

**MEETING OF THE OIE  
TERRESTRIAL ANIMAL HEALTH STANDARDS COMMISSION  
Paris, 12–16 March 2007**

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**Agenda**

- Item 1 General definitions (Chapter 1.1.1.)
- Item 2 Evaluation of Veterinary Services
  - a) Evaluation of Veterinary Services (Chapter 1.3.3.)
  - b) PVS
- Item 3 Zoning and compartmentalisation
  - a) zoning and compartmentalisation (Chapter 1.3.5.)
  - b) practical biosecurity guide for avian influenza and Newcastle disease
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- a) Guidelines for the transport of animals by sea and land
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## CHAPTER 1.1.1.

## GENERAL DEFINITIONS

**Animal handler**

means a person with a knowledge of the behaviour and needs of *animals* ~~who~~ which, with appropriate experience and a professional and positive response to an *animal's* needs, ~~results in~~ can achieve effective management and good welfare. ~~Their competence should be demonstrated through independent assessment and certification from the Competent Authority or from an independent body accredited by the Competent Authority. (under study)~~ Competence should be gained through formal training and/or practical experience.

**Collecting centre**

means a premises or a place ~~in which~~ where *animals for breeding or rearing* or *animals for slaughter* ~~coming~~ from different *establishments* or *markets* are collected together and which is:

- a) ~~under the control of an Official Veterinarian;~~
- b) ~~not located in an infected zone;~~
- c) ~~used only for animals for breeding or rearing or animals for slaughter which meet the conditions of the Terrestrial Code;~~
- d) ~~disinfected before and after use.~~

**Competent Authority**

means the *Veterinary Services*, Authority or other Governmental Authority of a Member Country, having the responsibility and competence for ensuring or supervising the implementation of ~~the~~ animal health and welfare measures ~~or~~ and other standards and guidelines in the *Terrestrial Code* in the entire territory of the country.

**Market**

means a place where animals are assembled for the purpose of trade or sale market which is:

- a) ~~placed under the control of an Official Veterinarian;~~
- b) ~~not located in an infected zone;~~
- c) ~~used only for animals for breeding or rearing or animals for slaughter which conform with the conditions provided in the Terrestrial Code;~~
- d) ~~disinfected before and after use.~~

**Veterinary Administration**

means the governmental *Veterinary Service* having authority in the whole country for implementing the animal health measures and international veterinary certification process which the OIE recommends, and supervising or auditing their application.

Appendix III (contd)***Veterinary Authority***

~~means a *Veterinary Service*, under the authority of the *Veterinary Administration*, which is directly responsible for the application of animal health measures in a specified area of the country. It may also have responsibility for the issuing or the supervision of the issuing of *international veterinary certificates* in that area.~~

means the Governmental Authority of a Member Country, comprising veterinarians, other professionals and para-professionals, having the responsibility and competence for ensuring or supervising the implementation of animal health and welfare measures and other standards and guidelines in the *Terrestrial Code* in the **entire territory of the country**.

***Veterinary Service(s)***

~~means the *Veterinary Administration*, all the *Veterinary Authorities*, and all persons authorised, registered or licensed by the veterinary statutory body.~~

means **the infrastructure comprising** the governmental and non-governmental organisations that **deliver implement** animal health and welfare measures and other standards and guidelines in the *Terrestrial Code* in the **entire territory of the country**. The *Veterinary Services* are under the overall control and direction of the *Veterinary Authority*. Private sector organisations are normally accredited or approved to deliver functions by the *Veterinary Authority*.

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## CHAPTER 1.3.5.

## ZONING AND COMPARTMENTALISATION

(Definition) once adopted, this will move to Chapter 1.1.1.

**Biosecurity plan**

means a plan that identifies potential pathways for the introduction and spread of disease in a zone or compartment, and describes the measures which are being or will be applied to mitigate the disease risks, if applicable, in accordance, when applicable, with the recommendations in the Terrestrial Code. The plan also describes how these measures are audited to ensure that the risks are regularly re-assessed and the measures adjusted accordingly.

Article 1.3.5.1.

**Introduction**

For the purposes of the *Terrestrial Code*, 'zoning' and 'regionalisation' have the same meaning.

Given the difficulty of establishing and maintaining a *disease* free status for an entire country, especially for *diseases* the entry of which is difficult to control through measures at national boundaries, there may be benefits to a Member Countries in establishing and maintaining a *subpopulation* with a ~~different~~ distinct animal health status within ~~national boundaries~~ its territory. *Subpopulations* may be separated by natural or artificial geographical barriers or, in certain situations, ~~animal industries~~ by the application of appropriate management systems practices, including biosecurity management.

Zoning and compartmentalisation are procedures implemented by a country under the provisions of this chapter with a view to defining *subpopulations* of ~~different~~ distinct animal health status within its territory for the purpose of *disease* control and/or *international trade*. Compartmentalisation applies to a subpopulation when management practices systems related to biosecurity are the defining factors applied, while zoning applies when a subpopulation is defined on a geographical basis. While zoning applies to an animal subpopulation defined primarily on a geographical basis (using natural, artificial or legal boundaries), compartmentalisation applies to an animal subpopulation defined primarily by management and husbandry practices related to biosecurity. In practice, spatial considerations and good management play important roles in the application of both concepts.

This chapter is to assist OIE Member Countries wishing to establish and maintain different *subpopulations* within their national borders territory using the principles of compartmentalisation and zoning. These principles should be applied in accordance with the measures recommended in the relevant *disease* chapter(s). ~~‡ This chapter also outlines a process through which for trading partners to follow in achieving recognition of~~ may recognise such *subpopulations*. ~~These procedures are~~ This process is best implemented by trading partners through establishing parameters and gaining agreement on the necessary measures prior to *disease outbreaks*.

Before trade in *animals* or their products may occur, an *importing country* needs to be satisfied that its *animal health status* will be appropriately protected. In most cases, the import regulations developed will rely in part on judgements made about the effectiveness of sanitary procedures undertaken by the *exporting country*, both at its borders and within its territory.

#### Appendix IV (contd)

~~The benefits of~~ As well as contributing to the safety of international trade, zoning and compartmentalisation may ~~include a contribution to assist disease control or eradication within Member Countries, and to the safety of international trade.~~ Zoning may encourage the more efficient use of resources within certain parts of a country ~~to allow trade in certain commodities from that zone in accordance with the Terrestrial Code.~~ and compartmentalisation may allow ~~safe trade due to~~ the functional separation of a *subpopulation* from other domestic or wild animals through biosecurity measures, which a *zone* (through geographical separation) would not achieve. Following a *disease outbreak*, the use of compartmentalisation may ~~be able to allow a Member Country~~ to take advantage of epidemiological links among subpopulations or common practices relating to biosecurity, despite diverse geographical locations, to facilitate *disease control* and/or the resumption continuation of trade.

Zoning and compartmentalisation cannot be applied to all diseases but separate requirements will be developed for each *disease* for which the application of zoning or compartmentalisation is considered appropriate.

To regain free status following a disease outbreak in a zone or compartment, Member Countries should follow the recommendations in the relevant disease chapter in the Terrestrial Code.

Article 1.3.5.2.

#### General considerations

The *Veterinary Services* of an *exporting country* which is establishing a *zone* or *compartment* within its territory for *international trade* purposes should clearly define the *subpopulation* in accordance with the ~~measures stipulated recommendations~~ in the relevant chapters in the *Terrestrial Code*, including those on surveillance, and the identification and traceability of live animals. The *Veterinary Services of an exporting country* ~~and~~ should be able to explain to the *Veterinary Services of an importing country* the basis for its claim of a distinct *animal health status* for the *zone* or *compartment* in such terms.

The procedures used to establish and maintain the distinct *animal health status* of a *zone* or *compartment* should be appropriate to the particular circumstances, and will depend on the epidemiology of the *disease*, environmental factors and applicable biosecurity measures ~~(including movement controls, use of natural and artificial boundaries, commercial management and husbandry practices), and surveillance and monitoring.~~

The authority, organisation and infrastructure of the Veterinary Services, including laboratories, must be clearly documented in accordance with the chapter on the evaluation of Veterinary Services of the Terrestrial Code, to provide confidence in the integrity of the zone or compartment. The final authority of the zone or compartment, for the purposes of domestic and international trade, lies within the Veterinary Administration Authority.

In the context of maintaining the animal health status of a population, references to 'import', 'importation' and 'imported animals/products' found in the Terrestrial Code apply both to importation into a country and to the movement of animals and their products into zones and compartments. Such movements should be the subject of appropriate measures to preserve the health status of the zone/compartment.

The *exporting country* should be able to demonstrate, through detailed documentation published through official channels provided to the importing country, that it has implemented the ~~measures stipulated recommendations~~ in the *Terrestrial Code* for establishing and maintaining such a *zone* or *compartment*.

An *importing country* should recognise the existence of this *zone* or *compartment* when the appropriate measures recommended in the *Terrestrial Code* are applied and the *Veterinary Administration Authority* of the *exporting country* certifies that this is the case.

The exporting country should conduct an assessment of the resources needed and available to establish and maintain a zone or compartment for international trade purposes. These include the human and financial resources, and the technical capability of the Veterinary Services (and of the relevant industry, in the case of a compartment) including disease surveillance and diagnosis.

Biosecurity and surveillance are essential components of zoning and compartmentalisation, and the arrangements should be developed through cooperation of industry and Veterinary Services.

Industry's responsibilities in most cases include the application of biosecurity measures, quality assurance schemes, monitoring the efficacy of the measures, documenting corrective actions, conducting surveillance, rapid reporting and maintenance of records in a readily accessible form.

The Veterinary Services should provide movement certification, periodic inspections of facilities, biosecurity measures, records and surveillance procedures. Veterinary Services should conduct or audit surveillance, and reporting and conduct or oversee laboratory diagnostic examinations.

Article 1.3.5.3.

### **Prerequisite considerations in defining a zone or compartment**

~~The exporting country should conduct an assessment of the resources needed and available to establish and maintain a zone or compartment for international trade purposes. These include the human and financial resources, and the technical capability of the Veterinary Services (and of the relevant industry, in the case of a compartment).~~

Article 1.3.5.4.

### **Principles for defining a zone or compartment**

In conjunction with the above considerations, the following principles should apply when Member Countries defining a zone or a compartment should be based on the application of the following principles:

1. The extent of a zone and its geographical limits should be established by the Veterinary ~~Administration~~ Administration Authority on the basis of natural, artificial and/or legal boundaries, and made public through official channels.
2. The ~~requirements regarding factors defining~~ requirements regarding factors defining a compartment should be established by the Veterinary ~~Administration~~ Administration Authority on the basis of relevant criteria such as ~~biosecurity~~ biosecurity management and husbandry practices related to biosecurity, and made public through official channels.
3. Animals and herds belonging to such subpopulations need to be ~~clearly~~ clearly recognisable as such through a clear epidemiological separation from other animals and all things presenting a disease risk. For a zone or compartment, the Veterinary ~~Administration~~ Administration Authority ~~must~~ must ~~should~~ should document in detail the measures taken to ensure the identification of the subpopulation and the ~~recognition~~ recognition ~~establishment~~ establishment and maintenance of its animal health status through a biosecurity plan. The ~~procedures~~ procedures ~~measures~~ measures used to establish and maintain the distinct animal health status of a zone or compartment should be appropriate to the particular circumstances, and will depend on the epidemiology of the disease, environmental factors, the animal health status of animals in adjacent areas, applicable biosecurity measures (including movement controls, use of natural and artificial boundaries, the spatial separation of animals, and commercial management and husbandry practices), and surveillance.

## Appendix IV (contd)

4. The existence of a valid animal traceability system is a prerequisite to assess the integrity of the zone or compartment. Relevant animals within the zone or compartment should be identified in such a way that their history can be audited. Depending on the system of production, identification may be done at the herd, flock lot or individual animal level. All Relevant animal movements into and out of the zone or compartment should be well documented, controlled and supervised. The existence of a valid animal traceability system is a prerequisite to assess the integrity of the zone or compartment.
5. For a compartment, the biosecurity plan should describe the partnership between the relevant enterprise/industry and the Veterinary Administration Authority, and their respective responsibilities. It should also describe the routine operating procedures to provide clear evidence that the surveillance conducted, the live animal identification and traceability system, and the management practices are adequate to meet the definition of the compartment. In addition to information on animal movement controls, the plan should include herd or flock production records, feed sources, surveillance results, birth and death records, visitor logbook, morbidity and mortality history, medications, vaccinations, documentation of training of relevant personnel and any other criteria necessary for evaluation of risk mitigation. The information required may vary according to the species and disease(s) under consideration. The biosecurity plan should also describe how the measures will be audited to ensure that the risks are regularly re-assessed and the measures adjusted accordingly.
3. ~~Thus defined, the zones and compartments constitute the relevant subpopulations for the application of the recommendations in Part 2 of the Terrestrial Code.~~

Article 1.3.5.5.

### Sequence of steps to be taken in ~~defining~~ establishing a zone/compartment and having it recognised for international trade purposes

There is no single sequence of steps which ~~must~~ should be followed in ~~defining~~ establishing a zone or a compartment. The steps that the Veterinary Services of the importing country and the exporting country choose and implement will generally depend on the circumstances existing within ~~a~~ the countries ~~and at its~~ their borders, and their trading history. The recommended steps are:

1. For zoning
  - a) The exporting country identifies a geographical area within its territory, which it considers to contain an animal subpopulation with a distinct health status with respect to a specific disease/specific diseases, based on surveillance ~~and monitoring~~.
  - b) The exporting country ~~identifies~~ describes in the biosecurity plan for the zone the ~~procedures~~ measures which are being, or ~~could~~ will be, employed ~~applied~~ to distinguish such an area epidemiologically from other parts of its territory, in accordance with the ~~measures stipulated~~ recommendations in the Terrestrial Code.
  - c) The exporting country provides:
    - i) the above information ~~above~~ to the importing country, ~~and explains that~~ with an explanation of why the area can be treated as an epidemiologically separated zone for international trade purposes;
    - ii) access to enable the procedures or systems that establish the zone to be examined and evaluated upon request by the importing country.

- d) The *importing country* determines whether it ~~may~~ accepts such an area as a *zone* for the importation of *animals* and animal products, taking into account:
- i) an evaluation of the *exporting country's Veterinary Services*;
  - ii) the result of a *risk assessment* based on the information provided by the *exporting country* and its own research;
  - iii) its own animal health situation with respect to the *disease(s)* concerned; and
  - iv) other relevant OIE standards.
- e) The *importing country* notifies the *exporting country* of ~~the result of~~ its determination and the underlying reasons, within a reasonable period of time, being ~~either~~:
- i) recognition of the *zone*, or
  - ii) request for further information; or
  - iii) rejection of the area as a *zone* for *international trade* purposes.
- f) An attempt should be made to resolve any differences over ~~the definition~~ recognition of the *zone*, either in the interim or finally, by using an agreed mechanism to reach consensus (such as the OIE in-house procedure for settlement of disputes [Article 1.3.1.3.] ~~settlement mechanism~~).
- g) The Veterinary Administrations Authority of the *importing country* and the *exporting country* ~~may~~ should enter into a formal agreement ~~defining~~ recognizing the *zone*.

## 2. For compartmentalisation

- a) Based on discussions with the relevant enterprise/industry, the *exporting country* identifies within its territory a compartment of one or more *establishments* or other premises owned by an enterprise(s) which operates under a common biosecurity management system practices related to biosecurity, and which ~~it considers~~ contains an identifiable animal *subpopulation* with a distinct animal health status with respect to a specific *disease/specific diseases*; ~~and the exporting country describes how that~~ this status is maintained through a partnership between the relevant enterprise/industry and the Veterinary Services Authority of the *exporting country*.
- b) The *exporting country* examines the compartment's 'biosecurity plan management manual' produced by the ~~enterprise/industry for such establishment(s)~~, and confirms through an audit that:
- i) ~~such establishment(s)~~ the compartment is(are) epidemiologically closed throughout its routine operating procedures as a result of effective implementation of its 'biosecurity plan management manual'; and
  - ii) the surveillance and monitoring programme in place is appropriate to verify the ~~free~~ status of such *establishment(s)* with respect to such *disease(s)*.
- c) The *exporting country* ~~identifies~~ describes the ~~such an enterprise to be a free compartment~~, in accordance with the ~~measures stipulated~~ recommendations in the *Terrestrial Code*.

## Appendix IV (contd)

- d) The *exporting country* provides:
- i) the above information ~~above~~ to the *importing country*, ~~and explains that~~ with an explanation of why such an enterprise establishment(s) can be treated as an epidemiologically separated *compartment* for *international trade* purposes; and
  - ii) access to enable the procedures or systems that establish the compartment to be examined and evaluated upon request by the importing country.
- e) The *importing country* determines whether it ~~may~~ accepts such an enterprise establishment(s) as a *compartment* for the importation of animals and animal products, taking into account:
- i) an evaluation of the *exporting country's Veterinary Services*;
  - ii) the result of a *risk assessment* based on the information provided by the *exporting country* and its own research;
  - iii) its own animal health situation with respect to the *disease(s)* concerned; and
  - iv) other relevant OIE standards.
- f) The *importing country* notifies the *exporting country* of the result of its examination determination and the underlying reasons, within a reasonable period of time, being ~~either~~:
- i) recognition of the *compartment*; or
  - ii) request for further information; or
  - iii) rejection of such an enterprise establishment(s) as a *compartment* for international trade purposes.
- g) An attempt should be made to resolve any differences over the definition recognition of the *compartment*, either in the interim or finally, by using an agreed mechanism to reach consensus (such as the OIE in-house procedure for settlement of disputes [Article 1.3.1.3.] ~~settlement mechanism~~).
- h) The Veterinary Administrations Authority of the *importing country* and the *exporting country* ~~may~~ should enter into a formal agreement ~~defining~~ recognizing the *compartment*.

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## CHAPTER 2.2.5.

**RABIES**

## Article 2.2.5.1.

For the purposes of the *Terrestrial Code*, the *incubation period* for rabies shall be 6 months, and the *infective period* in domestic carnivores starts 15 days before the onset of the first clinical signs and ends when the animal dies.

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

## Article 2.2.5.2.

**Rabies free country**

A country may be considered free from rabies when:

1. the disease is notifiable;
2. an effective system of disease surveillance is in operation;
3. all regulatory measures for the prevention and control of rabies have been implemented including effective importation procedures;
4. no *case* of indigenously acquired rabies infection has been confirmed in man or any animal species during the past 2 years; however, this status would not be affected by the isolation of a European Bat Lyssa virus (EBL1 or EBL2);
5. no imported case in carnivores has been confirmed outside a *quarantine station* for the past 6 months.

## Article 2.2.5.3.

When importing from rabies free countries, *Veterinary Administrations* should require:

for domestic mammals, and wild mammals reared under confined conditions

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of rabies on the day of shipment;
2. were kept since birth or for the 6 months prior to shipment in a rabies free country or were imported in conformity with the regulations stipulated in Articles 2.2.5.5., 2.2.5.6. or 2.2.5.7.

## Article 2.2.5.4.

When importing from rabies free countries, *Veterinary Administrations* should require:

for wild mammals not reared under confined conditions

the presentation of an *international veterinary certificate* attesting that the animals:

Appendix V (contd)

1. showed no clinical sign of rabies on the day of shipment;
2. have been captured in a rabies free country, at a sufficient distance from any infected country. The distance should be defined according to the species exported and the reservoir species in the infected country.

## Article 2.2.5.5.

When importing from countries considered infected with rabies, *Veterinary Administrations* should require:

for dogs and cats

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of rabies within 48 hours of shipment;

AND EITHER

2. were vaccinated against rabies:
  - a) not less than 6 months and not more than one year prior to shipment in the case of a primary vaccination, which should have been carried out when the animals were at least 3 months old;
  - b) not more than one year prior to shipment in the case of a booster vaccination;
  - c) with an inactivated virus vaccine or with a recombinant vaccine expressing the rabies virus glycoprotein; and
- ~~3.~~ were identified by a permanent mark (including a microchip) before the vaccination (their identification number shall be stated in the certificate);
- ~~4.3.~~ were subjected not less than 3 months and not more than 24 months prior to shipment to an antibody test as prescribed in the *Terrestrial Manual* with a positive result equivalent to at least 0.5 IU/ml;

OR

- ~~5.4.~~ have not been vaccinated against rabies or do not meet all the conditions set out in points 1), 2), 3) and 4) above; in such cases, the *importing country* may require the placing of the animals in a *quarantine station* located on its territory, in conformity with the conditions stipulated in its animal health legislation.

