Annex 15

GLOSSARY

BIOSECURITY

means a set of management, behavioural and physical measures designed to reduce the likelihood ~~*risk*~~ of entry of pathogenic agents into a given *population* and the exposure of *animals* to these pathogenic agents ~~introduction, establishment and spread of pathogenic agents~~animal diseases, ~~*infections* or *infestations*~~ in order to avoid their establishment and spread within and from ~~and within an animal~~ that *population*.

BIOSECURITY PLAN

means a ~~plan~~ document or series of documents that identify~~ies~~ potential sources and pathways ~~and factors~~ for entry of pathogenic agents into a given *population,* and the exposure of animals and factors for the transmission of these pathogenic agents ~~the introduction, establishment and spread of pathogenic agents~~ disease in a ~~*zone* or *compartment*~~, and describe~~s~~ the corresponding *biosecurity* ~~measures~~ to be implemented and the mechanisms to evaluate ~~its performance~~ and ~~to~~ update it ~~which are being or will be applied to mitigate the disease *risks*, if applicable, in accordance with the recommendations in the *Terrestrial Code*~~.

BORDER INSPECTION POST

means any ~~airport, or any port, railway station or road check point~~ international ~~*point of entry*~~ for *commodities* ~~open to *international trade* of *commodities*~~, and associated facilities, where ~~import veterinary~~official inspection~~s can be~~ is performed by *Veterinary Services*.

CONTAINER

means a non-self-propelled receptable or other rigid structure ~~for holding *animals* to carry~~ hold *commodities* during transportation ~~a journey by one or several means of transport~~.

DISINFECTION

means an action ~~the application, after thorough cleansing, of procedures~~ intended to inactivate or destroy pathogenic agents on potentially contaminated objects. ~~the infectious or parasitic agents of animal diseases, including zoonoses; this applies to premises, *vehicles* and different objects which may have been directly or indirectly contaminated.~~

DISINSECTION

means an action intended to kill or eliminate arthropods from *establishments*, *means of transport*, *slaughterhouses* or any other premises or equipment used for *animals*.

ISOLATION

means the placement of an *animal* or a group of *animals* separated from other animals under appropriate *biosecurity*.

PATHOGENIC AGENT

means a biological agent that causes, or contributes to, the development of a disease in *animals*.

POINT OF ENTRY

means any ~~point~~ specific location at which *commodities* enter the territory of a country.

POINT OF EXIT

means any ~~point~~ specific location from where *commodities* leave the territory of a country ~~*the exporting* country~~.

QUARANTINE ~~STATION~~ CENTRE

means an *establishment* under the control of the *Veterinary Authority* where *animals* are maintained in isolation for observation, and if appropriate testing and treatment, during a specified length of time under appropriate *biosecurity* to prevent ~~with no direct or indirect ensure no contact with other *animals* and *vectors* when relevant, to ensure so that there is no transmission~~entry ~~of~~ specified pathogenic agents from entering ~~outside~~ into ~~nor~~ ~~escape~~ escaping out of the *establishment* ~~while the *animals* are undergoing observation for a specified length of time and, if appropriate, testing or treatment~~.

SEROCONVERSION

means either the change from a seronegative to a seropositive condition of an *animal*, demonstrated by a serological test specific for the antigen, or a four-fold or more rise in antibody titre in paired sera sampled at an appropriate interval, demonstrated by an ordinal test specific for the antigen.

SWILL

means food scraps or food waste~~,~~ that contain or have been in contact with *animal products*~~,~~ and ~~which~~ may be used as *feed*.

TRANSIT COUNTRY

means a country through which *commodities* destined for another country ~~an *importing country*~~ are transported or in which they make a stopover ~~is made at a *border post*~~.

~~VEHICLE/VESSEL~~MEANS OF TRANSPORT

means ~~any means of conveyance including~~ any land vehicle, ~~a train, truck, trailer,~~ aircraft or ~~ship~~vessel that is used for ~~carrying~~ transporting ~~animals~~ *commodities*.

CHAPTER 1.3.

DISEASES, INFECTIONS AND INFESTATIONS LISTED BY WOAH

[…]

Article 1.3.7.

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

– Caprine arthritis/encephalitis

– Contagious agalactia

– Contagious caprine pleuropneumonia

– Infection with *Chlamydia abortus* (Enzootic abortion of ewes, ovine chlamydiosis)

– Infection with peste des petits ruminants virus

– Infection with *Theileria lestoquardi*, *Theileria luwenshuni* and *Theileria uilenbergi*

– Maedi–visna

~~– Nairobi sheep disease~~

– Ovine epididymitis *(Brucella ovis)*

– Salmonellosis (*S.* abortusovis)

– Scrapie

– Sheep pox and goat pox.

[…]

CHAPTER 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

Article 1.6.1.

Application for official recognition of animal health status and endorsement of an official control programme by WOAH

A Member Country may request:

1) official recognition of *animal health status* by WOAH of:

   a) freedom of a country or *zone* from African horse sickness (AHS);

   b) risk status of a country or *zone* with regard to bovine spongiform encephalopathy (BSE);

   c) freedom of a country or *zone* from classical swine fever (CSF);

   d) freedom of a country or *zone* from contagious bovine pleuropneumonia (CBPP);

   e) freedom of a country or *zone* from foot and mouth disease (FMD), where *vaccination* is either practised or not practised;

   f) freedom of a country or *zone* from peste des petits ruminants (PPR);

2) endorsement by WOAH of:

   a) an *official control programme* for CBPP;

   b) an *official* control *programme* for FMD;

   c) an *official* control *programme* for PPR;

   d) an *official* control *programme* for dog-mediated rabies.

WOAH does not grant official recognition of *animal health status* or endorsement of an *official control programme* for diseases other than those listed under points 1 and 2 above.

The Member Country should present documentation setting out the compliance of their *Veterinary Services* with the provisions of Chapters 1.1., 1.4., 3.2., 3.3. and 4.4. of the *Terrestrial Code*, when relevant, and with the provisions of the relevant disease-specific chapters in the *Terrestrial Code* and the *Terrestrial Manual*.

When requesting official recognition of *animal health status* or endorsement by WOAH of an *official control programme*, the Member Country should follow the Standard Operating Procedures (available on the WOAH website) and submit to WOAH a dossier providing the information requested in the following chapters (as appropriate): 1.7. (for AHS), 1.8. (for BSE), 1.9. (for CSF), 1.10. (for CBPP), 1.11. (for FMD) or 1.12. (for PPR).

The WOAH framework for the official recognition of *animal health status*, the endorsement of *official control programmes*, and their maintenance is described in relevant Resolutions adopted by the World Assembly of WOAH Delegates.

The country or the *zone* will be included in the relevant lists of official *animal health status* or endorsed *official control programmes* only after the evidence submitted has been adopted by the World Assembly of WOAH Delegates.

When a Member Country requests official recognition of *animal health status* for a *zone*, the geographical boundaries of the proposed *zone* should be clearly defined. When applying for recognition of a free *zone* that is adjacent to another *zone* of the same status, it should be stated whether the new *zone* is being merged or kept separate. If the proposed *zone* remains separate, details should be provided of the control of the movement of relevant *commodities* between the *zones* in accordance with Chapter 4.4.

The overall objective of the WOAH endorsed *official control programmes* is for Member Countries to progressively improve their animal health situation and eventually attain official recognition of *animal health status* or in the case of dog-mediated rabies to make a self-declaration as a free country or *zone*. The *official control programme* should be applicable to the entire country even if certain measures are directed towards defined *zones*.

Article 1.6.2.

Maintenance of official recognition of animal health status and endorsement of an official control programme by WOAH

Retention on the lists of countries and *zones* having an official *animal health status* or of countries having an endorsed *official control programme* requires that the information in relevant chapters be re-submitted annually and that changes in the epidemiological situation or other significant events be notified to WOAH in accordance with the requirements in Chapter 1.1.

Non-compliance with the requirements for the maintenance of *animal health status* results in the suspension of that status. Within 24 months of suspension, except otherwise stated in the disease-specific chapter, a Member Country may apply for the recovery of a previously recognised status, following the provisions of the relevant disease-specific chapter. When the status has not been recovered within the specified period of its suspension, it is withdrawn and the Member Country should reapply following the procedure for the application for official recognition of *animal health status*.

WOAH may withdraw the endorsement of an *official control programme* if there is evidence of:

– non-compliance with the timelines or performance indicators of the programme; or

– significant problems with the quality of the *Veterinary Services* as described in Section 3 of the *Terrestrial Code*; or

– an increase in the *incidence* or distribution of the disease that cannot be addressed by the programme.

Article 1.6.3.

Publication by WOAH of a self-declaration of animal health status by a Member Country

A Member Country may make a self-declaration of freedom of a country, *zone* or *compartment* from a WOAH *listed disease* or another animal disease, *infection* or *infestation*. The Member Country may inform WOAH of the claimed status and request publication by WOAH of the self-declaration to inform WOAH Member Countries.

A Member Country requesting the publication of a self-declaration should follow the Standard Operating Procedure (available on the WOAH website) for submission of a self-declaration of *animal health status* and provide documented information on its compliance with the relevant chapters of the *Terrestrial Code*, including:

– evidence that the *infection* or *infestation* is a *notifiable disease* in the entire country;

– history of absence or eradication of the *infection* or *infestation* in the country, *zone* or *compartment*;

– *surveillance* including an *early warning system* for all relevant species in the country, *zone* or *compartment*;

– measures implemented to maintain freedom in the country, *zone* or *compartment*.

The self-declaration may be published only after all the information provided has been received and administrative and technical screening has been performed by WOAH. Publication does not imply endorsement of the claim of freedom by WOAH and does not reflect the official opinion of WOAH. Responsibility for the accuracy of the information contained in a self-declaration lies entirely with the WOAH Delegate of the Member Country concerned.

Except when otherwise provided for in the *listed disease*-specific chapter, an *outbreak* in a Member Country, a *zone* or a *compartment* having a self-declared free status results in the loss of the self-declared free status. A Member Country wishing to reclaim a lost free status should submit a new self-declaration following the procedure described in this article.

WOAH does not publish self-declarations for *listed diseases* in point 1 of Article 1.6.1.

Article 1.6.4.

Specific provisions

The *animal health status* of a *country* or *zone* is not affected by:

– the presence of the pathogenic agent in an *animal product* at a *border inspection post*;

– the presence of the disease, *infection*, or *infestation* in imported animals in a *quarantine centre*;

– the importation or the presence of the pathogenic agent, or of *commodities* or organisms carrying the *pathogenic agent*, in a *laboratory* or other *approved* facilities with appropriate laboratory biosafety and laboratory biosecurity in accordance with the *Terrestrial Manual*.

This should be supported by evidence of compliance with all relevant standards of the *Terrestrial Code* and *Terrestrial Manual*.

SECTION 4.

DISEASE PREVENTION AND CONTROL

CHAPTER 4.X.

BIOSECURITY

Article 4.X.1.

Introduction

Biosecurity is the cornerstone of animal health programmes and as such should be implemented to prevent and control diseases in *populations*. In addition to reducing the risk of disease, the benefits of *biosecurity* include a reduced ~~need for~~use of *veterinary medicinal products*; reduced *killing* of *animals* for disease control purposes; reduced economic losses; protection of livelihoods; ~~assurance of sustainability of~~improved animal production; improved food security and food safety; promotion of animal, human and environmental health; ~~, and assurance of~~ safe trade and business continuity.

Article 4.X.2.

Purpose and scope

This chapter provides general principles and recommendations to allow for a consistent approach that could be applied to implement *biosecurity* for a *population* or *subpopulation* irrespective of the settings or scale, such as at farm or non-production *establishment, herd/flock, compartment, zone,* or country~~, *zone*, *compartment*, *herd/flock*, farm or non-production establishment~~ level.

The purpose of this chapter is to provide guidance to the *Veterinary Authority* and other relevant actors, as described in Article 4.X.4., on the principles, implementation and evaluation of *biosecurity* to support disease prevention and control programmes. The chapter applies to *animals,* their gatherings and husbandry systems, to all components of animal keeping and transport, and to the interface between domesticated *animals*, *wildlife,* humans ~~and *wildlife*~~and the environment.

More specifically, this chapter aims to:

- describe the general guiding principles of *biosecurity*;
- identify the roles and responsibilities of the different actors in *biosecurity*;
- describe the potential sources and pathways for entry of pathogenic agents into a *population* and the exposure of *animals* and factors for the transmission of pathogenic agents;
- describe the components of *biosecurity*;
- provide guidance on the design, application, monitoring, evaluation and training with regards to *biosecurity* and *biosecurity plans.*

The chapter does not apply to laboratories. ~~, whose a~~Approaches to laboratory biosecurity are addressed in the *Terrestrial Manual*.

Article 4.X.3.

General ~~guiding principles~~provisions

The desired objectives of *biosecurity* should be defined. To achieve ~~the~~ these objectives ~~of *biosecurity*~~, the following should be considered:

1) The *population* for which *biosecurity* is to be implemented, including its context ~~and~~, size and its *animal health status*.

2) The identification of the ~~*hazards*~~ pathogenic agents of concern and from where and how they may be introduced, and how they may ~~the pathogenic agents may be introduced,~~ establish~~ed and spread~~ within ~~in~~ and spread from the *population.*

3) The factors and frequency of events that influence the introduction, establishment and spread of pathogenic agents.

4) Scientific evidence to assess the *risk.*

5) ~~and~~ P~~p~~roportionality of ~~to~~ the measures to manage the *risk*.

6)~~5)~~ Sustainability, adaptability~~,~~ and monitoring.

7)~~6)~~ Human behaviour to maximise compliance.

~~7) Evaluation of compliance built into the day-to-day operations.~~

8) Socio-economic impacts of *biosecurity*.

9) Impacts on other *populations* and the environment.

10) Development of a~~A~~ *biosecurity plan* that promotes consistent implementation of *biosecurity*.

11) Engagement with, training and awareness of, and communication with, all actors involved in *biosecurity*.

These ~~principles~~ general provisions ~~of *biosecurity*~~ apply to any type of activity (intensive, extensive, commercial or non-production); only the measures comprising the *biosecurity* should be adapted to the situation.

Article 4.X.4

Roles and responsibilities

The roles and responsibilities of different actors in *biosecurity* should be clearly defined and communicated ~~with consideration made~~and may vary depending on ~~to~~ the context (e.g. *establishment*, *compartment*, *zone*, or country ~~country, *zone, compartment*, *establishment*~~ level), the scale and type of operations and existing public-private partnerships. Implementation of *biosecurity* requires engagement and collaboration among~~st~~ all actors involved.

12) ***Veterinary Authority*** or other relevant *Competent Authorities* should be responsible for the development and oversight of ~~policy on and~~ legislative frameworks and general policies for *biosecurity*. These ~~policies~~ should include the relative contribution and roles of *veterinarians* and *veterinary paraprofessionals* in both the private and public sectors, promote and provide guidance for the implementation of *biosecurity*. When required ~~For~~ for international trade ~~purposes~~, the *Veterinary Authority* should have an active role in ~~enforcement,~~ oversight~~,~~ and verification of *biosecurity* and *biosecurity plans*.

1) ***Veterinary Services*** should execute and implement policies and legislation on *biosecurity* under the supervision of the *Veterinary Authority* or other relevant *Competent Authorities.*

2) ***Veterinarians* and *veterinary paraprofessionals* and other relevant advisors** should give advice on *biosecurity* and the *biosecurity plans*. This advice should be aligned with the policies and legislation, where available.

3) **Breeders, owners, managers, keepers, transporters, feed producers and other relevant actors** are responsible for developing, implementing and monitoring *biosecurity* and the *biosecurity plan* and should seek advice from *veterinarians, veterinary paraprofessionals* or other relevant advisors.

4) **Training entities** should provide training in *biosecurity* for relevant actors. Coordination between the *Veterinary Authority*, other relevant *Competent Authorities*, the *veterinary statutory body* and veterinary educational institutions may be required to ensure biosecurity training delivered to *veterinarians*, *veterinary paraprofessionals* and other relevant advisors meets relevant standards, especially the recommendations of Article 4.X.9.

5) **Farmer associations, veterinary and para-veterinary associations, and other relevant associations** should advocate and promote *biosecurity* among their members, and may become directly involved in leading and overseeing the biosecurity planning and implementation by their members.

Article 4.X.5.

Potential sources of pathogenic agents

Pathogenic agents can ~~be~~ spread ~~through~~ from different sources, which should be identified and considered when implementing *biosecurity* and developing a *biosecurity plan*. ~~The main~~ Potential sources of pathogenic agents ~~to be considered~~ include:

1) live *animals,*

2) *germinal products,*

3) secretions and excretions,

4) *animal products,*

5) dead *animals* and parts thereof and afterbirth materials,

6) arthropods such as mosquitoes, midges, flies, lice, ~~or~~ ticks or beetles,

7) fomites such as peoples' clothing, boots, *vehicle*s, crates, bedding, or farm equipment,

8) *feed* and *feed ingredients* ~~including~~ such as forage, grazing pastures and swill,

9) water, soil ~~and~~ air,

10) *biological products,*

11) humans.

Article 4.X.6.

Transmission pathways

Transmission of pathogenic agents can occur either through *animal*-to-*animal* contact without an intermediate (direct transmission), or through an intermediate such as fomites, water, *feed*, *animal products*, *germinal products*, *biological products*, humans and the relevant animal environment (indirect transmission). Transmission pathways of pathogenic agents should be assessed based on scientific evidence and considered when implementing *biosecurity* or developing a *biosecurity plan.* Transmission pathways are not mutually exclusive and include:

1) Vertical transmission from parents to offspring *in ovo*, *in utero* or during birth.

2) Horizontal transmission from one *animal* to another that is not vertical.

3) Iatrogenic transmission.

4) Sexual transmission through reproductive secretions such as semen and vaginal fluids or transmitted directly between surfaces in contact during mating.

5) Vector-borne transmission via *vectors* including blood-feeding arthropods such as mosquitoes, flies, ticks, fleas and lice. *Vectors* may be mechanical with no biological association between the *vector* and pathogenic agent or biological where the pathogenic agent undergoes a multiplication or a developmental change within the *vector*, necessary for survival, transmission or host *infection*.

6) Droplets or airborne transmission ~~of pathogenic agents~~ through particles suspended in the air. Pathogenic agents may travel in particles of multiple sizes (droplets and droplet nuclei) that remain suspended in the air or deposited on surfaces. Airborne transmission may include short or long distances (which may be referred to as aerosol or wind-borne transmission, respectively).

7) Transmission though fomites, *germinal products, animal products* and *biological products.*

The relative importance of the different transmission pathways will vary depending on the epidemiological characteristics of pathogenic agents of concern.

Article 4.X.7.

Components of biosecurity

Biosecurity can be applied to any type of *population.* The components of *biosecurity* focus on reducing the likelihood~~risk~~ of transmission of pathogenic agents through interactions with elements outside the *population* (external *biosecurity*) and on reducing ~~risk~~ the likelihood of transmission of pathogenic agents within the *population* (internal *biosecurity).* The components of *biosecurity* aim at avoiding or breaking the transmission pathways described in Article 4.X.6. All relevant components of *biosecurity* should be applied to address all potential sources of pathogenic agents of concern, transmission pathways as well as unexpected events, and may vary according to the *population*.

