain a conscious animal by: suspending or hoisting it; clamping or tying its legs or feet; severing its spine; immobilising it with an electric shock. These practices are **forbidden and unacceptable**.



7.6.2 Stunning

There are different methods of stunning sheep and goats that are used for **culling** and **depopulation** on-farm. You may choose one of the following methods.

7.6.2.1 Head-only electrical stunning / simple stunning

You may use head-only electrical stunning, or "simple stunning". Simple stunning renders the animal unconscious by the passage of sufficient electric current through the brain.

Preparation, positioning and parameters

Refer to text and figures at 5.5.3

Advantages

- You may not need to restrain the animal if you can apply tongs by approaching it from the rear in a narrow pen. However, that may not be the case for most animals, who will need to be restrained.
- The approach is from the rear of the animal. The animal accepts this more easily than the use of a frontal approach.
- When you use a portable electrical generator, the equipment can readily be taken to the animal.
- If sufficient electrical current is applied to the head of the lambs and kids, you can both cause unconsciousness and death by cardiac arrest. This works very reliably in small lambs and kids, but not in larger animals.

Disadvantages

- Head-only stunning at low levels of electrical current is reversible: it will not kill the animal. Animals have to be quickly bled or stunned in the heart to ensure death. If the animal was sick, bleeding or pithing on farm risks contaminating other animals or humans.
- The animal may be exposed to pre-stun shocks. This applies especially to goats, which are more active than sheep.
- If the equipment is not easily portable, animals have to be moved to the stunning area.
- Good electrical contact with the skin may be difficult due to hair/fleece.
- Good placement of the tongs can be difficult on animals with horns
- There is a cost for the purchase of electrical stunning equipment. The method is mainly used on farm for depopulation by competent authorities.
- The equipment requires regular maintenance.

This stunning method constitutes **acceptable practice**.



7.6.2.2 Head-to-body electrical stunning / stunning that stops the heart

You may use head-to-body electrical stunning. It makes the animal unconscious first by applying electrodes to the head. Then, and shortly afterwards, electrodes are applied across the heart, to stop the heart.

Preparation

Refer to text at 5.5.3.1

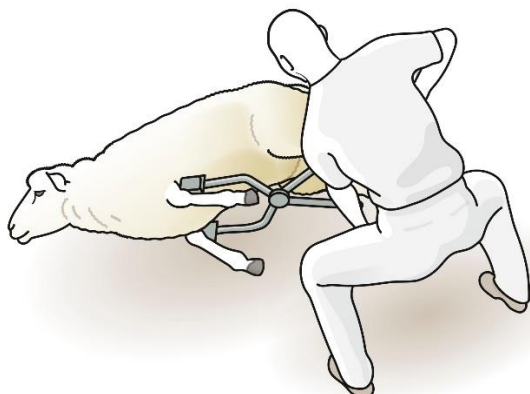
Positioning

Refer to text and figure at 5.5.3.2.

Once unconsciousness is observed, after the head-stun, the electrodes are then positioned across the heart. The electrodes should be placed directly behind the front legs. You may need to turn the animal on its back as far as possible to position the electrode.

Alternatively the electrodes can be placed on the middle of the chest and on the back of the animal so as to span the heart.

Figure 47. Recommended position of the electrodes for chest stunning of sheep/goat



Parameters

Recommendations in national guides for head-to-body stun vary. Recommendations for Amperage vary between 1.0A to 1.3A, and for Voltage between 220 and 400V. Recommendations for the duration of head stun vary between 3 and 8 seconds, and 3 to 15 seconds for the heart stun. The heart stun should be applied without delay, and **within 15 seconds after the head stun**. You should confirm that the animal is collapsed and in the tonic phase with legs extended before you stop its heart with the second stun. **Never stun the heart without stunning the head first as it causes very severe pain. That is unacceptable.**



You should have an audible warning if the duration of exposure falls below the required level (if it takes more than 1 second for the current to reach 1.3A, or if there is less than 1.3A for 4 seconds). You should also have a visible or audible signal to indicate the target current has been reached

Table 17. Recommended parameters for head-to-body stunning of sheep/goats (various sources)

Voltage	Amperage	Frequency	Duration head-only stun	Duration body stun
220-400V	1.0-1.3A	50 Hz	≥3-8 secs	≥3-15 secs

Advantages

- You may not need to restrain the animal if you can apply tongs by approaching it from the rear in a narrow pen. However, that may not be the case for most animals, who will need to be restrained.

- When you use a portable electrical generator, the equipment can readily be taken to the animal.
- With head to body stunning the animal will not regain consciousness until it is killed.
- There is no bleeding out on farm.
- The approach is from the rear of the animal. The animal accepts this more easily than the use of a frontal approach.

Disadvantages

- Unless the tongs are applied swiftly and in one movement the animal may be exposed to pre-stun shocks. This applies especially to goats that are more active than sheep.
- Unless the tongs are applied accurately the animal may be immobilised but not stunned (and have heart attack symptoms).
- Good electrical contact with the head or skin may be difficult due to hair/fleece.
- Good placement of the head tongs can be difficult on animals with horns.
- The head-only stun only lasts briefly in ruminants, therefore the heart stun must be applied within 15 seconds.
- You must have sufficient space to apply the tongs across the heart and repositioning may be required.
- The equipment requires regular maintenance.
- There is a cost for the purchase of electrical stunning equipment.

This stunning method constitutes **best practice**.



Control procedure: See Annex Table **A2.3.4.1**

7.6.3 Verifying that stunning has worked

See text and figure at 5.5.4.1

Control procedure: See Annex Table **A2.3.5**

7.7 Poultry

7.7.1 Handling and restraining

Poor handling of poultry can cause fractures, dislocations and bruising. Poor restraining can lead to inefficient stunning and killing. As a result, birds may experience avoidable pain, distress and suffering. By contrast, good handling and restraining practices prevent avoidable pain, stress and suffering. They also contribute to better meat quality.

7.7.1.1 Poultry behaviour

Understanding poultry behaviour helps you handle and restrain birds easily. Poultry such as chickens and turkeys originate from jungle environments. They are alert and flighty and can panic quickly. Ducks and geese are water birds and are therefore less agile on land. They are alert and vocal and can be feisty or aggressive. Poultry can get stressed from handling, especially if they have not been used to people or handled regularly.

7.7.1.2 Catching poultry

Different categories of poultry require different catching techniques. Injured birds may not be able to move easily or without pain. **You should not try to move them.** Stun and kill them where they are as quickly as possible. **Birds that are not injured** may be caught and carried to the place where they will be killed. You may **catch birds in a closed space or in an open space** (such as a field or a courtyard). If catching in a closed space, dim light is advised to prevent panic in the flock. If catching in open space, you can erect small pens, drive the birds into these and confine them before catching them by hand. You may **catch birds individually by hand or with landing nets.** If catching birds with landing nets, you should ensure not to injure birds with the rim of the net. When you remove the bird from the net you can take hold of the legs with one hand and secure the bird's body and wings (or neck of geese) with your other hand.

Different categories of poultry require different catching techniques.

For **chickens and ducks**, you can put one hand above both wings to prevent wing flapping, then put the other hand underneath the body and catch both legs. The bird can then be lifted, while your arm supports its breast and your hand holds the legs (refer to Figure 35). Chickens should be caught by two legs and ducks are traditionally caught by the neck.

End of lay hens are delicate and prone to injuries. Hens should be gently lifted up and away by their legs and extra care should be taken.

Geese can bite. Gently grab the neck first, so the bird cannot bite you. From that position, you can handle them in the same manner as chicken and ducks.

Turkeys are strong and heavy. You can stop them from moving by catching their legs from behind with one hand, and then gently lowering them unto their breast. Your free arm can then be put around the bird's wings and under its body for support. The turkey can then be lifted and held close to your body.

Adult turkeys can be lifted by grasping the wing at the shoulder furthest away from you with one hand, while the other hand catches its legs. The turkey can then be lifted and held close to your body. As an alternative method, adult turkeys can be caught and carried by both wings/shoulder joints. These catching methods constitute **good practice**.



7.7.1.3 Carrying poultry

Carrying poultry by hand

You can carry poultry **upright**, by supporting their breast with one hand, and covering their wings with the other, as described earlier. Alternatively, you can carry two birds up to 3kg side by side, by their back.

Refer to Figure 35.

This carrying method constitutes **best practice**.



You can also carry poultry by their legs by holding them upside down. If you do this with chickens, you should hold both legs (not one leg) and turn them upside down gently. You should not hold more than three chickens in one hand. Inversion is not advisable for larger birds such as turkeys, ducks and geese. Catching or carrying by the legs can result in hip dislocation, therefore you should not carry birds by hand for too long.

Ducks and geese may be lifted, held hanging or carried by the neck **if at the same time the breast of the bird is fully supported**. You should take care not to press too hard on the bird's windpipe.

Carrying poultry in crates

If using a crate to carry and move birds, you should put the birds in head-first to take advantage of the bird's movement away from you when filling the crate. While doing this, avoid squeezing the body as this can cause the bird to stop breathing. You should remove birds from crates individually by holding them securely with two hands over the wings. When unloading and moving poultry crates, it is important to handle them carefully to prevent the birds from being stressed and injured. Sudden movements are transmitted between crates, and can cause poultry to slide and smother other birds. When placing crates close to each other, make sure that birds' heads, legs or wings do not protrude and risk getting caught or breaking. When placing crates one on top of the other:

- Limit faeces falling on the birds placed underneath;
- Ensure stability of the crates; and
- Avoid blockages to ventilation.

Crates must be kept in good condition to prevent birds from escaping.

Do not throw, drop or knock over crates. Where possible, move crates horizontally and mechanically.

These carrying methods constitute **good practice**.



You should not under any circumstance attempt to move a bird by: striking it; pressing on sensitive parts of its body; lifting or dragging a bird by the neck, head, wing or tail; causing it pain or suffering; using an electric shock or sharp instrument to encourage the bird to move; holding the bird by the eyes. These practices are **forbidden and unacceptable**.



7.7.1.4 Restraining poultry

Refer to text and figures at section 5.6.3.

Control procedure: See Annex Table **A2.3.5.1**

7.7.2 Stunning

You must render the bird unconscious before killing it. Stunning before killing is a requirement from Regulation 1099/2009. Stunning before killing has also various benefits, including better bleed out, and easier plucking of feathers (because the bird is more relaxed if stunned beforehand). There are different ways of stunning poultry on-farm for the purpose of culling, emergency killing and slaughter, or direct supply of small quantities of meat. All of these methods should render the bird unconscious, or kill it right away. Maintenance, handling, and keeping of equipment is fundamental for successful use.

7.7.2.1 Penetrative captive bolt

You may use a **penetrative captive bolt** device or "penetrative stunner". It renders the animal unconscious by firing a bolt through the skull and into the brain. After firing, the bolt retracts into the stunner.

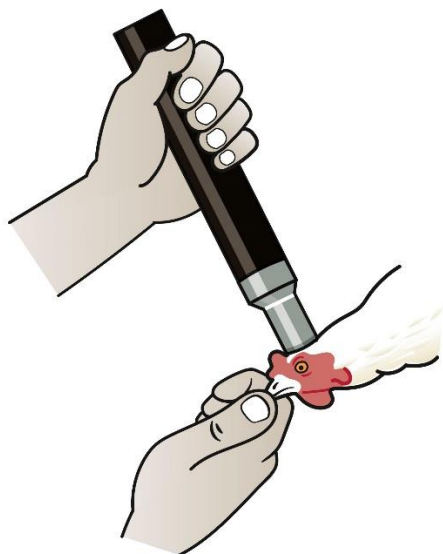
Restraining

You may restrain the bird by its body or you can put it in a cone or shackle. With one hand you gently hold the bird's beak, while the other hand operates the captive bolt. The head of the bird should be held against a hard surface.

Positioning

The target of the stunner is the top of the bird's head, Place the stunner firmly against the bird's head, at the centre, aiming straight down.

Figure 48. Recommended position of captive bolt gun for captive bolt stunning of poultry birds⁴²



Parameters

You should ensure that the type of stunner is appropriate for the bird and that the diameter and length of the penetrating pen is correct. Check the captive bolt is in good working order **and has been properly maintained**. You should ensure that the charge or air pressure of the stunner is appropriate for the bird. The diameter of the bolt shall be a minimum of 6 mm. It should be appropriate to destroy the skull and brain of the species of poultry. Some stunners use cartridges. There are different types of cartridges. They vary in strength. The manufacturers' instructions will tell which cartridge is appropriate for each model of stunner. Categories or cartridge are identified by calibre (0.22 or 0.25) and colour.

Other stunners use compressed air to drive the bolt. Such stunners can achieve a higher throughput of animals and requires less maintenance. As such it may be well suited for mass culling. The speed of the shot and the air pressure varies according to the model of stunner that you are using. Always refer to the manufacturer's instructions to make sure it is appropriate.

After the shot the pin should retract its entire length. If it does not, the captive bolt gun may not be used until it has been repaired.

⁴² Image drawn from original material published by HSA. Source: HSA Online Guide "Practical Slaughter of Poultry" Link: <https://www.hsa.org.uk/stunning-and-slaughter-electrical-stunning/use>. Produced with permission from HSA (September 2017).

Maximum stun-to-stick interval

Birds should be killed by bleeding as soon as possible, and **within one minute** after stunning.

Advantages

- It renders the majority of birds unconscious.

Disadvantages

- If the stunner uses cartridges, the necessity to reload / manually cock the stunner after every shot means it can slow down the slaughter speed and, as such, it may not be the best approach for culling / depopulation.
- There is a cost for the purchase of the stunner.
- The stunner requires regular maintenance.

This stunning method constitutes **acceptable practice**.



7.7.2.2 Non-penetrative captive bolt

You may use a non-penetrative captive bolt device, or non-penetrative stunner. A non-penetrative stunner renders the animal unconscious by striking its forehead with great force without penetrating the skull. When sufficient energy is applied, this can kill the bird.

Restraining

You may restrain the bird by its body or you can put it in a cone or shackle. With one hand you gently hold the bird's beak, while the other hand operates the captive bolt. The head of the bird should be held against a hard surface.

Positioning

The target of the stunner is the top of the bird's head, Place the stunner firmly against the bird's head, at the centre, aiming straight down.

Refer to Figure 48.

Parameters

You should ensure that the charge or air pressure of the stunner is appropriate for the bird. Stunners with a flat head are best for small birds, such as chickens. Stunners with convex heads are best for larger birds such as ducks, geese and turkeys. You should follow the manufacturer's instructions, which will contain the necessary information.

Maximum stun-to-stick interval

Birds should be killed by bleeding as soon as possible, and **within one minute** after stunning.

Advantages

- It renders the majority of poultry unconscious.
- Non-penetrative stunners can be shot repeatedly rapidly. You can stun animals more quickly than with penetrative stunners.

Disadvantages

- It is easy to fracture the skull with this method and this should be avoided.
- There is a cost for the purchase of the stunner.

- The stunner requires regular maintenance.

This stunning method constitutes **acceptable practice**.



7.7.2.3 Head-only electrical stunning / simple stunning

Refer to text and figure at section 5.6.4.1.

This stunning method constitutes **good practice**.



7.7.2.4 Manual cervical dislocation

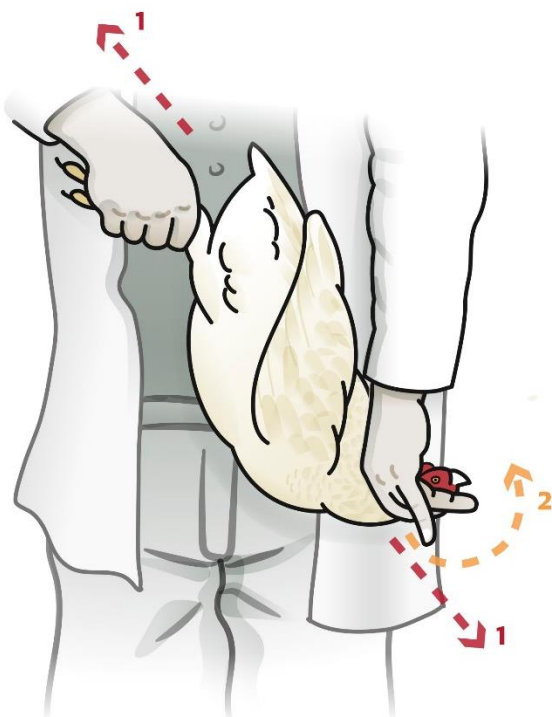
You may use cervical dislocation (or stretching). When done properly, it separates the spine from the head, leading to immediate insensibility. Cervical dislocation is a **killing method**. You can apply this method without equipment.

This method should not be used as a routine method. It should only be used when other methods are not available, for example in an emergency. You should kill with this method **not more than 70 birds per day**, and **only birds weighing up to 3 kg**. Specially made forceps can be used also to carry out this method on birds weighing up to 5 kg.

Restraining and positioning

You may lift and hold the bird by its legs with one hand, while the fingers from your other hand close around the bird's neck, with fingers placed on both sides of the neck, behind the skull. Then, in one continuous movement, **(1) pull both hands quickly and firmly in opposite directions and (2) snap the head back sharply**.

Figure 49. Diagram of cervical dislocation in poultry⁴³



Alternatively, a heavy stick (such as a broomstick) can be used for larger birds but with a maximum of 3kg. **Place the stick on the neck** and maintain it there by stepping on it. Hold the bird by its legs. To dislocate the neck, **pull the legs quickly and firmly backwards**.

Advantages

- This method can be carried out quickly without any specific equipment (unless using a forceps).
- It requires minimal training, but experience improves effectiveness.
- There is no cost involved in the use of this method (unless using a forceps).

Disadvantages

- This method is difficult to apply effectively on growing and adult birds and may cause unnecessary suffering.
- This method does not always lead to instantaneous death and may therefore be painful.
- It is tiring for the operator.

It is preferable to use cervical dislocation to kill birds that have already been made unconscious in another way.

This stunning method constitutes **acceptable practice**.



⁴³ Image drawn from original material published by HSA. Source: HSA (2004) Practical Slaughter of Poultry: A guide for the small producer. Humane 685 Slaughter Association 2001, reprinted with minor amendments 2004. Produced with permission from HSA (September 2017).

7.7.2.5 Percussive blow to the head

You may stun the bird by hitting it accurately at the back of the head with blunt force. When done appropriately, this causes severe damage to the brain. This method should not be used as a routine method. It should only be used when other methods are not available, for example in an emergency. This is a stunning method and killing by bleeding or cervical dislocation may still be required. You should kill with this method **not more than 70 birds per day**, and **only birds weighing up to 5 kg**.

Restraining and targeting

You may do this by lifting and holding the bird by its legs and resting its head on a hard surface, before hitting the bird's head. The blow should hit the back of the bird's head. You should hit the bird's head with a suitable object that is heavy enough, but easy to handle (club, piece of iron pipe). You must be fully committed and use sufficient force to cause immediate unconsciousness.

Advantages

- This method can be carried out quickly without any specific equipment.
- You do not need to bleed the bird to kill it
- It requires minimal training, but experience improves effectiveness.
- There is no cost involved in the use of this method.

Disadvantages

- You should be skilled and determined to effectively stun/kill poultry with this method.
- This method is tiring, especially if large numbers of animals need to be stunned.
- An inaccurate hit or insufficient force used to hit the animal will not make it unconscious nor kill it, but it is likely to cause great suffering.

This stunning method **constitutes acceptable practice**.



Control procedure: See Annex Table **A2.3.5.2**

7.7.3 Verifying that stunning has worked

After stunning a bird, you must **immediately** verify that it is unconscious. You must do so **before** you kill the bird.

If a bird is **stunned electrically**, refer to text at 5.6.5.1 and Figure 39.

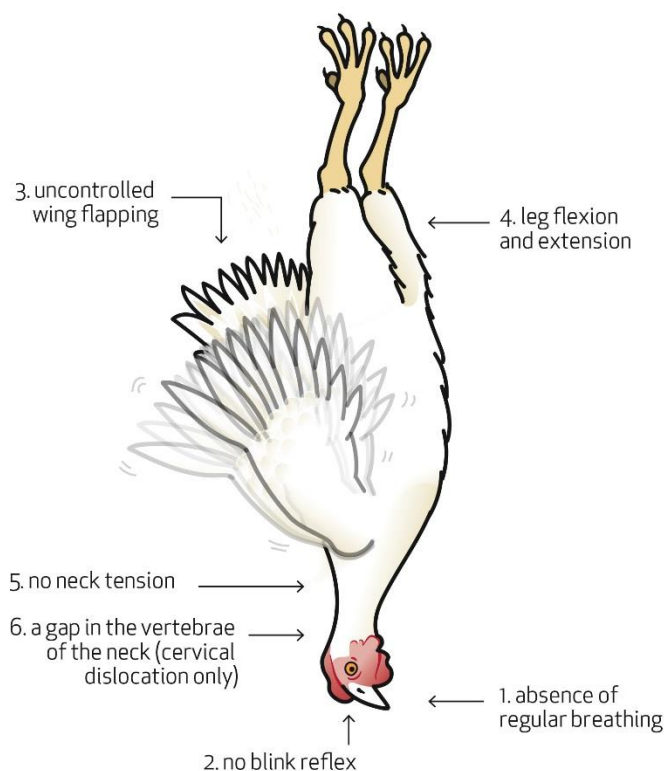
If a bird is **stunned by stunner and cervical dislocation**, you should check for:

1. the bird shows no regular breathing – the best place to check for this is between the legs if the bird is shackled
2. the bird's eyes do not blink when touched with the finger (eye signals are not always accurate)
3. the bird is flapping its wings uncontrollably
4. the bird is flexing and extending its legs
5. the bird has no neck tension

If a bird is stunned with dislocation, you should also check:

6. there is a gap in the vertebrae of the neck

Figure 50. Signs of unconsciousness in a bird stunned by concussion or cervical dislocation



Once you have verified that the bird is unconscious, you should immediately kill it by bleeding. **If the bird is not unconscious, you should not bleed it. Immediately apply the procedure for re-stun.** You must stun it again with the same equipment. If the animal is still conscious after the second stun, stun with the back-up method. You should review the system and the practice to identify what failed. You should then take corrective action before the stunning process resumes.

Control procedure: See Annex Table **A2.3.5.3**

7.8 Rabbits

7.8.1 Handling and restraining

Poor handling of rabbits can cause bone breaks, dislocations and bruising. Poor restraining can lead to inefficient stunning and killing. As a result, rabbits may experience avoidable pain, distress and suffering. By contrast, good handling and restraining practices prevent avoidable pain, stress and suffering. They also contribute to better meat quality.

7.8.1.1 Rabbits behaviour

Understanding rabbit behaviour helps you handle and restrain animals easily. In the wild, rabbits are preyed on by other animals. As a result, they are alert and flighty animals, especially if they have not been used to people or handled regularly. When they cannot escape a predator, they stop moving.

7.8.1.2 Lifting and carrying rabbits

There are different methods for lifting and carrying rabbits. You should choose the method depending on the size of the rabbit. You should also handle calm and agitated

rabbits differently. An agitated rabbit must be handled with care. If you do not handle it well, it can break its backbone. You can also get bruised or scratched. You may lift **all rabbits** by the skin on their neck (scruff). You may also lift them by the skin over the shoulders. You may lift **young and small rabbits** (under 1 kg) by grasping them gently around the loins, just above their back legs. While lifting, you must **support the rabbit's weight** with your other hand. You should do so if you move the rabbit for more than 5 or 10 seconds. You can support its behind. You can also carry the rabbit on your forearm. If the rabbit is agitated, carry it on the forearm, move its head further under your arm and put your other hand on its back. This is a calming position.

These carrying methods constitute **good practice**.



You should not carry rabbits by hand for too long. You may move a group of rabbits in a box or crate on wheels (trolley). **Severely injured rabbits** may not be able to move easily or without pain. **You should not try to move them.** Gently remove the rabbit from its housing, and stun and kill it without delay. **You should not under any circumstance attempt to move a rabbit by:** Striking it; Pressing on sensitive parts of its body; Lifting the rabbit by the head, ears, or tail; Causing it pain or suffering; Using an electric shock or sharp instrument to encourage it to move; Twisting, crushing or breaking the tail of the rabbit; Holding the rabbit by the eyes; These practices are **forbidden and unacceptable**.



7.8.1.3 Restraining rabbits

You should restrain rabbits for stunning. Different stunning methods require different restraining methods. These are explained later with each stunning method. **You should not under any circumstance restrain a conscious animal by:** suspending or hoisting it; clamping or tying its legs or feet; severing its spinal cord; immobilising it with an electric shock. These practices are **forbidden and unacceptable**.



7.8.2 Stunning

You must render the rabbit unconscious before killing it. Stunning before killing is a requirement from Regulation 1099/2009. There are different ways of stunning rabbit's on-farm for the purpose of culling, emergency killing and slaughter, or direct supply of small quantities of meat. All of these methods should render the rabbit unconscious, or kill it right away. Maintenance, handling, and keeping of equipment is fundamental for successful use.

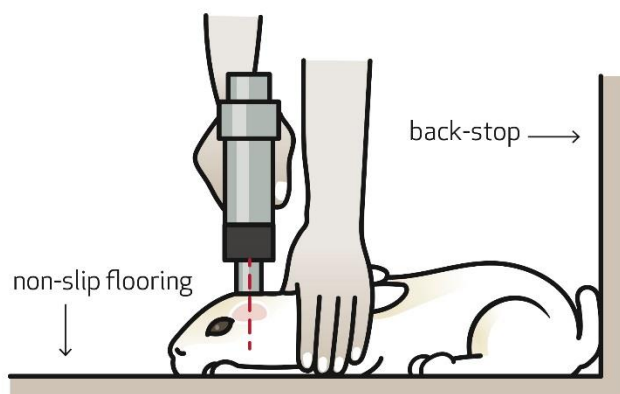
7.8.2.1 Penetrative captive bolt

You may use a **penetrative captive bolt** device or penetrative stunner. It renders the animal unconscious by firing a bolt through the skull and into the brain. After firing, the bolt retracts into the gun. This method will kill most animals, but you cannot rely on this, therefore bleeding should follow.

Restraining

It is essential to stabilise the head to prevent misses. With one hand, hold the rabbit down onto non-slip flooring. Its back end is placed against something so that the rabbit cannot back away. Your hand gently restrains the rabbit by the neck and shoulders, with the thumb and index finger lightly on either side of the rabbit's neck with rest of the hand over the rabbit's shoulders. The other hand operates the stunner.

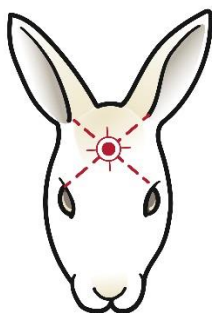
Figure 51. Recommended restraining for captive bolt stunning of rabbit



Positioning

The target of the stunner is on the forehead of the animal. Place the stunner firmly against the rabbit's head on the midline and at the intersection of lines drawn from the outside edge of the eye to the base of the opposite ear.

Figure 52. Recommended positioning for captive bolt stunning of rabbit



Parameters

Some stunners use cartridges. Other stunners use compressed air to drive the bolt. Such stunners can achieve a higher throughput of animals and requires less maintenance. It may be the method of choice in mass culling. You should ensure that the charge or air pressure of the stunner is appropriate for the animal. Always refer to the manufacturer's instructions to make sure it is appropriate. The bolt's diameter should be **at least 6 mm**.

After the shot the pin should retract its entire length. If it does not, the captive bolt gun may not be used until it has been repaired.

Maximum stun-to-stick interval

You should kill the rabbit by bleeding **as soon as possible**. Recommended maximum stun-to-stick times from national guides vary, from 5, to 10, and 20 seconds.

Advantages

- It renders the majority of rabbits unconscious.
- The use of stunners requires minimal training, but experience improves effectiveness.

Disadvantages

- The necessity to reload / manually cock the cartridge stunner after every shot means it can slow down the slaughter speed and, as such, it may not be the best approach for culling / depopulation.
- There is a cost for the purchase of the stunner.
- The stunner requires regular maintenance.

This stunning method constitutes **acceptable practice**.



7.8.2.2 Non-penetrative captive bolt

You may use a non-penetrative captive bolt device, or non-penetrative "stunner". A non-penetrative stunner renders the animal unconscious by striking its forehead with great force without penetrating the skull. It may be powered by a cartridge, by air pressure or be spring loaded. One shot form cartridge or air powered gun is usually sufficient to cause stunning but some spring loaded guns require two shots. Maintenance, handling, and keeping of equipment is fundamental to successful use.

Restraining

Refer to text and figure at section 7.8.2.1.1

Positioning

Refer to text and figure at section 7.8.2.1.2.

Parameters

Some stunners use cartridges. Other stunners use compressed air to drive the bolt. Such stunners can achieve a higher throughput of animals and requires less maintenance. It may be the method of choice in mass culling.

You should ensure that the charge or air pressure of the stunner is appropriate for the animal. Always refer to the manufacturer's instructions to make sure it is appropriate. However, an air pressure of 55psi (3,795 bar) is recommended.

Maximum stun-to-stick interval

You should kill the rabbit by bleeding **as soon as possible**. Recommended maximum stun-to-stick times from national guides vary, from 5, to 10, and 20 seconds.

Advantages

- It renders the majority of rabbits unconscious.
- Air-powered non-penetrative stunners can be shot in rapid succession. You can stun animals more quickly than with a penetrative stunner.
- The use of stun guns requires minimal training, but experience improves effectiveness.

Disadvantages

- It is easy to fracture the skull with this method and this should be avoided.
- The stunner requires regular maintenance.
- There is a cost for the purchase of the stunner.

This stunning method constitutes **acceptable practice**.



7.8.2.3 Head-only electrical stunning / simple stunning

You may use head-only electrical stunning, or “simple stunning”. Simple stunning renders the animal unconscious by the passage of sufficient electric current through the brain. Simple stunning is where you stun an animal to make it unconscious but do not kill it. It must make the animal unconscious immediately and it must stay unconscious until it is dead. You must then immediately use another method to kill the animal.

Restraining

You may restrain the rabbit with one hand supporting its belly. Your other hand should guide the head by holding its ears. You may thus avoid pain as well as injury to the rabbit’s back. Alternatively, you may hold both back legs of the rabbit with one hand, while the other hand holds the head. Your other hand should position the head by guiding the ears.

Parameters

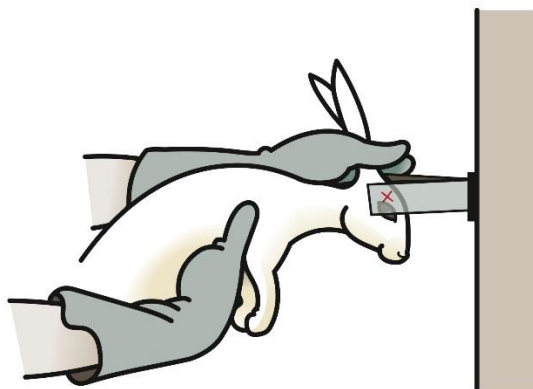
The parameters – voltage, amperage, frequency – should be visible to you on the monitor. Recommendations found in national guides for voltage vary from 100 to 117V. Recommendations for Amperage vary from 140mA to 400mA. Recommendations for the minimum duration of the stun vary from 0.5 seconds to 3 seconds. Some rabbits have thick fur, which is a poor conductor of electricity. You may wet the sides of the head to which the electrodes are applied with water, using either a spray or a damp sponge.

Positioning

Place the head of the rabbit in the V-shaped electrode so that the electrical current will flow through the brain. Place the electrodes **between the outer corners of the eyes and the base of the ears**, but **not close to the nose**.

Wear rubber gloves and boots to avoid being electrocuted.

Figure 53. Restraining and positioning for head-only electrical stunning of a rabbit



Maximum stun-to-stick interval

You should kill the rabbit by bleeding **as soon as possible**. Recommended maximum stun-to-stick times from national guides vary, from 5, to 10, and 20 seconds.

Advantages

- This method allows for a higher speed of stunning than some other techniques.

Disadvantages

- The rabbit is not rendered unconscious for long. It should be killed immediately afterwards.

- The fur on the rabbit's head may diminish the impact of the electrical current. As a result this technique may not always be effective unless at high current levels.
- Positioning the head of the animal by holding its ears can cause pain.

This stunning method constitutes **good practice**.



7.8.2.4 Percussive blow to the head

You may stun the rabbit by hitting it accurately at the back of the head with blunt force. When done appropriately, this causes severe damage to the brain, unconsciousness, and death. This method should not be used as a routine method. It should only be used when other methods are not available, for example in an emergency. You should kill with this method **not more than 70 rabbits per day**.

Restraining

You should hold the rabbit by its hind legs.

Targeting

The blow should hit the back of the rabbit's head **just behind the ears**. Hit the rabbit's head with a suitable object that is heavy enough but easy to handle (club, piece of iron pipe). You must be fully committed and use sufficient force to cause immediate unconsciousness.

Advantages

- This method can be carried out quickly without any specific equipment.
- There is no cost involved in the use of this method.
- It requires minimal training, but experience improves effectiveness.
- You do not need to bleed the rabbit to kill it.

Disadvantages

- An inaccurate hit or insufficient force used to hit the animal will not make it unconscious nor kill it, but it is likely to cause great suffering.
- You should be skilled and determined to effectively stun rabbits with this method.
- This method is tiring, especially if large numbers of animals need to be stunned.

This stunning method constitutes **acceptable practice**.



Control procedure: See Annex Table **A2.3.6.1**

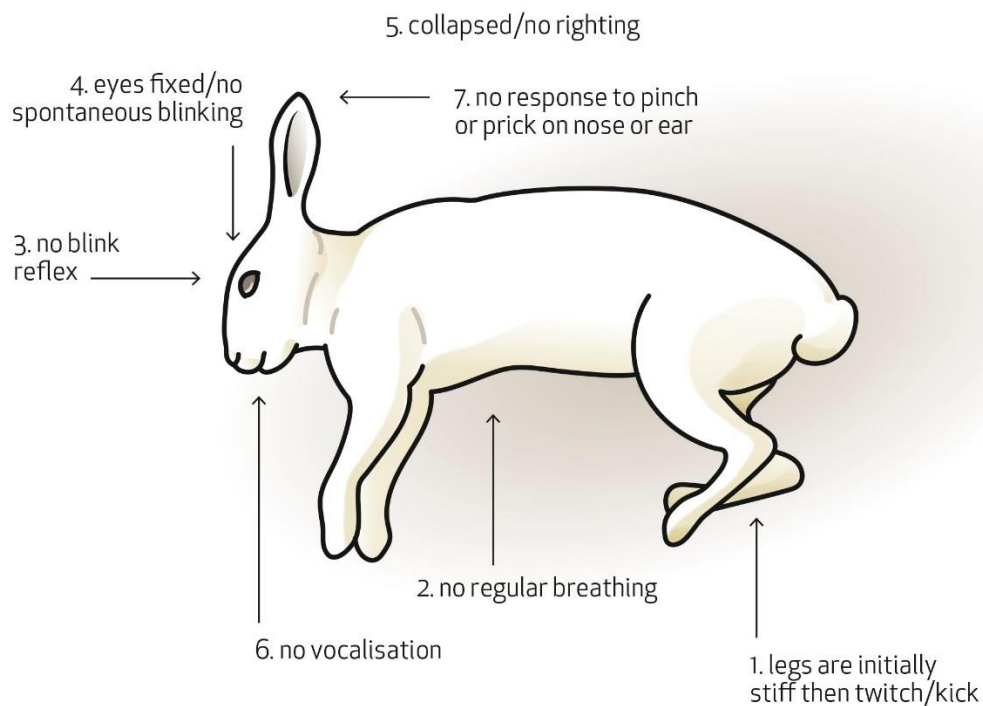
7.8.3 Verifying that stunning has worked

After stunning the animal, you must **immediately** verify that it is unconscious. You must do so **before** you kill the animal. You should check that:

1. the animal's legs are initially stiff and extended ("tonic phase"), followed by uncontrolled physical activity or kicking ("clonic phase")
2. the animal shows no regular breathing
3. the animal's eyes do not blink when touched with the finger (eye indicators are not always reliable)

4. the animal's eyes have a fixed, glazed expression / no spontaneous blinking
5. the animal has collapsed and does not attempt to right itself or lift its head
6. the animal is not making any noise;
7. the animal does not respond to any pinch or prick on the nose, toe or ear.

Figure 54. Signs of unconsciousness for a stunned rabbit



Once you have verified that the animal is unconscious, you should immediately kill it by bleeding. **If the animal is not unconscious, you should not bleed it. Immediately apply the procedure for re-stun.** You must stun it again with the same equipment. If the animal is still conscious after the second stun, stun with the back-up method. You should review the system and the practice to identify what failed. You should then take corrective action before the stunning process resumes.

Control procedure: See Annex Table **A2.3.6.2**

Annex 1 Terms of Reference

Title of study: Preparation of best practices on the protection of animals at the time of killing

Lead Unit: DG SANTE G2

Support unit: DG SANTE A3/A1

1. Purpose of the Contract

1.1 Context of the study

This study will aim to support the improvement of the welfare of animals.

In the context of the *EU animal welfare strategy 2012-2015*¹, the Commission foresaw to perform a list of actions, one of them being "*EU guidelines or implementing rules on the protection of animals at the time of killing*".

The purpose of the study is therefore to collect information on best practices on the protection of animals at the time of killing. Based on the outcomes of the study, the Commission will consider if such information could be used for EU guidance documents under appropriate formats depending on the subject matter considered.

Following the entry into application of Regulation (EC) No 1099/2009 *on the protection of animals at the time of killing*² the Commission experts performed a series of missions within the Member States. These audits as well as some legal references in the regulation identified certain subject matters where EU guidance documents could provide a useful technical assistance for implementing the EU legislation.

The Commission audits have indicated that information on best practices is particularly needed in certain areas such as the slaughter of animals in small slaughterhouses (poultry and mammals)) and the development of the respective animal welfare standard operating procedures, the slaughter of poultry using electrical waterbath, the slaughter of animals without stunning in the context of ritual slaughter and the killing of animals on farm (culled animals, emergency slaughter, emergency killing and slaughter for direct supply of small quantities of poultry, rabbits and hares).

1.2 Objectives and general approach of the study

The purpose of this study is to provide, assess and evaluate the necessary information to elaborate elements for best practices on the protection of animals at the time of killing.

The contract will consist in the following steps:

- collecting information on current practices regarding the subject matters,
- analysing and comparing the sources of information and identifying possible gaps,
- drafting elements for best practices,
- consulting stakeholders,
- finalising elements for best practices.

The final document will be designed to be read by business operators and in particular animal welfare officers in slaughterhouses, when applicable.

1.3 Sponsor and user of the contract

Technical line unit in charge is SANTE G2 – Animal Welfare Sector.

2. Task to be performed by the contractor

The successful tenderer will be asked to perform the following tasks which also form the basis of the indicators of achievement and assessment of deliverables as presented under this section.

2.1 Study scope and issues

The scope and issues of the study are described under Tables 1 and 2.

Table A1 Subject matters and issues for slaughterhouses

Subject matter	Equids and bovine animals	Pigs	Sheep and goats	Poultry(chickens and turkeys)
Layout, construction and equipment of slaughterhouses	How to establish and assess the information listed under Article 14(2) How to meet and assess compliance with the requirements laid down in Annex II			
Handling and restraining operations at slaughterhouses	How to develop and establish operations, and respective standard operating procedures, that comply meet with the requirements laid down in Annex III and Article 15(3)			
Stunning methods	How to meet and assess compliance with the requirements laid down in Annex I as well as to establish key parameters for the following stunning methods			
	Penetrative captive bolt	Head-only electrical stunning	Head-only electrical stunning	Head-only electrical stunning Electrical waterbath
Slaughter without stunning	Mechanical restraining systems for bovine animals	Not relevant	Mechanical restraining systems Bleeding operations	Electrical waterbath Manual bleeding operations
	Non penetrative captive bolt stunning			
	Bleeding operations			
	Post-cut stunning			
Monitoring procedures at slaughterhouses	How to establish and assess compliance of monitoring procedures			
Standard operating procedures for small slaughterhouses	How to assess and develop standard operating procedures that comply with the requirements of Article 6(1) and (2)			

Table A2 – Subject matters and issues for on-farm killing

Subject matter	Equids and bovine animals	Pigs	Sheep and goats	Poultry (chickens, turkeys, ducks and geese) and rabbits
Handling and restraining operations	During culling or depopulation			During culling or depopulation
Stunning methods	How to meet and assess compliance with the requirements laid down in Annex I as well as to establish key parameters for the following stunning methods			
	Penetrative captive bolt	Penetrative captive bolt	Head-only electrical stunning	Penetrative captive bolt
		Head-only electrical stunning	Head-to-body electrical stunning	Non penetrative captive bolt
		Head-to-body electrical stunning		Head-only electrical stunning
				Cervical dislocation
Percussive blow to the head			Percussive blow to the head	
Check on stunning	How to establish and assess compliance on checks on stunning			

The contractor is expected to collect information for each subject matter from at least nine Member States reflecting the diversity in terms of size, geographical distribution and types of production for the species concerned, and, when considered altogether, covering a significant proportion of the killing and related operations carried out under the Regulation.

2.3 Tasks

The Commission expects the contractor to perform the following tasks:

2.3.1 Task 1: Update of methodology and work plan

On the basis of the discussions and conclusions of the kick-off meeting the contractor will establish an updated **general work plan** and methodology in order to meet the objectives and address all issues.

Deliverable 1: Updated methodology and work plan

The deliverable will contain in details the methodology, the timeframe, the final list of experts and the organisations to be consulted during the whole study. This document should serve as a monitoring tool of the study during the contract.

2.3.2 Task 2: Collecting data and observations

The contractor will collect data based on desk research as well as by contacting experts in various Member States and preliminary visits in some Member States.

This task will mainly consist in collecting existing materials from stakeholders, equipment manufacturers, international guidelines, non-governmental organisations, publications, and training materials developed by official or private bodies in order to develop specific guidelines on the relevant topics.

The document should refer to stricter national rules especially in the context of slaughter without stunning and on-farm killing, if they are relevant in an EU context.

Deliverable 2: State of play

This deliverable will contain a synthesis of the current state of knowledge on all subject matters based on key references and a comparative analysis of the range of solutions used by the different sources. The deliverable will also identify the gaps in information for each subject matter.

2.3.3 Task 3: Drafting elements for best practices

Based on the previous findings, the contractor will draft a set of possible best practices (later called "*elements for best practices*"). The elements for best practices should reflect existing practices performed under commercial conditions (like sectorial or national good practices or voluntary standards).

The document should address the key issues accompanied with relevant explanations on the possible options ("toolbox"), their advantages/disadvantages. The contractor will establish a gradation between various elements proposed depending if they are considered to solely meet the legislation, going beyond as well as identify unacce

The contractor will take a particular attention in drafting the document in a simple and concise way, putting priority to visual supports (pictures, diagrams, and drawings) rather than text when possible.

As an indication documents could be drafted under two chapters: one on slaughterhouses and another one on on-farm killing. Each chapter could be then divided under sections organised per species groups (see scope and issues). Each section will be designed as a stand-alone document which could be later read and disseminated individually.

Deliverable 3: Elements for best practices for consultation

This deliverable will contain the elements for best practices covering all subject matters and species concerned.

2.3.4 Task 4: Consulting stakeholders on the elements for best practices

The contractor will present, discuss and finalise the elements of best practices with the relevant stakeholders. The contractor will also ensure that the interests of small undertakings, having local activities is also taken into account.

The contractor will consider the comments received from stakeholders and Member States, and after critical analysis, possibly amend the draft document, where contributions are substantiated by factual arguments or/and a broad consensus of opinions.

Then the contractor will submit to the Steering Group for final approval a summary of the outcomes of the consultations in a clear and concise way, presenting possible

conflicts of opinions, the pros and cons of each option and a suggested line in case of various alternatives.

Deliverable 4: Consultation and final elements for best practices

The deliverable will contain a summary of the consultation process and of the position of all stakeholders consulted, emerging from their written comments as well as during the meetings.

In addition the deliverable will present the final version of the elements of best practices as to reflect the consultation and the opinion of the Steering Group (Deliverable 3 revised).

3. Description of Experts and additional information

3.1 Experts competences

Due to the complexity and the technical nature of the work, the team leader will demonstrate work experience of at least 5 years at EU level in drafting of best practices, performing stakeholders' consultation and having knowledge on animal welfare issues related to the sectors covered by the scope, i.e. mainly slaughterhouses and farms. The team will contain experts of at least 10 years of technical experience in the relevant technical fields in order to analyse and sort the information collected. The team will also contain experts with at least 5 years of experience demonstrating legal knowledge to understand and interpret the relevant legislative provisions.

3.2 Specific elements to be provided in the tender for certain tasks

As regards Task 2, the tenderer in its offer will explain in details the different steps, criteria and tools they intend to use to perform this task including the possible national and EU organisations to be contacted. The tenderer will also provide a list of Member States to be visited and will explain the rationale of his/her choice based on explicit criteria.

As regards Task 4, the tender in its offer will propose a detailed methodology to consult and validate the elements for best practices in order to involve at least the following groups: animal welfare scientists, official veterinarians, farmers, animal traders, slaughterhouse operators, animal welfare organisations and religious authorities where relevant; As an indication stakeholders will be consulted following these different levels:

1. Stakeholders in some Member States;
2. EU stakeholders via the existing DG SANTE consultative fora;
3. Member States' competent authorities;
4. Scientific supports in some Member States;
5. Public consultation via the Internet.

To perform its tasks the contractor will consider the references listed in Section 6.

4.1 Budget allocated: Organisation of the work

Maximum amount foreseen within the band 200.000 - 250.000€

4.2 Overall management of the contract

The contractor is requested to produce records/minutes of meetings and to submit them to the Commission for approval the week following the meeting.

4.3 Deliverables & documentation

The study must be completed within **12 months** after the signature of the contract.

The present assignment includes the submission of a series of deliverables: reports and presentations during a meeting in Brussels. The contractor will deliver the following reports at 4 key stages of the evaluation process: (1) **kick off meeting report**, (2) **inception report**, (3) **interim report**, (4) **draft final report and final report**.

These reports will be submitted by the Commission to the established steering group, which may ask for complementary information or propose adjustments in order to redirect the work as necessary. Each draft report will be orally presented in Brussels to the Commission's steering group within 30 days after delivery.

Each report should be written in English, and critically assessed as it provides the basis for tracking the quality of the work done by the evaluator. Reports must be approved by the Commission. With work progressing and in the light of new findings, revisions of reports already approved may be necessary.

It is essential that all the reports be clear, concise, unambiguous and comprehensive. They should also be understandable for non-specialists. The presentation of the texts, tables and graphs has to be clear and complete and correspond to commonly recognised standards for studies to be published. A structured and precise elaboration of add-ons based on previous deliverables at every stage of the process is requested (for example, this could be done via colour-coding parts of the report developed at the offer, inception, interim and draft final stage).

- An indicative size of each report to be provided is (excluding inception report: up to 50 pages;
- interim report: up to 150 pages;
- final report: up to 200 pages. Annexes):

The reports must be provided to the Commission in both MS-Word and Adobe Acrobat (PDF) format with the charts in Excel (other formats may be added). They must be accompanied, where requested, by appropriate annexes and delivered in accordance with the deadlines and requirements set out in the Terms of Reference and confirmed in the kick-off meeting.

Reports must be designed as to respect the protection of private data³ so that they can be published or made available to the public without having to request any prior authorisation (see Annex VI).

The following reports and presentations shall be delivered:

Kick-off meeting report

After signature of the contract, the contractor will participate in a kick-off meeting with the Steering Group to present and discuss Deliverable 1.

Inception report – within 4 month(s) of the signature of the contract

The report will contain an updated version of Deliverables 1 (work plan) and 2 (state of play)

Interim report – within 6 months of the signature of the contract

The report will contain an updated version of Deliverables 1 (work plan), 2 (state of play) and 3 (draft for consultation).

Draft final report – within 10 months of the signature of the contract

The report will contain an updated version of Deliverables 1 (work plan), 2 (state of play), 4 (consultation process and final best practices in English).

The draft final report should include an **executive summary** of not more than 5 pages (synthesis of analyses and conclusions), the main report (structure to be confirmed by the Commission services but planned to reflect the content of the assignment), technical annexes (inter alia the Task Specifications and a compilation of all requested country-based information if applicable). The executive summary of this report has to be in English and French.

Final report - to be submitted within 12 months of the signature of the contract (after communication of comments made by the Commission on the draft final report)

The final report should have the same structure as the draft final report. It will take account of the results of the comments and discussions with the Steering Group regarding the draft final report insofar as they do not interfere with the autonomy of the contractor in respect to the conclusions. The executive summary (including the Key Messages section preceding it) should be provided.

The copyright of the reports remains with the Commission.

Month after signature	Reports	Presentation in Brussels	Deliverables	Payments
1	Kick-off meeting	Yes	Deliverable 1	No
	report			
4	Inception report	Yes	Deliverables 1 + 2	Yes
6	Interim report	Yes	Deliverables 1+2+3	Yes
10	Draft final report	Yes	Deliverables 1+2+4	No
12	Final report	No	Draft final report approved	Yes

4.4 Quality Assessment

The contractor will establish robust means to ensure the reliability, validity, and comparability of the information collected as well of its analysis and of its reporting.

The Commission's shall assess the quality of the final report on the basis of the quality assessment criteria defined in annex VII.

5. Timetable and physical location

The contractor is to start the desk-work at signing of the contract and the contract shall be completed according to the schedule laid down in the previous section 4 - Organisation of the work.

6. References

6.1. Reference documents

Regulation (EC) No 1099/2009 on the protection of animals at the time of killing

OIE guidelines on the slaughter of animals and on killing animals for disease control purposes

EFSA opinions on slaughter and killing of animals

Codes of good practices and guidelines notified by the Member States to the Commission's services

Overview report of FVO audits to evaluate the official controls of animal welfare at slaughter, carried out in Member States in 2013-2015

Relevant Member State FVO reports of audits evaluating the animal welfare controls in place at slaughter and during related operations

Country and report reference number	
2013	Estonia 6825 (pilot audit)
2014	Latvia 7077, Italy 7075, Spain 7079, United Kingdom 7080, Denmark 7061, Germany 7073, Czech Republic 7060, Hungary 7072, Belgium 7059, The Netherlands 7078
2015	Poland 7020, France 7427

6.2. Indicative list of stakeholders

Association of Poultry Processors and Poultry Trade in the EU countries AVEC

Compassion in World Farming

Animal stunning equipment manufacturers: Marel Stork, MPS, Karl Schemer, Accles and Shelvoke, Termet, Butina, etc.

Eurogroup for Animals

European Farmers and European Agri-Cooperatives COPA-COGECA

European Food Safety Authority

European Rural Poultry Association

Eyes on Animals

Federation of Veterinarians of Europe

Humane Slaughter Association HSA

International Butchers' Confederation IBC

Œuvre d'Assistance aux Bêtes d'Abattoirs OABA

Relevant religious organisations involved in slaughter without stunning

Third countries exporting meat to the EU like Canada, USA, Chile, Australia, New Zealand, Brazil, Argentina and Thailand.

UECBV European Livestock and Meat Trades Union

6.3. Useful web-links

Legislation and Commission activities:

http://ec.europa.eu/food/animals/welfare/practice/slaughter/index_en.htm

http://ec.europa.eu/food/animals/welfare/archive/index_en.htm

http://ec.europa.eu/food/food_veterinary_office/index_en.htm

EUWelNet see appendix 29: <http://www.euwelnet.eu/euwelnet/53430/7/0/80>

DIALREL project: <http://www.dialrel.eu/>

EFSA opinions on monitoring procedures: Cattle

<http://www.efsa.europa.eu/en/efsajournal/pub/3460.htm> Sheep/goats

<http://www.efsa.europa.eu/en/efsajournal/pub/3522.htm> Pigs

<http://www.efsa.europa.eu/en/efsajournal/pub/3523.htm> Poultry

<http://www.efsa.europa.eu/en/efsajournal/pub/3521.htm> Sample size

<http://www.efsa.europa.eu/en/efsajournal/doc/541e.pdf>

World Organisation for Animal Health (OIE)

Humane Slaughter Association publications: <http://www.hsa.org.uk/>

Temple Grandin: <http://www.grandin.com/>

New Zealand codes of welfare: <https://www.mpi.govt.nz/protection-and-response/animal-welfare/codes-of-welfare/>

Annex 2 Deliverable 4 – Control procedures

A2.1 Slaughterhouse operations

A2.1.1 Equids and cattle

A2.1.1.1 Layout, construction and equipment of slaughterhouses

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Falls	<p>No more than 1-3% fall</p> <p>No Injuries, carcass damage</p> <p>No animals fall over when moving.</p> <p>All animals move smoothly in one direction</p>	<p>Dirty floors – clean</p> <p>Slippery floor / slopes without non-slip fitting – retrofit</p> <p>Operator skill and competence</p> <p>Unusually excited animals</p> <p>Insufficient or incorrect litter</p> <p>Unwillingness to move, turn around in passageways</p> <p>Distractions (noise, drafts)</p> <p>Too much space</p> <p>Mixed groups</p>
Noise level	<p>In the lairage:</p> <p>optimal <75dB noise over 5 min</p> <p>good <80dB noise during slaughter</p>	<p>Metal to metal contacts – use rubber fitments on doors and unloading bay</p> <p>Building materials – retrofit with noise absorbing material</p> <p>Layout – retrofit to separate areas with different activities from one another</p> <p>People shouting or acting inappropriately – Operator training</p> <p>Animal vocalisation – create calm atmosphere, operator training</p>
Checks on drinking systems	<p>The drinking devices suit the species category, size and number of animals in terms of depth, height and strength.</p> <p>Any animal wanting to drink has access to clean water</p>	<p>Drinkers are out of order – maintain/ repair</p> <p>Insufficient trough length – retrofit</p> <p>Water supply is interrupted – have a back-up option to provide water to the animals</p>

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
		Insufficient maintenance of pipe works leads to contamination – Water systems are cleaned and disinfected once a week.
Design features in use Measurement of ease and speed of animal movement	Animal handlers can position themselves to facilitate the movement of animals and to allow free movements of animals without coercion	Poor design - retrofit
Frequency and location of balking	No balking	Where balking occurs: identify the problem and resolve it
Pen size	Pens can accommodate the species and class of animal (e.g., size, sight lines, height, and behaviour)	Revise slaughtering schedule Retrofit the lairage
Lighting	Sufficient to enable inspection Check that lighting is designed to encourage movement of animals.	Retrofit Power failure – back-up lighting system

A2.1.1.2 Ventilation systems

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Temperature Signs of freezing or overheating	Between 0/5°C and 25/30°C, however cattle can also accommodate temperatures inferior to 0°C or above 30-35°C if there are no sudden changes of temperature No signs of shivering or overheating	Adjust ventilation, close/open doors, and heating, reduce the number of animals per pen, use sprinkling/misting system (except if outside temperature is under 10°C).
Relative humidity	< 80%	
Ammonia	< 20 ppm	
CO2	< 0.15-0.5 Vol%	
Alarm	Alarm system is operational Alarm is tested regularly	Alarm system is not working – retrofit the alarm or emergency generator.