## Article 2.2.5.6.

When importing from countries considered infected with rabies, *Veterinary Administrations* should require:

for domestic ruminants, equines and pigs

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of rabies on the day of shipment;

Appendix V (contd)

2. were kept for the 6 months prior to shipment in an *establishment* where separation from wild and feral animals was maintained and where no *case* of rabies was reported for at least 12 months prior to shipment.

## Article 2.2.5.7.

When importing from countries considered infected with rabies, *Veterinary Administrations* should require:

for laboratory reared rodents and lagomorphs, and lagomorphs or wild mammals (other than non-human primates) reared under confined conditions

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of rabies on the day of shipment;
2. were kept since birth, or for the 12 months prior to shipment, in an *establishment* where no *case* of rabies was reported for at least 12 months prior to shipment.

## Article 2.2.5.8.

When importing from countries considered infected with rabies, *Veterinary Administrations* should require:

for wild mammals not belonging to the orders of primates or carnivores and not reared under confined conditions

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of rabies on the day of shipment;
2. were kept in a *quarantine station* for the 6 months prior to shipment.

## Article 2.2.5.9.

When importing from countries considered infected with rabies, *Veterinary Administrations* should require:

for frozen semen of dogs

the presentation of an *international veterinary certificate* attesting that the donor animals showed no clinical sign of rabies during the 15 days following collection of the semen.



## CHAPTER 2.2.10.

## FOOT AND MOUTH DISEASE

(Definition) once adopted, this will move to Chapter 1.1.1.

**Containment zone**

means a defined zone around and including suspected or infected establishments taking into account the epidemiological factors and results of investigations, where control measures to prevent the spread of the infection are applied.

Article 2.2.10.1.

For the purposes of this *Terrestrial Code*, the *incubation period* for foot and mouth disease (FMD) shall be 14 days.

For the purposes of this Chapter, ruminants include animals of the family of Camelidae.

For the purposes of this Chapter, a *case* includes an animal infected with FMD virus (FMDV).

For the purposes of *international trade*, this Chapter deals not only with the occurrence of clinical signs caused by FMDV, but also with the presence of infection with FMDV in the absence of clinical signs.

The following defines the occurrence of FMDV infection:

1. FMDV has been isolated and identified as such from an animal or a product derived from that animal; or
2. viral antigen or viral RNA specific to one or more of the serotypes of FMDV has been identified in samples from one or more animals whether showing clinical signs consistent with FMD or not, or epidemiologically linked to a confirmed or suspected *outbreak* of FMD, or giving cause for suspicion of previous association or contact with FMDV; or
3. antibodies to structural or nonstructural proteins of FMDV that are not a consequence of vaccination, have been identified in one or more animals showing clinical signs consistent with FMD, or epidemiologically linked to a confirmed or suspected *outbreak* of FMD, or giving cause for suspicion of previous association or contact with FMDV.

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

Article 2.2.10.2.

**FMD free country where vaccination is not practised**

Susceptible animals in the FMD free country should be separated from neighbouring infected countries by a *buffer zone*, or physical or geographical barriers, and animal health measures that effectively prevent the entry of the virus should be implemented.

Appendix VI (contd)

To qualify for inclusion in the existing list of FMD free countries where vaccination is not practised, a country should:

1. have a record of regular and prompt animal disease reporting;
2. send a declaration to the OIE stating that:
  - a) there has been no *outbreak* of FMD during the past 12 months;
  - b) no evidence of FMDV infection has been found during the past 12 months;
  - c) no vaccination against FMD has been carried out during the past 12 months;
  - d) no vaccinated animal has been introduced since the cessation of vaccination;

~~and~~

3. supply documented evidence that:
  - a) surveillance for both FMD and FMDV infection in accordance with Appendix 3.8.7. is in operation; ~~and that~~
  - b) regulatory measures for the prevention and control of FMD have been implemented;
- ~~3. not have imported since the cessation of vaccination any animals vaccinated against FMD.~~

The country will be included in the list only after the submitted evidence has been accepted by the OIE. Retention on the list requires that the information required in points 2 and 3a) above, should be submitted annually to the OIE.

Article 2.2.10.3.

### **FMD free country where vaccination is practised**

Susceptible animals in the FMD free country where vaccination is practised should be separated from neighbouring infected countries by a *buffer zone*, or physical or geographical barriers, and animal health measures that effectively prevent the entry of the virus should be implemented.

To qualify for inclusion in the list of FMD free countries where vaccination is practised, a country should:

1. have a record of regular and prompt animal disease reporting;
2. send a declaration to the OIE that there has been no *outbreak* of FMD for the past 2 years and no evidence of FMDV circulation for the past 12 months, with documented evidence that:

- a) surveillance for FMD and FMDV circulation in accordance with Appendix 3.8.7. is in operation, and that regulatory measures for the prevention and control of FMD have been implemented;
- b) routine vaccination is carried out for the purpose of the prevention of FMD;
- c) the vaccine used complies with the standards described in the *Terrestrial Manual*.

The country will be included in the list only after the submitted evidence has been accepted by the OIE. Retention on the list requires that the information required in point 2 above, should be submitted annually to the OIE.

If an FMD free country where vaccination is practised wishes to change its status to FMD free country where vaccination is not practised, the country should wait for 12 months after vaccination has ceased then notify the OIE and provide evidence showing that FMDV circulation has not occurred during that period.

Article 2.2.10.4.

### **FMD free zone where vaccination is not practised**

An FMD free zone where vaccination is not practised can be established in either an FMD free country where vaccination is practised or in a country of which parts are infected. In defining such zones the principles of Chapter 1.3.5. should be followed. Susceptible animals in the FMD free zone should be separated from the rest of the country ~~if infected~~, and from neighbouring ~~infected~~ countries, if of a different health status, by a *buffer zone*, or physical or geographical barriers, and ~~A~~ animal health measures that effectively prevent the entry of the virus should be implemented.

A country in which an FMD free zone where vaccination is not practised is to be established should:

1. have a record of regular and prompt animal disease reporting;
2. send a declaration to the OIE stating that it wishes to establish an FMD free zone where vaccination is not practised and that within the proposed FMD free zone:
  - a) there has been no *outbreak* of FMD during the past 12 months;
  - b) no evidence of FMDV infection has been found during the past 12 months;
  - c) no vaccination against FMD has been carried out during the past 12 months;
  - d) no vaccinated animal has been introduced since the cessation of vaccination, except in accordance with Article 2.2.10.8.;

e)3. supply documented evidence shows that surveillance in accordance with Appendix 3.8.7. is in operation for both FMD and FMDV infection in the proposed FMD free zone where vaccination is not practised;

4.3 describe in detail:

Appendix VI (contd)

- a) regulatory measures for the prevention and control of both FMD and FMDV infection,
- b) the boundaries of the proposed FMD free zone and, if applicable, the *buffer zone* or physical or geographical barriers,
- c) the system for preventing the entry of the virus (including the control of the movement of susceptible animals) into the proposed FMDV free zone (in particular if the procedure described in Article 2.2.10.8. is implemented),

and supply documented evidence that these are properly implemented and supervised.

The proposed free zone will be included in the list of FMD free zones where vaccination is not practiced only after the submitted evidence has been accepted by the OIE.

The information required in points 2, and 3 and 4 c) above should be submitted annually as well as any relevant changes under points 4 3 a) and b).

Article 2.2.10.5.

### **FMD free zone where vaccination is practised**

An FMD free zone where vaccination is practised can be established in either an FMD free country where vaccination is not practised or in a country of which parts are infected. In defining such zones the principles of Chapter 1.3.5. should be followed. Susceptible animals in the FMD free zone where vaccination is practised should be separated from the rest of the country, ~~if infected,~~ and from neighbouring ~~infected~~ countries, if of a different health status, by a *buffer zone*, or physical or geographical barriers, and ~~A~~ animal health measures that effectively prevent the entry of the virus should be implemented.

A country in which an FMD free zone where vaccination is practised is to be established should:

1. have a record of regular and prompt animal disease reporting;
2. send a declaration to the OIE that it wishes to establish an FMD free zone where vaccination is practised and that within the proposed FMD free zone, where
  - a) there has been no *outbreak* of FMD for the past 2 years;
  - b) ~~and~~ no evidence of FMDV circulation for the past 12 months; ~~with~~
  - c) documented evidence shows that surveillance in accordance with Appendix 3.8.7. is in operation for FMD and FMDV circulation in the proposed FMD free zone;
3. supply documented evidence that the vaccine used complies with the standards described in the *Terrestrial Manual*;
4. describe in detail:
  - a) regulatory measures for the prevention and control of both FMD and FMDV circulation,

- b) the boundaries of the proposed FMD free zone where vaccination is practised and, if applicable, the *buffer zone* or physical or geographical barriers,
- c) the system for preventing the entry of the virus into the proposed FMD free zone (in particular if the procedure described in Article 2.2.10.8. is implemented),

and supply evidence that these are properly implemented and supervised;

- 5. ~~supply documented evidence that it has a system of intensive and frequent surveillance for FMD in the FMD free zone where vaccination is practised.~~

The proposed free zone will be included in the list of FMD free zones where vaccination is practised only after the submitted evidence has been accepted by the OIE. The information required in points 2, 3 and 4 c) above should be submitted annually as well as any relevant changes under points 4 a) and b).

If a country that has an FMD free zone where vaccination is practised wishes to change the status of the zone to FMD free zone where vaccination is not practised, a waiting period of 12 months after vaccination has ceased is required and evidence must be provided showing that FMDV infection has not occurred in the said zone during that period

Article 2.2.10.6.

### **FMD infected country or zone**

An FMD infected country is a country that does not fulfil the requirements to qualify as either an FMD free country where vaccination is not practised or an FMD free country where vaccination is practised.

An FMD infected zone is a *zone* that does not fulfil the requirements to qualify as either an FMD free zone where vaccination is not practised or an FMD free zone where vaccination is practised.

Article 2.2.10.6 (bis) (under study)

### **Establishment of a containment zone within an FMD free country or zone**

In the event of a limited *outbreak* within an FMD free country or zone with or without vaccination, a *single containment zone, which includes all cases*, can be established for the purpose of minimizing the impact on the entire country or *zone*. For this to be achieved, the *Veterinary Administration* should provide documented evidence that:

1. the *outbreak* is limited based on the following factors:
  - a) immediately on suspicion, a rapid response including notification has been made;
  - b) standstill of animal movements has been imposed, and effective controls on the movement of other commodities mentioned in this chapter are in place;
  - c) epidemiological investigation (trace-back, trace-forward) has been completed;
  - ~~a) a single "containment zone" has been defined;~~
  - ed) the infection has been confirmed;

## Appendix VI (contd)

- fe) the primary case and its source of the outbreak have been identified;
- gf) all cases have been shown to be epidemiologically linked and are within the "containment zone";
2. surveillance, in accordance with Appendix 3.8.7., demonstrates that there are no undetected cases in the containment zone;
  3. a stamping-out policy has been applied;
  4. increased passive and targeted surveillance in accordance with Appendix 3.8.7. in the rest of the country or zone has been carried out and has not detected any evidence of infection;
  5. measures to prevent spread of the infection from the containment zone to the rest of the country or zone, including ongoing surveillance in the containment zone, are in place.

The free status of the areas outside the containment zone would be suspended pending the establishment of the containment zone. The suspension of free status of these areas could be lifted irrespective of the provisions of Article 2.2.10.7., once the containment zone is clearly established, by complying with points 1 to 5 above.

The recovery of the FMD free status of the containment zone should follow the provisions of Article 2.2.10.7.

Article 2.2.10.7.

### **Recovery of free status**

1. When an FMD outbreak or FMDV infection occurs in an FMD free country or zone where vaccination is not practised, one of the following waiting periods is required to regain the status of FMD free country or zone where vaccination is not practised:
  - a) 3 months after the last case where a stamping-out policy and serological surveillance are applied in accordance with Appendix 3.8.7.; or
  - b) 3 months after the slaughter of all vaccinated animals where a stamping-out policy, emergency vaccination and serological surveillance are applied in accordance with Appendix 3.8.7.; or
  - c) 6 months after the last case or the last vaccination (according to the event that occurs the latest), where a stamping-out policy, emergency vaccination not followed by the slaughtering of all vaccinated animals, and serological surveillance are applied in accordance with Appendix 3.8.7., provided that a serological survey based on the detection of antibodies to nonstructural proteins of FMDV demonstrates the absence of infection in the remaining vaccinated population.

Where a stamping-out policy is not practised, the above waiting periods do not apply, and Article 2.2.10.2. or 2.2.10.4. applies.

2. When an FMD outbreak or FMDV infection occurs in an FMD free country or zone where vaccination is practised, one of the following waiting periods is required to regain the status of FMD free country or zone where vaccination is practised:

- a) 6 months after the last *case* where a *stamping-out policy*, emergency vaccination and serological surveillance in accordance with Appendix 3.8.7. are applied, provided that the serological surveillance based on the detection of antibodies to nonstructural proteins of FMDV demonstrates the absence of virus circulation; or
- b) 18 months after the last *case* where a *stamping-out policy* is not applied, but emergency vaccination and serological surveillance in accordance with Appendix 3.8.7. are applied, provided that the serological surveillance based on the detection of antibodies to nonstructural proteins of FMDV demonstrates the absence of virus circulation.

Article 2.2.10.8.

**Transfer directly to slaughter of FMD susceptible animals from an infected zone to a free zone within a country**

FMD susceptible animals should only leave the infected zone if moved by mechanised transport to the nearest designated *abattoir* located in the *buffer zone* directly to slaughter.

In the absence of an *abattoir* in the *buffer zone*, live FMD susceptible animals can be transported to the nearest *abattoir* in a free zone directly to slaughter only under the following conditions:

1. no FMD susceptible animal has been introduced into the *establishment* of origin and no animal in the *establishment* of origin has shown clinical signs of FMD for at least 30 days prior to movement;
2. the animals were kept in the *establishment* of origin for at least 3 months prior to movement;
3. FMD has not occurred within a 10-kilometre radius of the *establishment* of origin for at least 3 months prior to movement;
4. the animals must be transported under the supervision of the *Veterinary Authority* in a *vehicle*, which was cleansed and disinfected before *loading*, directly from the *establishment* of origin to the *abattoir* without coming into contact with other susceptible animals;
5. such an *abattoir* is not approved for the export of *fresh meat* during the time it is handling the meat of animals from the infected zone;
6. *vehicles* and the *abattoir* must be subjected to thorough cleansing and *disinfection* immediately after use.

All products obtained from the animals and any products coming into contact with them must be considered infected, and treated in such a way as to destroy any residual virus in accordance with Appendix 3.6.2.

Animals moved into a free zone for other purposes must be moved under the supervision of the *Veterinary Authority* and comply with the conditions in Article 2.2.10.11.

Article 2.2.10.9.

When importing from FMD free countries where vaccination is not practised or FMD free zones where vaccination is not practised, *Veterinary Administrations* should require:

Appendix VI (contd)for FMD susceptible animals

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of FMD on the day of shipment;
2. were kept in an FMD free country or zone where vaccination is not practised since birth or for at least the past 3 months.
3. have not been vaccinated.

Article 2.2.10.10.

When importing from FMD free countries where vaccination is practised or from FMD free zones where vaccination is practised, *Veterinary Administrations* should require:

for domestic ruminants and pigs

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of FMD on the day of shipment;
2. were kept in an FMD free country or zone since birth or for at least the past 3 months; and
3. have not been vaccinated and were subjected, with negative results, to tests for antibodies against FMD virus, when destined to an FMD free country or zone where vaccination is not practised.

Article 2.2.10.11.

When importing from FMD infected countries or zones, *Veterinary Administrations* should require:

for domestic ruminants and pigs

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of FMD on the day of shipment;
2. were kept in the *establishment* of origin since birth, or
  - a) for the past 30 days, if a *stamping-out policy* is in force in the *exporting country*, or
  - b) for the past 3 months, if a *stamping-out policy* is not in force in the *exporting country*,

and that FMD has not occurred within a ten-kilometre radius of the *establishment* of origin for the relevant period as defined in points a) and b) above; and

3. were isolated in an *establishment* for the 30 days prior to shipment, and all animals in isolation were subjected to diagnostic tests (probang and serology) for evidence of FMDV infection with negative results at the end of that period, and that FMD did not occur within a ten-kilometer radius of the *establishment* during that period; or

Appendix VI (contd)

4. were kept in a *quarantine station* for the 30 days prior to shipment, all animals in quarantine were subjected to diagnostic tests (probang and serology) for evidence of FMDV infection with negative results at the end of that period, and that FMD did not occur within a ten-kilometre radius of the *quarantine station* during that period;
5. were not exposed to any source of FMD infection during their transportation from the *quarantine station* to the *place of shipment*.

## Article 2.2.10.12.

When importing from FMD free countries where vaccination is not practised or FMD free zones where vaccination is not practised, *Veterinary Administrations* should require:

for fresh semen of domestic ruminants and pigs

the presentation of an *international veterinary certificate* attesting that:

1. the donor animals:
  - a) showed no clinical sign of FMD on the day of collection of the semen;
  - b) were kept in an FMD free country or zone where vaccination is not practised for at least 3 months prior to collection;
2. the semen was collected, processed and stored in conformity with the provisions of Appendix 3.2.1. or Appendix 3.2.2., as relevant.

## Article 2.2.10.13.

When importing from FMD free countries where vaccination is not practised or FMD free zones where vaccination is not practised, *Veterinary Administrations* should require:

for frozen semen of domestic ruminants and pigs

the presentation of an *international veterinary certificate* attesting that:

1. the donor animals:
  - a) showed no clinical sign of FMD on the day of collection of the semen and for the following 30 days;
  - b) were kept in an FMD free country or zone where vaccination is not practised for at least 3 months prior to collection;
2. the semen was collected, processed and stored in conformity with the provisions of Appendix 3.2.1. or Appendix 3.2.2., as relevant.

## Article 2.2.10.14.

When importing from FMD free countries where vaccination is practised or from FMD free zones where vaccination is practised, *Veterinary Administrations* should require:

Appendix VI (contd)for semen of domestic ruminants and pigs

the presentation of an *international veterinary certificate* attesting that:

1. the donor animals:
  - a) showed no clinical sign of FMD on the day of collection of the semen and for the following 30 days;
  - b) were kept in a country or zone free from FMD for at least 3 months prior to collection;
  - c) if destined to an FMD free country or zone where vaccination is not practised:
    - i) have not been vaccinated and were subjected, not less than 21 days after collection of the semen, to tests for antibodies against FMD virus, with negative results; or
    - ii) had been vaccinated at least twice, with the last vaccination not more than 12 and not less than one month prior to collection;
2. no other animal present in the *artificial insemination centre* has been vaccinated within the month prior to collection;
3. the semen:
  - a) was collected, processed and stored in conformity with the provisions of Appendix 3.2.1. or Appendix 3.2.2., as relevant;
  - b) was stored in the country of origin for a period of at least one month following collection, and during this period no animal on the *establishment* where the donor animals were kept showed any sign of FMD.

Article 2.2.10.15.

When importing from FMD infected countries or zones, *Veterinary Administrations* should require:

for semen of domestic ruminants and pigs

the presentation of an *international veterinary certificate* attesting that:

1. the donor animals:
  - a) showed no clinical sign of FMD on the day of collection of the semen;
  - b) were kept in an *establishment* where no animal had been added in the 30 days before collection, and that FMD has not occurred within 10 kilometres for the 30 days before and after collection;
  - c) have not been vaccinated and were subjected, not less than 21 days after collection of the semen, to tests for antibodies against FMD virus, with negative results; or
  - d) had been vaccinated at least twice, with the last vaccination not more than 12 and not less than one month prior to collection;

Appendix VI (contd)

2. no other animal present in the *artificial insemination centre* has been vaccinated within the month prior to collection;
3. the semen:
  - a) was collected, processed and stored in conformity with the provisions of Appendix 3.2.1. or Appendix 3.2.2., as relevant;
  - b) was subjected, with negative results, to a test for FMDV infection if the donor animal has been vaccinated within the 12 months prior to collection;
  - c) was stored in the country of origin for a period of at least one month following collection, and during this period no animal on the *establishment* where the donor animals were kept showed any sign of FMD.

Article 2.2.10.16.

Irrespective of the FMD status of the *exporting country or zone*, *Veterinary Administrations* should authorise without restriction on account of FMD the import or transit through their territory of *in vivo* derived embryos of cattle subject to the presentation of an *international veterinary certificate* attesting that the embryos were collected, processed and stored in conformity with the provisions of Appendix 3.3.1. or Appendix 3.3.3., as relevant.