1. Components of external biosecurity may include the following:

   a) Introduction of *animals, animal products* and *germinal products* into a *population* should be limited to the extent necessary~~minimised~~ and if undertaken, the *animal health status* of the source *population* should be assessed.

   b) ~~Whenever~~Before *animals* are newly introduced into the *population*, they should go through a monitored isolation period of sufficient length, during which measures such as test or treatment may be implemented to reduce~~mitigate~~ the ~~risk~~ likelihood of transmission of pathogenic agents.

   c) Contact between *population*s of unknown or different *animal health status* should be avoided through segregation using managerial measures, physical or natural barriers.

   d) Human access to the *population* should be controlled. When humans come in contact with *animals,* they should take measures to reduce~~mitigate~~ the ~~*risk*~~likelihood of bi-directional transmission of pathogenic agents~~, which includes as a minimum wearing dedicated clothing and footwear, and hand hygiene~~. When humans come in contact with different *populations* subsequently, the order of the visits should be organised to minimise the likelihood of bi-directional transmission.

   e) Equipment and clothing used to handle or care for *animals* should not be shared between different *population*s. If shared, equipment and clothing should undergo cleaning and *disinfection* at least before each use~~and after use~~.

   f) Transport vehicles in contact with *animals* or their products should undergo cleaning and *disinfection* at least before each use~~and after use~~.

g) *Animal products*, faeces, manure or other waste materials should be handled in a way to ~~mitigate~~ minimise the spread of pathogenic agents. Special care should be taken to avoid contact with or attraction of other *animals* and arthropods.

h) Dead *animals* and parts thereof should be handled, stored and disposed of in a way to ~~mitigate~~ minimise the spread of pathogenic agents and to avoid contact with or attraction of other *animals* and arthropods.

i) *Feed* should be produced in accordance with Chapter 6.4. and should be~~,~~ stored and transported in dedicated equipment to minimise the contact with potential sources of pathogenic agents. Feeding of untreated swill should be avoided.

j) Water should originate from low-risk sources or be treated to remove or inactivate pathogenic agents. The safety of the water ~~and *feed*~~ should be checked regularly.

k)~~j)~~ Contacts between the *population* and pets, birds, rodents, insects, and other *wildlife* or pests should be avoided by selecting an appropriate site and through using engineering, mechanical or chemical control.

l)~~k)~~ To minimise airborne transmission of pathogenic agents, sufficient distance or physical barriers between *populations* and ~~possible~~ potential sources of pathogenic agents should be considered. In some circumstances, air treatments might be considered.

m)~~l)~~ When cleaning and *disinfection* or other measures are not feasible or effectiveness is undetermined, an additional period of no contact between potential sources of pathogenic agents (e.g. humans, buildings, *vehicles*, equipment, materials, pastures) and the *population* may be applied. The effectiveness of this measure will depend on the specific circumstances and should be verified.

2. Components of internal biosecurity may include the following:

a) Sick *animals* should be isolated to prevent other *animals* from being exposed. Treatments should be administered ~~safely~~ to avoid iatrogenic transmission.

b) All-in all-out management should be applied, as appropriate, to all *animals* kept in the same space including cleaning and *disinfection* of the space between groups of *animals*.

c) Stocking densities that result in impaired health through increased transmission rates and higher virulence of pathogenic agents, or increased susceptibility to *infection*s, should be avoided.

d) Within the *population*, *units* with different characteristics impacting disease *risk* should be kept separately.

e) When the management of the *population* involves contact with different *units*, the workflow should be organised from the lowest to the highest risk of *infection*, considering transmission of pathogenic agents and susceptibility of the *units*. When moving between the *units*, measures to mitigate transmission of pathogenic agents should be applied.

f) Cleaning and *disinfection* of the equipment and surfaces should be applied between consecutive groups of *animals*.

Article 4.X.8.

Biosecurity plan

A *biosecurity plan* promotes consistent implementation of *biosecurity*.~~,~~ While remaining scientifically justifiable, ~~and~~ it should balance the objectives and intended benefits with the practicality, cost, regulatory requirements and should include necessary provisions for its maintenance and continuous improvement. The aim of a *biosecurity plan* is to organise, structure and document *biosecurity* including its evaluation.

The *biosecurity plan* should include the following sections:

a) Purpose and scope

This section should provide an overview of the plan, its purpose and scope. In addition, it should outline the goals and objectives of the plan, as well as the *population* characteristics, including animal husbandry systems, and epidemiological context.

b) Roles and responsibilities

Design, implementation, and monitoring is a shared responsibility. Therefore, it is essential to describe the roles and responsibilities of all actors for ensuring adherence and compliance with *biosecurity*.

c) Identification of pathogenic agents, sources and transmission pathways

In addition to the identification of the potential pathogenic agents of concern, this section should include their potential sources and transmission pathways.

d) Description of biosecurity

This section should describe the relevant components of *biosecurity* in accordance with Article 4.X.7.

It should also include relevant response procedures for emergencies.

e) Surveillance of pathogenic agents

The *biosecurity plan* should include the procedures for *surveillance* for early detection ~~to detect the presence~~ of pathogenic agents of concern, in accordance with Chapter 1.4.

f) Communication and reporting

This section should outline the procedures for communicating information about the *biosecurity plan* to all relevant actors. It should also include procedures for reporting incidents and sharing information with relevant authorities.

g) Training and education

This section should outline the training and education needs and identify programmes to ensure all relevant actors are aware of the *biosecurity plan* and clearly understand their roles and responsibilities to implement and maintain the *biosecurity* and the consequences of non-compliance.

h) Supporting documents

This section should outline the standard operating procedures ~~(SOPs)~~, checklists, and record-keeping templates which describe routine management processes and ensure that responsibilities and duties are consistently fulfilled and documented. It should also include relevant training materials for all actors involved in the implementation of the *biosecurity plan*.

i) Evaluation and continuous improvement

This section should describe the procedures for monitoring and evaluation of the *biosecurity plan* and its implementation in accordance with Article 4.X.10. Biosecurity Incidents and breaches in *biosecurity*, as well as corrective actions taken, should be documented. The *biosecurity plan* should be reviewed and updated regularly to ensure its relevance and effectiveness.

Article 4.X.9.

Training and awareness

1. Training

Regular training on *biosecurity* should be undertaken according to the needs identified and should include all relevant actors. Training should be provided by those with sufficient qualifications and experience. The training should be in line with legislative and policy frameworks. Such training may include:

- Principles of *biosecurity,*

- Sources of pathogenic agents, transmission pathways and relevant factors to susceptibility,

- Components and implementation of *biosecurity,* including emergency planning and response,

- Monitoring and evaluation of *biosecurity,*

- Purpose, development and implementation of a *biosecurity plan,*

- Competency-based training requirements should be identified and documented for each actor. The training achieved should be recorded and monitored to ensure the required level of competencies are obtained or maintained.

2. Awareness

All relevant actors described in Article 4.X.~~4~~. and the general public, when applicable, should be made aware of the importance of *biosecurity* (and the *biosecurity plan* if appropriate) at strategic places (e.g. *border inspection posts*, farm entrances, *markets*) and times (e.g. disease *outbreaks*, changes in the epidemiological situation). Raising awareness may be the responsibility of the *Veterinary Authority,* other relevant *Competent Authorities*~~,~~ or *Veterinary Services*~~,~~. ~~or p~~Producers~~,~~ or~~and~~ other relevant actors may also be responsible depending on the context and extent of the *risk.*

Article 4.X.10.

Evaluation and continuous improvement

The implementation of *biosecurity,* the compliance with the *biosecurity plan* and the effectiveness of implemented measures should be subjected to evaluation for continuous improvement.

1) The evaluation of implementation should be based on predefined scope and criteria, taking into consideration the expected scale of the operation and the characteristics of the *population* concerned. This will determine at which level of responsibility the evaluation should be conducted, and at which frequency. The frequency should be adapted to changing circumstances such as new *animal health status*, newly identified pathogenic agents or changes in epidemiological situation, previous evaluations, changes in production or changes in plan. The evaluation should determine the level of implementation of *biosecurity,* through collected evidence that may include documentation of procedures, other routine records, monitoring technologies, onsite audits as well as interviews with personnel. Based on these findings, the evaluation may allow the establishment of a risk-based *biosecurity* score as a whole or for each measure.

2) Compliance with the *biosecurity plan* should be evaluated routinely or following a change in the epidemiological situation. Documented evidence of compliance should be collected routinely and be provided for any evaluation. The evaluation of compliance with the *biosecurity plan* should be executed preferably by an independent party, in accordance with the policies and legislation, where available.

3) The effectiveness of the *biosecurity plan* should be evaluated routinely or following a change in production type, epidemiological situation, or other significant change, to ensure the *biosecurity plan* is complete, fit for purpose and up to date. The evaluation should be based on animal health or performance data. The outcomes of the evaluations should be communicated to all relevant actors and should inform if the plan needs to be modified, and which risk mitigation or corrective actions are needed so that the *biosecurity plan* can be updated accordingly.

CHAPTER 5.4.

MEASURES AND PROCEDURES APPLICABLE ~~IN~~ TO THE EXPORTATION OF COMMODITIES

Article 5.4.1.

Purpose and scope

This chapter provides general principles for measures and procedures that are applicable ~~in~~ to the exportation of *commodities* to prevent the spread of pathogenic agents through *international trade* of *commodities*, without creating unjustified trade restrictions, covering from facilities of origin (such as *establishment*, *slaughterhouse*/*abattoir*, *semen collection centre*) to the *point of exit*.

For the purposes of this chapter, 'operator' means any natural or legal entity or person responsible for export of *commodities* subject to the provisions of this chapter.

This chapter provides *exporting countries* with recommendations on measures and procedures, and the roles and responsibilities of their *Veterinary Authority* or other relevant *Competent Authorities*~~,~~ and of operators, ~~business operators any natural or legal entity or person responsible for export of *commodities* subject to the provisions of this chapter (hereafter 'operator'),~~ in addition to responsibilities that are described in Article 5.1.3. This chapter provides guidance to ensure the quality and ~~performance~~ implementation of official controls for exportation.

This chapter applies to all *commodities*; some recommendations are specifically addressed to certain ~~of those~~ *commodities*.

Article 5.4.2.

General considerations

The *Veterinary Authority* of the *exporting country* should ~~ensure that~~ make operators aware of the *importing country* requirements, if they are available to the *Veterinary Authority* in accordance with Chapters 5.1. and 5.2. In addition, the *Veterinary Authority* should make operators aware of the process required to meet the conditions of the *international veterinary certificate* including *importing country* requirements. ~~including all information required for the agreed *international veterinary certificate*, in accordance with Article 5.1.1. and Chapter 5.3., are available to exporters.~~

The *Veterinary Authority* ~~of the *exporting country*~~ should be responsible for the implementation ~~performance~~ of official controls in coordination with other relevant *Competent Authorities* in accordance with *veterinary legislation* to ensure that exported *commodities* ~~can be traded safely and~~ meet the ~~requirements of the *importing country*~~ requirements. ~~Its~~ The~~ir~~ legal mandate and responsibilities of the *Veterinary Authority* and other relevant *Competent Authorities*~~, as described in Article 3.4.5. and 3.4.13.,~~ should include the ~~export~~ official controls ~~activities~~ at any step in the export process and the opportunity to request from the operator ~~exporter~~ any necessary information. Where appropriate, the *Veterinary Authority* and other relevant *Competent Authorities* may delegate certain tasks ~~in accordance with point 2 of Article 3.4.5~~. Adequate human, technical, physical and financial resources should be available in the *exporting country* for the *Veterinary Services* to ~~allow those~~effectively implement official controls ~~to be undertaken effectively~~ and to properly apply the certification obligations and procedures laid down in Chapters 5.1. and 5.2., in accordance with the quality principles ~~described~~ in ~~Article~~ Chapter 3.2.~~2.~~

The *Veterinary Authority* should cooperate closely with the customs authority and other authorities of the *exporting country* dealing with exports to ensure that official controls are implemented~~performed~~ effectively~~,~~ and ~~to protect~~ maintain ~~the status~~ compliance of the *commodities* with *importing country* requirements ~~without creating unjustified barriers to trade~~. This cooperation should also cover actions to prevent and combat fraud or illegal pathways.

The *Veterinary Authority* should have procedures, as applicable, for certification of the *animal health status* of the *herd/flock*, *compartment*, *zone*, or country~~, *zone*, *compartment*, or *herd/flock*~~ as well as of the disease situation in *establishments* and other premises and communicate with the operator ~~exporter~~ regarding any additional documentary evidence that may be required to support such certification.

The *Veterinary Authority* ~~in the *exporting country*~~ should ensure that the applicable certified *animal health status* of the *herd/flock*, *compartment*, *zone*, or country~~, *zone*, *compartment*, or *herds/flock* or *animals*~~, is based on appropriate *surveillance* and reporting in accordance with Chapter 1.4.

The *Veterinary Authority* ~~in the *exporting country*~~ should have procedures for registration and approval of *establishments* of origin, where applicable, and other facilities used for production and handling of consignments, to comply with the ~~agreed~~ *international veterinary certificate*. Operators should not hinder access by the *Veterinary Authority* to the *commodities*, the premises where they are located and the *means* ~~by which they are transported~~ *of transport*. During official controls, operators should assist and cooperate with the *Veterinary* ~~*Authority*~~ *Services* and make available all relevant information concerning the consignment.

The *Veterinary Authority* ~~of the *exporting country*~~ should ensure that appropriate identification of *commodities* is in place to support traceability for the consignment to comply with the ~~agreed~~ *international veterinary certificate*. *Animal identification* should be in accordance with Chapter 4.2. and Chapter 4.3.

Upon request from the *Veterinary Authority* of the *importing country* or from the *Veterinary Authority* of the *transit country*, the *Veterinary Authority* of the *exporting country* should provide additional information on the process to ensure compliance with the conditions included in the ~~agreed~~ *international veterinary certificate*, and undertake investigation and reporting, or~~and~~ give reasonable access for audit in case of repeated non-compliant consignments ~~jeopardising the safety of trade~~. The *Veterinary Authority* of the *exporting country* should ~~take~~ ensure that the ~~appropriate and necessary preventive measures to ensure that the status of the~~ *commodities* remain compliant~~is not jeopardised~~ before and during transport to the *point of exit*. The *exporting country* should suspend the export of a *commodity* when there is reason to believe that it may present a risk for animal health and public health or ~~that~~ if it does not comply with the ~~agreed~~ *international veterinary certificate*.

The *Veterinary Authority* of the *exporting country* should promptly communicate to the *Veterinary Authority* of the *importing country*, any change or situation, such as a change of the *animal health status*, that may affect its capacity to ~~fulfil~~ certify the conditions of the ~~agreed~~ *international veterinary certificate*.

The *Veterinary Authority* of the *exporting country* should also inform without delay the *Veterinary Authority* of the *importing country*~~,~~ and, where necessary, the *transit country*~~,~~ in the event that a particular issue such as the occurrence of a *listed disease* or a disease referred to in the *importing country* requirements which may affect~~s~~ ~~the~~ compliance ~~status~~ of a *commodity* which has already left the *exporting country*. This information should be part of the relevant emergency response plan developed in accordance with Chapter 4.19.

In case of *animals*, operators should ensure that *animal welfare* is maintained throughout the export process in accordance with Section 7 as relevant.

The *Veterinary Authority* ~~of the *exporting country*~~ should carry out collaborative activities with other relevant *Competent Authorities*, customs, other authorities and operators, and with *Veterinary Authorities* in other countries, to control the risk posed by the illegal cross-border movement of *commodities*, i.e. the international movement of *commodities* done in a way to expressly and intentionally avoid official controls.

Article 5.4.3.

General principles applicable to procedures for official controls for exportation

1. Preparation for exportation

   Operators~~Exporters~~ should ~~announce~~ inform the *Veterinary Authority* of their intention to ~~the~~ export ~~to the *Veterinary Authority*~~ sufficiently in advance ~~as~~ to meet the~~to~~ conditions of the ~~agreed~~ *international veterinary certificate* and the administrative requirements of the *exporting*, *transit* and *importing countries*.

   Operators~~Exporters~~ should provide to the *Veterinary Authority* the~~as~~ required details of the consignment. The *Veterinary Authority* should outline to the operator~~exporter~~ the procedures, standards and timeframe for preparation of the consignment, and the documentary evidence required to demonstrate compliance

with these requirements. Where relevant, the *Veterinary Authority* should identify eligible bodies or officers for the implementation~~performance~~ and certification of procedures specified in the ~~agreed~~ *international veterinary certificate*.

The operator~~exporter~~ and the *Veterinary Authority* should coordinate the implementation, and its documentation, of the conditions of the ~~agreed~~ *international veterinary certificate*. Implementation of these conditions and its documentation should be in accordance with the procedures and standards communicated by the *Veterinary Authority* of the *exporting country* and will form the basis upon which the *Official Veterinarian* will issue the *international veterinary certificate* for the consignment.

The *Veterinary Authority* should ensure that the facilities and operational procedures required for isolation of *animals* or processing of products comply with the conditions of the ~~agreed~~ *international veterinary certificate*, which may ~~including~~ include registration, approval, and inspection, in accordance with ~~Chapters 4.6., 4.7. and 5.7. or other~~ relevant chapters of the *Terrestrial Code*.

Testing of *commodities* required to fulfil the conditions of the ~~agreed~~ *international veterinary certificate* should be in accordance with Article 3.2.10. and with the *Terrestrial Manual*. The *Veterinary Authority* should define and communicate to the operator~~exporter~~ the procedures for sample collection, identification and submission, the list of ~~*approved*~~ *laboratories* and the *approved* diagnostic tests.

The *Veterinary Authority* should define and communicate to the operator~~exporter~~ the procedures for *vaccination* and treatment if required to fulfil the conditions of the ~~agreed~~ *international veterinary certificate*. The operator~~exporter~~ should arrange for *vaccination* or treatment of *animals* in line with these conditions, noting timeframes relevant to the scheduled date of exportation. *Vaccination* and treatment of *animals* should use *veterinary medicinal products* registered or allowed in the *exporting country*~~, in line with the conditions of the agreed *international veterinary certificate*~~.

The *Veterinary Authority* should define and communicate to the operator~~exporter~~ the standards and procedures for *disinfection* of and ~~disinsection~~ disinsection ~~elimination of arthropod *vectors*~~ from~~of *vehicles*/vessels~~the *means of transport* and *containers* in accordance with Chapter 4.14., if required to fulfil the conditions of the ~~agreed~~ *international veterinary certificate*.

In the case of *animals*, ~~T~~the operator~~exporter~~ should also be able to provide to the *Veterinary Authority* a *journey* ~~travel~~ transport plan ~~from the *point of exit* in the *exporting country* to the point of *unloading* in the *importing country*. In the case of animals, it should be~~ in accordance with ~~Chapters 7.2., 7.3. or 7.4.~~Section 7, and in compliance with the *importing country* requirements as relevant.

2. Procedures of exportation

   a) Verification and certification

      The operator~~exporter~~ should cooperate with the *Veterinary Authority* to demonstrate that the conditions of the ~~agreed~~ *international veterinary certificate* have been met and that the consignment is eligible for certification and export. The operator~~exporter~~ should provide all documentary evidence of compliance with the *importing country* requirements ~~conditions of the agreed~~ and the *international veterinary certificate* as required by the *Veterinary Authority*, including an import permit where appropriate. There should be clear traceability and linkage, at every stage of preparation of ~~animals and *animal product*~~*commodities*, to the final consignment presented for export, as relevant to fulfil the conditions of the ~~agreed~~ *international veterinary certificate*.

      The *Official Veterinarian* should review the preparation of the export consignment to confirm that *commodities* ~~animals and *animal products*~~ have been clearly identified at every stage of their preparation, that the consignment complies with the conditions of the ~~agreed~~ *international veterinary certificate* and is in accordance with Chapters 5.1. and 5.2. of the *Terrestrial Code*. The *Official Veterinarian* should also review ~~all transport arrangements~~ the *journey* ~~travel~~ plan for ~~the~~ consignments of *animals* to ensure it ~~they~~ ~~support~~ maintains~~enance~~ compliance with the *importing country* requirements and *animal welfare* recommendations in Section 7. ~~of the *commodity*'s status and *animal welfare*~~.