A2.1.1.3 Restraining equipment and facilities

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Entrance into the system	<p>No balking</p> <p>Animal enters voluntarily into the system</p> <p>Animal does not require prodding to move forward into the system</p> <p>Use of electric goads should be avoided as far as possible</p>	<p>Distractions – Block view of killing and shackling area before entry into the system, or leave space beyond the box to create impression of “passing through”; The slaughterman should not be visible at the other end</p> <p>Injuries or contusions causing problems when moving the animals</p> <p>Reflections – Surface of the system should be dark and non-reflective</p> <p>System door – Door should not be too short or too narrow</p> <p>Change of flooring – False floor similar to system floor 1.5m before entrance</p> <p>No lighting in the system / animal entering from light into darkness – provide diffuse light in the system</p>
Animal stress during entry into the system	<p>No vocalization (<3%) during restraining</p> <p>No struggling or attempts to escape (<3%)</p> <p>No injuries on carcasses</p>	<p>Animal experience during transport and unloading</p> <p>Operator behaviour</p> <p>If a number of animals (for example more than 3%) vocalize during entry, this should trigger immediate corrective action.</p>
Time to introduce the animal into the system	To be monitored by the animal welfare officer as a function of animals and operators.	<p>Too short a time might indicate excessive pressure being imposed on animals (goading).</p> <p>Too long a time might indicate obstacles or distractions</p>
Optimal pressure of restraining systems	Absence of struggling behaviour and vocalization during restraint (for example: less than 3% of animals vocalise while entering the restraining system or while being	The restraining system presses excessively against the animal and causes discomfort. – All mechanized parts that press against the animal should be equipped with

	<p>restrained)</p> <p>Absence of injuries and bruises caused by restraining</p> <p>In case of standing systems, the belly support does not lift the animal from the floor</p>	<p>pressure limiting devices that automatically prevent excessive pressure from being applied on the animal.</p> <p>If a number of animals (for example more than 3%) vocalize while restrained this should trigger immediate corrective action.</p> <p>Action to ensure no physical pressure on cut arteries</p>
Smooth surfaces	The parts of the restraining equipment that enter into contact with the animal have smooth, rounded surfaces	<p>Surfaces should be inspected at least daily; parts that could harm the animal are replaced promptly</p> <p>If belly lift, back push or chin lifts are used animals can be stressed. These devices should operate smoothly to prevent stress.</p>
Movements of the head/neck	The neck should be restrained	<p>Incorrect restraining of the head</p> <p>Deficient neck-yoke / head-yoke</p> <p>Operator skills –Train operators to improve their skills.</p>
Animal slips and falls	No slips and falls	Floor in the box entry or in the box may be slippery – Put non-slip flooring in the box
Movement of the box	<p>Smooth</p> <p>No slamming</p>	<p>Equipment problem – repair, revise, maintain</p> <p>Operator skills –Train operators to improve their skills.</p>
Trapped neck/body	Effective application of back push plate	Failure to push small animals – Improve restraining practices

A2.1.1.4 Stunning – Penetrative captive bolt

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Position and direction of the shots	As described in this document	<p>Incorrect positioning – Review positioning practices</p> <p>Ineffective restraint – Review restraining practices</p> <p>Operator skills and knowledge – Train</p>
Parameters: Charge Air pressure Length and diameter of the bolt	As indicated in the manufacturer’s instructions for the animal’s size, weight and age.	<p>Inadequate equipment – change to another size gun</p> <p>Inadequate charge or air pressure – review manufacturer’s instructions</p> <p>Equipment malfunction – Maintain/revise/repair the gun</p>
Speed and power of the shot	As indicated in the manufacturer’s instructions	<p>Equipment malfunction – Maintain the gun and replace worn washers</p> <p>Overheating – Check the gun is not overheating due to rapid firing</p> <p>Damp or ineffective cartridges – Keep cartridges dry, have spare cartridges available</p>
Effectiveness of stunning – Record the number of animals that have to be stunned more than once	No animal should have to be stunned twice	<p>All of the above</p> <p>Immediately re-stun the animal using the back-up stunning method with appropriate cartridge strength and then reassess the process.</p> <p>If the first shot was in the wrong position, then re-shoot in the correct position.</p> <p>If the first shot was in the right position, then re-shoot 10mm higher and 5mm to the side of the mid line aiming towards the brain. Stunning relies on the percussive force on the skull and if the skull has been damaged by the first</p>

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
		shot a second shot in the weakened area may not be effective

A2.1.1.5 Verification of stunning

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Signs of unconsciousness	See signs indicated in document	<p>Ineffective stunning – review stunning equipment, positioning and parameters for the weight and size of the animal, experience/competence of the operator, establish the reason for failure and implement corrective action.</p> <p>Immediately re-stun the animal using the back-up stunning method with appropriate cartridge strength and then reassess the process.</p> <p>If the first shot was in the wrong position, then re-shoot in the correct position.</p> <p>If the first shot was in the right position, then re-shoot 10mm higher and 5mm to the side of the mid line aiming towards the brain. Stunning relies on the percussive force on the skull and if the skull has been damaged by the first shot a second shot in the weakened area may not be effective.</p>
Times at which unconsciousness is verified	Immediately after stunning and before releasing the animal from restraint	<p>If conscious re-stun immediately.</p> <p>If the animal is not unconscious, releasing it could have serious welfare consequences.</p>
Circumstances / time of control	Immediately after stunning by holder of certificate of competence	If the animal is not unconscious releasing it could have serious health and safety consequences.

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
	<p>Immediately after new staff has begun working on the line</p> <p>Within 5 seconds, and after 60 seconds of stunning</p> <p>Alternatively: during the whole time from stunning to death</p>	
Frequency of checks	<p>Depending on outcomes of previous checks</p> <p>Depending on any factors that might affect the efficiency of the stunning process (e.g. new staff, new equipment)</p>	
Sample size for checking unconsciousness	<p>At least once for every 20 animals stunned</p> <p>Statistical model from EFSA</p>	
Number of animals not rendered unconscious	<1% of animals are conscious after being stunned	<p>Immediately re-stun that animal and then reassess the process</p> <p>Check equipment maintenance and operator competence.</p>
Number of animals bled while conscious	No animal is bled while conscious	

A2.1.2 Pigs

A2.1.2.1 Layout, construction and equipment of slaughterhouses

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Falls	<p>No more than 1-3% fall</p> <p>No injuries, no carcass damage</p> <p>No animals fall over when moving.</p> <p>All pigs move smoothly in one direction</p>	<p>Dirty floors – clean</p> <p>Slippery floor / slopes without non-slip fitting – retrofit</p> <p>Operator skill and competence</p> <p>Unusually excited animals</p> <p>Insufficient or incorrect litter</p> <p>Unwillingness to move, turn around in passageways</p> <p>Distractions (noise, drafts)</p> <p>Too much space</p>

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Noise level	In the lairage: optimal <75dB noise over 5 min good <80dB noise during slaughter	Mixed groups Metal to metal contacts – use rubber fitments on doors and unloading bay Building materials – retrofit with noise absorbing material Layout – retrofit to separate areas with different activities from one another People shouting or acting inappropriately – Operator training Animal vocalisation – create calm atmosphere, operator training
Checks on drinking systems	The drinking devices suit the species category, size and number of animals in terms of depth, height and strength. Any animal wanting to drink has access to clean water	Drinkers nozzles are blocked or damaged – maintain / repair Water supply is interrupted – have a back-up option to provide water to the animals Buckets are knocked over and left empty – Water buckets emptied every day and cleaned before they are filled up again. Insufficient maintenance of pipe works leads to contamination – Water systems are cleaned and disinfected once a week.
Design features in use Measurement of ease and speed of animal movement	Animal handlers can position themselves to facilitate the movement of animals and to allow free movements of animals without coercion	Poor design - retrofit
Frequency and location of balking	No balking	Where balking occurs: identify the problem and resolve it
Pen size	Pens can accommodate the species and class of animal (e.g., size, sight lines, height, and behaviour)	Revise slaughtering schedule Retrofit the lairage

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Lighting	Sufficient to enable inspection Check that lighting is designed to encourage movement of animals.	Retrofit Power failure – back-up lighting system

A2.1.2.2. Ventilation systems

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Temperature Signs of freezing or overheating	Between 5°C and 25°C, maximum of 30° C if water cooling at the same time No signs of shivering or overheating	Adjust ventilation, close/open doors, and heating, modify the number of animals per pen, use sprinkling/misting system (except if outside temperature is under 10°C).
Relative humidity	< 80%	
Ammonia	< 20 ppm	
CO2	< 0.5 Vol%	
Alarm	Alarm system is operational Alarm is tested regularly	Alarm system is not working – retrofit the alarm or emergency generator.
Pigs behaviour in the lairage	Pigs lie down within 20-30 minutes after unloading Pigs are not in close contact with one another (if they are it demonstrates too cold ambient temperatures)	Inadequate temperature

A2.1.2.3 Maximum capacity for the lairage

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Animal behaviour (tail biting, aggressive behaviour, social withdrawal, fear)	No pig fighting, no vocalisation	Excessively high or low density – review density of animals in pens
% mortality in the lairage	No pig mortality in the lairage	Investigate the causes and implement corrective plan
Level of treatment required: number of animals requesting treatment, mg of antibiotic per animal or kg	No treatment required for pigs in lairage	Investigate the causes and implement corrective plan
Checks before and after slaughter	No lesions on live animals (for example: < 10% of carcasses show signs of scratching or biting)	Excessively high or low density – review density or animals in pens Problems on farm or during

		transport – Investigate and address the problems with suppliers and haulers
Recording of data	Collected on a batch basis, trended on a monthly basis	Management

A2.1.2.4 Handling and restraining

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Falls and/or vocalization on ramps and during unloading	No more than 1-3% fall No injuries, no carcass damage No animals fall over when moving. All pigs move smoothly in one direction	Poor flooring and ramps Dirty flooring Inadequate ramps; flooring, slopes Poor lighting Number of pigs unloaded is too high Speed of unloading is not appropriate Operator skills and competences
Procedure for sick/weak pigs is complied with	Isolation pen available and emergency slaughter equipment and procedure	Lairage design and operation SOP Operator skills and competence
Equipment used to handle pigs	Equipment in good order	Operator skill and competence Insufficient maintenance Insufficient back-up equipment
Procedure for sick/weak animals is complied with	Isolation pen available and emergency slaughter equipment and procedure in place and implemented	Lairage design and operation SOP Operator skills and competence
Goading	No unnecessary goading No goading of piglets	Lots too big Corridor / chute / pen design is not appropriate Operator skill and competence
Record of where animals stop, or turn	Smooth quiet movement through the system	Assess and make changes to layout Remove distractions in field of vision Poor coordination between

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Time to take pigs to stunning (taking into account the rate of stunning, design and equipment)	No undue delay	<p>operators in the corridor and in the chute / stunning pen</p> <p>Lots are too big</p> <p>Corridor design is not appropriate</p> <p>Distractions</p> <p>Poor coordination between operators in the corridor and in the chute / stunning pen</p> <p>Inefficient SOP</p>
Whether pigs become stuck in the restraining system	No pig stuck	<p>Operator skills and knowledge</p> <p>Poor communication between operators</p> <p>Design defect</p> <p>No SOP for when the chain stops</p>
Entrance into the restraining system	<p>No balking</p> <p>Animal enters voluntarily into the system</p> <p>Animal does not require prodding to move forward into the system</p>	<p>Distractions – Block view of killing and shackling area before entry into the box, or leave space beyond the box to create impression of “passing through”; The operator should not be visible at the other end</p> <p>Reflections – Surface of the box should be dark and non-reflective</p> <p>Box door – Door should not be too short or too narrow</p> <p>Change of flooring – False floor similar to box floor 1.5m before entrance</p> <p>No lighting – provide diffuse light in the box that does not shine in the animal’s eyes</p>
Animal stress during entrance into the restraining system and while being restrained	<p>No vocalization during restraining</p> <p>No struggling or attempts to escape</p> <p>No injuries and bruises caused by restraining</p>	<p>Animal experience during transport and unloading</p> <p>Operator behaviour</p> <p>The restraining system presses excessively against the animal and causes discomfort. – All</p>

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
		mechanized parts that press against the animal should be equipped with pressure limiting devices that automatically prevent excessive pressure from being applied on the animal.
Time to introduce the animal into the system	To be monitored by the animal welfare officer as a function of animals and operators.	Too short a time might indicate excessive pressure being imposed on animals. Too long a time might indicate obstacles or distractions
Smooth surfaces	The parts of the restraining equipment that enter into contact with the animal have smooth, rounded surfaces	Surfaces should be inspected at least daily; parts that could harm the animal are replaced promptly If belly lift, back push or chin lifts are used animals can be stressed. These devices should operate smoothly to prevent stress.
Animal slips and falls in the restraining system	No slips and falls	Floor in the system entry or in the system may be slippery – Install non-slip flooring or bedding.
Movement of the restraining system	Smooth No slamming	System maintenance

A2.1.2.5 Stunning

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Position of the electrodes	As described in this document Proportion of good positioning of the electrodes. Various recommendations in existing guides: >96% (all methods) ≥98% (manual positioning) ≥99% (semi-automatic positioning) ≥99.5% (fully automatic positioning)	Ineffective restraint – Review restraining practices You did not wait for the unrestrained animal to be in a good position before you applied the electrodes – Wait for right moment to apply the tongs. Incorrect positioning – Review guidance on positioning. The electrodes do not fit the head of the animal –

What should you check?	What does good look like?	What might go wrong? How can you fix it?
	<p>Frequency of checks:</p> <p>20% of all pigs stunned in one hour</p> <p>At least 50 pigs from different groups including various operators</p> <p>At least 100 pigs if using an automatic system</p>	<p>Change equipment.</p> <p>Operator skills and experience – Seek advice and training.</p>
Maintenance of the equipment	<p>Cleaning and de-carbonisation of electrodes</p> <p>Regular checking of back-up equipment</p> <p>Storage of stunning equipment (including back-up equipment) in dry location</p>	
Parameters	As described in this document	<p>Inaccurate parameters – Review and correct</p> <p>Equipment malfunction – Revise / repair / maintain equipment.</p> <p>The electrodes are dirty – clean tongs every 20 animals</p>
Effectiveness of stunning – Record the number of pigs that have to be stunned more than once	<p>No animal should have to be stunned more than once</p> <p><2% animals are conscious after stunning</p> <p>Alternatively:</p> <p><1% animals are conscious after stunning</p>	<p>All of the above</p> <p>Immediately re-stun the animal with the back-up method and then reassess the process.</p>

A2.1.2.6 Verification of stunning

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Signs of unconsciousness	As listed in document	Ineffective stunning – review stunning equipment, positioning and parameters for the weight and size of the animal, experience/competence of the operator, establish the reason for failure and implement corrective action.

What should you check?	What does good look like?	What might go wrong? How can you fix it?
		Re-stun immediately with the back-up method.
Times at which unconsciousness is verified	Immediately after stunning Immediately after new staff has begun working on the line Within 5 seconds, and after 60 seconds of stunning Alternatively: during the whole time from stunning to death	If the animal is conscious re-stun immediately If the animal is not unconscious releasing it could have serious health and safety consequences.
Frequency of checks	Depending on outcomes of previous checks Depending on any factors that might affect the efficiency of the stunning process (e.g. new staff, new equipment different category of animal)	

A2.1.3 Sheep and goats

A2.1.3.1 Layout, construction and equipment of slaughterhouses

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Falls	No falls No injuries, carcass damage	Dirty floors – clean Slippery floor / slopes without non-slip fitting – retrofit Operator skill and competence Unusually excited animals Insufficient or incorrect litter Unwillingness to move, turn around in passageways Distractions Too much space
Design features in use Measurement of ease and speed of animal movement	Animal handlers can position themselves to facilitate the movement of animals and to allow free movements of animals without coercion	Poor design - retrofit
Frequency and location of balking	No balking	Where balking occurs: identify the problem and

		resolve it
Checks on drinking systems	<p>The drinking devices suit the species category, size and number of animals in terms of depth, height and strength.</p> <p>Any animal wanting to drink has access to clean water</p>	<p>Drinkers nozzles are blocked or damaged – maintain / repair</p> <p>Water supply is interrupted – have a back-up option to provide water to the animals</p> <p>Buckets are knocked over and left empty – Water buckets emptied every day and cleaned before they are filled up again.</p> <p>Insufficient maintenance of pipe works leads to contamination – Water systems are cleaned and disinfected once a week.</p>
Pen size	<p>Pens can accommodate the species and class of animal (e.g., size, sight lines, height, and behaviour)</p>	<p>Revise slaughtering schedule</p> <p>Retrofit the lairage</p>
Lighting	<p>Sufficient to enable inspection</p> <p>Check that lighting is designed to encourage movement of animals.</p>	<p>Retrofit</p> <p>Power failure – back-up lighting system</p>

A2.1.3.2 Maximum capacity in the lairage

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Animal behaviour	No fighting, no vocalisation	<p>Excessively high or low density – review density of animals in pens</p> <p>Mixing unfamiliar animals – Try and ensure animals are not mixed together for first-time in lairage. Keep same groups as during transport.</p>

A2.1.3.3 Handling and restraining

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Equipment used to handle animals	Equipment in good order	Insufficient maintenance Insufficient back-up equipment
Falls and/or vocalization on ramps and during unloading	As few as possible	Poor flooring and ramps Dirty flooring Inadequate ramps; flooring, slopes Poor lighting Number of pigs unloaded is too high Speed of unloading is not appropriate Operator skills and competences
Procedure for sick/weak animals is complied with	Isolation pen available and emergent slaughter equipment and procedure in place and implemented	Lairage design and operation SOP Operator skills and competence
Record of where animals stop, or turn in passageways	Smooth quiet movement through the system	Assess and make changes to layout Remove distractions in field of vision Poor coordination between operators in the corridor and in the chute / stunning pen
Time to take animals to stunning (taking into account the rate of stunning, design and equipment)	No undue delay	Lots are too big Corridor design is not appropriate Distractions Poor coordination between operators in the corridor and in the chute / stunning pen Inefficient SOP
Animals becoming stuck in the stunning system	No animal stuck	Operator skills and knowledge Poor communication between operators Design defect

What should you check?	What does good look like?	What might go wrong? How can you fix it?
		<p>No SOP for when the chain stops</p> <p>Failure to push small animals</p>
<p>Entrance into the restraining system</p>	<p>No balking</p> <p>Animal enters voluntarily into the system</p> <p>Animal does not require prodding to move forward into the system</p>	<p>Distractions – Block view of killing and shackling area before entry into the box, or leave space beyond the box to create impression of “passing through”; The operator should not be visible at the other end</p> <p>Reflections – Surface of the box should be dark and non-reflective</p> <p>Box door – Door should not be too short or too narrow</p> <p>Change of flooring – False floor similar to box floor 1.5m before entrance</p> <p>No lighting – provide diffuse light in the box that does not shine in the animal’s eyes</p>
<p>Animal stress during entrance into the restraining system and while being restrained</p>	<p>No vocalization (<3%) during restraining</p> <p>No struggling or attempts to escape (<3%)</p> <p>No injuries and bruises caused by restraining</p>	<p>Animal experience during transport and unloading</p> <p>Operator behaviour</p> <p>The restraining system presses excessively against the animal and causes discomfort. – All mechanized parts that press against the animal should be equipped with pressure limiting devices that automatically prevent excessive pressure from being applied on the animal.</p>
<p>Time to introduce the animal into the system</p>	<p>To be monitored by the animal welfare officer as a function of animals and operators.</p>	<p>Too short a time might indicate excessive pressure being imposed on animals.</p> <p>Too long a time might indicate obstacles or distractions</p>
<p>Smooth surfaces</p>	<p>The parts of the restraining equipment that enter into contact with the animal</p>	<p>Surfaces should be inspected at least daily; parts that could harm the</p>

What should you check?	What does good look like?	What might go wrong? How can you fix it?
	have smooth, rounded surfaces	animal are replaced promptly If belly lift, back push or chin lifts are used animals can be stressed. These devices should operate smoothly to prevent stress.
Movements of the head/neck	The neck should be restrained	Incorrect restraining of the head Lack of experience / training
Animal slips and falls in the restraining system	No slips and falls	Floor in the system entry or in the system may be slippery – Install non-slip flooring or bedding.
Movement of the restraining system	Smooth No slamming	System maintenance

A2.1.3.4 Head only electrical stunning

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Position of the electrodes	As described in this document	Ineffective restraint (e.g. agitated goat) – Review restraining practices If unrestrained / in a stunning pen: you did not wait for the unrestrained animal to be in a good position before you applied the electrodes – Wait for right moment to apply the tongs. Incorrect positioning (e.g. due to the presence of the horns) – Review guidance on positioning. The electrodes do not fit the head of the animal – Change equipment. Operator skills and experience – Seek advice and training.
Parameters of the electrical stun	As described in this document	Inaccurate parameters – Review and correct Equipment malfunction – Revise / repair / maintain equipment.

Effectiveness of stunning – Record the number of sheep or goats that have to be stunned more than once	No animal should have to be stunned more than once	All of the above For sheep with woolly heads: you used electrodes without pins or with dry pins – change equipment The presence of wool slows or stops current flow – Clip wool and/or wet the animal’s wool under the tongs. Re-stun immediately with the back-up method.
--	--	---

A2.1.3.5 Verification of stunning

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Signs of unconsciousness	As listed in document	Ineffective stunning – review stunning equipment, positioning and parameters for the weight and size of the animal, experience/competence of the operator, establish the reason for failure and implement corrective action. Re-stun immediately with the back-up method.
Times at which unconsciousness is verified	Immediately after stunning Immediately before and during hoisting Immediately before and during bleeding Risk factors included (types of animals slaughtered, changes to personnel or working patterns)	If the animal is conscious re-stun immediately. If conscious, releasing it could have serious welfare consequences

A2.1.4 Poultry (chicken and turkey)

A2.1.4.1 Layout, construction and equipment of slaughterhouses

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Spacing between stacks of containers	At least 1 m, to be adapted depending on the climatic conditions	Retrofit installations Improve scheduling of arrivals
Lighting	Sufficient to allow inspection of all birds	Retrofit installations

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
		Power failure – back-up lighting system
Air quality parameters (humidity, temperature) and bird behaviour	Birds are not panting (heat stress) or huddling (cold stress)	Temperature / humidity levels are causing discomfort – Adjust ventilation, close/open doors, use heating / mechanical ventilation systems, increase/reduce the space between containers (when used) Excessive waiting time in the lairage for birds in containers – improve scheduling of arrivals and slaughter to minimize waiting times
% mortality in the lairage	As low as possible	Excessive density, heat stress, excessive waiting times
Alarm	Alarm system is operational Alarm is tested regularly	Alarm system is not working – retrofit the alarm or emergency generator.

A2.1.4.2 Restraining methods

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Bird behaviour	The bird is not struggling or flapping its wings, no pecking attempts. No vocalisations	Stressed bird – Review handling practices Bird discomfort – Review restraining practices Ineffective restraint (bird escapes) – Review restraining practices Skills – Train operators to improve their skills
For shackling: duration of shackling period	Record how much time animals are shackled before stunning. This should be no longer than 2 minutes for turkey and 1 minutes for chickens	Malfunction of the shackle line – revise/repair/maintain Immediately stun and kill with an appropriate back-up method all animals that are held for longer than the recommended time interval.
For shackling: optimal pressure of shackles	Absence of bruises and bone breaks.	Inappropriate shackle size – adjust shackles to the animals' size.

What should you check?	What does good look like?	What might go wrong? How can you fix it?
	Absence of / limited animals struggling and flapping their wings.	Inappropriate handling by operators – ensure that operators shackle animals gently.

A2.1.4.3 All stunning methods

What should you check?	What does good look like?	What might go wrong? How can you fix it?
For head-only electrical stunning: position of the electrodes	As described in this document	Ineffective restraint – Review restraining practices Incorrect positioning – Review guidance on positioning. The electrodes do not fit the head of the bird – Change equipment.
For head-only electrical stunning: parameters of the electrical stun	As described in this document	Inaccurate parameters – Review and correct Equipment malfunction – Revise / repair / maintain equipment. The presence of dirt (on tongs or bird's head) slows or stops current flow – Clean tongs; wet the bird's head with a sponge.
For electrical waterbath: signs of pre-stun shock	Bird becomes rigid when entering the waterbath Bird that show more than one contraction when entering the water experience a pre-stun shock, while those that show only one contraction do not receive the shock. Target value can usefully be set (for example: less than 5% of animals show signs of pre-stun shock.)	Inadequate entry into the waterbath – adjust the entry to the waterbath to reduce the risk of pre-stun shocks. Stressed animals struggling – calm down distressed animals by gently placing one hand on the animal's breast, or by gently holding the animal against the breast contact strip; review and improve shackling practices
For electrical waterbath: live electrode	The electrode placed in the water extends the full length and width of the waterbath	Waterbath design – improve the waterbath design
For electrical waterbath: earth rail	Shackle contact with the earth rail should be inspected visually (n = 50	Problem with the shackle line, poor maintenance – inspect and repair/maintain

What should you check?	What does good look like?	What might go wrong? How can you fix it?
	animals) and maintained on a daily basis.	
For electrical waterbath: depth of immersion	All animals have their heads and neck fully immersed in the water.	Inappropriate water height in the waterbath – adjust the height of the waterbath
For electrical waterbath: dwell time (time of animals' exposure to the current)	At least 4 seconds	Shackle speed – adjust shackle speed to ensure birds spend the minimal amount of time in the waterbath
Electrical parameters	As stated in this document	Inaccurate setting of parameters – revise parameters
Effectiveness of stunning – Record the number of birds that have to be stunned more than once	No animal should have to be stunned more than once Target value can be set (e.g. less than 5% of birds show signs of consciousness)	Re-stun immediately with back-up equipment.

A2.1.4.4 Verification of stunning

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Signs of unconsciousness	As listed in document	Malfunction of the stunning equipment – identify cause of ineffective stunning and revise stunning equipment accordingly. Inappropriate stunning parameters – revise parameters Re-stun immediately Record the number of animal that does not show signs of unconsciousness and the corrective measures taken.
Scope of checks	At basic level (visual) for all birds. More in-depth monitoring of signs of absence of consciousness (including reflexes) should cover a minimum number of animals for each flock processed in the waterbath, and any bird	Staff training

	<p>not displaying good signs of unconsciousness in the basic visual inspection.</p> <p><i>For example: operators handling the stunning machine: check at least 50 animals after exit of the waterbath / Back-up slaughter personnel: check all birds immediately after stunning and until the animal's death / Animal welfare officer: check 20 animals from entry into the waterbath until death</i></p>	
Times at which unconsciousness is verified	Immediately after stunning, during bleeding, and before releasing the bird from restraint	If the bird is not unconscious, releasing it could have serious welfare consequences. Confirm unconsciousness.

A2.2 Slaughter without stunning

A2.2.1 Cattle

A2.2.1.1 Mechanical restraining systems

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Entrance into the system	<p>No balking</p> <p>Animal enters voluntarily into the system</p> <p>Animal does not require prodding to move forward into the system</p> <p>Use of electric goads should be avoided as far as possible (<i>for example, less than 10% of the animals</i>)</p>	<p>Distractions – Block view of killing and shackling area before entry into the system, or leave space beyond the box to create impression of “passing through”; The slaughterman should not be visible at the other end</p> <p>Injuries or contusions causing problems when moving the animals</p> <p>Reflections – Surface of the system should be dark and non-reflective</p> <p>System door – Door should not be too short or too narrow</p> <p>Change of flooring – False floor similar to system floor 1.5m before entrance</p> <p>No lighting in the system / animal entering from light into darkness – provide diffuse light in the system</p>

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Animal stress during entrance into the system	Should be minimal (for example, <i>less than 10% of animals vocalize</i>).	Animal experience during transport and unloading Operator behaviour If too many animals (<i>for example, more than 10%</i>) vocalize during entrance, this should trigger immediate corrective action.
Time to introduce the animal into the system	To be monitored by the animal welfare officer as a function of animals and operators.	Too short a time might indicate excessive pressure being imposed on animals (goaded). Too long a time might indicate obstacles or distractions
Optimal pressure of restraining systems	Absence of struggling behaviour and vocalization during restraint (<i>for example: less than 5% of animals vocalise while entering the restraining system or while being restrained</i>) Absence of injuries and bruises caused by restraining In case of standing systems, the belly support does not lift the animal from the floor	The restraining system presses excessively against the animal and causes discomfort. – All mechanized parts that press against the animal should be equipped with pressure limiting devices that automatically prevent excessive pressure from being applied on the animal. If more than 10% of animals vocalize while restrained this should trigger immediate corrective action. Ventral opening of the neck restraint can sometimes press on neck impeding blood loss: Action to ensure no physical pressure on cut arteries
Smooth surfaces	The parts of the restraining equipment that enter into contact with the animal have smooth, rounded surfaces	Surfaces should be inspected at least daily; parts that could harm the animal are replaced promptly If belly lift, back push or chin lifts are used animals can be stressed. These devices should operate

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Movements of the head/neck	<p>The neck should be restrained</p> <p>A chin lift can also be used to extend and restrain the head for neck cutting.</p>	<p>smoothly to prevent stress.</p> <p>Incorrect restraining of the head</p> <p>Deficient neck-yoke / head-yoke / chin-lift</p> <p>Hyperextension of the neck – adjustments may be required for different categories of animals.</p> <p>Lack of experience / training</p> <p>The operator should observe easily and thoroughly the animal's responses. The operator performing the cut may communicate with the operator restraining the head to prevent incidents.</p>
Animal slips and falls	No slips and falls	Floor in the box entry or in the box may be slippery – Put non-slip flooring in the box
Movement of the box	<p>Smooth</p> <p>No slamming</p> <p>For rotating systems: it takes on average 15 seconds (and, in any case, no more than 30 seconds) to fully rotate the animal</p>	<p>Equipment problem – repair, revise, maintain</p> <p>Operator skills – Train operators to improve their skills.</p>
Trapped neck/body	Effective application of back push plate	Failure to push small animals – Improve restraining practices

A2.2.1.2 Use of non-authorized methods of stunning – non-penetrative captive bolt

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Monitor indicators of unconsciousness after stunning	As listed in document	Ineffective stunning – review stunning equipment, positioning and parameters for the weight and size of the animal

	<p>Re-stun: where the first shot from a non-penetrative stun gun fails to stun the animal, it shall immediately be stunned with a shot from a penetrative stun gun or stunned electrically</p> <p>A back-up system (penetrative stun gun, electric stunning) should be available and in good working order.</p>
--	---

A2.2.1.3 Bleeding operations

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Blade	<p>The length of the knife blade should be at least twice that of the width of the animal's neck, and at least 30cm.</p> <p>The tip of the knife remains visible during the cut.</p> <p>The blade should be straight</p> <p>The knife should be checked by the slaughtermen as frequently as required for nicks and bluntness</p>	<p>Too short knife – Change knife</p> <p>Knife is not sharp – Knife should be sharpened as required, and at least every 10 animals</p>
Animal discomfort	Signs of struggling, vocalization	Resistance to head restraining systems – Review head restraining equipment; partly release head restraint immediately after the cut.
Cut	<p>Close to the jaw bone</p> <p>Single cut in one movement (maximum of 3 movements)</p> <p>Deep cut</p> <p>Complete sectioning of both carotid arteries and both jugular veins</p> <p>No damage to neck bones</p>	<p>Operator skills – Train operators to improve their skills</p> <p>Animal is struggling at the time of the cut – Review restraining guidance</p> <p>Knife is straight but not sharp, requiring multiple cuts. – Sharpen knife</p> <p>Operator skills –Train operators to improve their skills.</p>
Monitor bleeding	Blood flow and pulsating	Too tight neck restraint,

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
	<p>effect of the heart-beat</p> <p>The proportion of animals showing obstacles to blood flow (such as blood clots) is close to 0% and, in any case, below 10%</p>	<p>preventing blood release – Partly release neck restraint immediately after the cut.</p> <p>Too tight head restraint – Partly release head restraint immediately after the cut.</p> <p>The animal has experienced too much stress, resulting in high blood pressure and reduced blood flow.</p> <p>Inaccurate cut – Review guidance on location of cut</p> <p>Ballooning / blood clots</p> <p>In the event of inefficient bleeding being exhibited during repeated checks after neck cutting, animals should be stunned with a suitable method as soon as possible, even if this requires the religious authorities to declare the animal as non-kosher or haram. (e.g. after 45 seconds / 150 seconds).</p>
<p>Time between stunning and ritual cutting (when the animal is stunned before the cut):</p>	<p>Record time interval between the animal becomes unconscious and the animal is cut. Target interval <10 seconds.</p>	<p>Lack of preparation – always ensure the operator is ready to perform the cut before stunning</p>
<p>Systematic monitoring of signs of unconsciousness</p>	<p>Loss of consciousness should be checked at least twice after cutting</p> <p>Loss of consciousness should begin within 10-15 seconds after neck cutting.</p> <p>Signs of consciousness should not be present after a maximum period of time (for example: 45 seconds; 150 seconds)</p>	<p>In the event of prolonged consciousness being exhibited during repeated checks after neck cutting, animals should be stunned with a suitable method as soon as possible, even if this requires the religious authorities to declare the animal as non-kosher or haram (e.g. after 45 seconds / 150 seconds).</p> <p>A back-up system (penetrative stun gun, electric stunning) should be available and in good working order.</p>

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Time before removing the animal from restraint after cutting	Once no signs of consciousness can be detected >45 seconds after cutting >90 seconds after cutting	
Time before further work on the carcass can be done (hoisting, dressing)	Once the animal has completely bled out and no signs of life can be detected (in particular loss of corneal reflex)	

A2.2.2 Sheep and goats

A2.2.2.1 Mechanical restraining systems

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Entrance into the system	No balking Animal enters voluntarily into the box No goading, no wool pull	Distractions – Block view of killing and shackling area before entry into the box, or leave space beyond the box to create impression of “passing through”; The slaughterman should not be visible at the other end Injuries or contusions causing problems when moving the animals Reflections – Surface of the box should be dark and non-reflective Box door – Door should not be too short or too narrow Change of flooring – False floor similar to box floor 1.5m before entrance No lighting – provide diffuse light in the box
Animal stress during entrance into the system	Minimal vocalization (<i>for example, less than 10% of the animals</i>).	Animal experience during transport and unloading Operator behaviour If too many animals vocalize (<i>e.g. more than 10%</i>) during entrance, this should trigger immediate corrective action.
Time to introduce the animal into the system	To be monitored by the animal welfare officer as a	Too short a time might indicate excessive pressure

What should you check?	What does good look like?	What might go wrong? How can you fix it?
	function of animals and operators.	being imposed on animals. Too long a time might indicate obstacles or distractions
Optimal pressure of restraining systems	Absence of struggling behaviour and vocalization during restraint: <i>(for example: less than 5% of animals vocalise while entering the restraining system or while being restrained)</i> Absence of injuries and bruises caused by restraining	The restraining system presses excessively against the animal and causes discomfort. – All mechanized parts that press against the animal should be equipped with pressure limiting devices that automatically prevent excessive pressure from being applied on the animal. If a number of animals vocalize <i>(for example more than 10%)</i> while restrained this should trigger immediate corrective action
Smooth surfaces	The parts of the restraining equipment that enter into contact with the animal have smooth, rounded surfaces	Surfaces should be inspected at least daily; parts that could harm the animal are replaced promptly If belly lift, back push or chin lifts are used animals can be stressed. These devices should operate smoothly to prevent stress.
Movements of the head/neck	The neck should be restrained	Incorrect restraining of the head Hyperextension of the neck – adjustments may be required for different categories of animals. Lack of experience / training The operator should observe easily and thoroughly the animal's responses. The operator performing the cut may communicate with the operator restraining the head to prevent incidents.
Animal slips and falls	No slips and falls	Floor in the system entry or in the system may be

What should you check?	What does good look like?	What might go wrong? How can you fix it?
		slippery – Put non-slip flooring
Movement of the system	Smooth No slamming	System maintenance
Trapped neck/body	Effective application of back push plate	Failure to push small animals

A2.2.2.2. Bleeding operations

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Blade	The length of the knife blade should be at least twice that of the width of the animal's neck. The tip of the knife remains visible during the cut. The blade should be straight The knife should be checked by the slaughter men (or Shochetim for Shechita) as frequently as required for nicks and bluntness	Too short knife – Change knife Knife is not sharp – Knife should be sharpened as required, and at least every 10 animals
Animal discomfort	Signs of struggling, vocalization These signs may occur approximately 30 seconds after restraining is applied.	
Cut	Close to the jaw bone Single cut Deep cut Complete sectioning of both carotid arteries and both jugular veins No damage to neck bones	Operator skills – Train operators to improve their skills Animal is struggling at the time of the cut – Review restraining guidance Knife is straight but not sharp, requiring multiple cuts. – Sharpen knife Operator skills – Train operators to improve their skills.
Monitor bleeding	Blood flow and pulsating effect of the heart-beat	Too tight head/.neck restraint, preventing blood release – Partly release restraint immediately after the cut.

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
		<p>The animal has experienced too much stress, resulting in high blood pressure and reduced blood flow.</p> <p>Inaccurate cut – Review guidance on location of cut</p> <p>In the event of inefficient bleeding being exhibited during repeated checks after neck cutting, animals should be stunned with a suitable method as soon as possible, even if this requires the religious authorities to declare the animal as non-kosher or haram. This should be done after 30 seconds / 45 seconds.</p> <p>A back-up system (penetrative captive bolt, electric stunning) should be available and in good working order.</p>
<p>Systematic monitoring of signs of unconsciousness</p>	<p>Loss of consciousness should occur within 30-40 seconds after neck cutting.</p> <p>Loss of consciousness should be checked at least twice after cutting.</p> <p>Loss of consciousness should begin within 10-15 seconds after neck cutting.</p> <p>Signs of consciousness should not be present after a maximum period of time (for example: 30 seconds; 45 seconds)</p>	<p>In the event of prolonged consciousness being exhibited during repeated checks after neck cutting, animals should be stunned with a suitable method as soon as possible, even if this requires the religious authorities to declare the animal as non-kosher or haram. This should be done after 30 seconds / 45 seconds.</p> <p>A back-up system (penetrative captive bolt, electric stunning) should be available and in good working order.</p>
<p>Time before removing the animal from restraint after cutting</p>	<p>Once no signs of consciousness can be detected</p>	
<p>Time before further work on the carcass can be done (hoisting, dressing)</p>	<p>Once the animal has completely bled out and no signs of life can be detected</p>	

A2.2.3 Poultry (chicken and turkey)

A2.2.3.1 Electrical waterbath

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Duration of shackling period:	Record how much time animals are shackled before stunning. This should be no longer than 2 to 3 minutes for turkey and 1 to 3 minutes for chickens	Malfunction of the shackle line – revise/repair/maintain Immediately stun and kill with an appropriate back-up method all animals that are held for longer than the recommended time interval.
Optimal pressure of shackles:	Absence of bruises and bone breaks. Absence of animals struggling and flapping their wings.	Inappropriate shackle size – adjust shackles to the animals' size. Inappropriate handling by operators – ensure that operators shackle animals gently.
Signs of pre-stun shock:	Animal that show more than one contraction when entering the water experience a pre-stun shock, while those that show only one contraction do not receive the shock. Target value: less than 5% of animals show signs of pre-stun shock.	Inadequate entry into the waterbath – adjust the entry to the waterbath to reduce the risk of pre-stun shocks. Stressed animals struggling – calm down distressed animals by gently placing one hand on the animal's breast, or by gently holding the animal against the breast contact strip; review and improve shackling practices
Live electrode:	The electrode placed in the water extends the full length and width of the waterbath	Waterbath design – improve the waterbath design
Earth rail:	Shackle contact with the earth rail should be inspected visually (n = 50 animals) and maintained on a daily basis.	Problem with the shackle line, poor maintenance – inspect and repair/maintain
Depth of immersion:	All animals have their heads and neck fully immersed in the water.	Inappropriate water height in the waterbath – adjust the height of the waterbath
Dwell time (time of animals' exposure to the current):	≥10 seconds	Shackle speed – adjust shackle speed to ensure birds spend the minimal amount of time in the

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Electrical parameters:	As stated in this document	waterbath Inaccurate setting of parameters – revise parameters
Bird response to waterbath, including absence of signs of consciousness:	Bird becomes rigid when entering the waterbath After exiting the waterbath: arched neck / completely limp body; wings held close to body; legs rigidly extended; no regular breathing, no spontaneous blinking, no vocalisation, no blink reflex, constant body tremors, no response to pinch or prick of its comb	Malfunction of the stunning equipment – identify cause of ineffective stunning and revise stunning equipment accordingly. Inappropriate stunning parameters – revise parameters Record the number of animal that do not show signs of unconsciousness and the corrective measures taken.
Scope of checks	At basic level (visual) for all birds. More in-depth monitoring of signs of absence of consciousness (including reflexes) should cover a minimum number of animals for each flock processed in the waterbath, and any bird not displaying good signs of unconsciousness in the basic visual inspection. <i>For example: operators handling the stunning machine: check at least 50 animals after exit of the waterbath / Back-up slaughter personnel: check all birds immediately after stunning and until the animal's death / Animal welfare officer: check 20 animals from entry into the waterbath until death</i>	Staff training

A2.2.3.2 Manual bleeding operations

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
Blade length:	The length of the knife blade should be at least twice that of the width of the bird's neck.	Too short knife – Change knife Knife is not sharp – Knife

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
	<p>The tip of the knife remains visible during the cut.</p> <p>The blade should be straight</p> <p>The knife should be checked by the slaughtermen (or Shochetim for Shechita) as frequently as required for nicks and bluntness</p>	<p>should be sharpened as required, and at least every 10 animals</p>
Animal discomfort	No stress and pain reaction during handling and cut	Operator skills – Train operators to improve their skills
Cut	<p>Complete sectioning of both carotid arteries and both jugular veins, oesophagus and trachea.</p> <p>No damage to neck bones</p>	<p>Operator skills – Train operators to improve their skills</p> <p>Animal is struggling at the time of the cut – Review restraining guidance</p> <p>Knife is straight but not sharp, requiring multiple cuts. – Sharpen knife</p> <p>Operator skills –Train operators to improve their skills</p>
Monitor bleeding	Blood flow and pulsating effect of the heart-beat on this flow	In the event of inefficient bleeding being exhibited 30 seconds after neck cutting, birds should be stunned with a suitable method as soon as possible, even if this requires the religious authorities to declare the animal as non-kosher or haram.
Systematic monitoring of signs of consciousness	<p>Twice within 15-25 seconds after cutting</p> <p>Loss of consciousness should begin within 10-15 seconds after neck cutting.</p> <p>There should not be signs of consciousness after 30 seconds</p>	<p>Record the number of animal that do not show all signs of unconsciousness after 30 seconds, and implement corrective measures.</p> <p>In case one or more signs of unconsciousness are missing 30 seconds after neck cutting, birds should be stunned with a suitable back-up method and killed as soon as possible, even if this requires the religious</p>

What should be checked?	What does good look like?	What might go wrong? How can it be fixed?
		authorities to declare the animal as non-kosher or haram.
Time before removing the bird from holding after cutting	Once no signs of consciousness can be detected	Operator training
Time before further work on the bird's carcass	Once the bird has completely bled out and no signs of life can be detected	Operator training

A2.3 On-farm killing

A2.3.1 Equids

A2.3.1.1 Stunning

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Position and direction of the shots Frequency of checks	As described in this document	Incorrect positioning – Review positioning practices Ineffective restraint – Review restraining practices Operator skills and knowledge – Train
Parameters: Charge Length and diameter of the bolt	As indicated in the manufacturer's instructions for the animal's size, weight and age.	Inadequate equipment – change to another size gun Inadequate charge or air pressure – review manufacturer's instructions Equipment malfunction – Maintain/revise/repair the gun
Speed and power of the shot	As indicated in the manufacturer's instructions	Equipment malfunction – Maintain the gun and replace worn washers Overheating – Check the gun is not overheating due to rapid firing Damp or ineffective cartridges – Keep cartridges dry, have spare cartridges available
Effectiveness of stunning – Record the number of horses that have to be stunned more than once	Effectiveness of stunning monitored for each and every animal. No horse should have to be stunned more than	All of the above Immediately re-stun the horse with the back-up stunning method, the appropriate cartridge

once	<p>strength and then reassess the process.</p> <p>If the first shot was in the wrong position, then re-shoot in the correct position.</p> <p>If the first shot was in the right position, then re-shoot 10mm higher and 5mm to the side of the mid line aiming towards the brain. Stunning relies on the percussive force on the skull and if the skull has been damaged by the first shot a second shot in the weakened area may not be effective.</p>
------	---

A2.3.1.2. Verification of stunning

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Check signs of unconsciousness	As listed in document	<p>Ineffective stunning – review stunning equipment, positioning and parameters for the weight and size of the animal, experience/competence of the operator, establish the reason for failure and implement corrective action.</p> <p>Re-stun immediately.</p>
Times at which unconsciousness is verified	Immediately after stunning and before releasing the horse from restraint	<p>If conscious re-stun immediately.</p> <p>If the horse is not unconscious, releasing it could have serious welfare consequences.</p>

A2.3.2 Cattle

A2.3.2.1 Stunning

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Position and direction of the shots	As described in this document	Incorrect positioning – Review positioning practices
Frequency of checks	For depopulation of large number of cattle check 5% of the heads	<p>Ineffective restraint – Review restraining practices</p> <p>Operator skills and knowledge – Train</p>
Parameters:	As indicated in the	Inadequate equipment –

Charge Air pressure Length and diameter of the bolt	manufacturer's instructions for the animal's size, weight and age.	change to another size gun Inadequate charge or air pressure – review manufacturer's instructions Equipment malfunction – Maintain/revise/repair the gun
Speed and power of the shot	As indicated in the manufacturer's instructions	Equipment malfunction – Maintain the gun and replace worn washers Overheating – Check the gun is not overheating due to rapid firing Damp or ineffective cartridges – Keep cartridges dry, have spare cartridges available
Effectiveness of stunning – Record the number of animals that have to be stunned more than once	Effectiveness of stunning monitored for each and every animal. No animal should have to be stunned more than once	All of the above Immediately re-stun the animal using the back-up stunning method with appropriate cartridge strength and then reassess the process. If the first shot was in the wrong position, then re-shoot in the correct position. If the first shot was in the right position, then re-shoot 10mm higher and 5mm to the side of the mid line aiming towards the brain. Stunning relies on the percussive force on the skull and if the skull has been damaged by the first shot a second shot in the weakened area may not be effective.

A2.3.2.2 Verification of stunning

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Check signs of unconsciousness	As listed in document	Ineffective stunning – review stunning equipment, positioning and parameters for the weight and size of the animal, experience/competence of the operator, establish the reason for failure and implement corrective action. Re-stun immediately.

Times at which unconsciousness is verified	Immediately after stunning and before releasing the animal from restraint	If conscious re-stun immediately. If the animal is not unconscious, releasing it could have serious welfare consequences.
--	---	--

A2.3.3 Pigs

A2.3.3.1 Stunning

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Captive bolt stunning: position and direction of the shots Frequency of checks	As described in this document	Incorrect positioning – Review positioning practices Ineffective restraint – Review restraining practices Operator skills and knowledge – Seek advice or training
Captive bolt stunning: parameters: Charge Air pressure Length and diameter of the bolt	As indicated in the manufacturer's instructions for the animal's size, weight and age.	Inadequate equipment – change to another size gun Inadequate charge or air pressure – review manufacturer's instructions Equipment malfunction – Maintain/revise/repair the gun
Captive bolt stunning: speed and power of the shot	As indicated in the manufacturer's instructions	Equipment malfunction – Maintain the gun and replace worn washers Overheating – Check the gun is not overheating due to rapid firing Damp or ineffective cartridges – Keep cartridges dry, have spare cartridges available
Electrical stunning: position of the electrodes	As described in this document	Ineffective restraint – Review restraining practices You did not wait for the unrestrained animal to be in a good position before you applied the electrodes – Wait for right moment to apply the tongs. Incorrect positioning – Review guidance on positioning. The electrodes do not fit the head of the animal – Change equipment. Operator skills and experience – Seek advice and training.
Electrical stunning: Parameters	As described in this document	Inaccurate parameters – Review and correct Equipment malfunction – Revise /

What should you check?	What does good look like?	What might go wrong? How can you fix it?
		repair / maintain equipment. The electrodes are dirty – clean tongs every 20 animals
Percussive blow to the head: force applied	Apply sufficient force to cause concussion.	Hesitation when stunning – Consider using another stunning method, or ask someone to stun the piglets in your stead.
Percussive blow to the head: location of the blow	As described in this document	Blow off target – Review stunning practices; Consider using another stunning method, or ask someone to stun the piglets in your stead
Effectiveness of stunning – Record the number of pigs that have to be stunned more than once	Effectiveness of stunning monitored for each and every animal. No animal should have to be stunned more than once Positive signs of unconsciousness (see “Verifying stunning” section)	All of the above Immediately re-stun the animal and then reassess the process. For head stun: re-stun using the back-up method For captive bolt: If the first shot was in the wrong position, then re-shoot in the correct position. If the first shot was in the right position, then re-shoot 3 cm to the side of the mid line aiming towards the brain. Stunning relies on the percussive force on the skull and if the skull has been damaged by the first shot a second shot in the weakened area may not be effective.

A2.3.3.2 Verification of stunning

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Check signs of unconsciousness	As listed in document	Ineffective stunning – review stunning equipment, positioning and parameters for the weight and size of the animal, experience/competence of the operator, establish the reason for failure and implement corrective action. Re-stun immediately.
Times at which unconsciousness is verified	Immediately after stunning and before releasing the animal from restraint	If the animal is conscious re-stun immediately. If conscious, releasing it could have serious welfare consequences

A2.3.4 Sheep and goats

A2.3.4.1 Stunning

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Position of the electrodes	As described in this document	<p>Ineffective restraint (e.g. agitated goat) – Review restraining practices</p> <p>You did not wait for the unrestrained animal to be in a good position before you applied the electrodes – Wait for right moment to apply the tongs.</p> <p>Incorrect positioning (e.g. due to the presence of the horns) – Review guidance on positioning.</p> <p>The electrodes do not fit the head of the animal – Change equipment.</p> <p>Operator skills and experience – Seek advice and training.</p>
Parameters of the electrical stun	As described in this document	<p>Inaccurate parameters – Review and correct</p> <p>Equipment malfunction – Revise / repair / maintain equipment.</p>
Effectiveness of stunning – Record the number of sheep or goats that have to be stunned more than once	<p>Effectiveness of stunning monitored for each and every animal.</p> <p>No animal should have to be stunned more than once</p>	<p>All of the above</p> <p>For sheep with woolly heads: you used electrodes without pins or with dry pins – change equipment</p> <p>The presence of wool slows or stops current flow – Clip wool and/or wet the animal's wool under the tongs.</p> <p>Re-stun with back-up stunning method</p>

A2.3.4.2 Verification of stunning

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Check signs of unconsciousness	As listed in document	<p>Ineffective stunning – review stunning equipment, positioning and parameters for the weight and size of the animal, experience/competence of the operator, establish the reason for failure and</p>

What should you check?	What does good look like?	What might go wrong? How can you fix it?
		implement corrective action. Re-stun immediately with back-up method.
Times at which unconsciousness is verified	Immediately after stunning and before releasing the animal from restraint (if restrained)	If the animal is conscious re-stun immediately. If conscious, releasing it could have serious welfare consequences

A2.3.5 Poultry (chicken, turkeys, geese, ducks)

A2.3.5.1 Restraining methods

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Bird behaviour	The bird is not struggling or flapping its wings, no pecking attempts and no vocalisation.	Stressed bird – Review handling practices Bird discomfort – Review restraining practices Ineffective restraint – Review restraining practices Skills – Train operators to improve their skills

A2.3.5.2 All stunning methods

What should you check?	What does good look like?	What might go wrong? How can you fix it?
For captive bolt stunning: position and direction of the shots	As described in this document	Incorrect positioning – Review positioning practices Ineffective restraint – Review restraining practices
For captive bolt stunning: monitor the speed of the bolt	The speed of the shot should be as indicated in the manufacturer's instructions	Equipment malfunction – Revise / repair / maintain.
For electrical stunning: position of the electrodes	As described in this document	Ineffective restraint – Review restraining practices Incorrect positioning – Review guidance on positioning. The electrodes do not fit the head of the bird –

What should you check?	What does good look like?	What might go wrong? How can you fix it?
		Change equipment.
For electrical stunning: parameters of the electrical stun	As described in this document	Inaccurate parameters – Review and correct Equipment malfunction – Revise / repair / maintain equipment. The presence of dirt (on tongs or bird’s head) slows or stops current flow – Clean tongs; wet the birds head with a sponge.
For percussive blow to the head and cervical dislocation: force applied	Apply sufficient force to cause concussion or neck dislocation.	Hesitation when stunning – Consider using another stunning method, or ask someone to stun the birds in your stead.
For percussive blow to the head: location of the blow	As described in this document	Blow off target – Review stunning practices; Consider using another stunning method, or ask someone to stun the birds in your stead
Effectiveness of stunning – Record the number of birds that have to be stunned more than once	Effectiveness of stunning monitored for each and every animal. No animal should have to be stunned more than once	All of the above For captive bolt: cartridges sometimes fail and may have to be replaced. Because the stunner has not fired the bird is not suffering. Re-stun immediately with back-up method.

A2.3.5.3 Verification of stunning

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Check signs of unconsciousness	As listed in document	Ineffective stunning – review stunning equipment, positioning and parameters for the weight and size of the animal Re-stun immediately with back-up method.
Times at which unconsciousness is verified	Immediately after stunning and before releasing the bird from restraint	If the bird is not unconscious, releasing it could have serious welfare consequences. Confirm unconsciousness.