Article 2.2.10.17.

When importing from FMD free countries where vaccination is not practised or FMD free zones where vaccination is not practised, *Veterinary Administrations* should require:

for *in vitro* produced embryos of cattle

the presentation of an *international veterinary certificate* attesting that:

1. the donor females:
  - a) showed no clinical sign of FMD at the time of collection of the oocytes;
  - b) were kept in a country or zone free from FMD at the time of collection;
2. fertilisation was achieved with semen meeting the conditions referred to in Articles 2.2.10.12., 2.2.10.13., 2.2.10.14. or 2.2.10.15., as relevant;
3. the oocytes were collected, and the embryos were processed and stored in conformity with the provisions of Appendix 3.3.2. or Appendix 3.3.3., as relevant.

Article 2.2.10.18.

When importing from FMD free countries where vaccination is practised or from FMD free zones where vaccination is practised, *Veterinary Administrations* should require:

for *in vitro* produced embryos of cattle

Appendix VI (contd)

the presentation of an *international veterinary certificate* attesting that:

1. the donor females:
  - a) showed no clinical sign of FMD at the time of collection of the oocytes;
  - b) were kept in a country or zone free from FMD for at least 3 months prior to collection;
  - c) if destined for an FMD free country or zone where vaccination is not practised:
    - i) have not been vaccinated and were subjected, with negative results, to tests for antibodies against FMD virus, or
    - ii) had been vaccinated at least twice, with the last vaccination not less than one month and not more than 12 months prior to collection;
2. no other animal present in the *establishment* has been vaccinated within the month prior to collection;
3. fertilization was achieved with semen meeting the conditions referred to in Articles 2.2.10.12., 2.2.10.13., 2.2.10.14. or 2.2.10.15., as relevant;
4. the oocytes were collected, and the embryos were processed and stored in conformity with the provisions of Appendix 3.3.2. or Appendix 3.3.3., as relevant.

Article 2.2.10.19.

When importing from FMD free countries where vaccination is not practised or FMD free zones where vaccination is not practised, *Veterinary Administrations* should require:

for fresh meat of FMD susceptible animals

the presentation of an *international veterinary certificate* attesting that the entire consignment of meat comes from animals which:

1. have been kept in the FMD free country or zone where vaccination is not practised since birth, or which have been imported in accordance with Article 2.2.10.9., Article 2.2.10.10. or Article 2.2.10.11.;
2. have been slaughtered in an *approved abattoir* and have been subjected to ante-mortem and post-mortem inspections for FMD with favourable results.

Article 2.2.10.20.

When importing from FMD free countries where vaccination is practised or from FMD free zones where vaccination is practised, *Veterinary Administrations* should require:

for fresh meat of cattle and buffalo (*Bubalus bubalis*) (excluding feet, head and viscera)

the presentation of an *international veterinary certificate* attesting that the entire consignment of meat comes from animals which:

Appendix VI (contd)

1. have been kept in the FMD free country or zone where vaccination is practised since birth, or which have been imported in accordance with Article 2.2.10.9., Article 2.2.10.10. or Article 2.2.10.11.;
2. have been slaughtered in an *approved abattoir* and have been subjected to ante-mortem and post-mortem inspections for FMD with favourable results.

Article 2.2.10.21.

When importing from FMD free countries where vaccination is practised or from FMD free zones where vaccination is practised, *Veterinary Administrations* should require:

for fresh meat or meat products of pigs and ruminants other than cattle and buffalo

the presentation of an *international veterinary certificate* attesting that the entire consignment of meat comes from animals which:

1. have been kept in the FMD free country or zone where vaccination is practised since birth, or which have been imported in accordance with Article 2.2.10.9., Article 2.2.10.10. or Article 2.2.10.11.;
2. have been slaughtered in an *approved abattoir* and have been subjected to ante-mortem and post-mortem inspections for FMD with favourable results.

Article 2.2.10.22.

When importing from FMD infected countries or zones, where an official control programme exists, involving compulsory systematic vaccination of cattle, *Veterinary Administrations* should require:

for fresh meat of cattle and buffalo (*Bubalus bubalis*) (excluding feet, head and viscera)

the presentation of an *international veterinary certificate* attesting that the entire consignment of meat:

1. comes from animals which:
  - a) have remained in the *exporting country* for at least 3 months prior to slaughter;
  - b) have remained, during this period, in a part of the country where cattle are regularly vaccinated against FMD and where official controls are in operation;
  - c) have been vaccinated at least twice with the last vaccination not more than 12 months and not less than one month prior to slaughter;
  - d) were kept for the past 30 days in an *establishment*, and that FMD has not occurred within a ten-kilometre radius of the *establishment* during that period;
  - e) have been transported, in a *vehicle* which was cleansed and disinfected before the cattle were loaded, directly from the *establishment* of origin to the *approved abattoir* without coming into contact with other animals which do not fulfil the required conditions for export;

Appendix VI (contd)

- f) have been slaughtered in an *approved abattoir*:
    - i) which is officially designated for export;
    - ii) in which no FMD has been detected during the period between the last *disinfection* carried out before slaughter and the shipment for export has been dispatched;
  - g) have been subjected to ante-mortem and post-mortem inspections for FMD with favourable results within 24 hours before and after slaughter;
2. comes from deboned carcasses:
- a) from which the major lymphatic nodes have been removed;
  - b) which, prior to deboning, have been submitted to maturation at a temperature above + 2°C for a minimum period of 24 hours following slaughter and in which the pH value was below 6.0 when tested in the middle of both the longissimus dorsi.

Article 2.2.10.23.

When importing from FMD infected countries or zones, *Veterinary Administrations* should require:

for meat products of domestic ruminants and pigs

the presentation of an *international veterinary certificate* attesting that:

1. the entire consignment of *meat* comes from animals which have been slaughtered in an *approved abattoir* and have been subjected to ante-mortem and post-mortem inspections for FMD with favourable results;
2. the *meat* has been processed to ensure the destruction of the FMD virus in conformity with one of the procedures referred to in Article 3.6.2.1.;
3. the necessary precautions were taken after processing to avoid contact of the *meat products* with any potential source of FMD virus.

Article 2.2.10.24.

When importing from FMD free countries or zones (where vaccination either is or is not practised), *Veterinary Administrations* should require:

for milk and milk products intended for human consumption and for products of animal origin (from FMD susceptible animals) intended for use in animal feeding or for agricultural or industrial use

the presentation of an *international veterinary certificate* attesting that these products come from animals which have been kept in the country or zone since birth, or which have been imported in accordance with Article 2.2.10.9., Article 2.2.10.10. or Article 2.2.10.11.

## Article 2.2.10.25.

When importing from FMD infected countries or zones where an official control programme exists, *Veterinary Administrations* should require:

for milk, cream, milk powder and milk products

the presentation of an *international veterinary certificate* attesting that:

1. these products:
  - a) originate from herds or flocks which were not infected or suspected of being infected with FMD at the time of *milk* collection;
  - b) have been processed to ensure the destruction of the FMD virus in conformity with one of the procedures referred to in Article 3.6.2.5. and in Article 3.6.2.6.;
2. the necessary precautions were taken after processing to avoid contact of the products with any potential source of FMD virus.

## Article 2.2.10.26.

When importing from FMD infected countries, *Veterinary Administrations* should require:

for blood and meat-meals (from domestic or wild ruminants and pigs)

the presentation of an *international veterinary certificate* attesting that the manufacturing method for these products included heating to a minimum internal temperature of 70°C for at least 30 minutes.

## Article 2.2.10.27.

When importing from FMD infected countries, *Veterinary Administrations* should require:

for wool, hair, bristles, raw hides and skins (from domestic or wild ruminants and pigs)

the presentation of an *international veterinary certificate* attesting that:

1. these products have been processed to ensure the destruction of the FMD virus in conformity with one of the procedures referred to in Article 3.6.2.2., Article 3.6.2.3. and Article 3.6.2.4.;
2. the necessary precautions were taken after collection or processing to avoid contact of the products with any potential source of FMD virus.

*Veterinary Administrations* can authorise, without restriction, the import or transit through their territory of semi-processed hides and skins (limed hides, pickled pelts, and semi-processed leather -e.g. wet blue and crust leather), provided that these products have been submitted to the usual chemical and mechanical processes in use in the tanning industry.

Appendix VI (contd)

## Article 2.2.10.28.

When importing from FMD infected countries or zones, *Veterinary Administrations* should require:

for straw and forage

the presentation of an *international veterinary certificate* attesting that these *commodities*:

1. are free of grossly identifiable contamination with material of animal origin;
2. have been subjected to one of the following treatments, which, in the case of material sent in bales, has been shown to penetrate to the centre of the bale:
  - a) either to the action of steam in a closed chamber such that the centre of the bales has reached a minimum temperature of 80°C for at least 10 minutes,
  - b) or to the action of formalin fumes (formaldehyde gas) produced by its commercial solution at 35-40% in a chamber kept closed for at least 8 hours and at a minimum temperature of 19°C;

OR

3. have been kept in bond for at least 3 months (under study) before being released for export.

## Article 2.2.10.29.

When importing from FMD free countries or zones (where vaccination either is or is not practised), *Veterinary Administrations* should require:

for skins and trophies derived from FMD susceptible wild animals

the presentation of an *international veterinary certificate* attesting that these products are derived from animals that have been killed ~~kept~~ in such a country or zone ~~since birth~~, or which have been imported from a country or zone free of FMD (where vaccination either is or is not practised).

## Article 2.2.10.30.

When importing from FMD infected countries or zones, *Veterinary Administrations* should require:

for skins and trophies derived from FMD susceptible wild animals

the presentation of an *international veterinary certificate* attesting that these products have been processed to ensure the destruction of the FMD virus in conformity with the procedures referred to in Article 3.6.2.7.

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## CHAPTER .2.12.

## RINDERPEST

## Article 2.2.12.1.

For the purposes of the *Terrestrial Code*, the *incubation period* for rinderpest (RP) shall be 21 days.

For the purpose of this chapter a case includes an animal infected with rinderpest virus (RPV).

For the purpose of this chapter susceptible animals apply to both domestic and wild artiodactyls.

For the purposes of international trade, this chapter deals not only with the occurrence of clinical signs caused by RPV, but also with the presence of infection with RPV in the absence of clinical signs.

Ban on vaccination against rinderpest means a ban on administering a RP rinderpest vaccine to any susceptible animal species and a heterologous vaccine against RP rinderpest to any large ruminants or pigs.

1. Animal not vaccinated against rinderpest RP means:
  - a) for large ruminants and pigs: an animal that has received neither a RP-rinderpest vaccine nor a heterologous vaccine against RP rinderpest;
  - b) for small ruminants: an animal that has not received a RP rinderpest vaccine.
2. The following defines the occurrence of RPV rinderpest virus infection:
  - a) RPV rinderpest virus has been isolated and identified as such from an animal or a product derived from that animal; or
  - b) viral antigen or viral RNA specific to RP rinderpest has been identified in samples from one or more animals showing one or more clinical signs consistent with RP rinderpest, or epidemiologically linked to an outbreak of RP rinderpest, or giving cause for suspicion of association or contact with RP rinderpest; or
  - c) antibodies to rinderpest virus RPV antigens which are not the consequence of vaccination, have been identified in one or more animals with either epidemiological links to a confirmed or suspected outbreak of RP rinderpest in susceptible domestic or wild animals, or showing clinical signs consistent with recent infection with RP rinderpest.

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

## Article 2.2.12.2.

**Rinderpest RP free country Infection free country**

To qualify for inclusion in the existing list of RP free countries, a country should:

Appendix VII (contd)

1. have a record of regular and prompt animal disease reporting;
2. send a declaration to the OIE stating that:
  - a) there has been no outbreak of RP during the past 24 months;
  - b) no evidence of RPV infection has been found during the past 24 months;
  - c) no vaccination against RP has been carried out during the past 24 months.

and supply documented evidence that surveillance for both RP and RPV infection in accordance with Appendix 3.8.2. is in operation and that regulatory measures for the prevention and control of RP have been implemented;

3. not have imported since the cessation of vaccination any animals vaccinated against RP.

The country will be included in the list only after the submitted evidence has been accepted by the OIE.

To be considered free from rinderpest infection, a country should meet the requirements contained in Appendix 3.8.2.

Should a localised rinderpest outbreak occur in an infection free country, the waiting period before infection free status can be regained shall be as follows:

1. 6 months after the last case where stamping out without vaccination and serological surveillance are applied; or
2. 6 months after the slaughtering of the last vaccinated animal where stamping out complemented by emergency vaccination (vaccinated animals should be clearly identified with a permanent mark) and serological surveillance are applied; or
3. 12 months after the last case or last vaccination (whichever occurs later) where emergency vaccination without slaughter (vaccinated animals should be clearly identified with a permanent mark) and serological surveillance are applied.

Article 2.2.12.3.

### **Disease free country or zone**

To be considered free from the disease, a country or a zone should meet the requirements contained in Appendix 3.8.2.

Article 2.2.12.4.

### **Provisionally free country or zone**

To be considered provisionally free from the disease, a country or a zone should meet the requirements contained in Appendix 3.8.2.

Article 2.2.12.3**Recovery of free status**

When a RP outbreak or RPV infection occurs in a RP free country, one of the following waiting periods is required to regain the status of RP free country:

1. 3 months after the last case where a stamping-out policy and serological surveillance are applied in accordance with Appendix 3.8.2.; or
2. 3 months after the slaughter of all vaccinated animals where a stamping-out policy, emergency vaccination and serological surveillance are applied in accordance with Appendix 3.8.2.; or
3. 6 months after the last case or the last vaccination (according to the event that occurs the latest), where a stamping-out policy, emergency vaccination not followed by the slaughtering of all vaccinated animals, and serological surveillance are applied in accordance with Appendix 3.8.2.

Where a stamping-out policy is not practised, the above waiting periods do not apply, and Article 2.2.12.2. applies.

Article 2.2.12.54.

**Infected country or zone**

When the requirements for acceptance as a RP infection free country, a disease free country or zone, or a provisionally free country or zone are not fulfilled, a country or zone shall be considered as RP infected.

Article 2.2.12.6.

Veterinary Administrations of countries shall consider whether there is a risk with regard to rinderpest in accepting importation or transit through their territory, from other countries, of the following commodities:

1. ruminants and swine;
2. semen of ruminants and swine;
3. embryos/ova of ruminants and swine;
4. products of animal origin (from ruminants and swine);
5. pathological material and biological products (see Chapter 1.4.5. and Section 1.5.). For the purposes of this Chapter, ruminants include animals of the family of Camelidae.

Article 2.2.12.57.

When importing from RP infection free countries, *Veterinary Administrations* should require

for RP susceptible animals;

for ruminants and swine

Appendix VII (contd)

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of RP rinderpest on the day of shipment;
2. remained in a RP infection free country since birth or for at least 30 days prior to shipment.

Article 2.2.12.8.

~~When importing from rinderpest disease free countries or zones, Veterinary Administrations should require:~~

~~for domestic ruminants and swine, and wild ruminants and swine reared under confined conditions the presentation of an *international veterinary certificate* attesting that the animals:~~

- ~~1. showed no clinical sign of rinderpest on the day of shipment;~~
- ~~2. were kept in a disease free country or zone since birth or for at least the past 3 months;~~
- ~~3. have not been vaccinated against rinderpest;~~
- ~~4. were kept isolated in their *establishment* of origin for the 30 days prior to shipment and were subjected to a diagnostic test for rinderpest on two occasions with negative results, at an interval of not less than 21 days;~~
- ~~5. were not exposed to any source of infection during their transportation from the *establishment* of origin to the *place of shipment*.~~

Article 2.2.12.9.

~~When importing from disease free countries or zones, Veterinary Administrations should require:~~

~~for wild ruminants and swine not reared under confined conditions~~

~~the presentation of an *international veterinary certificate* attesting that the animals:~~

- ~~1. showed no clinical sign of rinderpest on the day of shipment;~~
- ~~2. come from a disease free country or zone;~~
- ~~3. have not been vaccinated against rinderpest;~~
- ~~4. were kept in a *quarantine station* for the 30 days prior to shipment and were subjected to a diagnostic test for rinderpest on two occasions with negative results, at an interval of not less than 21 days;~~
- ~~5. were not exposed to any source of infection during their transportation from the *quarantine station* to the *place of shipment*.~~

Article 2.2.12.10.

~~When importing from provisionally free countries or zones, Veterinary Administrations should require: for domestic ruminants and swine, and wild ruminants and swine reared under confined conditions the presentation of an *international veterinary certificate* attesting that the animals:~~

## Appendix VII (contd)

1. showed no clinical sign of rinderpest on the day of shipment;
2. were kept in the *establishment* of origin since birth or for at least 21 days before introduction into the *quarantine station* referred to in point 3 below;
3. have not been vaccinated against rinderpest, were isolated in a *quarantine station* for the 30 days prior to shipment, and were subjected to a diagnostic test for rinderpest on two occasions with negative results, at an interval of not less than 21 days.

Article 2.2.12.644.

When importing from RP infected countries or zones, *Veterinary Administrations* should require:

for RP susceptible animals for domestic ruminants and swine, and wild ruminants and swine reared under confined conditions

the presentation of an *international veterinary certificate* attesting that:

1. RP is the subject of a national surveillance programme according to Appendix 3.8.2, in the country or zone, routine vaccination is carried out for the purpose of the prevention of rinderpest;
2. rinderpest RP has not occurred within a 10-kilometre radius of the *establishment* of origin of the animals destined for export for at least 21 days prior to their shipment to the *quarantine station* referred to in point 3b) below;
3. the animals:
  - a) showed no clinical sign of RP rinderpest on the day of shipment;
  - b) were kept in the *establishment* of origin since birth or for at least 21 days before introduction into the *quarantine station* referred to in point c) below;
  - c) have not been vaccinated against RP rinderpest, were isolated in a *quarantine station* for the 30 days prior to shipment, and were subjected to a diagnostic test for RP rinderpest on two occasions with negative results, at an interval of not less than 21 days;
  - d) were not exposed to any source of infection during their transportation from the *quarantine station* to the *place of shipment*;
4. RP rinderpest has not occurred within a ten-kilometre radius of the *quarantine station* for 30 days prior to shipment.

Article 2.2.12.742.

When importing from RP rinderpest disease or infection free countries, or from disease free zones, *Veterinary Administrations* should require:

for semen of RP susceptible animals domestic ruminants and swine

the presentation of an *international veterinary certificate* attesting that:

## Appendix VII (contd)

1. the donor animals:
  - a) showed no clinical sign of RP rinderpest on the day of collection of the semen;
  - b) were kept in a disease or infection RP free country, or disease free zone, for at least 3 months prior to collection;
2. the semen was collected, processed and stored in conformity with the provisions of either Appendix 3.2.1. or Appendix 3.2.2., as relevant.

~~Article 2.2.12.13.~~

~~When importing from provisionally free countries or zones, Veterinary Administrations should require:~~

~~for semen of domestic ruminants and swine~~

~~the presentation of an international veterinary certificate attesting that:~~

- ~~1. the donor animals:~~
  - ~~a) showed no clinical sign of rinderpest on the day of collection of the semen;~~
  - ~~b) were vaccinated against rinderpest before the ban referred to in point 3a) of Appendix 3.8.2.; or~~
  - ~~e) have not been vaccinated against rinderpest, and were subjected to a diagnostic test for rinderpest on two occasions with negative results, at an interval of not less than 21 days within the 30 days prior to collection;~~
- ~~2. the semen was collected, processed and stored in conformity with the provisions of either Appendix 3.2.1. or Appendix 3.2.2., as relevant.~~

## Article 2.2.12.814.

When importing from RP infected countries or zones, Veterinary Administrations should require:

for semen of RP susceptible animals domestic ruminants and swine

the presentation of an *international veterinary certificate* attesting that:

1. RP is the subject of a national surveillance programme according to Appendix 3.8.2.:

~~1. in the country or zone, routine vaccination is carried out for the purpose of the prevention of rinderpest;~~

2. the donor animals:
  - a) showed no clinical sign of RP rinderpest on the day of collection of the semen;
  - b) were kept in an *establishment* where no RP rinderpest susceptible animals had been added in the 21 days before collection, and that RP rinderpest has not occurred within 10 kilometres of the *establishment* for the 21 days before and after collection;

## Appendix VII (contd)

- c) were vaccinated against RP rinderpest at least 3 months prior to collection; or
  - d) have not been vaccinated against RP rinderpest, and were subjected to a diagnostic test for rinderpest on two occasions with negative results, at an interval of not less than 21 days within the 30 days prior to collection;
3. the semen was collected, processed and stored in conformity with the provisions of either Appendix 3.2.1. or Appendix 3.2.2., as relevant.

