

MEETING OF THE OIE TERRESTRIAL ANIMAL HEALTH STANDARDS COMMISSION

Virtual meeting, 1–11 February 2022

List of participants

MEMBERS OF THE CODE COMMISSION

Dr Etienne Bonbon

President

Senior Veterinary Advisor
EMC-AH / Animal Health Service
Food and Agriculture Organization of the
United Nations
Viale delle Terme di Caracalla
00153 Rome
ITALY
etienne.bonbon@fao.org
e.bonbon@oie.int

Prof. Salah Hammami

Epidemiologist & Virologist
Services of Microbiology-
Immunology & General Pathology
National School of Veterinary
Medicine
Sidi Thabet -2020
TUNISIA
hammami.salah@iresa.agrinet.tn
saleehammami@yahoo.fr

Dr Lucio Ignacio Carbajo Goñi

Agricultural Attaché
Ministry of Agriculture, Food and Environment
Spanish Embassy in Peru
SPAIN
lcarbajo@mapama.es
lcg958@gmail.com

Dr Kiyokazu Murai

Animal Health Division
Ministry of Agriculture, Forestry and Fisheries
1-2-1 Kasumigaseki
Chiyoda-ku
Tokyo 100-8950
JAPAN
kiyokazu_murai580@maff.go.jp

Dr Gaston Maria Funes

Counsellor for Agricultural Affairs
Embassy of Argentina to the EU
Avenue Louise 225, (4th floor)
1050 Brussels
BELGIUM
gmfunes@magyp.gob.ar

Dr Bernardo Todeschini

Agricultural Attaché
Mission of Brazil to the European Union -
Belgium
Ministry of Agriculture, Livestock
and Food Supply
BRAZIL
bernardo.todeschini@agricultura.gov.br

OIE HEADQUARTERS

Dr Gillian Mylrea

Head
Standards Department
g.mylrea@oie.int

Dr Charmaine Chng

Chargée de mission
Standards Department
c.chng@oie.int

Dr Francisco D'Alessio

Deputy head
Standards Department
f.dalessio@oie.int

Dr Elizabeth Marier

Chargée de mission
Standards Department
e.marier@oie.int

Dr Yukitake Okamura

Chargé de mission
Standards Department
y.okamura@oie.int

Dr Leopoldo Stuardo

Chargé de mission
Standards Department
l.stuardo@oie.int

MEETING OF THE OIE TERRESTRIAL ANIMAL HEALTH STANDARDS COMMISSION
Paris, 1–11 February 2022

Adopted agenda

- 1. Welcome from the Deputy Director General**
- 2. Meeting with the Director General**
- 3. Adoption of agenda**
- 4. Cooperation with other Specialist Commissions**
 - 4.1.** Scientific Commission for Animal Diseases
 - 4.2.** Biological Standards Commission
 - 4.3.** Aquatic Animal Health Standards Commission
- 5. Code Commission's work programme except texts proposed for comments or adoption**
 - 5.1. Ongoing priority topics (not in order of priority)**
 - 5.1.1.** Collection and processing of semen of animals (Chapter 4.6.)
 - 5.1.2.** Revision of Section 4 Disease prevention and control (New chapter on biosecurity, revision of Chapter 4.13. on disposal of dead animals and Chapter 4.14. on disinfection)
 - 5.1.3.** Revision of Section 5 Trade measures, import/export procedures and veterinary certification (especially Chapters 5.4. to 5.7.)
 - 5.1.4.** Responsible and prudent use of antimicrobial agents in veterinary medicine (Chapter 6.10.)
 - 5.1.5.** Transport of animals by sea, land and air (Chapters 7.2., 7.3. and 7.4.)
 - 5.1.6.** Infection with Mycobacterium tuberculosis complex (Chapter 8.11.)
 - 5.1.7.** Scrapie (Chapter 14.8.)
 - 5.1.8.** Harmonisation of official recognition of status by the OIE: contagious bovine pleuropneumonia (Chapter 11.5.), African horse sickness (Chapter 12.1.)
 - 5.1.9.** Mers Cov
 - 5.1.10.** Leishmaniosis
 - 5.1.11.** Pet food as safe commodities
 - 5.1.12.** Honey – definitions and provisions on importation
 - 5.1.13.** Framework for *Terrestrial Code* standards
 - 5.1.14.** Safe commodities SOP

5.2. New proposals and requests

- 5.2.1. Request from Wildlife Working Group
- 5.2.2. Chapter 7.Z. Animal welfare and laying hen production systems
- 5.2.3. Rabbit haemorrhagic disease (Chapter 13.2.)
- 5.2.4. Nipah virus encephalitis and Bovine viral diarrhoea
- 5.2.5. Request to clarify Glossary definition for Poultry
- 5.2.6. Listed diseases names: Discrepancies between Chapter 1.3. and disease-specific chapters
- 5.2.7. OIE Standard Operating Procedure for determining if a disease should be considered as an emerging disease – Comment received

5.3. Prioritisation of items in work programme

6. Texts proposed for adoption in May 2022

- 6.1. Glossary A ('Competent Authority', 'Veterinary Authority', 'Veterinary Services', 'Protein meal' and 'Stray dog')
- 6.2. Introduction to Recommendations on Veterinary Services (Article 3.1.1.) and Quality of Veterinary Services (Articles 3.2.3. and 3.2.9.)
- 6.3. Veterinary legislation (Articles 3.4.5. and 3.4.11.)
- 6.4. Zoonoses transmissible from non-human primates (Chapter 6.12.)
- 6.5. Stray dog population control (Dog population management) (Chapter 7.7.)
- 6.6. Infection with rinderpest virus (Chapter 8.16.)
- 6.7. Infection with *Echinococcus granulosus* (Chapter 8.5.) and Infection with *Taenia solium* (Porcine cysticercosis) (Chapter 15.4.)
- 6.8. Bovine spongiform encephalopathy (Chapter 11.4.) and Application for official recognition by the OIE of risk status for bovine spongiform encephalopathy (Chapter 1.8.). Revision of the use of terms 'meat-and-bone meal' and 'greaves' throughout the *Terrestrial Code*
- 6.9. Theileriosis (Chapter 11.10.) and Article 1.3.2.
- 6.10. Trichomonosis (Chapter 11.11.)
- 6.11. Terminology: Use of the term 'sanitary measure'

7. Texts circulated for comments

7.1. In September 2021 meeting report

- 7.1.1. Infection with foot and mouth disease virus (Chapter 8.8.)

7.2. Previously circulated (this is the order of priority)

- 7.2.1. Slaughter of animals (Chapter 7.5.)
- 7.2.2. Infection with rabies virus (Chapter 8.14.)

Annex 2 (contd)

- 7.2.3. Infection with Rift Valley fever virus (Chapter 8.15.)
- 7.2.4. New chapter on infection with *Trypanosoma Evansi* (Non equine surra) (Chapter 8.X.)
- 7.2.5. Contagious equine metritis (Chapter 12.2.)
- 7.2.6. Infection with equine influenza virus (Chapter 12.6.)
- 7.2.7. Equine piroplasmiasis (Chapter 12.7.)
- 7.2.8. New chapter on infection with *Theileria* in small ruminants and Article 1.3.3.

8. Other updates

- 8.1. OIE Observatory
- 8.2. OIE Digitalisation strategy
- 8.3. GBADs

9. For information / reference documents

- 9.1. Antimicrobial Resistance Working Group report (October 2021)
- 9.2. Wildlife Working Group report (December 2021)
- 9.3. New publication: Responsible and prudent use of anthelmintic chemicals to help control anthelmintic resistance in grazing livestock species
- 9.4. New publication: A key role for veterinary authorities and animal health practitioners in preventing and controlling neglected parasitic zoonoses – A handbook with focus on *Taenia solium*, *Trichinella*, *Echinococcus* and *Fasciola*

10. Meeting review

11. Date of next meeting

**WORK PROGRAMME FOR
THE TERRESTRIAL ANIMAL HEALTH STANDARDS COMMISSION**

Chapter	Issues	Status - February 2022		Priority order *
		Stage of consideration	Remarks (Month when draft text first circulated for comment /# of rounds for comment)	
N.A.	Use of terms: biosecurity / sanitary measures	Circulated for comments (proposed for adoption in May 2022)	Noted in Feb 2022 TAHSC report (Sep 2021/2)	1
	Use of terms: disease / infection / infestation	Preparatory work	Refer to Feb 2020 TAHSC report	2
	Use of terms: animal health status	Preparatory work	Refer to Feb 2020 TAHSC report	3
	Use of terms: animal-based measures / measurables	Preparatory work	Refer to Feb 2021 TAHSC report	2
	Use of terms: enzootic / endemic / epizootic / epidemic	Preparatory work	Refer to Feb 2021 TAHSC report	2
	Use of terms: notify / notifiable disease / report / reportable disease	Preparatory work	Refer to Feb 2019 TAHSC report	3
User's guide	Revision of the Users' guide (standing item)	Standing item		1
Glossary	'Competent Authority', 'Veterinary Authority' and 'Veterinary Services'	Circulated for comments (proposed for adoption in May 2022)	Noted in Feb 2022 TAHSC report (Sep 2018/4)	1
	'Death', 'euthanasia', 'slaughter' and 'stunning'	Circulated for comments	Noted in Feb 2022 TAHSC report (Sep 2019/3)	2
	'Case'	Not started	Refer to Sep 2020 TAHSC report and Feb 2020 BSC report	3
	'Stray dog'	Circulated for comments (proposed for adoption in May 2022)	Noted in Feb 2022 TAHSC report (Sep 2021/2)	1
	'Poultry'	Circulated for comments	Noted in Feb 2022 TAHSC report (Feb 2022/1)	2

	New definition for 'protein meal'	Circulated for comments (proposed for adoption in May 2022)	Noted in Feb 2022 TAHSC report (Feb 2021/3)	1
	New definitions for 'distress', 'pain' and 'suffering'	Preparatory work	AHG to address Member comments (Sep 2019/2)	2
	New definitions for 'animal products', 'product of animal origin' and 'animal by-product'	Preparatory work	Refer to Feb 2020 TAHSC report	3
	New definition for 'swill'	Preparatory work	Noted in Sep 2021 TAHSC report	1
	Use of terms 'meat-and-bone meal' and 'greaves'	Preparatory work	Noted in Feb 2022 TAHSC report	2
Section 1				
1.3.	Revision of Chapter 1.3. (to ensure alignment with disease-specific chapters)	Circulated for comments (proposed for adoption in May 2022)	Noted in Feb 2022 TAHSC report (Feb 2022/1)	1
	Revision of Article 1.3.2. (Theileriosis)	Circulated for comments (proposed for adoption in May 2022)	Noted in Feb 2022 TAHSC report (Sep 2021/2)	1
	Listing of Infection with <i>T. lestoquardi</i> , <i>T. luwenshuni</i> and <i>T. uilenbergi</i> (Article 1.3.3.)	Circulated for comments	Noted in Feb 2022 TAHSC report	2
	Delisting of paratuberculosis	Preparatory work	Pending assessment by SCAD	3
1.8.	Application for official recognition by the OIE of free status for bovine spongiform encephalopathy	Circulated for comments (proposed for adoption in May 2022)	Noted in Feb 2022 TAHSC report (Sep 2019/5)	1
Section 3				
3.1., 3.2.	Introduction to recommendations on Veterinary Services (Ch 3.1.) and Quality of Veterinary Service (Ch 3.2.)	Circulated for comments (proposed for adoption in May 2022)	Noted in Feb 2022 TAHSC report (Sep 2021/2)	1
3.4.	Veterinary legislation	Circulated for comments (proposed for adoption in May 2022)	Noted in Feb 2022 TAHSC report (Sep 2021/2)	1

Section 4				
4.4.	Zoning and compartmentalisation	Preparatory work	Refer to Sep 2021 TAHSC report	1
4.6.	Collection and processing of semen of animals	Expert consultation	Noted in Feb 2022 TAHSC report	1
4.7.	Collection and processing of bovine, small ruminant and porcine semen	Preparatory work	Pending progress of the work on Ch 4.6.	2
4.8.	Collection and processing of <i>in vivo</i> derived embryos from livestock and equids	Not started	Pending progress of the work on Ch 4.6. and Ch 4.7.	3
4.9.	Collection and processing of oocytes and <i>in vitro</i> produced embryos from livestock and horses	Not started	Pending progress of the work on Ch 4.6. and Ch 4.7.	3
4.13.	Disposal of dead animals	Preparatory work	Noted in Feb 2022 TAHSC report	2
4.14.	General recommendations on disinfection and disinsection	Preparatory work	Noted in Feb 2022 TAHSC report	2
4.X.	New chapter on biosecurity	Preparatory work	Noted in Feb 2022 TAHSC report	1
Section 5				
General	Revision of Section 5 Trade measures, import/export procedures and veterinary certification (especially Chs 5.4. to 5.7.)	Preparatory work	Noted in Feb 2022 TAHSC report	1
5.11.	Model veterinary certificate for international movement of dogs, cats and ferrets originating from countries considered infected with rabies	Preparatory work	Pending progress of the work on Ch 8.14.	3
5.12.	Model passport for international movement of competition horses	Preparatory work	Pending progress of the works on Chs on horse diseases	3
Section 6				
6.2.	The role of the Veterinary Services in food safety systems	Not started	Pending progress of the work on Glossary definitions for 'Competent Authority', 'Veterinary Authority' and 'Veterinary Services'	3
6.3.	Control of biological hazards of animal health and public health importance through ante- and post-mortem meat inspection	Not started	Pending progress of the work on Glossary definitions for 'Competent Authority', 'Veterinary Authority' and 'Veterinary Services'	3

6.10.	Responsible and prudent use of antimicrobial agents in veterinary medicine	Preparatory work	Noted in Feb 2022 TAHSC report	1
6.12.	Zoonoses transmissible from non-human primates	Circulated for comments (proposed for adoption in May 2022)	Noted in Feb 2022 TAHSC report (Feb 2021/3)	1
Section 7				
General	Transport of animals by land, sea and air (Chs 7.2., 7.3. and 7.4.)	Preparatory work	Noted in Feb 2022 TAHSC report	3
7.5.	Slaughter of animals	Expert consultation	Noted in Feb 2022 TAHSC report	1
7.6.	Killing of animals for disease control purposes	Preparatory work	Refer to Feb 2021 TAHSC report	2
7.7.	Stray dog population control (Dog population management)	Circulated for comments (proposed for adoption in May 2022)	Noted in Feb 2022 TAHSC report (Sep 2020/3)	1
7.X.	New chapter on animal welfare and laying hen production system		Noted in Feb 2022 TAHSC report	2
Section 8				
8.5.	Infection with <i>Echinococcus granulosus</i> (Articles 8.5.1. and 8.5.3.)	Circulated for comments (proposed for adoption in May 2022)	Noted in Feb 2022 TAHSC report (Sep 2021/2)	1
8.8.	Infection with foot and mouth disease virus	Preparatory work	Noted in Feb 2022 TAHSC report (Sep 2015/3)	1
8.11.	Infection with <i>Mycobacterium tuberculosis</i> complex	Not started	Noted in Feb 2022 TAHSC report	3
8.13.	Paratuberculosis	Not started	Refer to Sep 2020 TAHSC report. Pending listing assessment	4
8.14.	Infection with rabies virus	Circulated for comments	Noted in Feb 2022 TAHSC report (Sep 2020/2)	1
8.15.	Infection with Rift Valley fever virus	Circulated for comments	Noted in Feb 2022 TAHSC report (Feb 2019/4)	1

8.16.	Infection with rinderpest virus	Circulated for comments (proposed for adoption in May 2022)	Noted in Feb 2022 TAHSC report (Sep 2020/4)	1
8.X.	New Chapter on Surra	Preparatory work	Postponed for Sep 2022	2
Section 10				
10.3.	Avian infectious laryngotracheitis	Not started	Refer to Sep 2020 TAHSC report	4
10.9.	Infection with Newcastle disease virus	Not started	Noted in Feb 2022 TAHSC report (Feb 2022/1)	3
Section 11				
11.4.	Bovine spongiform encephalopathy	Circulated for comments (proposed for adoption in May 2022)	Noted in Feb 2022 TAHSC report and Feb 2022 SCAD report (Sep 2019/5)	1
11.5.	Infection with <i>Mycoplasma mycoides</i> subsp. <i>mycoides</i> SC (Contagious bovine pleuropneumonia)	Preparatory work	Postponed until Sep 2022	2
11.10.	Theileriosis	Circulated for comments (proposed for adoption in May 2022)	Noted in Feb 2022 TAHSC report (Sep 2017/4)	1
11.11.	Trichomonosis	Expert consultation	Noted in Feb 2022 TAHSC report (Sep 2020/2)	3
Section 12				
12.1.	African horse sickness	Preparatory work	Postponed until Sep 2022	2
12.2.	Contagious equine metritis	Circulated for comments	Noted in Feb 2022 TAHSC report (Sep 2020/2)	1
12.3.	Dourine	Expert consultation	Refer to Feb 2019 TAHSC report and SCAD Sept 2021	2
12.4.	Equine encephalomyelitis (Eastern and Western)	Not started	Pending ongoing work on case definition	3
12.6.	Infection with equine influenza virus	Circulated for comments	Noted in Feb 2022 TAHSC report (Feb 2019/4)	1

12.7.	Equine piroplasmiasis	Circulated for comments	Noted in Feb 2022 TAHSC report (Sep 2020/2)	1
12.11.	Venezuelan equine encephalomyelitis	Not started	Pending ongoing work on case definition	3
Section 13				
13.2.	Rabbit haemorrhagic disease	Not started	Noted in Feb 2022 TAHSC report	3
Section 14				
14.8.	Scrapie	Not started	Noted in Feb 2022 TAHSC report	3
14.X.	New Chapter on infection with <i>Theileria</i> in small ruminants	Circulated for comments	Noted in Feb 2022 TAHSC report (Sep 2017/2)	2
Section 15				
15.3.	Infection with porcine reproductive and respiratory syndrome virus (Article 15.3.9.)	Not started	Refer to Feb 2018 TAHSC report	4
15.4.	Infection with <i>Taenia solium</i> (Porcine cysticercosis) (Articles 15.4.1. and 15.4.3.)	Circulated for comments (proposed for adoption in May 2022)	Noted in Feb 2022 TAHSC report (Sep 2021/2)	1
Others				
X.X.	New Chapter on Crimean Congo haemorrhagic fever	Preparatory work	Noted in Feb 2022 TAHSC report Pending ongoing work on case definition	2
X.X.	New Chapter on infection with <i>Leishmania</i> spp. (Leishmaniasis)	Circulated for comments	Noted in Feb 2022 TAHSC report (Feb 2022/1)	2
X.X.	New Chapter on infection with Middle East respiratory syndrome coronavirus	Circulated for comments	Noted in Feb 2022 TAHSC report (Feb 2022/1)	2
X.X.	New Chapter on Camel pox	Not started	Refer to Sep 2020 TAHSC report Pending ongoing work on case definition	3

* Description of priority order	
1	- <i>active work for the TAHSC</i> - <i>to be put forward for next meeting agenda</i>
2	- <i>active work for the TAHSC</i> - <i>to be included in next meeting agenda if time allows, depending on other progress</i>
3	- <i>not immediate work for the TAHSC</i> - <i>needs to progress before consideration for next meeting agenda</i>
4	- <i>not active</i> - <i>not to be immediately started</i>

List of abbreviations	
AHG	<i>Ad hoc</i> Group
BSC	Biological Standards Commission
Ch	Chapter
HQ	OIE Headquarters
SCAD	Scientific Commission for Animal Diseases
TAHSC	Terrestrial Animal Health Standard Commission

GLOSSARY

For the purposes of the *Terrestrial Code*:

[...]