A2.3.6 Rabbits

A2.3.6.1 All stunning methods

What should you check?	What does good look like?	What might go wrong? How can you fix it?
For captive bolt stunning: position and direction of the shots	As described in this document	<p>Incorrect positioning – Review positioning practices</p> <p>Ineffective restraint – Review restraining practices</p> <p>The muzzle of the stunner may have shifted because the skin is loosely attached to the skull.</p>
For captive bolt stunning: monitor the speed of the bolt	The speed of the shot should be as indicated in the manufacturer's instructions	Equipment malfunction – Revise / repair / maintain.
For electrical stunning: position of the electrodes	As described in this document	<p>Ineffective restraint – Review restraining practices</p> <p>Incorrect positioning – Review guidance on positioning.</p> <p>The electrodes do not fit the head of the rabbit – Change equipment.</p>
For electrical stunning: parameters of the electrical stun	As described in this document	<p>Inaccurate parameters – Review and correct</p> <p>Equipment malfunction – Revise / repair / maintain equipment.</p> <p>The presence of dirt (on tongs or rabbit's head) slows or stops current flow – Clean tongs; wet the rabbit's head with a sponge.</p>
For percussive blow to the head: force applied	Apply sufficient force to cause concussion or neck dislocation.	Hesitation when stunning – Consider using another stunning method, or ask someone to stun the rabbits in your stead.
For percussive blow to the head: location of the blow	As described in this document	Blow off target – Review stunning practices; Consider using another stunning method, or ask someone to stun the rabbits in your stead
Effectiveness of stunning – Record the number of rabbits that have to be stunned more than once (except for spring-loaded stunners which are	<p>Effectiveness of stunning monitored for each and every animal.</p> <p>No rabbit should have to be stunned more than once.</p>	<p>All of the above</p> <p>For captive bolt: cartridges sometimes fail and may have to be replaced. Because the stunner has not fired the rabbit is not suffering.</p>

What should you check?	What does good look like?	What might go wrong? How can you fix it?
routinely shot twice).		<p>For electrical stun: the rabbit's fur may prevent a good flow of the current. Wet the fur with a sponge.</p> <p>Re-stun immediately using the back-up method.</p>

A2.3.6.2 Verification of stunning

What should you check?	What does good look like?	What might go wrong? How can you fix it?
Check signs of unconsciousness	As listed in document	<p>Ineffective stunning – review stunning equipment, positioning and parameters for the weight and size of the animal, establish the reason for failure and implement corrective action.</p> <p>Re-stun immediately using the back-up method.</p>
Times at which unconsciousness is verified	Immediately after stunning and before releasing the rabbit from restraint	If the rabbit is not unconscious, releasing it could have serious welfare consequences. Confirm unconsciousness.

Annex 3 Assessment of the drafts through closed questions – detailed results

This annex provides a detailed overview of stakeholders' feedback on the draft consultation documents, with a focus on responses to closed questions.

A3.1 Slaughterhouse operations

A3.1.1 Equids and cattle

Respondents tended to agree that the content of this draft section represented a complete and accurate description of good practices. There was some disagreement, however, on the accuracy of text and images.

Table A3.1 Responses to closed questions on the Slaughterhouse Operations – Equids and Cattle draft

Question	Yes	No
<i>Layout, Construction and Equipment</i>		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	5	14
Do the text and images (if any) in this section provide an accurate description of the good practices?	13	5
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	14	4
Is there information in this section that is not necessary or makes the section more complicated than it could be?	4	15
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	13	6
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	14	5
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	15	4
<i>Handling and Restraining</i>		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	3	17
Do the text and images (if any) in this section provide an accurate description of the good practices?	12	8
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	13	7
Is there information in this section that is not necessary or makes the section more complicated than it could be?	4	16
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	13	7
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	14	6
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	19	1

<i>Stunning</i>		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	5	15
Do the text and images (if any) in this section provide an accurate description of the good practices?	16	4
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	16	4
Is there information in this section that is not necessary or makes the section more complicated than it could be?	0	20
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	18	1
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	17	3
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	17	3
<i>Monitoring</i>		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	3	16
Do the text and images (if any) in this section provide an accurate description of the good practices?	15	5
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	16	4
Is there information in this section that is not necessary or makes the section more complicated than it could be?	0	20
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	17	3
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	16	4
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	17	2

A3.1.2 Pigs

Respondents' views were particularly positive for all sections of this draft consultation document.

Table A3.2 Responses to closed questions on the Slaughterhouse Operations – Pigs draft

Question	Yes	No
<i>Layout, Construction and Equipment</i>		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	4	12
Do the text and images (if any) in this section provide an accurate	11	5

<i>description of the good practices?</i>		
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	13	3
Is there information in this section that is not necessary or makes the section more complicated than it could be?	1	15
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	13	3
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	15	1
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	14	2
<i>Handling and Restraining</i>		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	3	11
Do the text and images (if any) in this section provide an accurate description of the good practices?	10	6
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	13	3
Is there information in this section that is not necessary or makes the section more complicated than it could be?	1	15
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	13	1
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	14	2
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	14	2
<i>Stunning</i>		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	2	14
Do the text and images (if any) in this section provide an accurate description of the good practices?	13	3
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	12	4
Is there information in this section that is not necessary or makes the section more complicated than it could be?	2	13
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	15	1
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	14	2
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	15	1
<i>Monitoring</i>		
Are you aware of any additional existing good practice (either national or	4	11

sectoral good practices, or voluntary standards) that may be included in this section?		
Do the text and images (if any) in this section provide an accurate description of the good practices?	11	5
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	13	3
Is there information in this section that is not necessary or makes the section more complicated than it could be?	1	15
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	15	1
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	13	3
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	12	1

A3.1.3 Sheep and goats

Respondents expressed positive feedback on all aspects of this draft document.

Table A3.3 Responses to closed questions on the Slaughterhouse Operations – Sheep and Goats draft

Question	Yes	No
Layout, Construction and Equipment		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	3	10
Do the text and images (if any) in this section provide an accurate description of the good practices?	10	3
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	10	2
Is there information in this section that is not necessary or makes the section more complicated than it could be?	2	11
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	12	1
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	11	2
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	11	2
Handling and Restraining		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	2	11
Do the text and images (if any) in this section provide an accurate description of the good practices?	11	2
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	10	2

Is there information in this section that is not necessary or makes the section more complicated than it could be?	1	12
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	12	1
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	12	1
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	12	1
Stunning		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	2	11
Do the text and images (if any) in this section provide an accurate description of the good practices?	11	2
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	10	2
Is there information in this section that is not necessary or makes the section more complicated than it could be?	0	13
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	13	0
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	12	1
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	13	0
Monitoring		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	2	11
Do the text and images (if any) in this section provide an accurate description of the good practices?	9	4
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	12	1
Is there information in this section that is not necessary or makes the section more complicated than it could be?	0	13
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	11	1
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	11	2
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	12	1

A3.1. 4 Poultry (chicken and turkeys)

Views on this element were overall positive, with some disagreement on the fact that text on handling and restraining of poultry accurately reflected existing good practice.

Table A3.4 Responses to closed questions on the Slaughterhouse Operations – Chicken and Turkeys draft

Question	Yes	No
Layout, Construction and Equipment		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	5	16
Do the text and images (if any) in this section provide an accurate description of the good practices?	15	7
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	18	3
Is there information in this section that is not necessary or makes the section more complicated than it could be?	5	17
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	15	5
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	18	4
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	17	4
Handling and Restraining		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	4	14
Do the text and images (if any) in this section provide an accurate description of the good practices?	12	7
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	14	4
Is there information in this section that is not necessary or makes the section more complicated than it could be?	4	15
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	18	1
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	14	5
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	13	6
Stunning		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	4	14
Do the text and images (if any) in this section provide an accurate	14	4

description of the good practices?		
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	14	4
Is there information in this section that is not necessary or makes the section more complicated than it could be?	1	17
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	16	2
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	13	5
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	14	3
Monitoring		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	5	13
Do the text and images (if any) in this section provide an accurate description of the good practices?	14	4
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	12	6
Is there information in this section that is not necessary or makes the section more complicated than it could be?	0	17
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	14	3
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	12	5
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	14	4

A3.2 Slaughter without stunning

The data on responses to the consultation for the slaughter without stunning drafts has been disaggregated by stakeholder group. That is because this set of drafts in particular was the object of significant variations between the consultees and disagreements on the drafts.

A3.2.1 Cattle

Consultees had negative views on different elements of this consultation document, including the level of detail and completeness of the information presented. There were mixed views also about the qualification of practices, and particularly for those regarding mechanical restraining and post-cut stunning. Negative views were often expressed by religious organisations.

Table A3.5 Responses to closed questions on the Slaughter without Stunning of Cattle draft

Question	Total		NCP		Animal welfare organisations		Equipment manufacturer		Industry		Official veterinarians		Religious organisations		Scientific support and experts	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Basic Rules																
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	16	7	7	0	3	2	0	0	0	0	2	0	1	4	3	1
Mechanical Restraining																
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	8	9	1	4	1	2	0	1	0	0	0	1	4	0	2	1
Do the text and images (if any) in this section provide an accurate description of the good practices?	10	7	4	1	2	1	1	0	0	0	1	0	0	4	2	1
Is there enough information in this section for end users to understand	10	7	4	1	2	1	1	0	0	0	1	0	1	3	1	2

Preparation of best practices on the protection of animals at the time of killing

what the good practices consist of and to actually implement them?																
Is there information in this section that is not necessary or makes the section more complicated than it could be?	7	9	2	3	0	2	0	1	0	0	0	1	3	1	2	1
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	9	7	3	2	2	1	1	0	0	0	1	0	0	3	2	1
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	8	8	2	2	2	1	1	0	0	0	1	0	0	4	2	1
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	7	9	4	1	0	3	0	1	0	0	1	0	1	2	1	2
Pre-cut stunning																
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	8	9	1	4	1	2	0	1	0	0	0	1	4	0	2	1
Do the text and images (if any) in this section provide an accurate description of the good practices?	9	8	4	1	2	1	1	0	0	0	1	0	0	4	1	2
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	7	10	3	2	2	1	1	0	0	0	1	0	0	4	0	3

Preparation of best practices on the protection of animals at the time of killing

Is there information in this section that is not necessary or makes the section more complicated than it could be?	5	12	0	5	1	2	0	1	0	0	0	1	3	1	1	2
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	8	6	3	2	2	1	0	0	0	0	1	0	1	2	1	1
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	9	8	4	1	2	1	1	0	0	0	1	1	0	4	1	1
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	5	11	3	2	0	3	1	0	0	0	1	0	0	3	0	3
Bleeding																
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	7	8	0	3	1	2	0	1	0	0	0	1	3	1	3	0
Do the text and images (if any) in this section provide an accurate description of the good practices?	8	8	3	1	2	1	1	0	0	0	1	0	0	4	1	2
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	9	7	3	1	2	1	1	0	0	0	1	0	0	4	2	1
Is there information in this section that is not necessary or makes the	6	10	1	3	2	1	0	1	0	0	0	1	3	1	0	3

Preparation of best practices on the protection of animals at the time of killing

section more complicated than it could be?																
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	10	5	4	0	2	1	1	0	0	0	1	0	0	3	2	1
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	8	8	3	1	1	2	1	0	0	0	1	0	0	4	2	1
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	7	6	2	1	1	2	1	0	0	0	1	0	0	2	2	1
Post-cut stunning																
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	9	8	3	2	1	2	0	1	0	0	0	1	3	1	2	1
Do the text and images (if any) in this section provide an accurate description of the good practices?	6	10	3	2	2	1	0	1	0	0	1	0	0	4	0	2
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	6	10	1	4	2	1	1	0	0	0	1	0	0	4	1	1
Is there information in this section that is not necessary or makes the section more complicated than it could be?	3	13	0	5	0	3	0	1	0	0	0	1	3	1	0	2

Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	5	7	2	2	2	1	0	0	0	0	1	0	0	2	0	2
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	9	7	4	1	2	1	1	0	0	0	1	0	0	4	1	1
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	10	4	5	0	1	2	1	0	0	0	1	0	0	2	2	0

A3.2.2 Sheep and goats

This consultation draft was also object of disagreement. Mixed views concerned aspects of the consultation drafts, with the exception of the level of detail provided, which generally received positive feedback.

Table A3.6 Responses to closed questions on the Slaughter without Stunning of Sheep and Goats draft

Question	Total		NCP		Animal welfare organisations		Equipment manufacturer		Industry		Official veterinarians		Religious organisations		Scientific support and experts	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Basic Rules																
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	9	6	3	0	1	2	0	0	0	0	1	0	1	3	3	1
Mechanical Restraining																
Are you aware of any additional existing good practice (either	7	7	0	4	1	1	0	0	0	0	0	1	4	0	2	1

national or sectoral good practices, or voluntary standards) that may be included in this section?																
Do the text and images (if any) in this section provide an accurate description of the good practices?	8	8	3	2	2	0	0	0	0	0	1	0	1	3	1	3
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	8	8	4	1	2	0	0	0	0	0	0	1	1	3	1	3
Is there information in this section that is not necessary or makes the section more complicated than it could be?	5	10	1	3	0	2	0	0	0	0	0	1	3	1	1	3
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	9	4	3	0	2	0	0	0	0	0	1	0	1	2	2	2
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	8	8	4	1	2	0	0	0	0	0	1	0	0	4	1	3
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	8	6	4	1	1	1	0	0	0	0	1	0	1	1	1	3
Bleeding operations																
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may	6	9	1	3	0	2	0	0	0	0	0	1	3	1	2	2

be included in this section?																
Do the text and images (if any) in this section provide an accurate description of the good practices?	8	7	3	1	2	0	0	0	0	0	1	0	1	3	1	3
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	6	8	3	1	2	0	0	0	0	0	1	0	0	4	0	3
Is there information in this section that is not necessary or makes the section more complicated than it could be?	6	9	1	3	1	1	0	0	0	0	0	1	3	1	1	3
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	10	3	4	0	1	0	0	0	0	0	1	0	1	2	3	1
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	7	8	4	1	2	0	0	0	0	0	1	0	0	4	0	3
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	9	3	4	0	1	1	0	0	0	0	1	0	0	2	3	0

A3.2.3 Poultry (chicken and turkeys)

As on other sections on ritual slaughter, consultees also expressed mixed views on the poultry document. Disagreement mainly concerned practices for mechanical restraining, pre-cut and post-cut stunning.

Table A3.7 Responses to closed questions on the Slaughter without Stunning of Poultry draft

Question	Total		NCP		Animal welfare organisations		Equipment manufacturer		Industry		Official veterinarians		Religious organisations		Scientific support and exports		
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
Basic Rules																	
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	10	4	5	0	1	1	0	0	1	0	0	0	2	3	1	0	
Electrical waterbath																	
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	5	8	2	4	0	2	0	0	0	0	0	0	3	1	0	1	
Do the text and images (if any) in this section provide an accurate description of the good practices?	7	5	3	2	2	0	0	0	0	0	0	0	1	3	1	0	
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	6	5	4	1	2	0	0	0	0	0	0	0	0	3	0	1	
Is there information in this section that is not necessary or makes the section more complicated than it could be?	5	7	2	3	0	2	0	0	0	0	0	0	3	1	0	1	

Preparation of best practices on the protection of animals at the time of killing

Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	7	3	4	1	2	0	0	0	0	0	0	0	0	2	1	0	
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	7	5	4	1	2	0	0	0	0	0	0	0	0	4	1	0	
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	5	5	4	1	1	1	0	0	0	0	0	0	0	2	0	1	
Manual bleeding operations																	
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	5	7	1	4	0	2	0	0	0	0	0	0	0	3	1	1	0
Do the text and images (if any) in this section provide an accurate description of the good practices?	6	6	3	2	2	0	0	0	0	0	0	0	0	4	1	0	
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	7	5	4	1	2	0	0	0	0	0	0	0	0	4	1	0	
Is there information in this section that is not necessary or makes the section more	3	9	0	5	0	2	0	0	0	0	0	0	3	1	0	1	

Preparation of best practices on the protection of animals at the time of killing

complicated than it could be?																
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	7	4	4	1	2	0	0	0	0	0	0	0	0	3	1	0
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	7	5	4	1	2	0	0	0	0	0	0	0	0	4	1	0
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	6	4	3	1	2	0	0	0	0	0	0	0	0	3	1	0

A3.3 On-Farm Killing

A3.3.1 Horses

Respondents provided positive feedback on all elements of this section, with the exception of mixed views about the possibility for operators to easily interpret and adopt stunning practices.

Table A3.8 Responses to closed questions on the On Farm Killing of Horses draft

Question	Yes	No
Basic Rules		
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	7	2
Handling and Restraining		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	1	7
Do the text and images (if any) in this section provide an accurate description of the good practices?	8	2
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	7	3
Is there information in this section that is not necessary or makes the section more complicated than it could be?	0	10
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	10	0
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	8	2
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	8	1
Stunning		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	3	8
Do the text and images (if any) in this section provide an accurate description of the good practices?	7	3
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	6	4
Is there information in this section that is not necessary or makes the section more complicated than it could be?	0	10
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	8	1
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	6	4
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	9	1
Verifying that stunning has worked		
Are you aware of any additional existing good practice (either national or	1	8

sectoral good practices, or voluntary standards) that may be included in this section?		
Do the text and images (if any) in this section provide an accurate description of the good practices?	8	2
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	8	1
Is there information in this section that is not necessary or makes the section more complicated than it could be?	0	9
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	9	1

A3.3.2 Cattle

All aspects of this guidance generally received positive feedback. There was only disagreement on the section describing basic rules for on-farm killing.

Table A3.9 Responses to closed questions on the On Farm Killing of Cattle draft

Question	Yes	No
Basic Rules		
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	16	15
Handling and Restraining		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	5	22
Do the text and images (if any) in this section provide an accurate description of the good practices?	21	7
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	19	8
Is there information in this section that is not necessary or makes the section more complicated than it could be?	6	21
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	25	2
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	19	8
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	16	10
Stunning		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	6	18
Do the text and images (if any) in this section provide an accurate description of the good practices?	20	3
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	15	7
Is there information in this section that is not necessary or makes the section more complicated than it could be?	4	18

Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	19	4
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	16	7
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	21	1
Verifying that stunning has worked		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	3	19
Do the text and images (if any) in this section provide an accurate description of the good practices?	19	3
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	16	7
Is there information in this section that is not necessary or makes the section more complicated than it could be?	2	20
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	18	4

A3.3.3 Pigs

There were mixed views about some elements of this document, including the qualification of the practices described and accuracy of text and images. Other aspects received positive feedback.

Table A3.10 Responses to closed questions on the On Farm Killing of Horses draft

Question	Yes	No
Basic Rules		
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	17	7
Handling and Restraining		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	4	17
Do the text and images (if any) in this section provide an accurate description of the good practices?	11	10
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	17	5
Is there information in this section that is not necessary or makes the section more complicated than it could be?	1	21
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	19	3
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	17	4
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	12	11
Stunning		

Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	8	12
Do the text and images (if any) in this section provide an accurate description of the good practices?	13	6
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	13	6
Is there information in this section that is not necessary or makes the section more complicated than it could be?	5	15
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	15	5
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	13	7
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	12	8
Verifying that stunning has worked		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	5	14
Do the text and images (if any) in this section provide an accurate description of the good practices?	11	9
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	12	7
Is there information in this section that is not necessary or makes the section more complicated than it could be?	1	19
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	16	4

A3.3.4 Sheep and goats

Feedback on basic rules was mixed, and consulted indicated that additional guidance is available on stunning of sheep and goat. Other aspects of this document tended to be rated positively.

Table A3.11 Responses to closed questions on the On Farm Killing of Sheep and goats draft

Question	Yes	No
Basic Rules		
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	7	5
Handling and Restraining		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	3	8
Do the text and images (if any) in this section provide an accurate description of the good practices?	7	4
Is there enough information in this section for end users to understand	7	4

what the good practices consist of and to actually implement them?		
Is there information in this section that is not necessary or makes the section more complicated than it could be?	2	9
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	11	0
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	8	3
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	10	1
Stunning		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	6	6
Do the text and images (if any) in this section provide an accurate description of the good practices?	7	4
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	7	4
Is there information in this section that is not necessary or makes the section more complicated than it could be?	3	8
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	9	2
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	7	3
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	7	4
Verifying that stunning has worked		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	3	7
Do the text and images (if any) in this section provide an accurate description of the good practices?	8	3
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	8	3
Is there information in this section that is not necessary or makes the section more complicated than it could be?	1	10
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	7	4

A3.3.5 Rabbits

This document generally received positive feedback, and particularly on the aspect of completeness: for example, only one respondent indicated the existence of additional good practice, beyond the documents reviewed for this study. However, there were mixed views on the fact that the text and images accurately reflected stunning practices.

Table A3.12 Responses to closed questions on the On Farm Killing of Rabbits draft

Question	Yes	No
-----------------	------------	-----------

Basic Rules		
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	7	3
Handling and Restraining		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	0	9
Do the text and images (if any) in this section provide an accurate description of the good practices?	9	1
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	9	1
Is there information in this section that is not necessary or makes the section more complicated than it could be?	0	10
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	10	0
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	9	1
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	10	1
Stunning		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	1	8
Do the text and images (if any) in this section provide an accurate description of the good practices?	4	5
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	9	1
Is there information in this section that is not necessary or makes the section more complicated than it could be?	2	8
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	10	0
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	8	2
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	8	2
Verifying that stunning has worked		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	0	9
Do the text and images (if any) in this section provide an accurate description of the good practices?	7	3
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	9	1
Is there information in this section that is not necessary or makes the section more complicated than it could be?	0	10

Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	9	1
--	---	---

A3.3.6 Poultry (chickens, turkeys, ducks and geese)

Respondents generally agreed that this document is complete and accurate. The main contentious aspects were those related to the qualification of the practices described.

Table A3.13 Responses to closed questions on the On Farm Killing of Poultry draft

Question	Yes	No
Basic Rules		
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	14	6
Handling and Restraining		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	5	14
Do the text and images (if any) in this section provide an accurate description of the good practices?	12	8
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	16	4
Is there information in this section that is not necessary or makes the section more complicated than it could be?	3	16
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	12	7
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	16	3
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	12	9
Stunning		
Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	7	11
Do the text and images (if any) in this section provide an accurate description of the good practices?	10	8
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	12	6
Is there information in this section that is not necessary or makes the section more complicated than it could be?	4	14
Is the level of detail in this section adequate, distinguishing between different species or categories of animals?	13	6
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	12	6
Do you agree with the way practices have been qualified in this section ("Unacceptable", "Acceptable", "Good", "Best")?	11	8
Verifying that stunning has worked		

Are you aware of any additional existing good practice (either national or sectoral good practices, or voluntary standards) that may be included in this section?	3	15
Do the text and images (if any) in this section provide an accurate description of the good practices?	15	4
Is there enough information in this section for end users to understand what the good practices consist of and to actually implement them?	14	3
Is there information in this section that is not necessary or makes the section more complicated than it could be?	2	17
Is this section fit to be shared and interpreted by those doing the job (business operators, animal welfare officers)?	15	4

Annex 4 Substantive comments received – detailed results

This annex lists the substantive comments received on the different consultation drafts, and summarises how comments have been addressed.

A4.1 Comments on the consultation drafts

A4.1.1 Slaughterhouse operations

Table A4.1 Equids and cattle

Comments	ICF Response
Code of Welfare: Commercial Slaughter 2016 https://www.mpi.govt.nz/protection-and-response/animal-welfare/codes-of-welfare/ (This link will direct you to all codes of welfare referred to throughout this submission) Code of Welfare: Horses and Donkeys Code of Welfare: Sheep and Beef Cattle	These are not guides / voluntary standards in use in European countries.
Control procedure for lighting could include emergency lighting facility in case of power failure.	We have edited the text to add mention of emergency lighting in case of power failure, in the relevant section - not in the control procedure.
You cannot Transport horses or cattle by a conveyor belt, you cannot fix head/neck of horses for captive bolt ... These Guidelines includes big mistakes!	HSA mentions that conveyor belt systems are used for cattle and the draft does not say that it applies to horses. The text makes clear that chin-lift / head yoke / neck yoke do not work with horses.
Preventing Slips and Falls by Managing Concrete Floors - RVC, EBLEX & HSA. Accessible on the following link: https://www.hsa.org.uk/shop/publications-1/product/prevent-slips-and-falls-by-managing-concrete-floors . Cattle Handling in Abattoirs and Markets - Cambac JMA Research, MLC & HSA. Accessible on the following link: https://www.hsa.org.uk/shop/publications-1/product/cattle-handling-in-abattoirs-and-markets .	The first of these sources was reviewed; the second was not. An email was sent to the consultee (Charlie Mason from the HSA) asking for specific information on what good practice they would add from that second document that is not there already. Consultee responded stating that there was no specific information, but that the reference was generally useful.
In Noise Limitation: It is worth include some examples like the Air compressor that normally stay outside close to the single race once it is used for the captive bolt stunner or for the the restraint chute. There is also noises from the air curtain normally because there is not an ideal maintenance. * It	Examples added. Feeding intervals for cattle and horses on farm are laid

Comments	ICF Response
<p>would be important to specify the maximum time of fasting period. The document says: "Existing good practices vary depending on whether cattle and horses stay for more than 3 6, or 12 hours in the lairage." But it will be important to consider the fastin time on farm and also how long it take to arrive at the slaughterhouse.</p>	<p>down by EU legislation on welfare on farm (Directive 98/58 (cattle and Horses) and by Council Directive 2008/119/EC) (Calves) and also Regulation EC 1/2005 on transport which specifies journey times , maximum feeding and resting intervals . Regulation 1099/ 2009 requires that all animals in lairage which have not been slaughtered within 12 hours of their arrival shall be fed, and subsequently given moderate amounts of food at appropriate intervals. Thereby provision is made of maximum intervals between feeding for animals moving from farm to slaughter.</p>
<p>More detailed photographs should be included</p>	<p>Noted</p>
<p>As a general comments across the document - we dont tend to specify things such as corridor side height and stocking desnity, but instead provide an outcome which must be met e.g. contained securely and safely with no risk of injury. able to stand up, turn round, lie down and move around in a natural posture etc. Lighting level of 200 lux etc. - just needs to be sufficient to allow inspection of animals day and night as referred to under 'facilitation of inspections and response to emergency'? In the dairy code of welfare we refer to 20-50 lux allowing inspection af animals kept indoors, and it not being so intense as to cause discomfort to the animals. 200 seems high? Recommend maximum slope of ramps not exceeding 20 degrees for all animals except bobbycalves where it should not exceed 12 degrees. Confirm if layout 1 or 2 is preferable for the layout for individual pens. Appears to describe 2 as preferable but names 1.</p> <p>Query the suitability of penning calves less than 8 weeks individually? In NZ this is not done. Control procedure section - Falls: Good should be no animals falling, not agitated animals falling? Unclear how percentages have been determined for 'good' for this section. This comment stands for the entire document. For stocking density the slaughter code of welfare requires that where animals are kept for more than 4 hours, they must be allowed to move freely, stand up and lie down. Tend to be outcome focussed</p>	<p>Noted that general perspective from NZ is towards less prescriptive and outcome-based GPs.</p> <p>Target / prescriptive values have been moved in brackets as examples provided in some guides.</p> <p>When in doubt of their actual use in commercial operations those target values have been removed from the final document, as well as accompanying qualifiers.</p>

Comments	ICF Response
<p>rather than prescriptive. 'Restraint equipment and facilities' - would advise using an outcome description e.g. animals must be presented for stunning in a manner that allows effective stunning / the restraining device must be designed and used in a way that avoids excessive stress to the animal. Our commercial slaughter code of welfare states that cattle, deer and equines must be individually restrained in appropriately designed stunning pens or conveyors. Unclear where the percentages are from when describing a good control procedure.</p>	
<p>Details have to be addressed to the species/category of animals</p>	<p>Noted – In the interest of being more concise information valid across species has been consolidated, while keeping information specific to certain species clearly identified as such and separate.</p>
<p>Important that drinker system is familiar to the animals, open source therefore more safe than nipple. 30 degrees too high! Alternative densities suggested for adult bovine OK, too small for horses and calves</p>	<p>Further information on specific good practices on densities that are in use in EU slaughterhouses has not been obtained.</p>
<p>* It is not clear in the text and images the difference between Crowd Pen and Curve raceway. * The image of the Crowd Pen is not the best one considering that just before the single race, it is necessary to have a wall align with the single race to avoid that two animals feel motivated to enter in the single race at the same time. If necessary I can send some images that are more align with the design of Dr. Temple Grandin. * We need to be careful when talk about individual waiting pens. Depends on the breed, the animal might have aggressive behaviour and can injure itself. It will also be important to determine how long time should be maximum. Depending the country, can take 20hours waiting to be slaughtered plus transport period. * when it says: "For cows, beef steers and heifers and veal calves the sides of the pens should be 1.80m, with a solid section up until 1.20m and horizontal bars above." - It depends where you are. In hot and warm countries, we would not recommend solid sides (walls) because it will block the natural ventilation. Bars with right size gaps it is much better. It will also facilitate the handling for handlers.</p>	<p>Text and figure of crowd pen edited. Curved raceway figure removed.</p> <p>Text on waiting pens edited to reflect the comments from the consultee.</p>
<p>*In some points the text mention pigs. Is that right? Should not be just cattle</p>	<p>Text has been edited to ensure no wrong references to</p>

Comments	ICF Response
and horses?	other species.
When referring to backstop gates - need to make mention of needing to position and operate them in such a way that they do not trap, injure, or put undue pressure on the animals. Comment applies throughout. When referring to slopes, advise emphasising the point that the design and slope of ramps must be such as to minimise animals skidding or becoming distressed or injured. Comment applies throughout.	We have edited the text reflecting these comments.
Not for horses [3]	<p>Emails sent to consultees requesting additional information and sources for good practices applying to horses on these issues of layout, construction and equipment. Response from Michael Maharens: "unfortunately I don't have any useful sources about stunning boxes or any fixation devices for horses, since only few horses were slaughtered in Germany." Response from Antonio Velarde: "Unfortunately, I am not aware of any document of good practices for horses."</p> <p>The text has been marked clearly when not relevant for horses.</p>
Slope: 'Recommendations on maximum slope inclination vary, from a maximum of 10° in which conditions is this max recommended?	We have edited the text to state clearly that the document lists existing good practices from national / sectoral guides and voluntary standards.
Curved raceway: 'This design relies on the natural behaviour' one sentence explaining the natural behaviour might be helpful.	We have edited the text based on details from Temple Grandin's website.
We recommend adding reference to : stunning equipment; maintenance equipment; back up stunning equipment; training; documentation on assessment of insensibility; return to sensibility; description of tasks; monitoring; verification; self-audits; operators' written animal welfare program.	This information is relevant to the SOP section, rather than Cattle & Horses.
We recommend the title indicates the species concerned (horses, cattle and pigs)	This comment is unclear.

Comments	ICF Response
Flooring must be non-slip, easily cleanable and kept clean [not should]	We have edited the text to reflect this.
Flooring must be even as much as possible [not should]	We have edited the text to reflect this.
We recommend adding «...and slip or fall». [to 'Water reflects light and can cause animals to balk.']	We have edited the text to reflect this.
We recommend adding «and smooth». [to 'you may use solid and opaque sides']	We have edited the text to reflect this.
We recommend adding for all species (horses and pigs included) [to 'You may use slightly curved passageways...']	We have edited the text to reflect this.
We recommend adding «and equipment». [to 'Noise in lairages can be due to vocalisation of animals and people']	We have edited the text to reflect this.
Addition of 'like most animals' to 'Cattle and horses dislike bright lights.'	We have edited the text to reflect this.
We recommend specifying there must be a segregation for stallions.	We have edited the text to reflect this.
We find the information too prescriptive: they may not fit well for all species/breed. This [generic size pen] does not seem large enough for a bovine or a horse?	We have edited the text including: "some national guides recommend the following sizes for pens. However bigger pens may be preferable depending on the size of the animal."
We recommend changing «most animals» to «all animals». [sufficient drinkers should be available to allow most of the animals to drink on entering the pen]	We have edited the text to reflect this.
We recommend changing to « water must be available at all times». ['You should provide water in buckets to animals if they stay in that area for more than 30 minutes'] We recommend adding «the number of animals» to the list. ['Water supply system in pens should take account of:']	We have edited the text to reflect this.
For first Control Procedure table: (1) We recommend the table to indicate set criteria and limits for monitoring those criteria. Please refer to the Meat Hygiene Manual of Procedures, Chapter 12, Annex C :	The control procedure has been edited to reflect known practices in a European context.

Comments	ICF Response
<p>http://www.inspection.gc.ca/aliments/produits-de-viande-et-de-volaille/manuel-des-methodes/chapitre-12/annexe-c/fra/1390408218933/1390408220183 (2) 'monitored' instead of 'checked' (3) We recommend the table to indicate wilful acts of abuse, vocalization and prod use. (4) Slips should be noted (5) Agitated animals should not fall and this should not be tolerated. (6) We suggest a maximum of 1% [for all instances of animals falling] (7) We recommend access to water at all times. (8) We recommend adding the water must not be frozen.</p>	
<p>'You must ensure the frequent maintenance of equipment and facilities following supplier instructions and manuals.' [not should]</p>	<p>We have edited the text to reflect this.</p>
<p>We recommend the document to indicate pens for segregation of animals must be available when needed.</p>	<p>We have edited the text to reflect this.</p>
<p>We recommend the document to specify animals must not be in conveyors and stunning box during shot down periods/breaks. We recommend specifying the conveyor system must not be used for horses.</p>	<p>We have edited the text to reflect this.</p>
<p>We recommend this be stressed, as it can be dangerous to use this on horses. [use of chin-lift and neck-yoke]</p>	<p>We have edited the text to add emphasis: no use of chin lift and neck yoke on horses.</p>
<p>We recommend adding «smooth and with no noise». ['Those parts should move slowly and evenly']</p>	<p>We have edited the text to reflect this.</p>
<p>Page 7 Maximum capacity for the lairage: a print error at the end of the text "animals" instead of "animals"</p>	<p>The text has been edited.</p>
<p>There is a lot of information. Might suggest starting each section with the outcome you want to achieve and then go into more detail. You have currently highlighted key points in bold which does help break the text up but it could be made clearer.</p>	<p>Noted – the text will be revised to enhance readability.</p>
<p>"Each pen should be equipped with two drinkers." - It is not clear how would be distributed and the size of the drinkers. In Brazil it is used a long drinker where animals can have access simultaneously. We would recommend here that 20% of the cattle must have access (drink) at the same time.</p>	<p>Noted.</p>

Comments	ICF Response
<p>page 1, right column, the end, ...the pigs -> this is bovine and horse good practice page 8, left column, ...between pigs -> this is bovine good practice page 4, left column, ...the weather is bad -> describe what is bad weather</p>	<p>We have edited the text to include descriptions of bad weather as too cold, too hot, too wet, and too dry.</p>
<p>Page 1 In the paragraph related to Crows pen in the last line the text refers to pig. Page 1 In the paragraph related to Crows pen in the last line the text refers to pig. Page 9 the sheep and pig in the picture may generate confusion [2]</p>	<p>The text has been edited.</p>
<p>As a general comment - much of the content is duplicated by species. Would suggest that where the content is the same for a set of species this is consolidated, with species specific information then clearly differentiated.</p>	<p>Noted – Documents have been consolidated</p>
<p>There is only one stocking density given for horses, whereas those for cattle and calves cater for animals of different weights. Why not the same for horses? There should be a caveat that the space allowances given are only a guide, as there are variables other than time in lairage, such as temperature and humidity, which need to be taken into account.</p>	<p>Little good practice information for slaughter of horses could be found.</p>
<p>Horses and cattle behave differently and should have separate sections. E.g. Collective pens for horses which have not been group housed together prior to slaughter cannot be recommended.</p>	<p>We have edited the text to better differentiate between horses and cattle.</p>
<p>No belly support for horses</p>	<p>Agreed – We have edited the text to clearly distinguish what applies to cattle from what applies to horses.</p>
<p>There are several errors in the use of English and spelling in this text. Why specify pigs at the end of page 1?</p>	<p>Text edited</p>
<p>The communication towards the people who are handling the animals is often not ok. There is a problem of language and understanding because most of those people don't speak the language because they work for a contractor and are foreigners or they belong to a social group that often work for low remuneration and have poor education. Those people, who are crucial in terms of animal welfare because they do the handling should be informed as well! And there is a bottle neck in the communication in my opinion. The sensitivity towards animal welfare is also an important point which is often</p>	<p>Addressed as far as possible by striving to achieve accessible text</p>

Comments	ICF Response
under addressed in hiring profiles	
In the "Alternative Layouts for Waiting Pens" section it says that Layout 1 is preferable to Layout 2 but I think it should be the other way round (i.e. Layout 2 is preferable). Also, on Page 8. I would emphasise that electric goads should not be used routinely.	Layout 1 in "fishbone" shape is preferable as it has no right angles. Regarding electric goads, we have edited the text to reflect this.
There should be reference to legislative provisions	In the interest of readability the text does not include references to legislative provisions everywhere, but it does in some sections.
Are conveyor systems more acceptable for cattle and horses than a stun box? Are they widely used if at all? They are used for calves, pigs and sheep in NZ but do not consider them appropriate for cattle and horses?	Conveyor systems are not widely used, and when they are it is for calves only. The text in the final version of the documents clearly mentions this.
Use of individual restraining boxes is classified as 'acceptable'. For cattle and horses this should at least be 'good' and, in the case of fully-adjustable, modern boxes with head restraints, maybe 'best practice'. [2]	When well designed, with smooth loading and suitable arranges for stunning conveyors can meet standards of best practice. Restraining boxes vary considerably in design and in use may only provide acceptable welfare due to difficulties in loading and ease of shooting. Boxes with modifications including head restraints vary in their performance and may need adaptation for size of animals. Head restraints have both benefits and disadvantages as can result in increased handling of animals and thus are good but unless stock are of similar size modified boxes rarely deliver best practice.

Comments	ICF Response
<p>BMPA Guide to Good Practice - Welfare at Slaughter. Accessible at: http://www.bmpa.uk.com/_attachments/Resources/3602_S4.pdf. HSA publications: Guidance Notes No. 6 Humane Handling of Livestock and Humane Slaughter - Taking Responsibility (DVD training package).</p>	<p>It is unclear what good practice this comment is referring to.</p>
<p>ON page 2 - Electric goads. I would recommend to establish a maximum percentage. Probably following Temple's recommendation.</p>	<p>Grandin has consistently stated that " Electric prods should be used sparingly on cattle" She has observed various incidence rates of goad (Prod) use and recommended several target levels which may not be appropriate to European conditions as rates of use of goads are often lower than those in USA.</p>
<p>I believe that the indicator of good practice should be linked better, with its corresponding text</p>	<p>Edited</p>
<p>more detailed photographs would be helpful</p>	<p>Noted – illustrations have been provided for a number of good practices in the final version of the documents.</p>
<p>Under 'handling' you refer to sheep and goats moving if you enter their flight zone. This is true for more than just this species. In addition this section is meant to be about cattle and horses? Second paragraph under 'good practices specific to unloading' ... sick or injured animals that are suffering from severe pain etc. should be killed immediately. If they are unable to walk this should be done in the situation in which they are found. This section needs tidying up as it is currently confusing and not good practice. Is the use of showers and fans appropriate?</p>	<p>Text has been edited to remove references to incorrect species.</p>
<p>Horses and cattle have no fleece, page 2.</p>	<p>Generic text for all species has been consolidated under a shared section</p>
<p>Guidelines should be prepared for each species separately with more details</p>	<p>The text has been consolidated at the Commission's request.</p>

Comments	ICF Response
<p>A two hours limit to kill an injured animal in pain is far too long. [2] Page 3, Column left I do not think that it is a good practice for sick etc. animals to wait for 2 h in any case: " Sick or injured animals that are suffering from severe pain, or have large, deep wounds, severe bleeding, or a severely disturbed general condition are slaughtered immediately. If this is not possible, you must separate them from the others and slaughter them as soon as possible, and within the next 2 hours."</p>	<p>This section has been amended.</p>
<p>It can be even more detailed.</p>	<p>There is no specific indication on where to add detail – trade off with length,</p>
<p>Almost too much information - should be more concise with key points and clearer subheadings. Information is often repeated both within these pages and across previous pages. Duplication - e.g. 'dairy animals may have no flight zone at all' ' dairy cattle may have a small or no flight zone at all' - both in the same paragraph. What are 'adequate conditions for calves and welfare of new-borns'?</p>	<p>We have edited the text to review and simplify it.</p>
<p>Here, sometimes other species are mentioned (sheep and goats), and expressions used for other species than cattle and horses (e.g. fleece) are used. (Even valid for the previous section in which pigs were mentioned, bottom first page)</p>	<p>Text has been edited to remove references to incorrect species.</p>
<p>Like I mention in other sections, the end user is one of the most crucial steps in addressing animal welfare best practice. In some cases, there is a poor communication because of a big diversity in spoken languages and pictograms can't compensate this.</p>	<p>Efforts to ensure communicability have been made.</p>
<p>Two different document, one for cattle and another for horses might be better.</p>	<p>These species have been kept together as advised by the Commission.</p>
<p>On page 4, I would not use: "Size of the lots: It is preferable to move animals in small lots of 4 to 6 large animals, or 15 to 20 calves. " because it depends on the size and slaughter capacity. I have seem very good handling with lots of 10-15 large animals because the lairage and races are really good and based on the slaughter capacity.</p>	<p>We have edited to include text that approximates: "some national guides recommend that animals may be moved in small lots of ...; however, it is also good practice to move animals in larger groups if lairage and races are well designed taking into account the slaughter capacity."</p>

Comments	ICF Response
Yes there is enough information, but some layout is needed to make the information more absorbable.	We have edited this section for readability, shortening the text and adding headings.
Duplication should be avoided. Could make better use of subheadings and key points to make the information clearer and easier to navigate.	We have edited this section for readability, shortening the text and adding headings. Text has been consolidated
Repeated text about dairy cattle and flight distance page 2.	Text has been edited to remove repetition.
Information already covered by the regulation might not be necessary. I guess the document should go beyond the regulation.	The document restates what is unacceptable, i.e. forbidden by the Regulation, as well as compulsory.
First two paragraphs are unclear. First sentence refers to horses and cattle. Third sentence then just suggests that cattle can experience pain as a result. In this section and across the document be consistent which species you are referring to in which section? Second paragraph - electric shocks and sharp instruments cannot be used except for cattle? Disagree that sharp instruments should be used at all. Electric shocks - are you referring to electric prods, in which case the page previous suggested they could be used when loading a stunning pen? For both cattle and horses some of the same dislikes are mentioned, bright lights, shouting, sudden movements etc. - would advise these are the same for all animals and have them applicable across all, only referring to specific dislikes by species where they are specific to that species. If this section is about cattle and horses only, no need to refer to handling the fleece?	We have edited the text as use of sharp instruments is forbidden for all animals so any confusing statement in the text on that matter should be removed.
Again, I'd prefer that horses were treated in a different section than cattle. Although this section works better than the previous. [2]	Addressed earlier
I would separate the fasting period between horses and cattle.	Feeding intervals for cattle and horses on farm are laid down by EU legislation on welfare on farm (Directive 98/58 (cattle and Horses) and by Council Directive 2008/119/EC) (Calves) and also Regulation EC 1/2005 on transport which specifies journey times , maximum feeding and resting intervals . Regulation 1099/ 2009

Comments	ICF Response
	requires that all animals in lairage which have not been slaughtered within 12 hours of their arrival shall be fed, and subsequently given moderate amounts of food at appropriate intervals. Thereby provision is made of maximum intervals between feeding for animals moving from farm to slaughter.
Page 1, Column right, Handling - is this advice based on research findings? "Operators should be dressed in dark clothing when moving the animals"	This is not based on research findings, only existing guides to good practice.
A kind of "check list" (points) would be more user-friendly.	Noted.
not enough details	It is not clear from this comment what additional details are needed.
If you mean only the business operators, animal welfare officers, than yes, but if e.g. the people that handle the animals, the end users, cfr. my former remark	Addressed above
On page 2. I would emphasise that electric goads should not be used routinely. I would also change the wording on Page 3 so that it says that emergency slaughter of injured animals is carried out "immediately or as soon as possible". I would delete the part of the sentence that says "if this is not possible then animals should be killed within 2 hours". The wording on this in the pig section is better.	The edits suggested in this comment have already been incorporated.
Some layout would do good	We have edited this section to improve layout.
Use of the electric prod, it is known that the way this instrument is used is not the way it is described here. So the problem is not the description but the compliance to the rules and the law	We agree with this comment.
heavy bulls & water buffaloes: bolt position slightly off the median line	We have edited the text as suggested.
there is nothing mentioned on unstunned slaughter, where can I find that part	Non-stun slaughter is included in another document.

Comments	ICF Response
<p>It is very important to determine the minimum air pressure for Compressed air stunners. I have seen lots of ineffective stunning due to low pressure and/or maintenance. In some slaughterhouses, they use the same air compressor for the captive bolt and for the stunning box (when is operated by compressed air). As the stunning chute and the captive bolt require different air pressures, it cause problems and compromise the welfare of the animal. When it says to follow the manufactures recommendation, are they scientific approved?</p>	<p>Use manufacturer's recommendations for air pressures used to power captive bolt guns</p>
<p>Stun to stick interval sheep: aim should be much shorter than 40 sec. Bolt lengths: 15 cm bolts are difficult to find on the market.</p>	<p>Values are those found in existing guides. Consistent recommendation is to keep it as short as possible.</p>
<p>Maximum stun to stick interval - The time between stunning and effective bleeding out must be kept to a minimum in all cases. All animals must be rapidly rendered insensible and remain that way until death. This should be added to the stipulation that cattle should be bled out / pithed within 60 seconds of stunning - query that 60 seconds is appropriate?</p>	<p>Stun to stick interval should be as short as possible; but because cattle and horses usually need to be hoisted before sticking this interval should be preferably less than 30 seconds when non penetrating captive bolt is used and 60 seconds for the penetrative captive bolt stun.</p>
<p>Well, what to do if the second stun was not effective. Reported that a second stun can be ineffective, but no instructions about what to do in that case.</p>	<p>It is rarely the case that second attempt to stun with captive bolt is not successful if correct dry charge and new correct position is used away from the first shot. The document also provides for an evaluation of each failure of stunning such as incorrect position, inadequate bolt speed due to poor maintenance or inadequate charge so further information on third shot was not provided.</p>
<p>Perhaps mention that horses often are shot too low. perhaps also mention that velocity is more important for effect than bolt mass ($KE=1/2 mv^2$), emphasizing the need for proper maintenance</p>	<p>We have edited the text to add the first point, and second point as emphasis on maintenance only.</p>
<p>the situation on the captive bolt stunner market needs to be taken into account. <i>Consultee indicated that they had found no 9 cm bolt captive stunners on the market, and therefore had to adapt the national ordinance to 8.5 cm.</i></p>	<p>These references are mentioned in existing guides, which suggest the equipment is accessible in the EU.</p>
<p>positioning: might be worth to indicate the angle of the bolt with the head</p>	<p>We have edited the text to reflect this.</p>

Comments	ICF Response
(90°)	
It is not clear if the non-penetrating captive bolt is accepted.	Out of scope.
Lack of detail in the table with regard to the optimum charges for stunning horses. I think mention should also be made of the electrical stunning systems that are available for cattle. <i>Consultee stated that in the absence of specific guidance for horses, he would follow that for cattle and recommended that as a general rule, the most powerful charge available for the model of stunner being used is recommended for adult horses and ponies.</i>	Agreed. Text edited.
I think mention should also be made of the electrical stunning systems that are available for cattle.	Out of scope
The scale of ""good practices"" is placed inaccurately.	Edited
I would consider Captive bolt stunning as best instead of Good. [2]	All qualifiers have been reviewed and confirmed by the experts' team.
We do not recommend the use of captive bolt on horses. Their head cannot be restrained, they would panic and cause excessive stress. The approach of the captive bolt to their heads scares them and the target is often missed because of that. Firearm is strongly recommended as an alternative.	We have edited the text to add mention that this approach may not always work with horses and alternatives could be considered (firearm).
EFSA Scientific Opinion on monitoring procedures at slaughterhouses for bovines	Noted – given the content of existing guides regarding consciousness indicators the documents offer a long list of indicators. Commercial practices of monitoring unconsciousness remain poorly documented. That includes the use of EFSA's SO.
Waiting for signs of life should not be substituted with a waiting period only - regardless of the waiting period you should always check the animal is dead. Unclear what is meant by circumstances / time of control in the verification of stunning table.	Agreed. This has been removed.
Under verification of death it reads 'to confirm that the stun has been effective' ... do you not mean to confirm a kill? [2]	The text has been edited to correct this.

Comments	ICF Response
include Images about where and how to perform tests	Noted
no images	Noted
As above floppy head is an additional sign for an effective stun. Query if the signs of an effective stun should be more consistent across some of the species. E.g. referral to lifting head in sheep and goats but not here? Check for consistency where needed and differences where needed.	Text reviewed to ensure consistency.
what to do if stunning fails	Information on what to do if stunning fails is in the control procedure table
The problem is not the content but more the communication tools available(speaking different languages) and communication on welfare issues needs more than pictograms	Addressed above
The procedure might focus on 'warning indicators' that might show incorrect process (e.g. indicators of consciousness)	Text already includes line to look out for signs that the stunning might have failed
Distinguishing between different species or categories of animals.	Consolidation and distinctions implemented as requested by the Commission
In the table of control procedure, it is not clear action to be done if animal does not show one of the 6 signs listed.	Revised.
Every animal should be checked by the operator to verify effective stunning and to check for signs of death. I am not sure if the table is suggesting that the checking of a sample of animals is guidance for the AWO or the operator - this should be made clearer.	This text is designed for small slaughterhouses which may not have an AWO.
here you can only place a "go" or a "no go"	Agreed. There are no qualifiers here.

Table A4.2 Pigs

Comment	ICF Response
The Group-wise handling of pigs should be described more in detail.	Edited
It is confusing that the text is dealing with electrical stunning equipment,	Out of scope

Comment	ICF Response
while CO2 stunning equipment does not. I miss a similar text dealing with CO2 stunning Technical and practical guidelines for good animal welfare a Danish perspective, DMRI, 2006	
Improved Handling Systems for Pigs at Slaughter - Cambac JMA Research & HSA. Accessible at: https://www.hsa.org.uk/shop/publications-1/product/improved-handling-systems-for-pigs-at-slaughter . Preventing Slips and Falls by Managing Concrete Floors - RVC, EBLEX & HSA. Accessible on the following link: https://www.hsa.org.uk/shop/publications-1/product/prevent-slips-and-falls-by-managing-concrete-floors .	These sources were reviewed and main points were included in the document.
Guideline for gas stunning is absent. This system is used in some countries.	Out of scope
Also here, calm handling and moving and stunning pigs in groups greatly reduces stress reactions and any need for Electric prodding. Use of prods should be mentioned. Walking calmly behind a Group of pigs With some sort of a plastic Shield, may be a fine way to move pigs Down a raceway. I think that Space requirements in lairage is too low for pigs to rest properly. Also measures to prevent aggression should suggested. One drinker per pen gives a risk for no water at all if failure occurs	This is covered in the handling section, not in this section.
please add detailed photographs or short sequences on video	Noted
last paragraph bottom of page 3 should read 'such as truck washing'. Comment on 200 lux lighting as before (i.e. perceived as too high. commentator is from New Zealand where the recommendation is 20-50 lux).	Addressed above
Under 'alternative layouts for waiting pens' - should read stand, lie, and turn around. Not 'or'.	We have edited the text to reflect this.
Also under the same section, outdoor spaces without shelter or shade should not be used when the weather is bad, but also when it is too hot and sunny? Query if the correct thresholds have been set when describing what good looks like in the control procedures. E.g. 1-3% falling seems too high.	Reviewed
Page 7 - sentence doesn't make sense. You may spray pigs for 5 to 10 minutes after the animals have arrived in the lairage, and for a period of 10-20 minutes.	We have edited the text by removing the second half of the sentence.

Comment	ICF Response
Note - where ambient temperatures are hot, other strategies to keep the pigs cool include reduction in stocking density, as well as ventilation control and the use of cooling devices. In NZ minimum lying space for pigs is calculated as area (m ²) = 0.03 x live weight 0.67 (kg). Wording around restraint as before for other species.	We have edited the text to include these strategies for dealing with hot weather.
Under restraining equipment and facilities - refer to sheep and goats but this is the pig section? For restraining conveyors ensure that the width and angle of the conveyors suit all lines of animals that are being processed. They must be designed and managed to prevent animals from climbing on the backs of animals in front of them. Under electrical stunning equipment would make greater reference to how to use the stunners etc. - refer to code of welfare: commercial slaughter	Comment refers to non EU guidance: New Zealand Codes of Welfare. This is out of scope.
Throughout it might be nice, not essential, if the animals depicted in each species specific section were the animals referred to.	Noted
Comment around using outcomes rather than prescriptive standards as before and throughout this document.	Noted
Check use of English, some mistakes here. Some mention of sheep and goats page 5 and page 9. Suggest include emergency lighting provision in case of power failure in control table on page 5.	We have edited the text to reflect this.
Some Places other species (sheep and goats) are mentioned instead of pigs and the images should show pigs. [4]	The text has been edited to ensure references to correct species throughout.
Music might calm more the worker than the pigs. (not sure of scientific evidences)	This information comes from existing guides.
Images for long narrow pens vs square pens.	Noted
Why only electrical stunning included?	Out of scope
The maximum slope inclination of 20°, should be only for unloading. - A with of 80-90cm might be not enough for two pigs - Indications of the width of the labyrinth might be worth. "	We have edited the text to include the width for the labyrinth as 140 cm and indicate in brackets "some guides to good practice recommend a width of."