## Article 2.2.12.945.

When importing from RP disease or infection free countries, or from disease free zones, *Veterinary Administrations* should require:

for in vivo derived embryos of domestic RP susceptible animals ruminants and swine

the presentation of an *international veterinary certificate* attesting that:

- 1. the donor females were kept in an *establishment* located in a RP rinderpest disease or infection-free country, or in a disease free zone, at the time of collection;
- 2. the embryos were collected, processed and stored in conformity with the provisions of Appendix 3.3.1. or Appendix 3.3.3., as relevant.

## Article 2.2.12.16.

When importing from provisionally free countries or zones, Veterinary Administrations should require:

for in vivo derived embryos of domestic ruminants and swine

the presentation of an international veterinary certificate attesting that:

- 1. the donor females:
  - a) showed no clinical sign of rinderpest at the time of collection and for the following 21 days;
  - b) were kept in an establishment where no rinderpest susceptible animals had been added in the 21 days before collection of the embryos;
  - e) were vaccinated against rinderpest before the ban referred to in point 3a) of Appendix 3.8.2.; or
  - d) have not been vaccinated against rinderpest, and were subjected to a diagnostic test for rinderpest on two occasions with negative results, at an interval of not less than 21 days within the 30 days prior to collection;
- 2. the embryos were collected, processed and stored in conformity with the provisions of Appendix 3.3.1. or Appendix 3.3.3., as relevant.

## Article 2.2.12.1047.

When importing from RP infected countries or zones, *Veterinary Administrations* should require:

## Appendix VII (contd)

for *in vivo* derived embryos of RP susceptible animals domestic ruminants and swine

the presentation of an *international veterinary certificate* attesting that:

- ~~1. in the country or zone, routine vaccination is carried out for the purpose of the prevention of rinderpest;~~
1. RP is the subject of a national surveillance programme according to Appendix 3.8.2.;
2. the donor females:
  - a) and all other animals in the *establishment* showed no clinical sign of RP rinderpest at the time of collection and for the following 21 days;
  - b) were kept in an *establishment* where no RP rinderpest susceptible animals had been added in the 21 days before collection of the embryos;
  - c) were vaccinated against RP rinderpest for at least 3 months prior to collection; or
  - d) have not been vaccinated against RP rinderpest, and were subjected to a diagnostic test for RP rinderpest on two occasions with negative results, at an interval of not less than 21 days within the 30 days prior to collection;
3. the embryos were collected, processed and stored in conformity with the provisions of Appendix 3.3.1. or Appendix 3.3.3., as relevant.

Article 2.2.12. ~~11-18.~~

When importing from RP rinderpest infection free countries, *Veterinary Administrations* should require:

for fresh meat or meat products of susceptible animals ruminants and swine

the presentation of an *international veterinary certificate* attesting that the entire consignment comes from animals which have been kept in the country since birth or for at least 3 months prior to slaughter.

~~Article 2.2.12.19.~~

~~When importing from disease free countries or zones, *Veterinary Administrations* should require:~~

~~for fresh meat or meat products of domestic ruminants and swine~~

~~the presentation of an *international veterinary certificate* attesting that:~~

- ~~1. the entire consignment comes from animals which have been kept in the country or zone since birth or for at least 3 months prior to slaughter;~~
- ~~2. the animals were slaughtered in an *approved abattoir located* in a disease free zone.~~

~~Article 2.2.12.20.~~

~~When importing from provisionally free countries or zones, *Veterinary Administrations* should require:~~

~~for fresh meat (excluding offal) of domestic ruminants and swine~~

~~the presentation of an international veterinary certificate attesting that the entire consignment of meat comes from:~~

~~1. animals which:~~

- ~~a) showed no clinical sign of rinderpest within 24 hours before slaughter;~~
- ~~b) have remained in the country or zone for at least 3 months prior to slaughter;~~
- ~~c) were kept in the establishment of origin since birth or for at least 30 days prior to shipment to the approved abattoir;~~
- ~~d) were vaccinated against rinderpest before the ban referred to in point 3a) of Appendix 3.8.2.; or~~
- ~~e) were not vaccinated against rinderpest, and were subjected to a diagnostic test for rinderpest with negative results during the 21 days prior to slaughter;~~

~~2. deboned carcasses from which the major lymphatic glands have been removed.~~

Article 2.2.12 ~~1224~~.

When importing from RP infected countries ~~or zones~~, *Veterinary Administrations* should require:

~~for fresh meat (excluding offal) of susceptible animals, domestic ruminants and swine~~

the presentation of an *international veterinary certificate* attesting that the entire consignment of meat:

~~1. comes from a country or zone where routine vaccination is carried out for the purpose of the prevention of rinderpest;~~

1. comes from a country where RP is the subject of a national surveillance programme according to Appendix 3.8.2.;

2. comes from animals which:

- a) showed no clinical sign of RP rinderpest within 24 hours before slaughter;
- b) have remained in the country or zone for at least 3 months prior to slaughter;
- c) were kept in the *establishment* of origin since birth or for at least 30 days prior to shipment to the *approved abattoir*, and that RP rinderpest has not occurred within a ten-kilometre radius of the *establishment* during that period;
- d) were vaccinated against RP rinderpest at least 3 months prior to shipment to the *approved abattoir*;
- e) had been transported, in a *vehicle* which was cleansed and disinfected before the animals were loaded, directly from the *establishment* of origin to the *approved abattoir* without coming into contact with other animals which do not fulfil the required conditions for export;

## Appendix VII (contd)

- f) were slaughtered in an *approved abattoir* in which no RP rinderpest has been detected during the period between the last *disinfection* carried out before slaughter and the date on which the shipment has been dispatched;

~~3. comes from deboned carcasses from which the major lymphatic glands have been removed.~~

Article 2.2.12. ~~13~~<sup>22</sup>.

When importing ~~from provisionally free countries or zones, or~~ from RP infected countries ~~or zones~~, *Veterinary Administrations* should require:

~~for meat products of susceptible animals domestic ruminants and swine~~

the presentation of an *international veterinary certificate* attesting that:

1. only *fresh meat* complying with the provisions of ~~Article 2.2.12.20. or~~ Article 2.2.12. ~~12~~<sup>21</sup>., as relevant, has been used in the preparation of the *meat products*, or
2. the *meat products* have been processed to ensure the destruction of the RPV rinderpest virus in conformity with one of the procedures referred to in Article 3.6.2.1.;
3. the necessary precautions were taken after processing to avoid contact of the *meat products* with any possible source of RPV rinderpest virus.

Article 2.2.12. ~~14~~<sup>23</sup>.

When importing from RP infection free countries, ~~or from disease free countries or zones~~, *Veterinary Administrations* should require:

~~for milk and milk products intended for human consumption and for products of animal origin (from rinderpest RP susceptible animals) intended for use in animal feeding or for agricultural or industrial use~~

the presentation of an *international veterinary certificate* attesting that these products come from animals which have been kept in the country ~~or zone~~ since birth or for at least 3 months.

Article 2.2.12. ~~15~~<sup>24</sup>.

When importing ~~from provisionally free countries or zones, or~~ from RP infected countries ~~or zones~~, *Veterinary Administrations* should require:

~~for milk and cream~~

the presentation of an *international veterinary certificate* attesting that:

1. these products:
  - a) originate from herds or flocks which were not subjected to any restrictions due to rinderpest RP at the time of *milk* collection;

- b) have been processed to ensure the destruction of the rinderpest virus RPV in conformity with one of the procedures referred to in Article 3.6.2.5. and in Article 3.6.2.6.;
2. the necessary precautions were taken after processing to avoid contact of the products with any potential source of rinderpest virus RPV.

Article 2.2.12 1625.

When importing ~~from provisionally free countries or zones, or~~ from rinderpest RP infected countries ~~or zones~~, *Veterinary Administrations* should require:

for milk products

the presentation of an *international veterinary certificate* attesting that:

1. these products are derived from *milk* complying with the above requirements;
2. the necessary precautions were taken after processing to avoid contact of the *milk products* with a potential source of rinderpest virus RPV.

Article 2.2.12 1726.

When importing ~~from provisionally free countries or zones, or~~ from RP infected countries ~~or zones~~, *Veterinary Administrations* should require:

for blood and meat-meals (from susceptible animals domestic or wild ruminants and swine)

the presentation of an *international veterinary certificate* attesting that the manufacturing method for these products included heating to a minimum internal temperature of 70°C for at least 30 minutes.

Article 2.2.12 1827.

When importing from ~~provisionally free countries or zones, or from RP~~ infected countries ~~or zones~~, *Veterinary Administrations* should require:

for wool, hair, bristles, raw hides and skins (from susceptible animals domestic or wild ruminants and swine)

the presentation of an *international veterinary certificate* attesting that:

1. these products have been processed to ensure the destruction of the rinderpest virus RPV in conformity with one of the procedures referred to in Article 3.6.2.2., Article 3.6.2.3. and Article 3.6.2.4.;
2. the necessary precautions were taken after processing to avoid contact of the products with any potential source of rinderpest virus RPV.

*Veterinary Administrations* can authorise, without restriction, the import or transit through their territory of semi-processed hides and skins (limed hides, pickled pelts, and semi-processed leather - e.g. wet blue and crust leather), provided that these products have been submitted to the usual chemical and mechanical processes in use in the tanning industry.

Appendix VII (contd)Article 2.2.12 1928.

When importing from ~~provisionally free countries or zones, or from RP~~ infected countries ~~or zones~~, *Veterinary Administrations* should require:

for hooves, claws, bones and horns, hunting trophies and preparations destined for museums (from susceptible animals domestic or wild ruminants and swine)

the presentation of an *international veterinary certificate* attesting that these products:

1. were completely dried and had no trace on them of skin, flesh or tendon; and/or
2. have been adequately disinfected.

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[*Note: International veterinary certificates for animal products coming from ~~provisionally free countries or zones, or RP~~ infected countries ~~or zones~~, may not be required if the products are transported in an approved manner to premises controlled and approved by the Veterinary Administration of the importing country for processing to ensure the destruction of the ~~rinderpest virus~~ RPV as described in Article 3.6.2.2., Article 3.6.2.3. and Article 3.6.2.4.]*

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## APPENDIX 3.8.2.

**(replaces the entire existing text in the 2006  
edition)****SURVEILLANCE FOR RINDERPEST****1. Purposes of the document**

In order to receive OIE recognition of rinderpest freedom, a country's national authority must present for consideration a dossier of information relating to its livestock production systems, rinderpest vaccination and eradication history and the functioning of its veterinary services. The dossier must contain convincing evidence derived from an animal disease surveillance system that sufficient evidence has accrued to demonstrate that the presence of rinderpest virus would have been disclosed were it to be present. Guidelines for the structure and the functioning of veterinary services and diagnostic support services are provided in Chapters 1.3.3. and 1.3.4. of the *Terrestrial Code*. A Member Country must also be in compliance with its OIE reporting obligations (Chapter 1.1.2. of the *Terrestrial Code*).

**2. Definitions****2.1. Rinderpest**

For the purpose of this text, rinderpest is defined as an infection of large ruminants (cattle, buffalo, yaks etc.), small ruminants, pigs and various wildlife species within the order Artiodactyla, caused by rinderpest virus. In small ruminants and various species of wildlife, particularly antelopes, infection generally passes without the development of frank clinical signs. Characteristic clinical signs and pathological lesions are described in Chapter 2.2.4. of the *Terrestrial Manual*.

Outbreaks of rinderpest in cattle may be graded as per-acute, acute or sub-acute. Differing clinical presentations reflect variations in levels of innate host resistance (*Bos indicus* breeds being more resistant than *Bos taurus*), and variations in the virulence of the attacking strain. It is generally accepted that unvaccinated populations of cattle are likely to promote the emergence of virulent strains and associated epidemics while partially vaccinated populations favour the emergence of mild strains associated with endemic situations. In the case of per-acute cases the presenting sign may be sudden death. In the case of sub-acute (mild) cases, clinical signs are irregularly displayed and difficult to detect.

Freedom from rinderpest means freedom from rinderpest virus infection.

**2.2. Rinderpest vaccines**

For the purpose of this text and the *Terrestrial Code*, OIE-recognised rinderpest vaccines currently in use, or likely to become so in the foreseeable future, are considered to be commercial modified live vaccines produced from attenuated rinderpest virus (referred to as 'rinderpest vaccine') produced in accordance with Chapter 2.2.4. of the *Terrestrial Manual*.

Appendix VIII (contd)**3. Rinderpest surveillance**

General guidelines on animal disease surveillance are outlined in Appendix 3.8.1. of the *Terrestrial Code*.

Rinderpest must be a notifiable disease i.e. notification of outbreaks of rinderpest as soon as detected or suspected must be brought to the attention of the Veterinary Authority.

The precise surveillance information required for establishing freedom will differ from country to country depending on factors such as the former rinderpest status of the country, the regional rinderpest situation and accreditation status, the time elapsing since the last occurrence of rinderpest, livestock husbandry systems (e.g. extensive pastoralism, nomadism and transhumance versus sedentary agropastoralism) and trading patterns.

Evidence of efficiency of the surveillance system can be provided by the use of performance indicators.

Surveillance results presented will be expected to have accrued from a combination of surveillance activities including some or all of the following:

- 3.1. A routine national animal disease reporting system supported by evidence of its efficiency and follow-up - an on-going, statutory, centrally organised system of reporting

Ideally disease reports should be expressed in a Geographical Information System environment and analysed for clustering of observations and followed-up.

- 3.2. Emergency disease reporting systems and investigation of epidemiologically significant events ('stomatitis-enteritis syndrome')

Emergency reporting systems can be devised to short-circuit normal passive reporting systems to bring suspicious events to the fore and lead to rapid investigation and tracing. All such investigations should be well documented, for presentation as an outcome of the surveillance system.

- 3.3. Detection and thorough investigation of epidemiologically significant events ('stomatitis-enteritis syndrome') which raise suspicion of rinderpest supported by evidence of efficiency of the system.

Laboratory examination undertaken to confirm or rule out rinderpest is given extra credibility if it is accompanied by the results of differential diagnostic examinations.

- 3.4. Searching for evidence of clinical rinderpest

Active search for disease might include participatory disease searching combined with village disease searching, tracing backwards and forwards, follow-up and investigation.

- 3.5. Serosurveillance

- 3.5.1 *Randomised serosurveys*

Statistically selected samples from relevant strata within the host populations are examined to detect serological evidence of possible virus circulation.

A sampling unit for the purposes of disease investigation and surveillance is defined as a group of animals in sufficiently close contact that individuals within the group are at approximately equal risk of coming in contact with the virus if there should be an infectious animal within the group. In most circumstances, the sampling unit will be a herd which is managed as a unit by an individual or a community, but it may also be other epidemiologically appropriate groupings which are subject to regular mixing, such as all animals belonging to residents of a village. In the areas where nomadic or transhumant movements exist, the sampling unit can be the permanent bore holes, wells or water points. Sampling units should normally be defined so that their size is generally between 50 and 1,000 animals.

#### *Criteria for stratification of host populations*

Strata are homogeneously mixing sub-populations of livestock. Any disease surveillance activities must be conducted on populations stratified according to the management system, and by herd size where this is variable. Herds, or other sampling units, should be selected by proper random statistical selection procedures from each stratum.

#### *Field procedures and sample sizes*

Annual sample sizes shall be sufficient to provide 95% probability of detecting evidence of rinderpest if present at a prevalence of 1% of herds or other sampling units and 5% within herds or other sampling units. This can typically be achieved by examining 300 herds per stratum per year, but procedures for sampling should be in accordance with the "Guide to Epidemiological Surveillance for Rinderpest"<sup>5</sup>, or another procedure that would achieve the same probability of detection.

Where the sampling frame of herds is known, herds shall be selected for examination by the use of random number tables. Otherwise, samples of herds can be selected by taking the nearest herd to a randomly selected map reference, provided that the herds are evenly distributed. Failing this, any herd(s) within a fixed radius of randomly selected map references should be sampled. It must be compulsory for any selected herd to be examined or tested as required.

In carrying out clinical surveillance for evidence of rinderpest, all animals in selected herds or sampling units will be examined by a veterinarian for signs of the disease, especially mouth lesions. Any positive result shall be evaluated using epidemiological and laboratory methods to confirm or refute the suspicion of rinderpest virus activity. All animals born after the cessation of vaccination and more than one year old will be eligible for serological testing.

Where operational considerations require it, the number of eligible animals tested within each sampled herd may be reduced. This will reduce the probability of within-herd detection and there must be at least a compensatory increase in the number of herds sampled, so that the required 95% probability of detecting 1% between-herd prevalence is maintained.

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<sup>5</sup> James AD. Guide to epidemiological surveillance for rinderpest. Rev Sci Tech. 1998 Dec;17(3):796-824

Appendix VIII (contd)3.5.2 *Risk-focussed serosurveillance*

Risk-focussed serosurveillance differs from randomised serosurveillance in that it increases detection sensitivity by obtaining samples from areas/populations determined to be at higher risk of infection, so as to detect serological evidence of possible virus circulation. The operational modalities for risk-based focussing of surveillance require definition (randomisation within defined focus, high risk animals etc.). The extent to which randomisation needs to be retained in the generation of risk-focussed serosurveillance data needs to be established.

Focussing can be achieved by reference to some or all of the following:

- Historical disease patterns (prior probability mapping) – clinical, participatory and laboratory-based
- Critical population size, structure and density
- Livestock husbandry and farming systems
- Movement and contact patterns – markets and other trade-related movements
- Transmission parameters (e.g. virulence of the strain, animal movements)
- Wildlife and other species demography

4. Selection of cattle and buffalos for serosurveillance

Ageing cattle and Asian buffalos for the purpose of serosurveillance:

Mis-ageing of cattle selected for serosurveillance is the most common source of error. Colostral immunity can persist almost up to one year of age when measured by the H eELISA. Thus, it is essential to exclude from sampling buffalos and cattle less than one year of age. In addition, it is frequently necessary to be able to exclude those which are older than a certain age, for example, to select only those born after cessation of vaccination.

Accounts of the ages for eruption of the incisor teeth vary markedly and are clearly dependent on species, breed, nutritional status and nature of the feed.

Pragmatically, and solely for the purposes of serosurveillance it can be accepted that:

- a) cattle having only one pair of erupted permanent central incisor teeth are aged between 21 and 36 months (Asian buffalos 24-48 months);
- b) cattle having only two pairs of erupted permanent central incisor teeth are aged between 30 and 48 months (Asian buffalos 48-60 months).

Thus selecting a cohort of cattle possessing only one pair of permanent incisors will preclude any interference from maternal immunity derived from earlier vaccination or infection and ensure that vaccinated cattle are not included if vaccination ceased three years or more previously (for Asian buffalos four years or more).

Although it is stressed here that animals with milk teeth only are not suitable for surveillance based on serology, they are of particular interest and importance in surveillance for clinical disease. After the loss of colostral immunity, by about one year of age, these are the animals which are most likely to suffer the more severe disease form and in which to look for lesions indicative of rinderpest.

5. Wildlife surveillance where a significant, susceptible wildlife population exists

There are some key wildlife populations, especially African buffalo, which act as sentinels for rinderpest infection. Where a significant population of a susceptible wildlife species exists, serosurveillance data are required to support absence of infection. These populations should be monitored purposively to support the dossiers to be submitted for freedom from rinderpest virus infection. Detection of virus circulation in wildlife can be undertaken indirectly by sampling contiguous livestock populations.

Obtaining meaningful data from wildlife surveillance can be enhanced by close coordination of activities in the regions and countries. Both purposive and opportunistic sampling are used to obtain material for analysis in national and reference laboratories. The latter are required, because most countries are unable to perform the full testing protocol for detecting rinderpest antibodies in wildlife sera.

Purposive sampling is the preferred method to provide wildlife data to evaluate the status of rinderpest infection. In reality, the capacity to perform purposive work in the majority of countries remains minimal. Opportunistic sampling (hunting) is feasible and it provides useful background information.

Wildlife form transboundary populations, therefore any data from the population could be used to represent the result for the ecosystem and be submitted by more than one country in a dossier (even if the sampling was not obtained in the country submitting). It is recommended therefore that the countries represented in a particular ecosystem should coordinate their sampling programmes.

The standards for serosurveillance are different from that set for cattle because the serological tests are not fully validated for wildlife species and financial and logistic constraints of sampling prevent collection of large numbers of samples.