POULTRY

means all birds reared or kept in captivity for the production of any commercial animal products or for breeding for this purpose, fighting cocks used for any purpose, and all birds used for restocking supplies of game or for breeding for this purpose, until they are released from captivity.

Birds that are kept in a single household, the products of which are used within the same household exclusively, are not considered *poultry*, provided that they have no direct or indirect contact with *poultry* or *poultry* facilities.

Birds that are kept in captivity for other reasons, including those that are kept for shows, racing, exhibitions, zoological collections, ~~and~~ competitions and companionship, and for breeding or selling for these purposes, ~~as well as pet birds,~~ are not considered *poultry*, provided that they have no direct or indirect contact with *poultry* or *poultry* facilities.

[...]

GLOSSARY

For the purposes of the *Terrestrial Code*:

DEATH

means the irreversible permanent loss of all vital functions brain activity demonstrable by the loss of brain stem reflexes. This may be confirmed through a combination of criteria such as dilated pupil and absence of corneal reflex, cardiac activity and breathing.

DISTRESS

means the state of an animal that has been unable to adapt to stressors, that and that manifests as abnormal physiological or behavioural responses or no signs. It can be acute or chronic and may result in pathological conditions.

EUTHANASIA

means killing of an animal the act of inducing death using a method that causes a rapid and irreversible loss of consciousness with the most rapid, method and with the least painless and distress free suffering method possible minimum pain and distress to animal.

PAIN

means an acutely or chronically unpleasant or aversive sensory and emotional experience state of an animal associated with actual or potential tissue damage. It may elicit protective actions, result in learned avoidance and distress and may modify species-specific traits of behaviour, including social behaviour.

SLAUGHTER

means any killing procedure that causes the death of an animal by bleeding of an animal primarily intended for human consumption.

STUNNING

means any mechanical, electrical, chemical or other procedure that causes rapid immediate loss of consciousness with minimal pain and other types of and suffering for the purpose of killing; when used before slaughter, the loss of consciousness lasts until death from the slaughter process; in the absence of slaughter, the procedure would allow the animal to recover consciousness.

SUFFERING

means an acutely or chronically unpleasant or aversive, undesired, physical or mental, emotional state of being that is the outcome of the impact on an animal, including pain and resulting from of noxious negative stimuli and/or the absence of important essential positive stimuli. It is the opposite of good welfare.

CHAPTER 1.3.
**DISEASES, INFECTIONS AND INFESTATIONS
LISTED BY THE OIE**

[...]

Article 1.3.3.

The following are included within the category of sheep and goat diseases and *infections*:

- Caprine arthritis/encephalitis
- Contagious agalactia
- Contagious caprine pleuropneumonia
- Infection with *Chlamydia abortus* (Enzootic abortion of ewes, ovine chlamydiosis)
- Infection with peste des petits ruminants virus
- Infection with *Theileria lestoquardi*, *Theileria luwenshuni* and *Theileria uilenbergi*
- Maedi–visna
- Nairobi sheep disease
- Ovine epididymitis (*Brucella ovis*)
- Salmonellosis (*S. abortusovis*)
- Scrapie
- Sheep pox and goat pox.

[...]

DRAFT CHAPTER 7.5.

ANIMAL WELFARE DURING SLAUGHTER

Article 7.5.1.

Introduction

Providing good welfare to the animals at *slaughter* is ethically and economically beneficial. The implementation of animal welfare measures in addition to giving value to the product directly for ethical reasons, contributes to the improvement of workers' health and safety and product quality, and is essential for (including food safety) and consequently to the improvement of economic returns [Blokhuis *et al.*, 2008; Lara and Rostagno, 2018].

Article 7.5.2.

Scope

This chapter identifies potential *animal welfare hazards* during *slaughter* and provides recommendations for arrival and *unloading, lairage*, handling, *restraint, stunning* and bleeding of animals in slaughterhouses/abattoirs. It provides animal-based measures to assess the level of welfare and recommends remedial actions to be applied, when necessary.

This chapter applies to the *slaughter* in *slaughterhouses/abattoirs* of free-moving animals the following domestic animals, e.g. cattle, buffalo, bison, sheep, goats, horses, donkeys, mules, ruminants, equids and pigs, and animals in containers (e.g. rabbits and most poultry species), hereafter referred as “animals”. Recommendations consider whether animals arrive at the slaughterhouse/abattoir in containers or are free-moving.

This chapter should be read with the guiding principles for *animal welfare* provided in Chapter 7.1, Chapter 7.14, killing of reptiles for their skins, meat and other products and relevant provisions of Chapters 6.2. and 6.3.

The principles underpinning these recommendations may should also be applied apply to the *slaughter* of other species and those slaughtered in other places.

Article 7.5.3.

Definition for the purpose of this chapter

Bleeding means the act of severing major blood vessels that supply the brain, to ensure death.

Article 7.5.4.

Animal welfare hazards

Hazards to animal welfare during each of the pre-slaughter stages have an additive cumulative effect on the stress of the animals [Moberg and Mench, 2000].

At the *slaughterhouses/abattoirs*, animals are exposed to *animal welfare hazards* including fastingfeed and water deprivation, mixing of unfamiliar *animals*, handling by humans, exposure to a novel environment (e.g. noise, lighting, flooring), forced movement physical exercise, limited space allowance, extreme adverse weather conditions and ineffective inadequate stunning and bleeding. These *hazards* can have negative impacts on the welfare of the animals that can be assessed through animal-based measures. In absence of feasible animal-based measures, in addition resource-based measures and management-based measures may be used as a substitute proxy. *Animal welfare hazards* can be minimised by appropriate design of premises and choice of equipment, and through good management, training and competency of personnel.

Article 7.5.5.

Criteria (or measures)

The welfare of animals at *slaughter* should be assessed using outcome animal-based measures. Although consideration should be given to the resources provided as well as the design and management of the system, animal-based criteria are preferential. However, key stunning parameters need to be considered alongside animal-based measures.

The routine use of these outcome-based measures and the appropriate thresholds should be adapted to the different situations in which animals are managed at a *slaughterhouse/abattoir*. It is recommended that target values or thresholds for *animal welfare* measurables be based on current scientific knowledge and appropriate national, sectorial or regional standards.

Article 7.5.6.

Management

The *slaughterhouse/abattoir* operator is responsible for the development and enforcement/implementation of a dedicated operating plan that should consider the following:

- ≡ training and competency of personnel;
- design of premises and choice of equipment;
- operating procedure and corrective actions;
- ~~training and competency of personnel;~~
- throughput (number of animals slaughtered per hour);
- maintenance and cleaning procedures;
- contingency plans;
- ~~operating procedure and corrective actions.~~

Article 7.5.7.

Training and competency of personnel

Animal handlers and other personnel have a crucial role to play in ensuring good *animal welfare* conditions from the time of arrival of the animals at the *slaughterhouse/abattoir* through to their *death*. Training for all personnel should emphasise the importance of *animal welfare* and their responsibility in contributing to the welfare of the animals that come through the *slaughterhouse/abattoir*.

Animal handlers should understand the species-specific behavioural patterns of the animals they are working with and their underlying principles to carry out the required tasks whilst ensuring good *animal welfare*. They should be experienced and competent in handling and moving the animals with knowledge about animal behaviour and physiology and able to identify signs of distress, fear, pain and suffering. Personnel in charge of *restraint* and of *stunning* and bleeding operations should be familiar with the relevant equipment, their key working parameters and procedures. Personnel *stunning*, shackling and bleeding animals should be able to identify and take corrective actions in case of ineffective stunning of the animal and signs of recovery of consciousness, should be able to detect if an animal is still alive prior to dressing or scalding and should be able to take corrective actions, if necessary [EFSA, 2013a; EFSA 2013b].

- a) ineffective stunning of the animal;
- b) recovery of consciousness;
- c) animal is still alive prior to dressing or scalding.

Competencies may be gained through a combination of formal training and practical experience. These competencies should be assessed by the *Competent Authority* or by an independent body recognised by the *Competent Authority*.

Only the personnel actively working on the slaughter line in areas where live animals are handled should be present in these areas where animals are handled. The presence of visitors or other personnel should be limited in those areas in order to prevent unnecessary noise, shouting, or movement or risk of accidents.

Article 7.5.8.

Design of premises and choice of equipment

The design of premises and the choice of equipment used in a *slaughterhouse/abattoir* have an important impact on the welfare of animals. They should consider the animals' needs, in terms of their physical comfort including:

- thermal comfort conditions,
- ease of movement,
- protection from injury, ~~protection from sudden or excessive noise~~
- fear,
- and ability to perform natural and social behaviours, as well as
- watering and feeding needs, including for the need of sick or injured animals.

Premises should be designed to eliminate distractions that may cause approaching animals to stop, baulk or turn back.

Flooring should be non-slip to prevent injury and stress due to slipping. Adequate quality and quantity of lighting allowing adequate ante-mortem inspection of animals and assisting the moving of animals utilising low-stress handling techniques.

The design of the *slaughterhouse/abattoir* and choice of equipment should take into consideration the species, categories, quantities, ~~and~~ size or weight and age of the animals. *Restraint*, *stunning* and bleeding equipment is critical for the welfare of an animal at the time of *slaughter*. Appropriate back-up equipment should be available for immediate use in case of failure of the *stunning* equipment initially used.

Article 7.5.9.

Throughput (number of animals slaughtered per hour)

The throughput of the *slaughterhouse/abattoir* should never exceed the maximum specification of the design of the facilities or equipment, ~~and may~~ The *slaughterhouse/abattoir* operators should continuously monitor throughput and adjust it to any operational changes, such as staff numbers and experience or line breakdowns. #Throughput may also need to be reduced depending on their welfare outcomes are is negatively impacted.

Personnel allocation should be adequate for the anticipated throughput and be sufficient to implement the *slaughterhouse/abattoir* operating plan as well as ante and post-mortem inspections.

Article 7.5.10.

Maintenance and cleaning procedures

All equipment should be clean and well maintained, including calibration, in accordance with manufacturer's instructions in order to ensure *animal welfare* ~~and safety of personnel~~.

Maintenance and cleaning of handling, unloading, lairage and moving facilities and equipment contribute to ensuring that animals are handled smoothly, preventing pain and fear.

Maintenance and cleaning of *restraining*, *stunning* and bleeding equipment are essential to ensure reliable and efficient *stunning* and *slaughter*, thereby minimising pain, fear and suffering.

Article 7.5.11.

Contingency plans

Contingency plans should be in place at the *slaughterhouse/abattoir* to protect the welfare of the animals in the event of an emergency. The contingency plans should consider the most likely emergency situations given the species slaughtered and the location of the *slaughterhouse/abattoir*.

Contingency plans should be documented and communicated to all responsible parties.

Each personnel who has a role to play in implementing contingency plans should be well trained on the tasks they have to perform in case of emergency.

Article 7.5.12.

Arrival of free-moving animals

On arrival at the *slaughterhouse/abattoir*, animals will already have been exposed to *hazards* that may have negative impacts on their welfare. Any previous *hazards* will have a cumulative effect that may affect the welfare of the animals throughout the *slaughter* process. Therefore, animals should be transported to the *slaughterhouse/abattoir* in a manner that minimises adverse animal health and welfare *outcomes*, and in accordance with Chapters 7.2. and 7.3.

1. Animal welfare concerns:

Delay in *unloading* of animals is a major ~~the main~~ *animal welfare* concern at arrival [NAMI, 2017].

Animals in *vehicles* have smaller space allowances than on farm, undergo water and *feed* deprivation, may have suffered from an injury, and may be exposed to thermal stress due to adverse weather conditions and to stress and discomfort from social disturbance, noise, vehicle vibration and motion. In addition, stationary *vehicles* may have insufficient ventilation. Delays in *unloading* animals will prolong or exacerbate the impact of these *hazards*. Under these circumstances, injured or sick animals requiring urgent attention ~~will~~ may not be identified or dealt with appropriately and therefore the duration of their suffering will be increased.

2. Animal-based and other measurables include:

It can be difficult to assess animal-based measures while animals are in the *vehicle*. Some measurables that may be assessed include animals with injuries, lameness and / or poor body condition or those that are sick or have died. Panting, shivering and huddling may indicate thermal stress. Drooling and licking may indicate prolonged thirst.

Animals dead or emergency killed (see Article 7.5.19.) on arrival or condemned on arrival should be recorded and monitored as an indicator of *animal welfare* prior to and during transport.

Time from arrival to *unloading* and the environmental temperature and humidity can be used to establish relevant thresholds for corrective action.

3. Recommendations:

Animals should be unloaded promptly on arrival. This is facilitated by scheduling the arrival of the animals at the *slaughterhouse/abattoir* to ensure that there are sufficient personnel and adequate space in the *unloading* or *lairage* area.

Consignments of animals assessed to be at greater risk of *animal welfare hazards* should be unloaded first. When no space is immediately available, creating space should be a priority. Provisions should be made to provide shelter, shade or additional ventilation during waiting periods, or animals should be transported to an alternative nearby location where such provision is available.

Animals should be provided with water as soon as possible after *unloading*.

Special consideration should be given to animals that have undergone long or arduous journey times, injured animals, lactating or pregnant animals and young animals. These animals should be slaughtered as a priority. If this is not possible, arrangements should be made to mitigate or prevent suffering, in particular by milking dairy animals at intervals of not more than 12 hours and providing appropriate conditions for suckling and the welfare of the newborn animal in the case of a female having given birth. Mortalities and injuries should be reported to the competent authority.

4. Species-specific recommendations:

Some species such as Ppigs and shorn sheep are especially sensitive to extreme temperatures and therefore special attention should be taken when dealing with delays in unloading this species sensitive animals. This may include careful consideration of transport plans to time arrival and processing, provision of additional ventilation / heating, etc.

Shorn sheep might be especially sensitive to extreme temperatures and therefore special attention should be taken when dealing with delays in unloading.

Lactating animals should be given special attention and given priority when unloading and processing.

Unweaned animals are especially sensitive to extreme temperatures and can find it difficult to regulate their body temperature. They are very more susceptible to dehydration, illness and stress after transportation and handling. These animals must be given special attention and be given priority when unloading and processing.

Article 7.5.13.

Displacements Handling of free-moving animals

This article addresses the handling of animals during unloading and lairage, and in the killing area.

1. Animal welfare concerns:

During unloading, animals are exposed to similar hazards to those encountered when being loaded (see Chapters 7.2. and 7.3). Inappropriate equipment in the vehicle or the slaughterhouse/abattoir, such as a lack of lateral protection when unloading, excessively steep ramps, slippery surfaces, or an absence of foot battens, may result in animals slipping, falling or being trampled, causing injuries. The absence of ramps, or lifts or an unloading bay or dock could ~~can~~ result in animals being pushed or thrown off the vehicle. These hazards can also be associated with inappropriate handling and forced physical movement of animals that are unable to move independently as a result of weakness or injuries. Exposure to novel environments (e.g. noise, lighting, flooring, smell) will cause fear and reluctance to move, or turning back. Poorly designed facilities will increase the risk of such fear.

2. Animal-based and other measurables include:

- a) animals ~~running~~ slipping and falling;
- b) animals with broken or otherwise injured limbs;
- c) animals turning-back, attempting to escape and reluctant to move;
- d) animal vocalisation and frequency of e.g. high pitched vocalisation for pigs especially for pigs and cattle;
- d e) animals that are unable to move by themselves due to reasons other than those with broken or injured limbs;
- e f) animals that strike against the facilities;
- f g) frequency of use of excessive force by personnel;
- g h) frequency of use of electrical prods.

Animals are safely handled when these measures are below an acceptable threshold.

3. Recommendations:

Ramps or lifts should be provided and used. Ramps or lifts should be positioned so that the animals can be handled safely. There should be no gap between the vehicle and the ramp, the gradient should not be too steep preventing animals from voluntarily moving, and solid side barriers should be in place.

Design of the facilities should promote the natural movements of animals, and, as far as possible, with a minimal/minimise human interaction.

Preventive measures such as foot battens, rubber mats and deep groove flooring can help animals to avoid slipping.

The *unloading* area and raceways should be well lit so that animals can see where they are going.

The design of *unloading* areas and raceways should aim to minimise the potential for distractions that may cause animals to stop, balk or turn back when being unloaded (e.g. shadows, changes in flooring, moving objects, loud or sudden noises). For details refer to Chapters 7.2. and 7.3.

Animals that are injured, sick or unable to rise require immediate action and, when necessary, emergency killing should be performed euthanised without moving them and without delay. Refer to Articles 7.5.19. and 7.5.20¹. Such animals should never be dragged, nor should they be lifted or handled in a way that might cause further pain, suffering or exacerbate injuries.

Personnel should be calm and patient, assisting the animals to move using a soft voice and slow movements. They should not shout, kick, or use any other means that is likely to cause fear or pain to the animals. Under no circumstances should *animal handlers* resort to violent acts to move animals (see Article 7.5.20.).

Personnel should not stand between an animal and where they want it to move to as this may cause the animal to balk.

Mechanical aids ~~and electric goads~~ should be used in a manner to encourage and direct movement of the animals without causing distress and pain. Preferred mechanical aids include panels, flags, plastic paddles, flappers (a length of cane with a short strap of leather or canvas attached), plastic bags and metallic rattles.

~~Electric goads should only be used in extreme cases and not on a routine basis to move animals, when other measures have been ineffective and there is room for the animal to move forward without obstruction (e.g. obstacles or other animals).~~

The use of electric goads should be limited to battery-powered low voltage goads applied to the hindquarters of adult pigs and large ruminants, and never to sensitive areas such as the eyes, mouth, ears, ano-genital region or belly. Such instruments should not be used on equids, camelids, rarties, sheep and goats of any age, or on calves or piglets. Shocks shall not be used repeatedly if the animal fails to respond.

~~Mechanical. Other Hhandling aids and electric goads~~ should not be used as a substitute for good facility design and handling. They should not be used repeatedly if an animal fails to respond or move. In such cases it should be determined whether some physical or other impediment is preventing the animal from moving.

~~Electric goads should only be used in extreme cases and not on a routine basis to move animals.~~

~~The use of electric goads should be limited to battery-powered goads applied to the hindquarters of adult pigs and large ruminants, and never to sensitive areas such as the eyes, mouth, ears, anogenital region or belly. Such instruments should not be used on horses, sheep and goats of any age, or on calves or piglets.~~

The manual lifting of animals should be avoided; if it is necessary, animals should not be grasped or lifted in a manner which causes pain or suffering and physical damage (e.g. bruising, fractures, dislocations). (See Article 7.5.20.).

4. Species-specific recommendations:

None identified.

Article 7.5.14.

Lairage of free-moving animals1. Animal welfare concerns:

Animals during *lairage* may be exposed to several *animal welfare hazards* including:

- a) food and water deprivation leading to prolonged hunger and thirst,
- b) absence of protection against ~~extremes~~ adverse in weather or climate conditions leading to thermal stress,
- c) sudden or excessive noises, including from personnel, machinery, metal yards and gates, leading to fear,
- d) insufficient space to lie down and move freely leading to fatigue and aggressive behaviour,
- e) poor design and maintenance leading to distress and injuries,
- f) mixing of unfamiliar animals leading to aggressive behaviour, or social stress,
- g) limited access to resources (e.g. drinkers, bedding) leading to aggressive behaviour;
- h) exposure to hard, sharp or abrasive surfaces leading to injury or lameness.