Comment	ICF Response
Some repetition - could be more concise which would help keep the points clear.	Text edited.
"We tend to use outcomes rather than be prescriptive e.g. passageways should be 80 - 90cm vs should allow two heavy pigs to walk side by side. Using outcomes rather than specific measurements would help with any variation in the size of animals across countries / breeds etc.	The requirement from the Commission is to provide a range of options. Specific indications might be indicated in brackets. We agree that the outcomes are preferred but specific range may be more helpful to the reader.
I would be important to differentiate Electro narcosis from Electrofusion, giving more information about both. I suppose that will be discussed later in other section. The information given to the Electrical Stunning Equipment is poor. I would recommend to talk about different types of equipment (electrical stunning). Head-only, Head-to-heart, types of electrodes that may be better for each system.	Noted – text kept simple to enhance communicability
Individual restraining box should be labelled ""Acceptable"" as the other methods are better.	Agreed – text edited accordingly
On page 9, I would consider the stun pen as acceptable instead of Good. A very strong disadvantage of this layout is the stun-to-stick interval, which is always more than 15s. In that case, when you use electro narcosis, it increases the risk to recover the conscious.	All qualifiers have been reviewed.
Code of Welfare: Pigs Code of Welfare Commercial Slaughter	These documents cannot be used without more specific advice.
BMPA Guide to Good Practice - Welfare at Slaughter. Accessible at: http://www.bmpa.uk.com/_attachments/Resources/3602_S4.pdf . HSA publications: Guidance Notes No. 6 Humane Handling of Livestock and Humane Slaughter - Taking Responsibility (DVD training package	These documents cannot be used without more specific advice.
I think gas stunning should be included. This is common practice in some countries.	Out of scope
Further, good low stress handling systems With Group handling and Group stunning is important for Level of stress shown. Miss info on use of prods. I think suggested Space allowance at lairage is very dense and undisturbed	Group handling and group stunning are mentioned in the document and low stress levels identified as advantage.

Comment	ICF Response
rest will be difficult.	
Why not illustrate pigs on the images. [3]	Noted
In my opinion ung boars (male pigs) not yet used for reproduction could be lairaged together with female pigs without any problems. Exact recommendations should be avoided, e.g. a pig not able to walk by its own from the truck should be killed within 3 min. And the waiting time should be within 1-2 hours. Better is: should be killed as fast as possible and the frame for lairaging more than 12 hours should be adjusted according to the number of animals, available space etc.	We have edited the text to clearly mention active reproducers are the ones lairaged separately.
Under control procedure - duplication of 'procedure for sick/weak pigs / animals is complied with'.	Table edited.
What kind of emergency would require feed to be spread on the floor? Not sure that if 25% of pigs are goaded this is good practice. Think this is a bit high.	We have edited the text to remove "in an emergency", and replace with "if no other alternative exists." Reviewed
Would suggest that electric goads should only be used on pigs where the safety of the handler is at risk or when loading a stunning pen. Though note in its current state you have marked this as acceptable rather than good or best. Query why the limit of 3 minutes has been set for pigs arriving and unable to move, should it not just be as soon as possible? Ditto for the 20 minute threshold. Under - good practices specific to lairaging - stocking density will also help pigs that are too hot or cold. Under control procedures - as in all of the sections, unclear as to why falls and vocalisations etc. have been set at the particular threshold they have been set at.	Reviewed – an outcome goal has been kept
Information about pig's vision is missing.	We have edited the text to reflect this.
I would recommend to set the maximum voltage that might be used in the electric goads. <i>Consultee wrote that some high-standard voluntary guidance exists that sets 12V or 18V as a maximum, and believed that the national maximum given in Brazil was 50V.</i>	Added
Across all of the sections there is a lot of duplication within each species	Text consolidated

Comment	ICF Response
information. E.g. repetition of pigs liking well lighted areas etc. There is also duplication across sections for details such as flight zone, good practices specific to unloading etc. - better to have this all in one general handling section and then only highlight the species specific features in their relevant section.	
For goad use suggest that no unnecessary goading, and no goading of piglets should be chosen.	We have edited the text to include that no piglets should be goaded under the relevant section.
Pigs should only be brought to the hospital pen if they will be treated appropriately - currently no mention of treatment.	We have edited the section where hospital pens are mentioned and indicate that animals are to be treated appropriately there.
There is a lot of repetition throughout - think the document would be easier to read if areas of clear overlap across species were consolidated, and species specifics then separated out.	Text consolidated
It should be emphasised that electric goads are not to be used routinely.	We have edited the text to add emphasis.
This section also has not mentioned group handling systems that keep pigs in groups up to the point of entry into group gas stunning systems. These would represent ""best"" practice.	Out of scope
Code of Welfare: Pigs Code of Welfare: Commercial Slaughter	It is not clear what GP the consultee is referring to.
BMPA Guide to Good Practice. HSA Guidance Notes No. 4 Electrical Stunning of Red Meat Animals. HSA DVD training package: Humane Slaughter - Taking Responsibility"	It is not clear what GP the consultee is referring to.
please stress that it is essential to approach the animal from behind to position the stunner correctly - hence no further immobilisation is needed	We have edited the text under "positioning."
Are head only electrical stunning and simple stunning intended to be the same thing? Terms used inconsistently and a little confusingly here and throughout. Should it be advised that pigs are stunned with calliper-type electrodes rather than automatic stunners with conveyors? Currently not clear - The latter are only mentioned in the end of the first paragraph? Under Parameters - suggest that the current should be maintained until the animal	Text revised

Comment	ICF Response
<p>collapses and for a minimum of 1-3 seconds (where the current is attained and maintained for that duration). Time between stunning and bleeding out must be kept to a minimum. Consider within 30 seconds of stunning to be too long and advise 25 seconds. For head only reversible electrical stunning of pigs - slaughter by bleeding out must be carried out using either a thoracic stick or by severing both carotid arteries. If carotid arteries are severed this must be followed by a heart stopping electrical current, or a thoracic stick, or another validated method to ensure the animal does not recover breathing or sensibility prior to bleeding to death. Both the severance of the carotid artery and the secondary procedure must be completed within 15 seconds of stunning. Refer to Code of Welfare: Commercial Slaughter Minimum Standard 10. Under control procedure - effectiveness of stunning. Agree that no animal should have to be stunned more than once. And maximum stun to stick interval is 15 seconds for pigs.</p>	
<p>The figure with the position of the electrodes is not clear.</p>	<p>Noted / revised and reviewed by expert</p>
<p>By the passage of sufficient electric current through the brain'. Not clear to what purpose should be sufficient (e.g. to induce epileptic seizure)</p>	<p>This document is meant for end users. Therefore it does not discuss in more detail what the stunning does to the body of the animal.</p>
<p>The animal must then be killed by bleeding or sticking....important to specify: without any delay.</p>	<p>We have edited the text to reflect this.</p>
<p>'Correct size'. It would be helpful to detail the correct size according to the weight of the animals. Otherwise is too ambiguous. The critical parameter is the amperage, and the voltage will vary according to the required voltage and impedance. - bleeding should be done before clinic phase. 30s of stunning is too late.</p>	<p>Email sent to consultee (Antonio Velarde) asking for existing guidance on size relative to weight of animal. Response from consultee: "Unfortunately I do not have information about the size of the tongs." No action.</p>
<p>I do not understand this sentence: You should kill the pig by bleeding as soon as possible and within 5 seconds of stunning, or alternatively within 15 seconds of stunning, or alternatively, within 30 seconds of stunning.</p>	<p>Text already edited to clearly indicate that different recommendations exist across the sources that have been used.</p>
<p>Killing methods (electrocussion) would be important to be discussed. The vast majority of pig's slaughterhouses uses head-to-chest (electrocussion) methods.</p>	<p>Out of scope for the slaughterhouse operations document.</p>

Comment	ICF Response
Lots of repetition throughout. Would advise starting with an overall statement and then being species specific, i.e. all animals must be rapidly rendered insensible and remain in that state until death.	The text has been consolidated into a shared section for all mammals
HSA no longer recommends outputs of less than 250 volts for head-only stunning.	We have edited the table to include ">250V" in addition to voltages already listed, for all categories of pigs.
Head-only stunning should be applied for not less than 3 seconds. The stun-to-stick time should be within 15 seconds from the start of stunning.	We have edited the text to include within 15 seconds between the 5 and 30 seconds recommendations already mentioned.
Code of Welfare: Commercial Slaughter	It is not clear what GP the consultee is referring to.
BMPA Guide to Good Practice. HSA Guidance Notes No. 4 Electrical Stunning of Red Meat Animals. HSA DVD training package: Humane Slaughter - Taking Responsibility	It is not clear what GP the consultee is referring to.
Check DISA www.disa.slu.se	It is not clear what GP the consultee is referring to.
EFSA opinion	It is not clear what GP the consultee is referring to.
the text is confusing - the positive signs for a good stun must be clearer and more concisely named	Email sent to consultee (Peter Jakob) asking for further guidance on this point. Consultee responded that he would like to see something more along the lines of the EFSA guidelines.
Under control procedure - with electrical stunning you may wait for the animal to regain full consciousness before you re-stun. Would advise that this is incorrect - you do not wait and instead stun again as soon as possible. Times at which unconsciousness is verified should be from stunning to death. Number of animals not rendered unconscious should be set at 0. Should always check for signs of life before further operations can begin, not just wait a set amount of time. This applies here and through the document. An animal can be dead and still bleed? Unsure of this is a good indicator to use. A floppy head is another sign of a stunned animals.	We agree with these comments. The indicator for death is that "the animal has stopped bleeding", nowhere is it indicated that the animal still bleeds even if it is dead.
Numbering is wrong on page 1. Numbers 4 and 5 are the same thing.	Noted.

Comment	ICF Response
Need more specific indicators for evaluating unconsciousness/consciousness, not just 3 [2]	Noted – given the content of existing guides regarding consciousness indicators the documents offer a long list of indicators. Commercial practices of monitoring unconsciousness remain poorly documented. That includes the use of EFSA’s SO.
No figures.	Noted
It might be included indicators of consciousness (warning signals). - The tail relaxed or the tongue straight and floppy, might not correspond with a pig unconscious during clonic phase.	Noted - see response to same comment under cattle and horses
'At least 3 indicators are positive'. The term positive, in this case is ambiguous. Why 3?	Noted – given the content of existing guides regarding consciousness indicators the documents offer a long list of indicators. Commercial practices of monitoring unconsciousness remain poorly documented. That includes the use of EFSA’s SO.
Again would have one section covering the material here which is consistent across species and then only split out species specific issues where needed.	Noted – drafts revised accordingly
Every animal should be checked by the operator to verify effective stunning and to check for signs of death. I am not sure if the table is suggesting that the checking of a sample of animals is guidance for the AWO or the operator - this should be made clearer.	See response to same comment under cattle and horses summary.

Table A4.3 Sheep and goats

Comment	ICF Response
Code of Welfare: Commercial Slaughter Sheep and Beef	Code of Welfare: Goats Code of Welfare: Non-EU guidance
See www.disa.slu.se	Not clear which GP this comment is referring to
please add more detailed photos or film sections	Noted/Out of scope

Comment	ICF Response
<p>Slopes should not be greater than 20 degrees. Same comment as before on lux level for light. For control procedure - only agitated animals fall as 'good' - should it be no animals fall? When referring to 'restraining equipment and facilities' in this section the poor handling is not marked as unacceptable in the same way as it was for previous sections?</p>	<p>Reviewed based on original source The values included in the document are all drawn from existing guides. Information is not necessarily carried over from one document to the other, as this depends on what information could be found for the relevant species in existing guides.</p>
<p>The English needs checking Reference to a pig page 1. Under control table lighting, suggest add that there should be emergency lighting in place in case of power failure. Following unclear, page 5: "you may rapidly, for example, change the density in the lairage" Density of what? I am not sure I understand the comment on page 6 that maximum stocking density is dependent on time of day.</p>	<p>The text has been edited to ensure no references to incorrect species. We have edited the control table on lighting as suggested. We have edited the text by replacing "density" with "stocking density."</p>
<p>Training is covered in EC 1099/2009 Art. 21: indicates EU Member States are to designate a competent authority to certify individuals (training, etc.). We recommend adding training to the document. Employees must know the temperament of these animals and how to handle them in a manner to avoid stress and injury. The use of prods, electrified or not is not recommended on these animals and not necessary because they are easy to be manually handled.</p>	<p>Training is out of scope. On prods, this is mentioned in the control procedure table "the animal does not require prodding to enter into the system"</p>
<p>We recommend adding 'and have no sharp turns'. [To 'and at least walk side by side.']</p>	<p>We have edited the text as suggested.</p>
<p>We recommend adding 'and in good condition to avoid injuries' [to 'For ramps and corridors, you may use solid and opaque sides, to avoid injuries and distraction.']</p>	<p>We have edited the text as suggested.</p>
<p>We recommend adding 'and in good condition to avoid injuries'. [To 'Gates should be designed to facilitate the movement of the animals and to secure them in a given area.']</p>	<p>We have edited the text as suggested.</p>
<p>We recommend adding 'bright light'. [to 'Sheep and goats may not move calmly if they are distracted by people or objects']</p>	<p>We have edited the text as suggested.</p>

Comment	ICF Response
We recommend the document to indicate prods must not be used on goats and sheep.	Already covered in existing text: You must not under any circumstance attempt to move an animal by: striking it; kicking it; pressing on sensitive parts of its body; lifting the animal by the head, ears, horns, legs, tail, or fleece; causing it pain or suffering; using an electric shock or sharp instrument to encourage the animal to move; twisting, crushing or breaking the tail of the animal; holding the animal by the eyes. These practices are forbidden and unacceptable.
And it scares the animals. [To 'Direct sunlight should be avoided as it creates dark shadows.']	We have edited the text as suggested.
You must house sheep and goats only in pens where water can be provided. [not should]	Must is used in the text for obligations that are clearly stated in the Regulation – use of must for other obligations may create misunderstanding that new legally binding obligations are being created.
Your lairage must enable you to separate animals from different categories: [not should]	Answered above
Should read stand, lie, and turn around [not 'or']	We have edited the text as suggested.
All should changed to must: They should be equipped for water and feed. If the animals are housed outside, they should be protected from weather (shelter or shade). If there are no protections those spaces should not be used when the weather is bad.	Answered above.
We recommend adding «avoid sharp turns». [To 'as they provide a simple route to follow from arrival to the stunning area.']	We have edited the text as suggested.

Comment	ICF Response
<p>For Control procedure table: (1) We recommend the table to indicate set criteria and limits for monitoring those criteria. Please refer to the Meat Hygiene Manual of Procedures, Chapter 12, and Annex C: http://www.inspection.gc.ca/aliments/produits-de-viande-et-de-volaille/manuel-des-methodes/chapitre-12/annexe-c/fra/1390408218933/1390408220183 (2) We recommend adding «slipping». [to 'Falls'] (3) This ['Only agitated animals fall'] should not be associated to handling. And falling is not supposed to happen, and is therefore unacceptable. (4) This [carcass damage] is quality of meat, no link with animal welfare (5) Conception of facility is the main problem in these cases, prod use, etc.... ['Too much space'] (6) Monitoring instead of 'Checks' (7) Add 'and water flow' to 'The drinking devices suit the species category, size and number of animals in terms of depth, height and strength.' (8) Add 'and not frozen' to 'Any animal wanting to drink has access to clean water' (9) We recommend adding «so each animal can lay down and have access to water». [to 'Pen size']</p>	<p>Non-EU source We have edited the text as suggested.</p>
<p>To address this issue you must ensure adequate ventilation in the lairage. [not should]</p>	<p>We have edited the text as suggested.</p>
<p>All 'should' to be must: 'You should monitor air quality. Values should appear on readable screens for frequent monitoring. You may usefully program alarms (sound, or light, or both) in case the ventilation system fails or air quality deteriorates. The alarm system should be able to function even if there is a power failure (an emergency generator should be provided). You should regularly check the alarm system. You should have a contingency plan in place to respond if air quality deteriorates. You may, for example, rapidly change the density in the lairage. Should mechanical ventilation equipment fail, alternative (natural) means of providing ventilation must be available. You should ensure the frequent maintenance of equipment and facilities following supplier instructions and manuals.'</p>	<p>Answered above</p>
<p>All shoulds to be must: 'you should consider the need for animals to stand, lie down, turn around and access drinkers easily.'; 'To estimate the maximum capacity in the lairage you should also take into account'; 'You should establish lairage capacity by category/weight and sex of animal for each and every pen.' ;</p>	<p>Answered above</p>

Comment	ICF Response
'Once established you should label each pen with maximum and minimum stocking rates taking into account the following space allowances, as well as the date and time of arrival.'	
We recommend specifying the method of slaughter. For example, in religious rite slaughter, animals take more time to collapse than when stunning is applied. [for 'the capacity of the stunning systems']	Religious rite slaughter is covered in a different document.
For the tasks or for the monitoring? Or both? ['The team for monitoring stunning']	We have edited the text to clarify this point.
We recommend adding « and have a back-up stunner for missed stunned or for secure stuns». [to 'Monitor the animal after they are stunned']	We have edited the text as suggested.
Add 'which cause them to be less stressed' to 'The animals are not alone but together with other animals'	We have edited the text as suggested.
We recommend adding the following: a back-up stunner is necessary in cases of missed stuns (e.g. captive bolt) [to 'Sheep close to the one being stunned risk receiving electric shocks.']	We have edited the text as suggested.
It must accommodate and/or be adjusted to fit the size of the animal, and prevent the animal from turning. [not should]	Answered above
We recommend adding these supports/pushers must be activated slowly with smooth movement and without noise. [to 'belly support']	Edit already incorporated in text.
We recommend adding «and is in conformity with the species you slaughter. » [To 'You should purchase only stunning equipment that includes instructions for use and maintenance.']	We have edited the text as suggested.
We recommend adding «or above». [to 'Clearly visible and audible warning if the duration of exposure falls below the required level']	We have edited the text as suggested.
We recommend adding «and well maintained». [to 'There is always back up equipment available']	We have edited the text as suggested.
I expect that info on tongue placement, head only and head to back stunning, current/voltage, Application time etc. comes later	No action, this is covered in a subsequent section.
""..display and record the details of electric parameters (voltage, amperage,	We have edited the text as suggested, keeping only

Comment	ICF Response
frequency, duration of stun)..."" => it is very difficult to find such devices on the market; Amperage and duration of stun should be sufficient in praxis to be recorded, if a reliable signal warns in case of insufficient stunning - this is more urgent than a host of technical detail.	amperage and duration of stun.
As before - avoid duplication where possible. Here you refer to side walls being " high enough to block the animals' view. The sides should also be high enough to prevent jumping." This 'outcome approach' is preferable to earlier examples where you have specified a particular height. "	Acknowledged
"For group stun - how large is the risk of other animals close to the sheep being stunned receiving electric shocks? Are the other methods preferable? In NZ conveyor systems are more commonly used for restraining sheep, and free-standing stunning is not advised.	Noted. The document acknowledges that conveyor systems provide better welfare than group stunning.
The ""Individual Restraining Box"" should be ""Acceptable"" as the other methods are better."	Agreed
Code of Welfare: Commercial Slaughter Code of Welfare: Sheep and Beef Cattle	This is non-EU guidance.
"Disagree that it is ok to wait for 2 hours to kill an animal that is sick or injured and suffering from severe pain. Under control procedure for good re falls and / or vocalizations on ramps and during unloading you have stated 'as few as possible' - why has this target been chosen as opposed to a proportion for other species? Advise that for all species you should aim for 0.	No targets identified in existing guides for sheep and goats. Targets for other species have not been carried over to this document.
English checking. Page 1. ""Know down handlers"", what does that mean? Page 4, ""that may be the case for male kids"". Why not female and why not lambs? Control procedures table mentions pigs It also states ""as few as possible"", for other species in these documents numbers are suggested. "	The text has been edited to correct the typo. As above
Sheep and goats behaviour are very difference (e.g. gregarious behaviour in sheep) and should be differentiated.	Text from the on-farm draft differentiating between sheep and goats has been carried over.
There is a lot of duplication across the sections which makes the species specific differences difficult to pull apart.	Text has been consolidated
Stun to stick interval needs to be kept below 10 sec.	Expert view that a maximum of 15 seconds is

Comment	ICF Response
	appropriate
As previous, advice that the minimum current level must be achieved within 1 second and be maintained for at least 1-3 seconds. Maximum stun to stick interval - should be no more than 20 seconds for sheep and goats. Under control procedure - effectiveness of stunning - Strongly advise that you do not wait for the animal to regain full consciousness before you restun. "	Intervals have been drawn from existing guides Agreed
see previous comments in pig electrical stunning document - not clear why frequency only of 50Hz is recommended (different from the pigs)	Parameters have been drawn from existing guides. The documents provide examples of recommended parameters.
"Photos would be more informative than the image (especially in the case of fixed eyes/no blink reflex).	Noted
Blinking can occur initially with electrical stunning when cornea is manipulated important: short stun to stick interval!	Noted
Verification of stunning section - last sentence 'If the animal is still unconscious after the second stun, contact the responsible person, then stun with the back-up method' should this read if the animal is still conscious?	The text has been edited to correct the typo.
Would you not use the back-up method before contacting someone to avoid prolonging the suffering of the animal?	Agreed
Good here that under verification of stunning you refer to verifying that the animal is unconscious before killing. This should be consistent across all species guidance. Also good here that in the control procedure table you refer to immediate re-stunning if the animal is conscious. This should be corrected in the previous sections	Text harmonised across species
Again dressing should not commence until you have verified that the animal is dead - waiting a set time limit instead of verifying death is not sufficient.	Agreed - removed
Additional signs of an effective stun - floppy head, relaxed jaw, tongue hanging out Unclear why currently for some species you have to check all signs of an	Noted – given the content of existing guides regarding consciousness indicators the documents offer a long list of indicators. Commercial practices of monitoring unconsciousness remain poorly

Comment	ICF Response
effective stun and for others just three signs - would ensure eky signs are checked for each species	documented. That includes the use of EFSA's SO.
In the control procedure box, referral to ineffective stunning with electrical stunning - states that you may wait for the animal to regain full consciousness. Disagree - would advise that the animal is re-stunned immediately.	Agreed
The last table says At least once - should be At least one"	Noted
Every animal should be checked by the operator to verify effective stunning and to check for signs of death. I am not sure if the table is suggesting that the checking of a sample of animals is guidance for the AWO or the operator - this should be made clearer.	The documents were elaborated for the benefit of small slaughterhouses, which may not have an AWO.

A4.4 Poultry (chicken and turkeys)

Comment	ICF Response
Each slaughter house need their own SOP and Good practice. They are controlled by the Danish Authorities.	Out of scope
Code of Welfare: Commercial Slaughter Welfare: Layer Hens	Code of Welfare: Meat Chicken Code of Welfare: Layer Hens
Poultry Welfare off the Farm - Defra publication accessible at: https://www.gov.uk/guidance/poultry-welfare-off-the-farm .	Not clear what GP the consultee is referring to
Light - dimming at during the night should be done with a dusk/dawn approach in order to minimise stress when the lighting is changed.	Text edited
* Enthalpy graph would be important. See Mitchell & Kettlewell (2004). * Fasting period would also be important. * Crates/Modules stocking density * Crates/Modules maintenance * Dead-on-arrivals (DOAs)	Noted -information on crates/modules stocking density has been added
I miss sections on stocking density in modules (containers or crates). Although these are stocked on the farm, it is still a relevant parameter for the slaughterhouse, as it may influence the need for ventilation.	Text edited accordingly
In Sweden it is not allowed to stock a higher number of poultry in a crate/module	

Comment	ICF Response												
<p>than can be able to lie down simultaneously next to each other on the floor. The height of the module/crate should be fit for the species and the size of the birds.</p> <table border="0"> <tr> <td>Type of poultry</td> <td>Minimum space allowance in crates/modules</td> </tr> <tr> <td>Dayold chicks</td> <td>21 - 25 cm² per chick</td> </tr> <tr> <td>Poultry <1,6 kg</td> <td>180 - 200 cm²/kg</td> </tr> <tr> <td>Poultry 1,6 - 3,0 kg</td> <td>160 cm²/kg</td> </tr> <tr> <td>Poultry 3 - 5 kg</td> <td>115 cm²/kg</td> </tr> <tr> <td>Poultry >5 kg</td> <td>105 cm²/kg"</td> </tr> </table>	Type of poultry	Minimum space allowance in crates/modules	Dayold chicks	21 - 25 cm ² per chick	Poultry <1,6 kg	180 - 200 cm ² /kg	Poultry 1,6 - 3,0 kg	160 cm ² /kg	Poultry 3 - 5 kg	115 cm ² /kg	Poultry >5 kg	105 cm ² /kg"	
Type of poultry	Minimum space allowance in crates/modules												
Dayold chicks	21 - 25 cm ² per chick												
Poultry <1,6 kg	180 - 200 cm ² /kg												
Poultry 1,6 - 3,0 kg	160 cm ² /kg												
Poultry 3 - 5 kg	115 cm ² /kg												
Poultry >5 kg	105 cm ² /kg"												
<p>First part of the text on ventilation and temperature is too long. It would be better if this part gives answers to the questions: high temperature- how to minimise it? etc.</p>	<p>Noted.</p>												
<p>It should be stressed that natural ventilation is normally NOT sufficient for broilers in lairage. Mechanical ventilation should be the norm. Monitoring of body temperature: it is unclear how this is to be carried out, and in any case it is more efficient to monitor bird behaviour (panting, signs of distress, birds turning towards the sides of the modules to get air) than to monitor body temperature.</p>	<p>Agreed. Text edited</p>												
<p>There is no solid scientific evidence for recommending a lairage time of at least 1 hour! This is often applied by the industry, but there is no research showing benefits of such unnecessary lairage times.</p>	<p>Noted</p>												
<p>They are too general. We never reed temp. Like 42 and no slope for walking is used. It need to be more focusing on the current situation. It is not feasible or realistic to supply broilers while waiting to be stun and slaughtered. A clear distinction needs to be made between birds in containers and loose birds. The latter is far less common than the former.</p>	<p>Text revised to clearly distinguish between the two.</p>												
<p>It could be very difficult if not impossible to measure the body temperature of</p>	<p>There are temperature probes that can be inserted</p>												

Comment	ICF Response
birds.	into crates.
Some of the wording within this whole section seems inappropriate for hens and like it was copied directly from other sections. Check relevance. E.g. maximum capacity for lairage references pigs. [2]	Text revised
Suggest add in control procedure table, under lighting, under what might go wrong, power failure, and the necessity of back-up lighting system.	Text edited
Should guideline lighting, temperature gas levels be included in order to provide optimal values for slaughterhouse functioning.	Noted – recommended temperature levels vary with humidity levels.
Monitoring is covered in EC 1099/2009; Art. 16 indicates requirements for monitoring procedures at slaughterhouses, but the verification, corrective actions, prevention and self-audits that should part of the operator’s animal welfare program are not found here.	Noted
Birds must not suffer from heat or cold stress [not should]	Language reviewed – this document is not meant to set new obligations and should not be interpreted as such.
We suggest adding the following example: «Driving trucks on the road to ensure ventilation in cases of delays for slaughter.» [to '■ Natural means: opening and closing doors and windows, allowing for openings in walls and roofs. ']	We have edited the text as suggested.
We recommend specifying this is for monitoring purposes. [to 'Allow enough space (approximately one metre) between containers to allow access to at least one person.']	We have edited the text as suggested
We recommend to add the following: «at a frequency that avoids any case of suffering». [to 'You should monitor bird temperatures.']	We have edited the text as suggested
We recommend adding the following: «to ensure adequate ventilation to bring body temperatures to normal». We recommend monitoring of this be added to the document. [to 'then you should keep poultry in the lairage area for a minimum of one hour and a maximum of 2 hours.']	We have edited the text as suggested
We recommend adding a note regarding birds escaping from crates and how it should be avoided. Everything must be in place to avoid loose /escape birds from	Added.

Comment	ICF Response
<p>crates, for example, doors of crates must be in good condition to stay closed.</p> <p>See chapter 12.12.3 of Manual of procedures of CFIA. http://www.inspection.gc.ca/food/meat-and-poultry-products/manual-of-procedures/chapter-12/animal-welfare-requirements/eng/1392144659190/1392144660111</p>	
<p>You must not push these birds to accelerate the killing line, so they won't run away from employees and walk/push on each other, get injured and sometimes die. [to 'You should also ensure that there are no gaps between, ramps, flooring and sidewalls.']</p>	<p>Edits to the section on "moving loose birds"</p>
<p>Because they are not used to it. [to 'Birds dislike direct sunlight.']</p>	<p>We have edited the text as suggested.</p>
<p>Scare them and... [to 'Distractions may cause them to hurt themselves']</p>	<p>We have edited the text as suggested.</p>
<p>You must slaughter these animals as soon as possible after they arrive in the slaughterhouse. [not should]</p>	<p>This document is not meant to set new obligations and should not be interpreted as such.</p>
<p>Ducks, turkeys, etc.... [to 'You should provide water to loose housed birds (turkeys) in the lairage']</p>	<p>Only turkeys and chickens are within scope.</p>
<p>For Control Procedure table: (1) We recommend the table to indicate set criteria and limits for monitoring those criteria. Please refer to the Meat Hygiene Manual of Procedures, Chapter 12, Annex C: http://www.inspection.gc.ca/aliments/produits-de-viande-et-de-volaille/manuel-des-methodes/chapitre-12/annexe-c/fra/1390408218933/1390408220183 (2) Monitoring and verification [to 'How can it be fixed? '] (3) 'Monitored' instead of 'checked' (4) We recommend specifying «are not wet or dirty». [to 'What does good look like?'] (4) We recommend specifying how good communication with truckers, catchers, farmers, etc.... for time of arrival minimizes the waiting time.</p>	<p>Noted</p>
<p>Page 3. Change text in bullet point regarding behaviour. It say pigs, should be birds? Will the birds really fight if the stocking density is to low? Or is this section just suitable for mammals?</p>	<p>Text removed</p>
<p>Some images of good practices would be nice.</p>	<p>Noted</p>
<p>Much is, in Denmark, considered to be self-evident and does not provide any</p>	<p>This comment is unclear.</p>

Comment	ICF Response
further knowledge or change in relationship or practice.	
The HSA is not aware of any processing plants in which birds are loose-housed. Therefore we question the inclusion of the sections on 'flooring', 'slopes' and 'slides'. Have these sections simply been copied from the corresponding documents on mammals? [4]	Some good practice guidance on loose housed birds has been found and is therefore reproduced in this document.
A lot of text. Will people read it? Can it be shortened or presented in a more easy way?	Text has been consolidated
Does not distinguish between different categories. [2]	Noted
I recommend to separate out completely the aspects related to birds in modules and loose-housed birds respectively, as the conditions are so very different. It is confusing to have them in the same sections or paragraph.	Agreed – text revised.
There is no such text. [4]	N/A
"Poultry Welfare off the Farm - Defra publication accessible at: https://www.gov.uk/guidance/poultry-welfare-off-the-farm . HSA DVD training package 'Poultry Slaughter - Taking Responsibility' and HSA publication Guidance Notes No. 7 'Electrical Waterbath Stunning of Poultry' accessible at: https://www.hsa.org.uk/downloads/hsagn7waterbathpoultryapril2016pdfoptimiser.pdf .	Unclear what GPs are referred to here
* Lighting intensity in the shackling area * Curves and uneven in the shackle line should be avoided * Obstacles should be verified to avoid injuries. * Pre-stun shock must be avoided. "	Text edited.
Is ""fractures"" better English than ""bone breaks""? The recommendation ""not to move"" injured birds is strange - normally they have to be lifted up for euthanasia... But they should not be moved around any longer distances, and not shackled. This should be clarified. Normally, one differentiates between crates (single-storey, manual handling) and containers (multi-storey ""drawer-type"" modules, being handled by fork-lift). These categories are together referred to as ""modules"". No birds should ever be carried by one leg only, regardless of type and species.	Bone breakages or fractures are equally ok. We deleted "You should not try to move them around" and revise: "crates" to "crates or containers." For consistency, we changed "containers" in the "Carrying poultry" section, to "crates."

Comment	ICF Response
It is not applicable to daily routines at a modern poultry slaughterhouse. We do not catch broilers by hand in Denmark - by machines before they are transported in crates to the slaughterhouse.	Acknowledged – the documents are meant to account for the variety of situations that can be found on the ground, including small slaughterhouses / slaughterhouses where some handling may be required.
the problem of tilting should be included	'We already state that it is important to handle crates carefully and not 'knock them over'.
A lot of these good or best practices are not practical, nor feasible! There is a lack of images to describe the practices properly. However, the existing images are good. A drawing is better than real pictures.	Noted
Is leaving birds for 2 minutes, and turkeys for 3 minutes in a cone excessive? (2)	We note the views of consultees on this matter, which are consistent with parameters for bird inversion in Regulation 1099/2009 (under waterbath stunning). Accordingly we have revised these parameters to only 1 minute for chicken and 2 minutes for turkeys (also for non-stun and on farm).
Page 3, removed appears twice in one sentence. Suggest delete the first one.	The text has been edited to correct this.
From Council of Europe Recommendation on turkeys of 21. June 2001, art. 20, number 5: ""Turkey shall not be lifted by a single leg only. When turkeys are carried, they shall be carried individually, using techniques appropriate to the size and weight of the birds. Small birds should either be held by both legs or be supported between the catcher's arm and body. Larger birds should be carried by one leg and the diagonally opposite wing. They shall be carried with their heads upwards except for short periods whilst they are picked up."	The text has been edited to reflect this.
it's not target the Danish practice	Out of scope
The table in the last page is not clear about duration of shackling period. It seems that you can keep the chicken up to 3 minutes shackled independently of the system you are using.	Durations of shackling period have been revised to align with Regulation 1099/2009
In my opinion it could be better underline also at the end of the text that carrying	Edited

Comment	ICF Response
by legs is acceptable only for chickens	
This is relevant for very small operation and do not focusing or applying for the Danish poultry slaughterhouses.	Acknowledged – the documents are meant to account for the variety of situations that can be found on the ground, including small slaughterhouses / slaughterhouses where some handling may be required.
Some assertions are confusing and not necessary. Furthermore, it is not scientifically based : ""poultry originate from jungle environment"" [2]"	"This is scientific fact and gives some relevance to the next sentence."
what are about ducks?	Out of scope
The illustration of a shackled bird is wrong. It has a cone around its body - why?? Furthermore, the bird will in reality be hanging downwards from the shackles, not sideways...	Acknowledged – Picture removed. It was meant to represent the principle of Topkip's Odigos system, which combines cones and shackles. The text has been revised to make that point more clearly.
not applying for the situation regarding unloading and shackle the boilers before stunning	Comment unclear
Not practical for operators. Not feasible. Way too much text!	Text length acknowledged – Revision aims to improve readability.
The maximum shackling time should be the same as required in EC 1099/2009: 2 minutes for ducks, geese and turkeys and 1 minute for all other poultry."	Agreed – text revised accordingly
This is theoretical and practise is not taken into consideration.	Effort has been made to record good practice information from existing national or sectoral guides, and voluntary standards, and other good practices observable in commercial conditions.
First, we do not agree with the term ""best practices"". See the working group about transport. There should not be a category named ""acceptable practices"", as both good practices and acceptable practices are accepted by the regulation. There should only be good practices. Hanging - shackle line: these practices are good practices !	ICF is following the requirements from the TOR, which state that there should be a gradation between the practices. The study team has defined a more detailed scale to enable distinguishing between different practices.
"Manual restraint 2"" should be ""Acceptable"" and ""Cone"" should be	All qualifiers have been reviewed and revised for

Comment	ICF Response
""Acceptable"" because both of these methods involve inversion of the birds.	consistency
Carrying poultry concludes ""Good practice"" but the colour scale shows Best practice"	Colour scale revised
Stun quality should be checked at basic level for EACH and every individual. not by looking at details such as eyes and reflexes, but by for example ensuring that the birds is hanging properly, no conscious movements, and no breathing. This is a minimum requirement for ensuring basic stun quality. This is included in Swedish animal Welfare legislation.	This information is in the text. See control procedure
The Danish legislation stress out The effectiveness of the stunning must be ensured according to a predetermined procedures: 1) at the start of each team employee at the slaughterhouse and 2) during bleeding as needed several places on the slaughter line. The slaughterhouse's standard procedures or guidelines for good practices must also specify which indicators should be included in the assessment of the effectiveness of anaesthetics. The requirements must be stated in the slaughterhouse's standard procedures or guidelines for good practice.	Text edited in control procedure table
Poultry Welfare off the Farm - Defra publication accessible at: https://www.gov.uk/guidance/poultry-welfare-off-the-farm . HSA DVD training package 'Poultry Slaughter - Taking Responsibility' and HSA publication Guidance Notes No. 7 'Electrical Waterbath Stunning of Poultry' accessible at: https://www.hsa.org.uk/downloads/hsagn7waterbathpoultryapril2016pdfoptimiser.pdf .	Not clear what GPs this comment is referring to
Photos would be more informative.	Noted – only drawings have been included.
it is not always good welfare to handle the broilers; unshackle an so if it unconscious after exit the water bath - It should not happen and other procedures is necessary	This comment is unclear.
There are differences between: - species,- type of stunning,- pre bleeding and post bleeding checks. ==> This has not been taken into account.	Noted
The best place to check the regular breathing is between the legs when they are shackled.	We have edited text as suggested.

Comment	ICF Response
It MUST be clarified that these signs of consciousness relate to birds stunned by ELECTRICITY only! Birds stunned with gas show a quite different pattern to be evaluated for stun quality, with a relaxed body, relaxed wings, no seizures....	Agreed – emphasis added.
Too much text, not practical.	Text consolidated
Query if less than 5% of birds showing signs of consciousness is the correct threshold? Dilated pupils are a sign of death, not of just a stunned animal. absence of a corneal reflex is a sign of an effective stun	Revised
I would use spontaneous blinking instead of pupils are dilated. When it says: ""If the bird is not unconscious you must stun it again. Once you have verified that the animal is unconscious, you should immediately kill it by bleeding."" How would be in a shackling line running at 12,000 /hour? How the operator guarantee that all animals are bled unconscious? "	Pupil dilation is less precise and less reliable. We have replaced pupil dilatation with spontaneous blinking for stun check. Drawing adjusted and also copied across to the on farm guide.
Under verification of death, point 3 refers to 'wings being 'detached' from body'. The HSA thinks this wording should be changed to 'wings hanging loose or limp'.	We have revised the text as suggested.
Still only focusing on broilers - the headline is poultry meaning; ducks guinea fowl and so on...	only chicken and turkeys are within scope
See previous comment. The EFSA toolbox distinguished between: - stunning system, - time of checking (before or after bleeding) furthermore, the guide implies it is necessary to check all the unconsciousness signs, which is not necessary!	Given the content of existing guides regarding consciousness indicators the documents offer a long list of indicators. Commercial practices of monitoring unconsciousness remain poorly documented. That includes the use of EFSA's SO.
These recommendations will not ensure proper monitoring of stun quality. See above and below.	Acknowledged, text revised
Not practical enough.	No clear direction on how to make it more practical
There should be an operator on the bleeding line observing all birds and checking further/back-up stunning/neck cutting all birds which give any cause for concern. I am not sure if the table is suggesting that the checking of a sample of animals is guidance for the AWO or the operator - this should be made clearer.	Revised

Comment	ICF Response
This section should be switched after the one related to stunning methods	Structure set according to the TOR
<p>One must know that unless the stunning equipment is totally broken or faulty, poor stunning can be expected to arise in maybe 1-5 % in the slaughtered birds. To find such poorly stunned birds, in order to correct such malfunctions, it is hence necessary to inspect 20-100 birds – it is simple mathematics. (And then this rises with the number of birds slaughtered, but not in a straight line – the higher the number of birds slaughtered, the lower the percentage of birds that have to be checked individually in this thorough way, because of the effect of n.) If checking one bird only when slaughtering for example 100 birds at a small slaughterhouse, you cannot rule out the risk that 99 % of the birds are poorly stunned... Basically, I would as an animal scientist argue that VISUAL inspection of stun quality (i.e. checking that birds show no breathing, no intention movements, no violent wing flapping and so on, without interfering with the birds), should be done for 100 % of the birds, regardless of the size of the slaughterhouse. One MUST check that they are unconscious before being bled! Then more in-depth controls, including checking reflexes, can be applied for a limited percentage of the birds only, plus of course on any birds NOT displaying good signs of unconsciousness at the superficial visual inspection.”</p>	<p>Agreed. Text edited accordingly;</p>
0.12 Amp for waterbath stunning, low frequency. Will give more predictable results.	<p>Note added to the text: Alternatively, stunning of chicken at low frequencies with 120 mA has also been used to achieve more effective stunning rates.”</p>
Danish legislations	No clear direction from comment
Electrical dry stun should be included, esp. for large poultry, ducks and other large birds as an option preferable to waterbath-stunning	Head-only stunning included
<p>Poultry Welfare off the Farm - Defra publication accessible at: https://www.gov.uk/guidance/poultry-welfare-off-the-farm. HSA DVD training package 'Poultry Slaughter - Taking Responsibility' and HSA publication Guidance Notes No. 7 'Electrical Waterbath Stunning of Poultry' accessible at: https://www.hsa.org.uk/downloads/hsagn7waterbathpoultryapril2016pdfoptimizer.pdf. HSA publication 'Practical Slaughter of Poultry - a Guide for the Small Producer'”</p>	<p>Not clear what GPs the comment is referring to</p>

Comment	ICF Response
The drawing of the waterbath stunner shows birds with their heads touching the bottom of the waterbath and the electrical electrode there. This is incorrect, they shouldn't hang that low. They should just hang in the water. (2)	Drawing reviewed
Need to distinguish between 'stun to kill' and 'stun to live'. Waterbath stunning is use to religious slaughtering.	Waterbath stunning for religious slaughtering is discussed in a separate document
please add more detailed photographs on the mechanical method, if possible	Noted
Hand held head only stunners must be set to deliver at least 340mA for poultry. The current must be applied for 5 seconds or longer and both carotid arteries must be cut within 10 seconds of the end of stunning. Advice that in addition to amp etc. being visible, there should also be a mechanism which indicates that the current was applied for the required duration. Whatever stun to bleed/kill interval is used, it should ensure that birds do not regain consciousness before they die. Waterbath Parameters. When using a 50Hz sinusoidal AC, we advise that the average current per bird that will induce cardiac arrest is approximately 120mA for chickens, 130mA for Ducks and 150mA for Turkeys. But we acknowledge that it is difficult to specify minimum currents for every frequency and waveform. Instead or in addition to, there should be routine inspection on the adequacy of the stunning and neck-cutting procedures. Key is that the birds do not regain consciousness. "	Parameters from Regulation 1099/2009 have been included in the documents
More information on the depth of water, the risk of pre-stun shocks and other problems would be useful.	Text revised
See answer above - and what about other stunning methods as gas and atmosphere pressure.	Out of scope
as above Plus could mention steps to reduce the likelihood of pre-stun shocks when using a water bath e.g. ensure water does not overflow at entrance, ensure the entry ramp is electrically isolated from the water inside the water bath. The use of breast comforters along the shackle line can greatly reduce flapping and calm birds.	Text edited
Under parameters, there are no minimum voltages and currents given for manual stunning of large birds over 2.5 kg - consult Steve Wotton.	Parameters indicated in Table.

Comment	ICF Response
Actually most of slaughterhouses that use Waterbath stunning are not applying the current required by 1099/2009. This happen in all places around the world because it caused lots of injuries and losses. Some companies are trying different types of current (hybrid) and are avoiding to much losses but at the same time do not guarantee the loss of conscious."	Noted
still just focusing on broilers/hens	Text mentions distinctions between chicken and turkeys
The stun-to-stick time should be a maximum of 15 seconds from the start of stunning.	Immediately after stunning, followed by reference times found in existing guides
The tab related to parameters (page 1 mechanical methods) should be formatted and the voltage should be verified. Page 2 is not clear the format of the page. Moreover, in the upper left side of the page, there is a * but I cannot find the reference	Text edited
The heading ""mechanical method"" for an electrical stunning method is very confusing. Suggested heading is ""automated method"" instead.	Text edited
Electrical waterbath is in the regulation, so it is good practice.	All qualifiers have been reviewed.
I don't know enough about the relative costs and positives of the two stun approaches	No action

A4.1.2 Slaughter without stunning

Table A4.5 Cattle

Comment	Response from ICF
"It may be addressed in later documents. But I suggest to add the different step covered by SOP and more generally speaking by ""religious rites"" : initial state of the animals (when does it start) and final expected state	A separate document addresses SOPs for small slaughterhouses; SOPs for other operations are out of scope
It should say ""SOPs should be displayed in a place where ... workers can see them"" rather than ""It helps to have...""	Section revised completely

<p>The European Regulation n°1099/2009 defines "killing" as "means of any intentionally induced process which causes the death of an animal", and "slaughtering" by "means for killing of animals intended for human consumption". Also, in Art. 4-1, it is highlighted that "Animals shall only be killed after stunning". That is why we wonder if it is accurate to use the term "slaughter without stunning", as the definition provided in the regulation requires that slaughter includes stunning. On the other hand, the European Regulation gives a clear definition of the special status of the religious slaughter of animals. In Art. 2, the "religious rite" is defined as "means a series of acts related to the slaughter of animals and prescribed by a religion", and the religious slaughter is designated in Art. 4-4 by "particular methods of slaughter without stunning prescribed by religious rites". So, given the above remarks and documents, please note our remarks and suggestions for your documents "The Basis Rules":</p>	<p>wording throughout revised to "slaughter without stunning prescribed by religious rites"</p>
<p>(1) The title of the consultation should be "Animal Welfare Consultation: Religious Slaughter" rather than "Animal Welfare Consultation: The Slaughter without Stunning"</p>	<p>(1) wording throughout revised to "slaughter without stunning prescribed by religious rites"</p>
<p>(2) The definition of "religious rites" should be given</p>	<p>(2) Revised introduction refers to Regulation No 1099/2009: "religious rite' means a series of acts related to the slaughter of animals and prescribed by a religion"</p>
<p>(3) Include the wording of Art. 4.4 "In the case of animals subject to particular methods of slaughter without stunning prescribed by religious rites, the requirements of paragraph 1 shall not apply provided that the slaughter takes place in a slaughterhouse", and highlight that the European regulations establish that derogation from stunning animals prior to slaughter is done to comply with the need to respect "the freedom of religion and the right to manifest religion or belief in worship, teaching, practice and observance, as enshrined in Article 10 of the Charter of Fundamental Rights of the European Union" paragraph 18.</p>	<p>(3) Text revised in introduction</p>
<p>(4) The phrase "For animals subject to slaughter without stunning for the purpose of religious rites" should be replaced by the terms used in the European Regulations "In the case of animals subject to particular methods of slaughter without stunning prescribed by religious rites"</p>	<p>(4) Text revised in introduction</p>

(5) The European Regulation defines the notion of religious slaughter, but as a secular document, it is not competent to give a detailed technical definition for the religious practices. Also, you highlight in the introduction that the controls in place in Europe have shown that there are poor practices occurring in the religious slaughter of animals. Indeed, when the business operators do not directly involve the competent religious authorities, poor practices are easily introduced, and both animals' and consumers' rights are not respected. That is why religious representatives must be present to prepare and supervise the application of the SOP. Also, clear technical descriptions of the religious slaughter have to be requested from the competent religious representatives and then it is appropriate for the secular authorities to hold both the religious supervision agencies and the slaughterhouses responsible for meeting the written requirements.

(5) It is outside the scope of the document to address the roles of other parties than the business operators, or to discuss any issues pertaining to training.

(6) Our organizations suggest that religious representatives have to be involved in preparing and applying the SOP and to train religious operators on animal welfare for the purpose of assuring that both animal welfare and religious practices are properly carried out.

(6) See 5

The text should clearly identify - Who are the "Business operators" - What requirements are necessary for this "Certificate of competence", who issues this certificate. - Who is and how to identify the competent authority in each Member state (a list as an annex would be extremely useful) The basic rules should also include a paragraph explaining that most of the halal produce in Europe is destined for exports to more than 60 countries whose regulations must also be observed. E.g. Most destination countries do not accept pre-stunning for halal slaughtering, hence some Member states will lose their capacity to export to these destinations. "

The purpose of the document is not to provide this kind of information, which is outside the scope of the work. The purpose of the document is not to set new standards and therefore it does not prescribe practices that will hamper exporting activities.

Additional info from Borest Final report and Interbev Guide For example, anti back-ward systems, visual control of the restraining procedure, max delay for the cut after the end of restraining, Maybe you should also underline that there is a recommended order to start the different pushers depending on the device ...

The Borest report and Interbev guide were reviewed.

Noted. Conveyor systems are used only for calves. The revised text makes this clear.

Based on my experience, conveyor system is not a good practice for cattle because of issues with head restraint. Abattoirs equipped with some of these

systems stopped to use it. But maybe there are some new systems I'm not aware of and I would appreciate reference

UK and others will have additional good practice in national rules but the introduction says that this guide would cover EU requirements only

National guides have been reviewed to prepare consultation documents.

Please check some Halal Standards (different approaches to stunning) SMIIC OIC OIC/SMIIC 1 General Guidelines on Halal Food (<https://www.smiic.org/en/project/3>) GSO 2055-1:2015 HALAL FOOD - Part 1 : General Requirements (<https://www.gso.org.sa/store/gso/standards/GSO:693304?lang=en>) MS 1500:2009 (E) HALAL FOOD - PRODUCTION, PREPARATION, HANDLING AND STORAGE - GENERAL GUIDELINES (SECOND REVISION) (https://www.msonline.gov.my/catalog.php?score=checked&istc_id=66) Halal Institute - Regulation of use Halal Guarantee Mark (<http://www.institutohalal.com/certificacion/?lang=en>)

These standards are used by EU operators to export to third countries. Unfortunately they have not been made accessible to the study team...

Any form of mechanical restraint is acceptable according to 1099/2009. Any guide needs to make it clear that it is not exclusively the methods it states that would comply with the legislation.

A disclaimer has been added to all documents to clarify the non-binding character of the information they contain

The time to lose consciousness in upright position is shorter than inversed position (cfr. Report WUR 405), which means that the upright position might be less interacting negatively on animal welfare, and there is no prove that rotated restraining give more stress than up right (both induce a serious amount of stress !) WUR Report 379 !! Further investigation is necessary in my opinion. < 5 % vocalisation is best practice (T. Grandin) To strive towards that is necessary in my opinion to strive to a use of < 5 % in use of electric prod. I think it is necessary to mention and emphasise these numbers, < 1% should slip on the floor (T. Grandin). For the conveyor system we should be aware that the distance between animals should be large enough to ensure that the head couldn't rest on the back of the animal in front because after the throat cut this might induce contact of the wound edges with will augment ballooning phenomenon! Up-right systems should always have a belly plate, because otherwise, after collapse after the throat cut, the wound edges will touch the restraining device in some cases and will induce ballooning with rise in time to lose consciousness and so a decrease in animal welfare The head restraining should not be released before loss of consciousness,

There is a lack of knowledge on the relative merits of upright or rotating systems, which prevents a firm qualification of these methods. The pressure of abdominal organs on the chest, which results from rotation, is the only obvious element in this debate. There is no proof that loss of consciousness occurs more rapidly in an upright position. Suggestions drawn from Temple Grandin's publications are not based on firm evidence either.

<p>which in practice happens to often. There is a difference between the day to day practices and the legislation. The bounds between AWO and the slaughterhouse management is tight sometimes in my opinion. Etc. many things to remark in general, big space of improvement, in control on good practice in some member states I think.</p>	
<p>pigs are unlikely to be ritually slaughtered</p> <p>The conveyor belt depicted shows animals of different species on the same line, which technically is not the case.</p>	<p>The picture of a central track restrain has been revised.</p>
<p>Conveyer restraint is not compatible with Article 15(2), which requires that animals that are killed in accordance with Article 4(4) without prior stunning are individually restrained</p>	<p>The conveyer restraint is in fact the conveyer belt which is before the individual restrainer. The belt move animals one by one to the foot of the restrainer. This is a well-known technical system already used in slaughterhouses.</p> <p>This system perfectly respects Article 15(2), which requires that animals that are killed in accordance with Article 4(4) without prior stunning are individually restrained</p>
<p>The following phrases are unclear and require editing. The quotes we refer to in the consultation document are in quotation marks and our comments are written after the dash: 'Slaughter methods without stunning' - throughout the consultation whenever the word 'stunning' is used, it should say 'mechanical stunning' as the shechita method fully complies with the EU definition of stunning as set out in the legislation (Article 2(f)). 'Stunned before or after cutting its throat' - this should read 'mechanically' stunned as shechita incorporates an integral stun and fully complies with the EU definition of stunning as set out in the legislation (Article 2(f)). [2]</p>	<p>Till now, according to the definition of Article 2(f), no method used in ritual sacrifice is recognised as a "stunning". To obtain this recognition, (shehitah or dhabiha) a scientific study should be undertaken officially and conclude that this method could be an approved method.</p>
<p>""It is also safer for the slaughtermen. A poorly restrained animal will struggle. Cutting and bleeding will be difficult. It will also be more painful for the animal, and could be dangerous for the slaughtermen."" This is an opinion and not a certainty, it is therefore inappropriate for the document to use the word 'will'. This should be replaced with the word 'may'</p>	<p>Text edited: "will" has been replaced with "would" or "could"</p>

<p>"In case the animal is stunned before or after cutting its throat, restraining facilitates stunning as well"" "For the Jewish community, it is not permitted to stun the animal before or after slaughter.</p>	<p>The documents are not including any comments on what the views from the different religious communities are.</p>
<p>In the conveyor belt, animals should not be moved during the bleeding process. - Control procedure: the use of electric goads in 20% of the animals seems too high to look good.</p>	<p>The source of this of this good practice target is the BOREST report. The use of goads should be minimised.</p>
<p>Complete the first sentences "For the use of slaughter methods without stunning, be "in accordance with Article 4(4)".</p>	<p>Text has been revised</p>
<p>The religious slaughterer needs training and empowerment from his religious authorities. It is actually our belief that most self-proclaimed halal slaughtermen are not competent to perform religious slaughter.</p>	<p>Noted. Training is out of scope.</p>
<p>Examples are needed to illustrate situations of non-compliant restraint systems with the size or the category of the animals. For this, I note that some animal welfare associations used videos of situations with non-compliant systems to demonstrate a supposed cruelty of the religious slaughter. It is important to note that such violations need to be corrected but do not directly reflect on the religious slaughter.</p>	<p>Noted. Due to resource constraints no illustrations of non-compliant systems could be included.</p>
<p>The cost of the equipment might not be a disadvantage for good practices.</p>	<p>This study has included qualitative cost indications for all the methods. As the definitions of the scale indicate this is not an element that comes into play to qualify a practice as "good". Hence, a "good" practice can also be very expensive.</p>
<p>As far as I know, conveyor belt is not very used in Europe (only for calves) and we have strong concerns with this system [2]</p>	<p>Noted – We are aware that it is used for calves only and we have made that clear in the text.</p>
<p>It is not proper to include the sentence ""In case the animal is stunned before or after cutting its throat, restraining facilitates stunning as well" because the subject here is slaughter without stunning.</p>	<p>The text has been revised to clearly indicate that it covers slaughter that may involve unauthorised stunning methods.</p>
<p>Repeatment of: not dangerous of the slaughterman- safer for the slaughterman in the first alinea</p>	<p>Text edited</p>
<p>Differences between the different categories of bovine are not addressed. This is a</p>	<p>Pens need to be adjusted for size. This is already</p>

major issue in small abattoirs [2]	mentioned in the text.
More details and particularly images are necessary	Noted, no edits required. Illustrations have been revised
As written, the consultation reads as if religious slaughter is inferior to other methods. As a best practice guide, it needs to ensure that this is not the case.	The document does not constitute a best practice guide, but a summary of ways of complying with the requirements of Regulation 1099/2009. For slaughter without stunning as well as for other documents, a range of practices has been included.
YES the level of detail is sharp enough, but there should be added some more things see the first section (vocalisation best practice < 5%, < 1% slipping, < 5% electric prod is BEST practice and that	See response earlier to similar comment.
No distinguishment made. Need to pay attention that e.g. boxes for average calves are not adequate to be used for small calves"	The document already states that restraint systems should "be adjustable to the size of the animal"
"Suggest reconsidering the advantage / disadvantage for upright restraining and rotating pens; Ballooning is easier to resolve in a rotated position than in an upright position. Description on possibilities for post cut stunning in the different systems is lacking.	There is a lack of knowledge on the relative merits of upright or rotating systems, which prevents a firm qualification of these methods.
Still to be defined who are included under the category ""Business operators"", but it is too technical / complex for some slaughterers [2]	Section on basic rules has been edited.
Rotating boxes are good practice due to our opinion.	There is a lack of knowledge on the relative merits of upright or rotating systems, which prevents a firm qualification of these methods. Rotating boxes have been qualified as acceptable.
Upright restraining pens should be judged as acceptable instead of good practice.	There is a lack of knowledge on the relative merits of upright or rotating systems, which prevents a firm qualification of these methods. Upright boxes have been qualified as acceptable.
Preliminary remark replace electric shock with electric current	Text edited as suggested.
In the standing position, the management of ballooning is far more difficult than in	

the inverted position. Furthermore, there is a higher risk of contact between the wounded area and the restraining device that can affect bleeding. Last scientific research from Dutch team show a higher risk of delayed loss of consciousness Where there is no belly pusher, the animal can fall Therefore I suggest to rank the system as acceptable

Regarding conveyor systems, based on my experience, the system is unacceptable because the head restraint is very poor and animals are hung during the bleeding. The abattoirs themselves stop using these systems because of poor welfare conditions

Regarding rotating pens, one of the main advantage of the system is that the bleeding could be performed far more easily and more precisely than in standing position; in particular the monitoring of the bleeding and the management of balloning. Therefore I do not understand the disadvantages Furthermore, you should be aware that some religious authorities are opposed to the use of upright system. The rotation induce of course a stress but the main stress of the animals is handling/restraining procedure. And this happen in all system. What is important with rotating is the duration of rotation and the time spent by the animals in inverted position. Modern design of rotating pen+ immediate bleeding after the end of rotation (

There is a lack of knowledge on the relative merits of upright or rotating systems, which prevents a firm qualification of these methods.

