Annex 3

WORK PROGRAMME FOR
THE TERRESTRIAL ANIMAL HEALTH STANDARDS COMMISSION

EU comment

The EU commends the Code Commission for its continuous efforts to prioritise its heavy work programme, in coordination with other specialist commissions as relevant. We thank the Code Commission for having taken into consideration comments submitted previously. We fully support the revised work programme and its prioritisation.

Regarding the detection of certain Influenza A viruses of avian origin in (wild) mammals, we have noted that some countries notify such detections via WAHIS as "Influenza A viruses of high pathogenicity (Inf. with) (non-poultry including wild birds)", with reference to Article 1.1.3.1.f) of the code ("occurrence of a *listed disease* in an unusual host species"), while others inform WOAH with reference to Article 1.1.5.1. ("*Although Member Countries are only required to notify listed diseases and emerging diseases, they are encouraged to provide the OIE with other important animal health information.*"). Given that both "Infection with high pathogenicity avian influenza viruses" and "Infection of birds other than poultry, including wild birds, with influenza A viruses of high pathogenicity" are listed in Article 1.3.6. ("category of avian diseases and infections"), and that the relevant case definitions in points 1 and 4 of Article 10.4.1. refer only to occurrence in poultry and birds other than poultry, respectively, the EU queries whether the detection of Influenza A viruses of avian origin in (wild) mammals is notifiable to WOAH via WAHIS, and if yes under what provision(s) of the Code.

As usual, the EU advocates for a transparent approach to the animal health situation globally. This point is even more important considering the One Health context, and therefore there is a need for clear indications enabling transparent reporting on animal diseases worldwide. However, we believe that clarification and guidance to all WOAH Members on the procedures would encourage adherence to WOAH standards.

Chapter	Issues	Summary of the work	Status - February 2023	Priority order *

			Stage of consideration	Remarks (Month when draft text first circulated for comment /# of rounds for comment)	
General	Wildlife Health	Overarching consideration on how wildlife animal health is addressed in the *Terrestrial Code*	Preliminary discussions	Noted in Feb 2023 TAHSC report	3
	Five domains concept	Impact assessment for the inclusion of the concept in the *Terrestrial Code* (revision of Ch 7.1. as well)	Preparatory work	Noted in Feb 2023 TAHSC report	2
	Pet-food commodities	Consider the inclusion of 'extruded dry pet food' and 'heat-treated meat products in a hermetically sealed container with an F0 value of 3 or above' in the list of safe commodities of chapters (when revised).	Preparatory work	Refer to Sep 2022 TASHC report	2
		In Chapter 15.1. Infection with African swine fever virus	Preparatory work	Noted in Feb 2023 TASHC report	2
Use of terms	Use of terms: disease / infection / infestation	Review use of the terms across the Code for consistency	Preparatory work	Refer to Feb 2020 TAHSC report	2
	Use of terms: animal health status	Review use of the terms across the Code for consistency	Preparatory work	Refer to Feb 2020 TAHSC report	3
	Use of terms: animal-based measures / measurables	Review use of the terms across the Code for consistency Develop a policy for their use	Preparatory work	Noted in Feb 2023 TAHSC report	2
	Use of terms: enzootic / endemic / epizootic / epidemic	To consider replacing 'enzootic' with 'endemic' and 'epizootic' with 'epidemic' throughout the Code	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Sep 2022/2)	1

	Use of terms: notify / notifiable disease / report / reportable disease	Review use of the terms across the Code for consistency. Develop a policy for their use	Preparatory work	Refer to Feb 2019 TAHSC report	2
	Use of terms: Competent Authority / Veterinary Authority / Veterinary Services	Review use of the terms across the Code for consistency	Circulated for comments	Noted in Feb 2023 TAHSC report (Feb 2023/1)	1
	Use of terms: fetal / foetal / fetus / foetus	Review use of the terms across the Code for consistency	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Sep 2022/2)	1
	Use of terms: bovid / bovidae / bovine / cattle	Review use of the terms across the Code for consistency Develop a policy for their use	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Sep 2022/2)	1
User's guide	Revision of the Users' guide (standing item)	Amendments related to use of terms: Competent Authority / Veterinary Authority / Veterinary Services and bovid / bovidae / bovine / cattle	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Sep 2022/2)	1
Glossary	'Death', 'euthanasia', 'slaughter' and 'stunning'	In-depth revision in relation to work on Ch 7.5-7.6	Expert consultation	Noted in Sep 2022 TAHSC report (Sep 2019/3)	1
	New definition for 'protein meal'	Develop the new definition as a result of discussion on revision of Ch 11.4.	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Feb 2021/5)	1
	New definitions for 'distress' and 'pain'	Develop the new definitions as a result of discussion on revision of Ch 7.5. (to remove them from Ch 7.8.)	Circulated for comments (proposed for adoption in May 2023)	Refer to Sep 2022 TAHSC report (Sep 2019/2)	1

	New definitions for ‘animal products’, ‘product of animal origin’ and ‘animal by-product’	Review use of the terms across the Code for consistency. Develop a policy for their use and draft definitions.	Circulated for comments	Noted in Feb 2023 TAHSC report (Feb 2023/1)	2
	New definition for ‘swill’	Review use of the term across the Code. Develop a policy for its use and consider developing a definition. (connected to biosecurity work)	Preparatory work	Noted in Feb 2023 TAHSC report	2
	Use of terms ‘meat-and-bone meal’ and ‘greaves’	Review use of the term ‘meat-and-bone meal’ across the Code and consider replacing the term with 'protein meal’ after adoption of new definition	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Sep 2022/2)	1
		Review use of the term ‘greaves’ across the Code and consider replacing the term with 'protein meal’ after adoption of new definition	Preparatory work	Refer to Sep 2022 TAHSC report	2
Section 1					
1.3.	Listing of Infection with *T. lestoquardi*, *T. luwenshuni* and *T. uilenbergi* (Article 1.3.3.)	Consider listing based on the conclusion that the disease meets the criteria for listing	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Feb 2022/3)	1
	Revision of disease names: Infection of dromedary camels with Middle East respiratory syndrome coronavirus, Leishmaniosis	Partial revision to align disease names with the title of corresponding disease-specific chapters	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Feb 2023/1)	1
	Revision of animal categories	Partial revision of the animal categories referred to in each article	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TASHC report (Feb 2023/1)	1

1.6.	Procedures for official recognition of animal health status, endorsement of an official control programme, and publication of a self-declaration of animal health status, by WOAH	Partial revision to improve clarity on the ability for Members to hold pathogenic agents within laboratories without affecting their animal health status	Circulated for comments	Noted in Feb 2023 TAHSC report (Feb 2023/1)	2
1.8.	Application for official recognition by WOAH of free status for bovine spongiform encephalopathy	Full revision of chapter	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Sep 2019/7)	1
Section 4					
4.4.	Zoning and compartmentalisation	Partial revision to define a time limit for containment zones	Preparatory work	Refer to Sep 2021 TAHSC report	1
4.6.	Collection and processing of semen of animals	Comprehensive revision of chapter	Circulated for comments	Noted in Feb 2023 TAHSC report (Sep 2022/2)	1
4.7.	Collection and processing of bovine, small ruminant and porcine semen	Comprehensive revision of chapter	Preparatory work	Pending progress of the work on Ch 4.6.	3
4.8.	Collection and processing of *in vivo* derived embryos from livestock and equids	Consider potential amendments as a consequence of the changes in the IETS Manual	Preparatory work	Pending progress of data collection	2
4.9.	Collection and processing of oocytes and *in vitro* produced embryos from livestock and horses	Consider potential amendments as a consequence of the changes in the IETS Manual	Preparatory work	Pending progress of data collection	2
4.13.	Disposal of dead animals	Consider including all potentially contaminated wastes/products/fomites	Preparatory work	Refer to Feb 2022 TAHSC report	2
4.14.	General recommendations on disinfection and disinsection	Comprehensive revision of chapter	Preparatory work	Refer to Feb 2022 TAHSC report	2

4.X.	New chapter on biosecurity	Develop a new chapter	Expert consultation	Noted in Feb 2023 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.)	Comprehensive revision of Chs 5.4. to 5.7.	Expert consultation	Noted in Feb 2023 TAHSC report	1
5.2.	Certification procedures	Partial revision to review provisions on electronic certification	Expert consultation	Refer to Sep 2022 TAHSC report	3
5.11.	Model veterinary certificate for international movement of dogs, cats and ferrets originating from countries considered infected with rabies	Consequential revision due to revision of Ch 8.14.	Preparatory work	Pending progress of the work on Ch 8.14.	3
5.12.	Model passport for international movement of competition horses	Update the relevant chapters on equine diseases to take into account proposals made by the AHG on HHP Horses Veterinary Certificates	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	Review the chapter based on the revised Glossary definitions for 'CA', 'VA' and 'VS'	Preparatory work	Refer to Sep 2022 TAHSC report	3
6.3.	Control of biological hazards of animal health and public health importance through ante- and post-mortem meat inspection	Revision to avoid duplication with Ch 6.2., to simplify and to refer to relevant Codex GLs more	Not started	-	3

6.10.	Responsible and prudent use of antimicrobial agents in veterinary medicine	Comprehensive revision of chapter	Circulated for comments	Noted in Feb 2023 TAHSC report (Sep 2022/1)	1
6.12.	Zoonoses transmissible from non-human primates	Consider possible inclusion of SARS-CoV-2 in this chapter, possible inclusion of Macacine Herpesvirus 1 and the revision of test schedule and animal species to be tested for tuberculosis (Origin Member requests)	Not started	Refer to Feb 2022 TAHSC report	3
Section 7					
7.2., 7.3.	Transport of animals by land and sea	Comprehensive revision of chapters	Expert consultation	Noted in Feb 2023 TAHSC report	2
7.4.	Transport of animals by air	Comprehensive revision of chapter	Preparatory work	Refer to Sep 2022 TAHSC report	3
7.5.	Slaughter of animals	Comprehensive revision of chapter	Expert consultation	Refer to Sep 2022 TAHSC report (Feb 2021/2)	1
7.6.	Killing of animals for disease control purposes	Comprehensive revision of chapter	Expert consultation	Refer to Sep 2022 TAHSC report	2
Section 8					
8.8.	Infection with foot and mouth disease virus	Comprehensive revision of chapter (including harmonisation of chapters with official status recognition)	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Sep 2015/5)	1
8.10.	Japanese encephalitis	Comprehensive revision of chapter (related to works on Chs 12.4. and 12.11.)	Expert consultation	Noted in Feb 2023 TAHSC report	2
8.11.	Infection with *Mycobacterium tuberculosis* complex	Partial revision - to add recommendations for camelids and goats	Not started	Refer to Feb 2022 TAHSC report	3

		- to clarify point 1(b) of Article 8.11.4.			
8.13.	Paratuberculosis	Consider amendments to ensure alignment with recently revised Manual chapter	Not started	Refer to Sep 2020 TAHSC report	4
8.14.	Infection with rabies virus	Partial revision - to amend the provisions for the importation of vaccinated dogs from infected countries or zones - to add provisions for the implementation of a rabies vaccination programme for dogs	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Sep 2020/4)	1
		Partial revision - to add recommendations on wildlife-mediated rabies	Preparatory work	Refer to Sep 2022 TAHSC report	3
8.15.	Infection with Rift Valley fever virus	Comprehensive revision of chapter	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Feb 2019/6)	1
8.X.	New Chapter on Infection with *Coxiella burnetiid* (Q fever)	Develop a new chapter	Circulated for comments	Noted in Feb 2023 TAHSC report (Sep 2022/2)	2
8.Y.	New Chapter on infection with *Leishmania* spp. (Leishmaniosis)	Develop a new chapter following Manual chapter	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Feb 2022/3)	1
8.Z.	New Chapter on Surra	Develop a new chapter	Circulated for comments	Noted in Feb 2023 TAHSC report (Feb 2023/1)	2

Section 10					
10.3.	Avian infectious laryngotracheitis	Consider amendments to ensure alignment with recently revised Manual chapter	Not started	Refer to Sep 2020 TAHSC report	4
10.5.	Infection with *Mycoplasma gallisepticum* (Avian mycoplasmosis)	Full update of the chapter (content and structure) based on the recent update of the *Manual* Chapter. Consider inclusion of *M. synoviae* into a single chapter (and listed disease).	Preparatory work	Noted in Feb 2023 TAHSC report	3
10.9.	Infection with Newcastle disease virus	Remove the definition of poultry	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Feb 2022/3)	1
		Revision to align with recent revision of Ch 10.4.	Not started	Refer to Feb 2022 TAHSC report	3
Section 11					
11.4.	Bovine spongiform encephalopathy	Comprehensive revision of chapter	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Sep 2019/7)	1
11.5.	Infection with *Mycoplasma mycoides* subsp. *mycoides* SC (Contagious bovine pleuropneumonia)	Harmonisation of chapters with official status recognition	Circulated for comments	Noted in Feb 2023 TAHSC report (Sep 2022/2)	2
11.11.	Trichomonosis	Comprehensive revision of chapter	Expert consultation	Refer to Feb 2022 TAHSC report (Sep 2020/2)	3

11.X.	New Chapter on Infection with bovine pestivirus (bovine viral diarrhoea)	Develop a new chapter	Circulated for comments	Noted in Feb 2023 TAHSC report (Sep 2022/2)	2
Section 12					
12.1.	African horse sickness	Harmonisation of chapters with official status recognition Proposals from AHG on AHS and SCAD	Circulated for comments	Noted in Feb 2023 TAHSC report (Sep 2022/2)	2
12.2.	Contagious equine metritis	Comprehensive revision of chapter	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Sep 2020/4)	1
12.3.	Dourine	Comprehensive revision of chapter	Expert consultation	Noted in Feb 2023 TAHSC report	2
12.4.	Equine encephalomyelitis (Eastern and Western)	Comprehensive revision of chapter (related to works on Chs 8.10. and 12.11.)	Expert consultation	Noted in Feb 2023 TAHSC report	2
12.6.	Infection with equine influenza virus	Partial revision - to add a case definition - to revise Article 12.6.6. based on the outcomes of work to evaluate equine influenza vaccination protocols prior to shipment of horses coordinated by a WOAH Reference Laboratory - to consider the consequential amendments to the chapter	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Feb 2019/6)	1
12.7.	Equine piroplasmosis	Comprehensive revision of chapter	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Sep 2020/4)	1

12.11.	Venezuelan equine encephalomyelitis	Comprehensive revision of chapter (related to works on Chs 8.10. and 12.4.)	Expert consultation	Noted in Feb 2023 TAHSC report	2
Section 13					
13.2.	Rabbit haemorrhagic disease	Partial revision - to add a case definition - to add a new article on recovery of free status - to revise other articles, as appropriate	Circulated for comments	Noted in Feb 2023 TAHSC report (Feb 2023/1)	3
Section 14					
14.8.	Scrapie	Comprehensive revision of chapter	Preparatory work	Noted in Feb 2023 TAHSC report	2
14.9.	Sheep pox and goat pox	(Not defined yet)	Not started	Noted in Feb 2023 TAHSC report	3
14.X.	New Chapter on infection with *Theileria* in small ruminants	Develop a new chapter	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Sep 2017/4)	1
Section 15					
15.3.	Infection with porcine reproductive and respiratory syndrome virus (Article 15.3.9.)	Partial revision to address a concern that the testing regime in relation to semen collection centres is not sufficient to prevent the introduction of the virus through semen from countries that are not free from PRRS	Not started	Refer to Feb 2018 TAHSC report	4
Others					
X.X.	New Chapter on Crimean Congo haemorrhagic fever	Develop a new chapter	Preparatory work	Noted in Feb 2023 TAHSC report	2

				Pending ongoing work on case definition	
16.1.	New Chapter on infection with Middle East respiratory syndrome coronavirus	Develop a new chapter following listing and Manual chapter	Circulated for comments (proposed for adoption in May 2023)	Noted in Feb 2023 TAHSC report (Feb 2022/3)	1
16.Z.	New Chapter on Camelpox	Develop a new chapter	Circulated for comments	Noted in Feb 2023 TAHSC report (Sep 2022/2)	2

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

List of abbreviations	
AHG	***Ad hoc* Group**
BSC	**Biological Standards Commission**
Ch	**Chapter**
HQ	**WOAH Headquarters**
IETS	**International Embryo Technology Society**

SCAD	**Scientific Commission for Animal Diseases**
TAHSC	**Terrestrial Animal Health Standard Commission**

EU comment

The EU supports the proposed changes to the glossary.

GLOSSARY

ANIMAL PRODUCT

means any part of an *animal*, and raw or manufactured products containing any material derived from *animals*, excluding germinal products, biological products and *pathological material*.

COMMODITY

means live *animals*, animal products ~~of animal origin~~, ~~animal genetic material~~ germinal products, biological products and *pathological material*.

GERMINAL PRODUCTS

means animal semen, oocytes, embryos and *hatching eggs*.

EU comment

The EU thanks the Code Commission for the review of this chapter and for considering the EU suggestions. One comment is provided below.

CHAPTER 4.6.

~~GENERAL HYGIENE IN~~ SEMEN COLLECTION, PROCESSING AND STORAGE

Article 4.6.1.

General provisions

The objective of this chapter is to provide recommendations that will reduce the likelihood of introduction and spread of *listed diseases* and contamination of fresh, chilled, or frozen semen of various species of donor animals with ~~potentially~~ pathogenic agents in a *semen collection centre*.

1) This chapter provides recommendations on:

~~1~~a) procedures for the collection, processing, and storage of semen of bovine, ovine, caprine, porcine, equine, and cervid donor animals;

~~2~~b) *biosecurity* ~~measures~~ for the ~~operation of~~ *semen collection centres*;

~~3~~c) conditions applicable to the management and housing of semen donor animals and teasers.

This chapter provides a comprehensive framework for processes that can be applied to reduce the likelihood of transmission of *listed diseases* ~~in~~ through semen. *Veterinary Services* play a key role in identifying, assessing, and managing disease *risk* posed by the collection, processing, and storage of semen from various species of donor animals in a *semen collection centre*

and establishing appropriate measures to minimize this risk. The *Veterinary Authority* should provide the regulatory standards and/or oversight to ensure that the recommendations in this chapter, as appropriate, are complied with.

Although this chapter is focused on reducing the probability of transmitting *listed diseases* through international trade of semen, tThe recommendations in this chapter may also be appropriately applyied when to semen is collected, processed, and stored for international trade or for domestic distribution.

Recommendations on *animal welfare* in accordance with the principles in Chapter 7.1. of the *Terrestrial Code* are applicable should be applied to the animals kept within the *semen collection centre*, in accordance with relevant articles in Chapter 7.1. of the *Terrestrial Code*.

Recommendations regarding specific animal health requirements for donor animals to provide assurance of the absence of selected *listed diseases*, infections and infestations are found in Chapter 4.7. and other relevant disease-specific chapters.

2) For the purposes of the *Terrestrial Code,* the *semen collection centre* is comprised of:

1a) animal accommodation facilities;

2b) semen collection facilities;

3c) semen processing facilities, including mobile laboratories processing units;

4d) semen storage facilities;

5e) administration offices.

The listed facilities may be on one location or consist of single or multiple facility entities on several locations.

3) For the purposes of this chapter,

1a) 'biosecure' refers to the state of a place or facility, in which *biosecurity* is effectively implemented;

2b) 'resident facility' means a biosecure animal accommodation facility where donor and teaser animals are kept for the purpose of semen collection;

3c) 'pre-entry isolation facility' means a biosecure animal accommodation facility where donor and teaser animals are subjected to testing prior to entering the resident facility;

4d) 'germplasm cryogenic storage tank' means a sealable canister tank for storage and transport of semen, embryos or oocytes.

EU comment

Editorial comment since the document also relates to fresh semen and embryos.

The EU suggest this wording: "for storage and transport of frozen semen".

Article 4.6.2.

General conditions applicable to semen collection centres

For the approval of ~~T~~the *semen collection centre* ~~should be approved~~ by the *Veterinary Authority*~~.~~
~~For that purpose~~, the *Veterinary Services* should conduct regular audits of *biosecurity plans*, protocols, procedures and records on the health of the animals in the *semen collection centre* and on the hygienic production, storage and dispatch of semen, at least annually, and request and verify appropriate corrective actions, if needed.

Each facility in the *semen collection centre* should be under the direct supervision of a *veterinarian* who is responsible for ensuring that in the facilities under its supervision, the health~~,~~ and welfare of animals are monitored, ~~and~~ the *biosecurity plan* ~~in the facilities under his/her supervision are~~ is implemented, and all documentation including records of procedures is kept current and accessible.

Animal identification, animal traceability, and movement *registration* should be in accordance with Chapter 4.2. and Chapter 4.3.
The *semen collection centre* should implement and document processes that ensure identification and traceability of semen from collection to processing and storage and final dispatch from the semen storage facility. Fresh, chilled, or frozen semen products stored and/or dispatched from the semen storage facility should be identified ~~in accordance with the national regulation~~ to allow accurate and transparent identification of the donor animal, where the semen was collected and/or processed, and when it was collected.

Donor and teaser animals should be ~~maintained~~ kept in animal accommodation facilities separately from animals not associated with the *semen collection centre* ~~or maintained in separate animal accommodation facilities that may have a different *animal health status*~~.

Biosecurity plans should be developed for the *semen collection centre* in accordance with a *risk analysis* and should at a minimum address the following ~~for each facility~~:

1) Personnel on the *semen collection centre* should be technically competent and apply ~~high standards of~~ personal hygiene, to prevent the introduction of pathogenic agents. Personnel should receive regular training and demonstrate competency of skills applicable to the *semen collection centre* and covering ~~his/her~~ their specific responsibilities at the centre, which are documented.

2) In general, only donor and teaser animals of the same species should be permitted to the *semen collection centre*. All donor and teaser animals should meet the animal health status as determined by the *semen collection centre* and comply with the regulations set out by the *Veterinary Authority*. If other animals are needed on the *semen collection centre*, such as dogs for herding purposes, these should be kept on the *semen collection centre* and not transferred from one establishment to another and measures to prevent their contacts with *wildlife* should be implemented. If ~~O~~other species are needed ~~may be resident~~ on the *semen collection centre*, ~~provided that~~ appropriate pre-entry tests should have been

conducted and *biosecurity* ~~is~~ should be in place to ensure they meet the animal health status as determined by the *semen collection centre* prior to entry. ~~These animals should be kept in separate biosecure animal accommodation facilities that are physically separate from animals associated with semen production.~~

3) Natural mating should be avoided at least ~~four weeks~~ 30 days prior to entry into the pre-entry isolation facility and ~~avoided~~ should not occur after entry into the animal accommodation facility or semen collection facility.