2. Animal-based and other measurables include:

- a) thermal stress (e.g. panting, sweating, shivering, huddling behaviour),
- b) space allowance,
- c) excessive soiling with faeces (e.g. coat cleanliness, dag score for sheep),
- d) injuries (e.g. lameness, open wounds, fractures),
- e) illness (e.g. limping, diarrhoea, coughing),
- f) aggressive behaviours (e.g. mounting, fighting),
- g) frequency of animal vocalisation especially for pigs and cattle (e.g. hitch pitched vocalisation in pigs);
- h) restlessness (e.g. pacing, walking with continuous ear movements and frequency of snorts – especially for horses) [Micera *et al.*, 2010 and Visser *et al.*, 2008],
- i) carcass bruising.

3. Recommendations:

Animals should have constant access to clean water. Water supply points should be designed according to the species and age of the animal, with environmental conditions that allow for effective consumption. The number and location of the water supply points should minimise competition.

~~Animals should be provided with feed in *lairage* if the duration between loading and expected time for slaughter exceeds 24 hours.~~ Animals should be provided with feed in *lairage* if the duration between loading the last meal and expected time for slaughter exceeds a period appropriate for the species and age of animals. In absence of information on the transport duration in any case. Animals which are not expected to be slaughtered after within 12 hours of arrival should be fed as appropriate for the age and species and should be given moderate amounts of food at appropriate intervals.

The *lairage* should provide animals with protection against adverse weather conditions including shade and shelter.

Animals should be protected from excessive and sudden noise (e.g. ventilation fans, alarms, or other indoor or outdoor equipment).

Lairage areas should be free from sharp edges and other *hazards* that may cause injury to animals.

The *lairage* should provide enough space for all animals to lie down at the same time, to move freely and to move away in case of aggressive behaviours.

Lairage areas should have adequate lighting levels to allow inspection of the animals.

Animals from different groups (or different species) should not be mixed.

Animals that can move freely but are injured, sick, very young or pregnant should be isolated to protect them from other animals and be slaughtered with priority.

4. Species-specific recommendations:

None identified. Pigs should be kept in small groups (up to 15) when resting in lairage, when moving to the stunner and when stunned.

Bison and cervids need specific design and construction standards for the unloading and holding prior to slaughter.

Article 7.5.15.

Restraint for stunning or bleeding (free-moving animals)

1. Animal welfare concerns:

The purpose of *restraint* is to facilitate the correct application of the *stunning* or bleeding equipment. Incorrect *restraint* may not only lead to ineffective *stunning* or bleeding, but also cause pain and distress.

Other *hazards* include:

- a) slipping ing or falling of animals entering the restraining area;
- b) struggling or escape attempts caused by insecure *restraint*;
- c) injuries and pain caused by excessive force of *restraint*;
- d) fear caused by prolonged *restraint*, which may exacerbate insecure or excessive *restraint*.

In addition, *slaughter* without *stunning* increases the risk of pain and fear due to the need for robust *restraint* of conscious animals for neck cutting, especially if animals are turned on their sides or backs [von Holleben *et al.*, 2010; Pleiter, 2010].

2. Animal-based and other measurables include:

- a) animal slipping or falling;
- b) struggling;
- c) escape attempts;
- d) animal vocalisation (cattle and pigs)(e.g. high pitched vocalisation in pigs);
- e) reluctance to enter the restrainer;
- f) frequency of use of electric goads.

3. Recommendations:

Where individual restraint is used, the restrainer should be narrow enough that the animals cannot move either backwards or forwards or turn around.

The restrainer being used should be appropriate to the size of the animals and the restrainer should not be loaded beyond its design capacity.

In case of slaughter without stunning, the restrainer should restrain the head appropriately and should support the body of the animal appropriately.

The restraining should be maintained until the animal is unconscious.

When restrainers are used that hold an animal with its feet off the floor, the animal must be held in a balanced, comfortable, upright position.

When a restrainer is used to rotate an animal from an upright position, the body and head must be securely held and supported to prevent struggling and slipping within the device.

Restrainers should not have sharp edges.

Non-slip flooring should be used to prevent animals from slipping or falling.

Flooring and handling that intentionally cause loss of balance, slip or fall - i.e. a box with a floor that rises on one side upon entry to the box – should not be used.

Distractions (e.g. movements of equipment or people, loose chains or objects, shadows, shiny surfaces or floors) should be minimised to prevent baulking and improve ease of entry into the restrainer.

No animals should enter the restrainer until equipment and personnel are ready to slaughter that animal.

No animals should be released from the restrainer until the operator has confirmed loss of consciousness.

Animals should not be left in conveyor style restrainers during work breaks, and in the event of a breakdown animals should be removed from the conveyor promptly.

The restrainer should be in a clean and non-slip condition.

4. Species-specific recommendations:

Gondolas for gas *stunning* of pigs should not be overloaded and pigs should be able to stand without being on top of each other.

Head *restraint* is recommended for cattle.

Specialised restraining equipment and methods are required for Bison and cervids as well as any species which may be processed with or without stunning.

Article 7.5.16.

Stunning of free-moving animals1. Animal welfare concerns:

The main *animal welfare* concern associated with *stunning* is 'ineffective *stunning*' which results in pain, distress or fear during induction of unconsciousness and possible recovery before *death*.

The most common methods for *stunning* are mechanical, electrical and exposure to controlled atmosphere.

Stunning prior to slaughter decreases or avoidprevents pain and suffering to animals and also improves workers' safety.

Mechanical *stunning* is divided into penetrating *stunning* and non-penetrating non-penetrative percussive *stunning* applications. Both applications use different types of devices aimed to induce immediate loss of consciousness as the impact of the bolt on the skull results in concussion and disruption of normal brain function [Daly *et al.*, 1987; EFSA, 2004]. Penetrative *stunning* devices propel a bolt which penetrates the skull and enters the cranium damaging the brain. Non-penetrative percussive *stunning* devices propel a blunt bolt which does not penetrate the skull, but results in rapid loss of consciousness from impact. The main hazards preventing effective mechanical *stunning* are incorrect shooting position and incorrect direction of the impact. These may cause ineffective *stunning* and pain or short-lasting unconsciousness. Poor maintenance of the equipment or inadequate cartridge power or air line pressure (in pneumatic stunners) can result in low bolt velocity. Low bolt velocity, narrow bolt diameter or short length of bolt leading to shallow penetration, may also affect the effectiveness of *stunning*. In older animals with a thicker skull, low bolt velocity may result in there is an increased risk of an ineffective stun, especially with non-penetrating non-penetrative percussive *stunning* applications, high bolt velocity may cause fracture of the skull and ineffective *stunning* [Gibson *et al.*, 2014]. If not applied correctly, fracture of the skull and ineffective *stunning* are more likely to occur with young animals such as calves, when a higher bolt velocity is used. Absence of or incorrect restraint can lead to an incorrect shooting position.

Electrical *stunning* involves application of an electric current to the brain of sufficient magnitude to induce immediate unconsciousness [EFSA, 2004; Grandin, 1980]. The main hazards preventing effective electrical *stunning* are: incorrect electrode placement, poor contact, electrical arcing, high contact resistance caused by wool or dirt on the animal surface, dirty or corroded electrode, low voltage/current or high frequency [EFSA, 2004].

Controlled atmosphere *stunning* methods involve the exposure to high concentrations of carbon dioxide (hypercapnia), low concentration of oxygen (hypoxia) or a combination of the two (hypercapnic hypoxia). Loss of consciousness is not immediate following exposure of animals to controlled atmosphere *stunning*. The main hazards causing increased distress during induction of unconsciousness are irritant or aversive gas mixtures (e.g. CO₂ in high concentrations), low gas temperature and humidity. The main hazards causing ineffective controlled atmosphere *stunning* are incorrect gas concentration and too short gas exposure time [Anon, 2018; EFSA, 2004; Velarde *et al.*, 2007].

Gases or gas mixtures that are painful to inhale should preferably not be used to stun or kill pigs.

2. Animal-based and other measurables include.:

Effectiveness of *stunning* should be monitored at different stages: immediately after *stunning*, just before and during bleeding until death occurs is confirmed neck cutting, and during bleed-out [EFSA, 2013a; EFSA, 2013b; AVMA, 2016].

No single indicator should be relied upon alone. Multiple indicators should be used to determine whether a stun is effective and the animal is unconscious.

Mechanical *stunning*:

An effective stun is characterised by the presence of all the following signs: immediate collapse; apnoea; tonic seizure; absence of corneal reflex; absence of eye movements.

The presence of any of the following signs may indicate a high risk of ineffective stun or recovery of consciousness: rapid eye movement or nystagmus, vocalisation; spontaneous blinking; righting reflex; presence of corneal reflex; rhythmic breathing.

Electrical *stunning*:

An effective stun is characterised by the presence of all the following signs: tonic-clonic seizures; loss of posture; apnoea; and absence of corneal reflex.

The presence of any of the following signs may indicate a high risk of ineffective stun or recovery of consciousness: vocalisation; spontaneous blinking; righting reflex; presence of corneal reflex; rhythmic breathing.

Gas *stunning*:

An effective stun is characterised by the presence of all the following signs: loss of posture; apnoea; absence of corneal reflex; absence of muscle tone.

The presence of any of the following signs may indicate an high risk of ineffective stun or recovery of consciousness: vocalisation; spontaneous blinking; righting reflex; presence of corneal reflex; rhythmic breathing.

3. Recommendations:

Animals should always be stunned as soon as they are restrained.

When a two-step electrical stun-kill method is used, the electrical current must reach the brain before it reaches the heart otherwise the animal will experience cardiac arrest while still conscious.

In the case of ineffective *stunning* or recovery, animals should be re-stunned immediately using a backup system method. Ineffective *stunning* or return to consciousness should be systematically recorded and the cause of the failure identified and rectified.

Stunning equipment should be used, cleaned, maintained and stored following manufacturer's recommendations.

Regular calibration of the equipment according to the manufacturer's procedure are recommended. Effectiveness of the *stunning* should be monitored regularly.

Slaughterhouses/abattoirs should have standard operating procedures that define key operating parameters or and follow the manufacturer's recommendations for *stunning*, such as:

a) Mechanical:

- position and direction of the shot [AVMA, 2016];
- grain of the cartridge or air pressure appropriate to the type of animal (captive bolt) [Gibson et al. 20152014];
- length and diameter of the bolt (captive bolt);
- calibre and type of gun and ammunition (free bullet).

b) Electrical:

- shape, size and placement of the electrodes [AVMA, 2016];
- pressure contact between electrode and head;
- wetting point of contact;
- minimum exposure time;
- electrical parameters (current intensity(A), waveform type (AC and DC), voltage (V) and frequency (Hz));
- visual or auditory warning system to alert the operator to proper or improper function such as a device that monitors and displays duration of exposure, voltage and applied current.

c) Controlled atmosphere:

- gas concentrations and exposure time;
- temperature and humidity;
- rate of decompression (low atmospheric pressure system for stunning);
- animal-based measures should be monitored during the induction phase, if possible, because this can be a point of highest welfare risk for animals.

- visual or auditory warning system to alert the operator to proper or improper function such as a device that monitors gas concentration and temperature.
- gases or gas mixtures that are painful to inhale should preferably not be used to stun or kill pigs

4. Species-specific recommendations:

Non-penetrating captive bolt should not be used in animals with thick skull (e.g. bison, water buffalo) mature cattle and pigs [Finnie, 1993 and Finnie et al., 2003].

The *Competent Authority* should determine effective electrical parameters, based on scientific evidence for different types of animals.

Where high electrical frequencies is used, the amperage should also be increased.

Gases or gas mixtures that are painful to inhale should preferably not be used to stun or kill pigs.

Article 7.5.17

Bleeding of free-moving animals

1. Animal welfare concerns:

The main *animal welfare* concern at the time of bleeding following *stunning* is the recovery of consciousness due to prolonged stun-to-stick interval or due to incomplete severance of the main blood vessels.

Bleeding without prior *stunning* increases the *risk* of animal suffering because the incision to sever blood vessels results in substantial tissue damage in areas well supplied with nociceptors. The activation of these nociceptors causes the animal to experience pain [Gregory, 2004; Gibson *et al.*, 2009]. Loss of consciousness due to bleeding is not immediate and there is a period during which the animal can feel fear, pain and distress [Gregory, 2004; Johnson *et al.*, 2015]. This period will be reduced by applying stunning immediately after neck cutting.

Absence of or ineffective *stunning* may result in animals being released from the *restraint*, shackled, and bled and or further processed while they are still conscious or have the potential to recover consciousness.

2. Animal-based and other measurables include:

The main animal-based measurable is the blood flow (rate and duration). For animal-based and other measurables of return of consciousness after *stunning*, see Article 7.5.16.

In cases of bleeding without *stunning* the animal-based and other measurables that indicate loss of consciousness include all the following: absence of muscle tone; absence of corneal reflex; absence of rhythmic breathing. In addition, cessation of bleeding after a continuous and rapid blood flow can be used as an indicator of *death*.

3. Recommendations:

a) both carotid arteries or the blood vessels from which they arise should be severed;

a-b) continuous and rapid blood flow should be assured after bleeding;

b-c) ~~cessation of blood flow~~ death should be assured before further processing;

e d) bleeding knives should be sharpened for each animal.

In addition, the following should be considered:

Slaughter with stunning:

a) the stun-to-stick interval should be short enough to ensure that the animal will die before not recovering consciousness before it dies;

b) unconsciousness should be confirmed before bleeding.

Slaughter without stunning:

- a) bleeding should be carried out by a single incision; any second intervention should be recorded and analysed to improve procedures.
- b) Further processing may only be carried out when the death of the animal has been ascertained and no movement can be detected.

None identified.

Cattle are at risk of prolonged bleed out times and regaining consciousness if the bilateral vertebral arteries are not cut during a neck cut. IfAs they are not cut, the vertebral arteries will continue to provide blood to the brain and can cause any occlusion of the cut major arteries, will slowing exsanguination. Therefore, bleeding with a cut of the brachiocephalic trunk should always be preferred in cattle.

Article 7.5.18.

Slaughter of pregnant free-moving animals

1. Animal welfare concerns:

Foetuses in the uterus are considered not to cannot achieve consciousness [EFSA, 2017; Mellor, D. J. *et al.*, 2005; Diesch *et al.*, 2005]. However, if removed from the uterus the foetus may perceive pain or other negative impacts.

2. Animal-based and other measurables include:

None identified. Signs of consciousness in the foetus, such as breathing [Mellor, 2003; Mellor, 2010; EFSA, 2017].

3. Recommendations:

Under normal circumstances OIE recommendations (Chapter 7.3. Animal transport by land), pregnant animals that would be in the final 10% of their gestation period at the planned time of *unloading* at the *slaughterhouse/abattoir* should be neither transported nor slaughtered. If such an event occurs, an *animal handler* should ensure that pregnant females are handled separately.

The foetus should be left undisturbed in utero for at least 30 minutes after the *death* of the dam [EFSA, 2017; Anon, 2017]. The uterus could be removed as a whole, clamped and kept intact such that there is no possibility to the foetus to breathe.

In cases where the foetus is removed before 30 minutes has elapsed ethanasia (captive bolt followed by bleeding) should be carried out immediately.

4. Species-specific recommendations:

None identified.

Article 7.5.19.

Emergency killing of free-moving animals

This article addresses animals that show signs of severe pain or other types of severe suffering before being unloaded or within the *slaughterhouse/abattoir*. These animals may correspond to animals unfit to travel as listed in Article 7.3.7. Principles described below may also apply to animals that are not suitable for *slaughter* for commercial reasons, even if they do not present signs of pain or suffering.

1. Animal welfare concerns:

Some animals can arrive at *slaughterhouses/abattoirs* with injuries or severe illnesses that can cause undue pain and suffering. This is more likely in animals of low economic value.

2. Animal-based and other measurables include:

Animals requiring emergency *killing* are unable to walk independently or present severe injuries such as fractures, large open wounds, or prolapses. They may also present clinical signs of serious illness or being in a state of extreme weakness. New-born animals or animals that gave birth within the last 48 hours may also belong to this category.

3. Recommendations:

Animals should not be moved unless it can be done without causing **further** pain or suffering.

Animal handlers should euthanise the animal as soon as possible.

Emergency *killing* should be systematically recorded and analysed in order to improve procedures and prevent recurrences.

4. Species-specific recommendations:

None identified.

Article 7.5.20.

Methods, procedures or practices unacceptable on animal welfare grounds for free-moving animals

1) **None of the** following practices for handling animals are **un**acceptable and should not be used:

- a) crushing or breaking tails of animals;
- b) applying pressure using an injurious object or applying an irritant substance ~~to sensitive areas such as eyes, mouth, ears, anogenital region or belly;~~
- c) hitting animals with instruments such as large sticks, sticks with sharp ends, ~~metal~~-piping, stones, fencing wire or leather belts;
- d) kicking, throwing or dropping animals;
- e) grasping, lifting or dragging animals only by some body parts such as their tail, head, horns, ears, limbs, wool or hair;
- f) dragging animals by any body part, by any means, including with chains, or ropes or by hand;
- g) forcing animals to walk over other animals;
- h) interfering with any sensitive area (e.g. eyes, mouth, ears, anogenital region or belly).

2) **None of the** following practices for restraining **conscious** animals are **un**acceptable and should not be used:

- a) mechanical clamping of the legs or feet of the animals as the sole method of *restraint*;
- b) breaking legs, cutting leg tendons or blinding animals;
- c) severing the spinal cord, by using for example a puntilla or dagger;
- d) applying electrical current that does not span the brain;
- e) suspending or hoisting **conscious animals** ~~them~~ by the feet or legs;
- f) severing brain stem by piercing through the eye socket or skull bone;
- g) forcing animals to the ground sit or lay down by one or more handlers jumping on and lying across the animal's back.

3) Breaking the neck while the animal is still conscious during bleeding is also an unacceptable practice.

Article 7.5.21.

Arrival of animals in containers

On arrival at the *slaughterhouse/abattoir*, animals will already have been exposed to *hazards* that may have negative impacts on their welfare. Any previous *hazards* will have a cumulative effect that may impair the welfare of the animals throughout the *slaughter* process. Therefore, animals should be transported to the *slaughterhouse/abattoir* in a manner that minimises adverse animal health and welfare outcomes, and in accordance with Chapters 7.2. and 7.3.

1. Animal welfare concerns:

Animals in *containers* have smaller space allowances than on farm, undergo water and *feed* deprivation, and may be exposed to thermal stress due to adverse weather conditions and stress from social disturbance, noise, vehicle vibration and motion. In addition, stationary *vehicles* may have insufficient ventilation. Delays in *unloading containers* will prolong or exacerbate the impact of these *hazards*. Under these circumstances, injured or sick animals requiring urgent attention will not be identified and therefore the duration of their suffering will be increased.

2. Animal-based and other measurables include:

It can be difficult to assess animal-based measures while animals are in the *containers* and especially when the *containers* are on the vehicle or when many containers are stacked on top of each other. Some measurables that may be assessed include animals with injuries, or those that are sick or have died. Panting, reddening of the ears (heat stress in rabbits), shivering and huddling may indicate thermal stress. In rabbits drooling and licking may indicate prolonged thirst.

Time from arrival to *unloading* and slaughter, the environmental temperature and humidity (e.g. ambient, inside the vehicle) can be used to establish relevant thresholds for corrective action.