      Once satisfied that preparations and *journey* ~~travel~~ plans~~transport arrangements~~ are appropriate and that the consignment is eligible for certification and export, the *Official Veterinarian* should issue the *international veterinary certificate*.

b) Domestic transportation of commodities

The *Veterinary Authority* should collaborate with other relevant authorities and stakeholders to ensure that management of the consignment ~~pre-export~~ before and during transport to the point of exit is consistent with ~~agreed~~ established processes and standards.

The operator~~exporter~~ should ensure that the assembly, *loading* and crating of *animals* or other *commodities* is appropriate to maintain compliance with the *importing country* requirements~~preserving the status~~ and *animal welfare* of the consignment from the *place of shipment*, including adequate *disinfection* of and ~~disinsection~~ disinsection ~~elimination of arthropod *vectors*~~ from~~of~~ the ~~*vehicle*/*vessel*~~*means of transport* and *container*.

The *Veterinary Authority* in the *exporting country* may require health and welfare inspection of consignments of *animals* at the *point of exit*, which includes the possibility to deny permission to export if concerns are identified.

Article 5.4.4.

Specific recommendations depending on commodities

1. Animals

~~In the case of animals, the *Veterinary Authority* should ensure that *animal welfare* is maintained throughout the whole process of exportation, in accordance with Chapters 7.1., 7.2., 7.3. and 7.4. as relevant.~~

The operator~~exporter~~ should ensure that ~~*vehicles*/*vessels*~~*means of transport* used for transportation of *animals* throughout the ~~whole~~ export process ~~of exportation~~ undergo adequate *disinfection*, and that measures are implemented to prevent and control vermin such as rodents or arthropods. These measures should be applied before every *loading* of *animals*. ~~*Vehicles*/*vessels*~~*Means of transport* should contain only *animals* meeting the same sanitary requirements ~~of the same health status~~ except where effectively ~~adequately~~ separated to prevent disease transmission.

Containers should be either new or cleaned and disinfected before every *loading* of *animals*, in accordance with Chapter 4.14.~~, or be for single use~~

The *Veterinary Authority* should ensure that, before leaving the *exporting country*, consignments of *animals* ~~should be~~are subjected to a visual examination, at an appropriate place and time according to the procedures of the *exporting country* and the ~~agreed~~ *international veterinary certificate* ~~and the requirements of the *exporting country*~~. It should be ensured that, from the time of this visual examination ~~inspection~~ until the time of leaving the *exporting country*, the *animals* in the consignment are not in contact with other *animals* of a different health status.

The *Veterinary Authority* ~~in the *exporting country*~~ may require welfare inspection of consignments of *animals* at the *point of exit*. Such inspections should be supported by *veterinary legislation*, which should also ascribe authority to deny permission to export if *animal welfare* concerns are identified.

2. Germinal products

Consignments of *germinal products* should be packed, dispatched, and transported in a way that preserves the viability and integrity of the products.

Consignments of *hatching eggs* should be dispatched from parental *flocks* that meet the conditions of the ~~agreed~~ *international veterinary certificate*. *Containers* should be either new or cleaned and disinfected before every use, in accordance with Chapter 4.14.

Cryogenic tanks for semen, oocytes or~~,~~ embryos should be dispatched from *semen collection centres* or *collection centres* that meet the conditions of the ~~agreed~~ *international veterinary certificate*. They should be single-use cryogenic tanks or be cleaned and disinfected before use in accordance with Chapter 4.14. and use new liquid nitrogen.

Consignments of semen, oocytes or, embryos, should be identified in accordance with the relevant recommendations of Chapters 4.6. to 4.11.

The *Veterinary Authority* should ensure that, before leaving the *exporting country*, consignments of *germinal products* beare subjected to a visual examination and documentary check and cryogenic tanks for semen, oocytes or, embryos beare sealed and marked, according to the procedures of the *exporting country* and the agreed *international veterinary certificate* and the requirements of the *exporting country*.

3. Animal products

Containers used for transporting *animal products* should be suitable for the type of product, protect the *animal products* from damage or contamination, and fulfil the conditions of the procedures of the *exporting country* and the agreed *international veterinary certificate* and the requirements of the *exporting country*.

The *Veterinary Authority* should ensure that adequate measures are taken to clean and, where necessary after cleaning, to disinfect before use, *containers* and *means of transportation* in accordance with Chapter 4.14., particularly when conveying or transporting unpacked materials.

The *Veterinary Authority* should ensure that, before leaving the *exporting country*, consignments of *animal products* should beare subjected to a visual examination and documentary check, according to the procedures of the *exporting country* and the agreed *international veterinary certificate* and the requirements of the *exporting country*.

Article 5.4.5.

Emergency pPlanning for unexpected events

The *Veterinary Authority* should develop a plan to address the occurrence within the *exporting country* after the *commodities* have been exported, of a *listed disease* or a disease referred to in the *importing country* requirements, which may have impacted the status of the exported *commodities*. The *Veterinary Authority* should be guided by *importing country* requirements in implementing the plan.

The *Veterinary Authority* should ensure that the operatorexporter develops and documents a plan to address emergencies unexpected events which may impact the compliancestatus of the *commodities* with *importing country* requirements and *animal welfare* recommendations in Section 7. being exported, failure of transport arrangements, The plan should address concerns such as deviation from the *journey* plan, incidents compromising the characteristics of the *commodities*, failure to reach the *transit* or *importing country*, or rejection of the consignment by them *transit* or *importing country*. The emergency plan may be generic or specific to each consignment, and should focus on preserving the status of the consignment and *animal welfare* in accordance with Chapters 7.2., 7.3. and 7.4.

The emergency plan should identify responsibility for development and communication of alternative transport arrangements when necessary. The relevant *Competent Authority* in the *exporting*, *transit* and *importing countries* should be consulted as appropriate by the operator regarding revised transport arrangements to assess the implications for the compliancestatus of the *commodities* with *importing country* requirements and *animal welfare* recommendations. The *Veterinary Authority* in the *exporting country* should be consulted on alternative transport arrangements for consignments of *animals* to ensure that *animal welfare* is preserved.

The emergency plan should include procedures for managing exported consignments that fail to reach the designated *transit* or *importing countries* or are rejected by them.

Annex 20

CHAPTER 5.5.

MEASURES AND PROCEDURES APPLICABLE TO THE TRANSIT OF COMMODITIES

Article 5.5.1.

Purpose and scope

This chapter provides general principles for measures and procedures that are applicable to prevent the spread of pathogenic agents, without creating unjustified restrictions, when *commodities* destined for another country are either making a stopover in, or transported through a *transit country*, covering from the *point of entry* to the *point of exit.*

For the purposes of this chapter, *'*operator*'* means any natural or legal entity or person responsible for transit of *commodities* subject to the provisions of this chapter.

This chapter provides *transit countries* with recommendations on measures and procedures, and the roles and responsibilities of their *Veterinary Authority* and other relevant *Competent Authorities* and of operators ~~any natural or legal entity or person responsible for transit of *commodities* subject to the provisions of this chapter (hereafter 'operator')~~. An international movement of *commodities* may be considered a 'transit' if *commodities* are transported from an *exporting country* through a *transit country* to an *importing country*.The transit period should not exceed the time necessary for transport and logistics, and *commodities* and all relevant conditions as stated in the certificate issued by the *exporting country* should remain unchanged; otherwise the operation should be interpreted as an importation and exportation.

This chapter provides guidance to ensure the quality and implementation of official controls for transit.

Article 5.5.2.

General considerations

The *Veterinary Authority* or other relevant *Competent Authorities* of the *transit country* should ensure that *transit country* requirements and procedures, including a list of the *border inspection posts* designated for the transit of *commodities,* are made available to operators and to the *Veterinary Authority* of the *exporting country*.

A *transit country* may require adequate advance notice or approval regarding the date of entry into and exit from its territory of *commodities*, stating the type of *commodity*, species, quantity, *means of transport* and the *point of entry* or *border inspection post*, route, holding locations and *point of exit* to be used.

Operators should be aware of the *transit country* requirements and procedures before shipment, which may include announcing to the *Veterinary Authority* or other relevant *Competent Authorities* of the *transit country* the arrival of consignments at the *point of entry*. Operators should ensure that *commodities* are presented for official controls, including the original official certificates or documents, or digital equivalents, in accordance with *transit country* requirements, and that requirements and procedures defined by the *Competent Authorities* of the *transit country* are met.

Operators should ensure that the *commodities* are separated from any other *commodities* in the *transit country* not meeting the same sanitary requirements, that all relevant conditions as stated in the certification issued by the *exporting country* remain unchanged, and that the *Veterinary Authorities* of the *transit country* and the *importing country* are informed of any unforeseen unloading of *commodities* in the *transit country* ~~is informed to the *Veterinary Authorities* of the *transit country* and the *importing country*~~.
In the case of *animals*, operators should ensure that *animal welfare* is maintained throughout the transit process, in accordance with Section 7 as relevant.

Article 5.5.3.

General principles applicable to procedures for official controls for transit

The *Veterinary Authority* or other relevant *Competent Authorities* should implement official inspection, with appropriate frequency, based on risk ~~and with appropriate frequency~~ to ensure compliance with the *transit country* requirements. By way of derogation, the *Veterinary Authority* may exempt from inspection *safe commodities* or *commodities* posing a negligible risk and for which inspection is not considered necessary.

A *transit country* may not accept the transit of *commodities* not complying with its requirements.

The *Veterinary Authority* or other relevant *Competent Authorities* should ensure that conditions included in the *international veterinary certificate* at origin are maintained during official controls, stopover, storage and transport, that *biosecurity* is applied to prevent transmission of pathogenic agents throughout the transit process and that unnecessary delays are avoided. They should also ensure *animal welfare* is maintained during *transit* in accordance with Section 7. Original documentation intended for the *importing country* should remain with the consignment.

Article 5.5.4.

Planning for the unexpected events

The *Veterinary Authority* or other relevant *Competent Authorities* should ensure that the operator develops and documents a plan to address unexpected events which may compromise the compliance of the transited *commodities* with the requirements of the *transit country* or the *importing country*. The plan may be generic, or specific to each consignment, and should focus on preventing the introduction to the *transit* or the *importing country* of a *listed disease* or a disease referred to in the *transit* or the *importing country* requirements, and on ensuring *animal welfare* recommendations in Section 7. The plan should identify responsibilities and include procedures for commodities not complying with the *transit* or the *importing country* requirements.

Article 5.5.5.

General recommendations on measures to address identified informal or illegal movement of commodities at border inspection posts

To control the *risks* posed by informal or illegal cross-border movement at *border inspection posts*, the *Veterinary Authority* or other relevant *Competent Authorities* should coordinate and cooperate with the customs or relevant law enforcement authority as described in Article 5.6.8.

CHAPTER 5.6.

MEASURES AND PROCEDURES APPLICABLE ~~IN~~TO THE IMPORTATION OF COMMODITIES

Article 5.6.1.

Purpose and scope

This chapter provides general principles for measures and procedures that are applicable to ~~in~~ the importation of *commodities* to prevent the spread of pathogenic agents through *international trade* of *commodities*, without creating unjustified trade restrictions, covering from ~~the time of~~ arrival at the *point of entry* ~~border of~~in the *importing country* until clearance of *commodities*.

For the purposes of this chapter, 'operator' means any natural or legal entity or person responsible for transit of *commodities* subject to the provisions of this chapter.

This chapter provides *importing countries* with recommendations on measures and procedures, and the roles and responsibilities of their *Veterinary Authority* and other relevant *Competent Authorities*~~,~~ and of operators, ~~any natural or legal entity or person responsible for import of *commodities* subject to the provisions of this chapter business operators(hereafter 'operator'),~~ in addition to responsibilities that are described in Article 5.1.2. This chapter provides guidance to ensure the quality and implementation~~performance~~ of official controls for importation. This chapter not only covers legal importation, but also provides general recommendations for illegal or informal entry of commodities.

~~The *animal health status* of the *importing country* or *zone* is not affected by the presence of disease or infection in imported animals in a *quarantine centre* or at a *border inspection post*.~~

Article 5.6.2.

General considerations

The *Veterinary Authority* or other relevant *Competent Authorities* of the *importing country* should ensure that the *importing country* requirements, which may be included in ~~ing~~ *international veterinary certificates*, ~~and~~ as well as up-to-date information relevant to the import procedures, including a list of the *border inspection posts* designated for the import and transit of those *commodities*, are made available to operators and to the *exporting countries*.

The *Veterinary Authority* or other relevant *Competent Authorities* ~~of the *importing country*~~ should be responsible for the ~~performance~~ implementation of official controls in accordance with *veterinary legislation* to ensure that ~~imported~~ *commodities* can be safely imported. They should also ensure *animal welfare* is maintained in accordance with Section 7. ~~Its~~ The~~ir~~ legal mandate and responsibilities of the *Veterinary Authority* and other relevant *Competent Authorities*~~, as described in Articles 3.4.5. and 3.4.13.,~~ should include the ~~import~~ official controls ~~activities~~ at any step and the possibility to request from the operator~~importer~~ any necessary information. Where appropriate, the *Veterinary Authority* or other relevant *Competent Authorities* may delegate certain tasks ~~in accordance with point 2 of Article 3.4.5~~. Adequate human, technical, physical and financial resources should be available in the *importing country* for the *Veterinary Services* to effectively implement~~perform~~ official controls ~~inspection~~ in accordance with the quality principles ~~described~~ in ~~Article~~ Chapter 3.2.~~2~~.

An *importing country* may require adequate advance notice or approval regarding the date of entry of *commodities* into its territory ~~of *commodities*~~, stating the type of *commodity*, species, quantity, means of transport and the *border inspection post* to be used.

~~The *Veterinary Authority* or other *Competent Authorities* when relevant, should perform o~~Official inspections should be implemented, with appropriate frequency, ~~in accordance with Article 3.2.12. regularly,~~ based on ~~a~~ risk ~~basis and with appropriate frequency~~ to ensure compliance with the *importing country* requirements. By way of derogation, the *Veterinary Authority* or other relevant *Competent Authorities* may exempt from the inspection~~,~~ *safe commodities* or *commodities* posing a negligible risk and for which inspection is not considered necessary.

Biosecurity should be applied to prevent transmission of pathogenic agents from *commodities* throughout the import process.

An *importing country* may prohibit the ~~introduction~~ entry into its territory of a consignment of *commodities* not complying with the *importing country* requirements.

Operators~~Importers~~ should be aware of the *importing country* requirements and import procedure before the importation and inform~~announce~~, in advance, to the *Veterinary Authority* or other relevant *Competent Authorities* the arrival of consignments at the *border inspection post*, in accordance with *importing country* requirements. Operators~~Importers~~ should ensure that *commodities* are presented for official controls ~~inspection~~ at the *border inspection post*, together with the original ~~official~~ *international veterinary certificates* or documents, or digital equivalents, which are required to accompany the consignments.

In case of *animals*, operators~~importers~~ should ensure that *animal welfare* is maintained throughout the ~~whole~~ import process ~~of importation,~~ in accordance with ~~Chapters 7.1., 7.2., 7.3. and 7.4.~~Section 7 as relevant.

The *Veterinary Authority* ~~of the *importing country*~~ should carry out collaborative activities with other relevant *Competent Authorities*, customs, other authorities and operators, and with *Veterinary Authorities* in other countries, to control the risk posed by the illegal cross-border movement of *commodities*, i.e. international movement of *commodities* done in a way to expressly and intentionally avoid official controls.

Article 5.6.3.

General principles applicable to procedures for ~~import~~ official controls for importation

Veterinary Authority or other relevant *Competent Authorities* should ~~take~~ control ~~of~~ the imported *commodities* to ~~decide~~ determine whether ~~or not~~ the consignment complies with the *importing country* requirements.

~~Import~~ Official controls should be ~~performed~~ implemented at an appropriate place which might include a *border inspection post*, a point of entry, *quarantine centre*, the place of destination, or premises of the operator responsible for the consignment. The consignment should remain under the control of the *Veterinary Authority* or other relevant *Competent Authorities* until formal clearance.

In case of emergency, ships and aircraft~~s~~ may be granted access to a port or airport ~~which~~ that are not their intended destination. In those cases, they should be subjected to the animal health and *animal welfare* measures which the *Veterinary Authority* or other relevant *Competent Authorities* may consider necessary based on the potential risk.

1. Official inspection

   Where official inspections of *commodities* are ~~performed~~ implemented, they should always include a documentary check and, depending on the risk to human health, ~~and~~ animal health ~~and~~ or *animal welfare,* should also include identity checks and physical inspection~~checks~~*.* When the *Veterinary ~~Authority~~* ~~or other *Competent Authorities*~~*Services* need~~s~~ ~~to have~~ full access to the consignment for the purpose of identity checks or physical inspection, consignments should be partially or fully unloaded from the means of transport.

   a) Documentary check

      A documentary check should be implement~~performe~~d on all consignments presented for official controls ~~inspection~~ to ensure that they meet the *importing country* requirements.

      A ~~D~~ddocumentary check should include examination of the *international veterinary certificate*, and possibly of laboratory reports or other documents, including those of a commercial nature, which are required to accompany the consignment.

When implementing~~performing~~ a documentary check, the *Veterinary ~~Authority or other Competent Authorities~~Services* should inspect the required documents, in original or their digital equivalents as agreed between the *importing* and *exporting country*, to ensure that:

i) the *international veterinary certificate* has been issued by the *Official Veterinarian* of the *exporting country*; complies with relevant principles set out in Article 5.2.3. and corresponds as relevant to the model ~~established~~ established by the *importing country* or agreed between the *exporting* and ~~by~~ the *importing country* for that *commodity* and intended use~~, based on Chapters 5.10. to 5.13.~~; and

ii) the information contained in the checked documents complies with the *importing country* requirements.

b) Identity check

An i~~i~~dentity check should be implement~~perform~~ed upon arrival of the consignment at the point of inspection, as a visual inspection to verify that the content and the labelling of a consignment, including the identification of *commodities*, seals and means of transport, correspond to the information declared in the *international veterinary certificate* and accompanying documents.

The frequency of identity checks, the quantity of *commodities* to be inspected as well as the criteria for ~~sampling~~ selection for checking should be determined by the *Veterinary Authority* or other relevant *Competent Authorities* ~~of the *importing country*~~ based on *risk assessment*.

c) Physical inspection

To verify compliance with importing country requirements and physical integrity, ~~P~~physical inspection should include, as appropriate:

i) clinical examination of ~~an~~ *animals* for evidence of ~~transmissible~~ diseases and *animal welfare* issues

ii)~~ii) and~~ physical checks of *animal products* and *germinal products*,

iii)~~iii) and, as appropriate,~~ checks on packaging and labelling,

iv) checks on the means of transport~~, labelling~~ and temperature records,

v)~~v) the~~ sampling for analysis, testing or diagnosis, and

vi) any other checks required by the *Veterinary Authority* or other relevant *Competent Authorities* to verify compliance with the *importing country* requirements.

The frequency of physical inspection, the quantity of *commodities* to be inspected as well as the criteria for ~~sampling~~ selection for physical inspection should be determined by the *Veterinary Authority* or other relevant *Competent Authorities* ~~of the *importing country*~~ based on *risk assessment*, and considering the following:~~.~~

i) For a~~A~~nimals

The ~~*Veterinary Authority* or other *Competent Authorities* of the *importing country* should determine the~~ number of *animals* to be clinically examined should be determined in accordance with the overall number of *animals* in the consignment and the declared purpose of the *animals*;~~, which~~ it may be increased if the physical checks carried out have not been satisfactory.

In some cases, such as ~~F~~for *animals* ~~that are not required to be identified individually and animals~~ considered to be dangerous, clinical examination ~~should~~ could consist of observation of the state of health and behaviour of the entire group or of a representative number of *animals*.