From the collective experience of the laboratories and experts over the years, an appropriate test protocol is based on the high expected sero-prevalence in a previously infected buffalo herd (99% seroconversion of eligible animals within a herd), which is detected using a test, which is 100% sensitive. No single test can achieve this, however combining H c-ELISA to VNT raises sensitivity close to 100%.

In the order of 1-2% of a herd of African buffaloes must be sampled to ensure that no positive case is missed. For example in a herd of 300 buffaloes; five animals should be sampled and the above multiple test protocol followed. Where the serological history of the herd is known from previous work (as might be the case for a sentinel herd), repeat sampling need only focus on the untested age groups, born since the last known infection. Appropriate sampling fraction for other wildlife species are less well defined, as social organization (herd structure, likely contact rates, etc.) vary. The sample needs to be taken according to the known epidemiology of the disease in a given species. Opportunistic samples, which are positive, should not be interpreted without a purposive survey to confirm the validity of these results. Opportunistic sampling cannot follow a defined protocol and therefore can only provide background information.

Appendix VIII (contd)6. Evaluation of applications for accreditation of freedom from rinderpest

Evaluation of applications for the status of freedom from rinderpest will be the responsibility of the OIE Scientific Commission for Animal Diseases which can request the Director General to appoint an *ad hoc* group in order to assist in reaching an informed decision to present to the International Committee for approval.

The composition and method of selection of the ad hoc group shall be such as to ensure both a high level of expertise in evaluating the evidence and total independence of the group in reaching conclusions concerning the disease status of a particular country.

7. Steps to be taken to declare a country to be free from rinderpest

Recognition of the status *free from rinderpest* is given to a Member Country. Where traditionally managed livestock move freely across international borders, groups of Member Countries may usefully associate themselves into a group for the purposes of obtaining data to be used for mutually supportive applications for individual country accreditation.

For the purpose of this Appendix the following assumptions are made:

- a) that within most previously infected countries, rinderpest vaccine will have been used to control the rate of infection;
- b) that within an endemically infected population there will be a large numbers of immune hosts (both vaccinees and recovered animals);
- c) that the presence of a proportion of immune hosts within a vaccinated population could have led to a slowing of the rate of virus transmission and possibly the concomitant emergence of strains of reduced virulence, difficult to detect clinically;
- d) that the virulence of the virus (and therefore the ease of clinical detection) may or may not increase as the herd immunity declines following withdrawal of vaccination; however, continuing transmission will generate serological evidence of their persistence.

Before accreditation can be considered, countries which have controlled the disease by the use of rinderpest vaccine, must wait until an unvaccinated cohort is available to allow meaningful serological surveillance to be conducted.

The OIE has concluded that the majority of countries have stopped vaccinating for a sufficient length of time for it now to be feasible that a single submission of evidence gained over two years of appropriate surveillance shall be sufficient to gain rinderpest-free accreditation.

A Member Country accredited as free from rinderpest must thereafter submit annual statements to the Director General of OIE indicating that surveillance has failed to disclose the presence of rinderpest and that all other criteria continue to be met.

A country previously infected with rinderpest which has not employed rinderpest vaccine for at least 25 years and has throughout that period detected no evidence of rinderpest virus disease or infection may be accredited as free from rinderpest by the OIE based on historical grounds, provided that the country:

- has had throughout at least the last 10 years and maintains permanently an adequate animal disease surveillance system along with the other requirements outlined in Article 3.8.1.6.
- is in compliance with OIE reporting obligations (Chapter 1.1.2.).

The Veterinary Authorities of the Member Country must submit a dossier containing evidence supporting their claim to be free from rinderpest on a historical basis to the OIE Director General for evaluation by the OIE Scientific Commission for Animal Diseases and accreditation by the International Committee. The dossier should contain at least the following information:

- a description of livestock populations, including wildlife
- the history of rinderpest occurrence in the country and its control
- an affirmation that rinderpest has not occurred for 25 years, that vaccine has not been used during that time and that rinderpest is a notifiable disease
- evidence that in the last 10 years the disease situation throughout the Member Country has been constantly monitored by a competent and effective veterinary infrastructure that has operated a national animal disease reporting system submitting regular (monthly) disease occurrence reports to the Veterinary Administration
- the structure and functioning of the veterinary services
- the Member Country operates a reliable system of risk-analysis based importation of livestock and livestock products.

Evidence in support of these criteria must accompany the Member Country's accreditation application dossier. In the event that satisfactory evidence is not forthcoming, the OIE may seek clarification or refer the dossier back to the originators, giving its reasons for so doing. Under such circumstances a fresh dossier would be entertained in due course.

## **OR**

A Member Country having eradicated rinderpest within the last 25 years, wishing to be accredited free from rinderpest and having ended rinderpest vaccination must initiate a two year surveillance programme to demonstrate freedom from rinderpest whilst banning further use of rinderpest vaccine. The step of accreditation as free from rinderpest is subject to meeting stringent criteria with international verification under the auspices of the OIE.

A country historically infected with rinderpest but which has convincing evidence that the disease has been excluded for at least two years and is not likely to return, may apply to OIE to be accredited as free from rinderpest. The conditions which apply include that an adequate animal disease surveillance system has been maintained throughout at least that period.

The Veterinary Administration of the Member Country must submit a dossier containing evidence supporting their claim to be free from rinderpest to the OIE Director General for evaluation by the OIE Scientific Commission for Animal Diseases and accreditation by the International Committee showing that they comply with:

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- the provisions outlined in Chapter 2.2.12. of the *Terrestrial Code*
- OIE reporting obligations outlined in Chapter 1.1.2. of the *Terrestrial Code*.

Other conditions that apply are:

- The Member Country affirms that rinderpest has not occurred for at least two years, that vaccine has not been used during that time and that rinderpest is a notifiable disease.
- The Veterinary Administration has issued orders curtailing the distribution and use of rinderpest vaccine in livestock.
- The Veterinary Administration has issued orders for the recall and destruction of rinderpest vaccine already issued.
- The Veterinary Administration has issued orders restricting the importation of rinderpest vaccine into, or the further manufacture of rinderpest vaccine within, the territory under his jurisdiction. An exception can be made for establishing a safeguarded rinderpest emergency vaccine bank under the control of the Chief Veterinary Officer who can demonstrate that no calls have been made on that vaccine bank.
- The Veterinary Administration has set in place a rinderpest contingency plan.
- Over the previous two years at least the disease situation throughout the Member Country has been constantly monitored by a competent and effective infrastructure that has operated a national animal disease reporting system submitting regular (monthly) disease occurrence reports to the Veterinary Administration.
- All outbreaks of disease with a clinical resemblance to rinderpest have been thoroughly investigated and routinely subjected to laboratory testing by an OIE recognised rinderpest-specific test within the national rinderpest laboratory or at a recognised reference laboratory.

The dossier shall contain:

- the results of a continuous surveillance programme, including appropriate serological surveys conducted during at least the last 24 months, providing convincing evidence for the absence of rinderpest virus circulation
- a description of livestock populations including wildlife
- the history of rinderpest occurrence in the country and its control
- an affirmation that rinderpest has not occurred for at least 2 years, that vaccine has not been used during that time and that rinderpest is a notifiable disease
- evidence that in the last 2 years the disease situation throughout the Member Country has been constantly monitored by a competent and effective veterinary infrastructure that has operated a national animal disease reporting system submitting regular (monthly) disease occurrence reports to the Veterinary Administration

- the structure and functioning of the veterinary services
- the Member Country operates a reliable system of risk-analysis based importation of livestock and livestock products.

In the event that satisfactory evidence in support of the application is not forthcoming, the OIE may seek clarification or refer the dossier back to the originators, giving its reasons for so doing. Under such circumstances a fresh dossier would be entertained in due course.

8. Rinderpest outbreaks after the accreditation process and recovery of rinderpest free status

Should there be an outbreak, or outbreaks, of rinderpest in a Member Country at any time after recognition of rinderpest freedom, the origin of the virus strain must be thoroughly investigated. In particular it is important to determine if this is due to the re-introduction of virus or re-emergence from an undetected focus of infection. The virus must be isolated and compared with historical strains from the same area as well as those representatives of other possible sources. The outbreak itself must be contained with the utmost rapidity using the resources and methods outlined in the Contingency Plan.

After elimination of the outbreak a Member Country wishing to regain the status *free from rinderpest* must undertake serosurveillance to determine the extent of virus spread.

If investigations show the outbreak virus originated from outside the country, provided the outbreak was localised, rapidly contained and speedily eliminated, and provided there was no serological evidence of virus spread outside the index infected area, accreditation of freedom could proceed rapidly. The country must satisfy the OIE Scientific Commission for Animal Diseases that the outbreaks were contained, eliminated and did not represent endemic infection.

An application to regain the status free from rinderpest shall not generally be accepted until both clinical and serological evidence shows that there has been no virus transmission for at least three or six months, depending on whether or not stamping out or vaccination respectively has been applied.



## CHAPTER 2.2.13.

**BLUETONGUE**

## Article 2.2.13.1.

For the purposes of the *Terrestrial Code*, the *infective period* for bluetongue virus (BTV) shall be 60 days.

The global BTV distribution is currently between latitudes of approximately ~~33~~<sup>30</sup>°N and 34°S but is known to be expanding in the northern hemisphere.

In the absence of clinical disease in a country or *zone* within this part of the world, its BTV status should be determined by an ongoing surveillance programme (in accordance with Appendix 3.8.X). The programme may need to be adapted to target parts of the country or *zone* at a higher risk due to historical, geographical and climatic factors, ruminant population data and *Culicoides* ecology, or proximity to enzootic or incursional zones as described in Appendix 3.8.X.

All countries or *zones* adjacent to a country or *zone* not having free status should be subjected to similar surveillance. The surveillance should be carried out over a distance of at least 100 kilometres from the border with that country or *zone*, but a lesser distance could be acceptable if there are relevant ecological or geographical features likely to interrupt the transmission of BTV or a bluetongue surveillance programme (in accordance with Appendix 3.8.X.) in the country or *zone* not having free status supports a lesser distance.

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

## Article 2.2.13.2.

**BTV free country or zone**

1. A country or a *zone* may be considered free from BTV when bluetongue is notifiable in the whole country and either:
  - a) the country or *zone* lies wholly north of ~~50~~<sup>53</sup>°N or south of 34°S, and is not adjacent to a country or *zone* not having a free status; or
  - b) a surveillance programme in accordance with Appendix 3.8.X. has demonstrated no evidence of BTV in the country or *zone* during the past 2 years; or
  - c) a surveillance programme has demonstrated no evidence of *Culicoides* likely to be competent BTV vectors in the country or *zone*.
2. A BTV free country or zone in which surveillance has found no evidence that *Culicoides* likely to be competent BTV vectors are present will not lose its free status through the importation of vaccinated, seropositive or infective animals, or semen or embryos/ova from infected countries or zones.

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3. A BTV free country or zone in which surveillance has found evidence that *Culicoides* likely to be competent BTV vectors are present will not lose its free status through the importation of vaccinated or seropositive animals from infected countries or zones, provided:
  - a) the animals have been vaccinated in accordance with the *Terrestrial Manual* at least 60 days prior to dispatch with a vaccine which covers all serotypes whose presence in the source population has been demonstrated through a surveillance programme in accordance with Appendix 3.8.X., and that the animals are identified in the accompanying certification as having been vaccinated; or
  - b) the animals are not vaccinated, and a surveillance programme in accordance with Appendix 3.8.X. has been in place in the source population for a period of 60 days immediately prior to dispatch, and no evidence of BTV transmission has been detected.
  
4. A BTV free country or zone adjacent to an infected country or zone should include a zone as described in Article 2.2.13.1. in which surveillance is conducted in accordance with Appendix 3.8.X. Animals within this *zone* must be subjected to continuing surveillance. The boundaries of this *zone* must be clearly defined, and must take account of geographical and epidemiological factors that are relevant to BTV transmission.

## Article 2.2.13.3.

**BTV seasonally free zone**

A BTV seasonally free zone is a part of an infected country or zone for which for part of a year, surveillance demonstrates no evidence either of BTV transmission or of adult *Culicoides* likely to be competent BTV vectors.

For the application of Articles 2.2.13.7., 2.2.13.10. and 2.2.13.14., the seasonally free period is taken to commence the day following the last evidence of BTV transmission (as demonstrated by the surveillance programme), ~~or~~ and of the cessation of activity of adult *Culicoides* likely to be competent BTV vectors.

For the application of Articles 2.2.13.7., 2.2.13.10. and 2.2.13.14., the seasonally free period is taken to conclude either:

1. at least 28 days before the earliest date that historical data show bluetongue virus activity has recommenced; or
2. immediately if current climatic data or data from a surveillance programme indicate an earlier resurgence of activity of adult *Culicoides* likely to be competent BTV vectors.

A BTV seasonally free zone in which surveillance has found no evidence that *Culicoides* likely to be competent BTV vectors are present will not lose its free status through the importation of vaccinated, seropositive or infective animals, or semen or embryos/ova from infected countries or zones.

## Article 2.2.13.4.

**BTV infected country or zone**

A BTV infected country or zone is a clearly defined area where evidence of BTV has been reported during the past 2 years.

~~Article 2.2.13.5.~~

~~Veterinary Administrations of countries shall consider whether there is a risk with regard to BTV infection in accepting importation or transit through their territory, from other countries, of the following commodities:~~

- ~~1. ruminants and other BTV susceptible herbivores;~~
- ~~2. semen of these species;~~
- ~~3. embryos/ova of these species;~~
- ~~4. pathological material and biological products (from these species) (see Chapter 1.4.5. and Section 1.5.).~~

~~Other commodities should be considered as not having the potential to spread BTV when they are the subject of international trade.~~

## Article 2.2.13.6-5.

When importing from BTV free countries or zones, *Veterinary Administrations* should require:

for ruminants and other BTV susceptible herbivores

the presentation of an *international veterinary certificate* attesting that:

1. the animals were kept in a BTV free country or zone since birth or for at least 60 days prior to shipment; or
2. the animals were kept in a BTV free country or zone for at least 28 days, then were subjected, with negative results, to a serological test to detect antibody to the BTV group according to the *Terrestrial Manual* and remained in the BTV free country or zone until shipment; or
3. the animals were kept in a BTV free country or zone for at least 7 days, then were subjected, with negative results, to an agent identification test according to the *Terrestrial Manual*, and remained in the BTV free country or zone until shipment; or
4. the animals:
  - a) were kept in a BTV free country or zone for at least 7 days;
  - b) were vaccinated in accordance with the *Terrestrial Manual* 60 days before the introduction into the free country or zone against all serotypes whose presence in the source population has been demonstrated through a surveillance programme as described in Appendix 3.8.X;

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- c) were identified as having been vaccinated; and
- d) remained in the BTV free country or zone until shipment;

AND

- 5. if the animals were exported from a free zone, either:
  - a) did not transit through an infected zone during transportation to *the place of shipment*; or
  - b) were protected from attack from *Culicoides* likely to be competent BTV vectors at all times when transiting through an infected zone; or
  - c) had been vaccinated in accordance with point 4 above.

Article 2.2.13.7-6

When importing from BTV seasonally free zones, *Veterinary Administrations* should require:

for ruminants and other BTV susceptible herbivores

the presentation of an *international veterinary certificate* attesting that the animals:

- 1. were kept during the seasonally free period in a BTV seasonally free zone since birth or for at least 60 days prior to shipment; or
- 2. were kept during the BTV seasonally free period in a BTV seasonally free zone for at least 28 days prior to shipment, and were subjected during the residence period in the zone to a serological test to detect antibody to the BTV group according to the *Terrestrial Manual*, with negative results, carried out at least 28 days after the commencement of the residence period; or
- 3. were kept during the BTV seasonally free period in a BTV seasonally free zone for at least 14 days prior to shipment, and were subjected during the residence period in the zone to an agent identification test according to the *Terrestrial Manual*, with negative results, carried out at least 14 days after the commencement of the residence period; or
- 4. were kept during the seasonally free period in a BTV seasonally free zone, and were vaccinated in accordance with the *Terrestrial Manual* 60 days before the introduction into the free country or zone against all serotypes whose presence in the source population has been demonstrated through a surveillance programme in accordance with Appendix 3.8.X.; and were identified as having been vaccinated and remained in the BTV free country or zone until shipment;

AND

- 5. if the animals were exported from a free zone, either:
  - a) did not transit through an infected zone during transportation to the *place of shipment*; or
  - b) were protected from attack from *Culicoides* likely to be competent BTV vectors at all times when transiting through an infected zone; or

- c) were vaccinated in accordance with point 4 above.

Article 2.2.13.8-7

When importing from BTV infected countries or zones, *Veterinary Administrations* should require:

for ruminants and other BTV susceptible herbivores

the presentation of an *international veterinary certificate* attesting that the animals:

1. were protected from attack from *Culicoides* likely to be competent BTV vectors since birth or for at least 60 days prior to shipment; or
2. were protected from attack from *Culicoides* likely to be competent BTV vectors for at least 28 days prior to shipment, and were subjected during that period to a serological test according to the *Terrestrial Manual* to detect antibody to the BTV group, with negative results, carried out at least 28 days after introduction into the *quarantine station*; or
3. were protected from attack from *Culicoides* likely to be competent BTV vectors for at least 14 days prior to shipment, and were subjected during that period to an agent identification test according to the *Terrestrial Manual*, with negative results, carried out at least 14 days after introduction into the *quarantine station*; or
4. were vaccinated in accordance with the *Terrestrial Manual* at least 60 days before shipment, against all serotypes whose presence in the source population has been demonstrated through a surveillance programme in accordance with Appendix 3.8.X., and were identified in the accompanying certification as having been vaccinated; or
5. are not vaccinated, a surveillance programme in accordance with Appendix 3.8.X. has been in place in the source population for a period of 60 days immediately prior to shipment, and no evidence of BTV transmission has been detected;

AND

6. were protected from attack from *Culicoides* likely to be competent BTV vectors during transportation to the *place of shipment*; or
7. were vaccinated in accordance with the *Terrestrial Manual* 60 days before shipment or had antibodies against all serotypes whose presence in the zones of transit has been demonstrated through a surveillance programme in accordance with Appendix 3.8.X.

Article 2.2.13.9-8

When importing from BTV free countries or zones, *Veterinary Administrations* should require:

for semen of ruminants and other BTV susceptible herbivores

the presentation of an *international veterinary certificate* attesting that:

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1. the donor animals:
  - a) were kept in a BTV free country or zone for at least 60 days before commencement of, and during, collection of the semen; or
  - b) were subjected to a serological test according to the *Terrestrial Manual* to detect antibody to the BTV group, between 21 and 60 days after the last collection for this consignment, with negative results; or
  - c) were subjected to an agent identification test according to the *Terrestrial Manual* on blood samples collected at commencement and conclusion of, and at least every 7 days (virus isolation test) or at least every 28 days (PCR test) during, semen collection for this consignment, with negative results;
2. the semen was collected, processed and stored in conformity with the provisions of Appendix 3.2.1.

Article 2.2.13.40-9

When importing from BTV seasonally free zones, *Veterinary Administrations* should require:

for semen of ruminants and other BTV susceptible herbivores

the presentation of an *international veterinary certificate* attesting that:

1. the donor animals:
  - a) were kept during the BTV seasonally free period in a seasonally free zone for at least 60 days before commencement of, and during, collection of the semen; or
  - b) were subjected to a serological test according to the *Terrestrial Manual* to detect antibody to the BTV group, with negative results, at least every 60 days throughout the collection period and between 21 and 60 days after the final collection for this consignment; or
  - c) were subjected to an agent identification test according to the *Terrestrial Manual* on blood samples collected at commencement and conclusion of, and at least every 7 days (virus isolation test) or at least every 28 days (PCR test) during, semen collection for this consignment, with negative results;
2. the semen was collected, processed and stored in conformity with the provisions of Appendix 3.2.1.

Article 2.2.13.41-10

When importing from BTV infected countries or zones, *Veterinary Administrations* should require:

for semen of ruminants and other BTV susceptible herbivores

the presentation of an *international veterinary certificate* attesting that:

1. the donor animals:
  - a) were protected from attack from *Culicoides* likely to be competent BTV vectors for at least 60 days before commencement of, and during, collection of the semen; or

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- b) were subjected to a serological test according to the *Terrestrial Manual* to detect antibody to the BTV group, with negative results, at least every 60 days throughout the collection period and between 21 and 60 days after the final collection for this consignment; or
  - c) were subjected to an agent identification test according to the *Terrestrial Manual* on blood samples collected at commencement and conclusion of, and at least every 7 days (virus isolation test) or at least every 28 days (PCR test) during, semen collection for this consignment, with negative results;
2. the semen was collected, processed and stored in conformity with the provisions of Appendix 3.2.1.