The rotation is advantageous only for cutting, not bleeding.

Rotation of cattle should be deemed unacceptable. It can't be that some countries find it ok but others don't on welfare grounds but the EU thinks the poor welfare is acceptable. [2]

There is a lack of knowledge on the relative merits of upright or rotating systems, which prevents a firm qualification of these methods.

There are no examples of 'Best' practice in the guidelines. This method of slaughter is sanctioned within EU law and there should be an example of best practice. This is not clear in the current guidelines. 'Rotating Pen' - this is classed as acceptable. However, Report from the Commission to the European Parliament and the Council (2016) on systems restraining bovine animals by inversion or any unnatural position stated ""Both systems have advantages and disadvantages. The upright system was in the past considered more appropriate for the perspective of animal welfare because it does not put the animal in an unnatural position. Data collected on more than one thousand animals in the EU show that from an animal welfare point of view there is no conclusive findings indicating that one system is better than the other. Due to the variety of the situations found in slaughterhouses, the animal welfare outcomes depend more on the way devices

There is a lack of knowledge on the relative merits of upright or rotating systems, which prevents a firm qualification of these methods. The disadvantages do not justify calling either of these methods "best".

are designed and used than on the position of the animals (upright or inverted)."" All systems should, therefore, be classed as BEST	
Upright and inversed restraining, see remark WUR research reports 379 and 405. So this requires further investigation. Conveyor, distance between the animals?, wounds touching the back of the animal in front of the cutted one, ballooning incidence ... , rotating system, faster time to unconsciousness, same amount of stress than upright (WUR reports)? I do not agree with levels of practice here because of the mentioned research data.	There is a lack of knowledge on the relative merits of upright or rotating systems, which prevents a firm qualification of these methods.
The 180° position is not recommended for halal slaughter.	The documents do not discuss the relative preferences of different religious communities
I would change the wording around electric goad use so that it is clear that electric goads should not be used routinely.	The document already states that "Use of electric goads should be avoided as far as possible "
Also 20% electric prodding doesn't seem consistent with 10% vocalisation. 10% or less should be used for both (if electric prodding is to be allowed)	Agreed. To be edited. It should be noted that both indicators are drawn from the BOREST report.
First of all, it is not clear the distinction among what you call "unacceptable, acceptable, good and best" (is it arbitrary??) - Where this distinction is based upon? Currently there is no EU welfare reference system in use as regards slaughter without stunning.	The distinction is explained in the introduction to each set of documents. The qualifiers have been all reviewed and confirmed by experts from the study team.
penetrative captive bolt electrical stunning	Out of scope
To use a non penetrating device which is usually pneumatic, head restraint is mandatory. It should be highlighted in the text Suggestion : delete non authorised in the first paragraph because it sounds strange and explain later that non penetrating is not included in annex 1 and only allowed in this case	The text has been edited to add mention that, for the use of this method, the head should be restrained. The wording of "non-authorized method" has been discussed and confirmed with the Commission
There is extensive guidance from the Humane Slaughter Association on stunning. Does not mention that animals must be rendered unconscious until death even if the method of stunning is not one authorised in Annex 1 of 1099/2009 or the more detailed requirements for checking in Article 5	Revised "One should carefully assess whether it renders the animal unconscious until its death."
(regarding stunning with non-penetrative captive bolt) This method is not acceptable under Jewish law. The guidelines need to make this clear to users. As they stand, some operators may feel that this is an accepted religious method and	The revised text mentions that some religious interpretations may accept the use of non-authorized methods of stunning.

try and enforce this on operators. This needs to be taken into account when redrafting.

Criteria to check unconsciousness (which should be fulfilled before loosening the animal from the restraining device). Neither regular breathing (visibility insufficient, ear pinch (EEG shows no evidence of unconsciousness WUR reports, etc.). Loss of posture can't be evaluated properly since the restraining has to continue until the animal is unconsciousness and then is legally permitted to loosen. In my opinion only than this parameter can be evaluated. Only the induced eyelid reflex and cornea reflex are good but conservative parameters.(Report Vanthemsche 2015 Joods ritueel slachten NL)"

It is a requirement to check for signs of consciousness. The fact that the equipment may hamper monitoring may justify changes to the equipment used.

"Non penetrating captive bolt is not authorised due to the high percentage of ineffective stuns. Ineffective stun is very painful to the animal and therefore cannot be recommended neither for religious slaughter.

This is authorised by derogation for religious slaughter. However, there are uncertainties on the maximum animal weight for which this may be allowed. This requires clarification, which cannot be provided as part of this project.

suggestion : pneumatic device instead of thermic one / head restraint

Agreed – Text already mentions “charge or air pressure”

not enough detail

This comment lacks the sufficient level of detail that would enable ICF to address it.

In this section, we can no longer speak about slaughter without stunning. So I will not comment because as mentioned before, Muslim representatives in France do not accept any kind of stunning. However, I want to draw your attention to this item: the document should not include the sentence “Some religious interpretations may allow the use of non-authorized methods of stunning.” It is more proper to specify that “The business operator has to request the opinion of a competent religious institution and accept being supervised by such an organization to meet the religious requirements for halal or kosher products”. In fact, these secular guidelines should not highlight particular religious opinions to avoid taking sides in religious discussions that are the proper domain of the religious authorities. Also, our organizations have noted that when such remarks are included in formal guidelines, the veterinary staff sometimes tries to impose stunning on the plant.

The documents are not including any comments on what the views from the different religious communities are. The documents indicate that stunning is optional, not compulsory.

Percussive stunning causes fatal damage to the skull of cattle (hence stunning would be irreversible, therefore unacceptable). Please refer to the images and diagrams in the Malaysian Standard MS1500	Damage to the skull is an acknowledged risk of this method.
Doubts about the success rate of the technique (statistics per MS) Are those statistics reliable?	The reliability of the technique is an issue acknowledged in the documents
In the monitoring of unconsciousness, collapse should be included as indicator of unconsciousness. Non penetrating captive bolt should not be used in cattle!	Collapse was added to the control procedure table. Reservations on non-penetrative captive bolt have been noted.
Non penetrating captive bolt should not be used in cattle!	This is allowed for ritual slaughter by derogation
With pneumatic device, exit length of the bolt/mushroom has an impact on the stun efficiency and the frequency of skull lesions. It is not possible to provide slaughterhouses with precise figure but it can be useful to inform them that they should monitor	Agreed – Text edited, adding: “you may monitor how the length and shape of the bolt impact influence whether the stun is successful or not, and whether it causes skull lesions.”
availability of back-up equipment and more generally speaking stunning procedure should be performed in the same way as conventional stunning Maybe it could be relevant also to refer to the Malaysian code	Control procedures, including availability of back-up equipment, are already included in the document.
There is no information of permanent damage caused by stunning, which is considered in several International standards (mentioned)	The draft mentions the risk of skull damage as a disadvantage of the technique.
I think the all the parameters to check unconsciousness are not valid in my opinion (cf. WUR reports)	Already addressed above
Not clear who can give the derogation (based on national legislation? case by case?)	This is a matter for Member States to decide
Some more information about the appropriate size/age of animals for this stunning method. [2]	The manufacturer’s instructions should be followed to identify what bolt size and charge should be used for different categories of animals. This is already mentioned.
I don't have enough knowledge on this way of reversible stunning, I know that New Zealand electrical stunning when applied correctly is a valid method for reversible stunning ... "	The use of electrical stunning is mentioned later in the document.

<p>"Should be ""acceptable"" only, as the risk of poor stunning is relatively large. Still better than no stunning, though, so I can see why this classification has been chosen... [4]</p>	<p>We propose to qualify this method as "acceptable" because it does not work that well.</p>
<p>I would qualify this method as unacceptable [2]</p>	<p>We propose to qualify this method as "acceptable" because it does not work that well.</p>
<p>The cost and the maintenance of the stunner are not disadvantages compared to the advantage from an economic point of view for the slaughterhouses (speed line), for safety (operators) and for animal welfare. Advantages should include economic, safety, welfare</p>	<p>Acknowledged.</p>
<p>Non-penetrative captive bolt is qualified as ""good practice"". Is stunning is not allowed (depending on the destination market), stunning is ""unacceptable"". If this method is allowed, it would depend on the damage to skull and on its being reversible, qualifying as ""acceptable"" only if it meets International standards requirements</p>	<p>We propose to qualify this method as "acceptable" because it does not work that well.</p>
<p>Not confident towards the method, I have not enough knowledge at this moment to make a valuable comment but have many questions about this method that I mentioned in earlier section, especially on regaining consciousness and the time period in which this will happen, the condition in which animals will be after this kind of handling.</p>	<p>Noted</p>
<p>ballooning can be resolved by using the knife again</p> <p>Bleeding should occur immediately after the end of head restraint or rotation: less than 5s and preferably less It means that the bleeding operator should be ready before the end of the restraining procedure. This is a major concern it some of them Regarding knife length, to be honest, nobody has reliable recommendation on length. However, Replace vein with arteries. Clot arteries will delay the loss of consciousness. This is the major issue (not the death) The recommendation regarding the head restraint are contradictory. Regarding the monitoring of blood flow, I strongly with the recommendation and this does not reflect the reality of good practice. Clots appears not sometimes but frequently. Therefore operators shall monitor carefully the bleeding and perform corrective cut (only the clot without touching the wound) in the 5-15 s after bleeding Stunning is only recommended for the animal that show obvious significant problems of bleeding or</p>	<p>After the first cut the animal should not be manipulated again until loss of consciousness. The only other option to use captive bolt regardless of whether the carcass is rejected afterwards. If ballooning occurs frequently, the cause should be investigated and corrective action taken.</p> <p>It is fair to suggest "would/could" rather than "will". The text has been edited accordingly.</p> <p>Monitoring signs of consciousness is required by law.</p>

<p>obvious sign of consciousness. This is of particular importance because if you stun all the animals that show ballooning, it means that you will increase dramatically the number of animals cut without stunning because the stunned ones will be rejected according to the rite Sign of life: you should rewrite by distinguishing consciousness and life. Loss of consciousness does not appear within 10-15 s (where does it come from?) Tongue hanging out ... does not apply in this context It is recommended to wait at least 45 seconds, and up to 90 seconds, before checking sign of consciousness and, if relevant, releasing the animal from restraining. heart beat is maintained during a relatively long period after the end of bleeding and the absence of any sign of death (corneal reflex, absence of breathing/gasp, loss of muscle tone</p>	<p>However, EFSA opinions expand to include checks for signs of life too. The time periods as to when the animal will lose consciousness and /or die are guesses, but 10-15 sections is right as a minimum.</p>
<p>Please note that the sentence "There should be no further cuts after the initial single incision." is suitable in cases where no blood clots have formed. Otherwise, it may be necessary to cut a second time to increase the flow of blood. "Sometimes, blood clots form and reduce the flow of bleeding, generally within 5 to 15 seconds after cutting the throat. If that is the case, the animal should be stunned with a back-up stunning method (penetrative captive bolt, electrical stunning)." Please complete with "But if the slaughterer (who must be trained for this case) is ready, he can perform an immediate second cut to speed up the time to unconsciousness. Ideally it should be a rare occurrence as it can cause loss of the animal as halal or kosher. That is why it is important to improve the plan, the slaughterers' skills, and the SOP to reduce the number of such cases..."</p>	
<p>The parameters for measuring unconsciousness are not valid in my opinion. For cattle, 10 to 15 s is not realistic when it comes to loss of consciousness. Because of the anatomical differences (a. vertebralis) and the physiology (pressure) cattle in the circumstances of most of the European slaughterhouses and procedures. 45 sec is in my opinion much to long before proceeding to a reliable and irreversible stunning method. "</p>	<p>The time periods as to when the animal will lose consciousness and /or die are guesses, but 10-15 sections is right as a minimum.</p> <p>Existing guidance on time to irreversible stunning varies.</p>
<p>"The image is not clear if the other artery to the carotid is the vertebral or a different one. It might be recommended to name them.</p>	<p>Noted</p>
<p>In section Monitoring signs of life - first list should be titled Signs of unconsciousness; It cannot be said that consciousness lasting longer than 45 sec</p>	<p>Edited - the aim of the consultation is also to gather feedback on the feasibility of the different practices;</p>

is unacceptable but in one MS can last 150. If we accept 150 sec in one country we accept it in others too.	for this reason, different durations are presented.
Please specify the title "The religious bleeding operations"	This document is strictly for slaughter without stunning prescribed by religious rites.
A second knife and sharpening equipment should be available at all times. Good. Please add that "the slaughterer has to be well trained to sharpen the knife and know how to use the sharpening equipment."	Text edited.
Please rephrase this sentence: "It should not be contaminated with stomach content." By "If any contamination by stomach content occurs, it must be cut or carefully cleaned after the death of the animal."	This relates to other issues than animal welfare and are as such beyond the scope of the study.
Please complete this paragraph "Sometimes, animals take too long to lose consciousness. In case of prolonged consciousness, the animal should be stunned with a suitable method. A workable back-up solution for stunning is required (penetrative captive bolt, electrical stunning)." "But post-cut stunning cannot resolve problems resulting from the restrained system, lack of slaughterer skill, and other non-compliances with the previously establish plan. In fact, a prolonged consciousness usually reflects animal welfare issues before the cut and sometimes the incompetence of the religious slaughterer."	Text edited.
Frontal images , dotted lines indicating the cut are required	Noted
Throughout the consultation whenever the word 'stunning' is used, it should say 'mechanical stunning' as the shechita method fully complies with the EU definition of stunning as set out in the legislation (Article 2(f)). The following phrases are unclear and require editing. The quotes we refer to in the consultation document are in quotation marks and our comments are written after the dash: 'Knife' - The guidelines are a requirement of Jewish law, it is also a requirement that all slaughterman are trained in knife sharpening and regularly sharpen their blade between animals. 'The animal will lose consciousness more quickly' - this is an opinion and not a certainty, it is therefore inappropriate for the document to use the word 'will'. This should be replaced with the word 'may' ""one continuous back and forth movement"" â€" this is unclear and should read continuous back and forth	Till now, according to the definition of Article 2(f), no method used in ritual sacrifice is recognised as a "stunning". To obtain this recognition, (shehitah or dhabiha) a scientific study should be undertaken officially and conclude that this method could be an approved method. There is no guarantee that sharpening knives will quicken death, but it will help. Agreed to replace "will" with "could". Text edited.

<p>movements as stated in Welfare of Animals at Time Of Kill (England) 2015 Part 2, 5, a.</p> <p>"The wound should not be interfered with until the animal has lost consciousness"" "It is standard practice for the Shochet (trained Jewish slaughterman) to perform a manual check on the cut after shechita has been performed. A line should be added to the stating 'apart from the manual check performed by the shochet.' "Sometimes, blood clots form and reduce the flow of bleeding, generally within 5 to 15 seconds after cutting the throat. If that is the case, the animal should be stunned with a back-up stunning method (penetrative captive bolt, electrical stunning)."" "Shimon to advice. Monitoring signs of life "Article 5 (2) does not mentions signs of life, only signs of consciousness. It is confusing for the end user to mix the language as it becomes unclear as to what they are looking for. This should read 'signs of consciousness' ""After cutting the animal's neck"" "this language is pejorative and needs to be changed. It should read, after slaughter. ""Signs of life"" "this is misleading. Not only should it be consciousness as prescribed in the regulations, this also implies that the animal is still alive. This should be changed to 'Signs of loss of consciousness' ""this occurs within 1 to 2 minutes after cutting in cattle"" "this is not a sign of consciousness and should be removed. ""It is recommended to wait at least 45 seconds, and up to 90 seconds, before releasing the animal from restraining."" â€" operators to advise ""Cutting an animal's neck causes pain and distress. Therefore, to stun after a delay of loss of consciousness after 45 seconds may be acceptable practice (150 seconds in one Member State) but any longer would be unacceptable practice."" â€" There is no evidence to support this statement and no provision in legislation to stun after loss of consciousness. Therefore, this line is removed as it stating a negative opinion of religious slaughter rather than providing that facts for operators.</p>	<p>It is very clear that the wound should not be interfered with once the animal has been cut.</p> <p>Text edited replacing "signs of life" with "signs of unconsciousness"</p> <p>Recommendations to stun to kill due to prolonged consciousness after cutting are found in existing guides to good practice.</p>
<p>"The absence of signs of life must be verified before the slaughtering (dressing) can continue."" ""'slaughtering' should be changed to 'the slaughter process' In the Control procedures section: 'Operator skills "Train operators to improve their skills.' - this is repeated in the 'Cut' section.</p>	<p>Text revised.</p>
<p>'Time between stunning and ritual cutting' - this is not permitted according to Jewish law. This should be made clear in the guidelines. The word ritual is pejorative and should be removed. "</p>	<p>Text edited – time between stunning and cutting. The document is not discussing the views from different religious communities. The document makes clear that stunning is optional and allowed or</p>

	required in certain communities/member states.
there is no information on how to proceed back up stunning	This is mentioned in brackets (penetrative captive bolt, electrical stunning). A detailed discussion of these methods is beyond the scope of the assignment.
Please remind the reader that: "Where, for the purpose of Article 4(4), animals are killed without prior stunning, persons responsible for slaughtering shall carry out systematic checks to ensure that the animals do not present any signs of consciousness or sensibility before being released from restraint and do not present any sign of life before undergoing dressing or scalding." Yet I would like to bring to your attention that from a scientific point of view, the animal needs to be unconscious before being released, and it needs to be insensitive before being further cut. But from the Muslim religious point of view, the animal needs to be dead before being handled after the religious cut.	This is already mentioned in the document.
Additionally to cutting the two carotid arteries and jugular veins, both the trachea and oesophagus must also be cut in the same movement. CF referenced International halal standards	These requirements are specific to some religious communities and do not entail an animal welfare aspect.
Signs of life and signs of consciousness are mixed in the text. Bold title with signs of life is not correct. Mariella Debille did a extensive in the Netherland concerning the different signs of unconsciousness. The cornea reflex seemed to be most correct one. This is not clear in the text. "	Text edited.
"Do not state the Dutch and Spanish times. This is confusing. Better to have the 45 seconds and then state or see other national rules. 45 seconds should be the norm. It isn't clear what non-dutch or spanish countries should be seeing. Also confusing having >45 seconds after cutting or >90 seconds. Not clear why the two options	The document mentions the variety of recommendations available in existing guides, as requested by the Commission.
Remove this sentence: "If the animal was stunned (by a non-authorized penetrative captive bolt), it should be cut immediately after signs of unconsciousness have been verified "because it is off-topic.	In scope. No change needed
Please remove this non-objective sentence "Cutting an animal's neck causes pain and distress". Actually, it is possible to say this about the other methods of slaughter also and this information has simply not been studied in a credible	Text edited to: "is likely to"

<p>fashion. The following sentence has to be rephrased "Therefore, to stun after a delay of loss of consciousness after 45 seconds may be acceptable practice (150 seconds in one Member State) but any longer would be an unacceptable practice." In fact, the post-cut stun is not mandatory according to the regulation. The only explicit formal obligation is "to ensure that the animals do not present any signs of consciousness or sensibility before being released from restraint" Art. 5.2.</p>	<p>Post –cut stunning is optional, not mandatory, according to the Regulation. Text makes clear that this is in line with some religious interpretations only.</p>
<p>In terms of animal welfare this matter for this species is in my opinion unacceptable. The time for loss of consciousness, the validity of the parameters to assess consciousness and unconsciousness is not good, the reliable parameters for testing unconsciousness are very conservative. Taking action only after 45 s if the animal are still conscious (and most are e.g. WUR reports EEG measurements) is too late in my opinion, because of major implication on animal welfare. There are some stunning methods that are compatible with religious practice (Johnson et al. 2012).</p>	<p>Noted.</p>
<p>Head restraining and support: mixing the two paragraphs because the first mentions continuing supporting the dead, the second paragraph mentions to release partly. Both are correct, but better first mention realises partly and then the advantages of continue supporting</p>	<p>Agreed, text edited.</p>
<p>I would recommend to rely on the indicators of unconsciousness and death instead of the time (45s).</p>	<p>Noted</p>
<p>Images of different species would be useful</p>	<p>Noted</p>
<p>There is something wrong on page 2, where it says "Signs of Life" and then comes a list of signs of unconsciousness. Needs correction! [3]</p>	<p>Text edited</p>
<p>I would recommend that back-up stunning is used ""no later than 45 seconds"" if signs of consciousness, or inefficient bleeding are evident.</p>	<p>Noted</p>
<p>The section does not include qualification [2]</p>	<p>Noted</p>
<p>There are no examples of 'Best' practice in the guidelines. This method of slaughter is sanctioned within EU law and there should be an example of best practice. This is not clear in the current guidelines.</p>	<p>There is a lack of knowledge in this area. Guides available are incomplete and vary. This does not allow for the use of "best" qualifiers in this area.</p>
<p>Stun after 45 seconds is a long period and should not be mentioned as an acceptable practices. Moreover, in different slaughterhouse the post-cut stun</p>	<p>45 seconds is a value proposed in existing guides? It is kept here as the shortest GP target that has been</p>

(immediately after the cut) is practised, this is a good or acceptable practice. (The 40 second delay in The Netherlands is a political choice). "	identified.
In the initial paragraph, it may be mentioned that slaughterhouses can of course choose to implement post-cut stunning also in countries where this is not necessarily a national requirement.	"The present document only refers to the EU rules without prejudice to stricter national rules which may provide additional requirements."
Post-cut stunning can also be carried out using a PENETRATING captive bolt, which is usually more efficient. [5]	Out of scope
Electrical stunning can be used before the neck cut (NZ) Applying electrical stunning after the cut seems to me not feasible because of the movement of the animals and the blood flow. But I have no experience of this procedure On the contrary, most of the post cut stun are performed in abattoirs using non penetrating or penetrating captive bolt. There is a total lack of information on these procedure"	If this refers to electro immobilisation by passing current through the spinal cord, then that does not correspond to stunning.
"No clear the position of the electrodes. It might be indicated. [4]	Noted. Picture and text added.
Please complete the introduction sentence "Some stricter national rules may require that the animal should be rendered unconscious after neck cutting, "with "provided that they do not violate the liberties of the religious minorities".	Statement in introduction that the EU recognizes religious traditions as per the wording from Regulation 1099/2009.
The sentence "As a result, the animal will suffer less stress and pain" is not exact in cases where the religious slaughter is well done, the animal should collapse quickly and the post-cut stun is then without real benefit for animal welfare, but can lead to disqualifying the religious status of the meat.	From an animal welfare point of view the use of post-cut stunning is better than no post-cut stunning if it will reduce time to death.
The indicated time for applying stunning after slaughtering is too short and will not allow for proper bleeding	There is no relationship between stun duration and bleeding efficiency. As long as sufficient current is given unconsciousness is achieved.
There is no description on how to check effective stunning	The control procedures table includes a point on this issue
The "Equipment" section relates only to electrical post cut stunning, whereas this should cover also some details on the penetrating and non-penetrating captive bolt Equipment, presumably. Even if short, it is odd not to mention the application of the captive bolt at all in the subsequent paragraphs. [2]	The possibility of using non-penetrative captive bolt for post cut stunning is mentioned in the document. Penetrative captive bolt is not within scope.

Not all international halal standards accept this practice	The document does not address the specific religious requirements
There should be a differentiation between sizes / age of animals (calves vs bulls, etc.)	It is automatic and has two settings: irreversible and reversible for halal. There is no need to include any information on size and age.
More pictures of other species would be helpful	Noted
"I would change this to ""acceptable"" practice. I would also say that penetrative captive bolt stunning can be used as a post-cut stun and would be ""Best"" practice [2]	All qualifiers have been reviewed
"Acceptable"" with more time before post- cut stunning (45- 75 s)	All qualifiers have been reviewed

Table A4.6 Sheep and goats

Comment	ICF Response
Define the procedure (when does it start? end?)	The document is not a procedure.
It should say ""SOPs should be displayed in a place where ... workers can see them"" rather than ""It helps to have...""	Text edited
The text should clearly identify - Who are the ""Business operators"" - What requirements are necessary for this ""Certificate of competence"", who issues this certificate. - Who is and how to identify the competent authority in each Member state (a list as an annex would be extremely useful) The basic rules should also include a paragraph explaining that most of the halal produce in Europe is destined for exports to more than 60 countries whose regulations must also be observed. E.g. Most destination countries do not accept pre-stunning for halal slaughtering, hence some Member states will lose their capacity to export to these destinations.	The purpose of the document is not to provide this kind of information, which is outside the scope of the work. The purpose of the document is not to set new standards and therefore it does not prescribe practices that will hamper exporting activities.
No use of electrical prodding	Agreed
SMIIC OIC OIC/SMIIC 1 General Guidelines on Halal Food (https://www.smiic.org/en/project/3) GSO 2055-1:2015 HALAL FOOD - Part 1 : General Requirements (https://www.gso.org.sa/store/gso/standards/GSO:693304?lang=en) MS 1500:2009 (E) HALAL FOOD - PRODUCTION, PREPARATION, HANDLING AND STORAGE	These standards are used by EU operators to export to third countries. They have not been made available to the study team and could not be reviewed.

Comment	ICF Response
<p>- GENERAL GUIDELINES (SECOND REVISION) (https://www.msonline.gov.my/catalog.php?score=checked&istc_id=66) Halal Institute - Regulation of use Halal Guarantee Mark (http://www.institutohalal.com/certificacion/?lang=en)</p>	
<p>Any form of mechanical restraint is acceptable according to 1099/2009. Any guide needs to make it clear that it is not exclusively the methods it states that would comply with the legislation.</p>	<p>A disclaimer has been added to all documents to clarify the non-binding character of the information they contain</p>
<p>Images of some restraining systems are missing. [3]</p>	<p>Noted</p>
<p>Replace schok with current prod is forbidden for sheep Table looks like the bovines one and recommendation should be reviewed as they are not relevant (e.g. back pusher) I am not aware of figure regarding some of the indicators provided The indicators and figures used for bovines are probably not relevant</p>	<p>Agreed – “shock” has been replaced with “current” The table has been edited to include no goading, and no wool pulling.</p>
<p>Complete the first sentences “For the use of slaughter methods without stunning, as “in accord with Article 4(4)”,</p>	<p>Text has been revised.</p>
<p>Throughout the consultation whenever the word 'stunning' is used, it should say 'mechanical stunning' as the shechita method fully complies with the EU definition of stunning as set out in the legislation (Article 2(f)). The following phrases are unclear and require editing. The quotes we refer to in the consultation document are in quotation marks and our comments are written after the dash: ""It is also safer for the operator. a poorly restrained animal will struggle"" ""It will also be more painful for the animal, and could be dangerous for the operators."" "â€" these are opinion and not a certainty, it is therefore inappropriate for the document to use the word 'will'. This should be replaced with the word 'may.' "</p>	<p>Till now, according to the definition of Article 2(f), no method used in ritual sacrifice is recognised as a “stunning”. To obtain this recognition, (shechitah or dhabiha) a scientific study should be undertaken officially and conclude that this method could be an approved method. Text has been edited to replace “will” with “could.”</p>
<p>"No introduction to crate and V restraint (before advantages). [2]</p>	<p>Text revised.</p>
<p>Using a v shape conveyor should be better described e.g. mobile/not mobile at the time of bleeding?"</p>	<p>A conveyor is mobile. A V-restrainer can also be fixed.</p>
<p>"Some of the factors affecting the level of stress might not be clear: 'e.g. previous</p>	<p>Animal handling and lairage are covered by</p>

Comment	ICF Response
mixing with other animals'. It might be more important to list the measures to reduce stress. (or the state of the emotional animal before restraining)	separate documents.
Cradle and v-shap: in the description below this tile, the animal is placed on his side. So it is not a v-shape (I think that v-shape is only used for up-right position)	Agreed – Section revised to make sure that there is no confusion and V-shape is clearly understood as vertical whereas cradle is tilted.
NO distinction between sheep and goats	Noted
As written, the consultation reads as if religious slaughter is inferior to other methods. As a best practice guide, it needs to ensure that this is not the case. "	The document does not constitute a best practice guide, but a summary of ways of complying with the requirements of Regulation 1099/2009.
Lack of info on the use of v shape conveyor pictures of pigs!!! (see bovines comments)	Picture revised.
"In conveyor systems, after neck cutting the animal should not be moved until loss of consciousness?"	Introductory text (basic rules) states that systematic checks of loss of consciousness must be carried out before the animal is released from restraint
Restraining chute is acceptable (not good). Individual box is can be acceptable if well executed but not well! there is not enough info on the conveyor belt system to make the judgement	All qualifiers have been reviewed.
I am very surprised by the fact that the cost of an individual box is a disadvantage but not the cost of a conveyor system. This is not logical	The document does state that "Conveyor systems are costly to purchase and maintain"
I would change the category for ""Cradle or V restraint"" to ""Acceptable"".	Disagree
There are no examples of 'Best' practice in the guidelines. This method of slaughter is sanctioned within EU law and there should be an example of best practice. This is not clear in the current guidelines.	There is a lack of knowledge in this area. Guides available are incomplete and vary. This does not allow for the use of "best" qualifiers in this area.
I would like to see a section on post-cut stunning also for sheep and goats, as for cattle.	Outside of scope
Bleeding should be performed immediately after head restraint because usually manual head restraint is performed. In conveyor, conveyor should be stopped at the time of	Agreed.

Comment	ICF Response
bleeding and you should not delay the procedure (where does 30 s come?) I'm not aware of problems of closing veins it is not necessary that one operator hold the head and the other performs the cut. One operator could perform both operations there is no back and forth movement for sheep The head restraint should be maintained after the cut until the animal express the first relaxed behaviour (loss of posture of the head) loss of consciousness is known to appear 15 s after the cut signs of consciousness as they can be observed for sheep are different of those observed with cattle the pre stun of religious slaughtering of sheep is lacking	Signs of consciousness reviewed
Again, there is something wrong under the heading ""Signs of Life"" on page 2 (should be ""signs of Life"", by the way): the signs described are the opposite, i.e. signs of unconsciousness (no attempt to right itself, no regular breathing etcetera). Furthermore, change ""noises"" for ""vocalisation"", and ""pupil"" for ""pupils""	Text has been edited regarding "Signs of Life."
photos instead of pictures might be more clear	Noted
Copy/paste from bovines : review carefully as some indicators are probably not relevant	Noted
Text and table are inconsistent e.g. loss of consciousness	Noted
Please specify the title by "The Religious Bleeding Operations"	The title of the overall document (including text for other species) has been changed to "Slaughter without stunning prescribed by religious rites"
Throughout the consultation whenever the word 'stunning' is used, it should say 'mechanical stunning' as the shechita method fully complies with the EU definition of stunning as set out in the legislation (Article 2(f)). The following phrases are unclear and require editing. The quotes we refer to in the consultation document are in quotation marks and our comments are written after the dash: ""If the animal was stunned, it should be cut immediately after signs of unconsciousness have been verified."" - This is not a permitted practice according to Jewish law and this need to be made clear. 'Knife' - The guidelines are a requirement of Jewish law, it is also a requirement that all slaughterman are trained in knife sharpening and regularly sharpen their blade between animals. 'The animal will lose consciousness more quickly' - this is an opinion and not a certainty, it is therefore inappropriate for the document to use the	Till now, according to the definition of Article 2(f), no method used in ritual sacrifice is recognised as a "stunning". To obtain this recognition, (shehitah or dhabihah) a scientific study should be undertaken officially and conclude that this method could be an approved method. There is no guarantee that sharpening knives will quicken death, but it will help.

Comment	ICF Response
<p>word 'will'. This should be replaced with the word 'may' ""one continuous back and forth movement"" â€” this is unclear and should read continuous 'back and forth movements' as stated in Welfare of Animals at Time Of Kill (England) 2015 Part 2, 5, a. ""The wound should not be interfered with until the animal has lost consciousness"" ` It is standard practice for the Shochet (trained Jewish slaughterman) to perform a manual check on the cut after shechita has been performed. A line should be added to the stating 'apart from the manual check performed by the shochet.' ""A good cut should lead to loss of consciousness within 10-15 seconds."" - This is not required in the legislation and should be removed. Monitoring signs of life ` Article 5 (2) does not mentions signs of life, only signs of consciousness. It is confusing for the end user to mix the language as it becomes unclear as to what they are looking for. ""Signs of life"" ` this is misleading. Not only should it be consciousness as prescribed in the regulations, this also implies that the animal is still alive. This should be changed to 'Signs of loss of consciousness' ""Existing good practices on this issue vary widely from one Member State to another. Stunning is practiced if the animal is showing signs of consciousness or sensibility after 30 seconds in some, and up to after 45 seconds in others."" - This is not included in the EU Legislation and should be removed. ""The absence of signs of life must be verified before the slaughtering (dressing) can continue."" ` 'slaughtering' should be changed to 'the slaughter process' In the Control procedures section: 'Operator skills "Train operators to improve their skills.' - this is repeated in the 'Cut' section. ""Signs of consciousness should not be present after 30 seconds (Dutch guidance) Signs of consciousness should not be present after 45 seconds (Spanish guidance)"" - This is not required by EU legislation. This should be removed. "</p>	<p>Text edited to replace "will" with "could".</p> <p>It is very clear that the wound should not be interfered with once the animal has been cut.</p> <p>Text edited replacing "signs of life" with "signs of unconsciousness"</p> <p>Recommendations to stun to kill due to prolonged consciousness after cutting are found in existing guides to good practice.</p>
<p>"To start bleeding within 30 seconds of starting restraining the animal, seems a long time in small ruminants.</p>	<p>Noted - 30 seconds is a value proposed in existing guides. It is kept here as the shortest GP target that has been identified.</p>
<p>The cut must include aesophagus and trachea. A frontal picture would be useful</p>	<p>These requirements are specific to some religious communities and do not entail an animal welfare aspect. / Noted</p>
<p>Signs of life and signs of consciousness are mixed in the text. Bold title with signs of life is not correct. Mariella Debille did a extensive in the Netherland concerning the different</p>	<p>Noted – section revised</p>

Comment	ICF Response
signs of unconsciousness. The cornea reflex seemed to be most correct one. This is not clear in the text. "	
Should state the Dutch maximum as a maximum time to unconsciousness with the brackets saying unless national regulations. It's confusing have Spanish as an longer alternative and doesn't show good practice for other countries	Noted – the purpose of the document is to provide different reference values. Their origin should not be mentioned in the text and will be therefore removed.
The guidelines make no distinction.	Noted
signs of live should be changed in signs of unconsciousness [2]	Text edited
"I would change the wording to say that ""The neck of the animals should be stretched manually at the time of cutting. One should continue to support the head after the cut to facilitate bleeding. The animal will lose consciousness more quickly."" I would also change the text to say that a back-up stun should be applied ""no later than 30 seconds"" if there are signs of inefficient bleeding or continuing signs of consciousness.	Revise "can" to "should", as suggested The text currently provides two options: 30 or 45 seconds, as drawn from existing guides.
There are no examples of 'Best' practice in the guidelines. This method of slaughter is sanctioned within EU law and there should be an example of best practice. This is not clear in the current guidelines."	There is a lack of knowledge in this area. Guides available are incomplete and vary. This does not allow for the use of "best" qualifiers in this area.

Table A4.7 Poultry

Comment	ICF Response
"It should say ""SOPs should be displayed in a place where ... workers can see them"" rather than ""It helps to have...""	The text has been edited to reflect this.
The text should clearly identify - Who are the ""Business operators"" - What requirements are necessary for this ""Certificate of competence"", who issues this certificate. - Who is and how to identify the competent authority in each Member state (a list as an annex would be extremely useful) The basic rules should also include a paragraph explaining that most of the halal produce in Europe is destined for exports to more than 60 countries whose regulations must also be observed. E.g. Most destination countries do not accept pre-stunning for halal slaughtering, hence some Member states will lose their capacity to export to these destinations.	The purpose of the document is not to provide this kind of information, which is outside the scope of the work. The purpose of the document is not to set new standards and therefore it does not prescribe practices that will hamper exporting activities.

Comment	ICF Response
<p>Missing detail of different impedance in different birds that can affect the level of current they receive within a multi-bird bath. Shackles can be swapped for shorter/longer ones but many waterbaths are also adjustable for height</p>	<p>After "The height of the waterbath and the water levels should be adjusted according to the different sizes of the birds to be stunned." we have added "Shackles can also be swapped for shorter or longer ones."</p>
<p>References to examples of International Standards MIIC OIC OIC/SMIIC 1 General Guidelines on Halal Food (https://www.smiic.org/en/project/3) GSO 2055-1:2015 HALAL FOOD - Part 1 : General Requirements (https://www.gso.org.sa/store/gso/standards/GSO:693304?lang=en) MS 1500:2009 (E) HALAL FOOD - PRODUCTION, PREPARATION, HANDLING AND STORAGE - GENERAL GUIDELINES (SECOND REVISION) (https://www.msonline.gov.my/catalog.php?score=checked&istc_id=66) Halal Institute - Regulation of use Halal Guarantee Mark (http://www.institutohalal.com/certificacion/?lang=en)</p>	<p>These standards are used by EU operators to export to third countries. Therefore they will be reviewed by the study team to identify GPs that may be included in the final version of Deliverable 4.</p>
<p>Not more information, but some corrections would be appropriate. Re.: Basic rules, third paragraph: The Regulation states that in case of Slaughter without stunning prescribed by religious rites the requirements of article 4, first paragraph does not apply. It is not a condition that the Slaughter shall be without stunning. This would also conflict with a guidance involving a waterbath stunner.</p>	<p>Replaced with "slaughter without stunning prescribed by religious rites"</p>
<p>Re.: Electrical waterbath, introduction, second paragraph, last sentence: The birds shall remain unconscious until bleeding is finished.</p>	<p>This has been edited as suggested (replacing "until their throat is cut" with "until bleeding is finished")</p>
<p>Re.: Shackling, third paragraph, fourth bullet-point: We do not understand the meaning of this.</p>	<p>This comment refers to "■ Lift the bird by both legs and lower it onto its breast.". We have removed "and lower it onto its breast" as this is repeated in the last bullet.</p>
<p>Re.: Shackling, fifth paragraph and corresponding text in the table on control procedure: ""to 3"" should be deleted for both turkeys and chickens.</p>	<p>Aligned with Regulation 1099/2009</p>
<p>Re.: Parameters, the table: It should be remembered that a number of other factors influence the stunning effect, such as time from the birds leave the stunner and until</p>	<p>Edited in main section on waterbath</p>

Comment	ICF Response
bleeding, conductivity of the water, uniform size of the birds.	
Re.: The table on control procedure, Optimal pressure of shackles: ""Absence of animals ..."" should be replaced by ""Excessive struggling and wing flapping"". There will always be some struggling and wing flapping. When the yes-option is ticked above and below, it is in anticipation that our comments are taken into account."	Edited
This is very confusing. The heading is ""slaughter without stunning"" and then this chapter describes slaughter using a conventional water bath stunning. The description of the stunner and its function is good, but it is unclear how this relates to slaughter without stunning. If at all, this chapter may possibly focus on - the very poor - practice of using waterbath stunners with lower settings, resulting in poor stun quality/immobilization only, for religious slaughter purposes.	This has been replaced with ""slaughter without stunning prescribed by religious rites"" (also in line with the Regulation terminology)
Many slaughterhouses stunning birds electrically for religious slaughter will be using much higher frequencies, e.g. up to 1500Hz and above that, to avoid killing birds (a religious requirement not welfare). These frequencies are unlikely to provide a proper stun, rather electro-immobilise birds. This must be avoided	Agreed. There are higher frequencies that work (e.g. 100 Hz and no more than 200 Hz). However, higher frequencies than 200 Hz might not deliver a proper stun. Text revised in the main waterbath section
The requirements given for waterbath stunning are not in line with the legal requirements in EU-Reg 1099/2009. Especially the electrical parameters are not based on any of the above mentioned scientific investigation or any other official recommendation. The same applies to the "control procedures", just two examples: The minimum stunning time according to EU-Reg 1099/2009 is 4 sec, not > 10sec as given in the drafted document. The physical signs of birds in and after the waterbath are not correct, e.g. birds leaving the waterbath might show an arched neck, or might be completely limb, depending on the electrical parameters. In both cases birds can be effectively stunned. Movement (incl. wing movement) is not a sign of consciousness, but might as well be caused by tonic/clonic convulsions. Breathing is not a sign of consciousness.	It is common for plants to use lower parameters than those set by the Regulation. This results in poor animal welfare. There is a lack of clear guidance in this area. Reviewed
Throughout the consultation whenever the word 'stunning' is used, it should say 'mechanical stunning' as the shechita method fully complies with the EU definition of stunning as set out in the legislation (Article 2(f)).	Till now, according to the definition of Article 2(f), no method used in ritual sacrifice is recognised as a "stunning". To obtain this recognition, (shehitah or dhabiha) a scientific

Comment	ICF Response
	study should be undertaken officially and conclude that this method could be an approved method.
'Electrical Waterbath' - is not an acceptable practice within the Jewish faith and does not prescribe to Jewish law. As drafted, the section implies that this is compliant with religious practice and needs to be edited to ensure there is no confusion."	The "basic rules" section indicates that different religious practices apply; the edited first para of the electrical waterbath section should also make clear that this corresponds to some legal requirements in some MS irrespective of religious prescriptions"
"The stun should not kill the birds": This is a religious requirement, not a good practice and should be made clear. - ""More specifically, turkeys should not be held upside-down for more than 2 to 3 minutes, and chickens for no longer than 1 to 3 minutes"", this is contrary to legislation. Regulation indicate no more than 1 min in chicken and no more than 2 min in turkey. - The current recommended (120mA in poultry, and 150mA in turkey) is below the requirement of the legislation and not proved to induce effective stunning. [3]	Agreed – we have removed "the stun should not kill the birds". The terms of reference for this work require that all ""good practice"" advice is included. In this area the requirements from the Regulation do not apply. There is a dearth of guidance available.
I received a lot of questions about the need to have this part in a consultation regarding "slaughter without stunning", whereas there is any part about non-stunning. Most likely waterbath stunning for ritual slaughter should be in another part of the document, as it is not completely under derogation. As you might be aware the document sets some electrical parameters, below the parameters of the Regulation: It is not clear where ICF have found these criteria (?); a.v.e.c. is advocating the need to have only outcome based obligations.; It is essential to discuss with the stakeholders dealing with the daily practice in order to identify feasible electrical parameters for this production.	Noted
Some standards do not accept stunning in the case of poultry; In case stunning is allowed, see the different requirements for the electrical bath"	The "basic rules" section indicates that different religious practices apply; no change needed
"Where possible"" in the sentence:" "Bird of different sizes should be processed separately, where possible."" should be cancelled because can lead to misunderstanding.	Agreed – this was edited as suggested.
This sentence is off-topic "In some European Member States, business operators are	Agreed. The text was edited as follows:

Comment	ICF Response
required by law to render the bird unconscious before neck cutting." In fact, the pre-cut stun is required in all European members for the traditional slaughter, but the religious slaughter has an exemption from this rule to meet the requirements for religious freedom."	"business operators performing slaughter without stunning prescribed by religious rites are required..."
Other species, such as turkey or duck are not depicted	Noted
I agree that there is no good method of stunning of poultry but it is strange that the main method of stunning is evaluated as acceptable.	All qualifiers have been reviewed
In Europe we have Legislation aimed at the protection of animals at the time of killing. According to this legislation, which is based on a scientific opinion by the Efsa, waterbath stunning of poultry is in-line with the requirements to protect welfare at the time of killing. Numerous scientific publications form the basis of the Efsa opinion, and additional scientific evidence has been provided since then, including EEG assessment following waterbath stunning with various electrical parameters. The use of waterbath stunning has moreover passed a re-assessment after the legislation has come into force. It is therefore not acceptable that the drafted document rates it as "acceptable" stunning method, which according to the definition means it is legally authorized and provides limited protection of the animals. This rating is contrary to the above mentioned documents.	The document does not comment on what different religious inclinations see as acceptable or not"
Stunning is not always accepted; some standards accept this method, but a mention to the different parameters would be convenient"	Out of scope; no change needed
Why the survey is only talking about "manual bleeding?" Why you are not considering the automatic cutting?	Out of scope; no change needed
When birds are stunned an Automatic neck cutter can be used in accordance with the requirements of annex III, no 3.3 of Regulation (EC) No 1099/2009. However, as the headline of this is ""Manual bleeding operations"", we take it that this is self-evident."	Out of scope; no change needed
instead of ""Signs of consciousness"" should be ""signs of unconsciousness"" [3]	Agreed, text edited
Moreover, the described signs are not correct, breathing is not a sign of consciousness as already explained above, and the same applies to wing movement. The neck is not arched after cutting without stunning. The described check is not appropriate for assessment of unconsciousness after cutting without prior stunning, which is the scope	Text edited / section on signs of unconsciousness has been reviewed

Comment	ICF Response
of the document. According to scientific evidence the time to loss of consciousness without prior stunning exceeds 15 sec, therefore none of the described parameters is useful.	
There is nothing about restrung without water bath	Out of scope; dealt with in the slaughterhouse operations document
UK would prefer no interference with the wound at all as good practice. Decapitation of poultry is not normally practised in UK to enable post mortem health inspection.	The information included in the document is drawn from existing guides. The document does not contain any obligations, only options.
The document states that the control must be systematic, with at least 3 consciousness criteria, controlled twice within 15 to 25 seconds after cutting. Once again, it is essential to have the scientific background of this and likewise it is of utmost importance to exchange and discuss with the experts (physical meeting) the feasibility of your suggestion.	Noted
It is recommended to specify the title to highlight that this section is about religious slaughter of poultry. "The religious manual bleeding operations" is more appropriate as a title.	No change - the whole section is about slaughter without stunning prescribed by religious rites
See Ms1500 for a more detailed image	Noted
The following phrases are unclear and require editing. The quotes we refer to in the consultation document are in quotation marks and our comments are written after the dash: ""If stunned, bleeding should start immediately after having verified unconsciousness, and within 7 seconds of stunning the bird." This is hugely misleading as this is not normative practice in the Jewish community. There is no mechanical stun before or after slaughter and it should be made clear in the guidelines.	The "basic rules" section indicates that different religious practices apply; no change needed; the text indicates "if stunned". This can be emphasized by rewording "in case the animal has been stunned beforehand, ..."
"The cut must be accurate, or else the bird will take longer to lose consciousness and die." the word 'will' should be changed to 'may' as this is not a certainty	Rewritten to "could"
'The neck should be cut in a single continuous movement.' " this language is not clear and it should be replaced with 'uninterrupted movements' as in the UK legislation (WATOK 2015 Schedule 2, Part 2, 3 (2) (d))	The text has been edited as suggested.
""Signs of consciousness are:"" " this should read ""signs of loss of consciousness are""	Agreed, text edited as suggested.