If the clinical examination reveals an anomaly, a more thorough clinical examination may be carried out, including sampling and testing, where appropriate.

ii) ~~Germinal~~ For germinal products

~~The *Veterinary Authority* or other *Competent Authorities* should carry out~~ Physical checks of the consignment should be carried out to verify the compliance of labelling and the transport conditions with *importing country* requirements~~,~~ including, when relevant, temperature records ~~when relevant~~ and the integrity of the seals, packaging material and cryogenic tanks.

~~The *Veterinary Authority* or other *Competent Authorities* of the *importing country* should determine the number of items to be checked, which may be increased if the checks carried out have not been satisfactory.~~

~~The *Veterinary Authority* or other *Competent Authorities* may carry out physical checks to verify that the labelling complies with *importing country* requirements.~~

Physical inspection may include laboratory testing of the *germinal products*.

If the physical checks reveal an anomaly, a more thorough inspection may be carried out.

iii) For ~~A~~animal products

~~The *Veterinary Authority* or other *Competent Authorities* should carry out~~ pPhysical checks of the consignment should be carried out to verify the compliance of labelling and the transport conditions with *importing country* requirements, including temperature records when relevant and the integrity of the packaging material and seals.

~~The *Veterinary Authority* or other *Competent Authorities* may carry out physical checks to verify that the labelling complies with *importing country* requirements.~~

Physical inspection may include sensory examination and laboratory testing of the *animal products*.

If the physical checks reveal an anomaly, a more thorough inspection may be carried out.

2. Sampling and testing

Sampling and testing of imported *commodities* ~~with a view~~ to check~~ing~~ compliance with the ~~health~~ *importing country* requirements ~~laid down in the *international veterinary certificate*~~, may be implement~~perform~~ed following a risk-based sampling plan or upon suspicion of non-compliance resulting from the documentary, identity or physical checks of *commodities*, without creating unjustified barriers to trade. Testing should be implement~~perform~~ed in a~~n *approved* laboratory~~.

The *Veterinary Authority* or other relevant *Competent Authorities* may develop a risk-based sampling plan for imported consignments, that should specify the percentage of consignments to be sampled, taking into account the *animal health status* of the *importing* and *exporting country*, the species concerned, the nature and declared purpose of the *commodities*, the number of incoming consignments and the results of previous sampling.

Where no immediate danger to animal health or public health is suspected from *commodities* sampled in accordance with a sampling plan, a consignment may be released before the results of laboratory tests are available. A traceability system should be in place to recall commodities if needed.

3. Sanitary measures at import

To meet the *importing country* requirements, in addition to the *sanitary measures* implemented in the *exporting countries*, the *Veterinary Authority* or other relevant *Competent Authorities* ~~of *importing country*~~ may require *sanitary measures* to be implemented at importation before release of the *commodities* from official controls. Measures may include *disinfection* of and ~~disinsection~~ elimination of arthropod *vectors* from~~of~~ ~~*vehicles/vessels*~~*means of tranport* and *containers* used in the transportation and *unloading* of *commodities*, in accordance with Chapter 4.14.

In the case of *animals*, measures may include *vaccination*, treatment or isolation. In the case of other *commodities*, measures may include a holding period or the application of physical or chemical treatment.

4. Release of consignments

Based on the implement~~performed~~ ~~import~~ official controls, the *Veterinary Authority* or other relevant *Competent Authorities* ~~of *importing countries*~~ should decide whether the consignment complies with the *importing country* requirements.

When the decision is made that the consignment complies with the *importing country* requirements and has been cleared for release, the *Veterinary Authority* or other relevant *Competent Authorities* should notify the operator~~importer~~ and the information should be made available to the customs authorities.

Article 5.6.4.

Further action for non-compliant commodities

Commodities identified as non-compliant based on the implement~~performed~~ ~~import~~ official controls should not be released by the *Veterinary Authority* or other relevant *Competent Authorities* and should be ~~isolated~~ detained under appropriate conditions including isolation for *animals*, pending further decision ~~by the *Competent Authority*~~.

Depending on the type of *commodity* and the *risk* the *commodity* represents to human health and animal health, and the environment, or for~~due to~~ *animal welfare* reasons, the *Veterinary Authority* or other relevant *Competent Authorities*~~,~~ should identify the options for the disposition of the *commodities* and notify the operator~~importer~~. Disposition of *commodities* may include:

a) ~~re-dispatching~~ re-shipping the *commodity* back to the *exporting country* or another country, with the agreement, where appropriate, of the receiving *Competent Authority*;

b) subjecting the *commodity* to treatment or to other risk mitigation measures necessary to allow importation;

c) *killing* and disposal of *animals*, or destruction of other *commodities*.

Any action applied to consignments of *animals* should comply with ~~Chapters 7.1. and 7.6.~~the relevant provisions of Section 7.

The *Veterinary Authority* or other relevant *Competent Authorities* of the *importing country* should notify any decision and reasons to refuse entry of a *commodity* to the customs authorities and are encouraged to communicate it to the *Veterinary Authority* of the *exporting country*. Where appropriate, the *Veterinary Authority* of the *exporting country* should be given the opportunity to explain the situation in an attempt to have the consignment released.

Following decisions taken in relation to non-compliant *commodities*, the *Veterinary Authority* or other relevant *Competent Authorities* should supervise the effective disposition of the *commodities* and apply measures to prevent the introduction into the country of *commodities* which have been refused import, and the reuse of the *international veterinary certificate* that accompanied the consignment.

The *Veterinary Authority* or other relevant *Competent Authority* of the *importing country* should inform the *exporting country* of any case of a *listed disease* or disease referred to in the *importing country requirements* in a consignment of *animals*.

Article 5.6.5.

~~Emergencyp~~Planning for unexpected events

~~The *Veterinary Authority* or other *Competent Authorities* of the *importing country* should develop a plan to address the occurrence, within the *exporting country* after the *commodities* have been exported or within the *transit country* after the *commodities* have transited, of a *listed disease* or a disease referred to in the *importing country* requirements which may have impacted the status of the exported *commodities*.~~

~~The *Veterinary Authority* or other *Competent Authorities* may also develop a plan to address the occurrence of a *listed disease*, or a disease referred to in the *importing country* requirements, within the *importing country* before the animals have been released.~~

The *Veterinary Authority* or other relevant *Competent Authorities* should ensure that the operator~~importer~~ develops a plan to address unexpected events ~~emergencies~~ which may impact the compliance~~status of the *commodities*~~ with *importing country* requirements~~being imported, and non-compliant *commodities* described in Article 5.6.4~~. The ~~emergency~~ plan may be generic, or specific to each consignment, and should focus on preventing the introduction to the *importing country* of a *listed disease* or a disease referred to in the *importing country* requirements, and on *animal welfare* recommendations in ~~accordance with~~ Section 7~~Chapters 7.2., 7.3. and 7.4~~. The ~~emergency~~ plan should identify responsibility and include procedures for actions taken for non-compliant *commodities* described in Article 5.6.4.

Article 5.6.6.

General recommendations applicable to ~~vehicles/vessels~~means of transport and containers that transported infected animals

~~*Vehicles/vessels*~~*Means of transport* and *containers* that transported *animals* found to be infected with a pathogenic agent of a *listed disease* or a disease referred to in the *importing country* requirements should be considered ~~as~~ contaminated, and the *Veterinary Authority* or other relevant *Competent Authorities* should apply the following measures as appropriate to the risk:

a) treatment or safe disposal of the litter, forage and any other potentially contaminated material, by its removal from the ~~*vehicles/vessels*~~*means of transport* and *containers* for immediate transportation to an establishment assigned in advance, where the animal health measures required by the *importing country* should be strictly applied;

b) *disinfection* of all parts of the ~~*vehicles/vessels*~~*means of transport* and *containers* which were used in the transport, feeding, watering, moving and *unloading* of the *animals,* as well as all baggage of travelling attendants, in accordance with Chapter 4.14.;

c) ~~disinsection~~ elimination of arthropod *vectors* from ~~*of vehicles/vessels*~~*means of transport* and *containers* in case of *vector* disease.

Article 5.6.7.

General principles applicable to disposal of international catering waste

International catering waste that may contain or may have been in contact with animal products is considered a high-risk ~~category of~~ product and should therefore be subject to strict controls to minimise the risk of introduction of pathogenic agents.

The *Veterinary Authority* or other relevant *Competent Authorities* should ensure that ~~all~~ high risk international catering waste entering the country from the international means of transport is handled, collected and disposed of in a way to minimise the risk of introduction of pathogenic agents.

Article 5.6.8.

General recommendations on measures to address identified illegal movement of commodities at border inspection posts

To control the *risks* posed by illegal cross-border movement at *border inspection posts*, the *Veterinary Authority* or other relevant law enforcement *Competent Authorities* should coordinate and cooperate closely with the customs authority to ensure that the official controls ~~inspection of~~ for *commodities* entering the country are~~is~~ implement~~performe~~d in accordance with the rules of this chapter and national legislation, including when fraud is suspected.

For that purpose, the *Veterinary Authority* or other relevant *Competent Authorities* should ensure the timely exchange with the customs and other relevant law enforcement authority, including via electronic means, of information and decisions made relevant to the organisation and conduct of their respective activities for *commodities* entering the country. The *Veterinary Authority* or other relevant *Competent Authorities* should

collaborate with the customs and other relevant law enforcement authority to ensure immediate notification to the *Veterinary Authority* or other relevant *Competent Authorities* if ~~of circumstances where a declaration is submitted to the customs authority for~~ a consignment of those categories of *commodities* that should be subject to official ~~inspection~~ control but with no evidence of an official ~~inspection~~ control having been conducted.

The *Veterinary Authority* or other relevant *Competent Authorities*, in collaboration with the customs and other relevant law enforcement authorities, should have practical arrangements in place to ensure ~~the~~ implementation of the measures described in Article 5.6.4. in case of detection of illegal cross-border movement of *commodities* at a *border inspection post*.

Article 5.6.9.

General recommendations on measures to address identified informal or illegal movement of commodities outside border inspection posts

To control the *risks* posed by the illegal cross-border movement of *commodities* outside of *border inspection posts*, the *Veterinary Authority* or other relevant *Competent Authorities* should:

1) coordinate with border authorities (police, customs, transport, immigration) to provide technical support for identification of illegal cross border movement of *commodities*;

2) develop and implement practical mechanisms to address informal or illegal cross border movement of *commodities* ~~and implementation thereof~~ in close collaboration with border authorities.

CHAPTER 5.7.

BORDER INSPECTION POSTS AND QUARANTINE CENTRES

Article 5.7.1.

Purpose and scope

This chapter provides recommendations on *border inspection posts* and *quarantine centres* to support effective implementation of measures and procedures applicable to the exportation, transit and importation of *commodities,* in order to prevent the spread of pathogenic agents without creating unjustified trade restrictions.

Quarantine centres may be used for isolation of *animals* either pre-exportation in accordance with disease-specific chapters in the *Terrestrial Code* or post-arrival. The *Veterinary Authority* or other relevant *Competent Authorities* should ensure that the application of *biosecurity* at *quarantine centres* is appropriate to the type of isolation being undertaken, and effectively mitigates risks in accordance with disease-specific chapters of the *Terrestrial Code* (pre-export isolation) or via *risk analysis* (post-arrival quarantine).

Article 5.7.2.

General considerations

Appropriate legislation should be in place, in accordance with Chapter 3.4., to define the facilities, the resourcing and operation of *border inspection posts* and *quarantine centres,* and for their approval.

Material and financial resources should be available at *border inspection posts* and *quarantine centres* as necessary to undertake the relevant functions of the facility while managing official controls, *biosecurity*, health and safety risks and *animal welfare* associated with the type and volume of *commodities* presented for inspection.

Appropriate administration systems should be available to personnel at *border inspection posts* and *quarantine centres* as necessary for the functions of the facility, including record keeping and information and communication technology, to support decision-making and communication.

Biosecurity consistent with Chapter 4.X. is critical to fulfil the functions of *border inspection posts* and *quarantine centres.*

The *Veterinary Authority* or other relevant *Competent Authorities* should ensure that:

– Operations at *border inspection posts* and *quarantine centres* are supported by sufficient authorised personnel who are operating under the principles of Chapter 3.2., appropriately qualified with access to regular training, consistent with the intended use and the type and quantity of *commodities* presented.

– Operational details for *border inspection posts* and *quarantine centres* are made available to operators described in Chapters 5.4., 5.5. or 5.6., including the intended use and the categories of *commodities* for which they are designated, exact locations, contact details, hours of operation, booking requirements and costs.

– Standard Operating Procedures (SOP) are available to personnel at *border inspection posts* and *quarantine centres* describing the procedures undertaken there. Auditable records documenting the performance of these procedures should be kept, including the maintenance of *biosecurity*. Records should include the results of official controls, regular *surveillance* and *monitoring* in the facilities and the surrounding areas.

– *Border inspection posts* and *quarantine centres* have access to *laboratories* and other *approved* service providers with SOPs as necessary to support the implementation of official controls and the measures described in Chapters 5.4., 5.5. and 5.6. consistent with Article 3.2.6.

Article 5.7.3.

Cooperation with other agencies

The *Veterinary Authority* or other relevant *Competent Authorities* should engage with other governmental authorities with responsibilities at international borders in the design and operation of *border inspection posts*, to ensure that official inspection and clearance of transit or import consignments is streamlined where possible. Co-use of facilities and equipment at international borders with other authorities could be considered as long as it does not hinder normal operations described in this chapter. Key principles of the World Trade Organization (WTO) Trade Facilitation Agreement should be considered to facilitate importation and transit of *commodities*.

Article 5.7.4.

Requirements for a border inspection post

Design and operation of a *border inspection post* should be based on *risk analysis* and *biosecurity* including the following:

1) Separation between public areas and restricted areas for inspection of consignments.

2) Perimeter security of restricted areas to prevent entry of unauthorised people and *means of transport*, and unwanted animals, with access control for entry and exit of authorised personnel and *means of transport*.

3) Facilities and equipment suitable for the type and volume of *commodities* presented, necessary for implementation of the official control procedures described in Article 5.6.3, including secure unloading and loading, inspection, sampling and storage or detention of *commodities*, including adequate lighting and temperature control with surfaces appropriate for cleaning and *disinfection*.

4) Facilities and equipment for cleaning and *disinfection* and elimination of arthropod *vectors* of *means of transport* and *containers* that have been used in transportation of *commodities,* consistent with Article 5.6.6.

5) Waste management for restricted areas with storage facilities as necessary, for solid and liquid waste and~~, including discarded *feed,*~~ rejected consignments, ~~dead *animals* and used bedding,~~ with access and secure transportation to facilities for treatment of waste.

6) Operational procedures for cleaning and disinfection, waste management, and control of rodents and potential vectors.

Article 5.7.5.

Additional requirements for a border inspection post for animals

In addition to the principles described in Article 5.7.4., a *border inspection post* for consignments of *animals* should be designed and operate in accordance with *animal welfare* principles in Section 7 and should specifically include the following:

1) Separate access to restricted animal inspection areas via road infrastructure, to minimise delays.

2) Facilities necessary for the management of consignments of *animals* according to Article 5.6.3, including containment, feeding, watering, restraint and inspection, consistent with the type and number of *animals* presented.

3) Facilities for temporarily holding *animals*, with adequate space, light, ventilation and separation as appropriate between consignments and species.

4) Separate facilities to isolate sick animals.

5) Animal waste management for dead animals, discarded feed, solid and liquid waste and used bedding.

Article 5.7.6.

Facilities involved in official inspection other than border inspection post

When the *Veterinary Authority* or other relevant *Competent Authority* defines that official inspection could be implemented at an appropriate place other than a *border inspection post*, the facilities involved should be *approved* following the principles outlined in Articles 5.7.4. and 5.7.5., and the consignment should remain under the control of the *Veterinary Authority* or other relevant *Competent Authorities* until formal clearance.

Article 5.7.7.

Requirements for a quarantine centre

Design and operation of a *quarantine centre* should be based on consideration of the following:

1) The disease situation of the country, *zone* or area surrounding the *quarantine centr*e.

2) Location of facilities at a distance from other *establishments*, sufficient to avoid transmission of diseases of concern.

3) Site topography, to minimise disease risks associated with the flow of contaminated water.

4) Perimeter security to prevent entry of unauthorised people and *means of transport,* and unwanted animals.

5) Controls, including sanitary requirements, for entry and exit of authorised personnel, and the facilities necessary to apply these controls including changing rooms and showers. Controls for exit of authorised personnel may not be necessary for the isolation of *animals* before exportation or clearance.

6) Controls, including sanitary requirements, for entry and exit of *means of transport* and equipment, including veterinary instruments and supplies, and the facilities necessary to apply these controls. Controls for exit of *means of transport* and equipment may not be necessary for the isolation of *animals* before exportation or clearance.

7) Controls for entry of supplies, including the sources, sanitary status and entry process for *feed* and bedding, and facilities necessary to handle and store these supplies.

8) Facilities and equipment for cleaning and *disinfection*, and removal of arthropod *vectors* including control of waste and effluent, for *means of transport* and *containers* that have been used in transportation of import consignments of *animals*.

9) ~~Waste management.~~ In the case of isolation of *animals* after arrival, waste management should be in accordance with a *biosecurity plan* including storage facilities as necessary, for solid and liquid waste, including discarded *feed*, rejected consignments, dead *animals* and used bedding, with access and secure transportation to facilities for treatment of waste.

10) Facilities for containment and management of consignments of *animals*, including as appropriate to the animal species separation between consignments, *unloading/loading*, housing, yards, restraint, isolation, *vector* control, and for undertaking interventions required by *risk analysis* and/or relevant disease-specific chapters of the *Terrestrial Code*, including sample collection, testing, *vaccination*, treatment and veterinary inspection.

11) Equipment for cleaning and *disinfection* and removal of arthropod *vectors* in the facility between consignments of *animals*.

12) Operational procedures for cleaning and disinfection, waste management, and control of rodents and potential vectors.

13) Separate facilities to isolate sick animals.

A *quarantine centre* for isolation of *animals* before exportation should be used to address the specific requirements in disease-specific chapters of the *Terrestrial Code*. Unless specified in those chapters or *importing country* requirements, isolation of *animals* before exportation may be performed in other *approved* facilities.

Article 5.7.8.

Planning for unexpected events

The management of consignments at *border inspection posts* and *quarantine centres* that have failed clearance and have thus been refused transit or import is covered in Chapters 5.4. to 5.6.

The *Veterinary Authority* or other relevant *Competent Authorities* should ensure that plans are available to personnel at *border inspection posts* and *quarantine centres* that support responses to foreseeable but uncommon events. The plans should address communication, *biosecurity*, health and safety, and *animal welfare* in each instance, and may cover:

– Unexpected arrival of *commodities*.

– Evidence of a *listed disease* or a disease included in the *transit* or *importing country* requirements in a consignment of imported or transiting *animals* at a *border inspection post* or *quarantine centre*.

– Veterinary emergency in *animals* at a *border inspection post* or undergoing post-arrival isolation in a *quarantine centre*.

– Escape of *animals* or unwanted entry of *animals*.

– Evidence of *animal products* presenting a risk to animal or public health.

– Natural disasters and interruption of critical services threatening the operation of the *border inspection post* or *quarantine centre*.

CHAPTER 7.5.

ANIMAL WELFARE DURING SLAUGHTER

[…]

Article 7.5.30.

Electrical water-bath stunning for poultry

1. Animal welfare concerns

In electrical water-bath *stunning* poultry are inverted and shackled 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, improper system grounding, pre-stun shocks due to wings contacting water before the head, and the use of inappropriate electrical parameters (low voltage/current or high frequency).