4) Measures should be in place to prevent the entry of ~~*wildlife*~~ *wild* or *feral* animals (including rodents and arthropods) or other domestic animals susceptible to pathogenic agents transmissible to the animals in the *semen collection centre*.

5) In accordance with a *biosecurity plan*,

i) ~~T~~the entry of visitors to any part of the *semen collection centre* where *biosecurity* is required should only be allowed if authorised and controlled~~.~~;

ii) ~~A~~appropriate protective clothing and footwear only for use within the *semen collection centre* facilities should be provided~~.~~;

iii) ~~F~~footbaths should be provided, where necessary, and regularly cleaned and the disinfectant renewed~~.~~;

iv) any additional measures such as complete change or shower may be required depending on the risks; and

v) ~~R~~records should be kept of the daily movements of all staff and visitors that enter the *semen collection centre*.

6) Appropriate *disinfection* of work areas and equipment should be implemented and documented regularly by trained and competent staff.

~~7) Control measures should be in place to minimise the entry of insects and rodents.~~

~~8~~7) *Vehicles* for the transport of animals, *feed*, and waste and manure removal should be used in a manner which minimises health risks to animals in the *semen collection centre.*

8) Up-to-date and accessible records should be kept of all movements of animals and germinal products associated with the *semen collection centre* to ensure *traceability*.

Article 4.6.3.

Recommendations applicable to animal accommodation facilities

Animal accommodation facilities should be designed so that cleaning and *disinfection* measures ~~are easy and efficient to~~ can be implemented efficiently. Individual and group housing pens should be kept clean and the bedding renewed as often as necessary to ensure it is dry and clean.

The animal accommodation facilities should include dedicated areas for *feed* storage, for manure storage, bedding storage, and for the isolation of any sick animals. Animal accommodation facilities should be species-specific, where relevant.

There should be a separate pre-entry isolation facility that is managed as a separate biosecure facility for holding animals that are required to complete testing and isolation prior to entry to the resident facility. Procedures for animal identification, blood sampling and vaccination of animals within the *semen collection centre* should be conducted in accordance with relevant recommendations in the *Terrestrial Code*. In the instance where the *Veterinary Authority* has determined that pre-entry isolation facility is not required such as for the collection of equine semen, pre-entry conditions to enter the resident facility or semen collection facility should be included in the *biosecurity plan* of the *semen collection centre.*

The decision to house animals indoors or outdoors will be determined by the *semen collection centre* in accordance with the *biosecurity plan*. Donor animals and teasers that are housed outdoors or allowed access outdoors, should be accommodated to minimise *vector* attacks and adequately protected from adverse weather conditions. ~~Donor animals and teasers that are housed indoors, should be accommodated to allow for adequate ventilation and proper footing and bedding.~~

All donor and teaser animal accommodations should be adapted to the needs of the species of donor being collected. Watering and feeding systems should be constructed so that ~~it~~ they provide~~s~~ minimum contact between donor animals and can be easily cleaned.

Bedding should be clean and dry, soft, easy to spread and remove. Bedding should be removed regularly and replaced, following thorough cleaning and *disinfection* of relevant surfaces. *Feed* and bedding material should be kept in a dry place and stored in a manner to prevent access by *wildlife* or pests and stored in conditions that are well monitored.
Manure, litter, and bedding material should be disposed of in such a way as to prevent the transmission of diseases ~~and be in compliance with all relevant health and environmental legislation~~.

Article 4.6.4.

Recommendations applicable to semen collection and semen collection facilities

The semen collection facility can be co-located with the resident facility and share *biosecurity* to accommodate the same designated *animal health status* of the resident facility. If the semen collection facility is co-located with a resident facility, the semen collection facility should not be used to collect other donor animals not housed in the resident facility. If the semen collection facility is a separate facility, *biosecurity* should be in place to allow only animals of the same *animal health status* to be permitted entry into that facility.

Donors and teaser animals should be kept and prepared in a way to facilitate the hygienic collection of semen. Donor animals should be dry and clean when arriving in the semen collection area.

~~Donor animals~~ Semen should be collected from donor animals in the semen collection facility and not ~~collected~~ in the resident facility. Any exception should be justified and adequately managed by the *biosecurity plan*.

In addition to point 5 of Article 4.6.2., ~~P~~personnel and visitors ~~should~~ may be provided with specific protective clothing and footwear for use only at the semen collection facilities and worn at all times, and waiting periods before re-entering the centre can be required.

Equipment used for the animals should be dedicated to the semen collection facility ~~or~~, if not new, disinfected before being introduced to the *semen collection centre*. All other equipment and tools brought on to the ~~premises~~ semen collection facility should be examined and *disinfected*, if necessary, to minimise the introduction of pathogenic agents.

The semen collection facility and associated equipment should allow for effective cleaning and *disinfection*, where applicable.

The floor of the mounting area should be clean and provide safe footing. When rubber mats are used, they should be cleaned after each collection.
Preputial orifices of donor animals should be clean and free of excessive hair or wool to avoid contamination of the semen. Hair or wool at the preputial orifice should be regularly trimmed as needed but not completely removed to avoid excessive irritation of the preputial mucosa while urinating.
Hair or wool on the hindquarters of teaser animals should be kept short to avoid contamination during the collection process. A teaser animal should have its hindquarters thoroughly cleaned before each collection session. A plastic apron can be used to cover the hindquarters of the teaser animal, but the apron should be replaced with a clean apron or thoroughly cleaned and *disinfected* between donor animals.
A dummy mount, if used, should be made of a material that is easy to clean and disinfect and should be thoroughly cleaned after each collection. Disposable plastic covers may be used.
When used, the artificial vagina should be cleaned completely after each collection. It should be dismantled, washed, rinsed, dried, and protected from dust. The inside of the body of the device and the cone should be *disinfected* before re-assembly using *disinfection* procedures approved by the *Veterinary Authority.*
Lubricant used in the artificial vagina should be new and the equipment used to spread the lubricant should be clean and free of dust.
The artificial vagina should be handled in a manner to prevent dirt and debris from entering.
When successive ejaculates are being collected from the same donor, a new artificial vagina should be used for each collection to prevent any contamination. The artificial vagina should also be changed when the animal has inserted its penis without ejaculating.
All semen should be collected into a labelled sterile receptacle, either disposable or sterilised by autoclaving or heating and kept clean prior to use.
After semen collection, the receptacle should be left attached to the cone within its sleeve or sheath until it has been ~~re~~moved from the semen collection ~~area~~ facility to the ~~laboratory~~ semen processing facility.
During collection, the technician should wear disposable gloves and change them between donor animals.

Article 4.6.5.

General principles applicable to semen processing and semen processing facilities

The semen processing facility should be physically separated from the ~~other~~ semen collection facilities and may include separate areas for the preparation and cleaning of artificial vaginas, semen evaluation and processing, semen pre-storage and storage.

The semen processing facility should be constructed with materials that permit effective cleaning and *disinfection*, in accordance with Chapter 4.14.

Entry to the facility should be restricted to authorised personnel only.

Protective clothing for use only in the semen processing facility should be provided and worn at all times.

The facility and its equipment should be regularly cleaned and well maintained. Work surfaces for semen evaluation and processing should be regularly cleaned and disinfected.

Only semen from the same species and from donors with the same *animal health status* should be processed at the same time. Semen from donors with a different *animal health status* or from different species may be processed consecutively if appropriate hygienic measures in accordance with the *biosecurity plan* have been implemented.

Semen should be collected and processed in a manner that ensures accurate identification and traceability of collecting tubes from the time of semen collection until storage.

All containers and instruments used for the collection, processing, preservation or freezing of semen should be single-use or be cleaned and disinfected or sterilised before use, depending on the manufacturer's instructions.

If not immediately processed, t~~T~~he receptacle containing freshly collected semen should be ~~stoppered or~~ covered in a way to prevent contamination as soon as possible after collection, until processing. During processing, containers containing the semen should be ~~stoppered or~~ covered during times when diluent or other components are not being added.

Equipment used for gender-sorting of sperm should be clean and disinfected between ejaculates in accordance with the recommendations of the manufacturer. Where seminal plasma, or components thereof, is added to sorted semen prior to cryopreservation and storage, it should be derived from animals of the same *animal health status*.

Recommendations regarding the use of diluents for processing semen:

1) Buffer solutions used in diluents prepared on the premises should be sterilised by filtration (0.22 µm) or by autoclaving (121°C for 30 minutes) or be prepared using sterile water before adding egg yolk (if applicable) or equivalent additives, or antibiotics.

2) In the case of ready-to-use commercial extenders, the manufacturer's recommendations should be followed.

3) If the constituents of a diluent are supplied in commercially available powder form, the water used for preparing the semen diluent should have been distilled or demineralised, sterilised ~~(121°C for 30 minutes or equivalent)~~, stored correctly and allowed to cool before use.

4) Whenever milk, egg yolk or any other animal protein is used in preparing the semen diluent, the product should be free from pathogenic agents or sterilised; milk heat-treated at 92°C for 3–5 minutes, eggs from SPF flocks when available. When an egg yolk only is used as the extender, it should be separated from the egg white using aseptic techniques. Alternatively, commercial egg yolk prepared for human consumption or egg yolk treated by, for example, pasteurisation or irradiation to reduce bacterial contamination. Commercial UHT milk or powdered skim milk for human consumption may be used. Other additives should be sterilised before use.

5) Diluent should be stored according to manufacturer's instructions. Storage vessels should be ~~stoppered~~ closed.

6) Antibiotics may be added to the diluent to minimise the growth of bacterial contaminants or control specific venereal pathogens that may be present in semen.

Article 4.6.6.

General principles applicable to semen storage and storage facilities

Semen storage facilities and germplasm storage tanks should allow for easy cleaning and *disinfection*.

The manufacturer's instructions for the safe *disinfection* of germplasm storage tanks should be complied with.

Movement of germplasm storage tanks from one semen storage facility to another should be completed under controlled conditions subject to the *biosecurity plan* of the *semen collection centre.*

Access to the semen storage facility should be restricted to authorised personnel and the storage room should be locked when not in use.

Accurate records should be maintained that identify semen being transferred in, stored, and transferred out of the semen storage facility.

Only new liquid nitrogen should be used to fill or top up germplasm storage tanks.

DRAFT CHAPTER 7.5.

ANIMAL WELFARE DURING SLAUGHTER

EU comment

The EU thanks WOAH for having taken into consideration most of our previous comments.

While the EU welcomes and in general support the adoption of this revised chapter it still has several comments to share with WOAH.

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' wellbeing, health and safety. This will also contribute to food safety and product quality, ~~and product quality, and is essential for (including food safety)~~ and consequently to the improvement of economical returns [Blokhuis *et al.*, 2008; Lara and Rostagno, 2018].

Article 7.5.2.

Scope

This chapter identifies ~~potential~~ *hazards* to *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.~~

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

This chapter should be read in conjunction 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 with 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.

Definitions ~~for the purpose of this chapter~~

For the purposes of this chapter:

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

Article 7.5.4.

Hazards to a~~A~~nimal welfare ~~hazards~~

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

At ~~the~~ *slaughterhouses/abattoirs*, animals are exposed to *hazards* to *animal welfare* ~~*hazards*~~ including ~~fasting~~ feed 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 the absence of feasible animal-based measures, ~~In addition~~ resource-based measures and management-based measures may be used as a ~~substitute~~ proxy. *Hazards* to a~~A~~*nimal 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 m~~ 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~~ measures are preferential. However, key stunning parameters need to be considered alongside animal-based measures.

The routine use of these ~~outcome~~ animal-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-based measures ~~*welfare* measurables~~ be based on current scientific ~~knowledge~~ evidence 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;
- standard operating procedure ~~and corrective actions;~~
- recording, reporting adverse incidents and taking corrective actions;
- ~~training and competency of personnel;~~
- throughput (number of animals slaughtered per hour);
- maintenance and cleaning procedures of equipment and premises;
- ~~contingency~~ emergency 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 the~~ir~~ underlying principles ~~to~~ for carrying 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~~ that allows them to identify signs of distress, fear, pain and suffering and take preventive and corrective actions. Personnel in charge of *restraint* (including pre-stun shackling) and of *stunning* and bleeding operations should be familiar with the relevant equipment, ~~their~~ its key working parameters and procedures. Personnel *stunning*, post-stun shackling and bleeding

animals should be able to identify and take corrective actions in case of: ~~in~~effective ~~*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~~ signs of life 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~~ these areas in order to prevent unnecessary noise, shouting~~, or~~ and movement ~~or~~ and to reduce 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. The~~y should consider the~~ animals' needs should be considered~~, in terms of their physical comfort~~ including:

– thermal comfort ~~conditions,~~;

– ease of movement~~,~~ ;

– protection from injury, ~~protection from sudden or excessive noise~~;

– protection from visual, auditory and olfactory overstimulation;

– minimising fear~~,~~;

– ~~and~~ ability to perform natural and social behaviours~~,~~ ~~as well as~~

– watering and feeding needs~~, including the need of sick or injured animals~~;

– needs arising from illness or injury;

– needs arising from other vulnerabilities (e.g. pregnant, lactating or neonatal 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 or falling. There should be ~~A~~adequate quality and quantity of lighting to allow ~~allowing adequate~~ appropriate ante-mortem inspection of animals and to enable ~~assist~~ 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 *slaughte*r. Appropriate back-up equipment should be available for immediate use in case of failure of the primary *stunning* equipment ~~initially used~~.

Article 7.5.9.

~~The t~~Throughput ~~is (number of animals slaughtered per hour)~~

The throughput of the *slaughterhouse/abattoir* is the number of animals slaughtered per hour. It **s**hould 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. ~~It~~Throughput may ~~also~~ need to be reduced ~~depending on the~~if 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 the manufacturer's instructions in order to ensure positive outcomes for *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 handling, *restraining*, *stunning* and bleeding equipment are essential to ensure reliable and ~~efficient~~ effective *stunning* and *slaughter*, thereby minimising pain, fear and suffering.

Article 7.5.11.

~~Contingency~~ Emergency plans

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

~~Each p~~Personnel who ~~has~~have a role to play in implementing ~~contingency~~ the 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.

EU comment

The above paragraph is also found in Article 7.5.24 (animals in containers) and it might be more straightforward to move or merge its content to/with Article 7.5.4.

1~~.~~) Animal welfare concerns:

Delay in *unloading* of animals is a major ~~the main~~ *animal welfare* concern at arrival [NAMI, ~~2017~~2021].

Animals in *vehicles* have smaller space allowances than on farm, undergo water and *feed* deprivation, may have suffered from an injury, ~~and~~ 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~~ measures ~~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~~ whose welfare is ~~to be~~ at greater risk of being compromised ~~*animal welfare hazards*~~ should be unloaded first. When no space is immediately available, creating space should be a priority. Provision~~s~~ 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 ~~i~~s available.

Animals should not be isolated throughout the slaughter process.

EU comment

The EU suggests clarifying the meaning of the recommendation since it might be misinterpreted or deleting it.

Justification:

Some stunning methods requires the isolation of the animal (mechanical and head-only electrical methods). Furthermore, while in general animals should not be isolated, in some cases isolation is necessary because the animal presents particular risks for other animals or because the animal is too vulnerable to be mixed with others.

In addition, the recommendation is formulated under the article on arrival of free moving animals, but the scope of the recommendation refers to "throughout the slaughter process". This makes the recommendation confusing.

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

~~Special consideration should be given to a~~Animals that have undergone long or arduous journey times, are sick or injured ~~animals~~, are lactating or pregnant ~~animals~~ and ~~young~~ neonatal animals~~. These animals~~ should be slaughtered as a priority and without delay. If this is not possible, animals should be given appropriate care ~~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~~ neonatal 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 ~~P~~pigs and shorn sheep are especially sensitive to extreme temperatures and therefore special attention should be ~~taken~~ paid 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 verymore 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 and injuries.

2~~.~~) Animal-based and other ~~measurables~~ measures ~~include~~:

a) animals ~~running~~ slipping and falling;

b) animals with broken or otherwise injured limbs;

c) animals turning-back, attempting to escape ~~and~~ or reluctant to move;

d) animal vocalisation ~~and frequency of~~ (e.g. high-pitched vocalisation ~~for~~ in 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 except when the *vehicle* and the unloading dock are at the same hight. ~~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~~ unloading dock.~~,~~ Ramps or lifts should be positioned so that the animals can be handled safely.T~~t~~he gradient should not be too steep preventing animals from moving 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~~ equipment 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, baulk 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 7.5.2~~0~~1. Such animals should never be dragged, nor should they be lifted or handled in a way that might cause further pain~~,~~ and 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 baulk. They should keep in mind the flight distance and point of balance of the animal when positioning themselves to encourage movement.

Animals should be moved in small groups as this decreases fear and makes use of their natural tendency to follow other animals.

Mechanical handling aids ~~and electric goads~~ should be used in a manner to encourage and direct movement of the animals without causing distress, fear and ~~or~~ 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.

Other handling aids 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~~ not be used on a routine basis to move animals. ~~in extreme cases and not on a routine basis to move animals.~~ Electric goads may only be used when other measures have been ineffective, the animal has no injury or other condition that is impeding mobility 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, udders or belly. Such instruments should not be used on equids, camelids, ratites, sheep and goats of any age, or on calves or piglets. Shocks ~~shall~~ should not be used repeatedly if the animal fails to respond and should not last longer than one second [Ritter *et al.*, 2008].

~~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.).

Animals should not be forced to move at a speed greater than their normal walking pace to minimise injury through slipping or falling. Facilities should be designed, constructed and staffed with competent animal handlers, so that less than 1% of the animals fall.

~~4. Species-specific recommendations:~~

~~None identified~~.

Article 7.5.14.

Lairage of free-moving animals

1~~.~~) Animal welfare concerns:

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

a) ~~food~~ *feed* 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~~ facilities, ~~and~~ equipment 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 (e.g. sharp, abrasive).

2~~.~~) Animal-based and other ~~measurables~~ measures ~~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 referring to distress ~~especially for pigs and cattle~~ (e.g. ~~hitch~~ high-pitched vocalisation in pigs; loud moos or bellows in bovines)~~.~~;

h) restlessness (e.g. pacing, walking with continuous ear movements and frequency of snorts – especially ~~for~~ in 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~~ their last meal and expected time for *slaughter* exceeds a period appropriate for the species and age of animals. In the absence of information on the transport duration ~~in any case,~~ ~~A~~animals ~~which~~ that 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 categories (e.g. sexes, sizes, horned or not, species) ~~groups (or different species)~~ should not be mixed except if they are already familiar to each other.

Animals that ~~can move freely but~~ are injured, sick, ~~very young~~ neonate or pregnant should be slaughtered with priority or ~~isolated~~ separated to protect them from other animals ~~and be slaughtered with priority~~. Animals that are very ill or down or have catastrophic injuries should be euthanized (see Article 7.5.19.).

EU comment

The EU suggests amending the paragraph as follows:

"Animals that are injured, sick, neonate or pregnant should be either slaughtered with priority or separated to protect them from other animals and slaughtered as soon as possible after separation ~~or both~~. Animals that are very ill or down or have ~~catastrophic~~ severe injuries should be euthanized without delay (see Article 7.5.34)."

Justification:

The first amendment is justified because also separation might be needed before being slaughtered quickly. The second amendment is coherent with Article 7.5.34 2) and the urgency in terms of time should also be made clear.

4.) Species-specific recommendations:

~~None identified.~~ Pigs should be ~~kept~~ moved in small groups (up to 15) [Barton-Gade and Christensen ,1998] ~~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 distress, fear and pain ~~and distress~~.

Other *hazards* include:

a) slippery ~~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) a restraint box that is not appropriate to the size of the animal;

~~d~~e) ~~fear caused by~~ prolonged *restraint*, which may exacerbate insecure or excessive *restraint*.

~~In addition, s~~*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~~ measures ~~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, ~~T~~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 restraint~~ing~~ should be maintained until the animal is unconscious.

When restrainers ~~are used~~ that hold an animal with its feet off the floor are used, the animal ~~must~~ should 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~~ should be securely held and supported to prevent struggling and slipping within the device.

Restrainers should not have sharp edges and should be well maintained to minimise risk of injury.

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

Flooring design and handling methods that ~~intentionally~~ cause loss of balance, slipping or falling, i.e. a box with a floor that rises on one side upon entry to the box, should not be used intentionally.

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

No animals should enter the restrainer until equipment and personnel are ready to stun and 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.

EU comment

The EU suggests amending the last sentence as follows:

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

Justification:

Any type of restrainer (e.g. cattle 'kill box') should be emptied during work breaks and (longer lasting) breakdowns of the slaughter line.

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

Animals should not be able to pile on top of each other in the restrainer, nor receive pre-stun shocks from contact with the animal in front, in the case of electrical stunning.

Animals subject to specific methods of stunning should be individually restrained to ensure precise positioning of the stunning equipment. However, this should not apply when restraining is likely to cause additional distress or pain as well as excessive and unpredictable movements (e.g. animals that cannot move normally due to injuries or sickness, wild animals or horses).

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~~ bovines.

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.

General principles for ~~S~~stunning of free-moving animals and animals in containers

~~1. 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 penetrativeng *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., Llow bolt velocity, misuseInappropriate use of cartridge 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 inthere is an increase risk of an ineffective stun., especially with In 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. CO_2 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 occursis 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 indicates an 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 indicates an 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 indicates 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 reachbe applied to 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 areis 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 (law atmospheric pressure system for *stunning*);
- animal based measure 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-penetrativeng 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.~~

1~~.~~) Animal welfare concerns:

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

Animals should only be stunned using stunning methods that have been scientifically validated as effective for stunning that species. The most common methods for *stunning* are mechanical, electrical and exposure to controlled atmosphere. Animals should only be stunned using stunning methods that have been scientifically validated as effective for stunning that species.

EU comment

The EU suggests deleting the first sentence of the paragraph above.

Justification:

The sentence is identical to the third sentence of the paragraph.

Stunning prior to *slaughter* ~~decreases or~~ ~~avoid~~ prevents distress, fear and pain ~~and suffering~~ to animals during neck cutting and bleeding ~~and also improves workers' safety~~.

2~~.~~) Animal-based and other ~~measurables~~ measures ~~include.~~:

~~Effectiveness of *stunning* should be monitored at different stages: immediately after *stunning*, just before and during bleeding until death occursis 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.