Comment	ICF Response
<p>The lists of signs of consciousness goes above those listed in Scientific Opinion on monitoring procedures at slaughterhouses for poultry - EFSA Panel on Animal Health and Welfare (AHAW) attached. In section 3.9. Of this report, the following are described as 'Description of indicators for slaughter without stunning and overview of their performance' are defined as Breathing, Corneal reflex, Pupil size, Pupil size, Bleeding, Cardiac activity and pulse rate. There is no mention of wing movement, righting attempt, cries, neck is arched with head pointing down, no response to pinch or prick of its comb in the EFSA report and these should be removed as indicators on this list.</p>	<p>Reviewed / revised</p>
<p>"There should be no signs of consciousness before the bird can be removed from the holding system"" "the words holding system should be changed to being held.</p>	<p>Agreed, text changed to "before being released from restraint", in line with the text of the Regulation</p>
<p>'Signs of Death' as it stand is far stricter than in the report detailed above. Section 4.4.2 of the report above details the following factors: Permanent absence of breathing, Absence of corneal or palpebral reflex, Diluted pupils, End of bleeding, Relaxed carcass "</p>	<p>List is good, no action.</p>
<p>"Setting a time limit of 7 seconds between stunning and cutting it is not feasible.</p>	<p>This time limit is feasible for cutting at the exit of the waterbath.</p>
<p>To meet both animal welfare, and religious needs and requirements, the document should remind everyone of the importance of using trained, skilful slaughterers and good equipment (right type and size knife with proper sharpening, etc.).</p>	<p>Agreed, see edits in the ""performing the cut"" section. We have added mention that the cut should be performed by appropriately trained, skilful operators.</p>
<p>Also, it is important to specify the accepted speed (number of animals per minute) based on the number of slaughterers.</p>	<p>Text edited to add mention that the speed of the slaughter line should take account of the number of slaughterers and enable them to perform manual bleeding operations in good conditions.</p>
<p>The noise, the light and the time of rest after transport and before the restraint operation are also important parameters to ensure the welfare of the birds.</p>	<p>These issues are addressed in another document (on slaughterhouses' layout)</p>
<p>Two additional elements should be cut in the slaughtering: aseophagus and trachea"</p>	<p>These correspond to religious requirements, but they have no animal welfare benefit, hence they are not mentioned in the document</p>

Comment	ICF Response
<p>"The introduction of pre-cut and post-cut stuns in this section induces confusion. It would be more appropriate for these to be covered in a separate document.</p>	<p>ICF has followed the brief set by the Commission for this section.</p>
<p>This document should address the religious slaughter without the use of any kind of stunning. Also, the suggestion to use a post-cut stunning if a bird does not collapse within 30 second is not feasible in the industrial context. In fact, the chain speed in poultry slaughterhouses is relatively high. That is why the task of checking that each bird is consciousness after the cut or that it is alive just after the water-bath stun are quite impossible.</p>	<p>We are aware that neck dislocation is used when necessary to kill conscious birds. We are also aware that samples of birds are removed from the slaughter line for checks.</p>
<p>The chapter about manual cutting of birds again refers to the possibility of application after a stun. This sentence must be taken out of the document, since it is aimed at describing procedures for slaughter without stunning. Especially the requirement to cut a bird within 7 sec following stunning is not in line with EU-Reg 1099/2009.</p>	<p>ICF has followed the brief set by the Commission, which includes reference to waterbath / stunning</p>
<p>Some parameters given as "signs of death" are the same as the signs for absence of consciousness. Absence of breathing is not a sign of death. Stop of bleeding is not a sign of absence of life, since it is known that also birds stunned to kill still bleed effectively. Overall, the parameters described for assessment of consciousness and absence of life are not correct. An Efsa working group has spent a lot of effort on determining the parameters."</p>	<p>Reviewed</p>
<p>Does not refer to types of restraint during bleed out, e.g. cones.</p>	<p>Restraint methods are covered in another document</p>
<p>Include turkey and duck / As it stands this appears to apply to all types of poultry when there may be differences depending on species.</p>	<p>Turkeys are within scope. We are not aware of distinctions in terms of bleeding between chicken and turkeys.</p>
<p>It requires the edited stated above. It currently significantly disadvantages religious communities and would effectively prevent religious slaughter.</p>	<p>This document is not meant to become legally binding in any way / however, the comment suggests that the document should emphasize more clearly that it provides a tool box, rather than a set of requirements. This has been noted and taken into account for the finalization of the drafts.</p>

Comment	ICF Response
<p>a.v.e.c. is not in favour of publishing guideline for religious slaughter. As you know this is a particular sensitive topic and a.v.e.c. believes it is highly difficult to regulate religious issues without having an open and broad discussion involving the relevant stakeholders (poultry slaughterhouses, religious bodies and NGOs), possibly not during a holiday season.</p>	<p>Noted. As per the task order set by the European Commission, the elements for best practice should also cover slaughter without stunning.</p>
<p>The EHZ Standard is not the only standard available however, as we are aware, it is the only one that includes a time limit. Following a partial consultation among our members (considering the limited time provided) we found out that the EHZ standard it is not the common standard in use, especially considering the parameters for waterbath and time from stunning to cutting (7s) mentioned in your draft document.</p>	<p>Noted. As per the task order set by the European Commission, even good practices that are present in very few places are relevant for inclusion in this document, as long as they are practiced in commercial conditions.</p>
<p>a.v.e.c. remains not in favour of setting any specific electrical parameters for religious slaughtering since it is not requested by the EU legislation and there are no scientific benchmarks to define good, acceptable or not acceptable parameters. In addition, as already stated, in Europe we have Legislation aimed at the protection of animals at the time of killing. According to this legislation, which is based on a scientific opinion by the EFSA, waterbath stunning of poultry is in-line with the requirements to protect welfare at the time of killing. Numerous scientific publications form the basis of the EFSA opinion, and additional scientific evidence has been provided since then, including EEG assessment following waterbath stunning with various electrical parameters. It is therefore not acceptable that the drafted document rates it as "acceptable" stunning method, which according to the definition means it is legally authorized and provides limited protection of the animals. This rating is contrary to the above mentioned documents.</p> <p>Concluding: stunning and bleeding system performed on a legal basis are always good practice.</p>	<p>See above for response to similar comment.</p>
<ul style="list-style-type: none"> - A well performed waterbath stunning has the same or even better quality as a well performed manual stunning and is at least good practice - It is nonsense to mention manual stunning and manual bleeding. Only a very, very small number of birds is killed like this. - A time limit is not necessary, (from what we collected so far only the German 	<ul style="list-style-type: none"> - See above for response to similar comment - The TOR for this study include head-only stunning and manual bleeding operations - We note that few sources include a maximum stun-to-stick time limit. As per the task order

Comment	ICF Response
<p>Regulation on the protection of animals at the time of killing requires 20 sec. between stunning a bleeding)</p> <p>- There is no paragraph on gas stunning, which is one of the main systems accepted by a lot of third countries.</p>	<p>set by the European Commission, even good practices that are present in very few places are relevant for inclusion in this document, as long as they are practiced in commercial conditions. We are grateful for the information from the German Regulation.</p> <p>- As per the TOR the study does not include any information on gas stunning.</p>

A4.1.3 On-farm killing

Table A4.8 Cattle

Comment	ICF Response
<p>There is also no mentioning of procedures that the farmer should set up, in conjunction with the herd veterinarian, and no recommendations are done on how he can come to a conclusion to euthanize an animal, other than "failing to thrive" and "emergency". A decision tool could be very valuable in this context both to guarantee animal welfare and improve farm economics, as well as for public trust and personnel/farmer job satisfaction.</p>	<p>We were not able to identify any decision tools from the documents consulted.</p>
<p>Second column, second paragraph, final line - "to kill HORSE as soon as possible" - should change HORSE to CATTLE.</p>	<p>The text has been edited as suggested.</p>
<p>The section does not clearly differentiate which on farm killing instances require a CoC and which ones don't - a table clearly listing this would be easier to understand by users. [2]</p>	<p>Out of scope.</p>
<p>I do not think this is clear enough. Much can be done by simple word processing and using tables and for example different colours for owner/keeper and for competent authorities. Also terms like depopulation and emergency killing should be explained one by one.</p>	<p>Text revised.</p>
<p>On farm "normal" slaughter should be mentioned also.</p>	<p>Out of scope.</p>

Comment	ICF Response
I suggest that the reasons for killing cattle on-farm should include "when they are considered economically unviable" for example male dairy calves.	The text has been edited as suggested; the definition of culling has been included.
Humane Slaughter Association guidance	This advice is unclear and therefore unusable.
Cattle prefer inclines to downward slopes and will move readily along slightly inclined, curved raceways.	The text has been edited as suggested.
head support, preventing animal from moving head downwards.	This comment is already incorporated in the text of the consultation draft.
In Germany free-range cattle may be stunned and killed on farm via gunshot. See Schiffer et al. Animal Welfare 2017, 26:95-109.	Out of scope.
The paragraph about restraining horses: you should not under any circumstance restrain a conscious horse by... could be added in cattle and the same for the sentence: If the horse is not unconscious you must stun it again.	This comment is already incorporated in the text of the consultation draft.
Your inclusion of "If they are in severe pain, for which treatment is unlikely to be successful or is not economical then they should be stunned and killed without delay where they are" does not include killing methods that do not require animals to be stunned initially e.g. the use of free-bullets or shotguns.	Out of scope
Your statement "This enables stabilizing the head for stunning, including that of cattle that cannot be moved or cannot rise and need to be stunned were they are." The inclusion of head restraint by halter, etc. is not normally required for animals that cannot be moved, e.g. "downer" cattle.	Noted
No obvious connection between text and colour scale [2]	Reviewed
Probably due to the needs to be concise, there is an inconsistency: in the first column "cattle dislike bright light" but in the second "Cattle move easily from dark area to a bright area". The sentence is true but for the final user may be difficult to understand. To make the text more friendly I'll suggest to leaving the more important sentence for a practical point of view withdrawn bright lights from the list of "Cattle dislike"	The text has been edited as suggested and replaced with "from darkness to light".
Page 1, How cattle behave, I would put Dairy cows are used to people (not dairy	It is correct that cows can be agitated and

Comment	ICF Response
cattle). Cows can be agitated and aggressive when with their calf, not only when trying to separate cow and calf. Picture would be nice for cattle flight zone (like from Temple Grandin) Page 2, Crush or narrow pen, the same piece of a text is 2x	aggressive when with their calf or when one tries to separate them from their calf. Text has been edited accordingly.
It would be helpful to add images. [3]	Noted.
There is no reference to hearing and the effect of noise in this section!	Noted
The flight zone should be explained by using an image seems very theoretical	Noted; the image has been added. This advice is unclear and therefore unusable.
There should be additional information to be clear about what to do if an animal can't bear	This text is already provided in the document: "If they are in severe pain, for which treatment is unlikely to be successful or is not economical then they should be stunned and killed without delay and where they are, with an appropriate method".
But we propose to added an item at "Cattle dislike" : i,§ Slippery floor ____	The text has been edited as suggested.
"You may hold calves against a wall or fence." : this sentence needs further explanation (and an image would be helpful).	Noted
Well, I probably yes, but some illustrations wouldn't hurt. [2]	Noted
I suggest that you rewrite the first sentence as follows: "Poor handling of cattle will increase levels of stress, making the animals more difficult to handle and can cause bruises and bone breaks."	The text has been edited as suggested.
Under moving cattle your statement "Is the animal able to bear its own weight on all four feet? Can it move without pain?" does not match legislation which states "they are unable to move independently without pain or to walk unassisted"	The text has been edited as suggested.
The use of flight zones in this instance should be associated with cattle in raceways, not in open spaces.	Cross reference to picture of cattle in raceway from slaughterhouse ops document..
In your statement "Cattle move easily form a dark area to a bright area." Insert 'more' between "move" and "easily"	The text has been edited as suggested.
Restraining – In your statement "You should closely restrain cattle for stunning" and	The text has been edited as suggested.

Comment	ICF Response
'or killing' after "stunning"	
Crush or Narrow Pen - You may confine animals that can be moved in a crush or a narrow pen. This will give you easy access to the head. You can confine cattle that can be moved in a crush or narrow pen. This will give you easy access to the head. Repetition!	The text has been edited as suggested.
Under "Disadvantages. For some animals the head needs also to be restrained to stunning." Insert 'permit effective' between "to" and "stunning"	The text has been edited to "for effective stunning."
Under "Head collar and lead rope, halter, or bridle - You may use of a head collar and lead rope" delete "of"	The text has been edited as suggested.
Under Disadvantages of Manual Restraint - in "This causes discomfort to the animal" replace "causes" with 'can cause	The text has been edited as suggested.
Second page, second headings - duplication of text.	The text has been edited as suggested.
I think the colour coded scales could go and you could simply have subsections for each of the categories listing the methods	Corrected.
The first passage is not helpful it is valuing but there are no information for good practice enclosed	Noted.
The first unacceptable image should appear under the text these practices are forbidden and completely unacceptable. As the moment by having it above it is slightly confusing.	Corrected
more info is needed to distinguish between categories of animals; to what size is manual restraining acceptable, does it depend on killing or stunning methode,...	Noted.
there is nothing on calves for example, fractious bovines, etc.	Some information distinguishing between the behaviour of differernt categories of cattle
more description of categories and killing methods is required	Out of scope
slight modifications, but the category unacceptable - acceptable - good - best and the colours are good	No action is needed.
This sections is not prepared to be used by AWOs or business operators.	No clear direction from consultee on how to

Comment	ICF Response
	improve the drafts
It would be helpful to add images. [2]	Noted
Under your section "You should not under any circumstance attempt to move an animal by . . . using an electric shock" is contrary to EC 1099/2009.	The text has been edited to indicate that electric prodding is authorised for cattle and pigs.
Head collar restraint should be qualified as acceptable instead of good	All qualifiers have been reviewed
Head collar and lead rope, halter, or bridle" : given that this practice has no disadvantages, why is it only qualified as "good" and not "best"? I agree with the rest of the qualifications.	All qualifiers have been reviewed
Manual restraint should be qualified as acceptable instead of good	All qualifiers have been reviewed
in my opinion, manual restraining is a good practice only for young animals. For adult animals, it is only acceptable if there is no other option [3]	All qualifiers have been reviewed
Hold calves -change to "Acceptable". In fact the disadvantages of such practice are more than the advantage [3]	All qualifiers have been reviewed
Limited use of electric goads is permitted in EU legislation, but here is said to be 'forbidden'. There may be situations when careful use of an electric goad prevent overuse of a stick, for instance.	All qualifiers have been reviewed
For the one described I agree. It would be good to have also under UNACCEPTABLE moving the animals that can not stand or move without pain and a small drawing showing that bovine can not have tied legs together and than hooked to a winch to be moved.	The text has been edited as suggested.
Firearm with free projectile might be useful when stunning/killing beef cattle and should be addressed	Out of scope.
We think you should add use of a free bullet as a best practice way to kill cattle, horses, pigs and sheep. https://www.hsa.org.uk/downloads/publications/humane-	Out of scope.

Comment	ICF Response
killing-using-firearms-updated-with-2016-logo.pdf from the Humane Slaughter Association gives good advice on this	
When using a captive-bolt for on-farm killing, it is better to use the maximum charge permitted for use in the instrument being used.	Noted
It is really important for the operators recognize clinical signs of unconscious. From our experience in Brazil, people do know how to do, but insome cases, due to maintenance issues, the stunning/killing is innefctive and people are not able to recognize. I would suggest very simples signs like: - Rhythmic breathing - Vocalization - Attempt to stablish the position - Spontaneously blinkng	This comment is already incorporated in the text of the consultation draft.
In general yes, but we propose add something more detailed about equipment maintenance.	Noted
Correct maintaining of the captive bolt gun should be stressed more	The text has been edited as suggested; this was emphasized using bold font and adding "and has been properly maintained".
typo error Not It may be the method if choice in depopulation, but It may be the method of choice.in depopulation	The text has been edited as suggested.
Stunning is defined in EC 1099/2009 as: any intentionally induced process which causes loss of consciousness and sensibility without pain, including any process resulting in instantaneous death; Your statement "You should render the animal unconscious before killing it. That is called "stunning" does not include instantaneous death, which does not require a killing method!	The text has been edited as suggested; the text "this is called stunning" has been removed from in all drafts.
"A sufficiently long bolt is required to penetrate into the brain" theoretically the impact of the bolt on the skull produces the stun or concussed state and the penetration and damage to neural tissue is designed to prevent recovery!	No action is needed.
In your sentence "Cartridges range from 2.2 grain for calves, to 3.0 grain and 4.0 grain for large cattle and mature bulls" insert 'to 6.0 grain' between "4.0 grain" and "for larger bulls." Accles & Shelvoke produce a Magnum XL (http://www.acclesandshelvoke.co.uk/cash-magnum-xl) that uses a 6 grain cartridge and is recommended for large bulls. We recommend the use of a free-bullet for water buffalo (AWO training course, University of Bristol. 2017). Include info in note	The text has been edited as suggested.

Comment	ICF Response
4 in the table "Recommended charges for different categories of cattle are"	
In the table section 'what good looks like' I would expect to see information rather than simply a referral to instructions	Noted.
Details of how to carry out effective pithing and bleeding. This information is available from the Humane Slaughter Association (HSA) and reference should be made to its publications and online guides.	Out of scope.
mor information about sticking and phyting. How to do this and where. Also provide information what to do with blood after sticking (is material that should be removed from farm as material not suitable for human consumption (destruction material)	Out of scope.
Suggest include reference to page on checking effective stun here.	Noted
We propose to add information about stun-to-stick interval in the table. It's easier for end users	Noted
Additional images would be helpful. "The captive bolt should be aimed along the line of the spine, in the neck.": not clear enough. "In bulls, the target is 1 centimetre either side of the middle of the head.": an image would be helpful. "If the first shot was in the right position, then re-shoot 5 cm to the side of the mid line aiming towards the brain.": not clear enough, an image may be helpful.	Text reviewed
When a person use a penetrative captive bolt, you could add: the person performing the action must check that, after each shot, the pin retracts its entire length. If this is not the case, the gun may not be used until it has been repaired.	Added
We suggest to mention all the permitted method of stunning for each species and why they are useless.	Out of scope.
Under "Parameters" - "head stamp" generally indicates the manufacturer rather than the calibre or cartridge strength.	Ammunition head stamps are coloured. The colour relate to the charge.
Your statement "The captive bolt should be aimed along the line of the spine, in the	We cannot assume that target readers have a

Comment	ICF Response
neck" should read 'The muzzle of the stunner should be held at a right angle to the skull, so that the bolt is directed through the upper brain towards the brainstem' (https://www.hsa.org.uk/downloads/publications/captive-bolt-stunning-of-livestock-updated-logo-2016.pdf)	good understanding of cow anatomy, no edits .
Maintenance, handling, and keeping of equipment is fundamental for successful use. A section more stressing this would be helpful for the target group.	This comment has already been addressed above.
Cost of the Captive bolt - why is this pointed out? Every equipment has it's cost. There is no free stunning method.	The statement on costs has been inserted in the format agreed with the Commission.
The word stunning is a fixed term it is not necessary to explain it. It would be more helpful to explain the factors to realize the right level of unconsciousness	We agree with the consultee and have removed the definition of stunning.
Frequency of checks in the table - these guidelines, as we understand, should be used to do an emergency slaughter/killing of individual animals not depopulation and subsequent checks.	Agreed
Control procedure missing info: animal based parameters to check unconsciousness and death. Checking every 5% of the animals is not enough, with an individual approach every animal should be checked on effectivity of the procedure.	Agreed, corrected
The corresponding stun position for polled (animals without horns) needs to be detailed. This information is available from the HSA's publications and online guides.	Noted
There are no differences explained	See comment above.
WATok states after a simple stun the animal must be killed 'without delay'. to say within 60 seconds is not without delay and seems too long a period	The text has been edited as Noted
This section, as we understand, should be used for farmers, private vets not AWOs.	No actions are needed.
Suggestion to list some doings that are unacceptable. . Per ex . Using poorly maintained equipment that does not proved enough air pressure for the bolt to penetrate deep enough,â€¦ Not having a spare pistol at immediate reach to perform the stunning in the case the first one malfunctions,â€¦	Noted
"Maximum stun-to-stick interval" – "within 60 seconds of stunning" there is no peer reviewed scientific evidence to support this claim.	Drawn from existing good practice guides

Comment	ICF Response
Under "Advantages" your statement "Captive bolt guns are small and unlikely to cause concern to onlookers" if included you should also state under "Disadvantages" that 'the use of effective captive bolt stunning will result in post-stun convulsions (uncontrolled kicking) that may cause concern to onlookers'	removed
EFSA have produced guidance on signs of stunning which OV's currently use.	Noted. Section reviewed.
Details of what to do when re-stunning is necessary. Refer to HSA publication Guidance Notes No. 2: Captive-Bolt Stunning of Livestock, page 8.	Noted. Text on re-stunning in control procedure
It would be more useful if this replicated the already widely used wording of the signs of unconsciousness used in EFSA guides	Noted
suggest choose either regular or rhythmic breathing and stick to one of these. Regular breathing might be more easily understandable	The text has been edited as suggested.
Underline that each animal must be checked for signs of consciousness before releasing it from restraint. And mark that if the signs for consciousness are not checked this is an UNACCEPTABLE practice.	It is already mentioned in the control procedures that signs of consciousness must be checked. We have added in the main text that signs must be checked before releasing the animal from restraint.
Point "6. The animal's legs are initially stiff and extended (this is known as the "tonic phase"). . " with captive bolt stunning, the tonic phase is not always fully expressed, e.g. in downer cattle where due to lack of nutrition the animal may lack the necessary levels of muscle glycogen to enable physical activity post-stun to be expressed. Therefore, this point should not be included in the "Control Procedure Table;" - "The animal shows all of the 6 first signs listed above"	Duration and scale of the responses may differ but the tonic and clonic spasms are usually still present to a degree.
2. Recommended corrective action is "Any animal showing any sign of consciousness: - The animal should be re-stunned immediately. This can be done by: using the back-up stunning method, using the proper cartridge strength indicated by the manufacturer (if the previous cartridge used was not of the correct strength for the size of animal being stunned), repeating the shot 10 mm higher and 5 mm lateral	Text edited in control procedure table

Comment	ICF Response
<p>from the correct shooting position (if previous shooting position was according to the manufacturer's instructions) or in the correct shooting position (if the previous shooting position was not according to the manufacturer's instructions), before reassessment and release from restraint" ECWelNet recommendations http://www.euwelnet.eu/euwelnet/53430/7/0/80 Appendix 29.</p>	
<p>not enough info on best practices of killing. A note about the possibility that a veterinarian can also kill cattle (not intended for human consumption) with euthanasia</p>	<p>Out of scope.</p>
<p>The text and images are O.K. but this section lacks a qualification of the practices (we can only assume that the practices which are described are good, but is is not specified).</p>	<p>Noted.</p>
<p>I disagree with the discription of a clear tonic phase followed by a clear clonic phase. THis expression is true for electrical stunning, but not so for captive bot stunning, where the tonic phase is often ahrd to see at all, and the animal, also when properly stunned, often goes more or less straight into the convulsion phase. There should be instructions for how to restun (i.e. not placing the bolt in the same hole again, but a couple of centimetres to the side/correct position).</p>	<p>See response to similar comment above. Added</p>
<p>In Control procedure table, I woudl swich rows and put "time" first, then "signs". To me it's clearer way of reading it.</p>	<p>Noted.</p>
<p>The final table seems a bit complicate and in the second page (second column) the sentence "As described in this document For depopulation of large number of cattle check 5% of the heads?" is unclear.</p>	<p>Revised</p>
<p>Please delete the confusing examples in the brackets.</p>	<p>The comment is unclear, presumably refers to reference to tonic phase and clonic phase.</p>

Table A4.9 Horses

Comment	ICF Response
There is also no mentioning of procedures that the farmer should set up, in conjunction with the herd veterinarian, and no recommendations are done on how he can come to a conclusion to euthanize an animal, other than "failing to thrive" and "emergency". A decision tool could be very valuable in this context both to guarantee animal welfare and improve farm economics, as well as for public trust and personnel/farmer job satisfaction.	No such decision tool exists in the documents that were consulted.
suggest list circumstances when certificate of competence not needed.	Out of scope.
Modify/Clarify the text of the last sentence of paragraph 4 and paragraph 5, because doesn't make sense relatively the general text.	The comment is unclear.
There is some repeated text at the end. Also You may use a head collar not you may use of a head collar	The text has been edited as suggested.
Horses should not be killed on farm by owners. Veterinarians should euthanize these animals	Noted
Use of free bullet is not explained	Out of scope
But we propose to add an item at "Horses dislike" : i,§ Slippery floor _____ and show an image of the flight zone and critical points.	The text has been edited as suggested.
vets should kill horses on farm	Noted
The reasons for killing mares before their foals needs to be qualified.	The draft already provides the answer in the statement " mares may be come agitated if their foals are taken away and killed first"
We think you should add use of a free bullet as a best practice way to kill cattle, horses, pigs and sheep. https://www.hsa.org.uk/downloads/publications/humane-killing-using-firearms-updated-with-2016-logo.pdf from the Humane Slaughter Association gives good advice on this	Out of scope.

Comment	ICF Response
please note that it is compulsory that horses must immediately be bled after stunning	Text has already been edited based on previous comments.
HSA publication Guidance Notes No. 2: Captive-Bolt Stunning of Livestock, page 10.	Noted
some lines in the first section are misplaced	Noted.
We propose add something more detailed about equipment maintenance.	There is no indication of the level of detail suggested.
60 seconds between stun and kill seems too long and not to be considered good practice. In WAToK we have specified 'without delay'	The best practice is to bleed or pith immediately. The document already states that this should be done as soon as possible.
remark on possibility to call vet to euthanate the horse	Out of scope.
We propose to add information about stun-to-stick interval in the table. It's easier for end users	Noted
Maintenance, handling, and keeping of equipment is fundamental for successful use. A section more stressing this would be helpful for the target group.	Information added across all sections
information about foals and different size of horses is missing	Reference to manufacturers' instructions in text
in Control procedure: checking 5% of the animals is not good enough, every animal should be checked on effective stunning and killing	Agreed, revised
Further details of pithing and bleeding need to be included, as per comments in the cattle section. These can be found in HSA publications, which should be referenced.	Out of scope.
Suggest you do not use rhythmic and regular breathing but pick one of these terms in both contexts.	The text has been edited as suggested.
Timing is important, this should be highlighted.	The text has been edited by adding emphasis on timing of checks after stunning.

Table A4.10 Pigs

Comment	ICF Response
---------	--------------

Comment	ICF Response
<p>There is also no mentioning of procedures that the farmer should set up, in conjunction with the herd veterinarian, and no recommendations are done on how he can come to a conclusion to euthanize an animal, other than "failing to thrive" and "emergency". A decision tool could be very valuable in this context both to guarantee animal welfare and improve farm economics, as well as for public trust and personnel/farmer job satisfaction.</p>	<p>We were not able to identify any decision tools from the documents consulted.</p>
<p>In Croatia it's allowed to kill a pig (or :small ruminants, rabbits and poultry) for your own consumption (National rulebook about slaughter of animals for your own consumption, NN 84/2014). All the rules in that Rulebook regarding the welfare are in compliance with Reg. 1099/2009. So, our farmers sometimes slaughter animals on farm also for that purpose.</p>	<p>Out of scope.</p>
<p>how do farmers decide whether pigs (or other farm animals) ar failing to thrive. How do we prevent that killing pigs is done only on economical reasons?</p>	<p>Out of scope.</p>
<p>for example use different colours to different responsibilities: owner/keeper, authorities, emergency killing</p>	<p>General introduction revised</p>
<p>Modify/Clarify the text of the last sentence of paragraph 4 and paragraph 5, because doesn't make sense relatively the general text</p>	<p>Text revised</p>
<p>In the UK, The Welfare of Animals at the time of Killing (WATOK) contains provisions for slaughter or killing operations other than in slaughterhouses or knackery yards. Anyone killing a farmed animal or bird on-farm will need a WATOK licence for the relevant species and operation for killing animals outside of a slaughterhouse or Certificate of Competence - unless the animal is being killed in circumstances exempted from licensing requirements (WATOK (England) 2015, Part 2, Chapter 2 (14)) or under emergency killing procedures. This is contrary to your statement, I am concerned that when animals are regularly killed on-farm (predicted operation), the operative must have the necessary skill and competence as required by WATOK.</p>	<p>We are not addressing specific country requirements in this document.</p>
<p>Suggest list circumstances in which a certificate of competence is not needed [2]</p>	<p>Out of scope.</p>
<p>Pigs, like cattle, are inquisitive and will move readily along curved, solid-sided races, when given time. Like cattle, they prefer a slight incline to a downward slope.</p>	<p>The text has been edited as suggested.</p>

Comment	ICF Response
<p>Goads should not be allowed. This is not good practice. Rattling paddles can be useful [2]</p> <p>The use of pig boards (as mentioned later) should be encouraged. [2]</p>	<p>Revised</p>
<p>Have you consulted the FSA's Group Stunning Guidance (attached)?</p>	<p>Reviewed</p>
<p>Maybe to think about adding a picture regarding flight zone and point of balance? (it's also valid for cattle part)</p>	<p>Added</p>
<p>include more drawing and less texts [3]</p>	<p>Noted.</p>
<p>coloured lines should be ordered better (to have a better view on which line is connected to which item). - using a picture in this text</p>	<p>Revised</p>
<p>Suggest something clearer than "adequately spaced" for the use of goads. Especially as you also say hey should not be used repeatedly.</p>	<p>Noted</p>
<p>Typo with the word goad too.</p>	<p>Text edited.</p>
<p>But we propose to add an item at "Pigs dislike" : i,§ Slippery floor _____ and show an image of the flight zone and critical points.</p>	<p>Text edited.</p>
<p>Its not very clear what is considered a "narrow pen". Maybe some images would help to understand the concept</p>	<p>Noted</p>
<p>I suggest that you rewrite the first sentence as follows: 'Poor handling of pigs will increase levels of stress, making the animals more difficult to handle and can cause bruises and bone breaks.'</p>	<p>The text has been edited as suggested.</p>
<p>Amend the sentence "Pigs are very inquisitive and explore their environment with their mouths." by adding 'noses and' between "their" and "mouths"</p>	<p>The text has been edited as suggested.</p>
<p>Pigs are particularly susceptible to high frequency sound, they have a range of hearing from 42 Hz to 40 Hz and can hear frequencies that are beyond the range of human hearing. This should be reflected under "noise"</p>	<p>The text has been edited as suggested.</p>

Comment	ICF Response
Your statement "Before you try moving the animal, you should always ask yourself: "Is the animal able to bear its own weight on all four feet?" does not match legislation which states "they are unable to move independently without pain or to walk unassisted"	The text has been edited as suggested.
Check the use of commas in "lifting the animal by the head, ears, , legs, or tail,"	The text has been edited as suggested.
When using a mouth snare on "pigs that cannot move but require head restraint before stunning" if the pig is unable to move, this form of restraint should not be necessary.	Snaring is not good practice but if a farmer has no other reasonable restraint it is better to use this method and get a good and safe shot than risk not stunning the animal with a poor shot.
type of restraining adapted to the size of pig and his fitness [2]	The text has been edited as suggested.
The first paragraph is valuing but not helpful	Noted.
Pigs are more independent than cattle or sheep and therefore, the use of flight zones to encourage movement is not so relevant.	Noted, no action.
Some pictures would be useful (methods of restraining of pigs)	Noted.
This section lacks details about how the methods must be adapted to the size and the state of the pigs.	NOTed.
Pigs are also very sensitive to low temperatures and this becomes evident via special skin lesions.	This comment is pertinent for lairaging, which is covered in the slaughterhouse operations drafts.
Additional images would be helpful. + see additional information needed	Noted
electric goads are not "good" practice I suggest to qualify this as "acceptable" under specific conditions. In many situations it should be qualified as "unacceptable" [12]	This comment has been addressed above.
CO2 gaz for piglets [2]	Out of scope.
for sows and boars, the shot of captive bolt must be 2 cm besides the midline.	It is unclear how this differs from existing text.
We think you should add use of a free bullet as a best practice way to kill cattle, horses, pigs and sheep. https://www.hsa.org.uk/downloads/publications/humane-killing-using-firearms-updated-with-2016-logo.pdf from the Humane Slaughter Association gives good advice on this	Out of scope.

Comment	ICF Response
<p>We don't agree with stun-to-stick interval proposed to captive bolt stunning and head-only electrical stunning. It seems to us very little time and not controllable. What is the source of such parameter? _____ For this method, we already have doubts about the possibility of kill until 70 piglets/day. In fact it is a disposition of the Reg. 1099/2009/CE but, in this text it seems that we are talking about on-farm consumption. We don't agree with this disposition in this document. We already think that it is not correct refer "pigs" - the word must be change for "piglets". So, we propose some changes on this chapter, otherwise we can't support the text.</p>	<p>Intervals are drawn from existing guidance. The text is not about on-farm consumption.</p>
<p>A maximum stun-to-stick interval of 15 seconds for captive bolt stunning appears very short: is there a valid ground for requiring such a short interval? the shorter the better, of course, but it can be impractical and usually up to 60 seconds is considered OK for captive bolt stunning (in contrast to electrical stunning, where 15-20 sec is the true maximum). Regarding electrical stun-to-kill, it should be emphasized that this type of application very rapidly wears down/ causes over-heating of the Equipment, which may then fail. Hence, it is - when killing more than a couple of pigs - necessary to have two sets of tongs, to allow the Equipment to cool off inbetween batches of animals. This should be mentioned.</p>	<p>Intervals are drawn from existing guidance. An alternative interval of up to 60 seconds has been added. We have also added reference to overheating issues and necessity to have additional pair of tongs.</p>
<p>"You should kill the pig by bleeding or pithing as soon as possible and within 15 seconds of stunning." How can you pith a pig that has been head-only electrically stunned? Replace with "You should kill the pig by bleeding or electrocution (inducing ventricular fibrillation by placing the stunning electrodes across the chest, spanning the heart for ≥ 5 seconds) as soon as possible and within 15 seconds from the start of stunning."</p>	<p>The text has been edited as suggested, but with simpler text "by bleeding or electrical stunning to the heart."</p>
<p>Stunning as defined in EC 1099/2009 includes the use of Firearms with a free projectile (free bullet) of appropriate charge or calibre (shotguns, rifles, pistols) are also commonly used methods for killing larger pigs. Include a section of Firearms and Shotgun use.</p>	<p>Out of scope.</p>
<p>I suggest that you should include a section on the use of non-penetrating captive bolt to stun/kill neonate pigs on-farm – see Grist, et al. (2016)</p>	<p>Out of scope.</p>

Comment	ICF Response
HSA publication Guidance Notes No 2: Captive-Bolt Stunning of Livestock, pages 8 & 12.	Noted
It is NOT acceptable to position electrodes behind the ears, as described above. Please refer to the HSA publication and online guide - Electrical Stunning of Red Meat Animals.	The picture has been revised.
Drawing not clear	As above.
cattle mentioned on page 7	The text has been edited as suggested.
letter size is small	The text has been edited as suggested.
Stunning is defined in EC 1099/2009 as: any intentionally induced process which causes loss of consciousness and sensibility without pain, including any process resulting in instantaneous death; Your statement "You should render the animal unconscious before killing it. That is called "stunning" does not include instantaneous death, which does not require a killing method!	Revised
"You should kill the pig by bleeding or pithing as soon as possible and within 15 seconds of stunning." Captive bolt stunning is very effective with pigs provided the correct shop position is used. The 15 s stun-to-stick time is based on research at Bristol for electrical head-only stunning of pigs. There is no peer reviewed scientific evidence to support 15 s with captive bolt use with pigs.	The intervals used have been identified in existing guides.
In your first paragraph you state that "The animal must then be killed, except for piglets which may be killed by this method." Where is the evidence that piglets may be killed by head-only electrical stunning?	Expert view.
"Electrodes should be placed between the outer corners of the eyes and the base of the ears." This is the optimum electrode position however, it is often difficult to apply the electrodes in this position due to the profile of the pig's head. The minimum current requirement (1.3 Amp) has taken the problem of electrode positioning into account in that 1.3 Amps is sufficient current should the electrodes be applied on the neck. I suggest that you rewrite this sentence to read 'The optimum electrode position is between the outer corners of the eyes and the base of	The text has been edited as suggested.

Comment	ICF Response
<p>the ears however, alternative positions that span the brain are permitted.’ And delete “Alternatively, the electrodes may be placed on both sides behind the ears.”</p>	
<p>Rewrite “The voltage should be at least 180V, and optimally 240 to 250V. However this can be switched to 150V for piglets. The frequency should be 50Hz. The amperage should be at least 1.3A. It can be increased to 1.8A for pigs of more than 150kg, and 2A for sows and boars.” Wotton and O’Callaghan, (2000) demonstrated that ≥ 250 volts is necessary to break down the initial high impedance seen when applying stunning current to pigs. This voltage is necessary to ensure that sufficient current is applied to ensure that the stun is immediate in action. Therefore, I suggest the following ‘The voltage should be at least 250V. The frequency must be 50Hz to ensure heart muscle is affected. The amperage should be at least 1.3A. Constant current stunning equipment, where the voltage is adjusted depending on the impedance to deliver the current required, is available.’ I am not aware of any evidence to suggest that higher currents are necessary for larger pigs, higher voltages may be necessary but the current requirement remains the same. Please adjust the electrical parameters given in your table. [2]</p>	<p>The parameters indicated in the consultation draft are those provided in existing guides. Resistance affects the current, so larger pigs may have increased resistance. Our experts are not aware that the higher current causes any adverse effects. For this reason, we propose to maintain the parameters of the consultation draft.</p>
<p>“You may not need to restrain the animal if you can apply tongs by approaching it form the rear in a narrow pen.” Replace “form” with ‘from’</p>	<p>The text has been edited as suggested.</p>
<p>“Head-only stunning at low electricity levels is reversible: it will not kill the animal. Animals have to be quickly stuck or pithed to ensure death. If the animal was sick, bleeding or pithing on farm risks contaminating other animals or humans.” Replace the reference to pithing with ‘electrocution (inducing ventricular fibrillation by placing the stunning electrodes across the chest, spanning the heart for ≥ 5 seconds)’</p>	<p>The text has been edited as suggested, using simpler language (“stunning of the heart”).</p>
<p>“If the equipment is not easily portable, animals have to be moved to the stunning area. There is a cost for the purchase of electrical stunning equipment.” Delete “There is a cost for the purchase of electrical stunning equipment.” It is repeated in your next bullet point.</p>	<p>The text has been edited as suggested.</p>
<p>“Ensure there is sufficient space to apply the tongs across the chest once the pig is in a collapsed state from the head-only stun.” Replace “collapsed” with ‘tonic’.</p>	<p>Noted.</p>
<p>Replace “The Wear rubber gloves and boots to avoid being electrocuted” with ‘The</p>	<p>The text has been edited as suggested.</p>

Comment	ICF Response
wearing of rubber gloves and boots is advised to avoid being electrocuted'	
"Using both hands, place the electrode across the head so that the electrical current flows through the brain." Replace with 'With the stunning tongs held using both hands, place the electrodes across the head so that the electrical current flows through the brain.'	The text has been edited as suggested.
"The heart stun should be applied as soon as possible and within 30 seconds after the head stun." The electrodes should be applied across the heart within 15 s after the head stun, i.e. the same time limit as with stun-stick times because the time to cortical brain death following ventricular fibrillation is similar to the time following an accurate stick i.e. 19 vs. 18 s respectively.	Text revised: stun should be applied within 15 seconds, as suggested. This would represent best practice.
Table of recommended parameters should be rewritten as: Species: Pig; Voltage: ≥250 Volts; Amperage: ≥1.3 Amps; Frequency: 50 Hz; Duration - head: ≥3-8 s; Duration - heart: ≥8-15 s	Parameters have been revised as suggested by the consultee and also indicated by ICF's expert.
There is only a selection of methods listed (Vo (EG) 1099/2009). Other methods are also legal and available, such as: Gaseuthanasia (CO ₂ , CO, inert gasses) or by injection with specific compounds by the veterinarian for example.	Out of scope.
The dangers to staff in case of electrical stunning must be better explained.	The document is focused on animal welfare issues, health and safety issues cannot be discussed at length.
<p>There is a disadvantage in the use of Captive bolt stunning in pigs which is the strong clonic phase. This should be considered because in practice, if you do not want to have any risk to worker safety, you will have to wait until the clonic phase ends and then bleed or perform the pithing.</p> <p>The major disadvantage of captive bolt use with pigs is the severe post-stun convulsions (kicking) that makes assessment of the effectiveness of the stun almost impossible. In addition, their use creates a Health & Safety issue for the operator and can be a cause of concern to onlookers.</p>	This has been added to the list of "disadvantages" under captive bolt stunning.

Comment	ICF Response
Rewrite "The Wear rubber gloves and boots to avoid being electrocuted" to read 'The wearing of rubber gloves and boots is advised to avoid being electrocuted'	The text has been edited as suggested.
"Because this method requires equipment, it is best used for depopulation." All methods of stunning and/or killing require some equipment therefore, you need to quantify this statement by including 'expensive', 'a power supply' or some other descriptive that will differentiate it from mechanical stunning.	We cannot quantify this, as discussed with the Commission. Text has been edited: "because this method requires heavier equipment than others".
Maintenance, handling, and keeping of equipment is fundamental for successful use. A section more stressing this would be helpful for the target group.	Text has been edited across all sections to ensure these points are mentioned in the text.
Pointing out that Head-only stun also has chest application could lead to some misunderstandings of the reader.	We do not think the document creates confusion.
Control procedures.	unclear
page 1 I don't think this is necessary: ...the bolt may also damage the brain itself page 3 "at least 5 or 8 seconds". If it is at least 8, why bother with 5? page 4, repeated text: there is a cost...	Text has been edited to emphasize that the document lists good practice recommendations from different sources, which include the different options presented.
"As a general rule, the current should be maintained until the animal collapses and legs are extended." This describes the tonic phase that begins when current is applied to the pig and therefore is not an indicator of sufficient application time therefore, should be deleted.	We have revised the text and indicated that current should be applied for a minimum of 3 seconds, and that the animal should demonstrate the signs of unconsciousness.
explain more the bleeding in the captive bolt practice with the possibilities for bleeding the pigs (extra or intra cardiac bleeding for exemple to avoid the dessimination of blood)	Out of scope.
mentions cattle in the table instead of pigs	<i>Edited</i>

Comment	ICF Response
<p>In larger boars and sows the skull has a more 'dished' conformation which has to be accounted for when aiming the captive bolt pistol. Shot position for adult pigs is at a point 5 cm caudal of a line joining the rear margin of the eyes slightly to one side of the midline. The HSA recommend electrical stunning for adult pigs, because of the bone development (http://www.hsa.org.uk/shop/publications-1/product/humane-killing-of-livestock-using-firearms-2nd-ed)</p>	<p>Noted</p>
<p>Please take note to the above mentioned. We already propose to add information about stun-to-stick interval in the table. It's easier for end users.</p>	<p>Noted.</p>
<p>There is something strange with the sentence about rubber gloves - probably a typo? R(elates to electrical stunning chapters)</p>	<p>The text has been edited as suggested.</p>
<p>Placing tongs behind the ears is not acceptable. Please see above.</p>	<p>This comment has been already addressed above.</p>
<p>the different assessment is not clear why is one acceptable and best!</p>	<p>All qualifiers have been reviewed</p>
<p>The major advantage of captive bolt guns is their portability!</p>	<p>The text has been edited as suggested.</p>
<p>In the case of Head-only Electrical Stunning, I would not recommend it because even that it is considered a stunning method, in practices, what we see is that most animals recover from unconsciousness because time is critical and on a farm handling, might be really difficult to perform without eminent risks. So that I would suggest as unacceptable on farm.</p>	<p>This method cannot be considered unacceptable, because it is legal. Additionally, it is acceptable on farm because it is a very effective method for farm clearance for disease control purposes. We suggest to revise the text and add emphasis on the necessity for operators to be prepared to bleed the animals, and be aware of risks so as to minimize the stun to stick interval.</p>
<p>"However, that may not be the case for most animals, who will need to be restrained." Most pigs can be head-only electrically stunned while free-standing in a pen. You suggest restraint is necessary but the methods described in your previous section only offer the use of a mouth snare, which has serious welfare connotations. See FSA's Group Stunning Guidance (attached) where the use of a swinging gate to restrict animal movement is a viable alternative.</p>	<p>Noted. Mention added to section on restraining.</p>

Comment	ICF Response
<p>Head-to-body electrical stunning / stunning that stops the heart: "This stunning method constitutes best practice." How can this be best practice if you consider Head-Only Electrical stunning to be only acceptable practice?</p>	<p>stun kill is not better than stun bleed from a welfare point of view, but it is easier to use on farm because operators do not have to deal with associated problems of blood disposal.</p>
<p>"This stunning method constitutes acceptable practice." Head-only electrical stunning when correctly applied should be considered as 'Good practice'</p>	<p>Head-only electrical stunning implies bleeding on farm, which can cause problems.</p>
<p>Best practice should only be what can be safely implemented for animal and handler without any risk or stress. Is this the case for electrocution in an on farm environment?</p>	<p>Anyone with the right equipment and training can use this method, which is good for disease control purposes. Qualifier kept</p>
<p>"This method is particularly effective for small pigs, which may have softer skulls reducing the effectiveness of a captive bolt. Piglets may be killed." Recent research Grist, et al., (2016) has shown that non-penetrating captive bolt is an effective, humane method of killing piglets ≤10.9 kg and is a cheaper more portable alternative to electrical stunning.</p>	<p>Out of scope.</p>
<p>You may stun a pig by striking the back or top of the head with a sudden swift blunt force. A percussive blow to the head is recommended only for use on piglets under 4 weeks of age and less than 5kgs in weight. EC 1099/2009 actively discourages the use of Manual Blunt Force Trauma - 3. Cervical dislocation and percussive blow to the head</p> <p>These methods shall not be used as routine methods but only where there are no other methods available for stunning. No person shall kill by manual cervical dislocation or percussive blow to the head more than seventy animals per day. Alternative mechanical non-penetrating methods have been developed for on-farm use (Grist, et al., 2016, Sutherland, et al., 2015) therefore there is now an</p>	<p>Out of scope.</p>

Comment	ICF Response
alternative to manual blunt force trauma subsequently, should you be encouraging its continued use? I suggest that you replace this section with one describing the use of non-penetrating mechanical stun/killing with piglets. [2]	
leaflet in France since 2008 at IFIP in revision/ discussion since new regulation CE 1099/2009 [2]	Noted
EFSA guide to signs of life/unconsciousness is used widely in the field by OV's. Would benefit from using same terminology	Reviewed
perhaps include some photos or drawing on the signs of inconscious ?.	Noted
It's not clear if these indicators are the same for all previously mentioned stunning procedures. (e.g. does a percussive blow to the head also relsut in a tonic/clonic phase?) [4]	A percussive blow to the head would produce the same signs of previously mentioned procedures.
choose one of "rhythmic" or "regular" breathing.	The text has been edited and we removed "rhythmic".
There is some information about signs of correct electrical stunning that must be included in the text, namely: that eyes signals are not 100% secures to check that the animal is correctly stunned. [2]	Agreed, edited.
The text and images are O.K. but this section lacks a qualification of the practices (we can only assume that the practices which are described are good, but is is not specified).	Noted
Problem is that the signs of good stunning are different depending on if the animal has been stunned using a captive bolt or electricity. This has to be refelcted by thext and illustrations.	Signs of unconsciousness are the same for both methods of stun. The tonic phase is short with captive bolt stunning.
Details on re-stuning (methods, location) should be included.	A detailed explanation of back-up stunning methods is out of scope. However, when the same method described in the consultation draft is used

Comment	ICF Response
	<p>as back-up, it is appropriate to provide text on how it should be applied. Text indicates that operators should not repeat electric stunning, and that the back-up system should be used immediately.</p> <p>For captive bolt stunning, the skull is already damaged so the percussion effect is likely to be reduced. Operators should re-stun the animal aiming at the centre of the brain and placing the gun 5 centimetres from the original site.</p>
<p>"5. No vocalisation" Note vocalisation can occur when the current (head-only electrical stunning) is first applied if the pig has inspired immediately before the electrodes are applied. (2)</p>	<p>The text has been edited as suggested.</p>
<p>"6. The animal's legs are initially stiff and extended (this is known as the "tonic phase"), followed by twitching and or kicking (this is known as the "clonic phase")" Replace "twitching and or kicking" with 'uncontrolled physical activity or kicking' also in the diagram.</p>	<p>The text has been edited as suggested.</p>
<p>drawing actions in cases of remove conscious</p>	<p>Noted.</p>
<p>information about killing is missing (all animals). When sticking, blood is cat 2 animal by product that should be removed from farm separately.</p>	<p>Out of scope.</p>
<p>Timing - 15 seconds to check and kill</p>	<p>This comment has already been addressed above.</p>

A4.11 Rabbits

Comment	ICF Response
<p>There is also no mentioning of procedures that the farmer should set up, in conjunction with the herd veterinarian, and no recommendations are done on how he can come to a conclusion to euthanize an animal, other than "failing to thrive" and</p>	<p>No such tool exists for rabbits</p>

Comment	ICF Response
<p>"emergency". A decision tool could be very valuable in this context both to guarantee animal welfare and improve farm economics, as well as for public trust and personnel/farmer job satisfaction.</p>	
<p>List circumstances when certificate of competence is not needed.</p>	<p>Out of scope</p>
<p>Modify/Clarify the text of the last sentence of paragraph 4 and paragraph 5, because don't make sense relatively the general text. _____</p>	<p>Unclear</p>
<p>It will be better have image(s) how to carry rabbits.</p>	<p>Noted</p>
<p>images how to restrain rabbits, and what is forbidden</p>	<p>Noted</p>
<p>Lifting and carrying practice - lifting by the skin of the neck or shoulders is not good practice unless the animal is supported with the other hand. Text should be adjusted to make clear that the second point is necessary to make this good practice</p>	<p>Agreed - <i>Text edited.</i></p>
<p>Misting the rabbits prior to electrical stunning rather than suggesting a spray or sponge.</p>	<p>The document already states that "You may wet the sides of the head to which the electrodes are applied with water, using either a spray or a damp sponge".</p>
<p>At page nr 3 there are some paging issues mainly in section nr 3. Maximum stun-to-stick interval The sentence "within 5 seconds of stunning or within 10 seconds of stunning" is not clear. Could be possible to define an interval "within 5-10 seconds..."? [3]</p> <p>Informed, evidence-based opinion on the stunning and killing of rabbits is hard to come by. The position shown for captive-bolt stunning may be considered a little low by some observers.</p>	<p>Reworded, clarifying that recommendations vary, and list them, as done for other drafts.</p> <p>Noted.</p>
<p>We don't agree with stun-to-stick interval proposed to captive bolt stunning and head-only electrical stunning. It seems to us a very short time and not controllable. What is the source of such parameter? _____ So, we propose some changes on this</p>	<p>Text edited</p>

<p>chapter, otherwise we can't support the text. <i>Consultee stated than in Portugal 20 seconds was considered good practice.</i></p>	
<p>Practically in very young rabbits those methods can be difficult to apply. More research should be funded to also find a adaequate solution for this group.</p> <p>Maintenance, handling, and keeping of equipment is fundamental for successful use. A section more stressing this would be helpful for the target group.</p>	<p>Acknowledged - Out of scope</p> <p>Text edited to emphasize importance of maintenance, handling and keeping of equipment.</p>
<p>In this section, the final table seems to complicate then make the comprehension of the text easier</p>	<p>Reviewed</p>
<p>We do not believe it is possible to achieve an accurate blow to the head as defined in legislation from swinging an animal against a solid object and this method</p>	<p>We agree that this practice is not likely to satisfy the requirements of Annex I, Table 1 of the Regulation. Text edited.</p>
<p>Handling of the rabbits by the ears and one leg goes against previous section that said animals must not be held by the ears. It should be clear that when lifting out of crates animals should not be picked up by their ears.</p>	<p>As indicated by the respondent, the text specifies that lifting by the ears is not allowed. When discussing restraining for head only stunning, the text states "you may hold the rabbit by the back legs with one hand, while the other hand holds the ears". Changed to "Alternatively, you may hold both back legs of the rabbit with one hand, while the other hand holds the head". and ": 'Your other hand should position the head by guiding the ears". This is also presented in the illustration.</p>
<p>suggest you pick one of rhythmic and regular breathing</p>	<p>Text edited to keep only regular breathing</p>
<p>There is some information about signs of correct electrical stunning that must be included in the text, namely: eyes signals are not 100% secures to check that the animal is correctly stunned</p>	<p>This is correct, the absence of a corneal reflex is not a 100% reliable sign (it could be caused by severed reflex pathways, as indicated by EFSA 2006). The control procedures require to check</p>

	multiple signs of unconsciousness, thus addressing the issue that eye signals alone may not be an accurate signs.
there should be also information on how to verify death vocalisation versus involuntary passage of air along the vocal cords	It should be possible to tell the difference between a rabbit screaming in pain and the sound of 'air passing along the vocal cords'. Therefore, we suggest that no edits are required.

Table A4.12 Sheep and goats

Comment	ICF Response
Required level of competence should be defined more clearly. There is also no mentioning of procedures that the farmer should set up, in conjunction with the herd veterinarian, and no recommendations are done on how he can come to a conclusion to euthanize an animal, other than "failing to thrive" and "emergency". A decision tool could be very valuable in this context both to guarantee animal welfare and improve farm economics, as well as for public trust and personnel/farmer job satisfaction.	No such tool exists in published guides.
And suggest list circumstances in which certificate of competence is not needed	Out of scope.
Modify/Clarify the text of the last sentence of paragraph 4 and paragraph 5, because don't make sense relatively the general text.	Unclear
I do not understand the table? Is it here by mistake? [2]	This was included in the consultation doc by mistake
I suggest that the reasons for killing sheep and goats on-farm should include "when they are considered economically unviable" for example male dairy sheep or goats.	Generic section for all species has been added.
If you include point 1 above then "You do not need a Certificate of Competence to carry out the killing in all these circumstances." Is not accurate, a C-o-C or a WATOK licence (WATOK requires an appropriate level of competence in those carrying out killing and related operations on farm in order to do so without causing the animals any avoidable pain, distress or suffering. Anyone carrying out a killing operation must	Member states can formulate their own rules for on-farm killing which go beyond what EU legislation requires. This is a matter for each Member State, but not for this document.

Comment	ICF Response
ensure that the animal is restrained appropriately and is stunned before killing. Operations requiring a WATOK licence are detailed in WATOK Chapter 2, section 13 and exceptions in section 14.) is required.	
HSA publication Guidance Notes No. 6: Humane Handling of Livestock, page 4.	Noted
"Rams and bucks can be unpredictable and can KNOCK Down handlers". "You should not under any circumstance....holding the animals by the EARS"	Text edited
But we propose to added an item at "Sheep and goats dislike" i,§ Slippery floor _____ and show an image of the flight zone and critical points.	Text edited to add "slippery floor"; flight zone has been added
Additional images would be helpful, especially as regards the ability of the animal to move.	Noted
"Poor handling of sheep and goats can cause bruises and bone breaks." I suggest that you replace this sentence with 'Poor handling of sheep and goats will increase levels of stress, making the animals more difficult to handle and can cause bruises and bone breaks.'	Agreed, text has been edited as suggested
"Before you try moving the animal, you should always ask yourself: "Is the animal able to bear its own weight on all four feet? Can it move without pain?" does not match legislation which states "they are unable to move independently without pain or to walk unassisted"	Text edited
As with pigs, the use of Flight Zones with sheep and goats is not as useful as with cattle. It is more important to make sure that the way ahead is open and clear of obstacles.	Noted/edited
"You may use of a head collar and lead rope, halter or bridle, which is secured to restrict movement of the head." Delete "of" between "use" and "a head"	<i>Text edited</i>
Use some pictures on restraining of animals.	Noted
"Can it move without pain?" should be explained more clearly. Additional images would be helpful.	Noted
"Sheep and goats dislike:" I suggest that you add 'Noise, in particular impulse sounds	<i>Text edited as suggested</i>

Comment	ICF Response
and/or high frequency sound.' To this list.	
Additional images would be helpful. + see additional information needed	Noted
"Head collar and lead rope, halter, or bridle" : given that this practice has no disadvantages, why is it only qualified as "good" and not "best"? I agree with the rest of the qualifications.	Use of head collars etc. are only in use for small proportions of sheep and goats and the method requires trained animals, which are not readily identifiable in the lairage.
Captive bolt stunning might also be used for sheep and goats [6 mentions total including penetrative and non-penetrative captive bolt]	Out of scope
lacks descriptions of mechanical methods	Out of scope
1. We think you should add use of a free bullet as a best practice way to kill cattle, horses, pigs and sheep. https://www.hsa.org.uk/downloads/publications/humane-killing-using-firearms-updated-with-2016-logo.pdf from the Humane Slaughter Association gives good advice on this	Out of scope
We don't agree with stun-to-stick interval proposed to head-only and head-to- body electrical stunning. It seems to us very short time and not controllable. What is the source of such parameter? _____ So, we propose some changes on this chapter, otherwise we can't support the text.	The stun-to-stick interval of 8 seconds is drawn from this guidance on depopulation: TVT (2015) Tierschutzgerechtes Schlachten von Rindern, Schweinen, Schafen und Ziegen. Merkblatt Nr. 89. On page 26: "The interval between the end of the flow and the cut should not be longer than 8 seconds since the recovery from the epileptiform attack is faster than in the pig." Revised to 15 seconds based on expert advice.
HSA publication Guidance Notes No 4: Electrical Stunning of Red Meat Animals, pages 6, 11, 12, & 20.	Noted
It is NOT acceptable to place electrodes in the alternative position, as described in the text, ie. one on top of the head and one under the chin. Please refer to the HSA publication and online guide - Electrical Stunning of Red Meat Animals. Stun-to-stick times should be within 15 seconds, not 8 seconds.	Agreed – Alternative positioning removed from the document.