Hazards that increase the likelihood of animals experiencing pre-stun shocks are: poor handling at shackling, inappropriate line speed, physical contact between birds, incorrect angle of entry ramp, entry ramp wetted by charged water, 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 ~~insufficient~~ inappropriate electrical *stunning* parameters are used, conscious animals are at risk of being electro-immobilised or paralysed causing *pain* and suffering.

2. Animal-based and other measures

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: tonic-clonic seizures; apnoea; and absence of corneal or palpebral reflex.

Animal-based measures of ineffective stun or recovery of consciousness are: vocalisation; spontaneous blinking; righting reflex; presence of corneal or palpebral reflex; rhythmic breathing; spontaneous swallowing; and head shaking.

3. Recommendations

The height of the water-bath stunner should be adjusted so that the birds' heads are completely immersed in the water. Avoid distractions such as people walking under the birds because this can cause birds to pull up.

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

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

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

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

In the case of ineffective *stunning* or recovery, animals should be re-stunned using a backup system or 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 be preferred to constant voltage stunners because the former ensure that the minimum current is provided to the animals independently from their impedance.

Regular calibration of the equipment according to the manufacturer's procedure 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 intensity, voltage and frequency (for DC) during electrical water-bath ***stunning*** practices, to maximise the effectiveness of ***stunning***. Lower frequencies ensure an effective stunning. Higher frequencies provide the lowest probability of a successful stun even at the highest intensity.

Hazards to *animal welfare* such as inversion of conscious birds, pre-stun shocks, and variability in electrical current delivered to each bird are inherent risks of electrical water-bath *stunning*. Thus, alternative *stunning* systems which avoid these associated *hazards* should be preferred.

4. Species-specific recommendations

Effective electrical parameters should be based on scientific evidence for different species of birds.

Effective electrical parameters should be based on scientific data with field evidence on the welfare outcomes for different types and conditions of animals in accordance with point 5 of Article 7.1.4.

For water-bath ***stunning*** depending on the frequency, ~~minimum~~ recommended ~~parameters~~ intensities ~~are recommended~~ for the following species are:

- For 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.

Birds should receive the current for at least 4 seconds.

For d~~D~~ucks, geese and quails ~~should not be stunned at~~ frequencies higher than 200 Hz will not achieve effective stunning and therefore are not recommended. ~~[under study].~~

For c~~C~~hicken and turkeys ~~should not be stunned at~~ frequencies higher than 600 Hz will not achieve effective stunning and therefore are not recommended. ~~[under study].~~

[…]

Annex 24

CHAPTER 7.6.

ANIMAL WELFARE AT THE TIME OF KILLING FOR PURPOSES OTHER THAN SLAUGHTER

Article 7.6.1.

Introduction

Animals are killed for a variety of reasons, including those that may not make the transport for *slaughter* or the safe use of their products possible. Such reasons may include for contagious disease control, in cases where their welfare may be compromised due to ~~of~~ natural or ~~man-made~~ human-made disasters, when they are otherwise suffering from disease or injuries or for economic reasons. It is important to ~~consider~~ optimise their welfare during such killing for purposes other than slaughter ~~this process~~.

Article 7.6.2.

Scope

This chapter identifies hazards to animal welfare during *killing* for purposes other than *slaughter* and provides recommendations for the appropriate procedures for such *killing*. It provides animal-based and other measures to assess the level of welfare during the process and recommends appropriate remedial actions to be applied.

This chapter applies to the killing of domestic and *captive wild* ~~ruminants, equids, birds, pigs, rabbits, camelids and mustelids for all purposes, except for slaughter which is covered by Chapter 7.5. Animal welfare during slaughter~~ mammals and birds (hereafter animals). Killing of reptiles is covered by Chapter 7.14.Killing of reptiles for their skin, meat and other products and killing of dogs for population management is covered by Chapter 7.7. The numbers of animals killed is situation dependent and could range from an individual to a large scale population.

This chapter should be read in conjunction with the guiding principles for *animal welfare* provided in Chapter 7.1.

Article 7.6.3.

General principles ~~for the operations regarding the *killing* of animals~~

The decision as to whether to kill animals should not be delayed if there is any risk to the welfare of those animals. The recommendations in this Chapter are based on the premise that a decision to kill the animals has been made and they address the need to ensure the welfare of the animals until they are dead.

During decision making and prior to *killing* the animals, appropriate husbandry, especially supply of feed and water and thermal comfort, should be maintained until the animals are killed. Medical care should be provided if needed.

Advanced planning for various scenarios, including adverse events, should clearly identify operational procedures and responsibilities.

For large scale killing, specific plans should be in place.

The decision maker should be clearly identified to ensure decision making is not delayed.

All personnel involved in the killing of animals should have the relevant skills and competencies, acquired through training or experience.

As necessary, operational procedures should be evidence-based adapted to the specific circumstances in the affected locations or on the premises and should address, apart from animal welfare, the cost, effectiveness, and the speed of implementation of the method, operators' safety and mental health, biosecurity and environmental aspects relevant to the species.

~~During decision-making and prior to killing the animals, normal husbandry, especially supply of feed and water, should be maintained until the animals are killed.~~

Animals might be killed on site or moved to a dedicated place for killing. The handling and movement of animals should be minimised and carried out in accordance with the recommendations described below.

When restraint is required ~~Animal restraint~~ it should be sufficient to facilitate effective killing, and in accordance with animal welfare and operator safety requirements~~. When restraint is required~~, and killing should follow without ~~minimal~~ delay. The type and size of restraint deployed should be appropriate for the age, size and species of animal to be killed. When herding or corralling is applied, a low-stress method using appropriate apparatus to facilitate the safe and effective killing of animals should be used.

Killing methods used should result in immediate death or loss of consciousness lasting until death. When loss of consciousness is not immediate, induction of unconsciousness ~~should involve as little aversion as possible and~~ should not cause avoidable distress, fear and pain. A backup procedure should be available and used to kill the animal if the first method does not result in death or unconsciousness.

~~Young animals should be killed before older animals on which they are dependent to reduce potential distress.~~

Planning should take into account the order in which animals are killed. Where possible vulnerable animals should be killed as a matter of priority, which may include:

- groups with symptomatic animals,
- animals that are unable to obtain feed or water,
- animals that have compromised housing or are without shelter,
- young [REF] or unweaned animals should be killed before older animals on which they are dependent,
- potentially dangerous or aggressive animals, such as bulls, sows with litters, or boars,
- animals in late stage of pregnancy or in parturition, and
- animals in-utero may need to be ~~humanely~~killed following the killing of the dam if the amniotic sac is ruptured.

~~For disease control purposes and for biosecurity considerations, infected animals should be killed first, followed by in-contact animals, and then remaining animals.~~

There should be continuous monitoring of the operational procedures to ensure they are consistently effective regarding animal welfare, operator safety and mental health ~~and~~, *biosecurity* and environmental aspects.

When large scale or disease control ~~the~~ operational procedures are concluded, there should be a debriefing session or written report describing the practices adopted and their effect on animal welfare, operator safety, *biosecurity and responsible personnel*.

Article 7.6.4.

Organisational structure for the operations ~~regarding the~~ of large scale killing or killing for disease control of animals

Plans for large scale killing or killing for disease control should contain details of responsibilities, management structure, contact details, disease control strategies, operational procedures and necessary equipment and resources. *Animal welfare* considerations should always be addressed as a priority in these plans. The plans should include a strategy to ensure that an adequate number of personnel competent in the *killing* of animals is available.

The personnel responsible for the handling, moving, restraining and killing the animals should follow the recommendations of this chapter.

In case of disease control, o~~O~~perational activities should be led by the *Competent authority* who has the authority to ensure the required *animal welfare* and *biosecurity* standards.

The Competent authority should nominate a responsible agent for all activities across one or more affected locations or premises who should be supported by coordinators for planning operations and logistics to facilitate efficient operations.

The nominated responsible agent ~~of the *Competent authority*~~ should provide overall guidance to personnel and logistic support for operations at all affected locations or premises to ensure consistency in adherence to the *Terrestrial Code's animal welfare* and animal health recommendations.

A specialist team, led by a team leader answerable to the nominated responsible agent ~~nominated by the *Competent Authority*~~, should be deployed to work on each affected location or premises. ~~In some situations,~~ When needed personnel may be required to fulfil more than one function. Each team should contain a competent *veterinarian* or have access to veterinary advice at all times.

~~Emergency plans should be in place and contain details of responsibilities, management structure, disease control strategies, operational procedures and necessary equipment and resources. *Animal welfare* considerations should always be addressed in these emergency plans. The plans should include a strategy to ensure that an adequate number of personnel competent in the *killing* of animals is available.~~

~~Depopulation under disease control emergency plans should be performed under the supervision of *Competent Authority* and address any *animal welfare* issues that may result from standstill or any other animal movement restriction~~.

In considering the *animal welfare* issues associated with *killing* animals, the key personnel, their responsibilities, and competencies required are described in Article 7.6.5.

In ~~other~~ situations that do not necessarily involve the *Competent Authority*, the personnel responsible should follow the recommendations of this chapter.

Article 7.6.5.

Responsibilities, training and competencies of the specialist team for the operations regarding the ~~mass~~ killing of animals

All personnel have a crucial role to play in ensuring good animal welfare conditions through to the killing. Training for all personnel should emphasise the importance of animal welfare and their responsibility in contributing to the welfare of the animals.

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*

1. Team leader

    a) Responsibilities

        (i) plan overall operations on affected location or premises;

        (ii) determine and address requirements for *animal welfare*, operator safety and *biosecurity*;

        (iii) organise and manage team of people to facilitate *killing* of the relevant animals on the location or premises in accordance with national regulations and these recommendations;

        (iv) determine logistics required;

        (v) monitor operations to ensure *animal welfare*, operator safety and *biosecurity* requirements are met;

        (vi) seek and use veterinary advice;

        (vii) report upwards on progress and problems;

        (viii) provide a written report at the conclusion of the *killing* operation, describing the practices adopted and their effect on *animal welfare*, operator safety, efficacy of *biosecurity* and environmental impact.

b) Training and c~~C~~ompetencies

i) ~~knowledge~~ understanding of and experience with relevant animal husbandry practices;

ii) ~~knowledge~~ understanding of *animal welfare*, impact of ~~,~~ different killing methods, and the details, planning and implementation of the *killing* operation~~,~~ ~~;~~ ~~and the underpinning behavioural, anatomical and physiological processes involved in the *killing* operation;~~

iii) leadership and ability to ~~skills to~~ manage all activities on the location or premises ~~and deliver outcomes on time~~;

iv) awareness of psychological effects on farmer, team members or person(s) in charge of animals [AVMA, 2019], and general public;

~~iv)~~ v) awareness of fatigue effects on those carrying out repeated killing of large numbers of animals and on the effectiveness of the procedure [AVMA, 2019].

~~v)~~ vi) ability to communicate effectively with different audiences ~~communication skills~~;

~~vi)~~ vii) capacity to evaluate the environmental impacts caused by their operation.

2. Veterinarian

a) Responsibilities

i) advise on ~~determine~~ and supervise the implementation of the most appropriate *killing* method to ensure that animals are killed ~~without avoidable pain and distress~~ minimising pain, fear and suffering;

ii) determine and implement any necessary ~~the~~ additional requirements for *animal welfare*, including the order of *killing*;

iii) ensure that confirmation of the *death* of the animals is carried out by competent persons as soon as possible ~~at appropriate times~~ after the *killing* procedure;

iv) minimise the risk of disease spread within and from the location or premises through the supervision of *biosecurity*;

v) ~~continuously monitor~~ ensuring *animal welfare* and *biosecurity* during killing process;

vi) collaborate with the team leader on the written report at the conclusion of the *killing*.

b) Training and c~~C~~ompetencies

i) understanding of ~~ability to assess~~ *animal welfare* and ability to assess it;

ii) ~~Understanding~~ knowledge of ~~especially~~ the effectiveness of the *killing* process and ~~the~~ ability to correct any deficiencies;

iii) knowledge of the different killing methods and their impacts on animal welfare, and the underlying anatomy, physiological and behavioural processes involved in the killing operation.

iv) ability to assess *biosecurity* risks.

3. Animal handlers

a) Responsibilities

i) review on-site facilities in terms of their appropriateness;

ii) design temporary animal handling facilities, when required;

iii) move and restrain animals;

iv) report *animal welfare* and *biosecurity* issues to the *veterinarian*.

b) Training and c~~C~~ompetencies

i) understand the species-specific behavioural patterns of the animals they are working with and the underlying principles for carrying out the required tasks;

ii) ~~animal handling in emergency situations and in close confinement is required;~~ capable to identify signs of distress, fear, and pain and to take preventive and corrective actions;

iii) understanding of *biosecurity*.

4. Personnel in charge of killing animals

a) Responsibilities

i) k*illing* of the animals using an appropriate method;

ii) when applicable confirm the unconsciousness of the animals;

iii) confirm the death of the animals.

b) Training and c~~C~~ompetencies

i) Safely and correctly use and maint~~e~~ain~~ance of relevant~~ equipment;

ii) Operate ~~familiarity with the techniques of~~ restraining and killing equipment for the species involved;

iii) ~~knowledge~~ ability to assess effective killing, to recognize signs of recovery of consciousness, and the skill to take immediate corrective action;.

~~5. Personnel in charge of disposal of dead animals~~

~~a) Responsibilities~~

~~i) An ensuring efficient dead animal disposal so that (to ensure *killing* operations are not hindered) should be ensured~~

~~ii) understanding of biosecurity and ensuring compliance with Chapter 4.13~~

~~b) Training and Competencies~~

~~i) The personnel should be competent to safely use and maintain available equipment and apply techniques for the species involved.;~~

~~ii) Recognise signs of life.~~

5. Breeder, owner, farmer or keeper ~~or manager~~

a) Responsibilities

i) assist when requested.

b) Training and c~~C~~ompetencies

i) specific knowledge of ~~his/her~~ the animals that ~~are~~ they are responsible for and their ~~environment~~ premises.

Article 7.6.6.

Considerations in the planning of the operations regarding the ~~mass~~ large scale killing of animals

Many activities will need to be conducted on affected locations or premises, including the *killing* of animals. The team leader should develop a plan and prepare for large scale *killing* of animals on the location or premises which should include consideration of:

a) minimising handling, restraint and movement of animals;

b) *killing* the animals on the affected locations or premises; however, there may be circumstances where the animals may need to be moved to another location for *killing*; when the *killing* is conducted at a *slaughterhouse/abattoir*, the recommendations in Chapter 7.5. should be followed;

c) the species, number, age and size of animals to be killed, and the order of *killing* them;

d) methods of *killing* the animals~~, and their cost~~;

e) available resources, including cost, staff numbers, and any other practical elements

f) description of the assessment of state of consciousness and signs of life;

g) housing, husbandry, location of the animals as well as accessibility of ~~the farm or~~ the place they are situated;

h) the availability and effectiveness of equipment needed for *killing* of the animals, as well as the time necessary to kill the required number of animals using such methods;

i) the availability on the locations or premises of facilities that will be used to assist with the *killing*, and the necessity of any additional facilities;

j) potential *biosecurity* and environmental impact of the operations;

k) the health and safety of personnel conducting the *killing*;

~~l) any legal issues that may be involved, for example where restricted veterinary drugs may be used, or where the process may impact on the environment;~~

~~m) the presence of other nearby premises holding animals;~~

~~n) possibilities for removal and disposal of dead animals.~~

The plan should minimise the negative animal welfare impacts of the *killing* by taking into account the different phases of the procedures to be applied for *killing*.

Competences and skills of the personnel handling and *killing* animals should be included in the operational plan.

Article 7.6.7.

Hazards to animal welfare

~~For the purpose of this chapter, *hazards* to *animal welfare* means a factor with the potential to adversely affect *animal welfare*.~~

When killing animals, they may be exposed to different hazards to *animal welfare* ~~hazards~~ including improper ~~restraining~~ restraint, rough handling, forced movement, absence of or improper design of premises, inadequate construction and maintenance of premises, adverse weather conditions, unexpected loud noise and ineffective *killing* methods.

Exposure to multiple hazards to a*nimal welfare* can have a negative cumulative effect on the animals [Moberg and Mench, 2000].

Hazards to animal welfare can be minimised by appropriate design of premises and choice of equipment, and method of killing ~~and through~~, good management, training and competency of personnel.

Article 7.6.8.

Measures to assess animal welfare at the time of killing for purposes other than slaughter

~~Hazards to a~~Animal welfare at the time of killing for purposes other than slaughter should be assessed using animal-based measures. However, consideration should be given to the resources provided as well as the design and management of the method.

Measures to assess welfare during handling and restraint in Chapter 7.5 are applicable to this chapter.

These animal-based measures should be routinely used in the monitoring of the state of consciousness and death, with the most appropriate to be used in relation to the method applied.

1. The following animal-based measures can be useful indicators of animal welfare. These measures can be considered as tools to monitor the efficiency of design and management, given that they can affect animal welfare. Multiple indicators should be used to determine effectiveness of the method.

a) Immediate collapse

Effective ~~stunning~~ loss of consciousness can be recognised from the immediate loss of posture leading to collapse of the animal. ~~Ineffectively stunned~~ Conscious animals, on the other hand, will fail to collapse or will attempt to regain posture after collapse. ~~Some ineffectively stunned animals, may occur, for example, if captive bolt shooting position is wrong or electrically immobilised animals lose posture, but remain conscious~~. The absence of immediate collapse is always indicative of consciousness.

b) Tonic–clonic seizures

Effective electrical and in some cases captive bolt methods ~~stunning often~~ result in the presence of tonic–clonic seizures. Tonic seizures can be recognised by an arched back and rigidly flexed legs under the body and will last for several seconds. It is followed by clonic seizures lasting for seconds and manifested as leg kicking or paddling. The absence of tonic–clonic seizures may be indicative of consciousness [Van der Wal, 1971].

c) Righting reflex [Atkinson et al, 2013; Terlow et al, 2016]

The righting reflex refers to any reflex that tends to bring the body into its normal upright position. ~~Ineffectively~~ For example effectively ~~stunned~~ killed animals ~~and those recovering consciousness~~ will not attempt to raise ~~their heads~~ or shake their heads ~~after stunning, which is referred to as righting reflex~~.

d) Rhythmic breathing [Atkinson et al, 2013; Kamenik et al, 2019, Vecerek et al, 2020]

Effective ~~stunning~~ killing will result in immediate onset of apnoea (absence of breathing). Ineffectively ~~stunned~~ killed animals and those recovering consciousness will start to breathe in a pattern commonly referred to as rhythmic breathing, which may begin as gagging and lead to respiratory cycles of ~~inspiration~~ inhalation and ~~expiration~~ exhalation. Breathing can be recognised from the regular flank ~~and/~~or mouth and nostril movements. Recovery of breathing, if not visible through these movements, can be checked by holding a small mirror in front of the nostrils or mouth to look for the appearance of condensation due to ~~expiration~~ exhalation of moist air. Rhythmic breathing is not to be confused with agonal breaths.

e) Corneal reflex:

The corneal reflex is elicited by touching or tapping the cornea. ~~Ineffectively stunned~~ Conscious animals and those recovering consciousness will blink in response to the stimulus. Effectively ~~stunned~~ killed ~~and stuck (bled)~~ animals show the absence of the corneal reflex ~~during any key stage. On the other hand, ineffectively or poorly stunned animals and those recovering consciousness prior to sticking or during bleeding are expected to show the presence of the corneal reflex at any key stage. It is worth noting that placement of electrical stunning tongs (electrodes) over the eyes of animals may render this indicator invalid~~.

f) Palpebral reflex

The palpebral reflex is elicited by touching or tapping a finger on the inner/outer eye canthus or eyelashes. ~~Correctly stunned animals will not show a palpebral reflex~~. ~~Ineffectively stunned~~ Conscious animals and those recovering consciousness will blink in response to the stimulus ~~at any key stage. It is worth noting that placement of electrical stunning tongs (electrodes) over the eyes of animals may render this indicator invalid~~. Effectively killed animals will not show a palpebral reflex.

g) Eye movement

Eye movements and the position of the eyeball can be recognised from close examination of eyes after stunning. Conscious animals and those recovering consciousness will show eye movements. ~~Correctly stunned~~ Effectively killed animals will show fixed eyes, and this can be recognised from

wide open and glassy eyes with clearly visible iris/cornea in the middle. ~~Eyeballs may be obscured in some animals owing to rotation into the eye socket following effective stunning. Ineffectively stunned~~ Conscious ~~animals and those recovering consciousness will show eye movements [EFSA AHAW Panel, 2013, Kamenik et al, 2019]~~

2. The following animal-based measures can be used as indicators of consciousness but are not sensible to indicate unconsciousness. Therefore, they can be use in addition to the previously mentioned animal-based measures:

~~a) Response to painful stimuli~~

~~Poor stunning can be recognised from the response to painful stimulus. The absence of response to a painful stimulus indicates unconsciousness following stunning. [Terlow et al, 2016. Kemenik et al, 2018]~~

a) ~~b)~~ Spontaneous blinking

Conscious animals may show spontaneous blinking and therefore this sign can be used to recognise ineffective ~~stunning~~ killing or recovery of consciousness after stunning. However, not all the conscious animals may show spontaneous blinking. ~~Spontaneous blinking can be used as an indicator at all key stages of monitoring. It is worth noting that placement of electrical stunning tongs (electrodes) over the eyes of animals may render this indicator invalid.~~ [Gregory et al, 2007; Terlouw et al, 2016, Kamenik et al, 2018]

b) ~~c)~~ Vocalisation

Vocalisation is expected only in conscious animals ~~and can be used as an indicator in all key stages of monitoring~~. However, not all conscious animals will vocalise, and hence the absence of vocalisation does not always mean that the animal is unconscious. [Atkinson et al, 2013; Kamenik et al., 2018]

3. The following animal-based measures can be used as the confirmation of death before carcass disposal:

a) Muscle tone

Immediately after killing, dead animals will lose muscle tone, which can be recognized from the completely relaxed legs, floppy ears, relaxed tongue and relaxed jaws.

b) Heartbeat

Onset of death leads to permanent loss of heartbeat, which can be ascertained physically by using a stethoscope or by heart or arterial palpation, where possible. [Vogel et al., 2011]

c) Dilated pupils

Dilated pupils (mydriasis) are an indication of death.