After stunning, the state of consciousness is assessed to identify if animals are successfully rendered unconscious or if they are conscious (e.g. stunning was ineffective or they recovered consciousness) and therefore at risk of experiencing distress, fear and pain. For each animal-based measures of state of consciousness, outcomes either suggesting unconsciousness (e.g. presence of tonic seizures) or suggesting consciousness (e.g. absence of tonic seizures) have been identified for each stunning method.

3~~.~~) Recommendations:

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

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.

Effectiveness of *stunning* should be monitored using multiple animal-based measures 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].

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~~is recommended. ~~Effectiveness of the *stunning* should be monitored regularly.~~

*Slaughterhouses/abattoir*s should have standard operating procedures that define key operating parameters ~~or~~ and follow the manufacturer's recommendations for *stunning* the species and age group concerned.~~, such as:~~

~~4.)~~ ~~Species-specific recommendations:~~

Article 7.5.17

Mechanical stunning of free-moving animals

1~~.~~) Animal welfare concerns:

Mechanical *stunning* is divided into penetrativeng ~~*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]. In addition to the concussive effect, ~~P~~penetrative *stunning* devices propel a bolt which penetrates the skull and enters the cranium causing additional damag~~in~~ge to 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 (concussive effect). 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 which delivers less concussive impact to the skull.. ~~L~~low bolt velocity, misuse Inappropriate use of cartridge ~~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 ~~In 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.

EU comment

The EU recommends deleting the last half sentence of the fourth sentence of this paragraph:

"Non-penetrative percussive *stunning* devices propel a blunt bolt which does not penetrate the skull~~, but results in rapid loss of consciousness from impact (concussive effect)~~."

Justification:

The desired effect is not necessarily achieved, especially with this method. The basic principle and aim are already explained in the second sentence of the paragraph.

Furthermore, the EU also suggests amending the penultimate sentence of the paragraph as follows:

"If not applied correctly, fracture of the skull and ineffective *stunning* are more likely to occur, especially ~~with~~ in young animals such as calves~~,~~ and when a non-penetrative device ~~higher bolt velocity~~ is used.

Justification:

As the speed of the bolt increases, its kinetic energy increases exponentially, which promotes the stunning effect. Skull fractures result when the device is incorrectly applied and occur particularly with non-penetrating devices.

For *wild* or *feral animals*, on-site shooting with a free bullet in the brain can be an alternative to prevent stressful handling and transport. Under such circumstances, the main animal welfare concern is a shot that kills the animal immediately.

EU comment

The EU suggests amending the first sentence of the paragraph as follows:

"For *wild* or *feral animals*, as well as certain extensively reared animals, on-site shooting with a free bullet in the brain can be an alternative to prevent stressful handling and transport."

Justification:

The method can also be a welfare-friendly alternative for e.g. domestic pigs and cattle kept outdoors. This does not seem to be reflected in the current wording.

2.) Animal-based and other ~~measurables~~ measures ~~include~~:

~~Mechanical *stunning:*~~

Animal-based measures of a~~A~~n effective stun are ~~is characterised by the presence of all the following signs~~: immediate collapse; apnoea; tonic-clonic seizure; absence of corneal reflex; absence of eye movements.

Animal-based measures ~~The presence of any of the following signs may indicates an a high risk~~ of ineffective stun or recovery of consciousness are: absence of collapse or attempts to regain posture rapid eye movement or nystagmus, vocalisation; spontaneous blinking; righting reflex; presence of corneal reflex; rhythmic breathing.

3.) Recommendations:

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

~~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.*, 2015~~2014~~];
- calibre and type of gun and ammunition (free bullet);
- length and diameter of the penetrating bolt ~~(captive bolt)~~;
- shape and diameter of the non-penetrating bolt;
- position and direction of the shot [AVMA, 2016];

~~– calibre and type of gun and ammunition (free bullet).~~

4~~.~~) Species-specific recommendations:

Non-penetrative~~ng~~ 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]~~.

EU comment

The EU suggests amending the sentence above as follows:

"Non-penetrative captive bolt should not be used in animals with thick skull (e.g. bison, water buffalo), as the risk of ineffective stunning, inherent in this procedure, further increases in these animals."

Justification:

To clarify the rationale of the recommendation.

Water buffaloes should be stunned with penetrative captive bolt in the occipital position using a heavy-duty contact-fired captive bolt gun directed at the nose or using large-calibre firearms and deformation ammunition (e.g. 0.357 Magnum).

Article 7.5.18

Electrical stunning in free moving animals

1~~.~~) Animal welfare concerns:

Electrical *stunning* involves application of an electric current across ~~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 electrical frequency [EFSA, 2004]. Excessively wet hides or fleeces may result in ineffective stunning due to electrical current taking the path of least resistance and flowing around the outside of the body rather than through the skull. This may paralyse the animal, or cause pre-stun shocks, rather than stunning the animal. If electrodes are energized prior to ensuring they have good contact with the animal, this results in pain from the shock.

2~~.~~) Animal-based and other measures:

~~Electrical *stunning:*~~

Animal-based measures of an effective stun are: ~~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; or palpebral reflex.

EU comment

The EU suggests adapting the last point of the list as follows:

"and absence of corneal reflex~~; or~~ and palpebral reflex once the epileptiform convulsions have subsided.

Justification:

Both reflexes should be absent, but their absence can only be assessed once the epileptiform convulsions induced by the electric current have subsided.

Animal-based measures of ineffective stun or recovery of consciousness are: ~~The presence of any of the following signs may indicates an high risk of ineffective stun or recovery of consciousness:~~ absence of tonic-clonic seizures; vocalisation; spontaneous blinking; righting reflex; presence of corneal reflex; palpebral reflex; rhythmic breathing.

EU comment

The EU suggests adapting the penultimate point of the list as follows:

"presence of corneal reflex~~;~~ or palpebral reflex once the epileptiform convulsions have subsided."

Justification:

See previous comment.

3~~.~~) Recommendations:

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

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

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

~~Electrical:~~

– shape, size and placement of the electrodes [AVMA, 2016];

– ~~pressure~~ contact between electrode and head;

– wetting point of contact;

EU comment

The EU suggests adapting the line above as follows:

"~~wetting~~ moisten point of contact."

Justification:

The change is to take better account of the fact that excessive wetting can lead to current flow bypassing the brain.

– minimum exposure time;

– electrical parameters (current intensity(A), waveform type (AC and DC), voltage(V) and frequency(Hz));

– maximum stun to stick interval;

– 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.

4~~.~~) Species-specific recommendations:

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

EU comment

The EU suggests adapting the sentence above as follows:

"~~The Competent Authority should determine e~~Effective electrical parameters~~,~~ should be determined based on scientific evidence for different types of animals."

Justification:

Slaughtering in accordance with animal welfare standards is first and foremost the responsibility of the business operators.

For head-only stunning, minimum parameters are recommended for the following species:

- 1.15 [AVMA] to 1.28 A for bovines [EFSA 2020b],
- 1.25 A for slaughter (finished) pigs [AVMA],
- 1.8 A for sows and boars [AVMA],
- 1 A for small ruminants [EFSA 2013c, and EFSA 2015, AVMA].

The minimum parameters above are recommended to be used with an electrical frequency of 50Hz. Where higher ~~electrical~~ frequencies ~~is~~ are used, the amperage should also be increased.

Article 7.5.19

Controlled atmosphere stunning in free moving animals

1~~.~~) Animal welfare concerns:

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. CO_2 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~~ measures ~~include.~~:

~~Gas *stunning*:~~

Animal-based measures of an effective stun are:~~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.

Animal-based measures of an ineffective stun or recovery of consciousness are:~~The presence of any of the following signs may indicates an high risk of ineffective stun or recovery of consciousness:~~ vocalisation; spontaneous blinking; righting reflex; presence of corneal reflex; rhythmic breathing.

3~~.~~) Recommendations:

~~c) Controlled atmosphere:~~

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

– gas concentrations and exposure time;

– temperature and humidity;

EU comment

The EU suggests adapting the line above as follows:

"temperature and humidity inside the stunning compartment."

Justification:

Clarification that the key parameters do not refer to the outdoor climate.

– ~~rate of decompression (law 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;

– since animal-based measures are difficult to monitor and adapt during the induction phase, resource-based measures should be used such as monitoring of gas concentration(s) and exposure time. Gas concentrations and exposure time, temperature and humidity ~~must~~ should be monitored continuously at the level of the animal inside the chamber;

– 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:

Gases or gas mixtures that are painful to inhale should ~~preferably~~ not be used ~~to stun or kill pigs~~. However, if such methods allow animals to be stunned in groups and it has a short induction phase, they could present a certain animal welfare benefit compared to methods requiring individual restraint.

EU comment

The EU suggests adapting the paragraph above as follows:

"Gases or gas mixtures that are painful to inhale or aversive in other ways should not be used. However, if such methods allow animals to be stunned in groups ~~and it has a short induction phase~~, ~~they~~ this ~~could~~ can present a certain animal welfare benefit compared to ~~methods requiring~~ an individual restraint required by other methods.

Justification:

First sentence: High-concentration CO_2 is not only painful, but also causes distress by activation of CO_2-sensors and resulting dyspnea.

Last sentence: There are currently no modified atmospheres with a "short induction phase". Which stunning method is preferable from an animal welfare point of view depends on the individual case and should not be generalized in one direction.

Article 7.5.20~~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~~ experience fear, pain and distress [Gregory, 2004; Johnson *et al.*, 2015]. This period will be reduced by applying stunning immediately after neck cutting.

EU comment

The EU suggests adapting the first three sentences of the paragraph above as follows:

"The incision for ~~B~~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, if it is not stunned beforehand [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~~ will experience fear, pain and distress [Gregory, 2004; Johnson et al., 2015]."

Justification:

The changes are intended to be more factual rather than referring to possibilities.

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~~ measures ~~include~~:

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

In cases of bleeding without *stunning* the animal-based and other ~~measurables~~ measures that indicate loss of consciousness include all the following: absence of muscle tone; absence of corneal reflex; absence of rhythmic breathing. Unconsciousness should be reassessed until death is confirmed. 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;

~~c~~ d) bleeding knives should be sharpened for each animal as necessary to fulfil recommendation a) and b).

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 recover~~ing~~ 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~~.

4) Species-specific recommendations:

~~None identified.~~

~~Cattle~~ Bovines are at risk of prolonged bleed out times and regaining consciousness as the bilateral vertebral arteries are not cut during a neck cut. ~~If As they are not cut, t~~The vertebral arteries will continue to provide blood to the brain. Furthermore ~~and can cause~~ any occlusion of the cut major arteries~~,~~ will slow~~ing~~ exsanguination. Therefore, bleeding with a cut of the brachiocephalic trunk should ~~always~~ be preferred in ~~cattle~~ bovines.

Article 7.5.21~~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.

EU comment

The EU suggests adapting the paragraph above as follows:

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

Justification:

The change reflects more accurately the cited EFSA opinion.

2.) Animal-based and other measurables measures include:

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

3.) Recommendations:

Under normal circumstances WOAH 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 for the foetus to breathe.

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

4.) Species-specific recommendations:

None identified.

Article 7.5.2219.

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 should be described in the emergency plan and may also apply to animals that are not suitable for *slaughter* for commercial reasons, even if they do not present signs of distress, pain or suffering.

1.) Animal welfare concerns:

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

2.) Animal-based and other measurables measures 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 7.5.2320.

Methods, procedures or practices that should not be used unacceptable on animal welfare grounds for free-moving animals

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

a) crushing, twisting or breaking tails of animals;

b) applying pressure using an injurious object or applying an irritant substance to any part of an animal 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, udder or belly).

2) ~~None of t~~The following practices for restraining conscious animals are unacceptable and should not be used under any circumstances:

a) mechanical clamping of the legs or feet of the animals as the sole method of *restraint*, including tying limbs together or lifting one or more limbs off the ground;

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~~.~~;

h) trip floor boxes that are designed to make animals fall.

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

Article 7.5.24~~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.

EU comment

See comment on Article 7.5.12

1~~.~~) Animal welfare concerns:

Animals in *containers* have smaller space allowances than on farm, undergo water and *feed* deprivation, may have suffered from injury 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 measures 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 measures 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 to a minimum.

Consignments of animals assessed to be at greater risk of compromised *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.

EU comment

The EU suggests adding the following sentence at the end of the paragraph above:

“In case of repeated occurrence, reduction measures should be taken at the farm of origin or during transport.”

Justification:

Such a finding should result in appropriate action.

Article 7.5.2522.

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*.

During *unloading* and moving *containers,* animals can be exposed to adverse weather or climate conditions and face heat stress, frost bite, or death.[EFSA, 2019].

2.) Animal-based and other ~~measurables~~ measures ~~include~~:

a) animals with broken limbs;

b) animals that strike against the facilities;

c) animals vocali~~z~~sing;

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 7.6.1724.

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

~~4.~~) ~~Species specific recommendations:~~

~~None identified.~~

Article 7.5.26~~23~~.

Lairage of animals in containers

1~~.~~) Animal welfare concerns:

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

a) ~~food~~ feed and water deprivation leading to prolonged hunger and thirst~~.~~;

b) poor ventilation;

c~~b~~) absence of protection against adverse weather or climate conditions ~~extremes in climate~~ leading to thermal stress~~.~~;

d~~c~~) sudden or excessive noises, including from personnel, leading to fear~~.~~;

e~~d~~) insufficient space to lie down and move freely leading to fatigue and aggressive behaviour~~.~~;

f~~e~~) not being inspected or accessible for emergency killing when necessary.

2~~.~~) Animal-based and other ~~measurables~~ measures ~~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 distress, fear and pain ~~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 7.5.27~~24~~.

Unloading animals from containers

EU comment

The EU suggest amending the line above as follows:

"Unloading animals from containers before stunning"

Justification:

With some CAS-systems, the animals are only removed from the containers after they have been stunned. This section is not relevant for these systems.

1.) 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~~ may occur, 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 shackling or *stunning*;

c) handling and removal of animals from containers before stunning;

~~c~~d) incorrect design of manual or mechanical tipping ~~manually or using mechanical~~ equipment that cause animals to fall~~ing~~ from a 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 slowly resulting in piling or injury.

2~~.~~) Animal-based and other ~~measurables~~ measures ~~include~~:

a) animals falling;

b) struggling, including wing flapping;

c) escape attempts;

d) vocalisation;

e) injuries, dislocations, fractures;

f) pi~~l~~ling ~~off~~up of animals.

3~~.~~) Recommendations:

Removal of animals from ~~the~~ *containers* in a way that causes 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, sw~~i~~ung or dropped.

Animals should not be mistreated in the process of unloading and shackling prior to stunning (e.g. excessive force used when shackling, punching, kicking, or otherwise hurting).

Modular systems that involve tipping of live birds are not conducive to maintaining good animal welfare. These systems, when used, should ~~be~~ have an 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~~.

It should be ensured that every animal is removed from the containers before they are returned.

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 7.5.28~~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 distress, fear and 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 distress, fear and 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 (e.g. shackles are too narrow or too wide, birds are hung by one leg, or when one bird is shackled on two different adjacent shackles) 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 the shackle line or high speed of the shackle line create fear and possible pain due to the sudden changes in position as well as increased effects of inversion.

2~~.~~) Animal-based and other ~~measurables~~ measures ~~include~~:

a) ~~struggling (~~wing flapping for birds;

b) escape attempts;

c) high frequency vocalisations (distress calls)~~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, this is not possible, ~~A~~animals should be handled and restrained to minimise ~~without provoking~~ struggleing 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~~ should be constructed and maintained so they do not jolt ~~birds~~animals ~~as~~ because this is likely to stimulate flapping (poultry) or struggleing. Shackle line speeds ~~must~~ should be optimised so that they do not cause the ~~birds~~animals to struggle. Shackling duration prior to stunning should be kept to a minimum.

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

Inappropriate shackling, such as shackles that are 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.

EU comment

The EU suggest amending the paragraph above as follows:

"Inappropriate shackling, ~~such as shackles that are 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"

Duplication with Article 7.5.28 No. 1 c).

Inappropriate shackling can be prevented by training staff to handle ~~birds~~animals with care and compassion, by a~~n~~ competent professional~~,~~ shackl~~e~~ing ~~birds~~animals gently by both legs and killing 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 or by the skin at the back of the neck without supporting the body.

Poultry:

Shackling should not be used with heavy birds ~~like~~ such as parent *flocks,* turkeys or with birds that are more susceptible to fractures ~~like~~ (e.g. end-of-lay hens).

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

Article 7.5.29~~26~~.

Head-only electrical stunning

1~~.~~) Animal welfare concerns:

Electrical *stunning* involves application of an electric current ~~to~~across the brain of sufficient magnitude ~~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, electrical arcing, high contact resistance caused by wool or dirt on the animal surface~~,~~ and inappropriate electrical parameters (low voltage/current or high frequency [EFSA, 2004]).

EU comment

The EU suggest amending the sentence above as follows

"The main hazards preventing effective electrical stunning are: incorrect electrode placement, poor contact, dirty or corroded electrode, electrical arcing, high contact resistance caused by ~~wool~~ fur, feather or dirt on the animal surface, and inappropriate electrical parameters (low voltage/current or high frequency [EFSA, 2004])."

Justification

Since this section deals with animals in containers (i.e. birds and rabbits), 'fur' or 'feather' seems more appropriate than wool.

2.) Animal-based and other measurables measures include:

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

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

Animal based measures of an effective stun are: 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 and palpebral reflex.

EU comment

The comment on Article 7.5.18 2) applies accordingly.

Animal-based measures of ineffective stun or recovery of consciousness are: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:

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 and be immediately killed immediately. 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 the manufacturer's recommendations.

Constant current stunners should always be preferred to constant voltage stunners since because the first ones former 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 is 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.

EU comment

The comment on Article 7.5.18 4) applies accordingly.

For head-only stunning, minimum parameters are recommended for the following species:

– 240 mA for hens and broiler chicken [EFSA, 2019],

– 400 mA for turkeys [EFSA, 2019],

– 600 mA for geese and ducks [EFSA, 2019],

– 140 mA for rabbits (100V of a 50 Hz sine wave AC) [EFSA, 2020a]].

Article 7.5.30~~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~~ measures ~~include~~:

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

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

Animal-based measures of an effective stun are ~~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 or palpebral reflex.

EU comment

The comment on Article 7.5.18 2) applies accordingly.

Animal-based measures of ineffective stun or recovery of consciousness are ~~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~~ should be adjusted so that the birds cannot pull themselves up and avoid the stunner. Avoid distractions such as people walking under the birds ~~as~~ because this can cause birds to pull up.

EU comment

EU suggest amending the first sentence of the paragraph above as follows:

"The height of the water-bath stunner ~~must~~ should be ~~adjusted~~ adjustable and set so that the birds' ~~cannot pull themselves up and avoid the stunner~~ heads are completely immersed in the water."

Justification:

The amendment is intended to take into account the need for uncomplicated height changes at the same slaughterhouse to accommodate different sizes of successive batches/flocks, and to express the intended result more precisely.

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~~ should be wetted only prior to birds' legs being placed in them.

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

EU comment

EU suggest amending the sentence above as follows:

"Pre-stun shocks ~~can be reduced~~ should be avoided by having a smooth shackle line and entry to the water-bath and by adjusting the water level of the bath."

Justification:

The amendment is intended to express more strongly that premature electric shocks are to be avoided, even though this may not be completely possible inherently in the system.

In the case of ineffective *stunning* or recovery, animals should be re-stunned ~~immediately~~ using a backup system and be killed immediately. 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 the manufacturer's recommendations.

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

EU comment

EU suggest amending the sentence above as follows:

"Constant current stunners should always be preferred to constant voltage stunners because the former ensure that the minimum current is provided to animals independently from ~~individual~~ their impedance."

Justification:

In the water bath, several birds are usually exposed to current at the same time. A constant current device can therefore ensure (within certain limits) that the sum of the currents required per animal is given. However, this does not exclude the possibility that a bird with a comparatively high resistance will have less than the required current flowing through it.

Regular calibration of the equipment according to the manufacturer's procedure ~~are~~ is 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;

– number of birds in the water-bath;

– 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*.

Hazards to *animal welfare* ~~hazards~~ such as inversion of 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 and~~ species of birds.

EU comment

The comment on Article 7.5.18 4) applies accordingly.

For water-bath stunning depending on the frequency, minimum parameters are recommended for the following species [EFSA, 2019]:

- Frequency below 200 Hz:
  - 100 mA for chicken,
  - 250 mA for turkeys,
  - 130 mA for Ducks and geese,
  - 45 mA for quails.
- For frequency from 200 to 400 Hz:
  - 150 mA for chicken,
  - 400 mA for turkeys.
- For frequency from 400-600 Hz:
  - 200 mA for chicken,
  - 400 mA for turkeys.

Ducks, geese and quails should not be stunned at frequencies higher than 200 Hz.

Chicken and turkeys should not be stunned at frequencies higher than 600 Hz.

Article 7.5.31~~28~~.

Mechanical stunning

The mechanical methods described here are penetrative and non-penetrative captive bolt systems, ~~percussive blow to the head, cervical dislocation and decapitation~~. Effective mechanical *stunning* requires a severe and immediate damage to the brain caused 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 require~~d~~ precision and often physical strength to restrain and stun the animals. ~~A~~ ~~c~~Common causes ~~for~~ of the misapplication of these methods ~~is~~ are ~~the~~ a lack of proper skill and ~~the~~ operator fatigue.

Penetrative and non-penetrative ~~c~~*C*~~*~~aptive bolt*

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

Improper captive bolt parameters may be linked to: the use of an inappropriate~~improper~~ gun (bolt diameter); inappropriate~~improper~~ cartridges~~,~~; or an 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 applyies to the brain, t~~The loss of consciousness may be delayed. ~~is not immediate and, in some cases,~~W ~~w~~hen the method is not properly applied there is a risk of neck crushing and the distress fear and pain ~~and fear~~ of the animal might be prolonged.

Decapitation

~~In addition, d~~Decapitation is associated with an open wound ~~leading to intense pain~~ and delayed loss of consciousness, leading to intense distress, fear and pain [EFSA, 2019].

2~~.~~) Animal-based and other ~~measurables~~ measures ~~include~~:

Penetrative and non-penetrative ~~*C*~~*captive bolt* ~~*and percussive blow to the head*~~

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

EU comment

The EU suggest amending the first sentence of the paragraph above as follows:

"Severe convulsions (wing flapping [poultry] and leg kicking i.e. uncontrolled muscular movements) occur immediately after ~~shooting or percussive blow~~ the mechanical stunning intervention."

Justification:

The method "percussive blow" is no longer explained above and should therefore not feature here.