3. Recommendations:

Animals should be slaughtered as soon as they arrive at the *slaughterhouse/abattoir*. If not possible, *containers* should be unloaded, or vehicles should be placed in lairage or in sheltered and adequately ventilated area, promptly on arrival. This is facilitated by scheduling the arrival of the animals at the *slaughterhouse/abattoir* to ensure that there are sufficient personnel and adequate space in the *lairage* area. Time at lairage should be kept at a minimum.

Consignments of animals assessed to be at greater risk of *animal welfare hazards* (e.g. from long journeys, prolonged lairage, end of lay hens) should be unloaded first or should be considered for prioritised *slaughter*. When no available space is immediately available, creating space should be a priority. Provisions should be made to provide shelter, shade, cooling or heating systems or additional ventilation during waiting periods, or animals should be transported to an alternative nearby location where such provisions are is available. Mortalities and injuries should be reported to the competent authority.

4. Species-specific recommendations:

~~Poultry is especially sensitive to extreme temperatures and therefore special attention should be taken when dealing with delays in unloading this species in extreme temperatures.~~

Birds may get trapped or their wings or claws may get caught in the fixtures, mesh or holes in poorly designed, constructed or maintained transport systems. Similarly, rabbits may trap their paws in the fixtures mesh or holes in poorly designed, constructed or maintained transport systems. Under these situations, operators *unloading* birds or rabbits should ensure gentle release of trapped animals.

Article 7.5.22

Moving of animals in containers

This article addresses the handling of containerised animals during *unloading* and *lairage*, and into the killing area.

1. Animal welfare concerns:

During *unloading* and moving *containers* animals can be exposed to pain, stress and fear due to tilting, dropping or shaking of the *containers*.

2. Animal-based and other measurables include:

- a) animals with broken limbs;
- b) animals that strike against the facilities;
- c) animals vocalizing;
- d) body parts (i.e. wings, limbs, feet, paws or heads) stuck between *containers*;
- e) animals injured by sharp projections inside *containers*.

3. Recommendations:

Containers in which animals are transported should be handled with care, moved slowly, and should not be thrown, dropped or knocked over. Where possible, they should be horizontal while being loaded or unloaded mechanically and stacked to ensure ventilation and prevent animals piling on one another. In any case, *containers* should be moved and stored in an upright position as indicated by specific marks.

Animals delivered in *containers* with perforated or flexible bottoms should be unloaded with particular care to avoid injury by crushing or jamming of body parts.

Animals that are injured, jammed or sick require immediate action and, when necessary, should be taken from the *containers* and euthanised without delay. Refer to Articles 7.5.8, 7.5.9., 7.6.8 and 7.6.17.

Staff should routinely inspect the *containers* and remove the broken *containers* that should not be re-used.

4. Species-specific recommendations:

None identified.

Article 7.5.23

Lairage of animals in containers

1. Animal welfare concerns:

Animals during *lairage* may be exposed to several *animal welfare hazards* including:

- a) food and water deprivation leading to prolonged hunger and thirst,
- b) absence of protection against extremes in climate leading to thermal stress,
- c) sudden or excessive noises, including from personnel, leading to fear,
- d) insufficient space to lie down and move freely leading to fatigue and aggressive behaviour.
- e) not being inspected or accessible for emergency killing when necessary.

2. Animal-based and other measurables include:

- a) thermal stress (e.g. panting, shivering, huddling behaviour),
- b) space allowance,
- c) excessive soiling with faeces,
- d) injuries (e.g. splay leg, open wounds, fractures),
- e) dead animals.

3. Recommendations:

Animals should be slaughtered upon arrival at the *slaughterhouse/abattoir*.

Staff should routinely inspect and monitor containers while in the lairage to observe animals for signs of suffering and distress and take appropriate corrective action to address any concerns.

The *lairage* should provide animals with protection against adverse weather conditions.

Animals should be protected from sudden and excessive noise (e.g. ventilation fans, alarms, or other indoor or outdoor equipment).

4. Species-specific recommendations:

None identified.

Article 7.5.24.

Unloading animals from containers1. Animal welfare concerns:

Animals are removed manually or automatically by tilting (poultry) from the transport *containers*.

When the *containers* with birds/animals are manually or mechanically emptied by tipping, animals fall on to conveyors. Dumping, piling up and shock might happen, especially for the last birds/animals which are often removed by manual or mechanical shaking of the *containers*.

Other *hazards* include:

- a) narrow openings or doors of the *containers*;
- b) *containers* placed too far away from the place of *stunning*;
- c) handling and removal of animals from containers before stunning;
- ed) incorrect design of tipping manually or using mechanical equipment that cause animals to falling from height and conveyor belts that are running too fast or too slow resulting in piling or injured animals;
- e) conveyor belts that are running too fast or too slow resulting in piling or injury.

2. Animal-based and other measurables include:

- a) animal falling;
- b) struggling, including wing flapping;
- c) escape attempts;
- d) vocalisation;
- e) injuries, dislocation, fractures;
- f) pilling-offup of animals.

3. Recommendations:

Removal of animals from the *containers* in a way that cause pain, e.g. by one leg, wings, neck or ears, should be avoided.

Animals should be removed from *containers* by the body or by both legs using both hands and one animal at a time. Animals should not be grabbed and lifted by one leg, the ears, wings or fur and they should not be thrown, swung or dropped.

Modular systems that involve tipping of live birds are not conducive to maintaining good animal welfare. These systems, when used, should be incorporated with a mechanism to facilitate birds sliding out of the transport system, rather than being dropped or dumped on top of each other from heights of more than a metre.

4. Species-specific recommendations:

Any animal Birds with broken bones and/or dislocated joints should be humanely/emergency killed before being hung on shackles for processing.

Article 7.5.25.

Restraint for stunning animals from containers

1. Animal welfare concerns:

The purpose of *restraint* is to facilitate the correct application of the *stunning* and/or bleeding procedures/equipment. Incorrect *restraint* and handling cause pain, fear and distress and may lead to ineffective *stunning* and/or bleeding.

Other *hazards* include:

- a) Inversion can provoke compression of the heart and lungs or air sacs by the viscera and might compromise breathing and cardiac activity. This might will cause pain and fear in conscious birds and rabbits.
- b) Shackling hanging birds upside down by inserting both legs into metal shackles. During shackling, the birds are also subjected to compression of their legs and wing flapping by their neighbour(s), leading to pain and fear.
- c) Inappropriate shackling leads to pain and fear when shackles are too narrow or too wide, when the birds are hung by one leg, or when one bird is shackled on two different adjacent shackles. Line speed, without a concomitant increase in workforce, can contribute to poor shackling outcomes.
- d) Drops, curves and inclination of shackle line or high speed of the slackline create fear and possible pain due to the sudden changes in position as well as increase effects of inversion.

2. Animal-based and other measurables include:

- a) struggling;
- b) escape attempts;
- c) vocalisations of high frequency (poultry);
- d) injuries and pain caused by excessive force of restraint or shackling;
- e) fear caused by prolonged restraint, which may exacerbate insecure or excessive restraint.

3. Recommendations:

Stunning methods that avoid handling, shackling and inversion of conscious animals should always be preferred.

Where, not possible, A animals should be handled and restrained to minimise without provoking struggle or attempts to escape.

Avoid inversion of conscious animals.

Avoid shackling of conscious animals but there is no real way to prevent or correct shackling, however, as it is a part of some of the *stunning* methods most commonly used in slaughter plants.

Shackle lines must be constructed and maintained so they do not jolt birds animals as this is likely to stimulate flapping (poultry) or struggle. Shackle line speeds must be optimised so that they do not cause the birds to struggle.

To minimise wing flapping (poultry) or struggle, breast support should be provided to the birds from the shackling point up to the stunner.

Inappropriate shackling such as too narrow or too wide shackles, birds/animals being pushed into the shackles with force, birds/animals shackled by one leg, or shackled on two different adjacent shackles, should be avoided.

Inappropriate shackling can be prevented by training staff to handle birds/animals with care and compassion, by an competent professional, shackle birds/animals gently by both legs and kill injured birds/animals before shackling, by rotating staff at regular intervals to avoid boredom and fatigue and by using shackles that are appropriate and adjustable for to the species and size of the birds/animals.

4. Species-specific recommendations:

Rabbits:

Restraining for head-only electrical *stunning* is manual and involves holding the rabbit with one hand supporting its belly, and the other hand guiding the head into the *stunning* tongs or electrodes.

Rabbits should not be lifted or carried by the ears, head or one leg.

Poultry:

Shackling should not be used with heavy birds like parent *flocks*, turkeys or with birds that are more susceptible to fractures like end-of-lay hens.

Poultry should not be lifted or carried by the head, wings or one leg.

Article 7.5.26.

Head only electrical stunning

1. Animal welfare concerns:

Electrical *stunning* involves application of an electric current to across the brain of sufficient magnitude current and intensity to induce immediate unconsciousness [EFSA, 2004; Grandin, 1980]. The main *hazards* preventing effective electrical *stunning* are: incorrect electrode placement, poor contact, dirty or corroded electrode, inappropriate electrical parameters (low voltage/current or high frequency [EFSA, 2004]).

2. Animal-based and other measurables include:

Effectiveness of *stunning* should be monitored at different stages: immediately after *stunning*, just before and during bleeding until death occurs is confirmed [EFSA, 2013a; EFSA, 2013b; AVMA, 2016].

No indicator should be relied upon alone.

An effective stun is characterised by the presence of all the following signs: tonic-clonic seizures; loss of posture; apnoea; and absence of corneal reflex.

The presence of any of the following signs indicate a high risk of ineffective stun or recovery of consciousness: vocalisation; spontaneous blinking; righting reflex; presence of corneal or palpebral reflex; rhythmic breathing; spontaneous swallowing and head shaking.

3. Recommendations:

Animals should be stunned as soon as they are restrained.

To minimise any disturbance to birds during shackling, where shackles are wet to improve conductivity, they should be wet only prior to birds' legs being placed in them.

In the case of ineffective *stunning* or recovery, animals should be re-stunned immediately using a backup system or be immediately killed. Ineffective *stunning* or return to consciousness should be systematically recorded and the cause of the failure identified and rectified.

Stunning equipment should be used, cleaned, maintained and stored following manufacturer's recommendations.

Constant current stunners should always be preferred to constant voltage stunners since the first ones ensure that the minimum current is provided to the animal independently from individual impedance.

Regular calibration of the equipment according to the manufacturer's procedure are recommended. Effectiveness of the *stunning* should be monitored regularly.

Slaughterhouses/abattoirs should have standard operating procedures that define key operating parameters and/or follow the manufacturer's recommendations for *stunning*, such as:

- shape, size and placement of the electrodes [AVMA, 2016];
- contact between electrode and head;
- electrical parameters (current intensity (A), waveform type (AC and DC), voltage (V) and frequency (Hz));
- visual or auditory warning system to alert the operator to proper or improper function such as a device that monitors and displays voltage and applied current.

4. Species-specific recommendations:

The *Competent Authority* should determine effective electrical parameters, based on scientific evidence for different types of animals.

Article 7.5.27.

Electrical water-bath stunning for poultry

1. Animal welfare concerns:

In electrical water-bath *stunning* poultry are inverted and hung by the legs from a shackle line. The bird's head has direct contact with the water-bath, and an electric current is passed from the water through the bird to the leg shackle. Hazards that may prevent effective electrical *stunning* are: lack of contact between head and water, differences in individual bird resistance pre-stun shocks due to wings contacting water before the head, and the use of inappropriate electrical parameters (low voltage/current or high frequency [AVMA 2016]).

Hazards that increase the likelihood of animals experiencing pre-stun shocks are: poor handling at shackling, line speed, physical contact between birds, incorrect angle of entry ramp, wet entry ramp, incorrect water-bath height, and shallow immersion.

Factors affecting individual bird resistance include the resistance between the shackle and the leg (leg/shackle interface), shackling on top of a severed foot, shackling by one leg, poor shackle position, incorrect shackle size, dry shackles, scale on the shackle surface, and keratinised skin on the legs (e.g. older birds).

Where inappropriate electrical stunning parameters (e.g. high frequency) are used, conscious animals are at risk of being electro-immobilized or paralysed causing pain and suffering.

2. Animal-based and other measurables include:

Effectiveness of *stunning* should be monitored at different stages: immediately after *stunning*, just before and during bleeding until death occurs [EFSA, 2019, EFSA, 2013a; EFSA, 2013b; AVMA, 2016].

No indicator should be relied upon alone.

An effective stun is characterised by the presence of all the following signs: tonic-clonic seizures; loss of posture; apnoea; and absence of corneal reflex.

The presence of any of the following signs indicate a high risk of ineffective stun or recovery of consciousness: vocalisation; spontaneous blinking; righting reflex; presence of corneal reflex or palpebral reflex; rhythmic breathing spontaneous swallowing and head shaking.

3. Recommendations:

The height of the water-bath stunner must be adjusted so that the birds cannot pull themselves up and avoid the stunner. Avoid distractions such as people walking under the birds as this can cause birds to pull up.

Personnel should watch for short or stunted birds as these birds will not be able to make contact with the water and will not be stunned. These birds should be stunned in the slaughter line (e.g. penetrative captive bolt) or removed and euthanised.

The rail of the shackle line should run smoothly. Sudden movement such as jolts, drops or sharp curves in the line may cause birds to flap and avoid the stunner.

To minimise any disturbance to birds during shackling, where shackles are wet to improve conductivity, they could be wet only prior to birds' legs being placed in them.

Pre-stun shocks can be reduced by having a smooth shackle line and entry into the water-bath and by adjusting the water level of the bath.

In the case of ineffective *stunning* or recovery, animals should be re-stunned immediately using a backup system. Ineffective *stunning* or return to consciousness should be systematically recorded and the cause of the failure identified and rectified.

Stunning equipment should be used, cleaned, maintained and stored following manufacturer's recommendations.

Constant current stunners should always be preferred to constant voltage stunners since the first ones ensure that the minimum current is provided to the animal independently from individual impedance.

Regular calibration of the equipment according to the manufacturer's procedure are recommended. Effectiveness of the *stunning* should be monitored regularly.

Slaughterhouses/abattoirs should have standard operating procedures that define key operating parameters or follow the manufacturer's recommendations for *stunning*, such as:

- water level;
- contact between water and head, as well as between the legs and the leg shackle;
- electrical parameters (current intensity (A), waveform type (AC and DC), voltage (V) and frequency (Hz));
- visual or auditory warning system to alert the operator to proper or improper function, such as a device that monitors and displays voltage and applied current.

Ensure an optimum combination of voltage and frequency during electrical water bath *stunning* practices, to maximize the effectiveness of *stunning*.

Animal welfare hazards such as conscious inversion of birds, pre-stun shocks, and variability in electrical current delivered to each bird are inherent risks of electrical water-bath stunning. The use of electrical water-bath stunning should be avoided and replaced by stunning systems which avoid these associated animal welfare hazards.

4. Species-specific recommendations:

The *Competent Authority* should determine effective electrical parameters, based on scientific evidence for different types of birds.

Article 7.5.28.

Mechanical stunning

The mechanical methods described here are penetrative and non-penetrative captive bolt, percussive blow to the head, cervical dislocation and decapitation.

Effective mechanical *stunning* requires a severe and immediate damage to the brain by the application of mechanical force. For that reason, cervical dislocation and decapitation cannot be considered as *stunning* methods.

1. Animal welfare concerns:

Mechanical methods required precision and often physical strength to restrain and stun the animals. A common cause for misapplication of these methods is the lack of proper skill and the operator fatigue.

Penetrative and non-penetrative cCaptive bolt

An incorrect shooting position or incorrect captive bolt parameters (not hitting the skull with sufficient force) will mis-stun and the animal leading to serious wounds and consequently pain, suffering, and fear.

Improper captive bolt parameters may be linked to the use of improper gun (bolt diameter), improper cartridges, overheated or badly maintained gun.

Percussive blow to the head

An incorrect application of the blow, by not hitting the brain with sufficient force will also mis-stunned the animals leading to serious wounds and consequently pain and fear.

In addition, the blow might not be consistently effective when delivered to an animal held upside down by its legs (part of the energy is dissipated by the movement of the body instead of damaging the brain).

Cervical dislocation and decapitation

Because neither method applies to the brain, the loss of consciousness is not immediate and, in some cases, when the method is not properly applied risk of neck crushing and the pain and fear of the animal might be prolonged.

In addition, decapitation is associated with an open wound leading to intense pain.

2. Animal-based and other measurables include:

Penetrative and non-penetrative cCaptive bolt and percussive blow to the head

With birds, sSevere convulsions (wing flapping (poultry) and leg kicking i.e. uncontrolled muscular movements) occur immediately after shooting or blowing. This is due to the loss of control of the brain over the spinal cord. Since mechanical stunning is applied on individual animals, its efficacy can be assessed immediately after the stun [Nielsen et al., 2018].

Effectiveness of stunning should be monitored at different stages: immediately after stunning, just before and during bleeding until death occurs [EFSA, 2019; EFSA, 2013a; EFSA, 2013b; AVMA, 2016].

An effective stun is characterised the following signs: the absence of corneal or palpebral reflex, the absence of rhythmic breathing and the presence of immediate collapse.

The presence of any of the following signs indicate a high risk of ineffective stun or recovery of consciousness: vocalisations; spontaneous blinking; righting reflex; presence of corneal or palpebral reflex; rhythmic breathing.

Cervical dislocation and decapitation

Death can be confirmed from several indicators: complete severance between the brain and the spinal cord (i.e. gap between neck vertebrae and base of skull), permanent absence of breathing, absence of corneal or palpebral reflex, dilated pupil, or relaxed carcass [EFSA, 2013a].

3. Recommendations:

Penetrative and non-penetrative C captive bolt and percussive blow to the head should only be used as backup or for small-scale slaughtering as in small *slaughterhouses/abattoirs* or on-farm slaughter or for emergency killing.

Penetrative and non-penetrative C captive bolt

The captive bolt gun should be used, cleaned, maintained and stored following manufacturer's recommendations.

Effectiveness of the *stunning* should be monitored regularly.

Because it requires precision, this method should only be applied with proper restraint of the head of the animals. In addition, in the case of birds, they should be restrained in a bleeding cone to contain wing flapping.

The captive-bolt should be pointing perpendicularly on the parietal bones of birds.

Placement is different for birds with or without combs:

Without comb

The placement of the device should be directly on the midline of the skull and at the highest/widest point of the head with the captive bolt aimed directly down toward the brain [AVMA, 2020].

With comb

As far as captive bolt in chickens (and poultry with comb development) is concerned, the placement should be directly behind the comb and on the midline of the skull with the captive bolt aimed directly down towards the brain of the bird [AVMA, 2020].

The power of the cartridge, compressed air line pressure or spring should be appropriate for the species and size of birds. Cartridges should be kept dry and the gun regularly inspected and maintained.

This method should be dealt with a single sufficiently strong hit placed in the frontoparietal region of the head and should result resulted in loss of auditory evoked potentials when using an EEG in broilers and broiler breeders.

Fatigue of the operator can lead to inconsistency in application, creating concern that the technique may be difficult to apply humanely to large numbers of birds. It should not be done with the animal's head hanging down since inversion is stressful and part of the energy of the blow will be dissipated by the movement of the body.

It should not be used as a routine method and should be limited as a back-up method limited to small size animals (e.g. up to 3kg liveweight manually and up to 5 kg mechanical).