Comment	ICF Response
<p>May be. We have some doubts about the second example of correct position to stunning. Where is it describe? Without an explanation, it will be difficult to accept this text.</p>	<p>Alternative position removed from the document</p>
<p>Additional images would be helpful.</p>	<p>Noted</p>
<p>"You should render the animal unconscious before killing it." Perhaps you should differentiate simple stunning from stunning that results in instantaneous death?</p>	<p>Noted.</p>
<p>"Ensure that the sheep's and goats' wool and hair are dry. If they are wet, the electricity will travel to earth via the body and not through the brain." This is incorrect! In addition, under Positioning you state "Wetting the area with water (especially salted water) can also increase electrical contact."</p> <p>If the wool or hair are dry, poor contact between the electrodes and the animal will result and they are unlikely to receive sufficient current to stun. The use of water particularly when stunning sheep, will help to bridge the gap between the electrodes and the skin of the animal, reducing contact impedance. Electricity will not travel to earth, because the output from the stunner control unit will include an isolating transformer which ensures that current can only flow between the electrodes and not to earth.</p>	<p>It is poor practice to slaughter sheep and goats with wet fleeces or hair for both hygiene and because of risk of shorting with some types of electrical stunners. Clearly if just the area of electrode application is wetted with saline this would be best practice as it facilitates optimal electrical stunning</p>
<p>"Using both hands, place the V-shaped electrode across the head so that the electrical current flows through the brain." The use of V-shaped electrodes is no longer permitted by UK Retailers because the use of fixed serrated electrodes can cause severe injury if not applied correctly or are applied when the supply has failed.</p> <p><i>"It is accepted that the electrode application with a Thornton head-to-back headset (fig 1.) configured for head-only application, may not always span the brain, (but will always be applied to the head) however the current field that will develop with this application will quickly involve the neural tissue of the brain within the required time for the stun to be immediate (<200 ms). "</i> [pictures included in email]</p>	<p>Text revised.</p>
<p>"Recommendations for Amperage vary between 1.0A to 1.3A" it is generally accepted that 1.0 Amp is sufficient to effectively stun sheep and goats. If this is amended, please also amend the value in the table.</p>	<p>No action - the document lists the various options that are discussed in existing guides</p>

Comment	ICF Response
<p>"Voltage between 220 and 250V" research at Bristol has shown that 150-200 volts are sufficient to break down the inherent high impedance with sheep however, contact impedance is likely to be higher therefore, a higher voltage is normally used. A constant current stunner is the best choice.</p>	<p>Noted</p>
<p>"If sufficient electricity is applied to the head of the lambs and kids, you can both cause unconsciousness and death by cardiac arrest. This works very reliably in small lambs and kids, but not in larger animals." I would be interested in reading the evidence for this statement? Presumably the frequency would be limited to 50 Hz?</p>	<p>Expert view</p>
<p>"Head-only stunning at low electricity levels is reversible: it will not kill the animal. Animals have to be quickly bled or pithed to ensure death. If the animal was sick, bleeding or pithing on farm risks contaminating other animals or humans." How can you pith a sheep or goat that has been head-only electrically stunned? Replace with 'You should kill the sheep or goat by bleeding or electrocution (inducing ventricular fibrillation by placing the stunning electrodes across the chest, spanning the heart for ≥ 5 seconds) as soon as possible and within 15 seconds from the start of stunning.'</p>	<p>Text has been edited as suggested but simplified: "... by bleeding or by stunning the heart.</p>
<p>"There is a cost for the purchase of electrical stunning equipment. The method is mainly used on ram for depopulation by competent authorities." Replace "ram" with 'farm'</p>	<p><i>Text edited</i></p>
<p>"Using both hands, place the electrode across the head so that the electrical current flows through the brain." Replace with 'With the stunning tongs held using both hands, place the electrodes across the head so that the electrical current flows through the brain.'</p>	<p><i>Text edited</i></p>
<p>Your diagram above shows the application of fixed electrodes mounted on a 'wand'. I believe that scissor-shaped tong should be used to ensure good contact with the animal.</p>	<p>Picture revised</p>
<p>Note: Stun/killing sheep with 300-400 V, AC, 50 Hz, minimum current of 1.0 A, for 3 sec, leads to epileptiform activity and cardiac ventricular fibrillation (Anil and McKinstry, 1991, Gregory and Wotton, 1984). These electrical parameters for head-to-body applications are the same as for head-only applications. The brain is surrounded by insulating bone whereas the heart is not!</p>	<p>Noted, no action</p>

Comment	ICF Response
Take note to the above mentioned. We already propose to add something more detailed about equipment maintenance and about stun-to-stick interval in the table. It's easier for end users.	Noted
"Alternatively, the electrodes may be placed one on top of the head and one under the head.": An image would be useful. "Alternatively, the electrodes can be placed on the middle of the chest and on the back of the animal so as to span the heart.": An image would be useful.	Noted
"Use electrodes with pins or with wet pins for woolly animals." It may help the reader to have a figure demonstrating pin electrode application e.g. [picture provided by Steve Wotton]	Noted
"You should kill the sheep or goat by bleeding as soon as possible and within 8 seconds of stunning." Replace "within 8 seconds of stunning" with 'within 15 seconds from the start of stunning'	See above response to similar comment
Maintenance, handling, and keeping of equipment is fundamental for successful use. A section more stressing this would be helpful for the target group.	Comment already addressed above
It might be difficult to understand whether the wool should be dry or wet as you recommend dry wool but also recommend to wet the wool with salt Water in certain body areas. Maybe under Preparation change to "Ensure that the...wool is not wet through"	Point already raised earlier, same response
Spelling mistake : « ... if you can apply tongs by approaching it form the rear in a narrow pen.": "form" should be "from". Something seems contradictory: the fact that after head-only stunning, on the one hand, the animal should be bled after only 8 seconds, but on the other hand, that the heart stun should be carried out after 15 seconds. This needs clarification.	Corrected
"As a general rule, the current for the head-stun should be maintained until the animal collapses." This describes the tonic phase that begins when current is applied to the animal and therefore is not an indicator of sufficient application time therefore, should be deleted.	Agreed

Comment	ICF Response
there are no categories described	No action
Additional images would be helpful. + see additional information needed	Noted
The head-to-body electrical stunning has many disadvantages. Therefore, it should be qualified as "acceptable" or "good", but not as "best". [2]	Head to body stunning done manually or automated is a highly effective reliable method of stunning sheep and is widely used in commercial practice. It has disadvantages with regard to potential damage to meat quality but from welfare perspective is best practice.
Also stunning of the heart bears risks for animal and handler and that there is simply no best practice at the moment and more research is needed	Addressed above
EFSA signs of unconsciousness/signs of life guidance is already widely used by OV's. Be good to use the same terminology.	Noted
HSA publication Guidance Notes No 4: Electrical Stunning of Red Meat Animals, pages 6, 11, 12, & 20..	Noted
suggest you use either "rhythmic" or "regular" breathing but not one in one context and the other in another.	Corrected to regular breathing.
There is some information about signs of correct electrical stunning that must be included in the text, namely: eyes signals are not 100% secure to check that the animal is correctly stunned . [2]	Agreed text edited
"5. No vocalisation" Note vocalisation can occur when the current (head-only electrical stunning) is first applied if the sheep/goat has inspired immediately before the electrodes are applied.	Noted
3. "The animal's legs are initially stiff and extended (this is known as the "tonic phase"), followed by twitching and or kicking (this is known as the "clonic phase")" Replace "twitching and or kicking" with 'uncontrolled physical activity or kicking' also in the diagram.	Text edited across all species

Comment	ICF Response
Sheep are "freezers". They also do not exhibit pain in a way very obvious to humans.	No action
Take note to the above mentioned. We already propose to add information about stun-to-stick interval in the table.	See response to same comment above
In the table, "Minimum number of signs of unconsciousness" should be clarified: what does "minimum" mean?	Revised
vocalisation versus involuntary passage of air along the vocal cords	As above, comment already addressed

Table A4.13 Poultry

Comment	ICF Response
The owner or keeper may not always be available, appointed staff needs to be competent to euthanise, too. What level of competence is exactly required? Training by the veterinarian? There is also no mentioning of procedures that the farmer should set up, in conjunction with the herd veterinarian, and no recommendations are done on how he can come to a conclusion to euthanize an animal, other than "failing to thrive" and "emergency". A decision tool could be very valuable in this context both to guarantee animal welfare and improve farm economics, as well as for public trust and personnel/farmer job satisfaction.	No such tool is available.
The term "culling" is not defined or mentioned in 1099 but might be interpreted as the killing non viable birds for commercial reasons either due non-notifiable veterinary issue or end of productive life, or simply not commercially viable.	Revised basic rules section
It needs to be made clear that "culling" is not emergency killing or depopulation - both of which are defined. There is the risk that businesses see "culling" as "emergency killing" and therefore excuse themselves from complying with certain articles and annexes of the regulations.	Noted.
Suggest list circumstances in which certificate of competence is not needed.	Basic rules section
Modify/Clarify the text of the last sentence of paragraph 4 and paragraph 5, because don't make sense relatively the general text.	Unclear

<p>This sentence needs clarification: "To supply small quantities of meat directly to the consumer or to local retailers;": What is a small quantity?</p>	<p>Definition of "small quantity" is a matter for national competent authorities to decide</p>
<p>1. I suggest that the reasons for killing poultry on-farm should include "when they are considered economically unviable" for example male chicks (breeding). 2. If you include point 1 above then "You do not need a Certificate of Competence to carry out the killing in all these circumstances." Is not accurate, a C-o-C or a WATOK licence (WATOK requires an appropriate level of competence in those carrying out killing and related operations on farm in order to do so without causing the animals any avoidable pain, distress or suffering. Anyone carrying out a killing operation must ensure that the animal is restrained appropriately and is stunned before killing. Operations requiring a WATOK licence are detailed in WATOK Chapter 2, section 13 and exceptions in section 14.) is required.</p>	<p>Noted. Edited as suggested. MS can set up their own rules for on-farm killing that may be more demanding than EU legislation. This is not discussed in these documents.</p>
<p>In chickens up to 3kg you can catch two birds at the same time by their back (side by side). This is still better than legs (inverted).</p>	<p>It is indeed possible to carry two chickens/birds (up to 3kg), side by side (pushed against each other), therefore we suggest to revise the text to indicate this possibility. However, it is better for welfare to carry chickens individually and support their body (without inversion), as already stated in the text. Assessing which technique is better requires additional research (e.g., Kannan G., Mench J.A. (1996). Influence of different handling methods and crating periods on plasma corticosterone concentrations in broilers. <i>British Poultry Science</i> 37: 21-31).</p>
<p>For restraining: Here it is important to specify that this method is only suitable for smaller birds (broilers/laying hens). And it is possible for one person to hold the bird manually under the left arm for example by holding its wings and stun it by a blow to the head with the right hand. It may actually be easier to do it that way then to have another person stun the bird. Specify that stunning is to be done with a blow to the head. For the second method of manual restraining - here it would also be important to specify that it is also only for small birds like broiler chickens and laying hens. (no source document - practical experience).</p>	<p>We agree with the points made by the respondent. Text edited. Some restrictions (such as bird size) can be added to the list of disadvantages.</p>

<p>For shackle restraining - it would be important to state that the size of the shackles need to be adapted to the size of the bird. Broiler chicken legs for example do not fit into laying hen shackles unless you force the leg through which causes injury.</p>	<p>The document already addresses the issue of shackle size ("Ensure that the size and shape of the shackles are appropriate for the legs of the bird"). No edits are needed.</p>
<p>I would not recommend fishing nets at all, as birds get tangled and can suffer when being distangled. Instead, for birds which are difficult to reach, I would recommend using a landing net, i.e. a "net bag on a stick". Maybe that is what the author is trying to say,, but a picture would certainly be useful! The inversion in restrainer cones should be restricted to one minute maximum. Shackling the birds is acceptable, but not good practice.</p>	<p>"Fishing nets" has been changed to "landing nets".</p>
<p>HSA publication: Practical Slaughter of Poultry - A Guide for the Small Producer.</p>	<p>Noted .</p>
<p>The sentence in the second last section under "Catching poultry" "Adult turkeys can also be caught and carried by both wings/shoulder joints" should be left out. Adult turkeys may too heavy for this management to be acceptable. From Recommendation regarding turkeys adopted by the Standing Committee of the European Council for the protection of animals kept for farming purposes, 21 June 2001: "Turkey shall not be lifted by a single leg only. When turkeys are carried, they shall be carried individually, using techniques appropriate to the size and weight of the birds. Small birds should either be held by both legs or be supported between the catcher's arm and body. Larger birds should be carried by one leg and the diagonally opposite wing. They shall be carried with their heads upwards except for short periods whilst they are picked up. The birds shall not be swung into or dropped into containers."</p>	<p>This content is drawn from HSA guide. The method mentioned gas been added as "alternative" option for lifting / catching turkey.</p>
<p>Under catching poultry, it would be better to put the phrase "different categories of poultry require different catching techniques" at the very beginning.</p>	<p>The text has been edited as suggested by the consultee.</p>
<p>For the carrying method: I am not aware of any publications actually showing that it is better to carry chickens by both legs instead of one leg.</p>	<p>We are also not aware of scientific publications about one leg/two leg carrying, but in practice carrying by two legs is regarded as better for animal welfare (for example, this is required by the RSPCA). We suggest that no edits are needed.</p>
<p>It will be better have image(s) how to carry, and restrain 8manual; cone) different species/categories of poultry. Hanging time/shackle line - Requirement</p>	<p>Adjusted to the Regulation's limits.</p>

of Reg.1099/2009/CE - 1 a 3 minutes depends chicken or ducks, geese or turkeys. We think 6 mn. is too much. We don't agree with such parameter and propose reduce it.	
Some pictures about good and best practice might help clarification of the text. - Explanation of the welfare consequence of inversion (lack of diafragm...)	Noted
Additional images would be helpful, especially about methods for catching, carrying and loading into crates.	Noted
Needs language editing? Bone breaks = fractures? Pictures of the landing net, of how to hold the birds, cones, shackles and so on would most likely be useful.	Edited / noted
Under Manual Restraining: Include '■ No bird inversion' in Advantages; Include '■ Bird inversion' in Disadvantages	Agreed, the advantages and disadvantages sections of the manual restraining sections have been edited.
Under Cone: Not sure that "This immobilises the bird completely." Rather that it restrains large birds and helps to restrict wing flapping; include 'Bird inversion' in Disadvanta	Agreed, text edited..
Under Hanging / shackle line: 1. "Birds on a shackle line should have enough space to spread their wings without touching one another." It is noticeable that when birds are shackled on a processing line amongst, and touching other birds, they flap less. I'm not sure that your requirement for space is justifiable on welfare grounds.	This advice is presented in the HSA guidance on electric waterbath (HSA, 2015): "Different types of birds can differ in their activity levels whilst on a shackle line, eg slow-growing chickens had a shorter latency to more intense struggling compared to fast-growing and heavy lines of chicken; and heavy-line chickens were less active than fastgrowing chickens (Debut et al, 2005). Anecdotally, broiler chickens are typically shackled close together to prevent wing flapping at the point of shackling. [...] Some bird types, and particularly those that tend to be active on a shackle line, may benefit from being adequately spaced out (eg if the shackle pitch cannot be spaced further then there should be an appropriate number of unoccupied shackles in between occupied shackles). This may limit opportunities for physical aggression as well as prevent struggling birds from

	beating their wings against other individuals, hopefully reducing transmission of disturbance. The most common shackle pitch for broiler chickens has typically been a 15 cm gap between birds (Kettlewell & Hallworth, 1990)."
2. "Birds on a shackle should be given time to calm down before they are stunned." This statement and the one above quoting times are not science based. Gregory and Bell (1987) demonstrated that broilers 'are as settled as they are going to be' after 12 seconds and turkeys after 25 seconds. There is no justification for longer times particularly when shackling and inversion produces increasing stress levels with time (Kannan et al, 1996) ; include 'Bird inversion' in Disadvantages	Time limits provided in text are in line with the research mentioned by the consultee.
For catching end of lay hens from aviaries - this is quite delicate and birds are prone to injuries. Especially when the hens are sitting on perches, they should not be "ripped off", but gently lifted up and away by their legs.	Text edited accordingly.
In the table, "Stressed bird" needs clarification on how to consider whether the bird is stressed or not.	Revised in control procedure table
Illustrations would be useful, please see above.	Noted
the final table could be withdrawal because it doesn't give any additional information	Noted
fishing net no sure how common it is	"Fishing nets" has been changed to "landing nets".
Some pieces of text are specific for the different species or body weights and some not. I think it would be good to be as specific as possible. E.g., if restraining methods are suitable for all species, this could be indicated. It could be considered to make a summarising table. [4]	Noted.
Please add some pictures of handling and restraining of different types of poultry.	Noted
Should some mention of ostriches be included here?	Out of scope
"For chickens and ducks, . . ." You should include 'Chickens should be caught by two legs and ducks are traditionally caught by the neck.' You do refer to two-leg	The text has been edited as suggested by the consultee.

catching under "Carrying Poultry" but it should also be included under "Catching."	
1. Carrying poultry upright individually and supporting their body should specifically be identified as a best practice.	All qualifiers have been reviewed
2. Hanging on a shackle line should not be described as a good practice since painful and stressful. [5]	All qualifiers have been reviewed
I would qualify the Manual restraining (2) methods as acceptable instead of Good because it is not comfortable for birds when they are inverted and considering that there are alternative methods better than this. [2]	All qualifiers have been reviewed
the rationale of the classification between good and best practices is not clear. (e.g manual restraining is good practice while cone is best practices)	Bird inversion / no bird inversion added to each method in the section on disadvantages and advantages, as relevant
Catching with a net should be qualified as an "acceptable" but not as a "good" practice.	All qualifiers have been reviewed
I'm unsure as to whether any method of restraining broilers that involves inversion can be classified as "Good Practice", I would use "Acceptable" [2]	As above, text has been edited as suggested
Cervical dislocation can also be done mechanically with specially made forceps - which is much easier to use than manual or with a stick (but not as a stunning method - only a killing method! see below).	Limited information on this found in existing guides
There is no mention of the use of gas stunning/killing. [4]	Out of scope
Mobile waterbath stunning equipment especially in cases of depopulation. It should be mentioned.	Out of scope
For non-penetrative captive bolt: "With one hand you gently hold the bird's beak, while the other hand operates the captive bolt." Recent gun development in the US (has suggested that the gun can be applied to a bird's head with minimal restraint (http://www.bock-industries.com/ted-turkey-training-minimal-restraint.html))	Noted
Why are the parameters in the tabel regarding head-only electrical stunning different from the parameters in Regulation 1099/2009 ?	Noted. Additional parameters drawn from existing national guides.

<p>page 3. Suggest decide if stun stick interval should be 15 or 20 seconds.</p>	<p>As agreed with the Commission the different values provided in existing guidance are all included in the document</p>
<p>waterbath stunning and gas stunning is no included</p>	<p>Out of scope</p>
<p>Cervical dislocation (manual or mechanical) is not a stunning method!!! Birds do not become immediately insensible (it can go up to 30 sec)! It is a killing method and not a stunning method. Erasmus et al., 2010, Poultry Science EFSA, 2004. Welfare aspects of the main systems of stunning and killing the main commercial species of animals. EFSA J. 45: 1-29. Gregory and Wotton, 1990, Veterinary Record Martin, J.E., McKeegan, D.E.F., Sparrey, J., Sandilands, V., 2015. Evaluation of electroencephalogram responses of chickens killed using three mechanical devices. Proc. of the Humane Slaughter Association (HSA) International Symposium, Recent Advances II, 40. Zagreb, Croatia. For penetrative and especially non-penetrative captive bolt, the head of the bird should be held against a hard surface, this can also be while restraining the bird in a cone. (ex: Erasmus et al., 2010, Poultry Science). Also, from our literature review, we have concluded that manual cervical dislocation should only be carried out on birds up to 3kg and mechanical (with specially made forceps) only in birds up to 5kg. Importantly, after cervical dislocation is carried out, one needs to immediately check the neck of the bird to ensure that there is a clean separation of the spine and head (only skin can be felt through fingers). Percussive blow to the head: - this is according to our literature review actually a good method of stunning rendering birds immediately insensible (good practice) - This is not a killing method!!! (See literature), it is only a stunning method! The birds either needs to be bled or killed with cervical dislocation after stunning with a blow to the head. Review restraining method. Cors et al., 2015, Poultry Science Erasmus et al., 2010, Poultry Science Erasmus et al., 2010, J. Appl. Poult. Res. Gregory et Wotton, 1990, Vet. Rec. Shaw, 2002, Progr. Neurobiol Woods et al., 2009. Recommended on-farm euthanasia practices. Pp 186-210. In "Improving Animal Welfare: A Practical Approach. Ed. Grandin, T. Wallingford, Oxfordshire: CABI (2009).</p>	<p>Text on cervical dislocation edited, to add at the beginning that it is a killing method. Also edits on other stunning methods made as suggested.</p>
<p>HEAD-ONLY ELECTRICAL STUNNING/SIMPLE STUNNING - We don't agree with the proposed current level to be applied. They are not described on Reg.</p>	<p>Electrical parameters are drawn from existing guides. Parameters from the Regulation have also been added</p>

<p>1099/2009/CE. What is the source of such parameter? . So, we propose some changes on this chapter, otherwise we can't support the text.</p>	<p>to the document.</p>
<p>For neck dislocation, just pulling the vertebrae apart is difficult and rarely sufficient. There needs to be an aspect to torsion involved, to ensure that the vertebrae are properly separated and that there is rupture of the blood vessels in the neck, to ensure internal bleeding. There should be images illustrating this. A percussive blow to the head is a useful stunning method, but not a safe killing method. Hence, birds should be bled afterwards, to avoid any recoveries. In general, more illustrations would be very useful.</p>	<p>Text edited in the relevant section to add mention that the process of cervical dislocation involves not only pulling but also turning. A picture has been added.</p>
<p>"Stunning before killing has also various benefits, including better bleed out, and easier plucking of feathers (because the bird is more relaxed if stunned beforehand)." Good bleed out is enhanced with bird movement post neck cut due to 'muscle pumping' therefore, a bird that is slaughtered without stunning is likely to show more post stun movement than a stunned but live bird because it will not have been electrically stimulated during the dwell time within the water bath, which has been shown to reduce movement during bleeding. Improved feather release occurs if the birds bleed out quicker and therefore can be scalded earlier before losing too much body temperature.</p>	<p>We agree with the suggestions and have removed the sentence cited by the consultee.</p>
<p>Non-penetrative captive bolt 1. After "skull." Insert 'When sufficient energy (≥ 27 Joules) is applied, these devices will also kill the bird (Hewitt, 2000).</p>	<p>edited</p>
<p>"Birds should be killed by bleeding within one minute after stunning." The use of a non-penetrating captive bolt device for poultry is a stun/kill method and there is no welfare requirement to follow this method with bleeding or killing (Hewitt, 2000).</p>	<p>Existing guidance mentions stick to stun intervals for penetrative captive bolt in birds. Defra 2015 White meat slaughterhouse guide says: after stunning - cut without delay so that the animal dies as soon as possible</p>
<p>"■ It is easy to fracture the skull with this method and this should be avoided." This requirement in EC 1099/2009 is unenforceable because if insufficient force is applied such that the skull is not fractured, the bird is unlikely to be stunned. The application of this device particularly with a convex head will produce a depressed fracture of the skull. A number of authorities suggested that this requirement be removed from the regulation when it was circulated for</p>	<p>Noted</p>

consultation but these requests were ignored!

Head-only electrical stunning / simple stunning
Restraining

Added

1. Include 'or you can put it in a cone or shackle' in this section.

"Birds stunned by electricity should be bled or killed within 15 to 20 seconds." I am unaware of any scientific evidence for this statement, the times to loss of brain function following effective neck cutting (15 s in Raj, et al. 2006) would suggest that neck cutting should be carried out 'as quickly as possible and at least within 15 seconds.'

These parameters are drawn from the available guidance, not the scientific literature. Text edited to include the mention "as quickly as possible" Edited

1. Pen Cap Bolt. Maximum stun to stick interval of one minute seems overly long, "it renders a majority of birds unconscious" should be an essential requirement not simply an advantage. Only cartridge powered CBs require loading - air powered mentioned in the same section, do not. The fact that a piece of stunning equipment requires maintenance should not be listed as a disadvantage, any piece of equipment for the killing of animals needs to be maintained. However, it may be that an advantage of manual cervical dislocation is that it requires no equipment and therefore no maintenance, Again a back-up system or method is an essential requirement to any killing method - not a "disadvantage". 2. Non-pen CB The table of air pressures is only relevant to a particular design/manufacturer of air powered stunner. The air pressure required depends on the geometry of the piston chamber and bolt. Section 2 implies that all non-penetrative CB are air powered, this is not the case. 3. head only stunning - restraining the bird by a second person holding it should not be recommended, it will mask the response of the bird to application of the current and will be difficult to hold onto. best to place in a cone or shackle and then the bird can be immediately bled. electrodes MUST be kept clean (not should) a bio-film rapidly builds up on the electrodes which significantly reduces current flow, Electrodes can be wetted to improve current flow, but wetting the head should be avoided as this can create a low resistance pathway, like a short circuit across the surface of the birds head and not through the brain. however the ammeter will still show a high current has flowed. The parameters do not discuss whether the current is direct or alternating, or if alternating what the frequency is. Head only electrical stunning is NOT likely to cause death by itself,

The text has been edited to clearly indicate that only cartridge powered gun require loading. To be consistent across all drafts, we also did not reference the need for back up equipment as a disadvantage.

The table with air pressures draws from existing guidance, however it applies only to some models.-
Section 2 has been revised to ensure that text does not imply that all non-pen captive bolts are air powered. Text has also been revised to highlight that holding the bird for head only stunning is not the best option; cone or shackle are better methods. In this same section, the term "should" has been replaced with "must" when referring to keeping electrodes clean. The suggestion that heads should be wetted has been removed.

Reworded: "This method is not likely to cause death, therefore it should be followed by a killing method such as bleeding or neck dislocation"

The comment on the description of manual dislocation

<p>the stun is reversible, current does not pass through the heart, therefore a killing method must be applied, you even say that head only electrical stunning is "simple stunning " in the first paragraph and then go on to contradict yourself in the "disadvantage" section. 4. MCD Manual cervical dislocation is badly described, it is not just "stretching", the head must also be levered back to ensure that the neck breaks as high up as possible, preferably at C0-C1, ie between the first vertebrae and the skull. See the description by the Humane Slaughter Association. your statement that it is difficult to apply in "growing or adult" birds is far too general, it can be applied to a 6 week broiler at 2 kg or an adult laying hen, it may be difficult on a 3 day old chick, or an adult duck or goose. 5. percussive blow to the head. As described this method is unacceptable, if you are required to bleed a bird after a percussive blow from a captive bolt then you must also bleed a bird after a manually applied blow. it takes a great deal of skill and experience and therefore training to be able to apply this method successfully. The table of "control procedures" serves no purpose, there are no quantifiable indicators, , I would have thought "what does good look like" should describe the physical and behavioural signs of a good stun,</p>	<p>has already been addressed elsewhere. The text has been revised to clearly reference the need to kill the bird after the percussive blow, by bleeding or cervical dislocation.</p>
<p>maintenance of the equipment might not be considered as a disadvantages. - Only the 'majority of birds' unconscious can not be regarded as a advantages, but a disadvantages (not all are unconscious).</p>	<p>Agreed</p>
<p>We propose add something more detailed about equipment maintenance.</p>	<p>Text kept short</p>
<p>The sentence needs to be reworded (not clear enough) "While applying the parameters stated in this document should cause death, this should be ensured by bleeding or neck dislocation." Additional images would be helpful, especially for the manual cervical dislocation part.</p>	<p>See above on same sentence</p>
<p>Illustrations needed.</p>	<p>Noted</p>
<p>The use of air pressures in your table is only relevant to guns powered by air! I suggest you replace this data with the energy required to stun/kill i.e. ≥ 27 Joules for all species of poultry.</p>	<p>Same comment addressed before</p>
<p>Maintenance, handling, and keeping of equipment is fundamental for successful use. A section more stressing this would be helpful for the target group.</p>	<p>Text edited accordingly.</p>

There is no information or description of an effective stun for any of the methods, eg loss of rhythmic breathing, loss of nictitating membrane reflex, checking for a gap in the vertebrae for cervical dislocation.	Comment addressed in the checks on stunning section
the final table could be withdrawal because it doesn't give any additional information.	Noted
I would prefer to have the table with control procedures for each method separately to avoid confusion	Noted
The table of control procedures serves no useful purpose in its present form, it needs verifiable and quantifiable indicators that a business operator can monitor and record to demonstrate compliance with the law.	Noted
yes, but, I personally prefer to have the information on suitability of a method per species at the end of each paragraph. E.g.: suitable for all types of poultry of all body weights; suitable only for poultry less than x kg, etcetera [4]	Noted
It is a little confusing since there is a section on restraining methods then in the stunning section the restraining methods specific to each stunning method are explained again.	Noted
Head-only electrical stunning: The minimum current requirements for effective stunning given in your table should be broken down by species rather than by weight ranges i.e. AC at 50 Hz: chickens 240 mA, Turkeys 400 mA (EC, 1099/2009), ducks 600 mA (Beyssen, 2004), Geese - unpublished research at Bristol showed that this method should not be recommended for geese as contact impedance between the electrodes and the head was too high for the voltage ranges available (Health & Safety Executive).	The requirements presented refer to guidance from the UK Poultry Council (2015).
We do not think swinging an animal against a solid object meets the legislative need for an ACCUARATE blow to the head and should not be considered good practice.	We agree that this practice is not likely to satisfy the requirements of Annex I, Table 1 of the Regulation. Therefore we have removed this practice from the documents.
In Manual Cervical Dislocation section 4, it is said that is suitable only for birds weighing up to 3 kg. At the same time, it say: Alternatively, a heavy stick (such as a broomstick) can be used, especially for large birds. Place the stick on the neck and maintain it there by stepping on it. Hold the bird by its legs. To	We agree that the text may cause confusion and have revised it as follows: "... a heavy stick (such as a broomstick) can be used, especially for larger birds (but with a maximum of 3kg)".

dislocate the neck, pull the legs quickly and firmly backwards. It sounds strange when you say large birds in this section because a bird up to 3kg it is not large. May cause some confusion for operators so that they will use it for adult animals. The perception of a large bird might be different for each person when you are not clear.	
Additional images would be helpful. + see additional information needed	Noted
I want to try and be as constructive as I can but I can find little in the document that I would keep. There are much better examples of guidance already in the public domain.	Noted
Percussive blow to the head could be considered a good method under certain circumstances - not just acceptable. <i>"We appreciate that the method should not be used as a routine method – on the other hand i.e. in smaller herds where you do not have access to captive bolt guns or tools for electrical stunning, percussive blow can be a good – not just acceptable – solution. Also for bigger birds like turkeys or geese it may be a good solution."</i>	Noted. The document already states that the method can be used without any equipment
not clear the criteria to classify practices as good or best	All qualifiers have been reviewed
Cervical dislocation as a stunning method is unacceptable. Though it is acceptable as a killing method. [2]	Addressed above: identify clearly cervical dislocation as a killing method.
The use of a non-penetrative stunner is qualified as a "best" practice, even though it has the disadvantage "It is easy to fracture the skull". Therefore, it might be better to qualify it as a "good" practice. Manual cervical dislocation could be qualified as a "good" practice for birds under 3 kg, instead of "acceptable".	All qualifiers have been reviewed.
The non-penetrating stunner is less reliable than the penetrating version, and should be classified "good practice" (not best). Cervical dislocation, for anything but very small chicks (All qualifiers have been reviewed
I am not convinced that penetrating captive bolt is a humane method of stunning poultry. Effective stunning with a penetrating captive bolt is produced by the impact of the bolt on hard bone inducing through differential acceleration a state of concussion. Birds have very thin, lightweight skulls (in order to fly!) that are not capable of offering sufficient opposition to the bolt travel to induce a	All qualifiers have been reviewed

concussion. Therefore, the method would rely on trauma to the brain and shot positioning would subsequently become very important. This is why non-penetrating captive bolt devices have been developed for poultry and neonate livestock. In addition, the gun shown in your diagram is very similar to the Cash Small Animal Tool (CPK200) non-penetrating captive bolt gun. Your conclusion that "This stunning method constitutes best practice." cannot be justified, in my view I would not include penetrating captive bolt in your document.

"You may stun the bird by hitting it accurately at the back of the head with blunt force. When done appropriately, this causes severe damage to the brain. This method should not be used as a routine method. It should only be used when other methods are not available, for example in an emergency. You should kill with this method not more than 70 birds per day, and only birds weighing up to 5 kg."

In the UK, WATOK (2015) states that:

"Percussive blow to the head

26.—(1) No person may stun an animal using a non-mechanical percussive blow to the head.

(2) But the prohibition in sub-paragraph (1) does not apply to rabbits, provided that the operation is carried out in such a way that the rabbit is immediately rendered unconscious and remains so until it is dead."

Therefore, a manual percussive blow to the head is illegal in the UK when used with poultry and I would use the same argument as given in 4. Manual cervical dislocation, comment 1. above to delete manual blunt force trauma from your document. There are more humane, alternative methods available e.g. a mechanical non-penetrating captive bolt stun/kill. [2]

The choice of methods covered is determined by the Commission's task order - we are not addressing specific country requirements in this document

EFSA signs of unconsciousness/signs of life widely used by OV's - be good to stick to same terminology

Noted

The physical symptoms that are displayed by chickens following effective head-only stunning are given in Gregory and Wotton (1990). The subjective assessment of the physical response of birds to electrical head-only stunning is probably more reliable than assessment following water bath stunning. The return of rhythmic breathing does not indicate the return of consciousness in

Noted

birds merely that they are alive. The use of the return of neck tension should be valid in birds that are head-only stunned, therefore the criteria that you could use would be: 'Poultry that are effectively head-only stunned show a return to rhythmic ≥ 10 seconds and the time to return of neck tension ≥ 30 seconds and they should be bled or neck dislocated within 15 seconds.'	
The drawing of the shackles should be revised as 7. says not applicable to birds in shackles	Edited
the pdf is not of poultry (different from the webpage)	NA
There is some information about signs of correct electrical stunning that must be included in the text, namely: eyes signals are not 100% secures to check that the animal is correctly stunned .	Edited
Under control procedure, what does good look like: "The bird shows at least absence of breathing and tonic seizures" - not clear what tonic seizures are as it is not described/defined above.	Revised wording
Loss of the nictating eye membrane (3rd eyelid): an image would be helpful.	Noted
"Uncontrolled wing flapping" seems difficult to assess (what is the difference between controlled and uncontrolled wing flapping?)	We left the text as it is: we could define this as "without intent", but the text may become contrived.
In the table, Â« Minimum number of signs of unconsciousness Â» should be clarified: what does Â« minimum Â» mean?	Noted
Explain what "tonic seizures" are.	The text already defines the tonic phase.
I'm worried about the possibility to verify the stunning effectiveness if you should bleeding the animal within one minute in the case of captive bolt or 15/20 seconds in case of electrical stunning. <i>"If I remember well my concern was not related to the ability of verify stunning effectiveness but only related to the sentence 'Birds should be killed by bleeding within one minute after stunning'.</i> <i>My question was: Is so important to give a maximum time? I have not been able to find the maximum duration of unconsciousness after stunning with</i>	.Values are drawn from existing guides. It is stated in every section on stunning that killing by bleeding should be carried out without delay.

<p><i>captive bolt; the only reference I found is a manual produced by the Humane Slaughter Association (attached) who suggests to bleed the animals within 15' from stunning. Probably the best solution could be rephrase "Birds should be killed by bleeding with no delay"</i></p>	
<p>vocalisation versus involuntary passage of air along the vocal cords</p>	<p>Noted, edits completed.</p>

A4.2 Comments on pictures - summary

Table A4.14 Comments on pictures – slaughterhouse operations

Section	Request	Number of times requested
-	Make representation of animals closer to anatomical reality	1
Cattle and horses – layout, construction and equipment	General request for images	1
Cattle and horses – handling and restraining	General request for images	1
Cattle and horses – monitoring	General request for images	1
Cattle and horses – monitoring	Images of where and how to perform tests	1
Pigs – layout, construction and equipment	General request for images	1
Pigs	Request for pictures of pigs rather than other species (e.g. for crowd pen and stunning pen)	6
Pigs – layout, construction and equipment	Images for long narrow pens vs square pens	1
Pigs - stunning	Clearer image showing position of electrodes	1
Pigs - monitoring	General request for images	1
Sheep and Goats - layout, construction and equipment	Request for photographs	1
Sheep and Goats – monitoring	Request for photograph of fixed eyes/no blink reflex	1
Poultry - layout, construction and equipment	Images of good practices	1
Poultry – handling and restraining	General request for images	1
Poultry – stunning	Request for photographs	1
Poultry - monitoring	Images of mechanical method	1

Table A4.15 Comments on pictures – slaughter without stunning

Section	Request	Number of times requested
	Request for image of lateral conveyor belt without pig / showing only one species on the same line	3
	Make representation of animals closer to anatomical reality	1

Section	Request	Number of times requested
Cattle – Mechanical Restraining	General request for images	1
	Request for examples to illustrate situations of non-compliant restraint systems with the size or the category of the animals	1
Cattle – Bleeding	Image from frontal perspective with dotted lines indicating the cut required	1
	Image showing different species	1
	Name the arteries in the picture	1
Cattle – Post-cut stunning	Image showing positioning of electrodes	4
	Image showing different species	1
Sheep and Goats – Mechanical restraining	Images showing restraining methods	3
Sheep and Goats – Bleeding operations	Image from frontal perspective	1
	Photos instead of pictures, as they might be clearer	1

Table A4.16 Comments on pictures and suggested response – on-farm killing

Section	Request	Number of times requested
-	Make representation of animals closer to anatomical reality	1
Cattle – Handling and Restraining	General request for images	5
	Image for cattle flight zone	3
	Image for holding calves against a wall or fence	1
	Image to explain position with calves	1
Cattle – Stunning	General request for images	1
	Image for "In bulls, the target is 1 centimetre either side of the middle of the head."	1
	Image for "If the first shot was in the right position, then re-shoot 5 cm to the side of the mid line aiming towards the brain."	1
	Image for Captive Bolt	1
Horses – Handling and	Image of flight zone and critical points	2

Section	Request	Number of times requested
Restraining		
Pigs – Handling and Restraining	General request for images	3
	Image of flight zone and point of balance	3
	Image of narrow pen	1
	Image of restraining pigs	1
Horses – Checks on stunning	Adjust the picture of a stunned horse with hind legs extended and head revised	1
Pigs - Stunning	[Better] image of head-only positioning of electrodes	4
Pigs – Checks on Stunning	Image showing signs of unconsciousness	2
Rabbits – Handling and Restraining	Images of how to carry/restrain rabbits	2
Sheep and Goats – Handling and Restraining	Image showing ability of the animal to move	1
	Image showing restraining	1
Sheep and Goats – Stunning	General request for images	1
	Image for “the electrodes may be placed one on top of the head and one under the head”	2
	Image for “the electrodes can be placed on the middle of the chest and on the back of the animal so as to span the heart.”	2
	On the form of the electrodes in heart electrocution picture, the shape of the electrodes should be revised to scissor-like	1
Poultry – Handling and Restraining	General request for images	1
	Image of net	2
	Images showing methods for catching, carrying and loading into crates	2
	Images showing handling and restraining different types of poultry	1
Poultry – Stunning	General request for images	1
	Request for image of manual cervical dislocation	1
Poultry – Checks on	Image showing nictating eye	1

Section	Request	Number of times requested
Stunning	membrane	

Annex 5 Table of Acronyms and Abbreviations

Acronym/abbreviation	Full name
AECOSAN	Ministerio de Sanidad, Servicios Sociales e Igualdad
AMIC	Australian Meat Industry Council
ANSVSA	Autoritatea națională sanitară veterinară și pentru siguranța alimentelor
ASSOCAT	Associació d'Escorxadors de Conill de Catalunya
AVEC	Association of Poultry Processors and Poultry Trade in EU
AVMA	American Veterinary Medical Association
BCVA	British Cattle Veterinary Association
BSI-Schwarzenbek	Beratungs- und Schulungsinstitut für Tierschutz bei Transport und Schlachtung
BURERT	Bollettino Ufficiale della Regione Emilia-Romagna
CCTV	Closed Circuit Television
CFIA	Canadian Food Inspection Agency
CIWF	Compassion in World Farming
CNADEV	Comité National des Abattoirs et ateliers de Découpe de Volailles
COE	Council of Europe
DAWR	Department of Agriculture and Water Resources
Dialrel	Religious slaughter: improving knowledge and expertise through dialogue and debate on issues of welfare, legislation and socio-economic aspects
DTI	Danish Technological Institute
DVFA	Danish Veterinary and Food Administration
EAWP	European Animal Welfare Platform
EFSA	European Food Safety Authority
EHZ	European Institute of Halal Certification
FAO	Food and Agriculture Organisation of the United Nations
EuWeINet	Coordinated European Animal Welfare Network
FIA	Fédération des Industries Avicoles
FNEAP	Fédération Nationale des Exploitants d'Abattoirs Prestataires de Service
FNICGV	Fédération Nationale des Industries et du Commerce en Gros des Viandes
FNOVI	Federazione Nazionale Ordini Veterinari Italiani
FSIS	Food Safety and Inspection Service (United States)

Acronym/abbreviation	Full name
HSA	Humane Slaughter Association
IFIP	Institut de la Filière Porcine
INTERBEV	Association Nationale Interprofessionnelle du Bétail et des Viandes
IZLER	Istituto Zooprofilattico Sperimentale della Lombardia e Dell'Emilia Romagna
IZSV	Istituto Zooprofilattico Sperimentale delle Venezie
LAV	AG Tierschutz der Länderarbeitsgemeinschaft Verbraucherschutz
LGL	Bayerisches Landesamt für Gesundheit und Lebensmittelsicherheit
MAPAMA	Ministerio de Agricultura y Pesca, Alimentación y Medio Ambiente
MIA	Meat Industry Association of New Zealand
MIHSF	Meat Industry Health and Safety Forum
NAEAC	National Animal Ethics Advisory Committee
OIE	World Organisation for Animal Health
RSPCA	Royal Society for the Prevention of Cruelty to Animals
SCAW	Swedish Centre for Animal Welfare
SIVeMP	Sindacato Italiano Veterinari Sanità Pubblica
SLU	Sveriges Lantbruksuniversitet (The Swedish University of Agricultural Sciences)
TVT	Tierärztliche Vereinigung für Tierschutz e.V.
UFAW	Universities Federation for Animal Welfare
VZS-KNS	Vereniging Zelfslachtende Slagers-Koninklijke Nederlandse Slagers
WAP	World Animal Protection

Annex 6 Sources collected and reviewed for Deliverable 2

125 documents from the 10 selected Member States (DK, FR, DE, EL, IT, NL, PL, RO, ES, SE), international organisations and third countries was reviewed. In addition, a selection of scientific references (including papers on religious slaughter), were consulted.

The number of documents identified in the ten target Member States, for the different species with subject matters/issues relevant to slaughterhouses is given in 0. Several national guides to good practice contain sections on all species and these documents will have been counted more than once (between species, but not within a species).

Table A6.1 Number of documents identified for the different subject matters and issues for slaughterhouses

Species	Denmark DK	France FR	Germany DE	Greece EL	Italy IT	Netherlands NL	Poland PL	Romania RO	Spain ES	Sweden SE	TOTAL
Equids		1	3		5	1	5	6	3	1	25
Bovines	2		7	3	8	1	5	6	3	7	42
Pigs	4	1	3	3	5	1	5	5	3	7	37
Sheep	1		3	3	5	1	3	3		5	24
Goats	1		1	3	5	1	3	5			19
Poultry (chicken & turkeys)		1	2	3	3	4	5	7	4	5	34
Rabbits		1	2	1	4			2	4	1	15

The number of documents identified in the ten target Member States, for the different species and for the subject matters/issues relevant to slaughter on-farm is given in 0. Several national guides to good practice contain sections on all species and would have been counted more than once (between species, but not within a species).

Table A6.2 Number of documents identified for the different subject matters and issues specific to on-farm slaughter

Species	Denmark DK	France FR	Germany DE	Greece EL	Italy IT	Netherlands NL	Poland PL	Romania RO	Spain ES	Sweden SE	TOTAL
Equids	1		1				1	1	1	1	6
Bovines			2		2					1	5
Pigs	1				1	1		1		1	5

Species	Denmark DK	France	Germany DE	Greece	Italy	Netherlands NL	Poland	Romania RO	Spain	Sweden	TOTAL
		FR		EL	IT		PL		ES	SE	
Sheep					1		1	1		1	4
Goats								1			1
Poultry (chicken, turkeys, ducks, geese)			1		2					1	4
Rabbits					2		1	1		1	5

Table A6.3 Summary of number and type of Member State documents (by species). Several documents covered more than one species.

Species	Total	Types of documents containing relevant information for each species
Equids	25	<p>14 are Competent Authority documents (from: FR, DE, IT, PL, RO, ES).</p> <p>9 are industry documents (from: DE, IT, NL, SE).</p> <p>2 documents are training material or textbooks (from: SE, PL)</p> <p>These documents cover all species, so none are specific to the slaughter of horses.</p>
Bovines	42	<p>25 are Competent Authority documents (from: DK, DE, EL, IT, PL, RO, ES, SE).</p> <p>15 are industry documents (from: DE, IT, NL, SE).</p> <p>2 documents are training material or textbooks (from: SE, PL)</p> <p>These documents cover all species, so none are specific to the slaughter of bovines.</p>
Pigs	39	<p>23 are Competent Authority documents (from: DK, DE, EL, IT, PL, RO, ES, SE).</p> <p>14 are industry documents (from: DK, FR, IT, NL, SE).</p> <p>2 documents were training material or textbooks (from: SE, PL).</p>
Sheep	24	<p>14 are Competent authority DE, EL ES FR, IT, NL, PL, RO, , SE,</p> <p>2 are industry IT ES</p> <p>4 are Other materials EL, IT, PL, RO, ES</p>
Goats	19	<p>11 are Competent authority EL FR, DE, NL, EL, IT, PL, RO, ES, SE,,</p>

Species	Total	Types of documents containing relevant information for each species
		5 are industry, IT, PL, FR, ES 3 are other materials ES IT, SE,,
Poultry (chicken & turkeys)	34	23 documents are national guides to good practice/veterinary instructions (from: FR, DE, EL, IT, NL, PL, RO, ES, SE). 4 documents are Competent Authority documents (from: DE, EL, PL, SE). 5 documents are from industry sources (from: NL, SE). 2 documents are training material or textbooks (from: SE, PL)
Rabbits	15	5 documents are national guides to good practice/veterinary instructions (from: ES, EL). 2 documents are Competent Authority documents (from: DE, IT). 7 documents are from industry sources (from: FR, DE, IT, RO). 1 document is training material (from: SE)

A6.2 Denmark

Source reference	Source type
DVFA, 2014. <i>Order on the slaughtering and killing of animals</i> . Ref. Ares (22014)489369. 25/02/2014	National authority
Danish Crown, n.d. <i>At the slaughterhouse</i> . [online] Available at: http://slaughterhouse.danishcrown.com/	Industry
DTI, n.d. <i>Slaughtering pigs in a humane way</i> . [online] Available at: http://www.dti.dk/services/slaughtering-pigs-in-a-humane-way/37379?page_order=0	Other – research institute
Unknown author, 2013. <i>Branchekode for beskyttelse af dyr af svineracen fra modtagelse til aflivning</i> .	Industry

A6.3 France

Source reference	Source type
FIA and CNADEV, 2016. <i>Guide de bonnes pratiques de Protection animale en abattoir de volailles 2016</i> .	National authority
IFIP, Culture Viande, FNICGV and FNEAP, 2016. <i>Guide de bonnes pratiques de la Protection Animale en abattoir de porcs</i> .	National authority
FIA and CNADEV, 2016. <i>Guide de bonnes pratiques de Protection animale en abattoir de lagomorphe 2016</i> .	National authority
INTERBEV, 2013. <i>Guide de bonnes pratiques pour la maîtrise de la protection animale des bovins à l'abattoir</i> .	National authority

A6.4 Germany

Source reference	Source type
------------------	-------------

BSI-Schwarzenbek. 2013. <i>Gute fachliche Praxis der tierschutzgerechten Schlachtung von Rind und Schwein</i> . [ONLINE] Available at: http://www.bsi-schwarzenbek.de/Dokumente/bsi_gute_Praxis_4_13.pdf . [Accessed 23 January 2017].	Other - advisory and training institute
German Government. 2012. <i>Ordinance on animal welfare in connection with slaughter or killing and for the implementation of Reg 1099/2009</i> .	National authority
LAV, 2014. <i>Handbuch Tierschutzüberwachung bei der Schlachtung und Tötung</i> . [ONLINE] Available at: http://www.kreis-oh.de/media/custom/335_7452_1.PDF?139592507 . [Accessed 23 January 2017].	National authority
LGL, 2014. <i>Schulungsfilm zu wesentlichen Aspekten der schonenden und tierschutzkonformen Schlachtung bei Rind, Schwein und Schaf</i> . [ONLINE] Available at: http://www.lgl.bayern.de/aus_fort_weiterbildung/fortbildung/schulungsfilm_schlachten.htm . [Accessed 23 January 2017].	National authority
TVT, 2011. <i>Töten größerer Tiergruppen im Seuchenfall</i> . [ONLINE] Available at: http://www.tierschutz-tvt.de/fileadmin/tvtdownloads/merkblatt84_2011.pdf . [Accessed 23 January 2017].	Industry
TVT, 2013. <i>Kugelschuss auf der Weide als Betäubungs und Tötungsverfahren bei Rindern</i> . [ONLINE] Available at: http://www.tierschutz-tvt.de/fileadmin/tvtdownloads/merkblatt136_2013_nov.pdf	Industry
TVT, 2015a. <i>Betäuben und Töten von Pferden</i> . [ONLINE] Available at: http://tierschutz-tvt.de/fileadmin/tvtdownloads/merkblatt89.pdf . [Accessed 23 January 2017].	Industry
TVT, 2015b. <i>Tierschutzgerechtes Schlachten von Rindern, Schweinen, Schafen und Ziegen</i> . [ONLINE] Available at: http://tierschutz-tvt.de/fileadmin/tvtdownloads/merkblatt89.pdf . [Accessed 23 January 2017].	Industry

A6.5 Greece

Source reference	Source type
ΕΦΑΡΜΟΓΗ ΚΑΝΟΝΙΣΜΟΥ 1099-2009_2014	National authority
ΟΔΗΓΟΣ ΟΡΘΗΣ ΠΡΑΚΤΙΚΗΣ_2016	
ΦΕΚ_2015	National authority
Οδηγός Ορθής Πρακτικής για την προστασία των ζώων κατά τη σφαγή ΟΔΗΓΟΣ ΟΡΘΗΣ ΠΡΑΚΤΙΚΗΣ_2016	
ΕΦΗΜΕΡΙΣ της ΚΥΒΕΡΝΗΣΕΩΣ, Τεύχος Δεύτερο, Αρ. Φύλλου 2641, 8 Δεκεμβρίου 2015 ΦΕΚ_2015	National authority
Εφαρμογή Κανονισμού 1099/2009 "για την προστασία των ζώων κατά τη θανάτωση" ΕΦΑΡΜΟΓΗ ΚΑΝΟΝΙΣΜΟΥ 1099-2009_2014	National authority

ΕΦΗΜΕΡΙΣ της ΚΥΒΕΡΝΗΣΕΩΣ, Τεύχος Δεύτερο, Αρ. Φύλλου 2641, 8 Δεκεμβρίου 2015 ΦΕΚ_2015 National authority

A6.6 Italy

Source reference	Source type
Bollettino Ufficiale della Regione Lazio, 2014. <i>Macellazione di Urgenza, aggiornamento procedure operative Regione Lazio</i> . [ONLINE] Available on: http://195.45.99.75/sievwweb/dmdocuments/ALLEGATO%20G12150.pdf . [Accessed 23 January 2017].	Other - Official Bulletin of the Lazio Region
BURERT, 2014. <i>Indicazioni operative in caso di macellazione d'urgenza al di fuori dal macello Regione Emilia Romagna</i> . [ONLINE]. Available on: http://bur.regione.emilia-romagna.it/bur/area-bollettini/bollettini-in-lavorazione/aprile-periodico-parte-seconda-1a-quindicina.2014-04-08.4513334 . [Accessed 23 January 2017].	Other - Official Bulletin of the Emilia-Romagna Region
Candotti, P., 2007. <i>Metodi e procedure operative per l'eutanasia degli animali appartenenti alla specie equina, bovina, ovi-caprina e suina</i> . Centro di Referenza Nazionale per il Benessere degli Animali, IZLER. [ONLINE] Available at: http://www.izsler.it/izs_bs/allegati/2250/EUTANASIA.pdf . [Accessed 23 January 2017].	Other
FNOVI, 2009. <i>Linee Guida sull'applicazione del Regolamento (cE) n. 1099/2009</i> . [ONLINE] Available at: http://www.fnovi.it/sites/default/files/old_fnovi/userfiles/files/Linee%20guida%201099%20Ministero%20rev9.pdf [Accessed 23 January 2017].	National authority
ISZV, 2015. <i>Manuali di buone pratiche di igiene e di lavorazione: Carni avicunicole fresche</i> . [ONLINE] Available at: http://ppl.regione.fvg.it/public/downloads/MANUALE_PPL_AVICUNICOLI_FVG.pdf . [Accessed 23 January 2017].	National authority
IZLER, n.d.a. <i>Macellazione conigli</i> . [ONLINE] Available at: http://www.izsler.it/izs_bs/allegati/3788/Macellazione%20Conigli.pdf . [Accessed 23 January 2017].	National authority
IZLER, n.d.b. <i>Macellazione Pollame</i> . [ONLINE] Available at: http://www.izsler.it/izs_bs/allegati/3788/Macellazione%20Pollame.pdf . [Accessed 23 January 2017].	National authority
IZLER, n.d.c. <i>Protezione degli animali alla macellazione - Linee guida di buone pratiche di macellazione rispettose del benessere Animale Centro Nazionale di Referenza per il Benessere Animale</i> . [ONLINE] Available at: http://www.izsler.it/izs_bs/allegati/3788/Macellazione%20Introduzione%20generale.pdf . [Accessed 23 January 2017].	National authority
IZSV, 2015. <i>Procedura Operativa per la protezione di avicoli e conigli durante la macellazione eseguita all'interno delle strutture di macellazione registrate ai sensi del Reg CE 852/2004 - Piccole Produzioni Locali Friuli Venezia Giulia -</i>	National authority

DPRReg. 179/2015.