Article 7.6.9.

Handling of animals

Handling is the process of preparation of the animals for killing, and may include moving them to the killing point. Handling and moving can be stressful to animals, especially when they are isolated out of their primary home area or from their group. [Gavinelli et al. ,2014].

1. Animal welfare concerns

Exposure to novel environments (e.g. noise, lighting, flooring, smell) may cause fear and reluctance to move, or turning back. Poorly designed facilities and inappropriate handling (e.g. inappropriate use of electrical goads, kicking, hitting with a stick) will cause *distress*, fear and *pain*.

2. Animal-based and other measures:

a) animals slipping, falling and piling up;

b) animals turning around or moving backwards, attempting to escape or reluctant to move;

c) animals vocalising;

d) animals that collide with facility structures;

e) animals with broken or otherwise injured limbs;

f) animals that are unable to move by themselves due to reasons other than broken or injured limbs;

g) use of force by personnel;

h) inappropriate use of electrical goads.

3. Recommendations

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

Floor should be clean, dry and not slippery.

Raceways should be well lit so that animals can see where they are going.

The design of raceways should minimise distractions that may cause animals to stop, baulk or turn back(e.g. shadows, changes in flooring, moving objects, loud or sudden noises).

Animals that are injured, sick or unable to rise require immediate action and, when necessary, emergency *killing* should be performed without moving them and without delay. Animals should not 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 animals to move using a soft voice and slow movements.

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

Handling aids such as panels or flags should be used in a manner to encourage and direct movement of the animals without causing *distress*, fear or *pain*.

Electric goads should not be used routinely, but only when other measures have been ineffective, the animal has no injury or other condition and there is room for the animal to move forward.

Only low-voltage goads should be 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, pregnant animals or on calves or piglets. Shocks should not be used repeatedly if the animal fails to respond and should not last longer than one second.

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).

Animals should not be forced to move at a speed greater than their normal walking pace to minimise injury through slipping or falling.

Article 7.6.10.

Killing Methods

The following killing methods are globally available and in use. The main purpose of this part of the chapter is to ensure that where killing methods are in use that they are undertaken in a manner that optimises animal welfare.

For each killing method the description of the killing method and its use in animal species, animal welfare concerns, identification of animal-based and other welfare measures, recommendations for effective use to optimise welfare, and any species-specific recommendations are presented in Articles 7.6.11. to 7.6.32.

Standard operating procedures should be in place that define key operating parameters and follow the manufacturer's recommendations for stunning or killing.

The killing methods covered are divided into two broad categories. Manual, individual killing methods which involve a human operator or operators manually performing a killing procedure on individual animals (Articles 7.6.11. to 7.6.22.); and automated large scale killing methods which involve automated procedures for large scale killing of many animals either sequentially (e.g. water baths) or simultaneously (e.g. atmospheric modification) (Articles 7.6.23. to 7.6.32).

Article 7.6.11.

Firearms

Firearms that fire free projectiles such as a shotgun, rifle, or handgun can provide a quick and effective method for killing when used properly. They require minimal or no restraint and can be used to kill from a distance by properly trained and competent marksmen or markswomen.

A firearm can be used from long range and may be aimed to penetrate the skull or soft tissue at the top of the neck of the animals (high neck shot) and to cause irreversible concussion and death and should only be used by properly trained and competent marksmen. The firearm may also be aimed to penetrate the thoracic cavity and heart causing respiratory and heart failure and death.

1. Animal Welfare Concerns

   This method has the potential for non-lethal wounding of the target animal and lethal or non-lethal wounding of non-target animals. This may occur because of inappropriate cartridge, calibre or type of bullet or incorrect shooting position.

2. Animal-based and other measures

   Animal-based measures of an effective shot include [HSA, 2016b]:

   a) immediate collapse

   b) apnoea

   c) carcass appearance (tonic or relaxed)

   d) duration of convulsions

   e) absence of eye movement

   f) glazed expression

   g) absence of corneal reflex

3. Recommendations

   Firearms and ammunition should be selected based on the species and the distance to shoot the animals. The correct cartridge, calibre and type of bullet for the different species age and size should be used.

   Firearms are suitable for killing agitated animals in open spaces.

   Firearms should not be used if trying to preserve brain tissue for diagnosis of diseases or when leakage of body fluids may present a biosecurity risk.

   Training is essential for ensuring effective killing with firearms. This training must include approaches that ensure skilled marksmanship; an understanding of safety principles, animal anatomy, animal behaviour; animal handling; use of appropriate combinations of firearms and bullets for the intended purpose; and appropriate judgment under field conditions.

At short range, the marksman or markswoman should ensure that the animal is not moving and in the correct position to enable accurate targeting and the range should be as short as possible (5–50 cm for a shotgun) but the barrel should not be in contact with the head or other part of the animals.

Animals that are not killed by the initial shot, should be re-shot or killed by a backup method.

The method is suitable for all species covered by this chapter.

4. Species-specific recommendations

None identified

Article 7.6.12.

Penetrating captive bolt

The aim of this method is to produce a state of unconsciousness and cause severe damage to the brain by the impact and penetration of a captive bolt using a mechanical device. The captive bolt should be positioned on the skull to penetrate the cortex and mid-brain of the animal. The force of impact and the physical damage caused by the passage of the bolt should result in immediate unconsciousness. Physical damage to the brain caused by penetration of the bolt may result in death; however, a secondary intervention such as pithing, bleeding or lethal injection should be performed as soon as possible after the shot to ensure the death of the animal.

A penetrating captive bolt is fired from a gun powered by either compressed air or a blank cartridge, designed to fire a retractable metal bolt into the animal's cranium. The bolt should be recessed into the body of the pistol to get the proper velocity required to penetrate the skull of the animal.

1. Animal welfare concerns

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

Regaining of consciousness before death due to delay in applying the secondary intervention.

2. Animal-based and other measures

Animal-based measures of an effective shot include:

a) immediate collapse

b) apnoea

c) tonic seizures

d) absence of eye movement

e) absence of corneal reflex

f) absence of palpebral reflex

g) absence of righting reflex

3. Recommendations

For cartridge powered and compressed air guns, the bolt velocity and the length of the bolt should be appropriate to the species and type of animal, in accordance with the recommendations of the manufacturer.

Captive bolt guns should be frequently cleaned and maintained in good working condition. Regular check-up of the bolt velocity is recommended for effective stunning, operator safety, and improved animal welfare.

More than one gun may be necessary to avoid overheating with repeated use, and a back-up gun should be available in the event of an ineffective shot.

Animals should be restrained and the operator should ensure that the head of the animal is accessible. The method is difficult to apply in agitated animals.

Proper positioning of the captive bolt equipment is required as incorrect positioning causes inefficient stunning leading to pain and distress in animals.

Animal-based measures should be monitored continuously after application until *death* to ensure the absence of brain stem reflexes.

Suitable training and experience of operators in the application of captive bolt pistol, ergonomics and workload conditions should be considered for reducing fatigue in operators.

Penetrating captive bolt should not be used if preservation of brain tissue for diagnosis of diseases or when leakage of body fluids may present a biosecurity risk.

The secondary intervention should be performed without delay after the shot to ensure the death of the animal.

The method is suitable for equids, camelids, cattle, sheep, goats, pigs, poultry, ratites, rabbits and *captive wild animals*.

4. Species-specific recommendations

The size of the skulls and the thickness of the skull bones should be taken into account when selecting parameters such as bolt diameter, bolt length and cartridge power in penetrative captive bolt stunning.

Heavily horned animals should be stunned with penetrative captive bolt in the occipital position using a heavy-duty contact-fired captive bolt gun directed forward at the nose.

In new world camelids the device should be placed at the crown position (highest point on the head) aiming downward to the base of the jaw [AVMA, 2020].

In turkeys the placement of the device should be directly on the midline of the skull and at the highest/widest point of the head with the captive bolt aimed directly down toward the brain.

In chickens (and poultry with comb development) the placement should be directly behind the comb and on the midline of the skull with the captive bolt aimed directly down.

In ratites a device with a short penetrating bolt and the smallest charge appropriate for poultry or rabbits should be applied to the top of the head at the midpoint of an imaginary line between the outer “ear” openings.

Article 7.6.13.

Pithing

Pithing is not a standalone killing or stunning method, it’s a secondary method of *killing* animals which have been stunned by a penetrating captive bolt, without immediate *death*.

Pithing physically disrupts the central nervous system by the insertion of a flexible rod. The rod can be inserted caudally through the brain stem and spinal cord following stunning by penetrative captive bolt or cranially through the spinal cord and brain stem following decapitation. Pithing can be used as a primary killing method for animals which have been stunned by a penetrating captive bolt, without immediate death or as a secondary method to ensure rapid death.

1. Animal welfare concerns

Since pithing is not a killing method, but rather an adjunct method, it doesn’t have any welfare concerns of its own. However, it shares the welfare concerns of the primary method of killing or stunning.

2. Animal-based and other measures

Absence of brain stem reflexes and other muscle movements (following initial violent muscle contractions) can be used to confirm successful pithing.

3. Recommendations

Pithing is an adjunct method that can be used in conjunction with penetrative captive bolt stunning or decapitation to ensure that an animal is dead (in the case of penetrative captive bolt stunning) or that an animal is no longer conscious (in the case of decapitation).

4. Species-specific recommendations

The pithing rod selected must be of a suitable size to be able to fit within the spinal canal of the animal.

Article 7.6.14.

Non-penetrating captive bolt followed by a secondary killing method

Non-penetrating captive bolt have a ‘mushroom headed bolt" which impacts the skull but does not enter the brain. It administers a blow to the animal’s skull of sufficient force to render the animal immediately unconscious. The gun should be placed on the front of the skull to deliver a percussive blow which produces instantaneous unconsciousness. A secondary intervention such as bleeding, cervical dislocation or lethal injection should be performed without delay after the shot to ensure the death of the animal.

1. Animal welfare concerns

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

Regaining of consciousness before death due to delay in applying the secondary intervention.

2. Animal-based and other measures

Animal-based measures of an effective shot include:

a) immediate collapse

b) apnoea

c) tonic seizures

d) absence of eye movement

e) absence of corneal reflex

f) absence of palpebral reflex

g) absence of righting reflex

3. Recommendations

For cartridge powered and compressed air guns, the velocity and diameter of the bolt should be appropriate to the species and type of animal, in accordance with the recommendations of the manufacturer.

Non-penetrating captive bolt guns should be frequently cleaned and maintained in good working condition. Regular check-up of the bolt velocity is recommended for effective stunning, operator safety, and improved animal welfare.

More than one gun may be necessary to avoid overheating, and a back-up gun should be available in the event of an ineffective shot.

Animals should be restrained and the operator should ensure that the head of the animal is accessible. The method is difficult to apply in agitated animals.

Proper positioning of the non-penetrating captive bolt equipment is required as incorrect positioning of the captive bolt causes inefficient stunning leading to pain and distress in animals.

Animal-based measures should be monitored continuously after application until death to ensure the absence of brain stem reflexes.

Suitable training and experience of operators in the application of non-penetrating captive bolt pistol and ergonomics and workload conditions should be considered for reducing fatigue in operators.

The secondary intervention should be performed without delay after the shot to ensure the death of the animal.

This methods is suitable for turkeys, chickens, ratites, rabbits, lambs and goats kids (approximately up to 4.5 kg) and piglets (approximately up to 10.9 kg).

4. Species-specific recommendations

In turkeys the placement of the device should be directly on the midline of the skull and at the highest/widest point of the head with the captive bolt aimed directly down toward the brain.

In chickens (and poultry with comb development) the placement should be directly behind the comb and on the midline of the skull with the captive bolt aimed directly down.

In ratites a device with the smallest charge appropriate for poultry or rabbits should be applied to the top of the head at the midpoint of an imaginary line between the outer “ear” openings.

In rabbits the device should be placed in the center 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.

In lambs and goats kids up to approximately 4.5 kg the preferred shooting position is with the muzzle of the non-penetrating captive bolt on the midline behind the poll (e.g., between the ears) with the chin tucked into the neck.

In piglets, non-penetrative captive bolt provides immediate and irreversible loss of consciousness and brain death in piglets up to 10.9 kg with a single application on the frontal–parietal position [Grist et al., 2017, 2018a].

Article 7.6.15.

Bleeding

Bleeding is a method of *killing* animals through the severance of the major blood vessels in the neck or chest that results in a rapid fall in blood pressure, leading to cerebral ischaemia and *death*.

1. Animal welfare concerns

The process of *bleeding* requires significant tissue trauma and this may be painful if the animal has not been rendered unconscious prior to the procedure [Gibson et al. 2009]. Consciousness may persist for periods of up to 20 or 60 seconds (depending on species) following blood vessel transection [Johnson et al. 2015]. Animals may experience fear, pain and *distress* during this period.

2. Animal-based and other measures

Animal-based and other measures that indicate loss of consciousness include all the following: absence of muscle tone; absence of corneal or palpebral 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

Bleeding should only be used as a last resort in animals that are not already unconscious or can be rendered unconscious prior to severance of the blood vessels.

4. Species-specific recommendations

None identified

Article 7.6.16.

Lethal injection

Lethal injection is a procedure that involves injecting one or more drugs into an animal to cause rapid death.

The animal is injected intravenously with a lethal dose of anaesthetic drugs and may also receive an initial injection of a sedative. In practice, barbiturates in combination with other drugs are commonly used. They induce a smooth transition from consciousness to unconsciousness and death by causing depression of the central nervous system and respiratory centres in the brain leading to cardiac arrest (Shearer, 2018).

The preferred route of administration is intravenous (HSA 18; AVMA, 2020), but in some cases it may be given intramuscularly, intracardially or intraperitoneally.

1. Animal welfare concerns

If routes of administration are inappropriate, consciousness may not be lost rapidly before death, causing pain and fear.

If doses of administration are not correct (sub-lethal), consciousness may not be lost rapidly before death, causing fear.

Some combinations of drug type and route of administration may be painful and should only be used in unconscious animals.

During rapid injection, some drugs may cause pain, irritation and paralysis, which can cause the suppression of respiration while the animal is still conscious [EFSA, 2004].

Intracardiac administration can be extremely painful if penetration of the heart is not successful on the first attempt (EFSA, 2004).

Personnel lacking appropriate training and skills, or personnel suffering fatigue, or fractious animals unable to be properly restrained, may cause ineffective administration and be detrimental to animal welfare (Søren et al., 2020).

2. Animal-based and other measures

Each animal should be examined carefully to confirm loss of consciousness and death:

Posture, breathing, heart auscultation, corneal or palpebral reflex, vocalization and eyes movements.

Absence of brain stem reflexes.

3. Recommendations

The animal should be sedated before the lethal injection to minimize stress, if required.

Lethal injection should only be performed by a qualified veterinarian or under their direct supervision.

Personnel performing this method should be trained and knowledgeable in anaesthetic techniques.

Personnel should be trained to use appropriate presentation of the animal and skilled intravenous administration to avoid extravasation of the drug and to use the correct dose according to the species and the animal live weight.

Personnel should be trained to use appropriate restraint in case it is necessary.

Intravenous administration is preferred, but intraperitoneal or intramuscular administration may be appropriate, especially if the agent is non-irritating.

The intracardiac route may be used in previously anesthetized or very small animals only.

Examine individual animals for signs of consciousness or life and apply a secondary killing method as a corrective measure, by giving a lethal injection of an anaesthetic drug if they are conscious or a lethal substance to kill them in case they are still alive but unconscious [AVMA, 2020].

The carcass of an animal that has been killed by lethal injection has to be disposed of properly and cannot be used for or where there may be a risk of human or animal consumption because of harmfulness of the used drugs.

This method is suitable for killing small numbers of dogs, cats, cattle, sheep, goats, pigs, equids, poultry, captive wildlife, but it can be used in all species.

4. Species-specific recommendations

The method is suitable for killing individual or small numbers of dogs, cats, cattle, sheep, goats, pigs, equids and poultry, but it can be used in all species.

In some species like cattle, restraint may be necessary prior to injection, if possible, to allow effective administration.

Venous access can be difficult in very small or young animals or animals with low blood pressure taking considerable veterinary skill and experience.

Article 7.6.17.

Cervical dislocation

Manual or mechanical cervical dislocation comprises stretching and twisting the neck, resulting in the separation of spinal cord from the brain and *death* from cerebral anoxia due to cessation of breathing or blood supply to the brain [AVMA, 2020].

1. Animal welfare concerns

Cervical dislocation even with separation of the spinal cord fails to produce immediate loss of consciousness and in this case animals may die due to asphyxiation [Gregory and Wotton, 1990].

For heavy rats and rabbits, the large muscle mass in the cervical region makes manual cervical dislocation physically more difficult

2. Animal-based and other measures

Animal-based measures of an effective application of cervical dislocation are signs of death.

3. Recommendations

Only to be used in unconscious animals.

Consistent results when performing manual cervical dislocation requires strength and skill so team members should be rested regularly to avoid fatigue and ensure consistently reliable results.

Mechanical cervical dislocation is preferred to manual as is more reliable and less prone to failure.

Cervical dislocation by crushing of vertebrae and spinal cord should not be used.

Animals should be monitored continuously until death to ensure the absence of brain stem reflexes.

The method is suitable for small birds, poultry, mice, rats and rabbits.