Rabbits

The device should be placed in the centre of the forehead, with the barrel in front of the ears and behind the eyes. The device should be discharged twice in rapid succession at the pressure recommended for the age and size of the rabbit. [Walsh *et al.*, 2017].

The power of the cartridge, compressed air line pressure or spring should be appropriate for the animal species and size of birds. Cartridges should be kept dry and the gun regularly inspected and maintained.

As an indication for broiler chickens, the appropriate specifications for captive bolt *stunning* are a minimum of 6-mm bolt diameter driven at an air pressure of 827 kPa to a penetration depth of 10 mm [Raj and O'Callaghan, 2001].

There should be sufficient bolt guns such that they are allowed to cool between operations, and they should be cleaned and maintained according to manufacturer's instructions.

Percussive blow to the head

This method ~~The blow should be dealt with a single sufficiently strong hit placed in the frontoparietal region of the head resulted in loss of auditory evoked potentials in broilers and broiler breeders.~~

~~Fatigue of the operator can lead to inconsistency in application, creating concern that the technique may be difficult to apply humanely to large numbers of birds. It should not be done with the animal's head hanging down since inversion is stressful and part of the energy of the blow will be dissipated by the movement of the body.~~

~~Considering that the application of this method is entirely manual and prone to error, percussive blow might be used only when no other *stunning* method is available and, by establishing a maximum number of animals per operator in time to avoid errors due to operator fatigue.~~

~~It should not be used as a routine method and should be limited as a back-up method limited to small size animals (e.g. up to 3kg liveweight manually and up to 5 kg mechanical).~~

~~This method should not be used in rabbits because of the difficulties to apply this method efficiently.~~

Cervical dislocation

Cervical dislocation should not be used in conscious birds under any circumstances, avoided since it does not render the animal unconscious immediately.

It should not be used as a routine method and should be limited as a back-up method limited to small size animals (e.g. up to 3kg liveweight manually and up to 5 kg mechanical).

Mechanical dislocation should be preferred to manual dislocation as the efficiency of the first is less dependent on the operator's strength than the later.

Cervical dislocation should not be undertaken with tools such as pliers as they cause neck crushing, rather than concussion, and consequently pain and fear.

Decapitation

Decapitation should not be used since it does not render the animal unconscious immediately.

4. Species-specific recommendations:

Because of their size, heavy animals such as turkeys, geese or mature rabbits should not be stunned through percussive blow to the head or cervical dislocation.

Turkeys and geese may be also properly stunned by non-penetrative captive bolt. [Walsh *et al.*, 2017; Woolcott *et al.*, 2018; Gibson *et al.*, 2019]

Article 7.5.29.

Controlled atmosphere stunning for poultry

Animals may be exposed to controlled atmosphere *stunning* methods either directly in crates or after being unloaded on a conveyor belt. Animals are not subject to restraint. Controlled atmosphere *stunning* includes exposure to carbon dioxide, inert gases, mixtures of carbon dioxide with inert gases or low atmosphere pressure (LAPS). The effectiveness and animal welfare impacts of LAPS are still being evaluated as it is a newer form of controlled atmosphere stunning in comparison to other methods, so far it has only been studied in poultry and therefore is not suitable for use in rabbits or other animals without further study.

1. Animal welfare concerns:

A common concern of all controlled atmosphere *stunning* methods is the risk of insufficient exposure of animals to the modified atmosphere, which can result in animals recovering returning to consciousness before bleeding and cause distress (respiratory), pain and fear. The insufficient exposure to modified atmosphere may be due to either a too short exposure time, a too low concentration of gas or a combination of these variables.

These variables are critical because animals being stunned in large groups need special attention to ensure unconsciousness prior to neck cutting. For this reason, the duration of unconsciousness induced needs to be longer than required by other *stunning* methods to ensure animals do not recover prior to being killed.

Furthermore, hazards causing increased distress during induction of unconsciousness are irritant or aversive gas mixtures, low gas temperature and humidity. In the case of exposure to carbon dioxide, there is a risk that animals are exposed to a too high concentration of this gas, leading to pain. Exposure of conscious animals to more than 40% carbon dioxide (CO₂) will cause painful stimulation of the nasal mucosa and aversive reactions.

Low atmospheric pressure systems (LAPS) should not be confused with decompression. LAPS utilise a slow removal of air where animals exhibit minimal to no aversive behaviours. Decompression is a fast process that is associated with induction of pain and respiratory distress.

2. Animal-based and other measurables include:

It may be difficult to monitor the effectiveness of controlled atmosphere *stunning* due to limited access to observation of animals during the *stunning* process. All chamber-type systems should have either windows or video cameras so that problems with induction can be observed. If problems are observed, there is a need to take immediately any corrective measure that could alleviate the suffering of the animals concerned.

Therefore, it is essential that the death of animals is confirmed at the end of the exposure to the controlled atmosphere.

Death can be confirmed from permanent absence of breathing, absence of corneal or palpebral reflex, dilated pupils and relaxed carcass.

Since animal-based measures are difficult to monitor, resource-based measures should be used such as monitoring of gas concentration(s), exposure time, gas displacement rate, and decompression rate of air removal (for low atmosphere pressure).

3. Recommendations:

Conscious animals should not be exposed to carbon dioxide exceeding 40%. Any compressed gas should also be vaporised prior to administration and humidified at room temperature to prevent the risk of animals experiencing thermal shock.

The duration of exposure and the gas concentration should be designed and implemented in such a way that all animals are dead before being shackled.

Gas concentrations and exposure time, temperature and humidity must be monitored continuously at the level of the animal inside the chamber.

Stunning systems should have visual and auditory warning system to alert the operator to improper function, such as inappropriate gas concentration or decompression rate.

In case of low atmosphere pressure *stunning*–decompression rate of air removal should be monitored continuously. The decompression rate should not be greater than or equivalent to a reduction in pressure from standard sea level atmospheric pressure (760 Torr) to 250 Torr in not less than 50 s. During a second phase, a minimum atmospheric pressure of 160 Torr shall be reached within the following 210 s.

In the case of ineffective *stunning* or recovery, animals should be re-stunned immediately using a backup system. Ineffective *stunning* or return to consciousness should be systematically recorded and the cause of the failure identified and rectified.

4. Species-specific recommendations:

Low atmosphere pressure *stunning* has only been scientifically studied on commercial broilers and therefore should not be used for other animals until further information is available.

The recommended CO₂ displacement rate for rabbits is 50-60% of the chamber or cage volume/min as this results in a significantly shorter time to insensibility and death (Walsh *et al.*, 2016, AVMA 2020). Exposure to CO₂ at high concentrations can reduce pre-stun handling and produce irreversible *stunning* in rabbits. With a stun to stick interval of up to 2 min, 200 s of exposure at 80%, 150 s at 90% and 110 s at 98% are recommended (Dalmau *et al.*, 2016). While there are advantages to high CO₂ exposure in rabbits, it is not without welfare concerns (aversion, vocalisation).

Article 7.5.30.

Bleeding in of animals arriving in containers

1. Animal welfare concerns

In poultry, the most common animal welfare concern at the time of bleeding is recovery of consciousness due to ineffective electric water bath *stunning* practices. There are a lot of factors that determine the efficacy of a *stunning* procedure such as type of chicken (broiler, breeder, layer), animal weight, voltage, frequency, impedance and duration of *stunning* or gas (mixture) concentration and exposure [Zulkifli *et al.*, 2013; Raj, 2006; Wotton & Wilkins, 2004].

Improper *stunning* practice leads to the risk of animal suffering fear, distress, and from pain, during and after *slaughter* if they regain consciousness. There is also an additional risk of injury on to bones (coracoid and scapula), wings and joints due to flapping if birds regain consciousness.

Bleeding without prior *stunning* increases the risk of animal suffering because the incision to sever blood vessels results in substantial tissue damage in areas well supplied with nociceptors. The activation of these nociceptors causes the animal to experience pain [Gregory, 2004; Gibson *et al.*, 2009]. Loss of consciousness due to bleeding is not immediate and there is a period during which the animal can feel fear, pain and distress [Gregory, 2004; Johnson *et al.*, 2015].

In case of bleeding without *stunning*, higher cases of injury, bruises, haemorrhage and broken body parts are expected to occur due to wing flapping and violent muscular contractions [McNeal *et al.*, 2003].

Bleeding duration also plays an integral part in processing, where animals that have not undergone a sufficient bleeding period (min 40 sec), may still be alive upon reaching the scalding tank. Live and conscious birds, if not removed prior to scalding, will then be subjected to additional pain stimulators from the heat inside the scalding tank.

2. Animal-based and other measurables include:

The main animal-based measurable is the blood flow (rate and duration). For animal-based and other measurables of return of consciousness after *stunning*, see Article 7.5.16 Article 7.5.26. to Article 7.5.29.

One of the most common parameters in determining bleeding efficiency is the percentage of blood loss, where the amount of blood loss is estimated through the difference between pre-slaughter weight and post-slaughter weight [Velarde *et al.*, 2003; Sabow *et al.*, 2015].

For poultry, the presence of 'red-skin' carcasses may be the result of ineffective killing and live birds entering the scalding tank.

The effectiveness of a *stunning* procedure on birds can be seen through the following signs: absence of corneal reflex, loss of posture tonic-clonic seizures and apnoea. Presence of one or more signs during bleeding may be the result of ineffective *stunning* procedure.

3. Recommendations:

The *slaughterhouse/abattoir* operators should ensure that:

- qualified personnel take random samples of birds between the end of *stunning* and before bleeding to ensure birds are not showing signs of consciousness;

- qualified personnel right after bleeding check that the jugular veins, carotid artery and windpipe were cut thoroughly, guaranteeing a well bleeding process afterwards;
- the slaughter line speed allows a minimum bleeding period of 40 seconds (for chickens) so that there is minimum blood loss of 60 percent before reaching the scalding tank or other potentially painful operation;
- qualified personnel check that at the bleeding line, especially before scalding, birds are completely dead. Birds that are still alive need to be ethanized immediately removed from shackle.

Decapitation should not be applied only in unconscious birds, used as a bleeding technique because it does not allow monitoring possible return of consciousness.

4. Species-specific recommendations

None identified.

Article 7.5.31

Emergency killing of animals arriving in containers

This article addresses animals that show signs of severe pain or other types of severe suffering before being unloaded or within the *slaughterhouse/abattoir*. These animals may correspond to animals unfit to travel as listed in Article 7.3.7. Principles described may also apply to animals that are not suitable for *slaughter* for commercial reasons, even if they do not present signs of pain or suffering.

1. Animal welfare concerns:

Some animals can arrive at *slaughterhouses/abattoirs* with injuries or severe illnesses that can cause undue pain and suffering.

2. Animal-based and other measurables include:

Animals requiring emergency *killing* are those, among others that present with severe injuries such as fractures, bone dislocations, and large open wounds.

They may also present clinical signs of serious illness or being in a state of extreme weakness.

3. Recommendations:

Animal handlers should euthanise the animal as soon as they are identified at arrival, during lairage or at the time of shackling.

Emergency *killing* should be systematically recorded and analysed to improve procedures and prevent recurrences.

4. Species-specific recommendations:

None identified yet.

Article 7.5.32.

Methods, procedures or practices unacceptable on animal welfare grounds for animals arriving in containers

1) None of tThe following practices for handling animals are unacceptable and they should not be used:

- a) applying pressure using an injurious object or applying an irritant substance to any part of the body of the animal;
- b) hitting animals with instruments such as large sticks, sticks with sharp ends, metal-piping, stones, fencing wire or leather belts;
- c) kicking, throwing or dropping animals;

Annex 6 (contd)

- d) grasping, lifting or dragging animals only by ~~some~~ body parts such as their tail, head, ears, limbs, hair or feathers;
 - e) dragging animals by any body parts.
- 2) ~~None of the~~ The following practices for restraining animals are unacceptable and should not be used:
- a) mechanical clamping of the legs or feet of the animals as the sole method of restraint;
 - b) breaking legs, cutting leg tendons or blinding animals;
 - c) applying electrical current that does not span the brain; ~~such as the use of the electrical stunning method with a single application leg-to-leg;~~
 - d) severing brain stem by piercing through the eye socket or skull bone;
 - e) neck crushing.

In poultry, electro-immobilisation for neck-cutting or preventing wing flapping during bleeding, or the method of brain piercing through the skull without prior *stunning*.

References

Animals 2018 Mar 8(3) 42: Evaluation of Two Models of Non-Penetrating Captive Bolt Devices for On-Farm Euthanasia of Turkeys; C. R. Woolcott et al.

Animals 2019 9(12) 1049: Pathophysiology of Concussive Non-Penetrative Captive Bolt Stunning of Turkeys; T. J. Gibson et al

Animals 2017, 7, 100: Efficacy of Blunt Force Trauma, a Novel Mechanical Cervical Dislocation Device, and a Non-Penetrating Captive Bolt Device for On-Farm Euthanasia of Pre-Weaned Kits, Growers, and Adult Commercial Meat Rabbits; J. L. Walsh, A Percival, and P. V. Turner

Anonymous (2017). Animal welfare aspects in respect of the slaughter or killing of pregnant livestock animals (cattle, pigs, sheep, goats, horses). EFSA Journal 15:4782.

Anonymous (2018). Scientific Opinion on monitoring procedures at slaughterhouses for bovines. EFSA Journal 11:3460.

Anonymous (2018). Technical Note No 19 Carbon Dioxide cx and Killing of Pigs. Humane Slaughter Association, UK. <https://www.hsa.org.uk/downloads/technical-notes/tn19-carbon-dioxide-stunning-and-killing-of-pigs.pdf>

AVMA Guidelines for the Humane Slaughter of Animals (2016). Available from: <https://www.avma.org/KB/Resources/Reference/AnimalWelfare/Documents/Humane-Slaughter-Guidelines.pdf>

Dalmáu, A., Pallisera, J., Pedernera, C., Muñoz, I., Carreras, R., Casal, N., Mainau, E., Rodríguez, P., Velarde, A., (2016). Use of high concentrations of carbon dioxide for stunning rabbits reared for meat production. World Rabbit Science, 24: 25-37.

Daly, C.C., Gregory, G. and Wotton, S.B. (1987). Captive bolt stunning of cattle: effects on brain function and role of bolt velocity. British Veterinary Journal 143 574-580.

EFSA (2004). Welfare aspects of animal stunning and killing methods. Scientific Report of the Scientific Panel for Animal Health and Welfare on a request from the Commission related to welfare aspects of animal stunning and killing methods. Available from: <http://www.efsa.europa.eu/de/scdocs/doc/45.pdf>.

EFSA AHAW Panel (EFSA Panel on Animal Health and Welfare) (2013a). Scientific opinion on monitoring procedures at slaughterhouses for bovines. EFSA Journal 2013. 11, 3460. Available from: <http://dx.doi.org/10.2903/j.efsa.2013.3460>.

EFSA AHAW Panel (EFSA Panel on Animal Health and Welfare) (2013b). Scientific opinion on monitoring procedures at slaughterhouses for sheep and goats. EFSA Journal 2013. 11, 3522. Available from: <http://dx.doi.org/10.2903/j.efsa.2013.3522>.

EFSA AHAW Panel (EFSA Panel on Animal Health and Animal Welfare) (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. Available from : <https://doi.org/10.2903/j.efsa.2017.4782>

EFSA AHAW Panel (EFSA Panel on Animal Health and Animal Welfare) (2019) Scientific Opinion on the Slaughter of animals: poultry. EFSA Journal 2019;17(11):5849, 91 pp. Available from : <https://doi.org/10.2903/j.efsa.2019.5849>

Finnie, J.W. (1993). Brain damage caused by captive bolt pistol. J. Comp. Patholo. 109:253–258.

Finnie, J.W, J. Manavis, G.E. Summersides and P.C. Blumbergs. (2003). Brain Damage in Pigs Produced by Impact with a Non-penetrating Captive Bolt Pistol. Aust. Vet. J. 81:153-5.

Gibson, T.J, Johnson, C.B, Murrell, J.C, Hulls, C.M., Mitchinson, S.L., Stafford, K.J., Johnstone, A.C. and Mellor, D.J. (2009). Electroencephalographic responses of calves to slaughter by ventral neck incision without prior stunning. New Zealand Veterinary Journal 57 77-83.

Gibson, T.J., Mason, C.W., Spence, J.Y., Barker, H. and Gregory, N.G. (2014). Factors Affecting Penetrating Captive Bolt Gun Performance. Journal of Applied Animal Welfare Science 18 222-238

Grandin, T. (1980). Mechanical, electrical and anesthetic stunning methods for livestock. International Journal for the Study of Animal Problems, 1(4), 242-263

Gregory, N.G.(2004). Physiology and Behaviour of Animal Suffering. Blackwell Science, Oxford, p. 227. ISBN: 0-632-06468-4.

Johnson, C.B., Mellor, D.J., Hemsworth, P.H. and Fisher, A.D (2015). A scientific comment on the welfare of domesticated ruminants slaughtered without stunning. New Zealand Veterinary Journal 63 58-65.

Micera, Elisabetta, Albrizio, Maria, Surdo, Nicoletta C., Moramarco, Angela M. and Zarrilli, Antonia (2010). 'Stress-related hormones in horses before and after stunning by captive bolt gun', Meat Science, 84(4), 634-637.

Mellor D (2003) Guidelines for the humane slaughter of the fetuses of pregnant ruminants. Surveillance 30:26-28.

Mellor, D.J., Diescha, T.J., Gunn, A.J. and Bennet, L. (2005). The importance of 'awareness' for understanding fetal pain. *Brain Research Reviews* 49 (2005) 455–471.

Mellor D (2010) Galloping colts, fetal feelings, and reassuring regulations: putting animal-welfare science into practice. *JVME* 37(1):94-100.

Nielsen, S. S., Alvarez, J., Bicout, D. J., Calistri, P., Depner, K., Drewe, J. A., Garin-Bastuji, B., Rojas, J. L. G., Schmidt, C. G., Michel, V., Chueca, M. A. M., Roberts, H. C., Sihvonen, L. H., Stahl, K., Calvo, A. V., Viltrop, A., Winckler, C., Candiani, D., Fabris, C., Mosbach-Schulz, O., Stede, Y. van der and Spooler, H. (2020). 'Stunning methods and slaughter of rabbits for human consumption.', *EFSA Journal*, 18(1), e05927.

Recommended Animal Handling Guidelines & Audit Guide: A Systematic Approach to Animal Welfare (2017). Rev. 1, North American Meat Institute (NAMI).

Pleiter, H. (2010). Review of Stunning and Halal Slaughter. Meat and Livestock Australia.

von Holleben, K., von Wenzlawowicz, M., Gregory, N., Anil, H., Velarde, A., Rodriguez, P., Cenci Goga, B., Catanese, B., Lambooi, B. (2010). Report on good and adverse practices—animal welfare concerns in relation to slaughter practices from the viewpoint of veterinary sciences. Dialrel report. Deliverable. 1, 3. <http://www.dialrel.eu/images/veterinary-concerns.pdf>

Lara, L. and Rostagno M. (2018). Animal welfare and food safety in modern animal production, in *Advances in Agricultural Animal Welfare, Food Science, Technology and Nutrition*, Pages 91-108.

Blokhuis, H., Keeling, L., Gavinelli, A. and Serratos, J. (2008) Animal welfare's impact on the food chain. *Trends in Food Science & Technology*, 19 (2008), 79-88.

Visser, E. Kathalijne, Ellis, Andrea D. and Van Reenen, Cornelis G. (2008). 'The effect of two different housing conditions on the welfare of young horses stabled for the first time', *Applied Animal Behaviour Science*, 114(3), 521-533.