## Article 2.2.13.42-11

Regardless of the bluetongue status of the *exporting country*, *Veterinary Administrations of importing countries* should require:

for *in vivo* derived bovine embryos /oocytes

the presentation of an *international veterinary certificate* attesting that the embryos/oocytes were collected, processed and stored in conformity with the provisions of Appendix 3.3.1. or Appendix 3.3.3., as relevant.

## Article 2.2.13.43-12

When importing from BTV free countries or zones, *Veterinary Administrations* should require:

for *in vivo* derived embryos of ruminants (other than bovines) and other BTV susceptible herbivores

the presentation of an *international veterinary certificate* attesting that:

1. the donor females:
  - a) were kept in a BTV free country or zone for at least the 60 days prior to, and at the time of, collection of the embryos; or
  - b) were subjected to a serological test according to the *Terrestrial Manual* to detect antibody to the BTV group, between 21 and 60 days after collection, with negative results; or
  - c) were subjected to an agent identification test according to the *Terrestrial Manual* on a blood sample taken on the day of collection, with negative results;
2. the embryos were collected, processed and stored in conformity with the provisions of Appendix 3.3.1.

## Article 2.2.13.44-13

When importing from BTV seasonally free zones, *Veterinary Administrations* should require:

for *in vivo* derived embryos/oocytes of ruminants (other than bovines) and other BTV susceptible herbivores and for *in vitro* produced bovine embryos

the presentation of an *international veterinary certificate* attesting that:

Appendix IX (contd)

1. the donor females:
  - a) were kept during the seasonally free period in a seasonally free zone for at least 60 days before commencement of, and during, collection of the embryos/oocytes; or
  - b) were subjected to a serological test according to the *Terrestrial Manual* to detect antibody to the BTV group, between 21 and 60 days after collection, with negative results; or
  - c) were subjected to an agent identification test according to the *Terrestrial Manual* on a blood sample taken on the day of collection, with negative results;
2. the embryos/oocytes were collected, processed and stored in conformity with the provisions of Appendix 3.3.1.

Article 2.2.13.14-~~15~~,14.

When importing from BTV infected countries or zones, *Veterinary Administrations* should require:

for *in vivo* derived embryos/oocytes of ruminants (other than bovines) and other BTV susceptible herbivores and for *in vitro* produced bovine embryos

the presentation of an *international veterinary certificate* attesting that:

1. the donor females:
  - a) were protected from attack from *Culicoides* likely to be competent BTV vectors for at least 60 days before commencement of, and during, collection of the embryos/oocytes; or
  - b) were subjected to a serological test according to the *Terrestrial Manual* to detect antibody to the BTV group, between 21 and 60 days after collection, with negative results; or
  - c) were subjected to an agent identification test according to the *Terrestrial Manual* on a blood sample taken on the day of collection, with negative results;
2. the embryos/oocytes were collected, processed and stored in conformity with the provisions of Appendix 3.3.1.

Article 2.2.13.14-~~15~~,15.**Protecting animals from *Culicoides* attack**

When transporting animals through BTV infected countries or zones, *Veterinary Administrations* should require strategies to protect animals from attack from *Culicoides* likely to be competent BTV vectors during transport, taking into account the local ecology of the vector.

Potential risk management strategies include:

1. treating animals with chemical repellents prior to and during transportation;

Appendix IX (contd)

2. *loading* transporting and *unloading* animals at times of low vector activity (i.e. bright sunshine, low temperature);
3. ensuring *vehicles* do not stop en route during dawn or dusk, or overnight, unless the animals are held behind insect proof netting;
4. darkening the interior of the *vehicle*, for example by covering the roof and/or sides of *vehicles* with shadecloth;
5. surveillance for vectors at common stopping and offloading points to gain information on seasonal variations;
6. using historical, ongoing and/or BTV modelling information to identify low risk ports and transport routes.

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## APPENDIX 3.X.X.

## GUIDELINES ON SURVEILLANCE FOR BLUETONGUE

Article 3.X.X.1.

### Introduction

This Appendix defines the principles and provides a guide on the surveillance for bluetongue (BT) in accordance with Appendix 3.8.1., applicable to countries seeking recognition for a declared BT status, with or without the use of vaccination. This may be for the entire country, or zone or compartment. Guidance for countries seeking free status following an *outbreak* and for the maintenance of BT status is also provided. This Appendix complements Chapter 2.2.13.

BT is a vector-borne infection transmitted by different species of *Culicoides* insects in a range of ecosystems. An important component of BT epidemiology is vectorial capacity which provides a measure of disease risk that incorporates vector competence, abundance, biting rates, survival rates and extrinsic incubation period. However, methods and tools for measuring some of these vector factors remain to be developed, particularly in a field context. Therefore, surveillance for BT should focus on transmission in domestic ruminants.

Susceptible wild ruminant populations should be included in surveillance ~~only if necessary~~ when these animals are intended for trade.

The impact and epidemiology of BT differ widely in different regions of the world and therefore it is impossible to provide specific guidelines for all situations. It is incumbent upon Member Countries to provide scientific data that explain the epidemiology of BT in the region concerned and adapt the surveillance strategies for defining their infection status (~~free, endemic or area of potential spread~~ free, seasonally free, infected or endemic country/zone) to the local conditions. There is considerable latitude available to Member Countries to justify their infection status at an acceptable level of confidence.

Surveillance for BT should be in the form of a continuing programme.

Article 3.X.X.2.

### Case definition

For the purposes of surveillance, a *case* refers to an animal infected with BT virus (BTV).

For the purposes of *international trade*, a ~~difference~~ distinction must be made between a case as defined below and an animal that is potentially infectious to vectors. The conditions for trade are defined in Chapter 2.2.13 of the *Terrestrial Code*.

The purpose of surveillance is the detection of virus circulation in a country or *zone* and not determination of the status of an individual animal or herds. Surveillance deals not only with the occurrence of clinical signs caused by BTV, but also with the ~~presence~~ evidence of infection with BTV in the absence of clinical signs.

Appendix X (contd)

The following defines the occurrence of BTV infection:

1. BTV has been isolated and identified as such from an animal or a product derived from that animal, or
2. viral antigen or viral RNA specific to one or more of the serotypes of BTV has been identified in samples from one or more animals showing clinical signs consistent with BT, or epidemiologically linked to a confirmed or suspected *case*, or giving cause for suspicion of previous association or contact with BTV, or
3. antibodies to structural or nonstructural proteins of BTV that are not a consequence of vaccination have been identified in one or more animals that either showing clinical signs consistent with BT, or epidemiologically linked to a confirmed or suspected *case*, or giving cause for suspicion of previous association or contact with BTV.

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

Article 3.X.X.3.

### **General conditions and methods**

1. A surveillance system in accordance with Appendix 3.8.1. should be under the responsibility of the *Veterinary Administration*. In particular:
  - a) a formal and ongoing system for detecting and investigating *outbreaks of disease* should be in place;
  - b) a procedure should be in place for the rapid collection and transport of samples from suspect cases of BT to a laboratory for BT diagnosis as described in the *Terrestrial Manual*;
  - c) a system for recording, managing and analysing diagnostic and surveillance data should be in place.
2. The BT surveillance programme should:
  - a) in a country/zone free or seasonally free, include an early warning system for reporting suspicious cases. Farmers and workers, who have day-to-day contact with domestic ruminants, as well as diagnosticians, should report promptly any suspicion of BT to the *Veterinary Authority*. They should be supported directly or indirectly (e.g. through private *veterinarians* or *veterinary para-professionals*) by government information programmes and the *Veterinary Administration*. An effective surveillance system will periodically identify suspicious cases that require follow-up and investigation to confirm or exclude that the cause of the condition is BTV. The rate at which such suspicious cases are likely to occur will differ between epidemiological situations and cannot therefore be predicted reliably. All suspected cases of BT should be investigated immediately and samples should be taken and submitted to an *approved laboratory*. This requires that sampling kits and other equipment are available for those responsible for surveillance;
  - b) conduct random or targeted serological and virological surveillance appropriate to the infection status of the country or *zone*.

With regards to BT, ~~compartment refers to establishments where animals are kept in a confirmed vector free environment to prevent BTV infection.~~ Generally, the conditions to prevent exposure of susceptible animals to BTV infected vectors will be difficult to apply. However, under specific situations like *artificial insemination centres* or *quarantine stations* ~~such conditions~~ exposure to vectors may be met preventable. The testing requirements for animals kept in these facilities are described in Articles 2.2.13.11 and 2.2.13.15.

Article 3.X.X.4.

### Surveillance strategies

The target population for surveillance aimed at identification of *disease* and/or *infection* should cover susceptible domestic ruminants within the country, or zone or compartment. Active and passive surveillance for BTV infection should be ongoing. Surveillance should be composed of random or targeted approaches using virological, serological and clinical methods appropriate for the infection status of the country or *zone*.

The strategy employed may be based on randomised sampling surveillance using randomised sampling that would demonstrate ~~requiring surveillance sampling consistent with demonstrating~~ the absence of BTV infection at an acceptable level of confidence. The frequency of sampling should be dependent on the epidemiological situation. Random surveillance is conducted using serological tests described in the *Terrestrial Manual*. Positive serological results may be followed up with virological methods as appropriate.

Targeted surveillance (e.g. based on the increased likelihood of *infection* in particular localities or species) may be an appropriate strategy. Virological and serological methods may be used concurrently to define the BTV status of targeted populations.

A country should justify the surveillance strategy chosen as being adequate to detect the presence of BTV infection in accordance with Appendix 3.8.1. and the prevailing epidemiological situation. It may, for example, be appropriate to target clinical surveillance at particular species likely to exhibit clinical signs (e.g. sheep). Similarly, virological and serological testing may be targeted to species that rarely show clinical signs (e.g. cattle).

In vaccinated populations, serological and virological surveillance is necessary to detect the BTV types circulating to ensure that all circulating types are included in the vaccination programme.

If a Member Country wishes to declare freedom from BTV infection in a specific *zone*, the design of the surveillance strategy would need to be aimed at the population within the *zone*.

For random surveys, the design of the sampling strategy will need to incorporate epidemiologically appropriate design prevalence. The sample size selected for testing will need to be large enough to detect evidence of infection if it were to occur at a predetermined minimum rate. The sample size and expected prevalence determine the level of confidence in the results of the survey. The applicant country must justify the choice of design prevalence and confidence level based on the objectives of surveillance and the epidemiological situation, in accordance with Appendix 3.8.1. Selection of the design prevalence in particular needs to be based on the prevailing or historical epidemiological situation.

Irrespective of the survey approach selected, the sensitivity and specificity of the diagnostic tests employed are key factors in the design, sample size determination and interpretation of the results obtained. Ideally, the sensitivity and specificity of the tests used should be validated for the vaccination/infection history and the different species in the target population.

Appendix X (contd)

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

The principles involved in surveillance for *disease/infection* are technically well defined. The design of surveillance programmes to prove the absence of BTV infection/circulation needs to be carefully followed to avoid producing results that are either insufficiently reliable to be accepted by ~~the OIE or~~ international trading partners, or excessively costly and logistically complicated. The design of any surveillance programme, therefore, requires inputs from professionals competent and experienced in this field.

### 1. Clinical surveillance

Clinical surveillance aims at the detection of clinical signs of BT at the flock/herd level. Whereas significant emphasis is placed on the diagnostic value of mass serological screening, surveillance based on clinical inspection should not be underrated, particularly during a newly introduced infection. In sheep and occasionally goats, clinical signs may include oedema, hyperaemia of mucosal membranes, coronitis and cyanotic tongue.

BT suspects detected by clinical surveillance should always be confirmed by laboratory testing.

### 2. Serological surveillance

An active programme of surveillance of host populations to detect evidence of BTV transmission is essential to establish BTV status in a country or *zone*. Serological testing of ruminants is one of the most effective methods of detecting the presence of BTV. The species tested depends on the epidemiology of BTV infection, and the species available, in the local area. Cattle are usually the most sensitive indicator species. Management variables that may influence likelihood of infection, such as the use of insecticides and animal housing, should be considered.

Surveillance may include serological surveys, for example abattoir surveys, the use of cattle as sentinel animals (which must be individually identifiable), or a combination of methods.

The objective of serological surveillance is to detect evidence of BTV circulation. Samples should be examined for antibodies against BTV using tests prescribed in the *Terrestrial Manual*. Positive BTV antibody tests results can have four possible causes:

- a) natural infection with BTV,
- b) vaccination against BTV,
- c) maternal antibodies,
- d) positive results due to the lack of specificity of the test.

It may be possible to use sera collected for other survey purposes for BTV surveillance. However, the principles of survey design described in these guidelines and the requirements for a statistically valid survey for the presence of BTV infection should not be compromised.

The results of random or targeted serological surveys are important in providing reliable evidence that no BTV infection is present in a *country, or zone or compartment*. It is, therefore, essential that the survey is thoroughly documented. It is critical to interpret the results in light of the movement history of the animals being sampled.

Serological surveillance in a free *zone* should target those areas that are at highest risk of BTV transmission, based on the results of previous surveillance and other information. This will usually be towards the boundaries of the free *zone*. In view of the epidemiology of BTV infection, either random or targeted sampling is suitable to select herds and/or animals for testing.

A surveillance *zone* within a free country or *zone* should separate it from a potentially infected country or *zone*. Serological surveillance in a free country or *zone* should be carried out over an appropriate distance from the border with a potentially infected country or *zone*, based upon geography, climate, history of infection and other relevant factors.

Serological surveillance in infected *zones* will identify changes in the boundary of the *zone*, and can also be used to identify the BTV types circulating. In view of the epidemiology of BTV infection, either random or targeted sampling is suitable.

### 3. Virological surveillance

Isolation and genetic analysis ~~of samples~~ of BTV from a proportion of infected animals is beneficial in terms of providing information on serotype and genetic characteristics of the viruses concerned.

Virological surveillance using tests described in the *Terrestrial Manual* can be conducted:

- a) to identify virus circulation in at risk populations,
- b) to confirm clinically suspect cases,
- c) to follow up positive serological results,
- d) to better characterize the genotype of circulating virus in a country or *zone*.

### 4. Sentinel herds animals

Sentinel ~~herds~~ animals are a form of targeted surveillance with a prospective study design. They are the preferred strategy for BTV surveillance. They comprise groups of unexposed animals managed at fixed locations and sampled regularly to detect new BTV infections.

The primary purpose of a sentinel ~~herd~~ animal programme is to detect BTV infections occurring at a particular place, for instance sentinel groups may be located on the usual boundaries of infected *zones* to detect changes in distribution of BTV. In addition, sentinel ~~herd~~ animal programmes allow ~~incidence rates to be determined and~~ the timing and dynamics of infections to be observed.

Appendix X (contd)

A sentinel ~~herd~~ animal programme should use animals of known source and history of exposure, control management variables such as use of insecticides and animal housing (depending on the epidemiology of BTV in the area under consideration), and be flexible in its design in terms of sampling frequency and choice of tests.

Care is necessary in choosing the sites for the sentinel groups. The aim is to maximise the chance of detecting BTV activity at the geographical location for which the sentinel site acts as a sampling point. The effect of secondary factors that may influence events at each location, such as climate, may also be analysed. To avoid confounding factors, sentinel groups should comprise animals selected to be of similar age and susceptibility to BTV infection. Cattle are the most appropriate sentinels but other domestic ruminant species may be used. The only feature distinguishing groups of sentinels should be their geographical location.

Sera from sentinel ~~herd~~ animal programmes should be stored methodically in a serum bank to allow retrospective studies to be conducted in the event of new serotypes being isolated.

The frequency of sampling will depend on the reason for choosing the sampling site. In endemic areas, virus isolation will allow monitoring of the serotypes and genotypes of BTV circulating during each time period. The borders between infected and non infected areas can be defined by serological detection of infection. Monthly sampling intervals are frequently used. Sentinels in declared free *zones* add to confidence that BTV infections are not occurring unobserved. In such cases, sampling prior to and after the possible period of transmission is sufficient.

~~The definitive measure of a country or zone's BTV infection status is detection~~ Definitive information on BTVs circulating in a country or zone is provided by isolation and identification of the viruses. If virus isolation is required, sentinels should be sampled at sufficiently frequent intervals to ensure that samples are collected during the period of viraemia.

##### 5. Vector surveillance

BTV is transmitted between ruminant hosts by ~~vector~~ species of *Culicoides* which vary across the world. It is therefore important to be able to identify potential vector species accurately although many such species are closely related and difficult to differentiate with certainty.

The main purpose of vector surveillance is to define high, medium and low-risk areas and local details of seasonality by determining the various species present in an area, their respective seasonal ~~incidence and profile~~ occurrence, and their abundance. Vector surveillance has particular relevance to potential areas of spread. Long term surveillance can also be used to assess vector ~~abatement~~ suppression measures.

The most effective way of gathering this information should take account of the biology and behavioural characteristics of the local vector species of *Culicoides* and may include the use of Onderstepoort-type light traps or similar, operated from dusk to dawn in locations adjacent to domestic ruminants, or the use of drop traps over ruminant animals.

Vector surveillance should be based on scientific sampling techniques. The choice of ~~the number and type~~ of traps to be used in a vector surveillance system and the frequency of their use will depend on ~~should take into account the availability of resources but is also dependent upon~~ the size of and ecological characteristics of the area to be surveyed.

The operation of vector surveillance sites at the same locations as sentinel ~~herds~~ animals is advisable.

The use of a vector surveillance system to detect the presence of circulating virus is not recommended as a routine procedure as the typically low vector infection rates mean that such detections can be rare. Other surveillance strategies (e.g. the use of sentinel ~~herds~~ animals of domestic ruminants) are preferred to detect virus circulation.

Article 3.X.X.5.

### Documentation of BTV infection free status

#### 1. Countries declaring freedom from BTV infection for the country; ~~or zone~~ ~~or compartment~~

In addition to the general conditions described in Chapter 2.2.13. of the *Terrestrial Code*, a Member Country declaring freedom from BTV infection for the entire country; ~~or a zone~~ ~~or a compartment~~ should provide evidence for the existence of an effective surveillance programme. The strategy and design of the surveillance programme will depend on the prevailing epidemiological circumstances and should be planned and implemented according to general conditions and methods described in this Appendix, to demonstrate absence of BTV infection during the preceding 24 months in susceptible domestic ruminant populations. This requires the support of a laboratory able to undertake identification of BTV infection through virus detection and antibody tests described in the *Terrestrial Manual*. This surveillance should be targeted to non-vaccinated animals. Clinical surveillance may be effective in sheep while serological surveillance is more appropriate in cattle.

#### 2. Additional requirements for countries; ~~or zones~~ ~~or compartments~~ that practise vaccination

Vaccination to prevent the transmission of BTV may be part of a disease control programme. The level of flock or herd immunity required to prevent transmission will depend on the flock or herd size, composition (e.g. species) and density of the susceptible population. It is therefore impossible to be prescriptive. The vaccine must also comply with the provisions stipulated for BTV vaccines in the *Terrestrial Manual*. Based on the epidemiology of BTV infection in the country; ~~or zone~~ ~~or compartment~~, it may be that a decision is reached to vaccinate only certain species or other subpopulations.

In countries; ~~or zones~~ ~~or compartments~~ ~~or zones~~ that practise vaccination, there is a need to perform virological and serological tests to ensure the absence of virus circulation. These tests should be performed on non-vaccinated subpopulations or on sentinels. The tests have to be repeated at appropriate intervals according to the purpose of the surveillance programme. For example, longer intervals may be adequate to confirm endemicity, while shorter intervals may allow on-going demonstration of absence of transmission.

Article 3.X.X.6.

### The use and interpretation of serological and virus detection tests

#### 1. Serological testing

Ruminants infected with BTV produce antibodies to structural and non-structural viral proteins, as do animals vaccinated with current modified live virus vaccines. Antibodies to the BTV serogroup antigen are detected with high sensitivity and specificity by competitive ELISA (c-ELISA) and to a lesser extent by AGID as described in the *Terrestrial Manual*. Positive c-ELISA results can be confirmed by neutralization assay to identify the infecting serotype(s); however, BTV infected ruminants can produce neutralizing antibodies to serotypes of BTV other than those to which they were exposed (false positive results), especially if they have been infected with multiple serotypes.