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

Animal-based measures of an effective stun are:~~An effective stun is characterised the following signs:~~ the absence of corneal reflex;~~or~~ palpebral reflex, apnoea~~;; the absence of rhythmic breathing and the presence of immediate collapse~~ loss of posture; presence of tonic-clonic seizure.

Animal-based measures of ineffective stun or recovery of consciousness are:~~The presence of any of the following signs indicates a high risk of ineffective stun or recovery of consciousness:~~ vocalisations; spontaneous blinking; righting reflex; presence of corneal reflex; ~~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].

Decapitation

~~ABM for death by decapitation:~~ ~~d~~Death can be confirmed by complete severance between the head and the body

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 the 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 animal~~s~~. 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~~ and 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 towards the brain [AVMA, 2020].

With comb

As far as captive bolt i~~t~~n chickens (and other poultry with comb development) ~~is concerned~~, the placement of the device 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 the frontoparietal region of the head and should 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 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 number of 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 is not recommended in conscious animals and should only be used when there are no other options available. ~~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 to use as a back-up method ~~limited to~~ for small ~~size~~ animals (e.g. up to 3kg liveweight manually and up to 5 kg mechanically).

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

Cervical dislocation should not be ~~undertaken~~performed with ~~tools such as pliers as they cause neck~~ crushing tools (e.g. pliers),~~rather than concussion, and consequently pain and fear~~. These tools may not cause complete severance between the brain and the spinal cord.

Decapitation

Decapitation should not be used in conscious rabbits ~~because 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, ducks and geese may be also properly stunned by non-penetrative captive bolt. [Walsh *et al.*, 2017; Woolcott *et al.*, 2018; Gibson *et al.*, 2019, Stiewert *et al.* 2021]

EU comment

The EU suggests amending the sentence above as follows:

Turkeys, ducks, ~~and~~ geese and chickens may be also properly stunned by non-penetrative captive bolt. [Walsh et al., 2017; Woolcott et al., 2018; Gibson et al., 2019, Stiewert et al. 2021]

Justification

To the EU's knowledge, appropriate suitable devices are also available for other poultry (e.g. chickens; for example see https://www.accles-.com/tools/other-cash-tools/cash-small-animal-tool). shelvoke

Article 7.5.32~~29~~.

Controlled atmosphere stunning for animals in containers ~~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 with other methods,~~ ; so far it has only been demonstrated to be effective for the stunning of chickens ~~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~~causing respiratory distress ~~respiratory~~, fear and pain ~~and fear~~. The insufficient exposure to the modified atmosphere may be due to either ~~a~~ too short exposure time, a too low concentration of gas or a combination of these variables.

EU comment

The EU suggests amending the first sentence of the paragraph above as follows:

"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 consciousness before or during bleeding and causing respiratory distress, fear and pain."

Justification:

Recovery during bleeding is also a welfare issue.

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 that 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 a concentration of this gas, leading to pain. Exposure of conscious animals to more than 40% carbon dioxide (CO_2) will cause painful stimulation of the nasal mucosa and aversive reactions.

EU comment

The EU suggests amending the second sentence of the paragraph above as follows:

"In the case of exposure to carbon dioxide, there is a risk that animals are exposed to too high a concentration of this gas, leading to pain and distress."

Justification:

High-concentration CO_2 is not only painful, but also causes distress by activation of CO_2-sensors and resulting dyspnoea.

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~~ measures ~~include~~:

It may be difficult to monitor the effectiveness of controlled atmosphere *stunning* ~~due to~~ because of 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 immediate~~ly any~~ corrective measure~~s~~ 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 by 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 also be used such as monitoring of gas concentration(s), exposure time, gas displacement rate, and ~~decompression~~ rate of air removal (for LAPS ~~low atmosphere pressure~~).

3~~.~~) Recommendations:

Conscious animals should not be exposed to carbon dioxide concentrations 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 rendered unconscious until death ~~dead before being shackled~~.

Gas concentrations and exposure time, temperature and humidity ~~must~~ should 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 the case of low atmosphere pressure *stunning* ~~decompression~~ the 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~~ the 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~~ chickens [Gurung *et al.*, 2018, Jongman and Fisher, 2021] and therefore should not be used for other animals until further information is available.

The recommended CO_2 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 CO_2 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 CO_2 exposure in rabbits, it is not without welfare concerns (aversion, vocalisation).

Article 7.5.33~~30~~.

Bleeding ~~in~~ of animals arriving in containers

1.) Animal welfare concerns

~~In poultry,~~ ~~t~~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~~ many of factors that determine the efficacy of a *stunning* procedure such as type of ~~chicken~~ animal ~~(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 animals suffering experiencing distress, fear and pain ~~fear, distress, and 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~~ struggling if ~~birds~~ animals 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~~ experience distress, fear~~,~~ and pain ~~and distress~~ [Gregory, 2004; Johnson *et al.*, 2015].

EU comment

The comment on Article 7.5.20 applies accordingly.

In case of bleeding without *stunning*, ~~higher~~ more cases of injury, bruis~~e~~ing, 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 ~~(a minimum 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 and death by drowning.

2~~.~~) Animal-based and other ~~measurables~~ measures ~~include~~:

The main animal-based ~~measurables~~ measure is the blood flow (rate and duration). For animal-based and other ~~measurables~~ measures 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~~ from 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~~ with 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:

- ~~=~~ both carotid arteries should be severed;
- qualified personnel take random samples of ~~birds~~ animals ~~between~~ after the end of *stunning* and before bleeding to ensure ~~birds~~ animals are not showing signs of consciousness;
- immediately after bleeding, qualified personnel ~~right after bleeding~~ check that the jugular veins, carotid arteries~~y~~ and trachea ~~windpipe~~ were cut thoroughly, guaranteeing ~~a well~~ an efficient bleeding process ~~afterwards~~.
- ~~the slaughter line speed allows a minimum bleeding period of 90 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 euthanised immediately removed from shackle.~~

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

4.) Species-specific recommendations

- for chicken, the slaughter line speed should allow a minimum bleeding period of 90 seconds ~~(for chickens)~~ so that there is minimum blood loss of 60 % before reaching the scalding tank or other potentially painful operation;

- qualified personnel should check that at the bleeding line, especially before scalding, birds are completely dead. Birds that are still alive need to be euthanised immediately and removed from shackle.

~~None identified.~~

Article 7.5.3431

Emergency killing of~~n~~ animals arriving in containers

This article addresses animals that show signs of severe distress or 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~~.

EU comment

The EU suggests reinstating the words “and suffering” in the sentence above.

Justification:

It is generally accepted that injuries and diseases can also cause negative states other than pain in animals and these conditions also further justify the need for killing. In line with this, "weakness" is named below under 2), which does not fall under pain.

2.) Animal-based and other ~~measurables~~ measures ~~include~~:

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

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

3.) Recommendations:

Animal handlers should euthanise the animals 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 7.5.3532.

Methods, procedures or practices that should not be used 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 under any circumstances:

a) applying pressure using an injurious object or applying an irritant substance to any part of the body of the an 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;

d) stepping on or crushing animals;

de) 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 tThe 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 the brain stem by piercing through the eye socket or skull bone;

e) crushing the 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* should not be used under any circumstances ~~are unacceptable~~.

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Annex 26

GLOSSARY

[…]

EU comment

The EU supports the proposed changes to the Glossary.

~~***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.~~

EUTHANASIA

means the killing of an animal ~~act of inducing death~~ using a method that causes a rapid and irreversible loss of consciousness with minimum pain and distress ~~to animal~~.

SLAUGHTER

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

STUNNING

means any ~~mechanical, electrical, chemical or other~~ procedure that causes ~~rapid~~ ~~immediate~~ loss of consciousness for the purpose of killing without ~~minimal~~ avoidable distress, fear and 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~~**.**

[…]

_____

EU comment

The EU thanks the Code Commission for considering the EU suggestions and, in general, supports this proposed new chapter.

CHAPTER 8.X.

INFECTION WITH *COXIELLA BURNETII* (Q FEVER)

Article 8.X.1.

General provisions

Various animal species and humans can be affected by Q fever, but many of them, including *wild* and *feral* animals, do not play an epidemiologically significant role. For the purposes of the *Terrestrial Code*, Q fever is defined as an *infection* of domestic and *captive wild* ruminants, dogs, and cats (hereafter 'susceptible animal') with *Coxiella burnetii*.

The following defines the occurrence of *infection* with *C. burnetii*:

1) *C. burnetii* has been isolated and identified as such in a sample from a susceptible animal; or

2) nucleic acid specific to *C. burnetii* has been detected in a sample from a susceptible animal showing clinical signs or pathological lesions consistent with *infection* with *C. burnetii,* or ~~that is~~ epidemiologically linked to a confirmed or suspected *case*; or

3) antibodies specific to *C. burnetii*, that are not the consequence of *vaccination*, have been detected in a sample from a susceptible animal showing clinical signs or pathological lesions consistent with *infection* with *C. burnetii,* or ~~that is~~ epidemiologically linked to a confirmed or suspected *case*.

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

_____

EU comment

The EU thanks the Code Commission and in general supports this proposed new chapter.

The EU seeks further clarification in relation to the possible need or not for risk mitigating measures for the importation of dogs and cats.

CHAPTER 8.Z.

INFECTION WITH *TRYPANOSOMA EVANSI* (SURRA)

Article 8.Z.1

General provisions

Surra is a disease caused by *Trypanosoma evansi* of the subgenus Trypanozoon and may manifest in acute, chronic or clinically inapparent forms.

T. evansi is a blood and tissue parasite that occasionally invades the nervous system. It can infect a large range of domestic and *wild* mammals. The disease has a significant socio-economic impact on animal production, especially in horses, camels, donkeys, buffaloes and cattle; it can also affect goats, sheep, deer, pigs, rodents and elephants. It has a serious clinical impact in dogs, cats and non-human primates, and may occasionally infect humans.

T. evansi is mainly transmitted mechanically by several biting flies (e.g. tabanids, *Stomoxys* spp.), but can also be transmitted vertically, iatrogenically and possibly venereally. Additionally, it is transmitted perorally (especially to carnivores) and it can be transmitted biologically by the bite of vampire bats (*Desmodus* spp.), which may act as host, reservoir or *vector*.

Co-infection of *T. evansi* with other *Trypanosoma* species (including *T. vivax*, *T. brucei*, *T. congolense*, *T. simiae*, *T. equiperdum* and *T. cruzi*) may occur although this may not always be detected using routine testing methods.

For the purposes of the *Terrestrial Code*, surra is defined as an *infection* of susceptible animals with *T. evansi*.

For the purposes of this chapter, 'susceptible animals' means domestic and *wild* animals from the following families: Equidae, Camelidae, Bovidae, Suidae, Canidae, Felidae; the orders Rodentia and Lagomorpha; and non-human primates.

The following defines the occurrence of *Infection* with *T. evansi*:

1) trypanosomes with *Trypanozoon* morphology have been observed in a sample from a susceptible animal and identified as *T. evansi* by the detection of nucleic acid; or

2) trypanosomes with *Trypanozoon* morphology have been observed in a sample from a susceptible animal epidemiologically linked to a confirmed *case* of *infection* with *T. evansi* or with relevant epidemiological context (including clinical signs, endemicity, origin of the host, absence of other *Trypanosoma* spp., absence of tsetse transmission) to support surra; or

3) nucleic acid specific to *Trypanozoon* has been detected in a sample from a susceptible animal epidemiologically linked to a confirmed *case* of *infection* with *T. evansi* or with relevant epidemiological context (including clinical signs, endemicity, origin of the host, absence of other *Trypanosoma* spp., absence of tsetse transmission) to support surra; or

4) antibodies specific to *Trypanosoma* spp. have been detected in a sample from a susceptible animal epidemiologically linked to a confirmed *case* of *infection* with *T. evansi* or with relevant epidemiological context (including clinical signs, endemicity, origin of the host, absence of other *Trypanosoma* spp., absence of tsetse transmission) to support surra.

For the purposes of the *Terrestrial Code*, the *incubation period* of *infection* with *T. evansi* shall be 90 days in all species of susceptible animals.

For the purposes of this chapter, a temporary importation of horses 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.

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

Article 8.Z.2.

Safe commodities

When authorising import or transit of the following *commodities, Veterinary Authorities* should not require any surra-related conditions regardless of the *animal health status* of the *exporting country* or *zone*:

1) pasteurised *milk* and pasteurised *milk products*;

2) hair, wool and fibre;

3) gelatine and collagen;

4) horns, hooves and claws;

5) *meat* from animals that have been slaughtered in a *slaughterhouse/abattoir* and have been subjected to ante- and post-mortem inspections with favourable results;

6) *meat products*;

7) hides and skins (except raw);

8) embryos or oocytes collected, processed, and stored in accordance with Chapters 4.8. to 4.10.

Article 8.Z.3.

Country or zone free from surra

A country or *zone* may be considered free from surra when:

1) the *infection* is notifiable in the entire country for at least the past two years;

2) measures to prevent the introduction of *infection* have been in place; in particular, the importations or movements of susceptible animals and other *commodities* into the country or *zone* have been carried out in accordance with this chapter and other relevant chapters of the *Terrestrial Code*;

3) and either:

   a) the country or *zone* is historically free as described in Article 1.4.6.; or

   b) for at least the past two years, *surveillance* in accordance with Articles 8.Z.16. to 8.Z.19. has been in place in the entire country or zone and there has been no *case* in the country or *zone*.

In order to maintain its status, a country or *zone* free from *infection* with *T. evansi* adjacent to an infected country or *zone* should include an area along the border, in which *surveillance* is conducted in accordance with Articles 8.Z.12. to 8.Z.15.

Article 8.Z.4.

Compartment free from surra

The establishment of a *compartment* free from surra should follow the provisions laid down in this chapter and in Chapters 4.4. and 4.5.

Susceptible animals in the free *compartment* should be protected against the *vectors* by the application of an effective *biosecurity* management system.

Susceptible animals in the free *compartment* should be protected against both iatrogenic and venereal transmission.

Article 8.Z.5.

Recovery of free status

Should a *case* of *infection* with *T. evansi* occur in a previously free country or *zone*, its status may be recovered after the following:

1) *cases* have been isolated and then immediately treated, killed or slaughtered and appropriately disposed of;

2) animals in contact with *cases* have been put immediately under protection from *vector* contact and tested;

3) appropriate *biosecurity* is in place, including *vector* control or protection from *vector* contacts in the affected area in accordance with Articles 1.5..2. to.1.5.3.;

4) *surveillance* in accordance with Articles 8.Z.12. to 8.Z.15. has been carried out with negative results;

5) for six consecutive months, either:

    a) after the last *case* was killed or slaughtered, the animals in contact have undergone monthly repeated serological and agent identification (microscope and molecular) tests with negative results in all tests; or

    b) if appropriate trypanocide treatment is applied to the *cases*, after the last *case* was killed, slaughtered or treated, whichever occurred last, both treated and in contact animals have undergone monthly repeated agent identification tests (microscope and molecular) with negative results, and serological tests with decreasing titres.

If points 1 to 5 are not applied, Article 8.Z.3. applies.

Article 8.Z.6.

Recommendations for importation of susceptible animals (except dogs and cats) from countries, zones or compartments free from surra

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

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

2) were kept since birth or at least six months prior to shipment in a free country, *zone* or *compartment*;

3) did not transit through an *infected zone* during transportation to the *place of shipment* or were protected from *vectors* or any source of *T. evansi* by the application of effective *biosecurity* during transportation to the place of shipment.

Article 8.Z.7.

Recommendations for importation of susceptible animals (except dogs and cats) from countries or zones infected with *T. evansi*

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

1) showed no clinical sign of *infection* with *T. evansi* during isolation and on the day of shipment;

2) were isolated in a *quarantine station* for at least 90 days prior to shipment, and all animals from the same *flock* or *herd* were subjected to serological and agent identification (microscope and molecular) on two occasions, immediately prior to entering quarantine and within 15 days before being released from quarantine, with negative results.

Article 8.Z.8.

Recommendations for importation of susceptible animals from countries or zones infected with *T. evansi* for immediate slaughter

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

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

2) were negative in an agent identification (microscope and molecular) and a serological test within 15 days prior to shipment;

3) were kept for the six months prior to shipment in an *establishment* in which *surveillance* in accordance with Articles 8.Z.12., 8.Z.13. and 8.Z.14. demonstrates that no *case* had occurred during that period;

4) were permanently identified and transported under the supervision of the *Veterinary Services* in a *vector*-protected *vehicle*, which underwent *disinfection* and disinsection before *loading*, directly from the *establishment* of origin to the *place of shipment* without coming into contact with other susceptible animals.

Article 8.Z.9.

Recommendations for the temporary importation of horses

If the importation of horses on a temporary basis does not comply with the recommendations in Article 8.Z.6. or Article 8.Z.7., *Veterinary Authorities* of *importing countries* should:

1) require:

   a) the equids 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 equids:

      i) were negative in an antibody detection test within 15 days prior to departure from the country of origin;

      ii) showed no clinical sign of *infection* with *T. evansi* on the days of shipments;

   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*:

   a) measures are taken to protect from *vectors* or any source of *T. evansi* by the application of effective *biosecurity*;

   b) the equids were not subjected to any practice that may represent a risk of iatrogenic transmission of *infection* with *T. evansi;*

   c) the equids are kept and transported individually in stalls and *vehicles/vessels* which are subsequently cleaned and disinsected before re-use.

Article 8.Z.10.

Recommendations for importation of semen of susceptible animals from countries, zones or compartments free from surra

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

1) the donor males:

   a) showed no clinical sign of *infection* with *T. evansi* on the day of semen collection;

   b) have been kept for at least six months prior to semen collection in a free country, *zone* or *compartment*; and

2) the semen was collected, processed and stored in accordance with Chapters 4.6. and 4.7.

Article 8.Z.11.

Recommendations for importation of semen of susceptible animals from countries or zones infected with *T. evansi*

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

1) the donor males:

   a) have been kept for at least six months prior to semen collection in an *establishment* in which *surveillance* in accordance with Articles 8.Z.12., 8.Z.13. and 8.Z.14. demonstrates that no *case* had occurred during that period;

   b) showed no clinical sign of *infection* with *T. evansi* on the day of semen collection;

   c) were negative in an agent identification (microscopic) and a serological test on a blood sample collected on the day of collection of the semen;

2) molecular examination of semen for *T. evansi* was negative;

3) the semen was collected, processed and stored in accordance with Chapters 4.6. and 4.7.

Article 8.Z.12.

Introduction to surveillance

Articles 8.Z.12. to 8.Z.14. define the principles and provide guidance on *surveillance* for *infection* with *T. evansi*, complementary to Chapter 1.4. and Chapter 1.5.

The purpose of *surveillance* could be the demonstration of the absence of *infection*, the early detection of *cases*, or the measurement and monitoring of the *prevalence* and distribution of the *infection* in a country, *zone* or *compartment*.

An important component of the epidemiology of surra is the capability of its *vectors*, which provides a measure of disease risk that incorporates *vector* competence, abundance, biting rates, survival rates, host affinity and in the case of biological *vectors*, the extrinsic *incubation period*. However, methods and tools for measuring some of these *vector* factors remain to be developed, particularly in a field context. Therefore, *surveillance* for *infection* with *T. evansi* should focus on transmission of *T. evansi* in susceptible animals.

The impact and epidemiology of surra widely differs between different regions of the world and therefore, it is not appropriate to provide specific recommendations for all situations. Member Countries should provide scientific data explaining the epidemiology of the disease in the country or *zone* concerned and adapt the *surveillance* strategies for defining their status to the local conditions. There is considerable latitude available to Member Countries to justify their status at an acceptable level of confidence.

Consideration should be given to risk factors such as susceptibility, co-infections with other *Trypanosom*a spp. and climate change.

Although *surveillance* in susceptible *wild animals* presents challenges that may differ significantly from those in domestic *animals*, *wildlife* should be considered in the *surveillance* system as they are included in the case definition and can serve as reservoirs of *infection* and as indicators of *risk* to domestic *animals.*

Article 8.Z.13.

General conditions and methods of surveillance

The *surveillance* system for *infection* with *T. evansi* should be in accordance with Chapter 1.4. and be under the responsibility of the *Veterinary Authority*.

1) It should include:

   a) formal and ongoing system for detecting and investigating *outbreaks* of disease;

   b) each country should establish a *surveillance* system or integrate activities into already established animal health *surveillance* programmes for purposes of sustainablity;

   c) the collection and transport of samples from suspected *cases* to a *laboratory* for diagnosis or a procedure for the rapid diagnosis in the field;

   d) appropriate tools, for collection, recording, managing and analysis of data; reporting and dissemination for decision making.

2) In addition, it should, at least:

   a) in a free country or *zone,* have an *early warning system* capable of detecting *T. evansi* which obliges animal owners and keepers and other stakeholders who have regular contact with susceptible animals, as well as *veterinarians* or *veterinary paraprofessionals*, to report promptly any suspicion of *infection* with *T. evansi* to the *Veterinary Authority*;

   b) include representative or risk-based serological or parasitological surveys appropriate to the status of the country, *zone* or compartment.

An effective *surveillance* system will periodically identify suspected *cases* that require follow-up and investigation to confirm or exclude whether the cause of the condition is *T. evansi*. The rate at which such suspected *cases* are likely to occur will differ between epidemiological situations and cannot therefore be reliably predicted. All suspected *cases* should be investigated immediately, and samples should be taken and submitted to a *laboratory*.

Article 8.Z.14.

Surveillance strategies

The target *population* should include domestic and *wild* susceptible animals of epidemiological significance within the country, *zone or compartment.* Active and passive *surveillance* for surra should be ongoing as epidemiologically appropriate. *Surveillance* should be composed of representative or risk-based approaches using parasitological, serological, clinical and entomological methods appropriate for the status of the country, *zone or compartment*.

In a free country, *zone* or *compartment,* it is appropriate to focus *surveillance* in an area adjacent to an infected country, *zone* or *compartment*, considering relevant ecological or geographical features likely to interrupt the transmission of surra.

A Member Country should justify the *surveillance* strategy chosen as being adequate to detect the presence of *infection* with *T. evansi* in accordance with Chapter 1.4. and Chapter 1.5., and with the prevailing epidemiological situation.

If a Member Country wishes to declare freedom from surra in a specific *zone*, the design of the *surveillance* strategy should be targeted to the susceptible population within the *zone*.