Walsh JL, Percival A, Turner PV. Efficacy of blunt force trauma, a novel mechanical cervical dislocation device, and a non-penetrating captive bolt device for on-farm euthanasia of pre-weaned kits, growers, and adult commercial meat rabbits. *Animals (Basel)* 2017;7:100.

CHAPTER 8.14.

INFECTION WITH RABIES VIRUS

[...]

Article 8.14.6bis.**Recommendations for importation of dogs from countries or zones infected with rabies virus**

Veterinary Authorities should require the presentation of an international veterinary certificate complying with the model of Chapter 5.11. attesting that the dogs:

- 1) showed no clinical signs of rabies the day prior to or on the day of shipment;
- 2) were permanently identified and their identification numbercode stated in the certificate;
- 3) and either:
 - a) were vaccinated or revaccinated in accordance with the recommendations of the manufacturer, with a vaccine that was produced in accordance with the *Terrestrial Manual* and were subjected, not less than 30 days and not more than 12 months prior to shipment, to an antibody titration test as prescribed in the *Terrestrial Manual* with a positive result of at least 0.5 IU/ml;
 - or
 - b) were kept in a quarantine station for six months prior to shipment.

Article 8.14.7.

Recommendations for importation of dogs, cats and ferrets from countries or zones infected with rabies virus

Veterinary Authorities should require the presentation of an *international veterinary certificate* complying with the model of Chapter 5.11. attesting that the animals:

- 1) showed no clinical signs of rabies the day prior to or on the day of shipment;
- 2) were permanently identified and their identification numbercode stated in the certificate;
- 3) and either:
 - a) were vaccinated or revaccinated in accordance with the recommendations of the manufacturer, with a vaccine that was produced in accordance with the *Terrestrial Manual* and were subjected not less than 3 months and not more than 12 months prior to shipment to an antibody titration test as prescribed in the *Terrestrial Manual* with a positive result of at least 0.5 IU/ml;
 - or
 - b) were kept in a *quarantine station* for six months prior to shipment.

Article 8.14.11bis.**Recommendations for dog-mediated rabies vaccination programmes**

When developing and implementing vaccination programmes for dog-mediated rabies, in addition to provisions in Chapter 4.18., Member Countries should:

1. Prepare for the vaccination programme:

- a) consult with all relevant stakeholders, including target communities to define the most appropriate time to increase community participation and reduce the time required to complete vaccination;
 - b) ensure safety of vaccination teams including training in humane dog capture and handling, and a strategy to manage exposure to suspect rabid animals.
2. Choose a vaccine and vaccination strategy:
- a) Priority should be given to vaccinating free-roaming dogs, including puppies, to immediately interrupt the rabies virus transmission cycle.
 - b) Vaccination campaigns should be conducted recurrently (usually annually). More regular vaccination campaigns may be considered in especially high-risk areas, or to quickly interrupt the cycle of virus transmission.
 - c) Vaccination strategy should take into account simultaneous dog population management programmes as described in Chapter 7.7.
3. Monitor the vaccination programme:
- a) To monitor the vaccination coverage, vaccinated dogs should be identified and registered in a database.
 - b) Vaccination certificates which state identification of the dog should be provided to dog owners as proof of vaccination.
 - c) Vaccination coverage should be monitored at the smallest administrative level possible.
-

CHAPTER 8.15.

INFECTION WITH RIFT VALLEY FEVER VIRUS

Article 8.15.1.

General provisions

- 1) The aim of this chapter is to mitigate the animal and public health risks posed by Rift Valley fever (RVF) and to prevent its international spread.
- 2) For the purposes of this chapter:
 - a) 'epizooticepidemic area' means a part of a country or zone in which an epizooticepidemic of RVF is occurring, and which does not correspond to the definition of zone;
 - b) 'epizooticepidemic of RVF' means a sudden and unexpected change in the distribution or increase in incidence of, or morbidity or mortality of RVF;
 - c) 'inter-epizooticepidemic period' means a period with low levels of vector activity and low rates of RVF virus (RVFV) transmission between two epidemics;
 - d) 'susceptible animals' means ruminants and dromedary camels.
- 32) Humans and many animal species are susceptible to infection can be affected by RVF. For the purposes of the *Terrestrial Code*, RVF is defined as an *infection* of ruminants 'susceptible animals' with Rift Valley fever virus ~~Rift Valley fever virus ((RVFV))~~.
- 43) The following defines the occurrence of *infection* with RVFV:
 - a) RVFV, excluding vaccine strains, has been isolated and identified as such from a sample from a ruminant susceptible animal; or
 - b) antigen or ribonucleic acid specific to RVFV, excluding vaccine strains, has been identified in a sample from a ruminant susceptible animal epidemiologically linked to a confirmed or suspected case of RVF, including in or to a human infected with RVFV, or giving cause for suspicion of association or contact with RVFV; or
 - c) antibodies to RVFV antigens which are not the consequence of *vaccination*, have been identified in a sample from a ruminant susceptible animal with either epidemiological links to a confirmed or suspected case of RVF, including in or to a human infected with RVFV, or giving cause for suspicion of association or contact with RVFV.
- 54) For the purposes of the *Terrestrial Code*, the *infective period* for RVF shall be 14 days and the incubation period shall be 7 days.
- 6) ~~For the purposes of the *Terrestrial Code*, the incubation period for RVF shall be 7 days.~~
- 765) In areas where RVFV is present, epizooticepidemics of RVF may occur following favourable climatic, and other environmental conditions and availability of susceptible host animal and competent *vector* populations. EpizooticEpidemics are separated by inter-epizooticepidemic periods. The transition from an inter-epizooticepidemic period to an epizooticepidemic complies with point 1(-de) of Article 1.1.3. in terms of notification.
- 6) For the purposes of this chapter:
 - a) 'area' means a part of a country that experiences epizootics and inter-epizootic periods, but which does not correspond to the definition of zone;

Annex 8 (contd)

- b) 'epizootic of RVF' means the occurrence of *outbreaks* at an incidence substantially exceeding that during an ~~inter-epizootic period or the occurrence of indigenous human cases~~;
 - e) 'inter-epizootic period' means the period of variable duration, often long, with intermittent low level of vector activity and low rate of virus transmission, which is often not detected;
 - d) ~~ruminants include dromedary camels.~~
- 7) ~~The historical distribution of RVF has been parts of the African continent, Madagascar, some other Indian Ocean Islands and the south western Arabian Peninsula. However, vectors, environmental and climatic factors, land-use dynamics, and animal movements may modify the temporal and spatial distribution of the infection.~~
- ~~78)~~ When authorising import~~ation~~ or transit of the *commodities* covered in the chapter, with the exception of those listed in Article 8.15.2., *Veterinary Authorities* should require the conditions prescribed in this chapter relevant to the RVF status of the ~~ruminant~~ susceptible animal population of the *exporting country*.
- ~~89)~~ Standards for diagnostic tests and vaccines are described in the *Terrestrial Manual*.

Article 8.15.2.

Safe commodities

When authorising import~~ation~~ or transit of the following *commodities* and any products made from them, *Veterinary Authorities* should not require any RVF-related conditions, regardless of the RVF health status of the ~~ruminant~~ susceptible animal population of the *exporting country or zone*:

- 1) hides and skins;
- 2) wool and fibre.

Article 8.15.3.

Country or zone free from RVF

A country or a *zone* may be considered free from RVF when *infection* with RVFV is notifiable in the entire country and either:

- 1) it meets the requirements for historical freedom in ~~point 1 a) of Article 1.4.6.~~; or
- 2) meets the following conditions:
 - a) an on-going pathogen-specific *surveillance* programme in accordance with Chapter 1.4. has demonstrated no evidence of *infection* with RVFV in ~~ruminants~~ susceptible animals in the country or *zone* for a minimum of ten years; and
 - b) during that period no indigenous human cases/infections in human have occurred has been reported by the public health authorities in the country or *zone*.

A country or *zone* free from RVF will not lose its free status through the importation of ~~ruminants~~ susceptible animals that are seropositive, so long as they are either permanently identified as such or destined for immediate *slaughter*.

Article 8.15.4.

Country or zone infected with RVFV ~~during the inter-epizootic period~~

A country or *zone* infected with RVFV, ~~during the inter-epizootic period~~, is one that does not comply with meet the requirements of Article 8.15.3. in which virus activity is present at a low level but the factors predisposing to an epizootic are absent.

Article 8.15.5.

Country or zone infected with RVFV during an epizootic

A country or zone infected with RVFV, during an epizootic, is one in which ~~outbreaks of RVF are occurring at an incidence substantially exceeding that of the inter-epizootic period; or one in which indigenous human cases of RVF are occurring even in the absence of detection of animal cases.~~

Article 8.15.6.

Strategies to protect from vector attacks during transport

Strategies to protect animals from *vector* attacks during transport should take into account the local ecology and potential insecticide resistance of the *vectors*, ~~and potential~~ *Risk management* measures include:

- 1) treating animals and vehicles/vessels with insect repellents and insecticides prior to and during transportation;
- 2) *loading*, transporting and *unloading* animals at times of low *vector* activity;
- 3) ensuring *vehicles/vessels* do not stop en route during dawn or dusk, or overnight, unless the animals are held behind insect-proof netting protected from vector attacks;
- 4) using historical and current information to identify lower er risk ports and transport routes.

Article 8.15.7.

Recommendations for importation of susceptible animals from countries or zones free from RVF**For ruminants susceptible animals**

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that the animals:

- 1) were kept in a country or *zone* free from RVF since birth or for at least 14 days prior to shipment;

AND

- 2) either:
 - a) were vaccinated at least 14 days prior to leaving the free country or *zone*; or
 - b) did not transit through an epizooticepidemic area ~~experiencing an epizootic during transportation to the place of shipment;~~ or
 - e) were protected from vector attacks when transiting through an epizootic area ~~experiencing an epizootic.~~

Article 8.15.8.

Recommendations for importation of susceptible animals from countries or zones infected with RVFV during the inter-epizootic period**For ruminants susceptible animals**

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that the animals:

- 1) showed no clinical signs of RVF on the day of shipment;
- 2) met one of the following conditions:
 - a) were vaccinated against RVF at least 14 days prior to shipment ~~with a modified live virus vaccine~~; or

Annex 8 (contd)

- b) were held for at least 14 days prior to shipment in a *vector-protected quarantine station*, which is located in an area of demonstrated low *vector* activity. During this period the animals showed no clinical sign of RVF;

AND

- 3) **either:**
 - a) did not originate or transit through an area experiencing an epizootic/epidemic area during transportation to the place of shipment; or
 - b) were protected from vector attacks when transiting through an area experiencing an epizootic area.

Article 8.15.98.

Recommendations for importation of susceptible animals from countries or zones infected with RVFV during an epizootic

For ruminants susceptible animals

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that the susceptible animals: 4

- 1) showed no clinical signs of RVF on the day of shipment;
- 2) did not originate from an in the epizootic area of the epizootic;
- 3) were vaccinated against RVF at least 14 days prior to shipment;
- 4) were held for at least 14 days prior to shipment in a vector-protected quarantine station, which is located in an area of demonstrated low vector activity outside the of an epizootic area of the epizootic. During this period the animals showed no clinical signs of RVF;

AND

- 5) **either:**
 - a) did not transit through an epizootic area experiencing an epizootic during transportation to the place of shipment; or
 - b) were protected from vector attacks when transiting through an epizootic area experiencing an epizootic.

Article 8.15.4098.

Recommendations for importation of semen and in vivo derived embryos of susceptible animals from countries or zones not free from infected with RVFV

For semen and in vivo derived embryos of ruminants susceptible animals

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that the donor animals:

- 1) showed no clinical signs of RVF within the period from 14 days prior to and 14 days following collection of the semen or embryos;

AND

- 2) either:
 - a) were vaccinated against RVF at least 14 days prior to collection; or
 - b) were subjected to a serological test demonstrated to be seropositive on the day of collection, with positive result; or

- c) were subjected to a serological test on two occasions with negative results on the day of collection and 14 days after collection testing of paired samples has demonstrated that seroconversion did not occur within 14 days of between semen or embryo collection and 14 days after.

Article 8.15.41 ~~109~~.

Recommendations for importation of fresh meat and meat products and meat products from ruminants susceptible animals from countries or zones ~~not free from~~ infected with RVFV

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that:

- 1) the entire consignment of *meat* or meat products comes from:
 - 1a) ~~ruminants which~~ susceptible animals that showed no clinical signs of RVF within 24 hours before *slaughter*;
 - 1b) ~~ruminants which~~ susceptible animals that were slaughtered in an approved *slaughterhouse/abattoir* and were subjected to ante- and post-mortem inspections with favourable results;
 - 1c) carcasses ~~which~~ that were submitted to maturation at a temperature above 2°C for a minimum period of 24 hours following *slaughter*;
- 2) the necessary precautions were taken to avoid contact of the products *meat* or meat products with any potential source of RVFV.

Article 8.15.10bis.

Recommendations for importation of meat products from susceptible animals from countries or zones infected with RVFV

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that the entire consignment of *meat products* comes from *meat* that complies with Article 8.15.10.

Article 8.15.42 ~~11~~ 10.

Recommendations for importation of milk and milk products of susceptible animals from countries or zones ~~not free from~~ infected with RVFV

For milk and milk products

Veterinary Authorities of importing countries should require the presentation of an *international veterinary certificate* attesting that the consignment:

- 1) was subjected to pasteurisation; or
- 2) was subjected to a combination of control measures with equivalent performance as described in the Codex Alimentarius Code of Hygienic Practice for Milk and Milk Products.

Article 8.15.43 ~~12~~ 11.

Surveillance

Surveillance for RVF should be carried out in accordance with Chapter 1.4.

Surveillance for arthropod *vectors* should be carried out in accordance with Chapter 1.5., especially to determine areas of low *vector* activity.

Detection of RVFV in *vectors* has low sensitivity and therefore is not a recommended *surveillance* method.

An epidemic should be suspected in countries or zones infected with RVFV or countries or zones adjacent to a country or zone in which epidemics have been reported, when ecological conditions favour the breeding of large numbers of mosquito and other vectors with concurrent or consequent occurrence of increased number of abortions, and mortality particularly in new-born susceptible animals showing clinical signs or pathological lesions consistent with RVF, or reports of infection in humans.

Ecological conditions can be assessed through the sharing and analysis of meteorological data, and precipitation and water levels data, as well as the monitoring of vector activity. Clinical surveillance targeted at abortions and the use of sentinel herds can support detection of epidemics. Serological surveillance can also be used to assess the increase of number seroconversions.

- 4) During an epizootic/epidemic, surveillance should be conducted to define the extent of the affected area epidemic area for the purpose of disease prevention and control as well of movements and trade of susceptible animals.
- 2) During the inter-epizootic/epidemic period, surveillance and monitoring of climatic factors predisposing to an epizootic should be carried out in countries or zones infected with RVFV.
 - 1) level of virus transmission should be assessed and determined by surveillance in sentinel herds of susceptible animals;
 - 2) monitoring of ecological and meteorological factors should be carried out.
- 3) Countries or zones adjacent to a country or zone in which epizootic/epidemics have been reported/ notified should determine their RVF status through an on-going specific surveillance programme.

To determine areas of low vector activity (see Articles 8.15.87, and 8.15.98.) surveillance for arthropod vectors should be carried out in accordance with Chapter 1.5.

Examination of vectors for the presence of RVFV is an insensitive surveillance method and is therefore not recommended.

The Veterinary Authority should coordinate in a timely manner with public health and other relevant authorities and share information to support the surveillance outcomes and the decision-making process for the prevention and control of RVF.

CHAPTER 10.9.

INFECTION WITH NEWCASTLE DISEASE VIRUS

Article 10.9.1.

General provisions

- 1) For the purposes of the *Terrestrial Code*, Newcastle disease (ND) is defined as an *infection of poultry* caused by Newcastle disease virus (NDV), which is an avian paramyxovirus serotype 1 (APMV-1) that meets one of the following criteria for virulence:
 - a) the virus has an intracerebral pathogenicity index (ICPI) in day-old chicks (*Gallus gallus*) of 0.7 or greater; or
 - b) multiple basic amino acids have been demonstrated in the virus (either directly or by deduction) at the C-terminus of the F2 protein and phenylalanine at residue 117, which is the N-terminus of the F1 protein. The term 'multiple basic amino acids' refers to at least three arginine or lysine residues between residues 113 and 116. Failure to demonstrate the characteristic pattern of amino acid residues as described above would require characterisation of the isolated virus by an ICPI test.

In this definition, amino acid residues are numbered from the N-terminus of the amino acid sequence deduced from the nucleotide sequence of the F0 gene, 113–116 corresponds to residues –4 to –1 from the cleavage site.'

- 2) ~~Poultry is defined as 'all domesticated birds, including backyard poultry, used for the production of meat or eggs for consumption, for the production of other commercial products, for restocking supplies of game, or for breeding these categories of birds, as well as fighting cocks used for any purpose'.~~

~~Birds that are kept in captivity for any reason other than those reasons referred to in the preceding paragraph, including those that are kept for shows, races, exhibitions, competitions, or for breeding or selling these categories of birds as well as pet birds, are not considered to be poultry.~~

- 3) For the purposes of the *Terrestrial Code*, the *incubation period* for ND shall be 21 days.
- 43) This chapter deals with NDV *infection of poultry* as defined in point 2 above, in the presence or absence of clinical signs.
- 54) The occurrence of *infection* with NDV is defined as the isolation and identification of NDV as such or the detection of viral ribonucleic acid specific for NDV.
- 65) A Member Country should not impose bans on the trade in *poultry commodities* in response to information on the presence of any APMV-1 in birds other than *poultry*, including *wild* birds.
- 76) Standards for diagnostic tests, including pathogenicity testing, are described in the *Terrestrial Manual*. When the use of ND vaccines is appropriate, those vaccines should comply with the standards described in the *Terrestrial Manual*.

[...]

CHAPTER 12.2.

INFECTION WITH TAYLORELLA EQUIGENITALIS (CONTAGIOUS EQUINE METRITIS)

Article 12.2.1.

General provisions

This chapter addresses the occurrence of clinical or asymptomatic *infection* of a mare caused by *Taylorella equigenitalis* as well as the presence of *T. equigenitalis* on the genital mucous membrane surface in the male horse.

For the purposes of the *Terrestrial Code*, the following defines *infection* with *T. equigenitalis*:

- 1) *T. equigenitalis* has been isolated and identified from a genital swab sample from a horse; or
- 2) antigen or genetic material specific to *T. equigenitalis* has been identified in a sample from a mare-horse showing clinical or pathological signs consistent with *infection* with *T. equigenitalis* or epidemiologically linked to a confirmed or suspected case of *infection* with *T. equigenitalis*;
- 3) genetic material specific to *T. equigenitalis* has been identified in a sample from a male horse.

For the purposes of the *Terrestrial Code*:

- due to long-term persistence of *T. equigenitalis* in horses, the *infective period* shall be lifelong;
- the *incubation period* in mares shall be 14 days.

Standards for diagnostic tests and vaccines are described in the *Terrestrial Manual*.

For the purposes of this chapter, a temporary importation refers to the introduction of a horse into a country or *zone*, for competition or cultural events excluding breeding, for a defined period of time, not exceeding 90 days, during which the *risk* of transmission of the *infection* is mitigated through specific measures under the supervision of the *Veterinary Authority*. Temporary imported horses are re-exported at the end of this period. The duration of the temporary importation period and the destination after this period, as well as the conditions required to leave the country or *zone*, should be defined in advance.