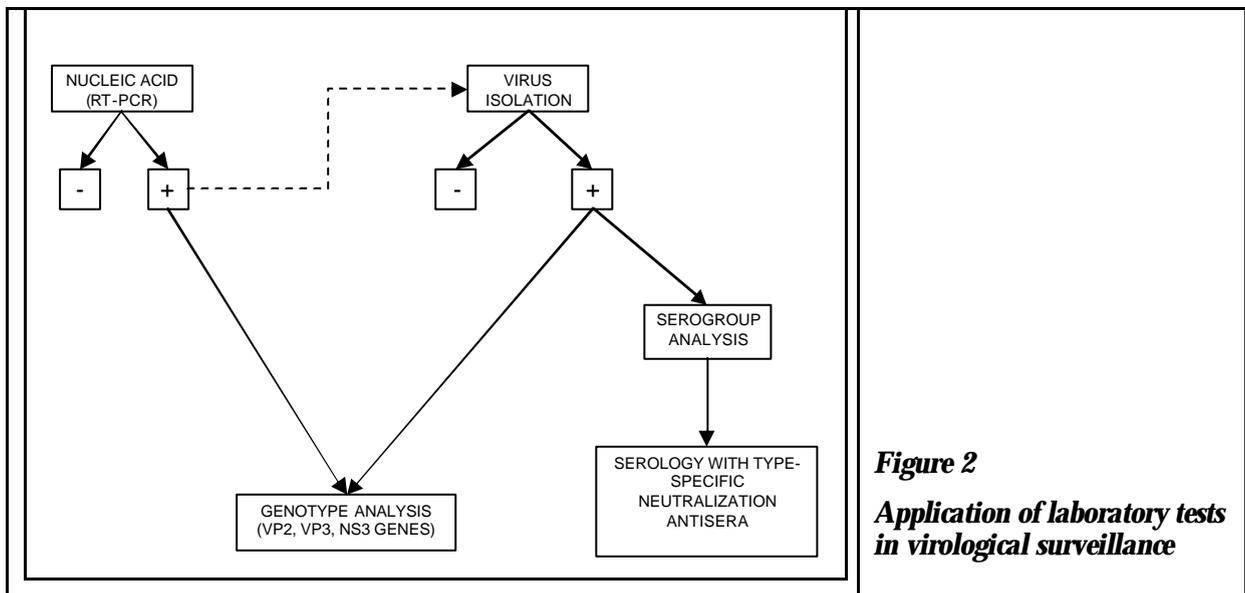
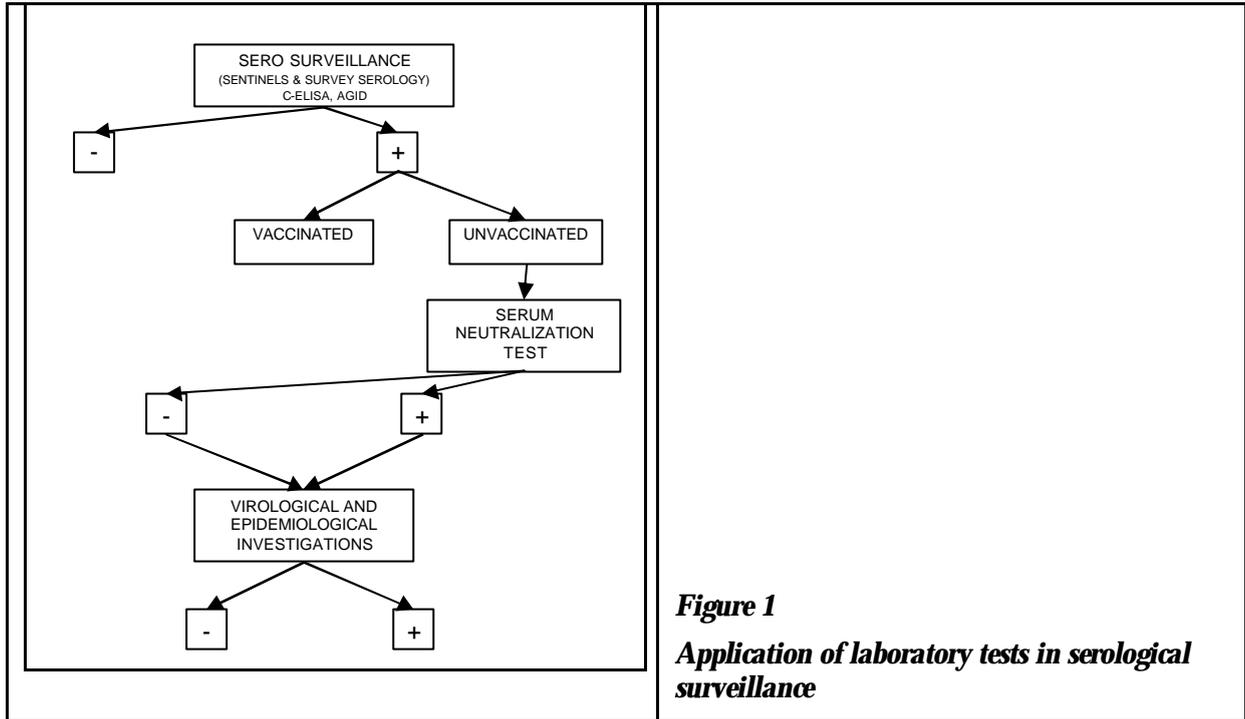
Appendix X (contd)2. Virus detection

The presence of BTV in ruminant blood and tissues can be detected by virus isolation or polymerase chain reaction (PCR) as described in the *Terrestrial Manual*.

Interpretation of positive and negative results (both true and false) differs markedly between these tests because they detect different aspects of BTV infection, specifically (1) infectious BTV (virus isolation) and (2) nucleic acid (PCR). The following are especially relevant to interpretation of PCR assays:

- a) The nested PCR assay detects BTV nucleic acid in ruminants long after the clearance of infectious virus. Thus positive PCR results do not necessarily coincide with active infection of ruminants. Furthermore, the nested PCR assay is especially prone to template contamination, thus there is considerable risk of false positive results.
- b) PCR procedures other than real time PCR allow sequence analysis of viral amplicons from ruminant tissues, insect vectors or virus isolates. These sequence data are useful for creating data bases to facilitate important epidemiological studies, including the possible distinction of field and vaccine virus strains of BTV, genotype characterization of field strains of BTV, and potential genetic divergence of BTV relevant to vaccine and diagnostic testing strategies.

It is essential that BTV isolates are sent regularly to the OIE Reference Laboratories for genetic and antigenic characterization.



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## CHAPTER 2.3.3.

# BOVINE TUBERCULOSIS

### Article 2.3.3.1.

The recommendations in this Chapter are intended to manage the human and animal health risks associated with *Mycobacterium bovis* (*M. bovis*) infection in domestic (permanently captive and owned free-range) bovines including cattle (*Bos taurus*, *B. indicus* and *B. grunniens*), and water buffalo (*Bubalus bubalis*) and wood bison (*Bison bison* and *B. bonasus*).

When authorising import or transit of the following *commodities*, *Veterinary Administrations* should comply with the requirements prescribed in this Chapter relevant to the status of bovine tuberculosis in the *exporting country, zone* or *compartment*:

1. live animals;
2. semen, ova and *in vivo* derived embryos collected and handled in accordance with the recommendations of the International Embryo Transfer Society;
3. *meat* and *meat products*;
4. *milk* and *milk products*.

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

### Article 2.3.3.2.

#### **Country, zone or compartment free from bovine tuberculosis**

To qualify as free from bovine tuberculosis, a country, *zone* or *compartment* should satisfy the following requirements:

1. bovine tuberculosis *Mycobacterium bovis* (*M. bovis*) infection in domestic (permanently captive and owned free-range) bovines including cattle (*Bos taurus*, *B. indicus* and *B. grunniens*), water buffalo (*Bubalus bubalis*) and wood bison (*Bison bison* and *B. bonasus*) is a notifiable disease in the country;
2. an on-going awareness programme should be in place to encourage reporting of all cases suggestive of tuberculosis;
3. regular and periodic testing of all cattle, and water buffalo and wood bison herds has shown that at least 99.8% of the herds and 99.9% of the animals in the country, *zone* or *compartment* have been found free from bovine tuberculosis and the percentage of herds confirmed infected with *M. bovis* has not exceeded 0.1% per year for 3 consecutive years;
4. a surveillance programme should be in place to detect bovine tuberculosis in the country, *zone* or *compartment*, through monitoring at slaughter based on the inspection described in Article 2.3.3.8.;

## Appendix XI (contd)

5. cattle, ~~and~~ water buffalo and wood bison introduced into a country, *zone* or *compartment* free from bovine tuberculosis should be accompanied by a certificate from an *Official Veterinarian* attesting that they come from a country, *zone* or *compartment* or herd free from bovine tuberculosis or comply with the relevant provisions in the articles 2.3.3.5 or 2.3.3.6.

Article 2.3.3.3.

**Herd free from bovine tuberculosis**

To qualify as free from bovine tuberculosis, a herd of cattle, ~~or~~ water buffalo or wood bison should satisfy the following requirements:

1. the herd is in a country, *zone* or *compartment* free from bovine tuberculosis and is certified free by the *Veterinary Administration*; or
2. cattle, ~~and~~ water buffalo and wood bison in the herd:
  - a) show no clinical sign of bovine tuberculosis;
  - b) over 6 weeks of age, have shown a negative result to at least two tuberculin tests carried out at an interval of 6 months, the first test being performed at 6 months following the slaughter of the last affected animal;
  - c) showed a negative result to an annual tuberculin test to ensure the continuing absence of bovine tuberculosis; or
    - i) showed a negative result to a tuberculin test every two years to ensure the continuing absence of bovine tuberculosis if the annual percentage of herds confirmed as infected with tuberculosis is not more than 1% of all herds in the country or *zone* during the last two years, or
    - ii) showed a negative result to a tuberculin test every three years to ensure the continuing absence of bovine tuberculosis if the annual percentage of herds confirmed as infected with tuberculosis is not more than 0.2% of all herds in the country or *zone* during the last four years, or
    - iii) showed a negative result to a tuberculin test every four years to ensure the continuing absence of bovine tuberculosis if the annual percentage of herds confirmed as infected with tuberculosis is not more than 0.1% of all herds in the country or *zone* during the last six years;
3. cattle, ~~and~~ water buffalo and wood bison introduced into the herd come from a herd free from bovine tuberculosis. This condition may be waived for animals which have been isolated and which, prior to entry into the herd were subjected to at least two tuberculin tests carried out at a 6-month interval with negative results.

Article 2.3.3.4.

*Veterinary Administrations of importing countries* should require:

for cattle, water buffalo and wood bison for breeding or rearing

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of bovine tuberculosis on the day of shipment;
2. originate from a herd free from bovine tuberculosis that is in a country, *zone* or *compartment* free from bovine tuberculosis; or
3. were subjected to the tuberculin test for bovine tuberculosis with negative results during the 30 days prior to shipment and come from a herd free from bovine tuberculosis; or
4. have been isolated and prior to entry into the herd were subjected to at least two tuberculin tests carried out at a 6-month interval with negative results.
  - ~~a) Were isolated for the 3 months prior to shipment and were subjected to the tuberculin test for bovine tuberculosis with negative results on two occasions, with an interval of not less than 60 days between each test.~~

Article 2.3.3.5.

*Veterinary Administrations of importing countries* should require:

for cattle, water buffalo and wood bison for slaughter

the presentation of an *international veterinary certificate* attesting that the animals:

1. originated from a herd free from bovine tuberculosis or were subjected to a tuberculin test for bovine tuberculosis with negative results during the 30 days prior to shipment;
2. were not being eliminated as part of an eradication programme against bovine tuberculosis.

Article 2.3.3.6.

*Veterinary Administrations of importing countries* should require:

for semen of cattle, water buffalo and wood bison

the presentation of an *international veterinary certificate* attesting that:

1. the donor animals:
  - a) showed no clinical sign of bovine tuberculosis on the day of collection of the semen;
  - b) were kept in an *artificial insemination centre* free from bovine tuberculosis in a country, *zone* or *compartment* free from bovine tuberculosis and which only accepts animals from free herds in a free country, *zone* or *compartment*; or
  - c) showed negative results to tuberculin tests carried out annually and were kept in a herd free from bovine tuberculosis;
2. the semen was collected, processed and stored in conformity with the provisions of Appendix 3.2.1.

Appendix XI (contd)

## Article 2.3.3.7.

*Veterinary Administrations of importing countries* should require:

for embryos/ova of cattle, water buffalo and wood bison

the presentation of an *international veterinary certificate* attesting that:

1. the donor females:
  - a) and all other susceptible animals in the herd of origin showed no clinical sign of bovine tuberculosis during the 24 hours prior to embryo collection;
  - b) originated from a herd free from bovine tuberculosis in a country, *zone* or *compartment* free from bovine tuberculosis; or
  - c) were kept in a herd free from bovine tuberculosis, and were subjected to a tuberculin test for bovine tuberculosis with negative results during an isolation period of 30 days in the *establishment* of origin prior to departure to the *collection centre*.
2. the embryos/ova were collected, processed and stored in conformity with the provisions of Appendix 3.3.1., Appendix 3.3.2. or Appendix 3.3.3., as relevant.

## Article 2.3.3.8.

*Veterinary Administrations of importing countries* should require:

for *fresh meat and meat products* of cattle, water buffalo and wood bison

the presentation of an *international veterinary certificate* attesting that the entire consignment of meat comes from animals which have been subjected to ante-mortem and post-mortem inspections as described in the Codex Alimentarius Code of Practice for Meat Hygiene Appendix 3.10.1.

## Article 2.3.3.9.

*Veterinary Administrations of importing countries* should require:

for *milk and milk products* of cattle, water buffalo and wood bison

the presentation of an *international veterinary certificate* attesting that the consignment:

1. has been derived from animals in a herd free from bovine tuberculosis; or
2. was subjected to pasteurization; or
3. a combination of control measures with equivalent performance as described in the Codex Alimentarius Code of Hygienic Practice for Milk and Milk Products.

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## CHAPTER 2.3.13.

## BOVINE SPONGIFORM ENCEPHALOPATHY

## Article 2.3.13.1.

The recommendations in this Chapter are intended to manage the human and animal health risks associated with the presence of the bovine spongiform encephalopathy (BSE) agent in cattle (*Bos taurus* and *B. indicus*) only.

1. When authorising import or transit of the following *commodities* and any products made from these *commodities* and containing no other tissues from cattle, *Veterinary Administrations* should not require any BSE related conditions, regardless of the BSE risk status of the cattle population of the *exporting country, zone or compartment*:
  - a) *milk and milk products*;
  - b) semen and *in vivo* derived cattle embryos collected and handled in accordance with the recommendations of the International Embryo Transfer Society;
  - c) hides and skins;
  - d) gelatine ~~and collagen~~ prepared exclusively from hides, ~~and skins~~ or bones;
  - e) collagen prepared exclusively from hides and skins;
  - ef) protein-free tallow (maximum level of insoluble impurities of 0.15% in weight) and derivatives made from this tallow;
  - fg) dicalcium phosphate (with no trace of protein or fat);
  - gh) deboned skeletal muscle meat (excluding mechanically separated meat) from cattle 30 months of age or less, which were not subjected to a stunning process prior to slaughter, with a device injecting compressed air or gas into the cranial cavity or to a pithing process, and which passed ante-mortem and post-mortem inspections and which has been prepared in a manner to avoid contamination with tissues listed in Article 2.3.13.13.;
  - hi) blood and blood by-products, from cattle which were not subjected to a stunning process, prior to slaughter, with a device injecting compressed air or gas into the cranial cavity, or to a pithing process.
2. When authorising import or transit of other *commodities* listed in this Chapter, *Veterinary Administrations* should require the conditions prescribed in this Chapter relevant to the BSE risk status of the cattle population of the *exporting country, zone or compartment*.

Appendix XII (contd)

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

## Article 2.3.13.2.

The BSE risk status of the cattle population of a country, *zone* or *compartment* should be determined on the basis of the following criteria:

1. the outcome of a *risk assessment*, based on Section 1.3., identifying all potential factors for BSE occurrence and their historic perspective. Countries should review the risk assessment annually to determine whether the situation has changed.

a) Release assessment

Release assessment consists of assessing, through consideration of the following, the likelihood that the BSE agent has either been introduced into the country, *zone* or *compartment* via *commodities* potentially contaminated with it, or is already present in the country, *zone* or *compartment*:

- i) the presence or absence of the BSE agent in the indigenous ruminant population of the country, *zone* or *compartment* and, if present, evidence regarding its prevalence;
- ii) production of *meat-and-bone meal* or *greaves* from the indigenous ruminant population;
- iii) imported *meat-and-bone meal* or *greaves*;
- iv) imported cattle, sheep and goats;
- v) imported animal feed and feed ingredients;
- vi) imported products of ruminant origin for human consumption, which may have contained tissues listed in Article 2.3.13.13. and may have been fed to cattle;
- vii) imported products of ruminant origin intended for *in vivo* use in cattle.

The results of any epidemiological investigation into the disposition of the *commodities* identified above should be taken into account in carrying out the assessment.

b) Exposure assessment

If the release assessment identifies a *risk* factor, an exposure assessment should be conducted, consisting of assessing the likelihood of cattle being exposed to the BSE agent, through a consideration of the following:

- i) recycling and amplification of the BSE agent through consumption by cattle of *meat-and-bone meal* or *greaves* of ruminant origin, or other feed or feed ingredients contaminated with these;
- ii) the use of ruminant carcasses (including from fallen stock), by-products and *slaughterhouse* waste, the parameters of the rendering processes and the methods of animal feed manufacture;
- iii) the feeding or not of ruminants with *meat-and-bone meal* and *greaves* derived from ruminants, including measures to prevent cross-contamination of animal feed;

- iv) the level of surveillance for BSE conducted on the cattle population up to that time and the results of that surveillance;
- 2. on-going awareness programme for veterinarians, farmers, and workers involved in transportation, marketing and slaughter of cattle to encourage reporting of all *cases* showing clinical signs consistent with BSE in target sub-populations as defined in Appendix 3.8.4.;
- 3. the compulsory notification and investigation of all cattle showing clinical signs consistent with BSE;
- 4. the examination **carried out in accordance with the *Terrestrial Manual*** in an *approved laboratory* of brain or other tissues collected within the framework of the aforementioned surveillance and monitoring system.

When the *risk assessment* demonstrates negligible risk, the country should conduct Type B surveillance in accordance with Appendix 3.8.4.

When the *risk assessment* fails to demonstrate negligible risk, the country should conduct Type A surveillance in accordance with Appendix 3.8.4.

Article 2.3.13.3.

### **Negligible BSE risk**

*Commodities* from the cattle population of a country, *zone* or *compartment* pose a negligible risk of transmitting the BSE agent if the following conditions are met:

- 1. a *risk assessment*, as described in point 1 of Article 2.3.13.2., has been conducted in order to identify the historical and existing risk factors, and the country has demonstrated that appropriate specific measures have been taken for the relevant period of time defined below to manage each identified risk;
- 2. the country has demonstrated that Type B surveillance in accordance with Appendix 3.8.4. is in place and the relevant points target, in accordance with Table 1, has been met;
- 3. EITHER:
  - a) there has been no *case* of BSE or, if there has been a *case*, every *case* of BSE has been demonstrated to have been imported and has been completely destroyed, and
    - i) the criteria in points 2 to 4 of Article 2.3.13.2. have been complied with for at least 7 years; and
    - ii) it has been demonstrated through an appropriate level of control and audit that for at least 8 years neither *meat-and-bone meal* nor *greaves* derived from ruminants has been fed to ruminants;

OR

- b) if there has been an indigenous *case*, every indigenous *case* was born more than 11 years ago; and
  - i) the criteria in points 2 to 4 of Article 2.3.13.2. have been complied with for at least 7 years; and

Appendix XII (contd)

- ii) it has been demonstrated through an appropriate level of control and audit that for at least 8 years neither *meat-and-bone meal* nor *greaves* derived from ruminants has been fed to ruminants; and
- iii) all BSE cases, as well as:
  - all cattle which, during their first year of life, were reared with the BSE cases during their first year of life, and which investigation showed consumed the same potentially contaminated feed during that period, or
  - if the results of the investigation are inconclusive, all cattle born in the same herd as, and within 12 months of the birth of, the BSE cases,

if alive in the country, *zone* or *compartment*, are permanently identified, and their movements controlled, and, when slaughtered or at death, are completely destroyed.

Article 2.3.13.4.