For random surveys, the sample size selected for testing should be large enough to detect evidence of *infection* if it were to occur at a predetermined minimum expected *prevalence*. The sample size and expected *prevalence* determine the level of confidence in the results of the survey. The Member Country should justify the choice of the minimum expected *prevalence* and confidence level based on the objectives of *surveillance* and the epidemiological situation, in accordance with Chapter 1.4. Irrespective of the survey approach selected, the sensitivity and specificity of the diagnostic tests employed are key factors in the design, sample size determination and interpretation of the results obtained. Ideally, the sensitivity and specificity of the tests used should be validated for the *infection* history and the different *Trypanosoma* species and other Kinetoplastid species (*T. vivax, T. congolense, T. brucei*, *T. equiperdum*, *T. cruzi* and *Leishmania* spp.) present in the target population.

Irrespective of the testing system employed, *surveillance* system design should anticipate the occurrence of cross reactions. There should be an effective procedure for following up cross reactions to determine, with a high level of confidence, whether they are indicative of *infection* with *T. evansi* or not. This should involve both supplementary tests and follow-up investigation to collect diagnostic material from the original sampling unit as well as those which may be epidemiologically linked to it.

The principles involved in *surveillance* are technically well defined. The design of *surveillance* programmes to prove the absence of *infection* with *T. evansi* should be carefully followed to avoid producing results that are either insufficiently reliable to be accepted by international trading partners, or excessively costly and logistically complicated.

The results of random or targeted surveys are important in providing reliable evidence that no *infection* with *T. evansi* is present in a country, *zone* or *compartment*. It is, therefore, essential that the survey is thoroughly documented. It is critical to consider the movement history of the animals being sampled when interpreting the results.

An active programme of *surveillance* of susceptible populations to detect evidence of *infection* with *T. evansi* is essential to establish the *animal health status* of a country, *zone or compartment.*

1. Clinical surveillance

   Clinical *surveillance* aims to detect clinical signs of *infection* with *T. evansi* in susceptible animals, particularly during a newly introduced *infection*. However, neither clinical nor post-mortem signs of *infection* with *T. evansi* are pathognomonic. Therefore, suspected *cases* of *infection* with *T. evansi* detected by clinical *surveillance* should always be confirmed by direct or indirect laboratory tests that confirm the presence of *T. evansi*.

2. Parasitological surveillance

   Parasitological examination (or agent identification) can be conducted to:

a) detect active *infection*;

b) confirm clinically suspected *cases*;

c) identify parasites at the subgenus level;

d) confirm active *infection* after positive serological results.

3. Molecular techniques

Molecular techniques can be conducted to:

a) increase the sensitivity of the detection of active *infections*;

b) confirm clinically suspected *cases*;

c) identify parasites at the subgenus level (Trypanozoon), or at the species level (*T. evansi*); (in the host and/or the *vector*);

d) confirm active *infection* after positive serological results.

4. Serological surveillance

a) Serological testing of susceptible animals is one of the most effective methods for detecting exposure to *T. evansi*. The host species tested should reflect the epidemiology of the disease. Management variables that may influence likelihood of *infection*, such as animal treatment, should be considered.

b) Owing to cross reactions with other Kinetoplastid species, co-infections with these pathogenic agents should be considered when interpreting the results of the serological *surveillance* system.

c) Serological techniques can be conducted to:

i) demonstrate individual or population freedom;

ii) detect subclinical or latent *infection* by *T. evansi*;

iii) determine by seroprevalence the magnitude of *infection* by *T. evansi* in the host population.

d) Positive test results can have different possible causes:

i) current *infection*;

ii) antibodies from previous *infection* (after effective treatment or self-cure);

iii) maternal antibodies;

iv) cross reactions with other Kinetoplastid species.

5. Sentinel animals

Sentinel *surveillance* may provide evidence of freedom from *infection* or provide data on *prevalence* and *incidence* as well as the distribution of the *infection*. Sentinel *surveillance* may consist of:

a) the identification and regular testing of one or more of sentinel animal units of known health or immune status in a specified geographical location to detect the occurrence of *infection* with *T. evansi*;

b) the investigation of clinical suspect *cases* targeting highly susceptible animals such as dogs (hunting dogs and dogs living around *slaughterhouses/abattoirs*), camels, donkeys or horses.

6. Vector surveillance

This point should be read in conjunction with Chapter 1.5.

For the purposes of this chapter, *vector surveillance* aims at determining different levels of *risk* by identifying the presence and abundance of various *vector* species (biting flies and vampire bats) in an area.

The most effective way of gathering *vector surveillance* data should consider the biology and behavioural characteristics of the local *vector* species and include traps, net, sticky targets or other collection tools. The choice of the number and type of collecting tools to be used and the frequency of their use should be made by considering the size and ecological characteristics of the area to be surveyed. In the *surveillance* of *wildlife* species, molecular techniques may be applied to *vectors*.

When sentinel animals are used, *vector surveillance* should be conducted at the same locations.

Article 8.Z.15.

Additional surveillance procedures for recovery of free status

In addition to the general conditions described in this chapter, a Member Country seeking recovery of country or *zone* free status, including a *containment zone* established in accordance with Article 4.4.7., should show evidence of an active *surveillance* programme to demonstrate absence of *infection* with *T. evansi*.

Populations under this *surveillance* programme should include:

1) *establishments* in the proximity of the *outbreak*;

2) *establishments* epidemiologically linked to the *outbreak*;

3) *animals* moved from previously affected *establishments*;

4) *animals* used to re-populate previously affected *establishments*.

EU comment

The EU in general supports the proposed changes to this chapter and thanks the Code Commission for considering the EU suggestions. Important comments are inserted in the text below.

CHAPTER 11.5.

INFECTION WITH *MYCOPLASMA MYCOIDES* SUBSP. *MYCOIDES* ~~*SC*~~ (CONTAGIOUS BOVINE PLEUROPNEUMONIA)

Article 11.5.1.

General provisions

~~1) For the purposes of this chapter, susceptible *animals* means domestic bovines (*Bos indicus, B. taurus, B. grunniens* and *Bubalus bubalis).*~~

12~~1~~) For the purposes of the *Terrestrial Code*, ~~the *incubation period* for~~ contagious bovine pleuropneumonia (CBPP) ~~shall be six months.~~

~~For the purpose of this chapter,~~ is defined as an ~~*animal*~~ *infection*~~ed~~ of ~~susceptible animals~~ bovines (*Bos indicus, B. taurus, B. grunniens* and *Bubalus bubalis*) with *Mycoplasma mycoides* subspecies *mycoides* ~~SC~~ (*Mmm* ~~SC~~)~~, and freedom from CBPP means freedom from *Mmm SC infection.*~~

~~For the purpose of this chapter, susceptible *animals* include bovids (*Bos indicus, B. taurus* and *B. grunniens*) and water buffaloes (*Bubalus bubalis)*~~

2~~3~~) ~~For the purposes of *international trade*~~This chapter deals not only with the occurrence of clinical signs caused by *Mmm*~~SC~~, but also with the presence of *infection* with *Mmm*~~SC~~ in the absence of clinical signs.

3~~4~~) The following defines the occurrence of *infection* with *Mmm*~~SC~~ ~~*infection*~~:

~~1~~a) *Mmm*~~SC~~ has been isolated and identified as such in ~~from an *animal*, embryos, oocytes or semen~~ a sample from a ~~susceptible animal~~ bovine~~; or~~

~~2~~b) ~~*Mmm* deoxyribo~~nucleic acid specific to *Mmm* has been detected in a sample from a ~~susceptible animal~~ bovine showing pathological lesions consistent with an *infection* with *Mmm*~~SC~~, and epidemiologically linked~~ed~~ to a confirmed *case*.

c) antibodies specific to *Mmm*~~SC antigens,~~ which are not the consequence of *vaccination*, have been detected in a sample from a ~~susceptible animal~~ bovine showing pathological lesions consistent with an *infection* with *Mmm*, and epidemiologically linked to a confirmed *case* ~~or *Mmm*SC deoxyribonucleic acid have been identified in one or more animals showing pathological lesions consistent with *infection* with *Mmm*SC with or without clinical signs, and epidemiological links to a confirmed *outbreak* of CBPP in susceptible *animals*~~.

EU comment

The EU thanks the Code Commission for addressing a previous comment on this same article. However, we believe there is a need to revisit point 3) with two main suggestions:

First suggestion:

The EU suggests aligning this case definition with point 2) of Article 11.5.1. and with case definition for other diseases, i.e. animals not showing clinical signs should not be excluded from the case definition. In addition, reference to pathological lesions should be kept.

Therefore, both points b) and c) should include the wordings "or epidemiologically linked to a confirmed case". These same points should refer to the wording "showing clinical signs or pathological lesions consistent with".

Second suggestion:

The words "; or" should be added at the end of points a) and b) to avoid the need to meet all three points to match the case definition, as we believe the intention of the case definition is to meet either a) or b) or c).

~~4~~5) The purposes of the *Terrestrial Code*, the *incubation period* shall be six months.

EU comment

Editorial comment: "For the purposes of the Terrestrial Code, the incubation period shall be six months"

~~When authorising import or transit of the *commodities* listed in this chapter, with the exception of those listed in Article 11.5.2., *Veterinary Authorities* should require the conditions prescribed in this chapter relevant to the CBPP status of the domestic bovids and water buffalo population of the *exporting country*, *zone* or *compartment*.~~

~~5~~6) Standards for diagnostic tests and vaccines are described in the *Terrestrial Manual*.

Article 11.5.2.

Safe commodities

When authorising the importation or transit of the following *commodities*, *Veterinary Authorities* should not require any CBPP-related conditions, regardless of the ~~CBPP~~ *animal health status* of ~~the domestic bovids~~ bovine ~~and water buffalo population of~~ the *exporting country*, *zone* or *compartment*:

1) *milk* and *milk products*;

2) hides and skins;

3) *meat* and *meat products* (excluding lung).

Article 11.5.3.

Country or zone free from CBPP ~~free country or zone~~

A country or *zone* may be considered free from CBPP when the relevant provisions in point 2 of Article 1.4.6. have been complied with, and when within the proposed free country or *zone* for at least the past 24 months:

1) there has been no *case* of *infection* with *Mmm*;

2) the *Veterinary Authority* has current knowledge of, and authority over, all *herds* of ~~susceptible animals~~ bovines;

3) appropriate *surveillance* has been implemented in accordance with:

   a) Article 1.4.6. where historical freedom can be demonstrated; or

   b) Articles 11.5.13. and 11.5.14. where historical freedom cannot be demonstrated;

4) measures to prevent the introduction of the *infection* have been in place: in particular, the importations or movements of bovine *commodities* into the country or *zone* have been carried out in accordance with this chapter and other relevant chapters of the *Terrestrial Code*;

5) no *vaccination* or treatment against CBPP has been carried out;

6) no animal vaccinated or treated against CBPP ~~have~~ has been introduced ~~since the cessation of *vaccination*~~.

~~To qualify for inclusion in the existing list of CBPP free countries and *zones*, a Member Country should:~~

~~1) have a record of regular and prompt animal disease reporting;~~

~~2) send a declaration to the OIE stating that:~~

~~a) there has been no *outbreak* of CBPP during the past 24 months;~~

~~b) no evidence of CBPP *infection* has been found during the past 24 months;~~

~~c) no *vaccination* against CBPP has been carried out during the past 24 months,~~

~~and supply documented evidence that *surveillance* for CBPP in accordance with this chapter is in operation and that regulatory measures for the prevention and control of CBPP have been implemented;~~

~~3) not have imported since the cessation of *vaccination* any animals vaccinated against CBPP.~~

The country or *zone* will be included in the list of countries or *zones* free from CBPP in accordance with Chapter 1.6. ~~only after the submitted evidence has been accepted by the OIE~~.

Retention on the list requires annual reconfirmation of compliance with all points above and ~~relevant~~ provisions under point 4 of Article 1.4.6. ~~that the information in points 2 *a)*, 2 *b)*, 2 *c)* and 3 above be re-submitted annually and~~ Documented evidence should be resubmitted annually for points 1 to 4 above. Any changes in the epidemiological situation or other significant events should be ~~reported~~ notified to WOAH in accordance with ~~the requirements in~~ Chapter 1.1.

Article 11.5.4~~6~~.

Compartment free from CBPP ~~free compartment~~

~~The bilateral recognition of a CBPP free *compartment* should follow the principles laid down in this chapter and in Chapters 4.3. and 4.4.~~

A *compartment* free from CBPP can be established in any country or *zone*. In defining such a *compartment* the principles of Chapters 4.4. and 4.5. should be followed. ~~Susceptible animals~~ Bovines in the *compartment* should be separated from any other ~~susceptible animals~~ bovines by the effective application of a *biosecurity plan*.

A Member Country wishing to establish a *compartment* free from CBPP should:

1) have a record of regular and prompt animal *disease* reporting and, if not free, have an *official control programme* and a *surveillance* system for CBPP in place in accordance with Articles 11.5.13. and 11.5.14. that allows knowledge of the prevalence, distribution and characteristics of CBPP in the country or *zone*;

2) declare for the free *compartment* that:

   a) there has been no *case* of CBPP during the past 24 months;

   b) no *infection* with *Mmm* has been detected during the past 24 months;

   c) *vaccination* against CBPP is prohibited;

   d) no animal vaccinated or treated against CBPP within the past 24 months is in the *compartment*;

   e) animals, semen and embryos may only enter the *compartment* in accordance with relevant articles in this chapter;

   f) documented evidence shows that *surveillance* in accordance with Articles 11.5.13. and 11.5.14. is in operation;

   g) an *animal identification* and *traceability* system in accordance with Chapters 4.1. and 4.2. is in place;

3) describe in detail:

   a) the animal *subpopulation* in the *compartment*;

   b) the *biosecurity plan* to mitigate the risks identified by the *surveillance* carried out in accordance with point 1 notably to prevent the aerosol transmission of CBPP.

The *compartment* should be approved by the *Veterinary Authority*.

Article 11.5.5.

Country of zone infected with *Mmm* ~~CBPP infected country or zone~~

A country or *zone* shall be considered as infected with *Mmm* ~~W~~when the requirements for acceptance as a ~~CBPP free~~ country or *zone* free from CBPP are not fulfilled~~, a country or *zone* shall be considered as infected~~.

Article 11.5.5bis.

Establishment of a containment zone within a country or zone previously free from CBPP

In the event of *outbreaks* of CBPP within a country or *zone* previously free from CBPP, including within a *protection zone*, a *containment zone*, which includes all epidemiologically linked *outbreaks*, ~~can~~ may be established, in accordance with Article 4.4.7., to minimise the impact on the rest of the country or *zone*.

For this to be achieved and for the Member Country to take full advantage of this process, the *Veterinary Authority* should submit as soon as possible to WOAH, in addition to the requirements of Article 4.4.7., ~~in support of the application,~~ documented evidence that:

1) on suspicion, a ~~strict~~ standstill has been imposed on the suspected *establishments*, and ~~in the country or *zone* animal movement control has been imposed and~~ effective controls on the movement of animals and other relevant *commodities* are in place in the country or *zone*;

2) the *infection* has been confirmed and notified in accordance with Chapter 1.1.;

3~~2~~) on confirmation, ~~an~~ the ~~additional~~ standstill and movement ~~of susceptible animals has been imposed~~ controls described in point 1 have been reinforced ~~in the entire *containment zone* and the movement controls described in point 1 have been reinforced~~;

4~~3~~) epidemiological investigations into the likely source of the *outbreaks* have been carried out;

5~~4~~) a *slaughter* policy, with or without the use of emergency *vaccination*, has been applied;

6~~5~~) *surveillance* in accordance with Articles 11.5.13. and 11.5.14. is in place in the *containment zone* and in the rest of the country or *zone*;

7~~6~~) measures that prevent the spread of CBPP to the rest of the country or *zone*, taking into consideration physical and geographical barriers, are in place.

The free status of the areas outside the *containment zone* is suspended while the *containment zone* is being established. The free status of these areas ~~outside the *containment zone*~~ may be reinstated irrespective of the provisions of Article 11.5.4., once the *containment zone* has been approved by WOAH as complying with Article 4.4.7. and points 1 to ~~6~~ 7 above.

In the event of recurrence of *infection* with *Mmm* in the *containment zone*, established in accordance with point 4(a) of Article 4.4.7., the approval of the *containment zone* is withdrawn and the ~~CBPP~~ free status of the whole country or *zone* is suspended until the relevant requirements of Article 11.5.4. are fulfilled.

In the event of occurrence of *infection* with *Mmm* in the outer zone of a *containment zone* established in accordance with point 4(b) of Article 4.4.7., the approval of the *containment zone* is withdrawn and the free status of the whole country or *zone* is suspended until the relevant requirements of Article 11.5.4. are fulfilled.

The recovery of the ~~CBPP~~ free status of the *containment zone* should follow the provisions of Article 11.5.~~4~~6.

Article 11.5.6~~4~~.

Recovery of free status

Should an outbreak of CBPP occur in a previously free country or zone, its status may be recovered when *surveillance* in accordance with Articles 11.5.13. and 11.5.14. has been carried out with negative results, and 12 months after:

1) the *disinfection* of the last affected *establishment*, provided that a *slaughter* policy without *vaccination* has been implemented; or

2) the *disinfection* of the last affected *establishment* and the *slaughter* of all vaccinated animals, provided that a *slaughter* policy with emergency *vaccination* and *slaughter* of vaccinated animals has been implemented.

~~When a CBPP *outbreak* occurs in a CBPP free country or *zone*, one of the following waiting periods is required to regain the status of CBPP free country or *zone*:~~

~~1) 12 months after the last *case* where a *stamping-out* policy and serological *surveillance* and strict movement control are applied in accordance with this chapter;~~

~~2) if *vaccination* was used, 12 months after the *slaughter* of the last vaccinated *animal*.~~

~~1) 12 months after the *slaughter* of the last *case* where a *slaughter* policy, without emergency *vaccination*, and *surveillance* are applied in accordance with Articles 11.5.13. and 11.5.14.; or~~

~~2) 12 months after the *slaughter* of the last *case* and of all vaccinated animals, whichever occurred last, where a *slaughter* policy, emergency *vaccination* and *surveillance* in accordance with Articles 11.5.13. and 11.5.14. are applied.~~

The country or *zone* will regain the status of CBPP free country or *zone* only after the submitted evidence, based on the provisions of Chapter 1.10., has been accepted by WOAH.

Where a ~~*stamping-out*~~ *slaughter* policy is not practised, the above waiting periods do not apply but Article 11.5.3. applies.

Article 11.5.7.

Recommendations for importation of ~~susceptible animals~~ bovines from ~~CBPP free~~ countries, ~~or~~ zones~~,~~ or compartments free from CBPP ~~free compartments~~

~~For domestic bovids and water buffaloes~~

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

1) showed no clinical sign of CBPP on the day of shipment;

2) were kept in a CBPP free country, *zone* or *compartment* since birth or for at least the past six months.

Article 11.5.8.

Recommendations for importation of ~~susceptible animals~~ bovines from ~~CBPP infected~~ countries or zones infected with *Mmm* for immediate slaughter

~~For domestic bovids and water buffaloes for slaughter~~

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

1) showed no clinical sign of CBPP on the day of shipment;

2) originate from an *establishment* in which *surveillance* in accordance with Articles 11.5.13. and 11.5.14. demonstrates that ~~where~~ no *case* of CBPP had occurred ~~was officially reported for~~ during the past six months; and

3) are transported ~~directly~~ under the supervision of the *Veterinary Authority* in a *vehicle/vessel,* which was subjected to *disinfection* before loading, directly from the *establishment* of origin to the ~~*slaughterhouse/abattoir*~~ *place of shipment* ~~in sealed *vehicles*~~ without coming into contact with other ~~susceptible animals~~ bovines.

EU comment

It is suggested that the terms "slaughterhouse / abattoir" be kept to clarify that these are risk mitigating measures for animals destined for direct slaughter and not any other category of animals.

Suggested wording:

" … to the slaughterhouse/abattoir for immediate slaughter without coming into contact with other bovines"

Article 11.5.9.

Recommendations for importation of bovine semen from CBPP free countries, ~~or~~ zones, or compartments free from CBPP ~~free compartments~~

~~For bovine semen~~

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

1) the donor animals:

a) showed no clinical sign of CBPP on the day of collection of the semen;

b) were kept in a CBPP free country, *zone* or *compartment* since birth or for at least the past six months;

2) the semen was collected, processed and stored in accordance with Chapters 4.6. and 4.7.

Article 11.5.10.

Recommendations for importation of bovine semen from ~~CBPP infected~~ countries or zones infected with Mmm

~~For bovine semen~~

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

1) the donor animals:

a) showed no clinical sign of CBPP on the day of collection of the semen;

b) were subjected to ~~the complement fixation~~ a serological test for CBPP with negative results, on two occasions, with an interval of not less than 21 days and not more than 30 days between each test, the second test being performed within 14 days prior to collection;

c) were isolated from other ~~domestic bovids and water buffaloes~~ ~~susceptible animals~~ bovines from the day of the first ~~the complement fixation~~ serological test until collection;

d) were kept since birth, or for the past six months, in an *establishment* in which *surveillance* in accordance with Articles 11.5.13. and 11.5.14. demonstrates that ~~where~~ no case of CBPP ~~was reported~~ had occurred during that period. ~~, and that the *establishment* was not situated in a CBPP infected *zone*;~~

e) AND EITHER:

i) have not been vaccinated against CBPP;

OR

ii) were vaccinated ~~using a vaccine complying with the standards described in the *Terrestrial Manual*~~ not more than four months prior to collection; in this case, the condition laid down in point b) above is not required;

2) the semen:

a) was collected, processed and stored in accordance with Chapters 4.~~5~~6. and 4.~~6~~7.;

b) was subjected to a test for the ~~identification~~ detection of the agent.

Article 11.5.11.

Recommendations for importation of *in vivo* derived or *in vitro* produced oocytes or embryos of ~~susceptible animals~~ bovines from ~~CBPP free~~ countries, ~~or~~ zones~~,~~ or compartments free from CBPP ~~free compartments~~

~~For *in vivo* derived or *in vitro* produced oocytes or embryos of domestic bovids and water buffaloes~~

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

1) the donor animals:

a) showed no clinical sign of CBPP on the day of collection of the oocytes or embryos;

b) were kept in a CBPP free country, *zone* or *compartment* since birth or for at least the past six months;

2) the oocytes were fertilised with semen meeting the conditions of Articles 11.5.9. or 11.5.10.;

3) the oocytes or embryos were collected, processed and stored in accordance with Chapters 4.8., 4.9. and 4.10., as relevant.

Article 11.5.12.