When authorising import or transit of the *commodities* listed in this chapter, with the exception of those listed in Article 12.2.2., *Veterinary Authorities* should require the conditions prescribed in this chapter relevant to the *T. equigenitalis* status of the *exporting country, zone* or establishment/herd.

Article 12.2.2.

Safe commodities

When authorising importation or transit of the following *commodities*, *Veterinary Authorities* should not require any *T. equigenitalis*-related conditions regardless of the *T. equigenitalis infection health* status of the animal population of the exporting country, zone, or establishment/herd:

- 1) geldings;
- 2) *milk* and *milk products*;
- 3) *meat* and *meat products*;
- 4) hides and skins;
- 5) hooves;
- 6) gelatine and collagen.

Article 12.2.3.

EstablishmentHerd free from infection with *T. equigenitalis*1. Prerequisite

Infection with *T. equigenitalis* has been a *notifiable disease* in the entire country for at least the past two years.

2. Qualification

To qualify as free from *infection* with *T. equigenitalis*, an establishmentherd should satisfy the following conditions:

- a) it is under the control of the *Veterinary Authority*;
- b) no *case* has occurred for at least two years;
- c) all horses from the establishmentherd have been subjected to *T. equigenitalis* tests, with negative results. These tests should have been carried out on three occasions, within a 12-day period with an interval of no less than three days apart between each test. Horses must have not been treated with antibiotics for at least 21 days before the sampling;
- d) stored semen was subjected to a test for detection of genetic material of to detect *T. equigenitalis* with negative results, carried out on an aliquot of the stored semen.

3. Maintenance of freedom

- a) requirements in points 1 and 2(a) and 2(b) of Article 12.2.3. are met;
- b) appropriate *surveillance*, capable of detecting *infection* with *T. equigenitalis* even in the absence of clinical signs, is in place; this may be achieved through a *surveillance* programme in accordance with Chapter 1.4. and this chapter;
- c) the introduction of horses and their germplasm into the establishmentherd is carried out in accordance with the import conditions for these *commodities* listed in this chapter.

4. Recovery of freedom

When a *case* is detected in a previously free establishmentherd the free status of the establishment should be suspended until the following conditions are met in the affected establishment:

- a) the *disinfection* of the *establishment* has been applied;
- b) 21 days after the last removal or the last treatment of an infected horse, all horses have been subjected to a *T. equigenitalis* test, with negative results, on three occasions, within a 12-day period with an interval of no less than three days apart between each test;
- c) stored semen from all infected horses in the herd was were subjected to a test to detect *T. equigenitalis* with negative results in accordance with Article 12.2.8., carried out on an aliquot of the stored semen;
- d) the introduction of horses and their germplasm into the establishmentherd is carried out in accordance with the import conditions for these *commodities* listed in this chapter.

Article 12.2.4.

Recommendations for importation of stallions or mares

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that:

- 1) mares showed no clinical sign of *infection* with *T. equigenitalis* on the day of shipment;

AND

- 2) horses have been kept ~~in an establishment~~:
- a) ~~since birth or for at least two years prior to shipment in an establishment~~ herd that has been free from infection with *T. equigenitalis* ~~since birth or for at least two years prior to shipment~~;

OR

- b)
- i) ~~for at least the last 60 days in an establishment~~ herd in which no case has been reported during that period the 60 days prior to shipment;

AND

- ii) were subjected to tests for the detection of the agent *T. equigenitalis* tests, with negative results, on three occasions, within a 12-day period with an interval of no less than three days apart between each test, being the last test carried out within the 30 days prior to shipment. Horses ~~must not~~ have not been treated with antibiotics for at least 21 days prior to sampling and have not been mated after sampling.

Article 12.2.5.

Recommendations for temporary importation of horses

When importing on a temporary basis horses that do not comply with recommendations in Article 12.2.4. for purposes different than breeding and rearing, *Veterinary Authorities* should:

- 1) require:
- a) the animals/horses be accompanied by a passport in accordance with the model contained in Chapter 5.12. or be individually identified as belonging to a high health status *subpopulation* as defined in Chapter 4.17.;
- b) the presentation of an *international veterinary certificate* attesting that the mares showed no clinical sign of infection with *T. equigenitalis* on the day of shipment;
- c) the duration of the temporary importation period and the destination after this period, and the conditions required to leave the country or *zone* be defined;
- 2) ensure that during their stay in the country or *zone*, the animals/horses:
- a) are not used for breeding (including artificial insemination, semen collection, used as teaser stallions) and do not have any sexual contact with other horses;
- b) ~~do not undergo any genital examinations~~ are not subjected to any practice that may represent a risk of transmission of infection with *T. equigenitalis*;
- c) are kept and transported individually in stalls and *vehicles/vessels* which are subsequently cleaned and disinfected before re-use.

Article 12.2.6.

Recommendations for importation of semen of horses

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that:

- 1) semen was collected in an *approved* centre and collection, processing and storing was done in accordance with Chapter 4.6; and

EITHER

- 2) the donor stallion was kept in an establishment ~~herd~~ free from infection with *T. equigenitalis*;

OR

3)

- a) the donor stallion was kept for at least 60 days prior to semen collection in an establishment in which no case has been reported during that period~~the 60 days prior to semen collection~~; and
- b) the donor stallion was subjected to *T. equigenitalis* identification tests, with negative results, on three occasions, within a 12-day period with an interval of no less than three days apart between each test, being the last test carried out within the 30 days prior to shipment. The donor stallion must not have been treated with antibiotics for at least 21 days prior to sampling. Horses have not been treated with antibiotics for at least 21 days prior to sampling and have not been mated after sampling;

OR

- 4) aliquots of fresh semen were subjected to culture and a test for detection of genetic material for *T. equigenitalis* with negative results, carried out immediately prior to processing and on an aliquot of semen collected within 15 to 30 days after the first collection of the semen to be exported;

OR

- 5) aliquots of frozen semen corresponding to the earliest and the most recent collection were subjected to culture and a test for detection of genetic material for *T. equigenitalis* with negative results.

Article 12.2.7.

Recommendations for importation of oocytes or embryos of horses

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that:

- 1) the oocytes and embryos were collected, processed and stored in *approved* centres following the general provisions in accordance with Chapters 4.9. and 4.10.;
- 2) the donor mare showed no clinical signs of *infection* with *T. equigenitalis* on the day of collection;

AND

for the importation of embryos:

- 3) the semen used for embryo production complied with Chapters 4.6. and 4.7.

Article 12.2.8.

Surveillance

1. General principles of surveillance

Surveillance for *infection* with *T. equigenitalis* is relevant for *establishments* seeking to achieve and demonstrate freedom from *infection*, as well as part of an *official control programme* in countries where the disease is endemic.

The *surveillance* strategy chosen should be adequate to detect the *infection* with *T. equigenitalis* even in the absence of clinical signs.

The *Veterinary Services* should implement programmes to raise awareness among farmers-owners, breeders and workers who have day-to-day contact with horses, as well as *veterinarians, veterinary paraprofessionals* and diagnosticians, who should report promptly any suspicion of *infection* with *T. equigenitalis* to the *Veterinary Authority*.

Under the responsibility of the *Veterinary Authority*, Member Countries should have in place:

- a) a formal and ongoing system for detecting and investigating cases;
- b) a procedure for the rapid collection and transport of samples from suspected cases to a *laboratory* for diagnosis;
- c) a system for recording, managing and analysing diagnostic and *surveillance* data.

2. Clinical surveillance

Clinical *surveillance* aims at detecting clinical signs by close physical examination of horses and based on reproduction performance. However, clinical *surveillance* should be complemented by bacteriological and molecular tests, as asymptomatic carriers play an important role in the maintenance and transmission of the *infection*.

3. Agent surveillance

An active programme of *surveillance* of horses to detect cases should be implemented to establish the status of a country, zone or ~~establishment~~herd. Culture for *T. equigenitalis* and molecular testing are the most effective methods of detection of the case.

Stored semen should be included in *surveillance* programmes. It represents a valuable source of material and may be very helpful in contributing to retrospective studies, including providing support for claims of freedom from *infection* and may allow certain studies to be conducted more quickly and at lower cost than other approaches. Samples can be gathered through representative sampling or following a *risk*-based approach.

4. Serological surveillance

Serological *surveillance* is not the preferred strategy for detecting *T. equigenitalis*. If used, serology should be used in conjunction with ~~agent identification~~agent identification-culture in assessing the status of a mare that may have been infected with *T. equigenitalis*. The usefulness of serological tests is further described in the *Terrestrial Manual*.

CHAPTER 12.6.

INFECTION WITH EQUINE INFLUENZA VIRUS

Article 12.6.1.

General provisions

For the purposes of the *Terrestrial Code*, equine influenza (EI) is defined as an *infection* of domestic and captive wild equids with equine influenza virus (EIV), i.e. influenza A viruses (H7N7 and H3N8).

This chapter deals not only with the occurrence of clinical signs caused by infection with equine influenza virus (EIV), but also with the presence of *infection* with EIV in the absence of clinical signs.

The following defines the occurrence of infection with EIV:

- 1) EIV, excluding modified-live virus vaccine strains following recent vaccination, has been isolated from a sample from a domestic or captive wild equid; or
- 2) ribonucleic acid or antigen specific to EIV has been detected in a sample from a domestic or captive wild equid showing clinical signs or pathological lesions suggestive of equine influenza or epidemiologically linked to a suspected or confirmed case of equine influenza; or
- 3) seroconversion due to recent exposure to EIV virus, demonstrated by a significant increase in antibody titres which are not the consequence of vaccination, have been detected in paired samples from a domestic or captive wild equid showing clinical signs or pathological lesions consistent with equine influenza, or epidemiologically linked to a suspected or confirmed case of infection with EIV.

~~For the purposes of this chapter, isolation is defined as 'the separation of domestic equids from domestic equids of a different EI health status, utilising appropriate biosecurity measures, with the purposes of preventing the transmission of infection'.~~

For the purposes of the *Terrestrial Code*, the *infective period* for EI shall be 21 days.

For the purposes of this chapter, a temporary importation refers to the introduction of horses into a country or zone, for a defined period of time, not exceeding 90 days, during which the risk of transmission of the infection is mitigated through specific measures under the supervision of the Veterinary Authority. Temporarily imported horses are re-exported at the end of this period. The duration of the temporary importation period and the destination after this period, as well as the conditions required to leave the country or zone, should be defined in advance.

When authorising import or transit of the *commodities* listed in this chapter, with the exception of those listed in Article 12.6.2., *Veterinary Authorities* should require the conditions prescribed in this chapter relevant to the EI status of the equine population of the *exporting country, zone or compartment*.

Standards for diagnostic tests and vaccines are described in the *Terrestrial Manual*.

Article 12.6.2.

Safe commodities

When authorising the importation or transit of the following *commodities*, *Veterinary Authorities* should not require any EIV-related conditions, regardless of the EI health status of the equine animal population of the *exporting country, zone or compartment*:

- 1) equine semen;
- 2) *in vivo* derived equine embryos collected, processed and stored in accordance with Chapters 4.8. and 4.10., as relevant (under study);;
- 3) meat and meat products from equids that have been slaughtered in a slaughterhouse/abattoir and have been subjected to ante- and post-mortem inspections with favourable results.

Article 12.6.3.

Determination of the EI status of a country, a zone or a compartment

The EI status of a country, a *zone* or a *compartment* can be determined on the basis of the following criteria:

- 1) the outcome of a *risk assessment* identifying all risk factors and their historic relevance;
- 2) whether EI is notifiable in the whole country, an ongoing EI awareness programme is in place, and all notified suspect occurrences of EI are subjected to field and, where applicable, *laboratory* investigations;
- 3) appropriate *surveillance* is in place to demonstrate the presence of *infection* in the absence of clinical signs in domestic and captive wild equids.

Article 12.6.4.

EI free country, zone or compartment free from EI

A country, *zone* or *compartment* may be considered free from EI provided ~~the disease that~~ *infection with EIV* is notifiable in the whole country and it shows evidence, through an effective *surveillance* programme, planned and implemented in accordance with the general principles in Chapter 1.4., that no case of *infection with EIV* occurred in the past two years. The *surveillance* may need to be adapted to parts of the country, *zone* or *compartment* depending on historical or geographical factors, industry structure, population data, movements of equids within and into the country, *zone* or *compartment*, *wild* equine populations or proximity to recent *outbreaks*.

A country, *zone* or *compartment* seeking freedom from EI, in which *vaccination* is practised, should also demonstrate that EIV has not been circulating in the population of domestic, captive wild, feral, and *wild* equids during the past 12 months, through *surveillance*, in accordance with Chapter 1.4. In a country in which *vaccination* is not practised, *surveillance* may be conducted using serological testing alone. In countries where *vaccination* is practised, the *surveillance* should include agent identification methods described in the *Terrestrial Manual* for evidence of *infection*.

A country, *zone* or *compartment* seeking freedom from EI should apply appropriate movement controls to minimise the risk of introduction of EIV in accordance with this chapter and be in accordance with relevant requirements and principles described in Chapter 4.4. and Chapter 4.5.

If an outbreak of clinical EI occurs in a previously free country, zone or compartment, free status can be regained 12 months after the last clinical case, providing that surveillance for evidence of infection has been carried out during that twelve month period in accordance with Chapter 1.4.

Article 12.6.4 bis.

Recovery of free status

If a case of infection with EIV occurs in a previously free country, zone or compartment, free status can be regained 12 months after the last case, providing that surveillance in accordance with Chapter 1.4. has been carried out during that 12-month period, with negative results.

Article 12.6.5.

Recommendations for the importation of domestic and captive wild equids for immediate slaughter

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that the domestic and captive wild equids showed no clinical sign of EI on the day of shipment.

Article 12.6.6.

Recommendations for the importation of domestic and captive wild equids for unrestricted movement

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that the domestic equids:

- 1) came from an EI free country, *zone* or *compartment* in which they had been resident for at least 21 days; in the case of a vaccinated domestic equid, information on its *vaccination* status should be included in the veterinary certificate;

OR

- 2) ~~came from a country, *zone* or *compartment* not known to be free from EI,~~ were subjected to pre-export isolation for 21 days and showed no clinical sign of EI during isolation nor on the day of shipment; ~~and~~

AND

- 3) were ~~immunised~~vaccinated in accordance with the recommendations of the manufacturer with a vaccine complying with the standards described in the *Terrestrial Manual* ~~and considered effective against the epidemiologically relevant virus strains, between 21 and 90 days before shipment either with a primary course or a booster;~~ information on their ~~vaccination~~ status should be included in the veterinary certificate or the passport in accordance with Chapter 5.12. in accordance with one of the following procedures:
 - a) between 14 and 90 days before shipment either with either a primary course or a booster; or
 - b) between 14 and 180 days before shipment, if they are older than four years of age, previously having received up to the date of this pre-shipment vaccination, at least four doses of the same vaccine at intervals not greater than 180 days.

Information on the vaccination status should be included in the international veterinary certificate or the passport in accordance with Chapter 5.12. as relevant.

~~For additional security, e~~Countries that are free of ~~from~~ EI or undertaking an eradication programme may also request that the domestic equids were ~~tested negative for EIV by~~ subjected to an agent identification test for EI described in the *Terrestrial Manual* with negative results, conducted on samples collected on two occasions, ~~at 7 to 14 days~~ four to six days after commencement of pre-export isolation and less than 5 prior to within four days ~~before~~ of prior to shipment.

Article 12.6.7.

Recommendations for the temporary importation of domestic equid which will be kept in isolation (see Article 12.6.1.) horses

If the importation of horses on a temporary basis does not comply with the recommendations in Article 12.6.6., Veterinary Authorities of importing countries should require the presentation of an international veterinary certificate attesting that the domestic equids:

1) require that:

- a) the horses be accompanied by a passport in accordance with the model contained in Chapter 5.12. or be individually identified as belonging to a high health status subpopulation as defined in Chapter 4.17.;
- b) the presentation of an international veterinary certificate attesting that the horses:
 - 4i) came from an ~~EI free~~ country, *zone* or *compartment* free from EI, in which they had been resident for at least 21 days; in the case of a vaccinated domestic equid, information on its *vaccination* status should be included in the veterinary certificate;

OR

- 2ii) showed no clinical sign of EI in any premises in which the domestic equids had been resident for the 21 days prior to shipment nor on the day of shipment; and
 - 3iii) were ~~immunised in accordance~~ vaccinated with ~~the recommendations of the manufacturer with~~ a vaccine complying with the standards described in the *Terrestrial Manual*; information on their *vaccination* status should be included in the veterinary certificate or the passport in accordance with Chapter 5.12.;
- 2) ensure that during their stay in the country or zone domestic equids are kept separated from domestic and captive wild equids of a different EI health status through appropriate biosecurity.**

Article 12.6.8.

Recommendations for the importation of fresh meat of equids

~~Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that the *fresh meat* came from equids which had been subjected to ante- and post-mortem inspections as described in Chapter 6.3.~~

CHAPTER 12.7.

**EQUINE PIROPLASMOSIS INFECTION WITH
THEILERIA EQUI AND BABESIA CABALLI
(EQUINE PIROPLASMOSIS)**

Article 12.7.1.

General provisions

The *infection with use of the term equine piroplasmosis* indicates clinical diseases caused by the transmission of *Theileria equi* (*T. equi*) or *Babesia caballi* (*B. caballi*) established after transmission of these pathogenic agents through competent ticks or iatrogenic practices may be asymptomatic or may cause a clinical disease known as equine piroplasmosis. Vertical transmission from mares to foals has also been reported. This chapter deals not only with the occurrence of clinical disease signs caused by infection with *T. equi* or *B. caballi*, but also with asymptomatic infections the presence of infection with *T. equi* or *B. caballi* in the absence of clinical signs.

Susceptible animals for *infection with T. equi* or *B. caballi* are primarily domestic and wild equids. Although old-world camelids are susceptible to *infection* and are potential reservoirs, they are not found to play a significant role in the epidemiology of the disease.

Equids infected with *T. equi* or *B. caballi* may remain carriers of these blood parasites for long periods, sometimes lifelong and act as sources of *infection* for competent tick vectors of the genera *Dermacentor*, *Rhipicephalus*, *Hyalomma* and *Amblyomma*.

For the purposes of the *Terrestrial Code*, the following defines *infection with T. equi* or *B. caballi*:

- 1) identification of the parasite by microscopic examination of a sample from an equid which may be showing clinical or pathological signs consistent with *infection with T. equi* or *B. caballi* or epidemiologically linked to a confirmed or suspected case of *infection with T. equi* or *B. caballi*; or
- 2) antigen or genetic material specific for *T. equi* or *B. caballi* has been identified in a sample from an equid which may be showing clinical or pathological signs consistent with *infection with T. equi* or *B. caballi* or epidemiologically linked to a confirmed or suspected case of *infection with T. equi* or *B. caballi*; or
- 3) antibodies specific to *T. equi* or *B. caballi* have been identified in a sample from an equid which may be showing clinical or pathological signs consistent with *infection with T. equi* or *B. caballi* or epidemiologically linked to a confirmed or suspected case of *infection with T. equi* or *B. caballi*.

For the purposes of the *Terrestrial Code*, the *incubation period* of *infection with T. equi* or *B. caballi* in equids shall be 30 days and the *infective period* shall be lifelong.