SIVeMP, 2013. *Procedure operative standard per il monitoraggio del benessere animale al macello* [ONLINE] Available at: http://www.veterinariapreventiva.it/notizia/Procedure+operative+standard+per+il+monitoraggio+del+benessere+animale+al+macello_1940.html. [Accessed 23 January 2017]. NGO

A6.7 Netherlands

Source reference	Source type
VZS-KNS, 2014. <i>Module Dierenwelzijn in het slachthuis</i> .	Industry
NEPLUVI, 2014. <i>Welzijnsgids pluimveeslachterijen gids voor goede praktijken ter bescherming van het welzijn van pluimvee op de pluimveeslachterij vanaf de aankomst op het terrein van de slachterij tot en met het doden</i> . [ONLINE] Available at: http://www.nepluvi.nl/dynamic/media/1/documents/Dierenwelzijn/welzijnsgids_slachterijen.pdf . [Accessed 23 January 2017].	Industry
TopKip, n.d.a. <i>Head Only Stunning System Volta and Odigo</i> . [ONLINE] Available at: http://www.topkip.com/system-videos . [Accessed 23 January 2017].	Industry
TopKip, n.d.b. <i>Odigos ritual fixation system</i> . [ONLINE] Available at: http://www.topkip.com/system-videos . [Accessed 23 January 2017].	Industry

A6.8 Poland

Source reference	Source type
Boniecki A., and Szyborski J., 2012. <i>Postępowanie ze zwierzętami przed i w czasie uboju (Proceedings with animals before and during slaughtering)</i> . Warsaw: Wieś Jutra Sp. z o.o. (pp.11-21, 22-44, 69-78)	Other - experts
Chief Veterinary Officer, 2013a. <i>Instruction of Chief Veterinary Officer (no. Nr GIWz. 420 – 31/13) related to procedures for carrying out the veterinary inspections in slaughterhouses according to animal welfare</i> . Warsaw, 28.03.2013.	Other – veterinary organisation
Chief Veterinary Officer, 2013b. <i>Instruction of Chief Veterinary Officer (no. GIWbż-500-1/2013) related to supervision over the culling methods in pigs, cattle, chickens and turkeys in slaughterhouses</i> . Warsaw, 03.04.2013.	Other – veterinary organisation
DG Sante, 2012. <i>Pracownik odpowiedzialny za dobrostan zwierząt w Unii Europejskiej</i> . Brussels.	Other - EU commission (DG Sante)

Ministry of Agriculture and Rural Development, 2013. <i>Practical hints for breeders in case of an urgent need for slaughter in livestock animals</i> . Date: 13 September 2013.	National Authority
--	--------------------

A6.9 Romania

Source reference	Source type
ANSVSA, n.d. <i>Ghid privind protecția animalelor în momentul uciderii</i> [ONLINE] Available at: www.ansvsa.ro	National authority
ANSVSA, 2010a. <i>Ghid ucidere păsări</i> . [ONLINE] Available at: www.ansvsa.ro	National authority
ANSVSA, 2010b. <i>Ghid ucidere porci</i> . [ONLINE] Available at: www.ansvsa.ro	National authority

A6.10 Spain

Source reference	Source type
AECOSAN, 2013. <i>PNT Para Operaciones del Sacrificio: Aturdimiento</i> . [ONLINE] Available at: http://www.aecosan.msssi.gob.es/AECOSAN/docs/documentos/seguridad_alimentaria/gestion_riesgos/PNT_ATURDIMIENTO.pdf . [Accessed 23 January 2017].	National authority
Secretaría General de Salud Pública y Participación, 2012. <i>Programa de Control Oficial de Bienestar Animal en Mataderos de Andalucía</i> . [ONLINE] Available at: https://www.uclm.es/profesorado/produccionanimal/PADR/BAMATADEROS2012.pdf . [Accessed 23 January 2017].	Other - university
MAPAMA, 2014. <i>Protección de los animales durante la matanza en los vaciados sanitarios por motivos de sanidad animal de acuerdo con el reglamento (CE) N° 1099/2009, DE 24 DE SEPTIEMBRE</i> . [ONLINE] Available at: http://www.mapama.gob.es/es/ganaderia/temas/produccion-y-mercados-ganaderos/manualmatanzaabril2015_tcm7-374536.pdf . [Accessed 23 January 2017]	National authority
ASSOCAT, 2014. <i>Guia de pràctiques correctes d'higiene per a escorxadors de conills a Catalunya</i> . [ONLINE] Available at: http://acsa.gencat.cat/web/.content/Documents/eines_i_re cursos/gpch_conills.pdf . [Accessed 23 January 2017].	Industry

A6.11 Sweden

Source reference	Source type
EuWeINet, 2013. EUWeINet SOPs: 1 poultry SOP 2013, 1 poultry waterbath SOP 2013. [ONLINE] Available at: www.slu.se/centrumbildningar-och-projekt/nationellt-centrum-for-djurvalfard/kontaktpunkt-slakt/ , "Standardrutiner vid slakt och annan avlivning", expand by clicking on "+".	Other - EuWeINet

Jordbruksverket (The Swedish Board of Agriculture), 2016. <i>Official guidelines (CAA) to the evaluation of animal welfare at slaughterhouses (including problem arising at the farm or during transport)</i> . [ONLINE] Available at: http://www.jordbruksverket.se/amnesomraden/djur/djurskydd/slaktochannanavlivning/vagledningforslakt.4.26aaa7aa15471338dade993e.html (Right hand column).	National authority
Jordbruksverket (The Swedish Board of Agriculture), 2009. <i>Official (CCA) brochures about on-farm killing of cattle</i> . Available at: http://webbutiken.jordbruksverket.se/sv/artiklar/hantering-vid-avlivning-av-notkreatur.html	National authority
Jordbruksverket (The Swedish Board of Agriculture), 2009. <i>Official (CCA) brochures about on-farm killing of pigs</i> . Available at: http://webbutiken.jordbruksverket.se/sv/artiklar/hantering-vid-avlivning-av-gris.html	National authority
Jordbruksverket (The Swedish Board of Agriculture), 2010. <i>Official (CCA) brochures about on-farm killing of poultry</i> . Available at: http://webbutiken.jordbruksverket.se/sv/artiklar/hantering-vid-avlivning-av-fjaderfa.html .	National authority
Jordbruksverket (The Swedish Board of Agriculture), 2010. <i>Official (CCA) brochures about on-farm killing of sheep</i> . Available at: http://webbutiken.jordbruksverket.se/sv/artiklar/hantering-vid-avlivning-av-far.html	National authority
SLU and SCAW, n.d. <i>Utbildning i djurvelfärd i samband med slakt och annan avlivning (DISA: animal welfare at slaughter and killing)</i> . [ONLINE] Available at: http://disa.slu.se/E_index_Disas.html .	Other – Higher education

A6.12 International organisations

Source reference	Source type
Anastasov, MI., and Wotton, SB., 2012. <i>Survey of the incidence of post-stun behavioural reflexes in electrically stunned broilers in commercial conditions and the relationship of their incidence with the applied water-bath electrical parameters</i> . <i>Animal Welfare</i> , Vol.21, 247-256. [pdf] Available at: http://www.ufaw.org.uk/downloads/awj-abstracts/v21-2-anastasov.pdf	International organisation - UFAW
Atkinson, S., Velarde, A., and Algiers, B., 2013. <i>Assessment of stun quality at commercial slaughter in cattle shot with captive bolt</i> . <i>Animal Welfare</i> , vol. 22, pp.479-481. [pdf] Available at: http://www.ufaw.org.uk/downloads/awj-abstracts/v22-4-atkinson.pdf	International organisation - UFAW
AVEC, 2013. <i>Annual Report 2013</i> . [ONLINE] Available at: http://www.avec-poultry.eu/system/files/archive/new-structure/publications/annual_reports/AVEC%202013%20-%20FINAL_0.pdf	International organisation - AVEC

Source reference	Source type
Bates, L.S.W., Ford, E.A., Brown, S.N., and Knowles, TG., 2014. <i>A comparison of handling methods relevant to the religious slaughter of sheep</i> . <i>Animal Welfare</i> , vol. 23(3), pp.251-258. [pdf] Available at: https://www.researchgate.net/publication/286162994_A_comparison_of_handling_methods_relevant_to_the_religious_slaughter_of_sheep	International organisation - UFAW
Berg, C., Nordensten, C., Hultgren, J., and Algers, B., 2012. <i>The effect of stun duration and level of applied current on stun and meat quality of electrically stunned lambs under commercial conditions</i> . <i>Animal Welfare</i> , Vol.21(S2), pp.131-138. [pdf] Available at: http://www.ufaw.org.uk/downloads/awj-abstracts/v21-s2-berg.pdf	International organisation - UFAW
Bergh, C., 2012. <i>The need for monitoring farm animal welfare during mass killing for disease eradication purposes</i> . <i>Animal Welfare</i> , vol. 21, pp.357-361. [pdf] Available at: http://www.ufaw.org.uk/downloads/awj-abstracts/v21-3-berg.pdf	International organisation - UFAW
CIWF Food Business, 2015. <i>Summary - Improving Electrical Waterbath Stunning</i> . Available at: https://www.compassioninfoodbusiness.com/resources/animal-welfare/improving-electrical-waterbath-stunning/	International organisation - CIWF
CIWF Food Business, 2016 <i>Humane Slaughter: Overview</i> . [pdf] Available at: https://www.compassioninfoodbusiness.com/resources/animal-welfare/humane-slaughter-summary/	International organisation - CIWF
CIWF, 2010. <i>Slaughter</i> (factsheet). [pdf] Available at: https://www.ciwf.org.uk/media/3818632/slaughter-factsheet.pdf	International organisation - CIWF
CIWF, 2014. <i>Chicken slaughter by the Halal method in England and Wales</i> . [pdf] Available at: https://www.ciwf.org.uk/media/5471755/technical-briefing-on-halal-chicken-slaughter.pdf	International organisation - CIWF
COE, 1979. <i>Human Rights and Legal Affairs – Recommendations - Slaughter</i> . [ONLINE] Available at: http://www.coe.int/T/E/Legal_affairs/Legal_cooperation/Biological_safety_and_use_of_animals/Slaughter/	International organisation - COE
Council of Europe, 1979. <i>Treaty No. 102 of 10 May 1979 on the European Convention for the Protection of Animals for Slaughter</i> . Available at: http://www.coe.int/en/web/conventions/search-on-treaties/-/conventions/treaty/102	International organisation - COE
Dalmau, A., Nande, A., Vieira-Pinto, M., Zamprogna, S., Di Martino, G., Ribas, J. C.R., Paranhos da Costa, M., Halinen-Elmo, K., and Velarde, A., 2016. <i>Application of the Welfare Quality® protocol in pig slaughterhouses of five countries</i> . <i>Livestock Science</i> , Volume 193, pp. 78-87. Accessed at: http://www.sciencedirect.com/science/article/pii/S1871141	International organisation - UFAW

Source reference	Source type
316302219	
EAWP, 2012a. <i>Beef & Dairy Production Strategic Approach Documents.</i>	International organisation - EAWP
EAWP, 2012b. <i>Egg Production Strategic Approach Documents.</i>	International organisation - EAWP
EAWP, 2012c. <i>Broiler Chicken Production Strategic Approach Documents.</i>	International organisation - EAWP
EAWP, 2012d. <i>Pork Production Strategic Approach Documents.</i>	International organisation - EAWP
EFSA Panel on Animal Health and Welfare, 2013a. <i>Scientific Opinion on monitoring procedures at slaughterhouses for bovines.</i> <i>EFSA Journal</i> , 11(12). Available at: https://www.efsa.europa.eu/en/efsajournal/pub/3460	International organisation - EFSA
EFSA Panel on Animal Health and Welfare, 2013b. <i>Scientific Opinion on monitoring procedures at slaughterhouses for pigs.</i> <i>EFSA Journal</i> , 11(12). Available at: https://www.efsa.europa.eu/en/efsajournal/pub/3523	International organisation - EFSA
EFSA Panel on Animal Health and Welfare, 2013c. <i>Scientific Opinion on monitoring procedures at slaughterhouses for poultry.</i> <i>EFSA Journal</i> , 11(12). Available at: https://www.efsa.europa.eu/en/efsajournal/pub/3521	International organisation - EFSA
EFSA Panel on Animal Health and Welfare, 2013d. <i>Scientific Opinion on monitoring procedures at slaughterhouses for sheep and goats.</i> <i>EFSA Journal</i> , 11(12). Available at: https://www.efsa.europa.eu/en/efsajournal/pub/3522	International organisation - EFSA
EFSA, 2013. <i>Sample size calculation tool for monitoring stunning at slaughter.</i> <i>EFSA Supporting Publications</i> , 10(12). Available at: https://www.efsa.europa.eu/en/supporting/pub/541e	International organisation - EFSA
EHZ, 2008. <i>Halal Standards, Appendix I: Animal welfare regulations for the slaughter of poultry, sheep and cattle.</i> pp.8-10. [pdf] Available at: http://www.eurohelal.de/images/Dokumente/11%20-%20EHZ%20Halal%20Standards.pdf	International organisation - EHZ
Eyes on Animals, 2011. <i>Improving conditions for "suspect" animals at slaughterhouses.</i> [pdf] Available at: http://www.eyesonanimals.com/wp-content/uploads/2011/12/Downloads_ENG_Improving_conditions_for_suspect_animals.pdf	International organisation – Eyes on Animals
Eyes on Animals, 2015a. <i>Improving animal welfare in pig slaughterhouses.</i> [pdf] Available at: http://www.eyesonanimals.com/wp-content/uploads/2016/06/Animal-welfare-in-pig-slaughterhouses-how-to-reduce-stress-suffering-and-ease-handling-aanp-1.pdf	International organisation – Eyes on Animals

Source reference	Source type
Eyes on Animals, 2015b. <i>Slaughterhouse modernization. A practical guide to raising animal-handling standards and meat quality in your plant.</i> [pdf] Available at: http://www.eyesonanimals.com/wp-content/uploads/2016/04/2015-06-18-Slaughterhouse-Modernization-Manual-EN-web-version.pdf	International organisation – Eyes on Animals
Fuseini, A., Knowles, TG., Lines, JA., Hadley, PJ., and Wotton, SB., 2016. The stunning and slaughter of cattle within the EU: a review of the current situation with regard to the halal market. <i>Animal Welfare</i> , volume 25, pp. 365-376. [pdf] Available at: http://www.ufaw.org.uk/downloads/fuseini.pdf	International organisation - UFAW
Gavinelli, A., Kennedy, T., and Simonin D., 2014. The application of humane slaughterhouse practices to large-scale culling. [pdf] <i>Revue Scientifique et Technique de l'OIE</i> , 04/2014 33(1), pp.291-301. Available at: http://www.oie.int/doc/ged/D13677.PDF	International organisation - OIE
Gilliam, JN., Shearer, JK., Bahr, RJ., Crochik, S., Woods, J., Hill, J., Reynolds, J., and Taylor, JD., 2016. Evaluation of brainstem disruption following penetrating captive-bolt shot in isolated cattle heads: comparison of traditional and alternative shot-placement landmarks. <i>Animal Welfare</i> , Vol. 25, pp. 347-353. [pdf] Accessed at: http://www.ufaw.org.uk/downloads/gilliam.pdf	International organisation - UFAW
Gilliam, JN., Shearer, JK., Woods, J., Hill, J., Reynolds, J., Taylor, JD., Bahr, RJ., Crochik, S., and Snider, TA., 2012. Captive-bolt euthanasia of cattle: determination of optimal-shot placement and evaluation of the Cash Special Euthanizer Kit® for euthanasia of cattle. <i>Animal Welfare</i> , Vol. 21(S2), pp. 99-102. [pdf] Available at: http://www.ufaw.org.uk/downloads/awj-abstracts/v21-s2-gilliam.pdf	International organisation - UFAW
GlobalGAP, 2012. GLOBALG.A.P. Livestock.	International organisation - GlobalGAP
GlobalGAP, 2016. Integrated farm assurance. All farm base – Livestock base – Pigs.	International organisation - GlobalGAP
Gouveia, KG., Ferreira, PG., da Costa, JC.R., Vaz-Pires, P., da Costa, PM., 2009. Assessment of the efficiency of captive-bolt stunning in cattle and feasibility of associated behavioural signs. <i>Animal Welfare</i> , vol. 18(2), pp. 171-175. Available at: http://www.ingentaconnect.com/contentone/ufaw/aw/2009/00000018/00000002/art00007	International organisation - UFAW
Grandin, T., 2012a. Auditing animal welfare and making practical improvements in beef-, pork- and sheep-slaughter plants. <i>Animal Welfare</i> , Vol. 21(S2), pp.29-34. Available at: http://www.ingentaconnect.com/content/ufaw/aw/2012/0000021/A00201s2/art00005	International organisation - UFAW

Source reference	Source type
Grandin, T., 2012b. Developing measures to audit welfare of cattle and pigs at slaughter. <i>Animal Welfare</i> , Vol. 21(3), pp.351-356. Available at: http://www.ingentaconnect.com/content/ufaw/aw/2012/0000021/00000003/art00007	International organisation - UFAW
Gregory, NG., von Wenzlawowicz, M., von Holleben, K., Fielding, HR., Gibson, TJ., Mirabito, L., and Kolesar, R., 2012. Complications during shechita and halal slaughter without stunning in cattle. [ONLINE] Available at: https://www.researchgate.net/publication/263077641_Complications_during_shechita_and_halal_slaughter_without_stunning_in_cattle	International organisation - UFAW
HAS, 2016c. Practical slaughter of poultry.	International organisation - HSA
HSA, 2010. <i>Prevent slips and falls by managing concrete floors</i> . [pdf] Available at: http://www.hsa.org.uk/downloads/publications/prevent-slips-and-falls.pdf	International organisation - HSA
HSA, 2011. <i>Poultry Catching and Handling</i> . [pdf] Available at: http://www.hsa.org.uk/downloads/technical-notes/TN15-poultry-catching-handling.pdf	International organisation - HSA
HSA, 2013a. <i>Captive-Bolt Stunning of Livestock</i> . [pdf] Available at: http://www.hsa.org.uk/downloads/publications/captive-bolt-stunning-of-livestock-updated-logo-2016.pdf	International organisation - HSA
HSA, 2013b. <i>Emergency Slaughter</i> . [pdf] Available at: http://www.hsa.org.uk/downloads/publications/emergencyslaughterdownload-updated-2016-logo.pdf	International organisation - HSA
HSA, 2015. <i>Effective neck-cutting of poultry (poster)</i> . [pdf] Available at: http://www.hsa.org.uk/downloads/hsatipeffneckcutpoultry14oct2015.pdf	International organisation - HSA
HSA, 2016a. <i>Electrical Stunning of Red Meat Animals</i> . [pdf] Available at: http://www.hsa.org.uk/downloads/publications/electricalstunningdownload-updated-2016-logo.pdf	International organisation - HSA
HSA, 2016b. <i>Electrical Waterbath Stunning of Poultry, HSA Guidance Notes No 7</i> . [pdf] Available at: http://www.hsa.org.uk/downloads/hsagn7waterbathpoultryapril2016pdfoptimiser.pdf	International organisation - HSA
International Horse Meat Federation, 2015. <i>Manual for the Animal Welfare of horses during transport and slaughtering</i> . [pdf] Available at: http://www.respectfullife.com/wp-content/uploads/2016/09/160202-Homefe-Guidelines-animal-welfare.pdf	International organisation – UECBV/International Horse Meat Federation
ISO, 2016. <i>ISO/TS 34700:2016 Animal welfare management - General requirements and guidance for organizations in the food supply chain</i> . [ONLINE] Available at:	International organisation - ISO

Source reference	Source type
http://www.iso.org/iso/catalogue_detail?csnumber=64749	
Johnson, CB., Gibson, TJ., Stafford, KJ., and Mellor, DJ., 2012. <i>Animal Welfare</i> , Vol. 21(S2), pp.113-122. [ONLINE] Available at: https://www.researchgate.net/publication/263077644_Pain_perception_at_slaughter	International organisation - UFAW
Kittelsen, KE., Granquist, EG., Vasdal, G., Tolo, E., Moe, RO., 2015. Effects of catching and transportation versus pre-slaughter handling at the abattoir on the prevalence of wing fractures in broilers. <i>Animal Welfare</i> , Vol. 24, pp. 387-389. [pdf] Available at: http://www.ufaw.org.uk/downloads/kittelsen.pdf	International organisation - UFAW
Lines, J A., Berry, P., Cook, P., and Knowles, TG., 2012. Improving the poultry shackle line. <i>Animal Welfare</i> , Vol.21(1). [ONLINE] Available at: https://www.researchgate.net/publication/263077742_Improving_the_poultry_shackle_line	International organisation - UFAW
McIlwraith, C. W., Rollin, B. E., 2011. <i>Equine welfare</i> . Bognor Regis, UK: UFAW/Wiley-Blackwell.	International organisation - UFAW
OIE, 2016. Terrestrial Animal Health Code, volume I. Ch. 7.5-7.6. [ONLINE] Available at: http://www.oie.int/international-standard-setting/terrestrial-code/access-ONLINE/	International organisation - OIE
Pig Veterinary Society, 2013. <i>The casualty pig – Interim Update April 2013</i> . [pdf] Available at: http://www.pigvetsoc.org.uk/files/document/192/Casualty%20Pig%20-%20April%202013-1.pdf	International organisation - HSA
Rodríguez, P., Velarde, A., Dalmau, A., and Llonch, P., 2012. Assessment of unconsciousness during slaughter without stunning in lambs. <i>Animal Welfare</i> , 21(2), pp.75-80. [ONLINE] Available at: https://www.researchgate.net/publication/230701300_Assessment_of_unconsciousness_during_slaughter_without_stunning_in_lambs	International organisation - UFAW
Schiffer, KJ., Retz, SK., Ritcher, U., Algers, B., and Hensel, O., 2014. Assessment of key parameters for gunshot used on cattle: a pilot study on shot placement and effects of diverse ammunition on isolated cattle heads. <i>Animal Welfare</i> , vol. 23(4), pp. 479-489.	International organisation - UFAW
UFAW, 2012. Recent Advances in the Welfare of Livestock at Slaughter. <i>Animal Welfare</i> , Vol. 21(S2). Available at: http://www.ufaw.org.uk/shop/publications/product/recent-advances-in-the-welfare-of-livestock-at-slaughter	International organisation - UFAW
von Wenzlawowicz, M., von Holleben, K., and Eser, E., 2012. Identifying reasons for stun failures in slaughterhouses for cattle and pigs: a field study. <i>Animal Welfare</i> , Vol. 21(S2), pp. 51-60. [pdf] Available at:	International organisation - UFAW

Source reference	Source type
http://www.ufaw.org.uk/downloads/awj-abstracts/v21-s2-wenzlawowicz.pdf	
World Animal Protection, 2011. Steps cattle (training dvd for slaughterhouse staff).	International organisation - WAP
World Animal Protection, 2015. <i>Steps pigs</i> (training dvd for slaughterhouse staff).	International organisation - WAP
World Animal Protection, 2015. Steps poultry (training dvd for slaughterhouse staff).	International organisation - WAP

A6.13 Third countries

Third country	Source reference	Source type
Australia	Animal Health Australia, 2005. <i>Operational procedures manual: Livestock welfare and management (Version 3.0)</i> . Australian Veterinary Emergency Plan (AUSVETPLAN), Edition 3, Primary Industries Ministerial Council, Canberra, ACT.	National authority
Australia	Animal Health Australia, 2015. <i>Operational manual: Destruction of animals (Version 3.2)</i> . Australian Veterinary Emergency Plan (AUSVETPLAN), Edition 3, Agriculture Ministers' Forum, Canberra, ACT.	National authority
US	AVMA, 2013. <i>AVMA Guidelines for the Euthanasia of Animals: 2013 Edition</i> . [ONLINE] Available at: https://www.avma.org/KB/Policies/Documents/euthanasia.pdf	NGO
US	AVMA, 2016. <i>AVMA Guidelines for the Humane Slaughter of Animals: 2016 Edition</i> . [ONLINE] Available at: https://www.avma.org/KB/Resources/Reference/AnimalWelfare/Documents/Humane-Slaughter-Guidelines.pdf	NGO
UK	BCVA, 2010. <i>Guidance for Veterinary Surgeons on the Emergency Slaughter of Cattle</i> . [pdf] Available at: https://www.food.gov.uk/sites/default/files/multi-media/pdfs/publication/emergency_slaughter_cat tle.pdf	Professional organisation
New Zealand	Cowan, P. and Brown, S., 2012. <i>A Review of Best Practice Management for Humane and Effective Vertebrate Pest Control</i> . [ONLINE] Available at: http://j6tf91d0ueo2tdwbl2hqjje.wpengine.netdna-cdn.com/wp-content/uploads/2016/08/4895165-LC974-Cowan-15187-Vertebrate-Pest-Control-Report-final-270712-Names-2.pdf	National authority

New Zealand	DairyNZ, n.d. <i>Humane slaughter. On-farm guidelines</i> . [ONLINE] Available at: https://www.dairynz.co.nz/media/1805311/animal-pub-humane-slaughter-guidelines.pdf	Industry
Australia	DAWR, 2011. <i>Guidance on Meeting OIE Code Animal Welfare Outcomes for Cattle and Buffalo</i> .	National authority
Australia	Edge, M. K., and AMIC, 2009. <i>National animal welfare standards for livestock processing establishments</i> .	Industry
New Zealand	MIHSF, 2013. <i>Meat Industry Health & Safety Guidelines</i> .	Industry
New Zealand	NAEAC, 2009. <i>Blood harvesting guidelines</i> .	National authority
New Zealand	New Zealand Government, 2012. <i>Layer hens. Animal Welfare (Layer Hens)</i> .	National authority
New Zealand	New Zealand Government, 2016. <i>Commercial Slaughter. Code of Welfare</i> .	National authority
Australia	RSPCA, 2016. <i>Welfare of animals at abattoirs and knackeries</i> .	NGO

A6.14 Religious slaughter

Source reference	Source type
Velarde, A., Rodriguez, P., Fuentes, C., Llonch, P., von Holleben, K., von Wenzlawowicz, M., Anil, H., Miele, M., Cenci Goga, B., Lambooi, B., Zivotofsky, A., Gregory, N., Bergeaud-Blackler, F., Dalmau, A., 2010. Improving Animal Welfare during Religious Slaughter. Recommendations for Good Practice. Available at: http://www.dialrel.eu/images/recom-light.pdf	Other – EU project
Velarde, A., Rodriguez, P., Dalmau, A., Fuentes, C., Llonch, P., von Holleben, K., Anil, H., Cenci Goga, B., Catanese, B., Lambooi, B., Pleiter, H., Yuksel, A., Yesildere, T., 2010. WP2.2. Religious slaughter: Evaluation of current practices. Available at: http://www.dialrel.eu/images/factsheet-practice.pdf	Other – EU project

Annex 7 References used for the completion of Deliverable 4

A7.1 Slaughterhouse operations – Equids and cattle

- Società Italiana di Medicina Veterinaria Preventiva, 2013: 'PROCEDURE OPERATIVE STANDARD PER IL MONITORAGGIO DEL BENESSERE ANIMALE AL MACELLO'.
- IZSLER. Manuale di guida di buone pratiche sulla protezione degli animali durante l'abbattimento (Regolamento CE 1099/2009), Centro di referenza nazionale per il benessere animale.
- EBLEX 2010 Prevent slips and falls by managing concrete floors.
- Plevraki E. 2016. Οδηγός Ορθής Πρακτικής για την Προστασία των Ζώων κατά τη Σφαγή.

- Secretaria General de Salud Publica y Participacion (2012) Programa de Control Oficial de Bienestar Animal en Mataderos de Andalucia.
- TVT (2011) Töten grösserer Tiergruppen im Seuchenfall (Schwein, Rind, Schaf, Geflügel), Merkblatt Nr.84.
- TVT (2015) Tierschutzgerechtes Schlachten von Rindern, Schweinen, Schafen und Ziegen. Merkblatt Nr. 89.
- LAV (2014) Handbuck Tierschutzüberwachung bei der Schlachtung und Tötung.
- Vereniging van Zelfslachtende Slagers (2014) Module Dierenwelzijn in het slachthuis
- Interbev (2013) Guide de bonnes pratiques – Maîtrise de la protection animale des bovins à l'abattoir
- ANSVA Ghid privind protectia animalelor in momentul sacrificarii
- BPMA 2014 ((http://www.bmpa.uk.com/_attachments/Resources/3602_S4.pdf)
- Equine Industry Welfare Guidelines Compendium for Horses, Ponies and Donkeys (Third Edition);
- Temple Grandin 2012 Answering Questions about Animal Welfare during Horse Slaughter
- EFSA AHAW Panel (EFSA Panel on Animal Health and Welfare), 2013. Scientific Opinion on monitoring procedures at slaughterhouses for bovines. EFSA Journal 2013;11(12):3460.
- EFSA AHAW Panel (EFSA Panel on Animal Health and Animal Welfare), More S, Bicout D, Bo tner A, Butterworth A, Calistri P, Depner K, Edwards S, Garin-Bastuji B, Good M, Gortazar Schmidt C, Michel V, Miranda MA, Saxmose Nielsen S, Velarde A, Thulke H-H, Sihvonen L, Spoolder H, Stegeman JA, Raj M, Willeberg P, Candiani D and Winckler C, 2017. Scientific Opinion on the animal welfare aspects in respect of the slaughter or killing of pregnant livestock animals (cattle, pigs, sheep, goats, horses). EFSA Journal 2017;15(5):4782, 96 pp. <https://doi.org/10.2903/j.efsa.2017.4782>

A7.2 Slaughterhouse operations – pigs

- Eyes on Animals (2015) Improving animal welfare in pig slaughterhouse, <http://www.eyesonanimals.com/wp-content/uploads/2015/09/Animal-welfare-in-pig-slaughterhouses-how-to-reduce-stress-suffering-and-ease-handling.pdf>
- Tracey Jones, Improved Handling Systems for Pigs at Slaughter, <https://www.hsa.org.uk/downloads/publications/improved-handling.pdf>
- BSI-Schwarzenbek (2013) Gute fachliche Praxis der tierschutzgerechten Schlachtung von Rind und Schwein, http://www.bsi-schwarzenbek.de/Dokumente/bsi_gute_Praxis_4_13.pdf
- IFIP (2016) Guide de bonnes pratiques de la protection animale en abattoir de porcs.
- Società Italiana di Medicina Veterinaria Preventiva, 2013: 'PROCEDURE OPERATIVE STANDARD PER IL MONITORAGGIO DEL BENESSERE ANIMALE AL MACELLO'.
- IZSLER. Manuale di guida di buone pratiche sulla protezione degli animali durante l'abbattimento (Regolamento CE 1099/2009), Centro di referenza natioanle per il benessere animale.
- TVT (2011) Töten grösserer Tiergruppen im Seuchenfall (Schwein, Rind, Schaf, Geflügel), Merkblatt Nr.84.
- http://www.mapama.gob.es/es/ganaderia/temas/produccion-y-mercados-ganaderos/manualmatanzaabril2015_tcm7-374536.pdf
- HSA, 2006. Best Practice Guidelines for Group-Stunning Systems <http://www.hsa.org.uk/downloads/publications/group-stunning.pdf>
- HSA, 2016. Electrical stunning of red meat animals.

- Cambac JMA Research & HSA, Improved Handling Systems for Pigs at Slaughter. Accessible at: <https://www.hsa.org.uk/shop/publications-1/product/improved-handling-systems-for-pigs-at-slaughter>
- RVC, EBLEX & HAS, Preventing Slips and Falls by Managing Concrete Floors. Accessible on the following link: <https://www.hsa.org.uk/shop/publications-1/product/prevent-slips-and-falls-by-managing-concrete-floors>
- TVT (2015) Tierschutzgerechtes Schlachten von Rindern, Schweinen, Schafen und Ziegen. Merkblatt Nr. 89.
- LAV (2014) Handbuck Tierschutzüberwachung bei der Schlachtung und Tötung.
- Secretaria General de Salud Publica y Participacion (2012) Programa de Control Oficial de Bienestar Animal en Mataderos de Andalucía.
- Vereniging van Zelfslachtende Slagers (2014) Module Dierenwelzijn in het slachthuis
- Christensen and Gade (1997) New Danish developments in pig handling at abattoirs. *Danish Meat Research Institute*.
- EFSA AHAW Panel (EFSA Panel on Animal Health and Welfare), 2013. Scientific Opinion on monitoring procedures at slaughterhouses for pigs. *EFSA Journal* 2013;11(12):3523.
- EFSA AHAW Panel (EFSA Panel on Animal Health and Animal Welfare), More S, Bicout D, Bo tner A, Butterworth A, Calistri P, Depner K, Edwards S, Garin-Bastuji B, Good M, Gortazar Schmidt C, Michel V, Miranda MA, Saxmose Nielsen S, Velarde A, Thulke H-H, Sihvonen L, Spoolder H, Stegeman JA, Raj M, Willeberg P, Candiani D and Winckler C, 2017. Scientific Opinion on the animal welfare aspects in respect of the slaughter or killing of pregnant livestock animals (cattle, pigs, sheep, goats, horses). *EFSA Journal* 2017;15(5):4782, 96 pp. <https://doi.org/10.2903/j.efsa.2017.4782>
- FSA group stunning guidance <https://www.food.gov.uk/sites/default/files/fsa-group-stunning-2017.pdf>
- RED TRACTOR guidance (voluntary standard) http://assurance.redtractor.org.uk/contentfiles/Farmers-5403.pdf?_=636287211202249485
- RED TRACTOR guidance (voluntary standard) http://assurance.redtractor.org.uk/contentfiles/Farmers-5615.pdf?_=635960611245183715 Slaughterhouse operations – sheep and goats

National, sectorial good practices and voluntary standards

- TVT (2011) Töten grösserer Tiergruppen im Seuchenfall (Schwein, Rind, Schaf, Geflügel), Merkblatt Nr.84.
- http://www.mapama.gob.es/es/ganaderia/temas/produccion-y-mercados-ganaderos/manualmatanzaabril2015_tcm7-374536.pdf
- HSA, 2004. Guidelines on the management, lairage handling, stunning/killing and bleeding of sheep and goats in commercial abattoirs. HSA 2004. ISBN 1 871561 39 2
- HSA, 2006. Best Practice Guidelines for Group-Stunning Systems <http://www.hsa.org.uk/downloads/publications/group-stunning.pdf>
- HSA, 2016. Electrical stunning of red meat animals.
- Plevraki E. 2016. Οδηγός Ορθής Πρακτικής για την Προστασία των Ζώων κατά τη Σφαγή.
- Società Italiana di Medicina Veterinaria Preventiva, 2013: 'PROCEDURE OPERATIVE STANDARD PER IL MONITORAGGIO DEL BENESSERE ANIMALE AL MACELLO'.
- IZSLER. Manuale di guida di buone pratiche sulla protezione degli animali durante l'abbattimento (Regolamento CE 1099/2009), Centro di referenza natioanle per il benessere animale.
- EBLEX 2010 Prevent slips and falls by managing concrete floors.

- TVT (2015) Tierschutzgerechtes Schlachten von Rindern, Schweinen, Schafen und Ziegen. Merkblatt Nr. 89.
- LAV (2014) Handbuck Tierschutzüberwachung bei der Schlachtung und Tötung.
- Secretaria General de Salud Publica y Participacion (2012) Programa de Control Oficial de Bienestar Animal en Mataderos de Andalucia.
- Vereniging van Zelfslachtende Slagers (2014) Module Dierenwelzijn in het slachthuis

Other sources

- New Zealand Meat Industry, 2013. Health and safety Guidelines Meat Industry Association
www.mia.co.nz/...S%20Guidelines/MIA%20H%20&%20S%20Guidelines%20FINAL
- EFSA AHAW Panel (EFSA Panel on Animal Health and Welfare), 2013. Scientific Opinion on monitoring procedures at slaughterhouses for sheep and goats. EFSA Journal 2013 11(12):3522.

A7.4 Slaughterhouse operations -poultry

National, sectoral guidance, or voluntary standards:

- http://www.aecosan.msssi.gob.es/AECOSAN/docs/documentos/seguridad_alimentaria/gestion_riesgos/PNT_ATURDIMIENTO.pdf
- http://www.ordineveterinariereggiuemilia.it/userfiles/files/manuale_3_webis.pdf.
- http://disa.slu.se/Hantering_Fjad/Hant_Fjad14.shtml;
- <https://www.jordbruksverket.se/download/18.6b0af7e81284865248a80002467/2010-015.pdf>
- FR: FIA and CNADEV, 2016. Guide de bonnes pratiques de Protection animale à l'abattoir de volailles 2016. [FR].
- UK: BPC (2015) The protection of animal at the time of killing – Guidance for Poultry. British Poultry Council.

Other sources:

- HSA:
<https://www.hsa.org.uk/downloads/hsagn7electricalwaterbathpoultry1.pdf>
- HSA: <https://www.hsa.org.uk/downloads/technical-notes/TN10-electrical-waterbaths.pdf>
- AVMA:
<https://www.avma.org/KB/Resources/Reference/AnimalWelfare/Documents/Human-Slaughter-Guidelines.pdf>
- <https://www.hsa.org.uk/downloads/hsatipeffneckcutpoultry14oct2015.pdf>
- EUWELNET Sub Deliverable 3.4.2. Standard operating procedures (SOPs) for the waterbath stunning of poultry and the valid and reliable assessment of unconsciousness following mechanical stunning in bovines, electrical stunning in ovines, water bath electrical stunning in poultry and gas stunning in pigs.
- <https://www.compassioninfoodbusiness.com/resources/broiler-chickens/halal-slaughter-effective-recoverable-stunning/>
- Guide to Alleviation of Thermal Stress in Poultry lairage PB3724 1998;
<http://adlib.eversite.co.uk/resources/000/250/255/PB3724.pdf>
- EFSA AHAW Panel (EFSA Panel on Animal Health and Welfare), 2013. Scientific Opinion on monitoring procedures at slaughterhouses for poultry. EFSA Journal 2013; 11(12):3521

A7.5 Slaughter without stunning - Cattle

National or sectoral good practices and voluntary standards

- Halal Standards, Appendix I: Animal welfare regulations for the slaughter of poultry, sheep and cattle, <http://www.eurohelal.de/images/Dokumente/11%20-%20EHZ%20Halal%20Standards.pdf>
- Denmark: Danish Order on the slaughtering and killing of animals¹⁾ section 10
- Spain: <https://www.uclm.es/profesorado/produccionanimal/PADR/BAMATADEROS2012.pdf>
- National rules in the Netherlands
- Netherlands: Module Dierenwelzijn in het slachthuis (Animal welfare in the slaughterhouse, Guide to good practice, Dutch association of Slaughter Butchers) http://www.nepluvi.nl/dynamic/media/1/documents/Dierenwelzijn/welzijnsgids_slachterijen.pdf
- France: Guide de bonnes pratiques – Maîtrise de la protection animale des bovins à l’abattoir – Novembre 2013, Interbev.
- Spain: http://www.aecosan.msssi.gob.es/AECOSAN/docs/documentos/seguridad_alimentaria/gestion_riesgos/PNT_ATURDIMIENTO.pdf
- DG SANTE 2015 Sanco/2012/10357restraining systems for bovine animals slaughtered without stunning welfare and socio-economic implications acronym: BOREST
- https://ec.europa.eu/food/sites/food/files/animals/docs/aw_practice_slaughter_com_borest_report.pdf (references good practices observed in the actual operations of slaughterhouses in various EU countries, which have therefore been included in this document).

Other relevant sources

- Anil M. Haluk 2012. Religious slaughter: A current controversial animal welfare issue. *Animal Frontiers* July 2012 2:64-67; doi:10.2527/af.2012-0051
- Dialrel WP 2.2, Improving Animal Welfare during Religious Slaughter Recommendations for Good Practice, <http://www.dialrel.eu/images/recom-light.pdf>
- AVMA Humane Slaughter guide 2016 <https://www.avma.org/KB/Resources/Reference/AnimalWelfare/Documents/Humane-Slaughter-Guidelines.pdf>
- <http://www.grandin.com/ritual/ritual.slaughter.tips.html>
- HSA: <https://www.hsa.org.uk/restraint/restrainer-conveyor>
- HSA: <https://www.hsa.org.uk/downloads/related-items/religious-slaughter.pdf>
- FAWC, UPRIGHT BOVINE RESTRAINING PENS FOR NON STUNNED SLAUGHTER – DESIGN AND OPERATING CRITERIA, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/324994/FAWC_advice_on_upright_bovine_restraining_pens_for_non-stun_slaughter.pdf
- Haluk Anil, Effects of slaughter method on carcass and meat characteristics in the meat of
- cattle and sheep, http://beefandlamb.ahdb.org.uk/wp/wp-content/uploads/2013/04/slaughter_and_meat_quality_feb_2012-final-report.pdf
- BTSF training materials: Animal Welfare at slaughter and killing for disease control. Unit 5 – Bleeding practices and killing for depopulation purposes

A7.6 Slaughter without stunning – sheep and goats

National or sectoral good practices and voluntary standards

- Halal Standards, Appendix I: Animal welfare regulations for the slaughter of poultry, sheep and cattle, <http://www.eurohelal.de/images/Dokumente/11%20-%20EHZ%20Halal%20Standards.pdf>
- Denmark: Danish Order on the slaughtering and killing of animals¹⁾ section 10
- Spain: <https://www.uclm.es/profesorado/produccionanimal/PADR/BAMATADEROS2012.pdf>
- Netherlands: Module Dierenwelzijn in het slachthuis (Animal welfare in the slaughterhouse, Guide to good practice, Dutch association of Slaughter Butchers) http://www.nepluvi.nl/dynamic/media/1/documents/Dierenwelzijn/welzijnsgids_slachterijen.pdf
- Spain: http://www.aecosan.msssi.gob.es/AECOSAN/docs/documentos/seguridad_alimentaria/gestion_riesgos/PNT_ATURDIMIENTO.pdf
- IT: SIVeMP, 2013. Procedure operative standard per il monitoraggio del benessere animale al macello;
- IT: FNOVI, 2009. Linee Guida sull'applicazione del Regolamento (cE) n. 1099/2009
- Halal and Kosher slaughter. DEFRA <https://www.gov.uk/guidance/halal-and-kosher-slaughter>
-

Other relevant sources

- Bates et al. (2014) A comparison of handling methods relevant to the religious slaughter of sheep. *Animal Welfare* 23: 251-258.
- Dialrel WP 2.2, Improving Animal Welfare during Religious Slaughter Recommendations for Good Practice, <http://www.dialrel.eu/images/recom-light.pdf>
- AVMA Humane Slaughter guide 2016 <https://www.avma.org/KB/Resources/Reference/AnimalWelfare/Documents/Humane-Slaughter-Guidelines.pdf>
- <http://www.grandin.com/ritual/ritual.slaughter.tips.html>
- HSA: <https://www.hsa.org.uk/restraint/restrainer-conveyor>
- HSA: <https://www.hsa.org.uk/downloads/related-items/religious-slaughter.pdf>
- Haluk Anil, Effects of slaughter method on carcass and meat characteristics in the meat of cattle and sheep, http://beefandlamb.ahdb.org.uk/wp/wp-content/uploads/2013/04/slaughter_and_meat_quality_feb_2012-final-report.pdf
- BTSF training materials: Animal Welfare at slaughter and killing for disease control. Unit 5 – Bleeding practices and killing for depopulation purposes
- HSA <https://www.hsa.org.uk/downloads/info/trainingworkshopcomplete.pdf>
- FAO Sheep stunning box <http://www.fao.org/docrep/003/x6909e/x6909e09.htm>

A7.7 Slaughter without stunning – poultry

- **National, sectoral guidance, or voluntary standards**
- Spain: http://www.aecosan.msssi.gob.es/AECOSAN/docs/documentos/seguridad_alimentaria/gestion_riesgos/PNT_ATURDIMIENTO.pdf
- Italy: http://www.ordineveterinariereggiuemilia.it/userfiles/files/manuale_3_webis.pdf
- <http://www.eurohelal.de/images/Dokumente/11%20-%20EHZ%20Halal%20Standards.pdf>
- **Other relevant sources**

- Dialrel WP 2.2, Improving Animal Welfare during Religious Slaughter Recommendations for Good Practice, <http://www.dialrel.eu/images/recom-light.pdf>
- HSA: <https://www.hsa.org.uk/downloads/hsagn7electricalwaterbathpoultry1.pdf>
- HSA: <https://www.hsa.org.uk/downloads/technical-notes/TN10-electrical-waterbaths.pdf>
- AVMA: <https://www.avma.org/KB/Resources/Reference/AnimalWelfare/Documents/Humane-Slaughter-Guidelines.pdf>
- <https://www.hsa.org.uk/downloads/hsatipeffneckcutpoultry14oct2015.pdf>
- EUWELNET Sub Deliverable 3.4.2. Standard operating procedures (SOPs) for the waterbath stunning of poultry and the valid and reliable assessment of unconsciousness following mechanical stunning in bovines, electrical stunning in ovines, water bath electrical stunning in poultry and gas stunning in pigs. <https://www.compassioninfoodbusiness.com/resources/broiler-chickens/halal-slaughter-effective-recoverable-stunning/>

A7.8 On-farm killing – Equids

- Alberta Farm Animal Care / Equestrian Federation 2015. Humane handling of horses and the care of compromised and unfit horses;
- NEWC 2011. Equine Industry Welfare Guidelines Compendium for Horses, Ponies and Donkeys (Third Edition);
- Farm animal welfare Advisory Council Animal Welfare Guidelines for Horses, Ponies and Donkeys, Farm & Food Care Ontario, 2013.
- Horse Euthanasia – On Farm Options.

A7.9 On-farm killing – sheep and goats

National, sectoral good practices and voluntary standards

- TVT (2011) Töten grösserer Tiergruppen im Seuchenfall (Schwein, Rind, Schaf, Geflügel), Merkblatt Nr.84.
- http://www.mapama.gob.es/es/ganaderia/temas/produccion-y-mercados-ganaderos/manualmatanzaabril2015_tcm7-374536.pdf

Other sources

- HSA 2013 On Farm slaughter of livestock for consumption.
- <http://www.grandin.com/humane/elec.stun.html>;
- Annex to the *EFSA Journal* (2006) 326, 1-18. The welfare aspects of the main systems of stunning and killing applied to commercially farmed deer, goats, rabbits, ostriches, ducks, geese and quail;
- <http://nwschoolanimals.com/sheep>;
- <http://nwschoolanimals.com/goats>;
- *The EFSA Journal* (2004), 45, 1-29. Welfare aspects of the main systems of stunning and killing the main commercial species of animals (i.e. cattle, sheep, pigs, poultry, horses and farmed fish). Opinion of the Scientific Panel on Animal Health and Welfare. ;

A7.10 On-farm killing – rabbits

National, sectoral good practices and voluntary standards

- AECOSAN, 2013. PNT Para Operaciones del Sacrificio: Aturdimiento. [ONLINE] Available at: http://www.aecosan.msssi.gob.es/AECOSAN/docs/documentos/seguridad_alimentaria/gestion_riesgos/PNT_ATURDIMIENTO.pdf. [Accessed 23 January 2017].

- Federation des Industries Avicoles: 'Guide de Bonnes Pratiques de protection animale en abattoir de lagomorphes', 2016
- Generalitat de Catalunya. Departament de Salut: 'Guia de Practiques Correctes d' hygiene per a escorxadors de Conills a Catalunya', 2014
- FNOVI, 2009. Linee Guida sull'applicazione del Regolamento (CE) No 1099/2009
- IZSLER, n.d.b. Macellazione conigli;
- MAPAMA, 2014. *Protección de los animales durante la matanza en los vaciados sanitarios por motivos de sanidad animal de acuerdo con el reglamento (CE) N° 1099/2009, DE 24 DE SEPTIEMBRE*. [ONLINE] Available at: http://www.mapama.gob.es/es/ganaderia/temas/produccion-y-mercados-ganaderos/manualmatanzaabril2015_tcm7-374536.pdf. [Accessed 23 January 2017]
- Ontario Veterinary College (2016) *Euthanasia Guide for Ontario Commercial Meat Rabbit Producers*;
- Secretaría General de Salud Pública y Participación, 2012. *Programa de Control Oficial de Bienestar Animal en Mataderos de Andalucía*. [ONLINE] Available at: <https://www.uclm.es/profesorado/produccionanimal/PADR/BAMATADEROS2012.pdf>. [Accessed 23 January 2017]
- SIMVEP, 2013. Procedure Operative Standard Per Il Monitoraggio Del Benessere Animale Al Macello

Other sources

- Lebas F, Coudert P, de Rochembeau H, Thébault RG (1997). The rabbit – husbandry, health, and production. FAO Animal Production and health Series No. 21. www.fao.org/docrep/t1690e/t1690e00.HTM
- Nodari, R.S., Lavazza, A., Candotti, P. (2008) Evaluation of rabbit welfare at stunning and slaughtering in a commercial abattoir. *Ethology and Welfare*, 9th World Rabbit Congress June 2008, Verona – Italy, 1239-1244 (<https://world-rabbit-science.com/WRSA-Proceedings/Congress-2008-Verona/Papers/W-Rota.pdf>).
- EFSA (2006) Annex to the *EFSA Journal (2006) 326, 1-18*. The welfare aspects of the main systems of stunning and killing applied to commercially farmed deer, goats, rabbits, ostriches, ducks, geese and quail;
- EFSA 2005 report on the impact of the current housing and husbandry systems on the health and welfare of farmed domestic rabbits (The *EFSA Journal* 267: 1-31, www.efsa.europa.eu/en/efsajournal/pub/267.htm)

Annex 8 Contributors to the consultation

In conformity with the legislation on personal data protection (Directive 95/46/EC), this tables lists only the names of individuals and organisations who explicitly agreed to be referenced in this report.

Table A8.1 Individuals and organisations who responded to the consultation exercise

Name	Organization	Group
Gabriele Damoser	Austrian Animal Welfare Council	Animal welfare organisations
Nathan Williams	Compassion in World Farming (CIWF)	Animal welfare organisations
Mariella Debille	Council on Animal Affairs	Animal welfare organisations

Name	Organization	Group
Olli Peltoniemi	Farm Animal Welfare Council	Animal welfare organisations
Satu Raussi	Finnish Centre for Animal Welfare	Animal welfare organisations
Charlie Mason	Humane Slaughter Association (HSA)	Animal welfare organisations
Jose Ciocca	World Animal Protection	Animal welfare organisations
	Accles and Shelvoke	Equipment manufacturers
	BANSS	Equipment manufacturers
	Deutscher Raiffeisenverband (DRV) – German Raiffeisen Association	Farmer organisations
	Asociación Nacional de Industrias de Carne en España (ANICE)	Industry
Annette Toft	Danish Agriculture and Food Council	Industry
Pascale Rouhier	European Liaison Committee for Agricultural and Agri-Food Trade (CELCAA)	Industry
	Federation of German Meat Industry Association (BVDF)	Industry
Ester Peeters	Belgium - Steering Committee of the Animal Welfare Council	NCP
Tomislav Mikuš	Croatia - Croatian Veterinary Institute	NCP
Simona Ninčáková	Czech Republic - Department of Animal Health and Welfare, State Veterinary Administration of the Czech Republic	NCP
Else Enemark	Denmark - Ministry of Environment and Food of Denmark (FVST), Danish Centre for Animal Welfare (DCAW)	NCP
Laure Paget	France - Ministry of Agriculture, Agrifood and Forestry Directorate General for Food Welfare office	NCP
Katerina Marinou	Greece - Ministry of Rural Development and Food Division of Animal Welfare	NCP
Iveta Kociņa	Latvia - Institute of Food Safety, Animal Health and Environment	NCP
Kristina Stakyte	Lithuania - Animal Health and Welfare Department at State Food and Veterinary Service	NCP
Carlo Dahm	Luxemburg - Ministry of Agriculture of Luxemburg	NCP
Cecilie M. Mejdell	Norway - Norwegian Veterinary Institute	NCP
	Portugal - Directorate General of Food and	NCP

Name	Organization	Group
	Animal Health	
Tea Dronjič	Slovenia - Administration of the Republic of Slovenia for Food Safety, Veterinary Sector and Plant Protection	NCP
Lotta Nordensten	Sweden - Swedish Board of Agriculture	NCP
Lotta Berg	Sweden - Swedish University of Agricultural Sciences (SLU), SCAW, contact point	NCP
Peter Jakob	Switzerland - Federal Food Safety and Veterinary Officer	NCP
Kaspar Jörgler	Switzerland - Swiss Federal Office, Head of Division Animal Welfare	NCP
Richard Aram	United Kingdom - Farm Animal Welfare Committee (FAWC)	NCP
	Federation of Veterinarians of Europe (FVE)	Official veterinarians
Mina Mpori	Panhellenic Union of State Veterinary Officers (PUSVO)	Official veterinarians
Joost van Herten	Section of Quality Care and Public Health of the Koninklijke Nederlandse Maatschappij voor Diergeneeskunde (KNMvD)	Official veterinarians
Laurent Perrin	Syndicat National des Vétérinaires de l'Administration (SNVIA)	Official veterinarians
Hanen Rezgui	ASIDCOM	Religious organisations
	Instituto Halal	Religious organisations
	Muslim Council of Britain	Religious organisations
	Shechita UK	Religious organisations
Steve Wotton	Bristol University	Scientific support and experts
Prof Valentina Ferrante	Dept. Veterinary Medicine, University of Milan	Scientific support and experts
Luc Mirabito	Institut de l'Elevage	Scientific support and experts
Dr Lubor Kostal	Institute of Animal Biochemistry and Genetics, Slovak Academy of Sciences	Scientific support and experts
Antonio Velarde	Institute of Food and Agricultural Research (IRTA)	Scientific support and experts
Julian Sparrey	Livetek Ltd	Scientific support and experts
Jess Martin	Royal Dick Veterinary School Edinburgh	Scientific support and experts

Name	Organization	Group
Ingrid de Jong	Wageningen University & Research Centre (WUR)	Scientific support and experts
Marien Gerritzen	Wageningen University & Research Centre (WUR)	Scientific support and experts
Michael Maharens	Welfare Reference Centre Celle	Scientific support and experts
Sandra Jerez	Embassy of Chile to the EU	Third countries

HOW TO OBTAIN EU PUBLICATIONS

Free publications:

- one copy:

via EU Bookshop (<http://bookshop.europa.eu>);

- more than one copy or posters/maps:
 - from the European Union's representations (http://ec.europa.eu/represent_en.htm);
 - from the delegations in non-EU countries (http://eeas.europa.eu/delegations/index_en.htm);
 - by contacting the Europe Direct service (http://europa.eu/europedirect/index_en.htm) or calling 00 800 6 7 8 9 10 11 (freephone number from anywhere in the EU) (*).

(*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

Priced publications:

- via EU Bookshop (<http://bookshop.europa.eu>).

Priced subscriptions:

- via one of the sales agents of the Publications Office of the European Union (http://publications.europa.eu/others/agents/index_en.htm).



Publications Office

doi: 10.2875/15243
ISBN: 978-92-79-75331-2