Recommendations for importation of *in vivo* derived or *in vitro* produced oocytes or embryos of ~~susceptible animals~~ bovines from ~~CBPP infected~~ countries or zones infected with *Mmm*

~~For *in vivo* derived or *in vitro* produced oocytes or embryos of domestic bovids and water buffaloes~~

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

1) the donor animals:

a) showed no clinical sign of CBPP on the day of collection of the embryos or oocytes;

b) were subjected to ~~the complement fixation~~ a serological test for CBPP with negative results, on two occasions, with an interval of not less than 21 days and not more than 30 days between each test, the second test being performed within 14 days prior to collection;

c) were isolated from other ~~domestic bovids and water buffaloes~~ bovines from the day of the first ~~the complement fixation~~ serological test until collection;

d) were kept since birth, or for the past six months, in an *establishment* in which *surveillance* in accordance with Articles 11.5.13. and 11.5.14. demonstrates that ~~where~~ no *case* of CBPP ~~was reported~~ had occurred during that period, ~~, and that the *establishment* was not situated in a CBPP infected *zone*;~~

e) AND EITHER:

i) have not been vaccinated against CBPP;

OR

ii) were vaccinated ~~using a vaccine complying with the standards described in the *Terrestrial Manual*~~ not more than four months prior to collection; in this case, the condition laid down in point *b)* above is not required;

2) the oocytes were fertilised with semen meeting the conditions of Articles 11.5.9. ~~and~~ or 11.5.10.;

3) the oocytes or embryos were collected, processed and stored in accordance with Chapters 4.8., 4.9. and 4.10., as relevant.

Article 11.5.13.

~~Introduction to surveillance~~ General principles of surveillance

Articles 11.5.13. ~~to~~ and 11.5.~~17~~14. define the principles and provide a guide for the *surveillance* of CBPP in accordance with Chapter 1.4. notably point 2(h) of Article 1.4.3. concerning quality assurance applicable to Member Countries seeking establishment ~~of freedom from CBPP. Guidance is provided for Member Countries seeking reestablishment,~~ maintenance or recovery of freedom from CBPP ~~for~~ at the ~~entire~~ country, ~~or for a *zone*, following an *outbreak*~~ or *compartment* level or seeking endorsement by WOAH of their *official control programme* for CBPP, in accordance with Article 11.5.13. *Surveillance* aims at identifying *infection* in bovines ~~susceptible species as indicated in Article 11.5.1~~.

1. Early detection

A *surveillance* system for early detection should be in place in accordance with Chapter 1.4. under the responsibility of the *Veterinary Authority.*

2. Demonstration of freedom

The impact and epidemiology of CBPP differ widely in different regions of the world and therefore it is impossible to provide specific recommendations for all situations. *Surveillance* strategies employed for demonstrating freedom from CBPP at an acceptable level of confidence should be adapted to the local situation. It is incumbent upon the applicant Member Country to submit a dossier to ~~the OIE~~WOAH in support of its application that not only explains the epidemiology of CBPP in the region concerned but also demonstrates how all the risk factors are managed. This should include provision of scientifically-based supporting data. There is therefore considerable latitude available to Member Countries to provide a well-reasoned argument to prove that the absence of CBPP *infection* is assured at an acceptable level of confidence.

Surveillance for CBPP should be in the form of a continuing programme designed to establish that the whole territory or part of it is free from CBPP *infection*.

A Member Country wishing to substantiate freedom from CBPP should demonstrate absence of *infection* with *Mmm* in susceptible populations.

~~Article 11.7.14.~~

~~General conditions and methods for surveillance~~

3. ~~OIE~~WOAH endorsed official control programme

Surveillance strategies employed in support of ~~an OIE~~a WOAH endorsed *official control programme* should demonstrate evidence of the effectiveness of any control strategy used and of the ability to rapidly detect all *outbreaks* of CBPP *outbreaks*.

Considerable latitude exists for Member Countries to design and implement *surveillance* to establish that the whole country or a zone is free from CBPP and to understand the epidemiology of CBPP as part of the *official control programme*.

The Member Country should submit a dossier to ~~the OIE~~WOAH in support of its application that explains the epidemiology of CBPP in the region concerned and demonstrates how all the risk factors are identified and managed. This should include provision of scientifically based supporting data.

The entire investigative process should be documented within the *surveillance* programme. All the epidemiological information should be substantiated, and the results should be collated in the final report.

~~The entire investigative process should be documented within the *surveillance* system in accordance with Chapter 1.4. should be under the responsibility of the Veterinary Authority. A procedure should be in place for the rapid collection and transport of samples from suspect cases of CBPP to a laboratory for CBPP diagnoses.~~

~~2)~~ ~~The CBPP *surveillance* programme.should:~~

~~a)~~ ~~include an early warning system throughout the production, marketing and processing chain for reporting suspicious cases. Farmers and workers (such as community animal health workers) who have day-to-day contact with livestock, *meat* inspectors as well as *laboratory* diagnosticians, should report promptly any suspicion of CBPP. They should be integrated directly or indirectly (e.g. through private *veterinarians* or *veterinary para-professionals*) into the *surveillance* system.~~ All ~~suspect cases of CBPP should be investigated immediately. Where suspicion cannot be resolved by~~ the epidemiological ~~and clinical investigation, samples should be taken and submitted to a *laboratory*. This requires that sampling kits~~ information should be substantiated, and ~~other equipment are available for those responsible for *surveillance*. Personnel responsible for *surveillance* should be able to call for assistance from a team with expertise in CBPP diagnosis and control;~~

b) ~~implement, when relevant, regular and frequent clinical inspection and testing of high-risk groups of *animals*, such as those adjacent to a CBPP infected country or *zone* (for example, areas of transhumant production systems);~~

c) take into consideration additional factors such as animal movement, different production systems, geographical and socio-economic factors that may influence the risk of *disease* occurrence.

An effective *surveillance* system will periodically identify suspicious cases that require follow-up and investigation to confirm or exclude that the cause of the condition is CBPP. The rate at which such suspicious cases are likely to occur will differ between epidemiological situations and cannot therefore be predicted reliably. Applications for freedom from CBPP *infection* should, in consequence, provide details of the occurrence of suspicious cases and how they were investigated and dealt with. This should include the results of *laboratory* testing and the control measures to which the *animals* concerned were subjected during the investigation (quarantine, movement stand-still orders, etc.). should be collated in the final report.

Article 11.7.15.

4. Surveillance strategies

1. Introduction

The target population for *surveillance* aimed at identifying *disease* and *infection* should cover all the susceptible species (*Bos taurus*, *B. indicus*, *B. grunniens* and *Bubalusbubalis*) within the country or *zone*.

Given the limitations of the diagnostic tools available, tThe interpretation of serological *surveillance* results should be at the *herd* level rather than at the individual animal level.

Randomised *surveillance* may not be the preferred approach given the epidemiology of the *disease* (usually uneven distribution and potential for occult foci of *infection* in small populations) and the limited sensitivity and specificity of currently available tests. Targeted Risk-based *surveillance* (e.g. based on the increased likelihood of *infection* in particular localities or species, focusing on *slaughter* findings, and active clinical *surveillance*) may be the most appropriate strategy. The applicant Member Country should justify the *surveillance* strategy chosen as adequate to detect the presence of CBPP *infection* in accordance with Chapter 1.4. and the epidemiological situation.

Targeted Risk-based *surveillance* may involve testing of the entire target subpopulation or a sample from it. In the latter case the sampling strategy should incorporate an epidemiologically appropriate design prevalence. The sample size selected for testing should be large enough to detect *infection* if it were to occur at a predetermined minimum rate. The sample size and expected *disease* prevalence determine the level of confidence in the results of the survey. The applicant Member Country should justify the choice of design prevalence and confidence level based on the objectives of *surveillance* and the epidemiological situation, in accordance with Chapter 1.4. Selection of the design prevalence in particular should be clearly based on the prevailing or historical epidemiological situation.

Regular and frequent clinical inspection and testing of high-risk groups of *animals*, such as those adjacent to a country or *zone* infected with *Mmm* (for example, areas of transhumant production systems) should be implemented when relevant.

Additional factors such as animal movement, different production systems, geographical and socio-economic factors that may influence the risk of *disease* introduction and occurrence should be taken into consideration.

Irrespective of the survey design selected, the sensitivity and specificity of the diagnostic tests employed are key factors in the design, sample size determination and interpretation of the results obtained. ~~Ideally, the sensitivity and specificity of the tests used should be validated.~~

5. Follow-up of suspected cases and interpretation of results

An effective *surveillance* system will identify suspected *cases* that require immediate follow-up and investigation to confirm or exclude that the cause of the condition is an *infection* with *Mmm*. Samples should be taken and submitted for diagnostic testing, unless the suspected *case* can be confirmed or ruled out by epidemiological and clinical investigation. Details of the occurrence of suspected *cases* and how they were investigated and dealt with should be documented. This should include the results of diagnostic testing and the measures applied to the animals concerned during the investigation.

~~Irrespective of t~~The surveillance ~~system employed, the~~ design should anticipate the occurrence of false positive *laboratory* results ~~reactions~~. If the characteristics of the testing system are known, the rate at which these false positives are likely to occur can be calculated in advance. There should be an effective procedure for following-up positives to ~~ultimately~~ determine with a high level of confidence, whether or not they are indicative of *infection* ~~or not~~. This should involve ~~follow-up with~~ supplementary tests~~, clinical~~ and follow-up investigation ~~and post-mortem examination in~~ to collect diagnostic material from the original ~~sampling~~ *epidemiological unit* ~~as well as~~ and *herds* which may be epidemiologically linked to it.

Laboratory results should be examined in the context of the epidemiological situation.

Article 11.5.14.

Methods of surveillance

1. Clinical surveillance

Clinical *surveillance* aims at detecting clinical signs of CBPP in a *herd* by close physical examination of ~~susceptible *animals*~~ bovines. Clinical inspection is an important component of CBPP *surveillance* contributing to reach the desired level of confidence of detection of disease if a sufficiently large number of ~~clinically susceptible *animals*~~ bovines is examined.

Clinical *surveillance* and *laboratory* testing should always be applied in series to clarify the status of CBPP suspects detected by either of these complementary diagnostic approaches. *Laboratory* testing and post-mortem examination may contribute to confirm clinical suspicion, while clinical *surveillance* may contribute to confirmation of positive serology. Any sampling unit within which suspicious *animals* are detected should be classified as infected until contrary evidence is produced.

~~3~~2. Pathological surveillance

Systematic pathological *surveillance* for CBPP is the most effective approach and should be conducted at ~~*slaughterhouses/abattoirs* and other~~ *slaughter* ~~facilities~~. Suspect pathological findings should be confirmed by agent identification. Training courses for *slaughter* personnel and *meat* inspectors are highly recommended.

~~4.~~ ~~Serological~~ 3. Laboratory testing

Serological *surveillance* is not the preferred strategy for CBPP. However, in the framework of epidemiological investigations, serological testing may be used.

The limitations of available serological tests for CBPP make the interpretation of results difficult and useful only at the *herd* level. Positive findings should be followed up by clinical and pathological investigations and agent identification.

Clustering of seropositive reactions should be expected in CBPP *infections* and is usually accompanied by clinical signs. As clustering may signal field strain *infection*, the investigation of all instances should be incorporated in the *surveillance* strategy.

Following the identification of a CBPP infected *herd*, contact *herds* should be tested serologically. Repeated testing may be necessary to reach an acceptable level of confidence in *herd* classification.

~~5.~~ ~~Agent surveillance~~

Agent *surveillance* should be conducted to ~~follow up and~~ confirm or exclude infection with *Mmm*. ~~suspect *cases*. Isolates should be typed to confirm *Mmm*SC.~~

~~Article 11.5.16.~~

~~Countries or zones applying for recognition of freedom from CBPP~~

~~In addition to the general conditions described in this chapter, a Member Country applying for recognition of CBPP freedom for the country or a *zone* should provide evidence for the existence of an effective *surveillance* programme. The strategy and design of the *surveillance* programme depend on the prevailing epidemiological circumstances and should be planned and implemented in accordance with general conditions and methods in this chapter, to demonstrate absence of CBPP *infection*, during the preceding 24 months in susceptible populations. This requires the support of a national or other *laboratory* able to undertake identification of CBPP *infection*.~~

~~Article 11.5.17.~~

~~Countries or zones re-applying for recognition of freedom from CBPP following an outbreak~~

~~In addition to the general conditions described in this chapter, a Member Country re-applying for recognition of country or *zone* freedom from CBPP should show evidence of an active *surveillance* programme for CBPP, following the recommendations of this chapter.~~

~~Two strategies are recognised by the OIE in a programme to eradicate CBPP *infection* following an *outbreak*:~~

~~1)~~ ~~*slaughter* of all clinically affected and in-contact susceptible animals;~~

~~2)~~ ~~*vaccination* used without subsequent *slaughter* of vaccinated animals.~~

~~The time periods before which an application can be made for re-instatement of freedom from CBPP depends on which of these alternatives is followed. The time periods are prescribed in Article 11.5.4.~~

Article 11.5.15~~18~~.

~~OIE~~WOAH endorsed official control programme for CBPP

~~The overall objective of an OIE endorsed *official control programme* for CBPP is for Member Countries to progressively improve their situation and eventually attain CBPP free status. The *official control programme* should be applicable to the entire country even if certain measures are directed towards defined subpopulations.~~

A Member Country~~ies~~ may, on a voluntary basis, apply for endorsement of ~~their~~ its *official control programme* for CBPP in accordance with Chapter 1.6., when ~~they have~~ it has implemented measures in accordance with this article.

For an *official control programme* for CBPP to be endorsed by ~~the OIE~~WOAH, the Member Country should provide a detailed *official control programme* for the control and eventual eradication of CBPP in the country or *zone*. This document should address and provide documented evidence on the following:

1) epidemiology:

   a) the detailed epidemiological situation of CBPP in the country, highlighting the current knowledge and gaps;

   b) the main production systems and movement patterns of ~~susceptible animals~~ bovines and their products within and into the country and, where applicable, the specific *zone*;

2) surveillance and diagnostic capabilities:

   a) CBPP *surveillance* in place, in accordance with Chapter 1.4. and Articles 11.5.13. and 11.5.14.;

   b) diagnostic capability and procedures, including regular submission of samples to a laboratory that performs diagnostic testing and further characterisation of strains in accordance with the *Terrestrial Manual* including procedures to isolate and identify *Mmm*;

3) vaccination (if practised as part of the *official control programme* for CBPP):

   a) *vaccination* is in accordance with Chapter 4.18. and compulsory in the target *population*;

   b) detailed information on *vaccination* campaigns, in particular:

      i) the strategy that is adopted for the *vaccination* campaign;

ii) target *populations* for *vaccination*;

iii) target geographical area for *vaccination*;

iv) monitoring of *vaccination* coverage, including serological monitoring of population immunity;

v) the strategy to identify vaccinated animals;

vi) technical specification of the vaccines used and description of the vaccine licensing procedures in place;

vii) use of vaccines fully compliant with the standards and methods described in the *Terrestrial Manual*;

viii) the proposed strategy and work plan including the timeline for transition to the cessation of *vaccination*;

4) the measures implemented to prevent the introduction of the pathogenic agent and to ensure the rapid detection of all CBPP *outbreaks*;

5) an emergency preparedness plan and an emergency response plan to be implemented in case of CBPP *outbreaks*;

6) work plan and timelines of the *official control programme*;

7) performance indicators for assessing the effectiveness of the control measures to be implemented;

8) monitoring, evaluation and review of the *official control programme* to demonstrate the effectiveness of the strategies.

~~1) have a record of regular and prompt animal disease reporting in accordance with the requirements in Chapter 1.1.;~~

~~2) submit documented evidence of the capacity of *Veterinary Services* to control CBPP; this evidence can be provided by countries following the OIE PVS Pathway;~~

~~3) submit a detailed plan of the programme to control and eventually eradicate CBPP in the country or *zone* including:~~

~~a) the timeline;~~

~~b) the performance indicators for assessing the efficacy of the control measures to be implemented;~~

~~c) submit documentation indicating that the *official control programme* for CBPP has been implemented and is applicable to the entire territory;~~

~~4) submit a dossier on the epidemiology of CBPP in the country describing the following:~~

a) the general epidemiology in the country highlighting the current knowledge and gaps;

b) the measures to prevent introduction of *infection*, the rapid detection of, and response to, all CBPP *outbreaks* in order to reduce the incidence of CBPP *outbreaks* and to eliminate CBPP in at least one *zone* in the country;

c) the main livestock production systems and movement patterns of CBPP susceptible animals and their products within and into the country;

5) submit evidence that CBPP *surveillance* is in place,

a) taking into account provisions in Chapter 1.4. and the provisions on *surveillance* of this chapter;

b) have diagnostic capability and procedures, including regular submission of samples to a *laboratory* that carries out diagnosis and further characterisation of strains in accordance with the *Terrestrial Manual* including procedures to isolate and identify *M. mycoides* subsp. *mycoides* SC as opposed to *M. mycoides* subsp. *mycoides* LC;

6) where *vaccination* is practised as a part of the *official control programme* for CBPP, provide:

a) evidence (such as copies of legislation) that *vaccination* of selected populations is compulsory;

b) detailed information on *vaccination* campaigns, in particular on:

i) target populations for *vaccination*;

ii) monitoring of *vaccination* coverage;

iii) technical specification of the vaccines used and description of the licensing procedures in place;

iv) the proposed timeline and strategy for the cessation of *vaccination*;

7) provide an emergency preparedness and contingency response plan to be implemented in case of CBPP *outbreaks*.

The Member Country's *official control programme* for CBPP will be included in the list of programmes endorsed by the OIE only after the submitted evidence has been accepted by the OIE.

The country will be included in the list of countries having an OIEa WOAH endorsed *official control programme* for CBPP in accordance with Chapter 1.6.

Retention on the list requires an annual update on the progress of the *official control programme* and information on significant changes concerning the points above. Changes in the epidemiological situation and other significant events should be reported to the OIE in accordance with the requirements in Chapter 1.1.

~~The OIE may withdraw the endorsement of the *official control programme* if there is evidence of:~~

- ~~non-compliance with the timelines or performance indicators of the programme; or~~
- ~~significant problems with the performance of the *Veterinary Services*; or~~
- ~~an increase in the incidence of CBPP that cannot be addressed by the programme.~~

EU comment

The EU thanks the Code Commission for this new chapter and proposes important comments below. Comments are inserted in the text below.

CHAPTER 11.X.

INFECTION WITH BOVINE PESTIVIRUSES (BOVINE VIRAL DIARRHOEA)

Article 11.X.1.

General provisions

For the purposes of the *Terrestrial Code*, bovine viral diarrhoea is defined as an *infection* of bovines (*Bos taurus*, *B. indicus* and *Bubalus bubalis*) ~~(herafter 'susceptible animals')~~ with bovine viral diarrhoea virus type 1 (pestivirus A), type 2 (pestivirus B), and type 3 (pestivirus H) (here~~in~~after 'bovine pestiviruses').

EU comment

The EU does not support the proposed definition of the term "bovines" in the paragraph above. Indeed, it is not clear why it does not include all species of the genus *Bos*, and also the genus *Bubalus* and *Bison*. We therefore suggest again referring to bovines only, or to add *Bos*, *Bubalus* and *Bison* spp. in parenthesis after "bovines".

Indeed, the assessment of the expert group of tasked with the development of the case definition for infection with bovine viral diarrhoea viruses (27 May to 17 June 2021) included all ruminants in the species hosts for infection with BVDV. While it might be understandable to narrow it down to all bovines, we should avoid keeping out some specific bovines species such as bison.

Therefore, we should refer to bovines only, or to add *Bos*, *Bubalus* and *Bison* spp. in parenthesis after "bovines".

The following defines the occurrence of *infection* with bovine pestiviruses:

1) bovine pestivirus, excluding vaccine strains, has been isolated and identified as such in a sample from a ~~susceptible animal~~ bovine; or

2) antigen or ~~ribo~~nucleic acid specific to bovine pestivirus, excluding vaccine strains, has been detected in a sample from a ~~susceptible animal~~ bovine.

EU comment

The EU thanks the Code Commission for considering the case definition in both the February 2023 and September 2021 meetings and we take note of the expert opinion reported in these reports.

However, this case definition would not allow to consider as an outbreak the case when animals (maybe even sentinel animals) seroconverted to BVD. Bearing in mind the more labour intensive surveillance required to identify antigen or nucleic acid, having in place serosurveillance appears fully justified.

The EU therefore needs to reiterate its earlier comment. The EU suggests adding a point 3, as follows:

"3) antibodies to bovine pestiviruses, that are not a consequence of vaccination, have been detected in a sample from a susceptible animal showing clinical signs consistent with bovine viral diarrhoea, or epidemiologically linked to a confirmed or suspected case of bovine viral diarrhoea."

In addition, to make the Article work correctly, we should add "; or" at the end of point 2 so that the case definition is met when fulfilling either point 1) or 2) or 3).

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

EU comment

The EU thanks the Code Commission for this revision and, in general, supports the proposed changes to this chapter provided the comment below is taken into consideration.

CHAPTER 12.1.

INFECTION WITH AFRICAN HORSE SICKNESS VIRUS

Article 12.1.1.

General provisions

For the purposes of the *Terrestrial Code*, African horse sickness (AHS) is defined as an *infection* of equids with African horse sickness virus (AHSV).

The following defines the occurrence of an *infection* with AHSV:

1) AHSV has been isolated and identified as such in a sample from an equid ~~or a product derived from that equid~~; or

2) ~~antigen or ribo~~nucleic acid specific to AHSV has been ~~identified~~ detected in a sample~~s~~ from an equid showing clinical signs or pathological lesions consistent with AHS, or epidemiologically linked to a confirmed or suspected ~~or confirmed~~ *case*; or

3) ~~serological evidence of active *infection* with AHSV by detection of~~ seroconversion due to recent exposure to ~~with production of antibodies against structural or nonstructural proteins of~~ AHSV, ~~that are~~ which is not ~~a~~ the consequence of *vaccination*, ~~have~~ has been ~~identified~~ detected in ~~a~~ paired sample~~s~~ from an equid ~~that either~~ show~~s~~ing clinical signs or pathological lesions consistent with AHS, or ~~is~~ epidemiologically linked to a confirmed or suspected ~~or confirmed~~ *case*.

EU comment

The EU considers not necessary to have a paired samples in point 3) of the case definition as it makes it more limiting than for other diseases. It should also be noted that the presence of antibodies against AHSV in an unvaccinated animal is an indicator that the animal has, or had, an infection by the virus.