For the purposes of this chapter, a temporary importation refers to the introduction of equidshorses into a country or zone, for a defined period of time, not exceeding 90 days, during which the risk of transmission of the *infection* is mitigated through specific measures under the supervision of the *Veterinary Authority*. Temporarily imported horses are re-exported or slaughtered at the end of this period. The duration of the temporary importation period and the destination after this period, as well as the conditions required to leave the country or zone, should be defined in advance.

When authorising import or transit of the *commodities* listed in this chapter, with the exception of those listed in Article 12.7.2, *Veterinary Authorities* should require the conditions prescribed in this chapter relevant to the status of *infection with T. equi* and *B. caballi* of the *exporting country or zone*.

Standards for diagnostic tests and vaccines are described in the *Terrestrial Manual*.

Article 12.7.2.

Safe commodities

When authorising importation or transit of the following commodities, Veterinary Authorities should not require any conditions related with infection with *T. equi* or *B. caballi*-related conditions, regardless of the infection-health status of the animal population of the exporting country or zone:

- 1) milk and milk products;
- 2) meat and meat products;
- 3) hides and skins;
- 4) hooves;
- 5) gelatine and collagen;
- 6) semen collected;
- 7) sterile filtered horse serum;
- 8) embryos collected, processed and stored in accordance with Chapters 4.9. and 4.10.

Article 12.7.3.

Country or zone free from infection with *T. equi* and *B. caballi*

- 1) Historical freedom as described in Chapter 1.4. does not apply to infection with *T. equi* and *B. caballi*.
- 2) A country or a zone may be considered free from infection with *T. equi* and *B. caballi* when:
 - a) infection with *T. equi* and infection with *B. caballi* have been notifiable diseases in the entire country for at least the past 10 years and, in the country or zone:

EITHER:

- i) there has been no case of infection with *T. equi* and no case of infection with *B. caballi* during the past six years; and
- ii) a surveillance programme performed in accordance with Article 12.7.9. has demonstrated no evidence of infection with *T. equi* and no evidence of infection with *B. caballi* in the past six years and has considered the presence or absence of competent vectors in the epidemiological situation.

OR

- iii) an ongoing surveillance programme performed in accordance with Article 12.7.9. has found no competent tick vectors for at least six years;
- b) imports of equids into the country or zone are carried out in accordance with this chapter. A country or zone free from infection with *T. equi* and *B. caballi* in which an epidemiological investigation has been conducted with favourable results ~~ongoing vector surveillance, performed in accordance with Article 12.7.9., has found no competent tick vector~~ will not lose its free status through the introduction of seropositive or infective equids imported temporarily in accordance with Article 12.7.6.;
- c) a country or zone free from infection with *T. equi* and *B. caballi* adjacent to an infected country or zone should include a high-risk area in which continuous serological, agent and vector surveillance is conducted in accordance with Article 12.7.9.

Article 12.7.4.**Recovery of a free status**

When infection with *T. equi* or *B. caballi* is detected in a previously free country or zone, Article 12.7.3. applies.

Article 12.7.25.**Recommendations for the importation of equines equids**

~~Veterinary Authorities of importing countries~~ should require the presentation of an *international veterinary certificate* attesting that ~~the animals~~:

- 1) the animals showed no clinical signs ~~equine piroplasmosis~~ of infection with *T. equi* or *B. caballi* on the day of shipment, and
- 2) EITHER:
 - a) the animals were kept in a country or zone free from infection with *T. equi* and *B. caballi* since birth;

OR

 - 2) were subjected to diagnostic tests for equine piroplasmosis (*Theileria equi* and *Babesia caballi*) with negative results during the 30 days prior to shipment;
 - b) i) were subjected to a serological ~~or and~~ agent identification test with molecular techniques for the detection of *T. equi* and *B. caballi* with negative results carried out on a blood sample taken within the 14 days prior to shipment; and
- 3) were maintained free from ticks, by preventive treatment when necessary, during the 30 days prior to shipment.
 - ii) were maintained free from competent ticks in accordance with Article 12.7.7. and not subjected to any practice that may present a risk of iatrogenic transmission of infection with *T. equi* or *B. caballi* during the 30 days prior to sampling and after sampling until shipment and throughout the transport to the destination country or zone.

Article 12.7.36.**Recommendations for the temporary importation of equids horses of competition horses on a temporary basis**

~~Veterinary Authorities of importing countries~~ should consider the possibility of importing competition horses on a temporary basis and which are positive to the testing procedure referred to in point 2) of Article 12.7.2. under the following safeguards:

If the importation of equids horses on a temporary basis does not comply with the recommendations in Article 12.7.5., Veterinary Authorities of importing countries should:

4.

- 1) require that:
 - a) the horses are the animal horses be accompanied by a passport in accordance with the model contained in Chapter 5.12. or be individually identified as belonging to a high health status subpopulation as defined in Chapter 4.17.;
 - 2.b) the Veterinary Authorities of importing countries require the presentation of an international veterinary certificate attesting that the animal horses:
 - a-i) showed no clinical sign of equine piroplasmosis infection with *T. equi* or *B. caballi* on the day of shipment;
 - b) were treated against ticks within the seven days prior to shipment;

- ii) were maintained free from ticks in accordance with Article 12.7.7. during the 30 days prior to shipment and during transport;
 - c) the duration of the temporary importation period and the destination after this period, as well as the conditions required to leave the country or zone, be defined;
- 3) ~~the horses are kept in an area where necessary precautions are taken to control ticks and that is under the direct supervision of the Veterinary Authority;~~
 - 4) ~~the horses are regularly examined for the presence of ticks under the direct supervision of the Veterinary Authority.~~
- 2) ensure that during their stay in the country or zone:
 - a) the ~~animals~~horses are protected from ticks in accordance with Article 12.7.7.;
 - b) equidshorses are examined daily for the presence of ticks of the genera *Dermacentor*, *Rhipicephalus*, *Hyalomma* and *Amblyomma* with particular attention to the ears, false nostrils, inter-mandibular space, mane, lower body areas, including the axillae, and inguinal region, and the perineum and tail, with negative results;
 - c) the ~~animals~~horses are not subjected to any practice that may represent a risk of iatrogenic transmission of infection with *T. equi* or *B. caballi*.

Article 12.7.7.

Protecting equids from ticks

Under the direct supervision of the Veterinary Authority:

- 1) equids are kept in tick-protected facilities and transported in protected ~~vehicles~~vehicles/vessels according to Article 12.7.8.;
- 2) equids have been preventively treated according to the manufacturer's recommendations with an acaricide effective against the competent ticks.

Article 12.7.8.

Protecting facilities and transports from ticks

The establishment or facility should be approved by the Veterinary Authority and the means of protection should at least comprise the following:

- 1) measures to limit or eliminate habitats for competent tick vectors should be implemented for an appropriate time and over an appropriate distance in the vicinity of the area where equids are kept;
- 2) the facility and immediate surroundings of the stables and exercise or competition areas should be treated with an effective acaricide before the arrival of equids;
- 3) when transporting ~~animals~~equids through infected countries or zones:
 - a) the vehicle should be treated with an effective acaricide before transporting the animals;
 - b) preventive treatment of the equids with an acaricide with an extended residual effect that lasts at least for the duration of any stopover during the trip should be conducted.

Article 12.7.9.

Surveillance strategies

1. General principles of surveillance

A Member Country should justify the surveillance strategy chosen as being adequate to detect the presence of infection with *T. equi* and the presence of infection with *B. caballi*, ~~even in the absence of clinical signs,~~ given the prevailing epidemiological situation in accordance with Chapter 1.4. and Chapter 1.5. and under the responsibility of the Veterinary Authority.

An active programme of surveillance of equids to detect evidence of infection with *T. equi* and evidence of infection with *B. caballi* by serological or agent identification molecular testing is required to establish the status of a country or zone considering that asymptomatic carriers play an important role in the maintenance and transmission of the infection.

The Veterinary Services should implement programmes to raise awareness among veterinarians, horse owners, riders and workers who have day-to-day contact with equids, as well as veterinary paraprofessionals and diagnosticians, who should report promptly any suspicion of infection with *T. equi* and any suspicion of infection with *B. caballi* to the Veterinary Authority.

Under the responsibility of the Veterinary Authority, Member Countries should have in place:

- = a formal and ongoing system for detecting and investigating cases;
- = a procedure for the rapid collection and transport of samples from suspected cases of infection with *T. equi* or *B. caballi* to a laboratory for diagnosis;
- = a system for recording, managing and analysing diagnostic and surveillance data.

2. Clinical surveillance

Clinical surveillance aims at detecting clinical signs by close physical examination of equids.

3. Serological and agent surveillance

An active programme of surveillance of equids to detect evidence of infection with *T. equi* and evidence of infection with *B. caballi* by serological or agent identification test with molecular techniques is required to establish the status of a country or zone considering that asymptomatic carriers play an important role in the maintenance and transmission of the infection.

The study population used for a serological survey should be representative of the population at risk in the country or zone.

4. Surveillance in high-risk areas

Disease-specific enhanced surveillance in a free country or zone should be carried out over an appropriate distance from the border with an infected country or zone, based upon geography, climate, history of infection and other relevant factors. The surveillance should be carried out particularly over the border with that country or zone unless there are relevant ecological or geographical features likely to limit the spatial distribution and thereby prevent the infestation of equids from competent ticks and interrupt the transmission of infection with *T. equi* or *B. caballi*.

5. Vector surveillance

Infection with *T. equi* or *B. caballi* is transmitted between equine hosts by species of Ixodid ticks in the genera *Dermacentor*, *Rhipicephalus*, *Hyalomma*, and *Amblyomma*.

Vector surveillance is aimed at demonstrating the absence of tick vectors or defining high, medium and low-risk areas and local details of seasonality by determining the various species present in an area, their respective seasonal occurrence, and abundance. Vector surveillance has particular relevance to potential areas of spread. Long term surveillance can also be used to assess vector abatement measures or to confirm the continued absence of vectors.

Vector surveillance sampling should be scientifically based. The choice of the number and types of traps to be used in vector surveillance and the frequency of their use should consider the size and ecological characteristics of the area to be surveyed as well as the biology and behavioural characteristics of the local vector species of Ixodid ticks.

The use of a vector surveillance system to detect the presence of circulating *T. equi* or *B. caballi* is not recommended as a routine procedure. Animal-based surveillance strategies are preferred to detect *T. equi* or *B. caballi* transmission than entomological surveillance.

CHAPTER 14.X.

INFECTION WITH *THEILERIA LESTOQUARDI*, *T. LUWENSHUNI* AND *T. UILENBERGI*

Article 14.X.1.

General provisions

~~Animals susceptible to infection with *Theileria* are~~ **Theileriosis is a disease of** bovines (*Bos indicus*, *B. taurus* and *B. grunniens*), water buffaloes (*Bubalus bubalis*), African buffaloes (*Syncerus caffer*), sheep (*Ovis aries*), goats (*Capra hircus*), camels (*Camellus dromedarius* and *C. bactrianus*) and some wild ruminants.

~~Infection with *Theileria*~~**Theileriosis** can give rise to disease of variable severity and ~~to *Theileria* transmission.~~
~~*Theileria* the pathogenic agent~~ may persist in ruminants for their lifetime. Such animals are considered carriers.

Only sheep and goats play a significant epidemiological role in the infection with *Theileria lestoquardi*, *T. luwenshuni* and *T. uilenbergi*.

For the purposes of the *Terrestrial Code*, infection with *Theileria lestoquardi*, *T. luwenshuni* and *T. uilenbergi* are defined as a tickborne infection of sheep and goats with *T. lestoquardi*, *T. luwenshuni* and *T. uilenbergi*.

For the purposes of this chapter, *Theileria* means *T. lestoquardi*, *T. luwenshuni* and *T. uilenbergi*.

The following defines the occurrence of infection with *Theileria*:

- 1) *Theileria* has been identified in a sample from a sheep or goat; or
- 2) antigen or nucleic acid specific to *Theileria* has been identified in a sample from a sheep or goat showing clinical signs consistent with infection with *Theileria*, or epidemiologically linked to a suspected or confirmed case, or giving cause for suspicion of previous association with *Theileria*; or
- 3) antibodies specific to *Theileria* have been detected in a sample from a sheep or goat ~~that either shows~~**showing** clinical signs consistent with *Theileria*, or **is** epidemiologically linked to a suspected or confirmed case, or giving cause for suspicion of previous association with *Theileria*.

For the purposes of the *Terrestrial Code*, the incubation period for infection with *Theileria* shall be 35 days.

Standards for diagnostic tests ~~and vaccines~~ are described in the *Terrestrial Manual*.

Article 14.X.2.

Safe commodities

When authorising ~~the~~ **importation** or transit of the following commodities, *Veterinary Authorities* should not require any *Theileria*-related conditions regardless of the ~~*Theileria* infection~~ **health** status of the animal population of the exporting country ~~or zone~~:

- 1) meat and meat products;
- 2) casings;
- 3) milk and milk products;
- 4) gelatine and collagen;
- 5) tallow;
- 6) semen and embryos;
- 7) hooves and horns;
- 8) bones.

Article 14.X.3.

Country or zone free from infection with *Theileria* in sheep and goats

- 1) A country or a *zone* may be considered free from *infection* with *Theileria* when the disease is notifiable in the entire country, importation of sheep and goats and their *commodities* is carried out in accordance with this chapter, and:
 - a) the country or *zone* is historically free as described in Article 1.4.6.; or
 - b) a *surveillance* programme in accordance with Chapter 1.4. has demonstrated no evidence of *infection* with *Theileria* in the country or *zone* for at least two years; or
 - c) an ongoing *surveillance* programme in accordance with Chapter 1.5. has found no **competent** tick vectors for at least two years in the country or *zone*.
- 2) A country or *zone* free from *infection* with *Theileria* in which ongoing *vector surveillance*, performed in accordance with Chapter 1.5., has found no **competent** tick vectors will not lose its free status through the introduction of vaccinated, test-positive or infected sheep and goats from infected countries or *zones*.
- 3) A country or *zone* free from *infection* with *Theileria* will not lose its status as a result of introduction of seropositive or vaccinated sheep and goats or their *commodities*, provided they were introduced in accordance with this chapter.

Article 14.X.4.

Recommendations for importation **of sheep and goats from countries or zones free from infection with *Theileria*****For sheep and goats**

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that the animals:

- 1) showed no clinical sign of *infection* with *Theileria* on the day of shipment;
- 2) come from a country or *zone* free from *infection* with *Theileria*.

Article 14.X.5.

Recommendations for importation **of sheep and goats from countries or zones not free from infection with *Theileria*****For sheep and goats**

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that the animals:

- 1) showed no clinical sign of *infection* with *Theileria* and no *infestation* with tick vectors on the day of shipment;
- 2) were kept isolated for at least 35 days prior to shipment in an *establishment* where no *case* of *infection* with *Theileria* has occurred during the preceding two years;
- 3) were treated with a registered acaricide, **the efficacy of which has been confirmed in relation to the area of origin of the animals, at the time of entry into the isolation establishment and then at regular intervals, according to manufacturer's instructions, allowing continuous protection against ticks until their shipment 48 hours prior to entry to the establishment, no more than two days after entering the establishment and three days prior to shipment;**
- 4) were subjected to **serological and agent detection tests with negative results on samples taken immediately prior to entry and at least 25 days after entry into the isolation establishment and five days before shipment.**

Article 14.X.6.

Recommendations for importation of hides and skins from countries or zones not free from infection with *Theileria*

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that the products have been:

Annex 13 (contd)

- 1) dry-salted or wet-salted for a period of at least 14 days prior to dispatch; or
- 2) treated for a period of at least seven days in salt (NaCl) with the addition of 2% sodium carbonate (Na₂CO₃);
or
- 3) dried for a period of at least 42 days at a temperature of at least 20°C; or
- 4) frozen to at least -20°C for at least 48 hours.

Article 14.X.7.

Recommendations for importation of wool and fibre of sheep and goats from countries or zones not free from infection with *Theileria*

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that the products were subjected to:

- 1) industrial washing, which consists of the immersion of the wool in a series of baths of water, soap and sodium hydroxide or potassium hydroxide; or
- 2) industrial scouring, which consists of the immersion of wool in a water-soluble detergent held at 60–70°C.

Article 14.X.8.

Recommendations for importation of trophies derived from susceptible **wild ruminants from countries or zones not free from infection with *Theileria***

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that the products have been processed to ensure the destruction of tick *vectors*.

CHAPTER X.X.

**INFECTION WITH MIDDLE EAST RESPIRATORY
SYNDROME CORONAVIRUS**

Article X.X.1.

General provisions

Middle East respiratory syndrome (MERS) is a viral respiratory infection of humans and dromedary camels which is caused by a coronavirus called Middle East Respiratory Syndrome Coronavirus (MERS-CoV).

Dromedary camels (*Camelus dromedarius*) have been confirmed by several studies to be the natural host and zoonotic source of the MERS-CoV infection in humans. Other species may be susceptible to *infection* with MERS-CoV. However, their epidemiological significance has not been demonstrated.

MERS-CoV has been associated with mild upper respiratory signs in some dromedary camels. While the impact of MERS-CoV on animal health is very low, human infections have a significant public health impact.

For the purposes of the *Terrestrial Code*, MERS is defined as an *infection* of dromedary camels with MERS-CoV.

The following defines the occurrence of *infection* with MERS-CoV:

- 1) MERS-CoV has been isolated from a dromedary camel, or
- 2) nucleic acid specific to MERS-CoV has been identified in samples from a dromedary camel showing clinical signs or pathological lesions suggestive of MERS-CoV or epidemiologically linked to a suspected or confirmed case of MERS-CoV, or from a dromedary camel giving cause for suspicion of previous association or contact with MERS-CoV.

Standards for diagnostic tests are described in the *Terrestrial Manual*.

CHAPTER X.Y.
**INFECTION WITH *LEISHMANIA* SPP.
(LEISHMANIOSIS)**

Article X.Y.1.

General provisions

For the purposes of the *Terrestrial Code*, *infection with Leishmania spp.* is defined as an *infection* of dogs and cats by parasites of the family *Trypanosomatidae*, order *Kinetoplastida*.

The *infection* is usually transmitted by the bite of an infected *Phlebotomus* sandfly.

The following defines the occurrence of *infection with Leishmania spp.*:

- 1) *Leishmania spp.* amastigotes have been observed in samples from a dog or a cat, or
- 2) Nucleic acid specific to *Leishmania spp.* has been detected in a sample from a dog or a cat showing clinical signs or pathological lesions consistent with infection with *Leishmania spp.*, or epidemiologically linked to a case, or giving cause for suspicion of previous association or contact with *Leishmania spp.*, or
- 3) Antibodies specific to *Leishmania spp.* that are not the consequence of vaccination have been detected in a sample from a dog or a cat showing clinical signs or pathological lesions consistent with infection with *Leishmania spp.*, or epidemiologically linked to a case, or giving cause for suspicion of previous association or contact with *Leishmania spp.*

Standards for diagnostic tests and vaccines are described in the *Terrestrial Manual*.

© **World Organisation for Animal Health (OIE), 2022**

This document has been prepared by specialists convened by the World Organisation for Animal Health (OIE). Pending adoption by the World Assembly of Delegates, the views expressed herein can only be construed as those of these specialists.

All OIE publications are protected by international copyright law. Extracts may be copied, reproduced, translated, adapted or published in journals, documents, books, electronic media and any other medium destined for the public, for information, educational or commercial purposes, provided prior written permission has been granted by the OIE.

The designations and denominations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the OIE concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in signed articles are solely the responsibility of the authors. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE in preference to others of a similar nature that are not mentioned.