4. Species-specific recommendations

Manual cervical dislocation is applicable in birds weighing up to 3 kg. and in rats up to 200 g

Mechanical cervical dislocation is applicable in birds weighing up to 5 kg.

None identified

Article 7.6.18.

Decapitation

Decapitation using a guillotine or knife results in death by cerebral ischaemia.

1. Animal welfare concerns

   The process of decapitation requires significant tissue trauma and this may be painful if the animal has not been rendered unconscious prior to the procedure [Kongara et al. 2014]. There is evidence that decapitation may not itself cause immediate loss of consciousness, which [Bates 2010] may persist in decapitated animals for as long as 30 seconds [Mikeska and Klemm 1975].

2. Animal-based and other measures

   Successful decapitation completely separates the head from the rest of the body and can be confirmed by visual inspection.

3. Recommendations

   Decapitation should only be used as a last resort in animals that are not already unconscious or can be rendered unconscious prior to decapitation.

4. Species-specific recommendations

   Equipment used for decapitation should be of sufficient construction and sharpness to complete the procedure quickly and without undue force.

Article 7.6.19.

Electrical — two-stage application

A two-stage application of low frequency electric current (50 Hz) comprises firstly an application of current to the head by scissor-type tongs that spans the brain, immediately followed by an application of the tongs across the chest in a position that spans the heart.

The application of sufficient electric current to the head will induce ‘tonic-clonic’ epilepsy and unconsciousness. Once the animal is unconscious, the second stage will induce ventricular fibrillation (cardiac arrest) resulting in death.

1. Animal welfare concerns

   The main hazards preventing effective electrical stunning and killing are: incorrect electrode placement, poor contact, a dirty or corroded electrode, electrical arcing, high contact resistance caused by hair or dirt on the animal surface, too short exposure time and inappropriate electrical parameters (low voltage/current or high frequency).

   The second stage should only be applied to unconscious animals to prevent unacceptable levels of pain.

2. Animal-based and other measures

   Before the application of the second stage, unconsciousness should be assessed with the following animal-based measures: immediately collapse, tonic-clonic seizures; apnoea; absence of corneal or palpebral reflex.

   Animal-based measures of ineffective stun or recovery of consciousness are: vocalisation; spontaneous blinking; righting reflex; presence of corneal or palpebral reflex; rhythmic breathing; spontaneous swallowing and head shaking.

After the application of the second stage, death should be assessed with the following animal-based measures: absence of muscle tone, apnoea, absence of corneal reflex, dilated pupils and absence of heartbeat.

3. Recommendations

Two team members are recommended, the first to apply the electrodes and the second to manipulate the position of the animal to allow the second application to be made.

Animals should be restrained, at a minimum free-standing in a pen.

The tongs should be of the correct design and size for the animal;

A stunning current should be applied in a position that spans the brain for a minimum of 3 seconds; immediately following the application to the head and after ensuring that the animal is unconscious, the electrodes should be transferred to a position that spans the heart and the electrodes applied for a minimum of 3 seconds.

Electrodes should be applied firmly for the intended duration of time with pressure not released until the stun is complete.

Animals should be monitored continuously after stunning until death to ensure the absence of brain stem reflexes.

Electrodes should be in good condition and cleaned regularly during and after use, to enable optimum electrical contact to be maintained.

The wool or hair should be entirely dry; if wet the electricity may flow (shunt) through the wet wool or hair rather than contacting the skin and passing through the brain or body.

Wetting the bare skin (not wool or hair) application area with water (especially salted water) can increase electrical contact.

Ineffective application of the first stage of the method should be followed by a backup method or the repetition of the first stage.

The method is suitable for calves, sheep and goats, and pigs.

4. Species-specific recommendations

Effective electrical parameters should be determined based on scientific evidence for different types of animals.

For electrical stunning of the head, minimum parameters are recommended for the following species:

- 1.5 A for bovines,
- 1.3 A for pigs,
- 1.8 A for sows and boars,
- 1.0 A for small ruminants.

Good placement of the tongs can be difficult on animals with horns and on sheep with woolly heads. Using electrodes with pins or with wet pins for woolly animals would help to overcome the problem. Alternatively, the wool should be removed from the area where the electrodes will be positioned on the animal.

Article 7.6.20.

Head to body electrical killing

Head-to-body electrical killing (electrocution) comprises the single application of sufficient electrical current to the head and back, to simultaneously stun the animal and fibrillate the heart. Provided sufficient current is

applied in a position that spans both the brain and heart at the same time, the animal will not recover consciousness.

1. Animal welfare concerns

   The main hazards preventing effective electrical killing are: incorrect electrode placement, poor contact, dirty or corroded electrode, electrical arcing, high contact resistance caused by hair or dirt on the animal surface, too short exposure time and inappropriate electrical parameters (low voltage/current or high frequency).

2. Animal-based and other measures

   Effective head to body electrical killing is characterise by tonic seizures during exposure to the method. After the exposure animals may have clonic seizures.

   After application death should be assessed with the following animal-based measures: absence of muscle tone, apnoea, absence of corneal reflex, dilated pupils and absence of heartbeat

   Animal-based measures of ineffective electrical killing are: absence of tonic-clonic seizures, presence of rhythmic breathing, presence of corneal or palpebral reflex or vocalisation.

3. Recommendations

   Animals should be restrained to avoid movement that can lead to interrupted contact with the electrodes.

   The device should be of the correct design and size for the animal.

   A current should be applied in a position that spans the brain and the heart at the same time, continuously for a minimum of 3 seconds.

   The device should be applied firmly for the intended duration of time and pressure not released until the stun is complete.

   Animals should be monitored continuously after stunning until death to ensure the absence of brain stem reflexes.

   Electrodes should be in good condition and cleaned regularly during and after use, to enable optimum electrical contact to be maintained.

   The wool or hair should be entirely dry; if they are wet, the electricity may flow (shunt) through the wet wool or hair rather than through the brain or body.

   Wetting the bare skin application area with water (especially salted water) can also increase electrical contact.

   Ineffective application of the first stage of the method should be follow by a backup method or the repetition of the first stage.

   The method is suitable for sheep and goats, and pigs.

4. Species-specific recommendations

   Effective electrical parameters should be determined based on scientific evidence for different types of animals.

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

   - 1.3 A for pigs,
   - 1.8 A for sows and boars,
   - 1.0 A for sheep and goats.

Article 7.6.21.

Head only electrical stunning followed by a secondary killing method

Comprises the single application of sufficient electrical current to the head of the animal in a position that spans the brain, causing unconsciousness; this needs to be followed by a killing method such as cervical dislocation or bleeding.

1. Animal welfare concerns

   The main hazards preventing effective electrical stunning are: inappropriate handling, inversion when applicable, incorrect electrode placement, poor contact, dirty or corroded electrode, electrical arcing, high contact resistance caused by hair or feathers or dirt on the animal surface and inappropriate electrical parameters (low voltage/current or high frequency).

   An additional hazard could occur when second intervention doesn't kill the animal.

2. Animal-based and other measures

   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: tonic-clonic seizures; apnoea; absence of corneal or palpebral reflex.

   Animal-based measures of an ineffective stun or recovery of consciousness or for ineffective killing are: vocalisation; spontaneous blinking; righting reflex; presence of corneal or palpebral reflex; rhythmic breathing.

3. Recommendations

   Animals should be stunned as soon as they are restrained.

   In the case of ineffective stunning or recovery, animals should be re-stunned using a backup system or 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 ensure that the minimum current is provided to the animal independently from individual impedance and should always be preferred to constant voltage stunners.

   Regular calibration of the equipment according to the manufacturer's procedure is recommended.

   For the killing methods to be use after stun refer to Articles 7.6.X and 7.6.X.

   This method is suitable for chickens, turkeys, ducks, geese and rabbits.

4. Species-specific recommendations

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

   - 240 mA for hens and broiler chicken,
   - 400 mA for turkeys,
   - 600 mA for geese and ducks,
   - 400 mA for rabbits.

Article 7.6.22.

Water bath killing

Electrocution leading to death can be achieved by drawing inverted and shackled poultry through an electrified water bath. Electrical contact is made between the water and earthed shackle and, when sufficient current (50 Hz AC) is applied, poultry will be simultaneously stunned and killed.

1. Animal welfare concerns

   In electrical water-bath killing, inverting and shackling conscious poultry by the legs can cause pain and fear.

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

   Hazards that may prevent effective electrical killing are: lack of contact between head and water, differences in individual bird resistance, improper system grounding, pre-stun shocks due to wings contacting water before the head, and the use of inappropriate electrical parameters (low voltage/current or high frequency) or too short exposure time.

   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 insufficient electrical killing parameters are used, conscious animals are at risk of being electro-immobilised or paralysed causing pain and suffering.

2. Animal-based and other measures

   Multiple indicators should be used to determine whether killing is effective.

   Animal-based measures of an effective electrocution are: absence of muscle tone; apnoea; and absence of corneal or palpebral reflex; absence of vocalisation and absence of righting reflex.

3. Recommendations

   Poultry should be shackled by both legs. Shackles should match the species and size of the birds to guarantee a good contact.

   Pre-stun shocks should be prevented and can be reduced by having a smooth shackle line and entry to the water-bath and by adjusting the water level of the bath to minimise overflow. Proper waterbath design, including a non-conductive entrance, will also help eliminate pre-stun shocks. Measures to calm the birds or to reduce the frequency of wing flapping can be put in place such as: breast rubs, low lighting, smooth transition into the waterbath and gentle shackling such that this does not trigger wing flapping.

   Poultry should be submerged into the water up to the base of the wings.

   A low frequency (50 Hz) current with a minimum of 400 mA per bird should be applied for a minimum of 3 seconds [EFSA, 2019].

   Death should be confirmed before disposal.

   In the case of ineffective killing, animals should be killed without delay using a backup system.

4. Species-specific recommendations

   None identified

Article 7.6.23.

Maceration

Maceration, utilising a mechanical apparatus with rotating blades or projections, causes immediate fragmentation and death in day-old birds and for embryonated eggs.

1. Animal welfare concerns

   Pain, suffocation and distress due to a slow rotation of blades or rollers, overloading and rollers set too wide.

2. Animal-based and other measures

   - absence of signs of life
   - immediate fragmentation

3. Recommendations

   The capacity of the apparatus (power and sharpness) should be sufficient to ensure that all day-old -birdsare killed instantaneously, even if they are handled in a large number. The rate of introducing the birds should not allow the equipment to jam. Only purpose built equipment should be used.

   The gap between rollers must ensure day-old-birds heads are crushed instantaneously leading to death [HSA, 2005].

   Mechanical killing of day-old-birds should result in slurry, rather than recognisable body parts such as internal organs, legs, wings and heads, to ensure day-old-birds that were truly macerated [HSA, 2005].

   It is important to ensure that the speed of the equipment is appropriate for the batch size and that day-old-birds are dead when they come out of the machine.

   Avoid adding more than one layer of day-old-birds at one time or in quick succession, avoid introduction of a batch into the macerator before previous day-old-birds are dead.

4. Species-specific recommendations

   Not identified

Article 7.6.24.

Addition of anaesthetics to feed or water

An anaesthetic agent which can be mixed with *poultry* feed or water may be used to kill *poultry* in houses. Commonly used general anaesthetic agents are not intended or approved for oral use. . *Poultry* which are only anaesthetised need to be killed by another method such as cervical dislocation.

1. Animal welfare concerns

   Ingestion of an insufficient quantity of the drug or inappropriate drug not leading to unconsciousness.. Failing to implement a secondary killing method before consciousness regained. Exposure of non-targeted animal or birds is a risk[https://www.hsa.org.uk]

2. Animal-based and other measures

   Absence of signs of life including breathing, body movement, righting reflex.

3. Recommendations

   To ensure that these anaesthetics have been effectively removed from the feeding or drinking water system and that no residue is left behind that could harm the next flock, a very careful cleaning procedure is necessary. Sufficient quantities of anaesthetic need to be ingested rapidly for effective response. Intake of sufficient quantities is facilitated if the birds are fasted or water is withheld. Should be followed by immediate killing if birds are anaesthetised only.

This method is suitable for confined poultry.

4. Species-specific recommendations

None identified

Article 7.6.25.

General principles of modified atmosphere killing

Modified atmosphere killing is performed by exposing animals to CO2, inert gases or their mixtures.

This can be performed either by placing the animals in a prefilled gas container, by placing transport modules or crates containing animals in a container and introducing a gas mixture, or by the gas being introduced into a poultry house.

Modified atmosphere killing can also be administered by using gas-filled foam, medium or low density water based foam or through low atmosphere pressure (LAPS).

Article 7.6.26.

Prefilled gas container

This method is the exposure of batches of animals to high concentrations of gas in pre-filled containers which can also be waste bins, skips or bags.

In this method, animals are manually caught in small batches and dropped into the container connected to gas cylinders.

The time to onset of death is related to the concentration of the gas and the duration of the exposure, i.e. lower concentration requires longer exposure [Raj and Gregory, 1990a,b].

When animals are exposed to the gas individually or in small groups in a container, the equipment used should be designed, constructed, and maintained in such a way as to avoid injury to the animals and allow them to be observed.

1. Animal welfare concerns

Manual catching and handling of animals cause distress, especially when birds are carried in an inverted position.

If there is no immediate loss of consciousness. Inhalation of high concentrations of gas while conscious is painful and causes respiratory distress.

The time and distance animals are carried depends on the location of the gas containers on the premises and on the type and size of the housings.

Overloading may lead to compression and suffocation caused by more animals being dropped into the container without a sufficient interval between two consequent batches of animals. In addition, each batch of animals dropped into the container will displace equal volume of gas into the atmosphere, which will result in fluctuating concentrations of gas.

Injection of cold gas directly to the animals causes hypothermia.

Verifying *death* while the animals are in the *container* is difficult.

2. Animal-based and other measures

Animal-based measures are difficult to assess due to container design and the presence of gas.

Animal-based measures of an effective kill are: absence of signs of life, such as breathing, righting reflex or body movement.

3. Recommendations

Containers should allow the required gas concentration to be maintained and accurately measured.

Each batch of birds dropped in the containers (one layer) should be allowed sufficient time to die before adding the next batch of birds [Webster and Collett, 2012].

Containers should not be overcrowded and measures are needed to avoid animals suffocating by climbing on top of each other.

Skilled catching teams are necessary.

This method is suitable for poultry and mink.

4. Species-specific recommendations

Non identified.

Article 7.6.27.

Gas introduced into a container

1. In this method, the crates or modules holding birds or pigs are loaded into a container. Small groups of pigs may also be walked into the container. Once the animals are in the container, a chosen gas, i.e. carbon dioxide, argon, nitrogen or mixtures of these gases, are administered to displace the atmospheric air in the container to create a lethal anoxic or hypercapnic situation (EFSA, 2019). Animal welfare concerns

Manual catching and handling of birds causes distress, especially when birds are carried in an inverted position.

There is no immediate loss of consciousness. Exposure to high concentrations of CO2 required for killing of birds and pigs (e.g. 40% or more) is reported to be aversive and painful to inhale and therefore these animals show escape attempts (EFSA, 2019; 2020).

The lower the CO2 concentration or higher the residual oxygen in inert gases the longer the time to induce death.

Exceeding the capacity of the equipment in terms of number of animals that can be loaded into the container with available floor space leading to overcrowding and animals climbing onto each other which results in injuries.

The time and distance animals are carried depend on the location of the gas containers on the premises and on the type and size of the housings.

Injection of cold gas directly to the animals in the container causes hypothermia.

Verifying *death* while the animals are in the *container* is difficult.

2. Animal-based and other measures

Animal-based measures related to pain, fear and respiratory distress are head shaking, laboured breathing (gasping), escape attempts and high-pitched vocalisations.

Animal-based measures of an effective kill are: absence of signs of life, such as breathing, righting reflex or body movement.

Animal-based measures are difficult to assess due to container design and the presence of gas.

3. Recommendations

Birds should be caught gently and placed in crates or modules of appropriate size and at appropriate stocking densities to allow all birds to sit down. Pigs should also be moved gently and in small groups into the containers.

Containers should not be overcrowded and measures are needed to avoid animals suffocating by climbing on top of each other.

Containers should allow the required CO2 and inert gases concentrations to be maintained and accurately measured.

Sufficient exposure time should be allowed for animals to die before the door is opened.

Each animal should be examined to ensure they are dead.

Any survivors should be killed without delay.

Staff training to acquire knowledge and skills necessary to proper calibration of equipment and monitoring of gas concentrations and relevant exposure times, to ensure that containers are fit for the purpose, gas is vaporised before injection, the rate of injection is correct and temperature inside the chamber is monitored.

This method is suitable for poultry and pigs.

4. Species-specific recommendations

None identified

Article 7.6.28.

Gas introduced into the barn or whole house gassing

This method is the exposure of birds in their housing to an increasing gas concentration. In general, this means that the barn is equipped with gas measuring units and gas tubing for the injection of gas. The barn is closed, and ventilation and other openings are sealed. The gas is injected which results in a gradual increase of the Gas. In practice mainly CO_2 is applied as this gas is most easy to apply and the desired concentration of >45% CO_2 in the breathing air can be reached relatively quickly.

1. Animal welfare concerns

There is no immediate loss of consciousness. Inhalation of increased concentrations of gas while conscious cause respiratory distress.

The induction of the gas makes noise and can lead to a fear response from the birds

2. Animal-based and other measures

Animal-based measures are difficult to assess due to the presence of gas in the whole barn.

Animal-based measures of an effective kill are: absence of signs of life, such as breathing, righting reflex or body movement.

Gas concentrations should be monitored and used as a proxy for animal based measures

3. Recommendations

The barns should be checked before starting the procedure to ensure they can be made air-tight enough for the required gas concentrations can be reached.

Staff entering the barn to prepare the gassing procedure should work calmly to minimize fear reactions from the birds.

Ventilation should be shut down as quickly as possible before starting the gas inlet.

Before removing the gas equipment but after ventilating the barn there should be a check on the effectiveness of the method.

The method is suitable for all poultry species.

4. Species-specific recommendations

None identified

Article 7.6.29.

Water based foam

Water based foam is a low to high density foam created with air. The principle is that animals in their housing or in a confined area are covered with a blanket of foam and that the animals will die due to occlusion of the airways leading to cessation of brain and heart activity (Benson et al 2009). Due to the density, the foam will not penetrate narrow openings or mesh wire structures. This method requires little human-animal interaction and has the capacity to effectively kill large numbers of animals.

1. Animal welfare concerns

Animals do not immediately lose consciousness

Animals will experience distress as oxygen is lost from the environment.

2. Animal-based and other measures

Animal based measures are difficult to assess once animals are covered in foam. Distress behaviours such as escape attempts and vocalizations (pigs) may be seen or heard.

Animal-based measures of an effective kill are: absence of signs of life such as breathing, righting reflex or body movement.

3. Recommendations

The temperature of the foam is determined mainly by the temperature of the water. The temperature of water used should be between (15 and 20 °C).

The foam should be produced with foaming agents that are proven to be non-irritating and having no aversive effect.

Foam should be applied after animals are contained.

Personnel should ensure that there is sufficient time allowed for each batch of animals to die before they are removed from the foam.

This method should only be applied to floor-reared animals.

This method is suitable for poultry, cattle, pigs, and small ruminants.

4. Species-specific recommendations

None identified

Article 7.6.30.

Gas infused high expansion foam

A way to introduce a high gas concentration or to create a situation with very low O2 in containers or in buildings that are difficult to fill with gas is by using a high expansion foam filled with the gas. The most suitable gas is Nitrogen. The principle of the method is that animals are exposed to an environment of > 99% of N2 (or other gas) and die due to anoxia. The high gas concentration is achieved due to the foam being produced using a gas from a pure source instead of with air.