Therefore, the EU suggests to keep the original writing: "seroconversion due to recent exposure to AHSV, which is not the consequence of vaccination, has been detected in ~~paired samples from~~ an equid […]"

For the purposes of the *Terrestrial Code*, the *infective period* for AHS is 40 days~~ for domestic horses. Although critical information is lacking for some species, this chapter applies to all Equidae.~~.

All countries or *zones* adjacent to a country or *zone* not having free status should determine their AHSV status from an ongoing *surveillance* programme.~~ Throughout the chapter, *surveillance* is in all cases understood as being conducted as described in Articles 12.1.11. to 12.1.13.~~

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

Article 12.1.2.

~~AHS free c~~Country or zone free from AHS

~~1)~~ A country or *zone* may be considered free from AHS when the relevant provisions in point 2 of Article 1.4.6.~~ have been complied with, and when within the proposed free country or *zone*: *infection* with AHSV is notifiable in the whole country, systematic *vaccination* is prohibited, importation of equids and their semen, oocytes or embryos are carried out in accordance with this chapter, and either:~~

1) for at least the past 24 months:

a) the *Veterinary Authority* has current knowledge of, and authority over, all domestic and *captive wild* equids in the country or *zone*;

b) the *Veterinary Authority* has current knowledge of the distribution, habitat and indication of disease occurrence through passive *surveillance* of *wild* and *feral* equids in the country or *zone*;

c) ~~either:~~

~~i)~~ there has been no *case* of *infection* with AHSV~~ and the country or *zone* is not adjacent to an infected country or *zone*; or~~

~~ii) a *surveillance* programme has demonstrated no evidence of *Culicoides* in accordance with Chapter 1.5.;~~

d) appropriate *surveillance* has been implemented in accordance with:

i) Article 1.4.6. where historical freedom can be demonstrated; or

ii) Articles 12.1.11. to 12.1.13. where historical freedom cannot be demonstrated; or

iii) Chapter 1.5. where a *surveillance* programme has demonstrated no evidence of *Culicoides*.

e) if adjacent to an infected country or *zone,* include an area in which *surveillance* is conducted in accordance with Articles 12.1.11. to 12.1.13.;

f) measures to prevent the introduction of the *infection* have been in place: in particular, the importations or movements of *commodities* into the country or zone have been carried out in accordance with this chapter and other relevant chapters of the *Terrestrial Code*;

2) no systematic *vaccination* against AHS has been carried out for at least the past 12 months.

~~a) historical freedom as described in Chapter 1.4. has demonstrated no evidence of AHSV in the country or *zone*; or~~

~~b) the country or *zone* has not reported any *case* of AHS for at least two years and is not adjacent to an infected country or *zone*; or~~

~~c) a *surveillance* programme has demonstrated no evidence of AHSV in the country or *zone* for at least two years; or~~

~~d) the country or *zone* has not reported any *case* of AHS for at least 40 days and a *surveillance* programme has demonstrated no evidence of *Culicoides* for at least two years in the country or *zone*.~~

~~2) An AHS free country or *zone* which is adjacent to an infected country or *zone* should include a *zone* in which *surveillance* is conducted in accordance with Articles 12.1.11. to 12.1.13., as relevant.~~

~~3) An AHS free country or *zone* will not lose its free status through the importation of seropositive or vaccinated equids and their semen, oocytes or embryos from infected countries or *zones*, provided these imports are carried out in accordance with this chapter.~~

~~4) To qualify for inclusion in the list of AHS free countries or *zones*, a Member Country should:~~

~~a) have a record of regular and prompt animal disease reporting;~~

~~b) send a declaration to the OIE stating:~~

i) the section under point 1) on which the application is based;

ii) no routine *vaccination* against AHS has been carried out during the past year in the country or *zone*;

iii) equids are imported in accordance with this chapter;

c) supply documented evidence that:

i) *surveillance* in accordance with Articles 12.1.11. to 12.1.13. is applied, unless historically free in accordance with Article 1.4.6.;

ii) regulatory measures for the early detection, prevention and control of *infection* with AHSV have been implemented.

5) The Member Country will be included in the list only after the submitted evidence has been accepted by the OIE.

The country or *zone* will be included in the list of countries or *zones* free from AHS in accordance with Chapter 1.6.

Retention on the list requires annual reconfirmation of compliance with all points above and relevant provisions under point 4 of Article 1.4.6. that the information in points 4 b) ii) and iii) and 4 c) above be annually re-submitted and Documented evidence should be resubmitted annually for point 1 above. Any changes in the epidemiological situation or other significant events should be reported notified to WOAH in accordance with the requirements in Chapter 1.1., and in particular, formally state that:

a) there has been no *outbreak* of AHS during the past year in the country or *zone*;

b) no evidence of *infection* with AHSV has been found during the past year in the country or *zone*.

Article 12.1.3.

AHS infected cCountry or zone infected with AHSV

A country or *zone* shall be considered as infected with AHSV For the purposes of this chapter, an AHS infected country or *zone* is one that does not fulfil when the requirements for acceptance as a country or *zone* free from AHS are not fulfilled to qualify as AHS free.

Article 12.1.4.

Establishment of a containment zone within a an AHS free country or zone previously free from AHS

In the event of ~~limited~~ *outbreaks* of AHS within a~~n AHS free~~ country or *zone* previously free from AHS, including within a *protection zone*, a ~~single~~ *containment zone*, which includes all epidemiologically linked *outbreaks*, ~~can~~ may be established, in accordance with Article 4.4.7., ~~for the purpose of~~ to minimis~~e~~ing the impact on the ~~entire~~ rest of the country or *zone*. ~~Such a *zone* should include all *cases* and can be established within a *protection zone*.~~

For this to be achieved and for the Member Country to take full advantage of this process, the *Veterinary Authority* should ~~provide~~ submit as soon as possible to WOAH, in addition to the requirements of Article 4.4.7., ~~in support of the application,~~ documented evidence that:

1) the *outbreaks* have been contained ~~are limited~~ based on the following factors:

   a) ~~immediately on suspicion, a rapid response has been implemented, including *notification* reporting, standstill of movements of equids and effective controls of the movements of equine *commodities* has been made~~on suspicion, a standstill has been imposed on the suspected *establishments* and effective controls on the movement of animals and other *commodities* are in place in the country or *zone*;

   b) the *infection* has been confirmed and notified in accordance with Chapter 1.1.;

   c~~b~~) ~~standstill of movements of equids has been imposed, and effective controls on the movement of equids and their products specified in this chapter are in place~~on confirmation, the standstill and movement controls described in point 1 have been reinforced;

   ~~c) epidemiological investigation (trace-back, trace-forward) has been completed;~~

   c~~d) the *infection* has been confirmed and notified in accordance with Chapter 1.1;~~

   d~~e~~) epidemiological investigations ~~on~~ into the likely source of the *outbreak* have been carried out;

   ~~f) all *cases* have been shown to be epidemiologically linked;~~

   e~~g~~) no new *cases* have been found in the *containment zone* within a minimum of two *infective periods* as defined in Article 12.1.1.;

~~2) the equids within the *containment zone* are clearly identifiable as belonging to the *containment zone*;~~

2) increased passive and targeted *surveillance* in accordance with Articles 12.1.11. to 12.1.13. in the rest of the country or *zone* has not detected any evidence of *infection*;

3) ~~animal health~~ measures are in place to effectively prevent the spread of AHSV *infection* to the rest of the country or *zone*, taking into consideration the establishment of a *protection zone* within the *containment zone*, the seasonal *vector* conditions and existing physical, geographical and ecological barriers;

4) ongoing *surveillance* in accordance with Articles 12.1.11. to 12.1.13. is in place in the *containment zone*.

~~The free status of the areas outside the *containment zone* is suspended while the *containment zone* is being established in accordance with points 1) to 5) above.~~ The free status of the areas of outside the *containment zone* is suspended while the *containment zone* is being established. The free status of these areas ~~outside the *containment zone*~~ may be reinstated irrespective of Article 12.1.5. once the *containment zone* has been approved ~~is recognised~~ by ~~the~~ WOAH as complying with points 1 to 4 above.

In the event of the recurrence of ~~AHSV~~ *infection* with AHSV in the *containment zone*, established in accordance with point 4(a) of Article 4.4.7., the approval of the *containment zone* is withdrawn and the ~~AHS~~ free status of the whole country or *zone* is suspended until the relevant requirements of Article 12.1.5. are fulfilled.

In the event of occurrence of *infection* with AHSV in the outer zone of a *containment zone* established in accordance with point 4(b) of Article 4.4.7., the approval of the *containment zone* is withdrawn and the free status of the whole country or *zone* is suspended until the relevant requirements of Article 12.1.5. are fulfilled.

The recovery of the ~~AHS~~ free status of the *containment zone* should follow Article 12.1.5.

Article 12.1.5.

Recovery of free status

~~To regain free status when an AHS *outbreak* occurs in a country or *zone* previously free, Article 12.1.2. applies, irrespective of whether emergency *vaccination* has been applied or not.~~

Should an *outbreak* of AHS occur in a previously free country or *zone*, its status may be recovered in accordance with Article 12.1.2., irrespective of whether emergency *vaccination* has been applied or not.

The AHS free status of the country or *zone* will be reinstated only after the submitted evidence has been accepted by ~~the~~ WOAH.

Article 12.1.6.

Recommendations for importation of equids from AHS free countries or zones

~~For equids~~

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

1) showed no clinical sign of AHS on the day of shipment;

2) have not been vaccinated against AHS within the last 40 days;

3) were kept in an AHS free country or *zone* since birth or for at least 40 days prior to shipment;

4) either:

a) did not transit through an infected *zone* during transportation to the *place of shipment*; or

b) were protected from *Culicoides* attacks at all times when transiting through an infected *zone*.

Article 12.1.7.

Recommendations for importation of equids from AHS infected countries or zones

~~For equids~~

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

1) showed no clinical sign of AHS on the day of shipment;

2) have not been vaccinated against AHS within the last 40 days;

3) were held in isolation in a *vector*-protected *establishment*:

a) for a period of at least 28 days and a serological test to detect antibodies against ~~the~~ AHSV ~~group~~, was carried out with a negative result on a blood sample collected at least 28 days after introduction into the *vector*-protected *establishment*; or

b) for a period of at least 40 days and serological tests to detect antibodies against AHSV were carried out with no significant increase in antibody titre on blood samples collected on two occasions, with an interval of not less than 21 days, the first sample being collected at least 7 days after introduction into the *vector*-protected *establishment*; or

c) for a period of at least 14 days and a~~n agent identification~~ test for the ~~identification~~ detection of the agent was carried out with a negative result on a blood sample collected not less than 14 days after introduction into the *vector*-protected *establishment*; or

d) for a period of at least 40 days and were vaccinated, at least 40 days before shipment, against all serotypes whose presence in the source population has been demonstrated through a *surveillance* programme in accordance with Articles 12.1.12. and 12.1.13., and were identified in the accompanying certification as having been vaccinated;

4) were protected from *Culicoides* attacks at all times during transportation (including transportation to and at the *place of shipment*).

Article 12.1.8.

Recommendations for the importation of equine semen

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

1) showed no clinical sign of AHS on the day of collection of the semen and for the following 40 days;

2) had not been ~~immunised~~ vaccinated against AHS with a live attenuated vaccine within 40 days prior to the day of collection;

3) were either:

   a) kept in an AHS free country or *zone* for at least 40 days before commencement of, and during collection of the semen; or

   b) kept in an AHS free *vector*-protected *artificial insemination centre* throughout the collection period, and subjected to either:

      i) a serological test to detect antibodies against ~~the~~ AHSV ~~group~~, carried out with a negative result on a blood sample collected at least 28 days and not more than 90 days after the last collection of semen; or

      ii) ~~agent identification~~ tests for the ~~identification~~ detection of the agent carried out with negative results on blood samples collected at commencement and conclusion of, and at least every seven days, during semen collection for this consignment.

Article 12.1.9.

Recommendations for the importation of *in vivo* derived equine oocytes or embryos

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

1) the donor animals:

   a) showed no clinical sign of AHS on the day of collection of the oocytes or embryos and for the following 40 days;

   b) had not been ~~immunised~~ vaccinated against AHS with a live attenuated vaccine within 40 days prior to the day of collection;

   c) were either:

i) kept in an AHS free country or *zone* for at least 40 days before commencement of, and during collection of the oocytes or embryos, or

ii) kept in an AHS free *vector*-protected *collection centre* throughout the collection period, and subjected to either:

– a serological test to detect antibodies against ~~the~~ AHSV ~~group~~ carried out with a negative result on a blood sample collected at least 28 days and not more than 90 days after the last collection of oocytes or embryos; or

– ~~agent identification~~ tests for the ~~identification~~ detection of the agent carried out with negative results on blood samples collected at commencement and conclusion of, and at least every seven days during oocytes or embryos collection for this consignment;

2) the embryos were collected, processed and stored in accordance with Chapters 4.8. and 4.10., as relevant;

3) the semen used to fertilise the oocytes complies at least with the requirements in Article 12.1.8.

Article 12.1.10.

Protecting animals from *Culicoides* attacks

1. Vector-protected establishment or facility

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

a) appropriate physical barriers at entry and exit points, for example double-door entry-exit system;

b) openings of the building are *vector* screened with mesh of appropriate gauge impregnated regularly with an approved insecticide in accordance with the instructions of the manufacturer;

c) *vector surveillance* and control within and around the building;

d) measures to limit or eliminate breeding sites for *vectors* in vicinity of the *establishment* or facility;

e) Standard Operating Procedure, including description of back-up and alarm systems, for operation of the *establishment* or facility and transport of equids to the place of *loading*.

2. During transportation

When equids are transporting equids through AHS infected countries or *zones*, *Veterinary Authorities* should require that they are strategies to protected animals from *Culicoides* attacks during transport, taking into account the local ecology of the *vector*.

a) Transport by road land

Potential *risk management* strategies include a combination of:

i) treating animals with chemical repellents prior to and during transportation, in sanitized *vehicles* treated with appropriate residual contact insecticide;

ii) *loading*, transporting and *unloading* animals at times of low *vector* activity (i.e. bright sunshine and low temperature);

iii) ensuring *vehicles* do not stop en route during dawn or dusk, or overnight, unless the *animals* are held behind insect proof netting;

iv) darkening the interior of the *vehicle*, for example by covering the roof or sides of *vehicles* with shade cloth;

v) surveillance for *vectors* at common stopping and offloading points to gain information on seasonal variations;

vi) using historical, ongoing or modelling information on AHS to identify low risk ports and transport routes.

b) Transport by air

Prior to *loading* the equids, the crates, *containers* or jet stalls are sprayed with an insecticide approved in the country of dispatch.

Crates, *containers* or jet stalls in which equids are being transported and the cargo hold of the aircraft should be sprayed with an approved insecticide when the doors have been closed and prior to take off. All possible insect harbourage should be treated. The spray containers should be retained for inspection on arrival.

In addition, during any stopover in countries or *zones* not free from AHS, prior to the opening of any aircraft door and until all doors are closed, netting of appropriate gauge impregnated with an approved insecticide should be placed over all crates, *containers* or jet stalls.

Article 12.1.11.

Introduction to surveillance

Articles 12.1.11. to 12.1.13. define the principles and provide guidance on *surveillance* for AHS, complementary to Chapter 1.4. and, for *vectors*, complementary to Chapter 1.5.

AHS is a *vector*-borne *infection* transmitted by ~~a limited number of~~ some species of *Culicoides* ~~insects~~. ~~Unlike the related bluetongue virus, AHSV is so far geographically restricted to sub Saharan Africa with periodic excursions into North Africa, southwest Europe, the Middle East and adjacent regions of Asia.~~ An important component of AHSV epidemiology is vectorial capacity which provides a measure of disease *risk* that incorporates *vector* competence, abundance, seasonal incidence, biting rates, survival rates and the extrinsic *incubation period*. ~~However, methods and tools for measuring some of these *vector* factors remain to be developed, particularly in a field context.~~

~~According to this chapter, a~~A Member Country demonstrating freedom from *infection* with AHSV for the entire country or a *zone* should provide evidence for the existence of an effective *surveillance* programme. The strategy and design of the *surveillance* programme will depend on the prevailing epidemiological circumstances and should be planned and implemented in accordance with general conditions and methods described in this chapter. This requires the support of a *laboratory* able to undertake identification of *infection* with AHSV through the ~~virus detection~~ tests for the detection of the agent and antibody detection tests.

Susceptible *captive wild*, *feral* and *wild* equine populations should be included in the *surveillance* programme.

The purpose of *surveillance* is to determine if a country or *zone* is free from AHS. *Surveillance* deals not only with the occurrence of clinical signs caused by AHSV, but also with evidence of *infection* with AHSV in the absence of clinical signs.

Article 12.1.12.

General conditions and methods for surveillance

1) A *surveillance* system should be under the responsibility of the *Veterinary Authority*. In particular the following should be in place:

   a) a formal and ongoing system for detecting and investigating *outbreaks* of disease;

   b) a procedure for the rapid collection and transport of samples from suspected cases of AHS to a *laboratory* for diagnosis;

   c) a system for recording, managing and analysing diagnostic, epidemiological and *surveillance* data.

2) In a free country or *zone*, the *surveillance* programme for AHS should include an *early warning system* for reporting suspected cases. Persons who have regular contact with equids, as well as diagnosticians, should report promptly any suspicion of AHS to the *Veterinary Authority*. An effective *surveillance* system will periodically identify suspected cases that require follow-up and investigation to confirm or exclude that the cause of the condition is AHS. The rate at which such suspected cases are likely to occur will differ between epidemiological situations and cannot therefore be predicted reliably. All suspected cases of AHS should be investigated immediately and samples should be taken and submitted to a *laboratory*. This requires that sampling kits and other equipment be available to those responsible for *surveillance*.

3) In a free country or *zone* ~~bordering~~ adjacent to an infected country or *zone*, *surveillance* ~~based upon~~ taking into account geography, climate, history of infection and other relevant factors should be carried out over an appropriate distance of at least 100 kilometres from the border with the infected country or *zone*; lesser distance could be acceptable if there are relevant ecological or geographical features likely to interrupt the transmission of AHSV.

4) In an AHS infected country or *zone*, random or targeted serological and virological *surveillance*, appropriate to the epidemiological situation, should be conducted in accordance with Chapter 1.4.

Article 12.1.13.

Surveillance strategies

The target population for *surveillance* aimed at identification of disease or *infection* should cover susceptible equids within the country or *zone*. Active and passive *surveillance* for *infection* with AHSV should be ongoing. *Surveillance* should be composed of random or targeted approaches using virological, serological and clinical methods appropriate to the epidemiological situation.

A Member Country should justify the *surveillance* strategy chosen as appropriate to detect the presence of *infection* with AHSV in accordance with Chapter 1.4. and the prevailing epidemiological situation. It may, for example, be appropriate to target clinical *surveillance* at particular species likely to exhibit clinical signs (e.g. horses). Similarly, virological and serological testing may be targeted to species that rarely show clinical signs (e.g. donkeys).

In vaccinated populations serological and virological *surveillance* is necessary to detect the AHSV types circulating to ensure that all circulating types are included in the *vaccination* programme.

Serological or virological *surveillance* is also needed to detect subclinical *infections* in free countries or *zones* adjacent to countries or *zones* in which live attenuated AHS vaccines are used.

For random surveys, the design of the sampling strategy should incorporate epidemiologically appropriate design prevalence. The sample size selected for testing should be large enough to detect *infection* if it were to occur at a predetermined minimum rate. The sample size, expected prevalence and diagnostic sensitivity of the tests determine the level of confidence in the results of the survey. The Member Country should justify the choice of design prevalence and confidence level based on the objectives of *surveillance* and the epidemiological situation, in accordance with Chapter 1.4. Selection of the design prevalence, in particular, should be based on the prevailing or historical epidemiological situation.

Irrespective of the survey approach selected, the sensitivity and specificity of the diagnostic tests employed are key factors in the design, sample size determination and interpretation of the results obtained. Ideally, the sensitivity and specificity of the tests used should be validated for the *vaccination* or *infection* history and the different species in the target population.

Irrespective of the testing system employed, *surveillance* system design should anticipate the occurrence of false positive reactions. If the characteristics of the testing system are known, the rate at which these false positives are likely to occur can be calculated in advance. There should be an effective procedure for following up positives to ultimately determine with a high level of confidence, whether they are indicative of *infection* or not. This should involve both supplementary tests and follow-up investigation to collect diagnostic material from the original sampling unit as well as those which may be epidemiologically linked to it.

The principles for *surveillance* for disease or *infection* are technically well defined. *Surveillance* programmes to prove the absence of AHSV *infection* or transmission, should be carefully designed to avoid producing results that are insufficiently reliable to be accepted by WOAH for official recognition of status. The design of any *surveillance* programme, therefore, requires inputs from professionals competent and experienced in this field.

1. Clinical surveillance

Clinical *surveillance* aims at the detection of clinical signs of AHS in equids particularly during a newly introduced *infection*. In horses, clinical signs may include pyrexia, oedema, hyperaemia of mucous membranes and dyspnoea.

Suspected cases detected by clinical *surveillance* should always be confirmed by *laboratory* testing.

2. Serological surveillance

Serological *surveillance* of equine populations is an important tool to confirm absence of AHSV transmission in a country or *zone*. The species tested should reflect the local epidemiology of *infection* with AHSV, and the equine species available. Surveillance plans should include consideration of species that display clinical signs less commonly, such as donkeys or zebra. Management variables that may reduce the likelihood of *infection*, such as the use of insecticides and animal housing, should be taken into account when selecting equids to be included in the *surveillance* system.

Samples should be examined for antibodies against AHSV. Positive AHSV antibody tests results can have four possible causes:

a) natural *infection* with AHSV;

b) *vaccination* against AHS;

c) maternal antibodies;

d) lack of specificity of the test.

Sera collected for other purposes may be used for AHSV *surveillance*. However, the principles of survey design described in these recommendations and the requirements for a statistically valid survey for the presence of *infection* with AHSV should not be compromised.

The results of random or targeted serological surveys are important in providing reliable evidence that no *infection* with AHSV is present in a country or *zone*. It is, therefore, essential that the survey is thoroughly documented. It is critical to interpret the results in light of the movement history of the animals being sampled.

Serological *surveillance* in a free *zone* should target those areas that are at highest risk of AHSV transmission, based on the results of previous *surveillance* and other information. This will usually be towards the boundaries of the free *zone*. In view of the epidemiology of AHSV, either random or targeted sampling is suitable to select *herds* or animals for testing.

~~Serological *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 over a distance of at least 100 kilometres from the border with that country or *zone*, but a lesser~~

~~distance could be acceptable if there are relevant ecological or geographical features likely to interrupt the transmission of AHSV. An AHS free country or *zone* may be protected from an adjacent infected country or *zone* by a *protection zone*.~~

Serological *surveillance* in infected *zones* will identify changes in the boundary of the *zone*, and can also be used to identify the AHSV types circulating. In view of the epidemiology of *infection* with AHSV, either random or targeted sampling is suitable.

3. Virological surveillance

Isolation and genetic analysis of AHSV from a proportion of infected animals is beneficial in terms of providing information on serotype and genetic characteristics of the viruses concerned.

Virological *surveillance* can be conducted:

a) to identify virus transmission in at risk populations;

b) to confirm clinically suspected cases;

c) to follow up positive serological results;

d) to better characterise the genotype of circulating virus in a country or *zone*.

4. Sentinel animals

Sentinel animals are a form of targeted *surveillance* with a prospective study design. They comprise groups of unexposed equids that have not been vaccinated and are managed at fixed locations and observed and tested regularly to detect new *infections* with AHSV.

The primary purpose of a sentinel equid programme is to detect *infections* with AHSV occurring at a particular place, for instance sentinel groups may be located on the boundaries of infected *zones* to detect changes in distribution of AHSV. In addition, sentinel equid programmes allow the timing and dynamics of *infections* to be observed.

A sentinel equid programme should use animals of known source and history of exposure, control management variables such as use of insecticides and animal housing (depending on the epidemiology of AHSV in the area under consideration), and be flexible in its design in terms of sampling frequency and choice of tests.

Care is necessary in choosing the sites for the sentinel groups. The aim is to maximise the chance of detecting AHSV activity at the geographical location for which the sentinel site acts as a sampling point. The effect of secondary factors that may influence events at each location, such as climate, may also be analysed. To avoid confounding factors sentinel groups should comprise animals selected to be of similar age and susceptibility to *infection* with AHSV. The only feature distinguishing groups of sentinels should be their geographical

location. Sera from sentinel animal programmes should be stored methodically in a serum bank to allow retrospective studies to be conducted in the event of new serotypes being isolated.

The frequency of sampling should reflect the equine species used and the reason for choosing the sampling site. In endemic areas virus isolation will allow monitoring of the serotypes and genotypes of AHSV circulating during each time period. The borders between infected and non-infected areas can be defined by serological detection of *infection*. Monthly sampling intervals are frequently used. Sentinels in declared free *zones* add to confidence that *infections* with AHSV are not occurring unobserved. Here sampling prior to and after the possible period of transmission is sufficient.

Definitive information on AHSV circulating in a country or *zone* is provided by isolation and identification of the viruses. If virus isolation is required sentinels should be sampled at sufficiently frequent intervals to ensure that some samples are collected during the period of viraemia.

5. Vector surveillance

AHSV is transmitted between equine hosts by species of *Culicoides* which vary across the world. It is therefore important to be able to identify potential *vector* species accurately although many such species are closely related and difficult to differentiate with certainty.

Vector surveillance is aimed at demonstrating the absence of *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 continued absence of *vectors*.

The most effective way of gathering this information should take account of the biology and behavioural characteristics of the local *vector* species of *Culicoides* and may include the use of Onderstepoort-type light traps or similar, operated from dusk to dawn in locations adjacent to equids.

Vector surveillance should be based on scientific sampling techniques. The choice of the number and types of traps to be used in *vector surveillance* and the frequency of their use should take into account the size and ecological characteristics of the area to be surveyed.

The operation of *vector surveillance* sites at the same locations as sentinel animals is advisable.

The use of a *vector surveillance* system to detect the presence of circulating viruses is not recommended as a routine procedure as the typically low *vector infection* rates mean that such detections can be rare. Animal-based *surveillance* strategies are preferred to detect virus transmission.

EU comment

The EU in general supports the proposed changes to this chapter provided important comments below are taken into consideration.

CHAPTER 13.2.

INFECTION WITH PATHOGENIC RABBIT LAGOVIRUSES (RABBIT HAEMORRHAGIC DISEASE)

Article 13.2.1.

General provisions

For the purposes of the *Terrestrial Code*, rabbit haemorrhagic disease (RHD) is defined as an *infection* of leporids with *Rabbit haemorrhagic disease virus type 1* (RHDV) and *Rabbit haemorrhagic disease virus type 2* (RHDV2) (hereafter 'pathogenic rabbit lagoviruses').

The following defines the occurrence of *infection* with pathogenic rabbit lagoviruses:

1) antigen or nucleic acid specific to pathogenic rabbit lagoviruses has been detected in a sample from a leporid showing clinical signs or pathological lesions consistent with *infection* with pathogenic rabbit lagoviruses, or epidemiologically linked to a confirmed or suspected *case*; or

2) antibodies specific to pathogenic rabbit lagoviruses, which are not the consequence of *vaccination*, have been detected in a sample from a leporid showing clinical signs or pathological lesions consistent with *infection* with pathogenic rabbit lagoviruses, or epidemiologically linked to a confirmed or suspected *case*.

For the purposes of the *Terrestrial Code*, the *infective period* for ~~rabbit haemorrhagic disease (~~RHD~~)~~ shall be 60 days.

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

Article 13.2.2.

Country free from RHD ~~free country~~

A country may be considered free from RHD when it has been demonstrated~~shown~~ that no *case* has occurred ~~the disease has not been present~~ for at least the past 12 months ~~one year~~, that no *vaccination* has been carried out in the past ~~previous~~ 12 months, and that virological or serological *surveillance* ~~surveys~~ in both domestic and *wild* ~~rabbits~~ leporids have confirmed the absence of the *infection* ~~disease~~.

This period may be reduced to six months after the last *case* has been destroyed ~~eliminated~~ and *disinfection* procedures have been completed in countries adopting a *stamping-out policy*, and where ~~the~~ serological *surveillance* ~~surveys~~ confirmed that no *case* ~~the disease had not~~ occurred in the *wild* ~~rabbits~~ leporids.

EU comment

Two points are raised in this article:

1) The free status should not include a vaccination ban as a prerequisite. Prophylactic vaccination against this deadly disease in free countries or especially in countries which have to restore a free status makes sense and should be possible. Serosurveillance can be performed in respect of vaccination data in domestic rabbits and investigations in wild rabbits.

Vaccination and biosafety measures are the tools of choice to fight the disease where prophylactic vaccination should be used in breeding facilities, as well as in pet animals worldwide to reduce the number of susceptible animals and to decrease the dramatic financial losses and the ecological damage even before the virus is actually introduced into certain regions or countries. This is also relevant for aspects of animal welfare.

In general, serological investigations play a very limited role in RHDV surveillance due to the peracute course of the disease and the cross-reactivity of possibly co-circulating apathogenic rabbit lagoviruses. Therefore, active and especially passive monitoring should be carried out, almost exclusively, by virological examinations. Sensitive PCR testing is not affected in vaccinated animals that die from RHD, because systemic virus replication as a cause of death will be detected without any diagnostic problems. In conclusion, PCR diagnostics and vaccination can be used side-by-side for RHD control. Serological surveillance is nevertheless feasible with ongoing vaccination campaigns, since unvaccinated animals can be selected for these analyses. Wild rabbits and hares e.g. do not come into contact with vaccines anyway and young animals that will lose their maternal antibodies very early at 4-6 weeks of age can be readily monitored for the presence of RHDV-induced antibodies.

Furthermore, documented recent vaccination in domestic and commercial rabbit holdings will exclude all affected animals from serological investigations, however the individual and usually patchy vaccination coverage will still enable sero-surveillance anyway which could then support a broad passive surveillance by real-time RT-PCR.

Therefore, we propose to review the text and exclude these words from the first para: "~~that no vaccination has been carried out in the past 12 months,~~".

2) The EU queries why 12 months have been chosen as a required period for demonstrating freedom from RHD.

Possibly such period could be extended to allow capturing epidemiological waves that have gap periods longer than 12 months.

[...]

EU comment

The EU thanks the Code Commission for this new Chapter and supports the proposed improvements.

CHAPTER ~~X~~ 16.Z.

INFECTION WITH CAMELPOX VIRUS

Article ~~X~~16.Z.1.

General provisions

For the purposes of the *Terrestrial Code*, *infection* with camelpox virus is defined as an *infection* of dromedary and bactrian camels (hereafter 'susceptible animals') with ~~c~~*Camelpox virus* ~~of genus *Orthopoxvirus*, family *Poxviridae*~~.

The following defines the occurrence of *infection* with ~~c~~*Camelpox virus*:

1) ~~c~~*Camelpox virus* has been isolated and identified as such in a sample from a susceptible animal; or

2) characteristic orthopox virions have been observed in a sample from a susceptible animal showing clinical signs ~~suggestive of~~ consistent with *infection* with ~~c~~*Camelpox virus* or epidemiologically linked to a confirmed or suspected *case*; or

3) antigen or nucleic acid specific to ~~c~~*Camelpox virus* has been detected in a sample from a susceptible animal showing clinical signs ~~suggestive of~~ consistent with *infection* with ~~c~~*Camelpox virus*, or epidemiologically linked to a confirmed or suspected *case*; or

4) antibodies specific to ~~c~~*Camelpox virus*, that are not the consequence of *vaccination*, have been detected in a sample from a susceptible animal showing clinical signs ~~suggestive of~~ consistent with *infection* with ~~c~~*Camelpox virus*, or epidemiologically linked to a confirmed or suspected *case*.

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

EU comment

The EU thanks the Code Commission for this review and supports the proposed changes to the Code.

TERMINOLOGY: USE OF THE TERMS 'COMPETENT AUTHORITY', 'VETERINARY AUTHORITY' AND 'VETERINARY SERVICES'

GLOSSARY

[...]

ANIMAL FOR SLAUGHTER

means an *animal* intended for *slaughter* within a short time, under the control of the relevant ~~*Veterinary*~~ *Competent Authority*.

[...]

SLAUGHTERHOUSE/ABATTOIR

means premises, including facilities for moving or lairaging *animals*, used for the *slaughter* of *animals* to produce animal products and approved by the ~~*Veterinary Services* or other~~ relevant *Competent Authority*.

Article 1.7.1.

[...]

6. AHS prevention

c) Import control procedures

i) Provide a map showing the number and location of all ports, airports and land border crossings. Describe the management structure, staffing levels and resources of the service responsible for import controls and its accountability to the ~~central *Veterinary Services*~~ *Veterinary Authority*. Describe the communication systems between the ~~central authorities~~ *Veterinary Authority* and the *border posts*, and between *border posts*.

[...]

Article 1.7.2.

[...]

6. AHS prevention

c) Import control procedures

i) Provide a map showing the number and location of all ports, airports and land border crossings. Describe the management structure, staffing levels and resources of the service responsible for import controls and its accountability to the ~~central *Veterinary Services*~~ *Veterinary Authority*. Describe the communication systems between the ~~central authorities~~ *Veterinary Authority* and the *border posts*, and between *border posts*.

[...]

Article 1.9.1.

[...]

6. CSF prevention

d) Import control procedures

i) Provide a map showing the number and location of all ports, airports and land border crossings. Describe the management structure, staffing levels and resources of the service responsible for import controls and its accountability to the ~~central *Veterinary Services*~~ *Veterinary Authority*. Describe the communication systems between the ~~central authorities~~ *Veterinary Authority* and the *border posts*, and between *border posts*.

[...]

Article 1.10.1.

[...]

6. CBPP prevention

c) Import control procedures

i) Provide a map showing the number and location of all ports, airports and land border crossings. Describe the management structure, staffing levels and resources of the service responsible for import controls and its accountability to the ~~central *Veterinary Services*~~ *Veterinary Authority*. Describe the communication systems between the ~~central authorities~~ *Veterinary Authority* and the *border posts*, and between *border posts*.

[...]

Article 1.10.2.

[...]

6. CBPP prevention

c) Import control procedures

i) Provide a map showing the number and location of all ports, airports and land border crossings. Describe the management structure, staffing levels and resources of the service responsible for import controls and its accountability to the ~~central *Veterinary Services*~~ *Veterinary Authority*. Describe the communication systems between the ~~central authorities~~ *Veterinary Authority* and the *border posts*, and between *border posts*.

[...]

Article 1.10.3.

[...]

3. Official control programme for CBPP submitted for WOAH endorsement

e) CBPP prevention

iii) Import control procedures

- Provide a map showing the number and location of all ports, airports and land border crossings. Describe the management structure, staffing levels and resources of the service responsible for import controls and its accountability to the ~~central *Veterinary Services*~~ *Veterinary Authority*. Describe the communication systems between the ~~central authorities~~ *Veterinary Authority* and the *border posts*, and between *border posts*.

[...]

Article 1.11.1.

[...]

6. FMD prevention

d) Import control procedures

i) Provide a map with the number and location of all ports, airports and land border crossings. Describe the management structure, staffing levels and resources of the service responsible for import controls and its accountability to the ~~central *Veterinary Services*~~ *Veterinary Authority*. Describe the communication systems between the ~~central authorities~~ *Veterinary Authority* and the *border posts*, and between *border posts*.

[...]

Article 1.11.2.

[...]

6. FMD prevention

d) Import control procedures

i) Provide a map with the number and location of all ports, airports and land border crossings. Describe the management structure, staffing levels and resources of the service responsible for import controls and its accountability to the ~~central *Veterinary Services*~~ *Veterinary Authority*. Describe the communication systems between the ~~central authorities~~ *Veterinary Authority* and the *border posts*, and between *border posts*.

[...]

Article 1.11.3.

[...]

6. FMD prevention

d) Import control procedures

i) Provide a map with the number and location of all ports, airports and land border crossings. Describe the management structure, staffing levels and resources of the service responsible for import controls and its accountability to the ~~central *Veterinary Services*~~ *Veterinary Authority*. Describe the communication systems between the ~~central authorities~~ *Veterinary Authority* and the *border posts*, and between *border posts*.

[...]

Article 1.11.4.

[...]

6. FMD prevention

d) Import control procedures

i) Provide a map with the number and location of all ports, airports and land border crossings. Describe the management structure, staffing levels and resources of the service responsible for import controls and its accountability to the ~~central *Veterinary Services*~~ *Veterinary Authority*. Describe the communication systems between the ~~central authorities~~ *Veterinary Authority* and the *border posts*, and between *border posts*.

[...]

Article 1.11.5.

[...]

3. Official control programme for FMD submitted for WOAH endorsement

e) FMD prevention

iv) Import control procedures

- Provide a map showing the number and location of all ports, airports and land border crossings. Describe the management structure, staffing levels and resources of the service responsible for import controls and its accountability to the ~~central *Veterinary Services*~~ *Veterinary Authority*. Describe the communication systems between the ~~central authorities~~ *Veterinary Authority* and the *border posts*, and between *border posts*.

[...]

Article 1.12.1.

[...]

6. PPR prevention

c) Import control procedures

i) Provide a map showing the number and location of all ports, airports and land border crossings. Describe the management structure, staffing levels and resources of the service responsible for import controls and its accountability to the ~~central *Veterinary Services*~~ *Veterinary Authority*. Describe the communication systems between the ~~central authorities~~ *Veterinary Authority* and the *border posts*, and between *border posts*.

[...]

Article 1.12.2.

[...]

6. PPR prevention

c) Import control procedures

i) Provide a map showing the number and location of all ports, airports and land border crossings. Describe the management structure, staffing levels and resources of the service responsible for import controls and its accountability to the ~~central *Veterinary Services*~~ *Veterinary Authority*. Describe the communication systems between the ~~central authorities~~ *Veterinary Authority* and the *border posts*, and between *border posts*.

[...]

Article 1.12.3.

[...]

3. Official control programme for PPR submitted for WOAH endorsement

e) PPR prevention

iii) Import control procedures

- Provide a map showing the number and location of all ports, airports and land border crossings. Describe the management structure, staffing levels and resources of the service responsible for import controls and its accountability to the ~~central *Veterinary Services*~~ *Veterinary Authority*. Describe the communication systems between the ~~central authorities~~ *Veterinary Authority* and the *border posts*, and between *border posts*.

[...]

Article 3.2.3.

[...]

8) formal external coordination mechanisms with clearly described procedures or agreements for activities (including preparedness and response mechanisms) between the *Veterinary Authority*, other *Competent Authorities*, other relevant governmental authorities and stakeholders, incorporating a One Health approach;

[...]

Article 4.1.1.

[...]

Prerequisites for developing such programmes include:

– quality *Veterinary Services* including legislative framework, *laboratory* capacity and adequate and committed funding;

– appropriate education and training to secure *veterinarians* and *veterinary paraprofessionals*;

– close links with research institutions;

– effective awareness of, and active cooperation with, private stakeholders;

– public-private partnerships;

– cooperation between ~~*Veterinary Authorities*~~ the *Veterinary Authority* and other *Competent Authorities*;

– regional cooperation among *Veterinary Authorities* on transboundary animal diseases.

Article 4.13.2.

[...]

4) any need to transfer the ownership of *animals* to the ~~competent authority~~ *Competent Authority*;

[...]

Should the chosen option for the disposal of dead *animals* be applied near the border of a neighbouring country, the ~~competent authorities~~ relevant *Competent Authority* of that country should be consulted.

Article 4.19.1.

[...]

The *Veterinary Authority* should determine the diseases against which *official control programmes* are to be prepared, developed and implemented, according to an evaluation of the actual or likely impact of the disease. *Official control programmes* should be prepared by the *Veterinary Authority* and ~~*Veterinary Services*~~ other *Competent Authorities* in close collaboration with the relevant stakeholders and other authorities, as appropriate.

[...]

Article 5.1.4.

[...]

3) In case of suspicion, on reasonable grounds, that an official certificate may be fraudulent, the *Veterinary Authority~~y~~ies* of the *importing country* and *exporting country* should conduct an investigation. Consideration should also be given to notifying any third country that may have been implicated. All associated consignments should be kept under official control, pending the outcome of the investigation. The *Veterinary Authorities* of all countries involved should fully cooperate with the

investigation. If the certificate is found to be fraudulent, every effort should be made to identify those responsible so that appropriate action can be taken in accordance with the relevant legislation.

_____

Article 5.6.4.

[...]

3) a list of airports in its territory which are provided with an area of direct transit, approved by the ~~relevant~~ *Veterinary Authority* and placed under its immediate control, where *animals* stay for a short time pending further transport to their final destination.

_____

Article 6.3.3.

[...]

The CHPM does not provide inspection measures for specific *hazards*, which remain the responsibility of ~~national competent authorities~~ *Competent Authorities*. The animal and public health *risks* associated with livestock populations vary across regions and animal husbandry systems, and ante- and post-mortem inspection needs to be tailored to the individual country situation and its animal and public health objectives.

[...]

Article 6.3.6.

[...]

The ~~national competent authority(ies)~~ *Competent Authority*(*ies*) should provide an appropriate institutional environment to allow *Veterinary Services* to develop the necessary policies and standards.

[...]

_____

Article 7.4.4.

[...]

1. Health and customs requirements

[...]

Contact the *Veterinary Authorit~~ies~~y* in the country of origin regarding veterinary certification.

[...]

_____

Article 7.7.6.

[...]

DPM activities performed by *Veterinary Services* or ~~other~~ relevant *Competent Authorities* should be integrated, to the greatest extent possible, with the activities of all other responsible agencies.

[...]

_____

Article 8.3.15.

[...]

2) The bluetongue *surveillance* programme should:

a) in a free country or *zone* or seasonally free *zone*, have an *early warning system* which obliges farmers and workers, who have regular contact with domestic ruminants, as well as diagnosticians, to report promptly any suspicion of bluetongue to the *Veterinary ~~Authority~~ Services*.

[...]

Article 8.18.8.

[...]

2) The *surveillance* programme for the pathogenic agent should, at least:

a) in a free country or *zone*, have an *early warning system* which obliges animal owners and keepers and other stakeholders who have regular contact with susceptible animals, as well as *veterinarians* or *veterinary paraprofessionals*, to report promptly any suspicion of *infection* with *T. brucei*, *T. congolense*, *T. simiae* and *T. vivax* to the *Veterinary ~~Authority~~ Services*.

[...]

Article 10.4.27.

[...]

2) The high pathogenicity avian influenza *surveillance* programme should include the following.

a) An *early warning system* for reporting suspected *cases*, in accordance with Article 1.4.5. throughout the production, marketing and processing chain. Farmers and workers who have day-to-day contact with *poultry*, as well as diagnosticians, should report promptly any suspicion of avian influenza to the *Veterinary ~~Authority~~ Services*. All suspected *cases* of high pathogenicity avian influenza should be investigated immediately and samples should be taken and submitted to a *laboratory* for appropriate tests.

[...]

Article 10.4.29.

[...]

Passive *surveillance*, i.e. sampling of birds found dead, is an appropriate method of *surveillance* in *wild* birds because *infection* with high pathogenicity avian influenza can be associated with mortality in some species. Mortality events, or clusters of birds found dead should be reported to the ~~local *Veterinary Authorities*~~ *Veterinary Services* and investigated, including through the collection and submission of samples to a *laboratory* for appropriate tests.

[...]

Article 15.1.29.

[...]

2) The ASF *surveillance* programme should:

a) include an *early warning system* throughout the production, marketing and processing chain for reporting suspected *cases*. Diagnosticians and those with regular contact with pigs should report promptly any suspicion of ASF to the *Veterinary ~~Authority~~ Services*. The reporting system under the *Veterinary Authority* should be supported directly or indirectly (e.g. through private *veterinarians* or *veterinary paraprofessionals*) by government or private sector awareness programmes targeted to all relevant stakeholders. Personnel responsible for *surveillance* should be able to seek expertise in ASF diagnosis, epidemiological evaluation and control;

[...]

Article 15.2.29.

[...]

2) The CSF *surveillance* programme should:

a) include an *early warning system* throughout the production, marketing and processing chain for reporting suspected *cases*. Diagnosticians and those with regular contact with pigs should report promptly any suspicion of CSF to the *Veterinary ~~Authority~~ Services*. The reporting system under the *Veterinary Authority* should be supported directly or indirectly (e.g. through private *veterinarians* or *veterinary paraprofessionals*) by information programmes. Given that many strains of CSFV do not induce pathognomonic gross lesions or clinical signs, *cases* in which CSF cannot be ruled out should be immediately investigated. Other important diseases such as African swine fever should also be considered in any differential diagnosis.

[...]

Article 15.3.14.

[...]

2) Any PRRS *surveillance* programme should:

a) include the reporting and investigation of suspected *cases*. Diagnosticians and those with regular contact with pigs should report promptly any suspicion of PRRS to the *Veterinary ~~Authority~~ Services*;

[...]