Animals may be kept in their housing, in a confined area or in a special chamber or box. The building, confined area or box is then filled with gas-filled foam until the box is completely filled or the animals are well covered. As the bubbles burst the animals will breathe in an atmosphere containing only the gas released from the foam with less than 1% O2. This very low O2 concentration will induce a rapid loss of consciousness and death.

This method requires little human-animal interaction and has the capacity to effectively kill large numbers of animals however it does require specialized equipment.

1. Animal welfare concerns

   Animals do not immediately lose consciousness

   Animals will experience distress as oxygen is lost from the environment.

2. Animal-based and other measures

   Animal based measures are difficult to assess once animals are covered in foam. Distress behaviours such as escape attempts and vocalizations (pigs) may be seen or heard.

   Animal-based measures of an effective kill are: absence signs of life, such as breathing, righting reflex or body movement.

3. Recommendations

   The foam should be generated with gas from a pure source (preferable >98%).

   The gas should be pre-heated to avoid freezing up the nozzles while the foam is generated.

   The temperature of the foam is determined mainly by the temperature of the water therefore, the temperature of the water used should be between (15 and 20 °C)

   The foam should be produced with a foam agents that is proven to be non-irritating and having no aversive effect.

   Foam should be applied after animals are contained.

   Personnel should ensure that there is sufficient time allowed for each batch of animals to die before they are removed from the foam.

   This method is suitable for poultry and pigs.

4. Species-specific recommendations

   None identified

Article 7.6.31.

Low atmosphere pressure (LAPS)

In this method, the birds are placed in crates or modules into a decompression chamber and are exposed to gradual decompression with a reduction of available oxygen to less than 5% [Martin et al., 2016a,b, c; Holloway and Pritchard, 2017].

When correctly applied, the LAPS procedure leads to loss of consciousness followed by death in all birds. The LAPS procedure does not induce immediate unconsciousness.

Mobile LAPS system can be used for on-farm killing.

1. Animal welfare concerns

   No immediate onset of unconsciousness.

   Rapid decompression and expansion of gases in the body cavity (i.e., sinuses, gut, or air sacs) can cause pain and respiratory distress. Furthermore, conscious birds might get injured from the convulsions of adjacent unconscious animals (i.e., strong wing flapping and leg paddling).

2. Animal-based and other measures

   - Animal- based measures of aversion: escape attempts

- Animal base measures of unconsciousness: loss of posture; loss of posture; absence of movements; tonic-clonic convulsions (wing flapping)

- Animal-based measures of an effective kill are: absence of signs of life such as breathing, righting reflex or body movement.

3. Recommendations

During the first phase, the decompression rate shall not be greater than equivalent to a reduction in pressure from standard sea level atmospheric pressure 760 to 250 Torr for a period of not less than 50 seconds.

During the second phase, a minimum standard sea level atmospheric pressure of 160 Torr shall be reached within the following 210 seconds.

The pressure time curve shall be adjusted to ensure that all animals are irreversibly stunned within the cycle time.

The chamber should be leak tested and pressure gauges calibrated before each operational session and not less than daily during periods of use.

Low atmospheric pressure stunning equipment shall be designed and built to ensure a vacuum within the chamber enabling slow gradual decompression with reduction in available oxygen and holding at minimal pressure.

The system shall be equipped to measure , display and record continuously the absolute vacuum pressure, the time of exposure, the temperature, the humidity and to give a clearly visible and audible warning if the pressure deviates from the required levels. The device should be clearly visible to the personnel.

Rate of decompression, duration of exposure, ambient temperature and humidity are key parameters.

Emergency procedures associated with system failures should be included by the manufacturer in the manufacturer's instructions for the use of the equipment.

This method is suitable for broiler chickens up to proximately 4kg liveweight.

4. Species-specific recommendations

None identified

Article 7.6.32

Ventilation shut down with supplementation

Ventilation shut down with supplementation such as active heating should not be routinely used and should be regarded as a method of last resort for poultry.

The method requires shutting down ventilation in animal housings that rely on the ventilation system to maintain constant temperature and air quality. It is a measure that kills animals predominantly by heat stress and lack of fresh air. Active heating of the ambient air or increasing the humidity in the building during ventilation shut down will shorten time to death and increase the effectiveness of the method.

This method can be effective at killing large numbers of animals with limited human-animal interaction and few resources. The effective implementation of the method can be challenging based on the ambient temperature at the facility and how well the facility can be sealed.

1. Animal welfare concerns

It can take a long time for animals to lose consciousness.

Animals will experience heat stress.

2. Animal-based and other measures

Animal-based measures may only be assessed via video if available.

Animal- based measures of unconsciousness: Loss of posture, absence of movements.

Animal-based measures of an effective kill are: absence of signs of life such as breathing, righting reflex or body movement.

3. Recommendations

Ventilation shut down with supplementation should only be used as a method of last resort.

Facilities must be properly sealed. Facilities that cannot be sealed properly or have poor insulation should not be used, due to the inability to hinder airflow and maintain uniform in-house temperatures depending on the season, and prolonging even further time to loss of consciousness.

Supplemental heaters should be used to increase the temperature of the facility.

Temperatures should be monitored at various heights and locations in the facility and the temperature should exceed 120° F or 49° C.

Humidity should be monitored at various heights and locations in the facility.

This method is a method of last resort suitable for poultry.

4. Species-specific recommendations

None identified

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CHAPTER 8.10.

INFECTION WITH JAPANESE ENCEPHALITIS VIRUS (JAPANESE ENCEPHALITIS)

Article 8.10.1.

General provisions

Japanese encephalitis is a *vector*-borne disease of significant importance to public health transmitted by bites of culicine mosquitoes. Suids are considered amplifying hosts and wild birds are considered to be reservoir and amplifying hosts. Equids are dead-end hosts and therefore, equids and their products do not present a risk of transmission. However, equids may be useful sentinels for the early detection of Japanese encephalitis to mitigate animal health and public health risks posed by the pathogenic agent.

For the purposes of the *Terrestrial Code*, Japanese encephalitis is defined as an *infection* of suids, equids, and wild birds (hereafter 'animal hosts') with Japanese encephalitis virus (JEV).

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

1) JEV has been isolated and identified as such in a sample from an animal host; or

2) nucleic acid or antigen specific to JEV has been detected in a sample from an animal host showing clinical signs or pathological lesions consistent with Japanese encephalitis, or epidemiologically linked to a confirmed or suspected *case*, or giving cause for suspicion of previous association with or exposure to JEV; or

3) seroconversion specific to JEV, which is not the consequence of *vaccination*, has been detected in an animal host; or

4) antibodies specific to JEV, which are not the consequence of *vaccination*, have been detected in a sample from an animal host showing clinical signs or pathological lesions consistent with Japanese encephalitis or epidemiologically linked to a confirmed or suspected *case*, or giving cause for suspicion of previous association with or exposure to JEV.

A notification of infection of equids or wild birds with JEV does not affect the Japanese encephalitis status of a country or zone.

For the purposes of the *Terrestrial Code*, the *infective period* in suids shall be seven days.

Standards for diagnosis and vaccines, as well as information on the epidemiology of this disease, are described in the *Terrestrial Manual*.

Article 8.10.2.

Safe commodities

When authorising the importation or transit of the following *commodities*, *Veterinary Authorities* should not require any Japanese encephalitis-related conditions regardless of the *animal health status* of the country or *zone* of origin:

1) equids and other equid *commodities*;

2) *meat* and *meat products* from suids;

3) *protein meal* and rendered fat from suids;

4) gelatine and collagen from suids; and

5) hides, skins and hair from suids.

Article 8.10.3.

Country or zone free from infection with JEV in suids

A country or *zone* may be considered free from *infection* with JEV when:

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

2) appropriate *biosecurity* and *sanitary measures* to prevent the introduction of *infection* have been in place; in particular, the importation or movements of suids or wild birds and their *commodities* into the country or *zone* have been carried out in accordance with this chapter or other relevant chapters of the *Terrestrial Code,* including Chapter 2.1. 'Import risk analysis';

3) *vaccination* against JEV of suids was not conducted in the entire country or *zone* for the past 12 months;

4) and either:

   a) the country or *zone* is historically free as described in point 2) b) of Article 1.4.6.; or

   b) for at least the past two years, *surveillance* in accordance with Article 8.10.9. has been in place in the entire country or *zone* and there has been no *case* in suids in the country or *zone*.

Article 8.10.4.

Compartment free from infection with JEV in suids

The establishment of a *compartment* free from *infection* with JEV should follow the relevant provisions laid down in Article 8.10.3. 1) and 2) and in Chapters 4.4. and 4.5.

Suids in the free *compartment* should be protected from the bites of culicine mosquitoes in accordance with Article 8.10.8.

Article 8.10.5.

Recovery of free status

To regain free status when an *infection* of JEV occurs in a previously free country or *zone*, Article 8.10.3. applies.

Article 8.10.6.

Recommendations for importation of suids from countries, zones or compartments free from Japanese encephalitis

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

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

2) were kept in a country, *zone* or *compartment* free from Japanese encephalitis since birth or for at least the past 14 days prior to shipment;

3) either,

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

   b. were protected from culicine mosquito bites at all times when transiting through an infected *zone* in accordance with Article 8.10.8.

Article 8.10.7.

Recommendations for importation of suids from countries or zones infected with JEV

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

1) showed no clinical sign of Japanese encephalitis on the day of shipment; and

2) either,

   a. were vaccinated against JEV, and *vaccination* was completed according to the manufacture recommendation at least 21 days and no longer than one year prior to shipment; or

   b. were isolated in a *vector*-protected *quarantine station*, which is located in an area of demonstrated low *vector* activity, for at least 14 days prior to shipment, and were protected from culicine mosquito bites at all times during transportation from the *quarantine station* to the *place of shipment* in accordance with Article 8.10.8.

Article 8.10.8.

Protecting suids from culicine mosquito bites

1) Vector-protected *quarantine station*

The means of protection of the *quarantine station* should at least comprise the following:

   a. appropriate physical barriers at entry and exit points, for example a double-door entry-exit system;

   b. openings of the building are *vector* screened with mesh of appropriate gauge;

   c. *vector surveillance* and *vector* control within and around the building;
   d. measures to limit or eliminate breeding sites for *vectors* in vicinity of the *quarantine station*;

   e. Standard Operating Procedures for operation of the *quarantine station* and for transport of suids to the place of *loading*.

2) During transportation

When transporting unvaccinated suids through countries or *zones* infected with JEV, *Veterinary Authorities* should require that strategies to protect suids from culicine mosquito bites are in place, considering the local ecology of the *vector*.

a. Transport by road

Potential *risk management* strategies include a combination of:

   i. treating animals with an *approved* repellent to prevent bites prior to and during transportation, in *vehicles disinfected* and disinsected with an *approved* insecticide;
   ii. *loading*, transporting and *unloading* animals at times of low *vector* activity;

   iii. ensuring *vehicles* do not stop en route during dawn or dusk, or overnight, unless the *vehicle* is insect proof;

   iv. using historical, ongoing or modelling information on JEV and *surveillance* for *vectors* at common stopping and offloading points to identify low risk ports and transport routes.

b. Transport by air

Prior to *loading* the suids, *containers* are sprayed with an *approved* insecticide.

Containers in which suids 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 insecticide sprayers should be retained for inspection on arrival.

In addition, during any stopover in countries or *zones* where *infection* with JEV occurs, 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 *containers*.

Article 8.10.9.

Surveillance for infection with Japanese encephalitis virus

The objectives of surveillance of Japanese encephalitis are for the *Veterinary Authority* to coordinate in a timely manner with public health and other relevant *Competent Authorities*, to share information to mitigate *risks* to animal health and human health, and to facilitate safe *international trade*.

Surveillance of Japanese encephalitis should be carried out in accordance with Chapter 1.4. and with the following recommendations.

Clinical and syndromic *surveillance* to detect signs of *infection* with JEV in animal hosts are components of an *early warning system*. However, clinical signs are not pathognomonic and not always present. Suspect *cases* should always be confirmed by laboratory testing, taking into account the epidemiological situation.

Oronasal fluids may be used for *surveillance* of Japanese encephalitis in suids due to their ease of collection and non-invasive nature.

Surveillance for Japanese encephalitis often involves serological monitoring. The use of sentinel animals, which provide early indication of local transmission of JEV, may involve several susceptible animals. This may include not only animal hosts but also incidental hosts such as dogs, cattle, goats and domestic birds.

In infected countries, the *Veterinary Authority* should develop *early warning systems* to detect Japanese encephalitis epidemic events, so as to promote awareness campaigns to sensitise the owners and keepers of suids and equids, the *veterinarians*, the public health authorities, and other relevant stakeholders to the disease risk. Environmental surveillance may play a role in detecting JEV in areas where animal hosts are present. This may include sampling of natural water sources, *establishments* and *slaughterhouse* or abattoir wastewater.

Surveillance for vectors conducted in accordance with Chapter 1.5. may be helpful in identifying vector activity and presence of JEV.

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CHAPTER 8.20.

INFECTION WITH FRANCISELLA TULARENSIS (TULAREMIA)

Article 8.20.1.

General provisions

The aim of this chapter is to mitigate the animal health and public health risks posed by tularemia. A wide variety of mammals, including humans, and some birds have been reported to be infected, but tularemia is primarily a disease of the orders Lagomorpha and Rodentia.

For the purposes of the *Terrestrial Code*, tularemia is defined as an *infection* of lagomorphs and rodents (hereafter 'animal hosts') with *Francisella tularensis* subsp. *tularensis* or *Francisella tularensis* subsp. *holarctica*.

Hereafter '*Francisella tularensis*' is used to collectively refer to both *Francisella tularensis* subsp. *tularensis* and *Francisella tularensis* subsp. *holarctica*.

The following defines the occurrence of *infection* with *Francisella tularensis*:

1) *Francisella tularensis* has been isolated and identified as such in a sample from an animal host; or

2) nucleic acid or antigen specific to *Francisella tularensis* has been detected in a sample from an animal host showing clinical signs or pathological lesions consistent with *infection* with *Francisella tularensis*; or epidemiologically linked to a confirmed or suspected *case* or a human infected with *Francisella tularensis*, or giving cause for suspicion of association or contact with *Francisella tularensis*; or
3) seroconversion specific to *Francisella tularensis* has been detected in an animal host; or

4) antibodies specific to *Francisella tularensis* have been detected in a sample from an animal host showing clinical signs or pathological lesions consistent with *infection* with *Francisella tularensis*, or epidemiologically linked to a confirmed or suspected *case* or a human infected with *Francisella tularensis*, or giving cause for suspicion of previous association or contact with *Francisella tularensis*.

For the purposes of the *Terrestrial Code*, the *incubation period* for tularemia ~~(in hares, genus *Lepus*)~~ shall be 15 days.

Standards for diagnosis ~~diagnostic tests~~, as well as information on the epidemiology, are described in the *Terrestrial Manual*.

Article 8.20.2.

~~Tularemia free country~~ Country or zone free from tularemia

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

1) the *infection* has been notifiable in the entire country ~~it has been shown that tularemia has not been present~~ for at least the past two years;

2) for at least the past two years, *specific surveillance* in accordance with Chapter 1.4. has been in place in the entire country or zone, and there has been no *case* in the country or *zone*; ~~and when bacteriological or serological surveys in previously infected *zones* have given negative results~~.

3) appropriate *biosecurity* and *sanitary measures* to prevent the introduction of *infection* have been in place; in particular, the importations or movements of animal hosts and other *commodities* into the country or *zone* have been carried out in accordance with this chapter or other relevant chapters of the *Terrestrial Code,* including Chapter 2.1. 'Import risk analysis';.

Article 8.20.2bis.

Recovery of free status

Should a *case* of *infection* with *Francisella tularensis* occur in a previously free country or *zone*, its status may be recovered one year after the *disinfection* and *disinsection* of the last affected *establishment*, provided that in the entire country or *zone*, *specific surveillance* in accordance with Chapter 1.4. has been carried and has demonstrated the absence of *infection*.

Otherwise, Article 8.20.2. applies.

Article 8.20.3.

~~Tularemia infected zone~~ Country or zone infected with Francisella tularensis

A country or *zone* should be considered as infected with *Francisella tularensis* when the conditions for freedom from tularemia are not fulfilled.~~tularemia until:~~

~~1) at least one year has elapsed after the last *case* has been confirmed;~~

~~AND~~

~~2) a bacteriological survey on ticks within the infected *zone* has given negative results; or~~

~~regular serological testing of hares and rabbits from that *zone* have given negative results.~~

~~Article 8.20.4.~~

~~Trade in commodities~~

~~*Veterinary Authorities* of tularemia free countries may prohibit importation or transit through their territory, from countries considered *infected* with tularemia, of live hares.~~

Article 8.20.5.

Recommendations for importation of hares from countries ~~considered~~ infected with Francisella tularensis~~tularemia~~

~~For live hares~~

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

1) showed no clinical sign of tularemia on the day of shipment;
2) were not kept in an ~~tularemia~~ infected *zone*;

3) have been treated against ~~ectoparasites~~ arthropod *vectors*; and

4) were kept in a *quarantine station* for ~~the~~ at least 15 days prior to shipment.

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CHAPTER 8.X.

INFECTION WITH CRIMEAN-CONGO HAEMORRHAGIC FEVER VIRUS

Article 8.X.1.

General provisions

Crimean-Congo haemorrhagic fever (CCHF) is a zoonotic disease caused by a tick-borne virus that can infect, in general subclinically, a wide variety of vertebrate animals, some of them playing a significant role in the virus transmission to humans.

The aim of this chapter is to mitigate the animal health and public health risks posed by CCHF.

For the purposes of the *Terrestrial Code,* ~~Crimean-Congo haemorrhagic fever~~CCHF is defined as an *infection* of ruminants, dromedary camels and ostriches (hereafter 'animal hosts') with Crimean-Congo haemorrhagic fever virus (CCHFV).

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

1) CCHFV has been isolated and identified as such in a sample from an animal host; or

2) nucleic acid specific to CCHFV has been detected in a sample from an animal host epidemiologically linked to a confirmed or suspected *case,* or to a human infected with CCHFV, or giving cause for suspicion of previous association ~~or contact~~ with or exposure to CCHFV; or

3) antibodies specific to CCHFV have been detected in a sample from an animal host epidemiologically linked to a confirmed or suspected *case,* or to a human infected with CCHFV, or giving cause for suspicion of previous association or contact with CCHFV.

Standards for diagnosis and information on the epidemiology are described in the *Terrestrial Manual*.

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CHAPTER 10.X.

INFECTION WITH AVIAN METAPNEUMOVIRUS (TURKEY RHINOTRACHEITIS AND SWOLLEN HEAD SYNDROME OF CHICKENS)

Article 10.X.1.

General provisions

For the purposes of the *Terrestrial Code*, *infection* with avian metapneumovirus is defined as an *infection* of *poultry* with avian metapneumovirus.

The following defines the occurrence of *infection* with avian metapneumovirus:

1) Avian metapneumovirus, excluding vaccine strains, has been isolated and identified as such in a sample from *poultry*; or

2) nucleic acid specific to avian metapneumovirus, which is not the consequence of *vaccination*, has been detected in a sample from *poultry* showing clinical signs or pathological lesions consistent with *infection* with avian metapneumovirus or is epidemiologically linked to a confirmed or suspected *case*; or

3) seroconversion specific to avian metapneumovirus, which is not the consequence of *vaccination*, has been detected in *poultry*; or

4) antibodies specific to avian metapneumovirus, which are not the consequence of *vaccination*, have been detected in a sample from *poultry* showing clinical signs or pathological lesions consistent with *infection* with avian metapneumovirus, or epidemiologically linked to a confirmed or suspected *case*.

Standards for diagnosis and vaccines, as well as information on the epidemiology, are described in the *Terrestrial Manual.*