**Controlled BSE risk**

*Commodities* from the cattle population of a country, *zone* or *compartment* pose a controlled risk of transmitting the BSE agent if the following conditions are met:

1. a *risk assessment*, as described in point 1 of Article 2.3.13.2., has been conducted in order to identify the historical and existing risk factors, and the country has demonstrated that appropriate measures are being taken to manage all identified risks, but these measures have not been taken for the relevant period of time;
2. the country has demonstrated that Type A surveillance in accordance with Appendix 3.8.4. has been carried out and the relevant points target, in accordance with Table 1, has been met; Type B surveillance may replace Type A surveillance once the relevant points target is met;
3. EITHER:
  - a) there has been no *case* of BSE or, if there has been a *case*, every *case* of BSE has been demonstrated to have been imported and has been completely destroyed, the criteria in points 2 to 4 of Article 2.3.13.2. are complied with, and it can be demonstrated through an appropriate level of control and audit that neither *meat-and-bone meal* nor *greaves* derived from ruminants has been fed to ruminants, but at least one of the following two conditions applies:
    - i) the criteria in points 2 to 4 of Article 2.3.13.2. have not been complied with for 7 years;
    - ii) it cannot be demonstrated that controls over the feeding of *meat-and-bone meal* or *greaves* derived from ruminants to ruminants have been in place for 8 years;

OR

- b) there has been an indigenous *case* of BSE, the criteria in points 2 to 4 of Article 2.3.13.2. are complied with, and it can be demonstrated through an appropriate level of control and audit that neither meat-and-bone meal nor greaves derived from ruminants has been fed to ruminants, but at least one of the following two conditions applies:
- i) the criteria in points 2 to 4 of Article 2.3.13.2. have not been complied with for 7 years;
  - ii) it cannot be demonstrated that controls over the feeding of *meat-and-bone meal* and greaves derived from ruminants to ruminants have been in place for 8 years;

AND

- iii) all BSE *cases*, as well as:
  - all cattle which, during their first year of life, were reared with the BSE *cases* during their first year of life, and which investigation showed consumed the same potentially contaminated feed during that period, or
  - if the results of the investigation are inconclusive, all cattle born in the same herd as, and within 12 months of the birth of, the BSE *cases*,  
  
if alive in the country, *zone* or *compartment*, are permanently identified, and their movements controlled, and, when slaughtered or at death, are completely destroyed.

Article 2.3.13.5.

### Undetermined BSE risk

The cattle population of a country, *zone* or *compartment* poses an undetermined BSE risk if it cannot be demonstrated that it meets the requirements of another category.

Article 2.3.13.6.

When importing from a country, *zone* or *compartment* posing a negligible BSE risk, *Veterinary Administrations* should require:

for all *commodities* from cattle not listed in point 1 of Article 2.3.13.1.

the presentation of an *international veterinary certificate* attesting that the country, *zone* or *compartment* complies with the conditions in Article 2.3.13.3.

Article 2.3.13.6.a

When importing from a country, *zone* or *compartment* posing a negligible BSE risk, but where there has been an indigenous *case*. *Veterinary Administrations* should require:

for cattle selected for export

Appendix XII (contd)

the presentation of an *international veterinary certificate* attesting that the animals:

1. are identified by a permanent identification system ~~enabling them to be traced back to the dam and herd of origin, and in such a way as to demonstrate that they~~ are not exposed cattle as described in point 3) b) iii) of Article 2.3.13.3.;
2. were born after the date from which the ban on the feeding of ruminants with *meat-and-bone meal* and *greaves* derived from ruminants had been effectively enforced.

Article 2.3.13.7.

When importing from a country, *zone* or *compartment* posing a controlled BSE risk, *Veterinary Administrations* should require:

for cattle

the presentation of an *international veterinary certificate* attesting that:

1. the country, *zone* or *compartment* complies with the conditions referred to in Article 2.3.13.4.;
2. cattle selected for export are identified by a permanent identification system ~~enabling them to be traced back to the dam and herd of origin, and in such a way as to demonstrate that they~~ are not exposed cattle as described in point 3b)iii) of Article 2.3.13.4.;
3. ~~in the case of a country, *zone* or *compartment* where there has been an indigenous case,~~ cattle selected for export were born after the date from which the ban on the feeding of ruminants with *meat-and-bone meal* and *greaves* derived from ruminants was effectively enforced.

Article 2.3.13.8.

When importing from a country, *zone* or *compartment* with an undetermined BSE risk, *Veterinary Administrations* should require:

for cattle

the presentation of an *international veterinary certificate* attesting that:

1. the feeding of ruminants with *meat-and-bone meal* and *greaves* derived from ruminants has been banned and the ban has been effectively enforced;
2. all BSE *cases*, as well as:
  - a) all cattle which, during their first year of life, were reared with the BSE *cases* during their first year of life, and, which investigation showed consumed the same potentially contaminated feed during that period, or
  - b) if the results of the investigation are inconclusive, all cattle born in the same herd as, and within 12 months of the birth of, the BSE *cases*,

if alive in the country, *zone* or *compartment*, are permanently identified, and their movements controlled, and, when slaughtered or at death, are completely destroyed;

3. cattle selected for export:
  - a) are identified by a permanent identification system enabling them to be traced back to the dam and herd of origin and are not the progeny of BSE suspect or confirmed females in such a way as to demonstrate that they are not exposed cattle as demonstrated in point 2 above;
  - b) were born at least 2 years after the date from which the ban on the feeding of ruminants with *meat-and-bone meal* and *greaves* derived from ruminants was effectively enforced.

Article 2.3.13.9.

When importing from a country, *zone* or *compartment* posing a negligible BSE risk, *Veterinary Administrations* should require:

for *fresh meat* and *meat products* from cattle (other than those listed in point 1 of Article 2.3.13.1.)

the presentation of an *international veterinary certificate* attesting that:

1. the country, *zone* or *compartment* complies with the conditions in Article 2.3.13.3.;
2. the cattle from which the *fresh meat* and *meat products* were derived passed ante-mortem and post-mortem inspections;
3. in countries with negligible BSE risk where there have been indigenous cases, the cattle from which the *fresh meat* and *meat products* were derived were born after the date from which the ban on the feeding of ruminants with *meat-and-bone meal* and *greaves* derived from ruminants had been effectively enforced.

Article 2.3.13.10.

When importing from a country, *zone* or *compartment* with an undetermined controlled BSE risk, *Veterinary Administrations* should require:

for *fresh meat* and *meat products* from cattle (other than those listed in point 1 of Article 2.3.13.1.)

the presentation of an *international veterinary certificate* attesting that:

1. the country, *zone* or *compartment* complies with the conditions referred to in Article 2.3.13.4.;
2. the cattle from which the *fresh meat* and *meat products* were derived passed ante-mortem and post-mortem inspections;
3. cattle from which the *fresh meat* and *meat products* destined for export were derived were not subjected to a stunning process, prior to slaughter, with a device injecting compressed air or gas into the cranial cavity, or to a pithing process;
4. the *fresh meat* and *meat products* were produced and handled in a manner which ensures that such products do not contain and are not contaminated with:

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- a) the tissues listed in points 1 and 2 of Article 2.3.13.13.,
- b) mechanically separated meat from the skull and vertebral column from cattle over 30 months of age.

## Article 2.3.13.11.

When importing from a country, *zone* or *compartment* with an undetermined BSE risk, *Veterinary Administrations* should require:

for *fresh meat* and *meat products* from cattle (other than those listed in point 1 of Article 2.3.13.1.)

the presentation of an *international veterinary certificate* attesting that:

1. the cattle from which the *fresh meat* and *meat products* originate:
  - a) have not been fed *meat-and-bone meal* or *greaves* derived from ruminants;
  - b) passed ante-mortem and post-mortem inspections;
  - c) were not subjected to a stunning process, prior to slaughter, with a device injecting compressed air or gas into the cranial cavity, or to a pithing process;
2. the *fresh meat* and *meat products* were produced and handled in a manner which ensures that such products do not contain and are not contaminated with:
  - a) the tissues listed in points 1 and 3 of Article 2.3.13.13.;
  - b) nervous and lymphatic tissues exposed during the deboning process;
  - c) mechanically separated meat from the skull and vertebral column from cattle over 12 months of age.

## Article 2.3.13.12.

1. Ruminant-derived *meat-and-bone meal* or *greaves*, or any *commodities* containing such products, which originate from a country, *zone* or *compartment* defined in Article 2.3.13.3. but where there has been an indigenous case of BSE, should not be traded if such products were derived from cattle born before the date from which the ban on the feeding of ruminants with *meat-and-bone meal* and *greaves* derived from ruminants had been effectively enforced.

~~1.2.~~ Ruminant-derived *meat-and-bone meal* or *greaves*, or any *commodities* containing such products, which originate from a country, *zone* or *compartment* defined in Articles 2.3.13.4. and 2.3.13.5. should not be traded between countries.

## Article 2.3.13.13.

1. From cattle of any age originating from a country, *zone* or *compartment* defined in Articles 2.3.13.4. and 2.3.13.5., the following commodities, and any commodity contaminated by them, should not be traded for the preparation of food, feed, fertilisers, cosmetics, pharmaceuticals including biologicals, or medical devices: tonsils and distal ileum. Protein products, food, feed, fertilisers, cosmetics, pharmaceuticals or medical devices prepared using these commodities (unless covered by other Articles in this Chapter) should also not be traded.

2. From cattle that were at the time of slaughter over 30 months of age originating from a country, *zone* or *compartment* defined in Article 2.3.13.4., the following commodities, and any commodity contaminated by them, should not be traded for the preparation of food, feed, fertilisers, cosmetics, pharmaceuticals including biologicals, or medical devices: brains, eyes, spinal cord, skull and vertebral column. Protein products, food, feed, fertilisers, cosmetics, pharmaceuticals or medical devices prepared using these commodities (unless covered by other Articles in this Chapter) should also not be traded.
3. From cattle that were at the time of slaughter over 12 months of age originating from a country, *zone* or *compartment* defined in Article 2.3.13.5., the following commodities, and any commodity contaminated by them, should not be traded for the preparation of food, feed, fertilisers, cosmetics, pharmaceuticals including biologicals, or medical devices: brains, eyes, spinal cord, skull and vertebral column. Protein products, food, feed, fertilisers, cosmetics, pharmaceuticals or medical devices prepared using these commodities (unless covered by other Articles in this Chapter) should also not be traded.

Article 2.3.13.14.

*Veterinary Administrations of importing countries* should require:

for ~~gelatine and~~ collagen prepared from bones and intended for food or feed, cosmetics, pharmaceuticals including biologicals, or medical devices

the presentation of an *international veterinary certificate* attesting that:

1. the *commodities* came from a country, *zone* or *compartment* posing a negligible BSE risk;
- OR
2. they originate from a country, *zone* or *compartment* posing a controlled or undetermined BSE risk and are derived from cattle which have passed ante-mortem and post-mortem inspections; and that
    - a) ~~skulls from cattle over 30 months of age at the time of slaughter have been excluded;~~
    - b) a) the bones have been subjected to a process which includes all of the following steps:
      - i) pressure washing (degreasing),
      - ii) acid demineralisation,
      - iii) acid or alkaline treatment,
      - iv) filtration,
      - v) sterilisation at >138°C for a minimum of 4 seconds,

or to an equivalent or better process in terms of infectivity reduction (such as high pressure heating);

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OR

3. ~~they originate from a country, zone or compartment posing an undetermined BSE risk and are derived from cattle which have passed ante-mortem and post-mortem inspections; and that~~
- ~~a) skulls and vertebrae (except tail vertebrae) from cattle over 12 months of age at the time of slaughter have been excluded;~~
  - ~~b) the bones have been subjected to a process which includes all of the following steps:
 
    - ~~i) pressure washing (degreasing);~~
    - ~~ii) acid demineralisation;~~
    - ~~iii) acid or alkaline treatment;~~
    - ~~iv) filtration;~~
    - ~~v) sterilisation at >138°C for a minimum of 4 seconds;~~~~or to an equivalent or better process in terms of infectivity reduction (such as high pressure heating).~~~~

Article 2.3.13.15.

*Veterinary Administrations of importing countries* should require:

for tallow and dicalcium phosphate (other than as defined in Article 2.3.13.1.) intended for food, feed, fertilisers, cosmetics, pharmaceuticals including biologicals, or medical devices

the presentation of an *international veterinary certificate* attesting that:

1. the *commodities* came from a country, *zone* or *compartment* posing a negligible BSE risk; or
2. they originate from a country, *zone* or *compartment* posing a controlled BSE risk, are derived from cattle which have passed ante-mortem and post-mortem inspections, and have not been prepared using the tissues listed in points 1 and 2 of Article 2.3.13.13.

Article 2.3.13.16.

*Veterinary Administrations of importing countries* should require:

for tallow derivatives (other than those made from protein-free tallow as defined in Article 2.3.13.1.) intended for food, feed, fertilisers, cosmetics, pharmaceuticals including biologicals, or medical devices

the presentation of an *international veterinary certificate* attesting that:

1. they originate from a country, *zone* or *compartment* posing a negligible BSE risk; or

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2. they are derived from tallow meeting the conditions referred to in Article 2.3.13.15.; or
3. they have been produced by hydrolysis, saponification or transesterification using high temperature and pressure.

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## CHAPTER 2.5.5.

# EQUINE INFLUENZA

### Article 2.5.5.1.

For the purposes of the *Terrestrial Code*, equine influenza (EI) is defined as an infection of domestic horses, ~~which shall include donkeys and mules.~~

For the purposes of *international trade*, this Chapter deals not only with the occurrence of clinical signs caused by equine influenza virus (EIV), but also with the presence of infection with EIV in the absence of clinical signs.

For the purposes of this chapter, isolation is defined as ‘the separation of horses from horses of a different equine influenza health status, utilising appropriate biosecurity measures, with the purpose of preventing the transmission of infection’.

For the purposes of the *Terrestrial Code*, the *infective period* for equine influenza is 21 days.

Standards for diagnostic tests and vaccines are described in the *Terrestrial Manual*. ~~For the purposes of this chapter, a primary vaccination course for an inactivated vaccine comprises two vaccine doses given at an interval specified by the manufacturer; in the case of a live vaccine, one dose constitutes the primary course. Subsequent doses are classified as booster doses.~~

### Article 2.5.5.2.

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

1. the outcome of a *risk assessment* identifying all potential factors for EI occurrence and their historic perspective;
2. whether EI is notifiable in the whole country, an on-going EI awareness programme is in place, and all notified suspect occurrences of EI are subjected to field and, where applicable, laboratory investigations;
3. appropriate surveillance is in place to demonstrate the presence of infection in the absence of clinical signs in horses; ~~this may be achieved through an EI surveillance programme.~~

### Article 2.5.5.3.

#### **Equine influenza free country, zone or compartment**

A country or *zone* or *compartment* may be considered free from EI provided the disease is notifiable in the whole country and it shows evidence of an effective surveillance programme, planned and implemented according to the general principles in Appendix 3.8.1. The surveillance may need to be adapted to parts of the country, *zone* or *compartment* depending on historical or geographical factors, industry structure, population data, movements of equids into the country, zone or compartment, wild equid populations or proximity to recent *outbreaks*.

## Appendix XIII (contd)

~~For a country, zone or compartment in which vaccination is not practised or is practised at a moderate to low level, the absence of clinical equine influenza in the country, zone or compartment for the past 12 months should be demonstrated.~~

A country, zone or compartment seeking freedom from EI, in which vaccination is practised ~~at a high level~~, should also demonstrate that EIV has not been circulating in the domestic horse population during the past 12 months, through surveillance in accordance with Appendix 3.8.1., at a level sufficient to provide at least a 95% level of confidence of detecting infection if it is present at a prevalence rate exceeding 1%. The level of population immunity required to prevent transmission will depend on the size, composition and density of the susceptible population, but the aim should be to vaccinate at least 80% of the susceptible population. Based on the epidemiology of EI in the country, zone or compartment, a decision may be reached to vaccinate only certain subsets of the total susceptible horse population. In a country in which vaccination is not practised surveillance could be conducted using serological testing. In countries where vaccination is practiced, the surveillance should include methods of virus detection.

If an outbreak of clinical equine influenza occurs in a previously free country, zone or compartment, free status can be regained 12 months after the last clinical case, providing that surveillance for evidence of infection has been carried out during that 12-month period at a level sufficient to provide at least a 95% level of confidence of detecting infection if it is present at a prevalence rate exceeding 1%.

## Article 2.5.5.4.

**Country, zone or compartment not free of undetermined from equine influenza status**

~~A country, zone or compartment may be considered not free from equine influenza of undetermined status when it does not meet the conditions for free status.~~

Article 2.5.5.4. (under study)

Regardless of the EI status of the *exporting country, zone or compartment*, the *Veterinary Administration* of a country, zone or compartment should authorise without restriction on account of EI the importation into their *territory* of the following *commodities*:

1. semen;
2. *in vivo* derived equine embryos collected, processed and stored in conformity with the provisions of Appendix 3.3.1.

Article 2.5.5.5.

When importing horses for immediate slaughter, the *Veterinary Administrations* ~~of an EI free country, zone or compartment~~ should require:

the presentation of an *international veterinary certificate* attesting that the horses:

1. came from an EI free country, zone or compartment in which they had been resident for at least 21 days;  
or

2. came from a country, zone or compartment not known of undetermined to be EI free status and had been subjected to pre-export isolation for 21 days, and showed no clinical sign of EI during isolation nor on the day of shipment.

## Article 2.5.5.7.

~~When importing horses for immediate slaughter, the Veterinary Administration of a country, zone or compartment of undetermined EI status should require:~~

~~the presentation of an international veterinary certificate attesting that the horses:~~

1. ~~came from an EI free country, zone or compartment in which they had been resident for at least 21 days;~~  
~~or~~
2. ~~came from a country, zone or compartment of undetermined EI status and showed no clinical sign of EI on the day of shipment.~~

Article 2.5.5.8. 7.6.

~~When importing horses for unrestricted movement, the Veterinary Administrations of an EI free country, zone or compartment should require:~~

~~the presentation of an international veterinary certificate attesting that the horses:~~

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

~~OR~~

2. ~~came from a country, zone or compartment not known to be free from of undetermined EI status, were subjected to pre-export isolation for 21 days and showed no clinical sign of EI during isolation nor on the day of shipment; and~~
3. ~~were vaccinated according to the manufacturer's instructions between 21 and 90 days before shipment either with a primary course or a booster. between 14 and 90 days before shipment either with a primary course or a booster.~~

Article 2.5.5.9. 8.7.

~~When importing horses for unrestricted movement, the Veterinary Administration of a country, zone or compartment of undetermined EI status should require:~~

~~the presentation of an international veterinary certificate attesting that the horses:~~

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

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OR

- ~~2. came from a country, zone or compartment of undetermined EI status and showed no clinical sign of EI on the day of shipment; and~~
- ~~3. were vaccinated between 14 and 180 days before shipment either with a primary course or a booster.~~

Article 2.5.5.10. 97

When importing horses which will be kept in isolation (see Article 2.5.5.1.) ~~the Veterinary Administrations of an EI free country, zone or compartment~~ should require:

the presentation of an *international veterinary certificate* attesting that the horses:

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

OR

2. showed no clinical sign of EI in any premises in which the horses had been resident for the ~~30~~ 21 days prior to shipment nor on the day of shipment; and
3. were vaccinated according to the manufacturer's instructions ~~between 14 and 180 days before shipment either with a primary course or a booster;~~
4. ~~(where applicable) had been kept in isolation except during competition.~~

~~Article 2.5.5.11.~~

~~When importing horses which will be kept in isolation, the Veterinary Administration of a country, zone or compartment of undetermined EI status should require:~~

~~the presentation of an *international veterinary certificate* attesting that the horses:~~

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

OR

- ~~2. showed no clinical sign of EI in any premises in which the horses had been resident for the 30 days prior to shipment nor on the day of shipment; and~~
- ~~3. were vaccinated between 14 and 180 days before shipment either with a primary course or a booster;~~
- ~~4. (where applicable) had been kept in isolation except during competition.~~

Article 2.5.5.12. 8

When importing *fresh horse meat* of horses, mules or donkeys ~~the Veterinary Administrations of a country, zone or compartment~~ should require:

the presentation of an *international veterinary certificate* attesting that the *fresh meat*

Appendix XIII (contd)

1. ~~came from an EI free country, zone or compartment in which the horses from which the meat was derived had been resident for at least 21 days; or~~
2. came from ~~horses~~ horses, mules or donkeys which had been subjected to ante-mortem and post-mortem inspections as described in Appendix 3.10.1, ~~the Codex Alimentarius Code of Hygienic Practice for Meat Hygiene.~~

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## CHAPTER 2.5.4.

**EQUINE INFECTIOUS ANAEMIA**

## Article 2.5.4.1.

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

## Article 2.5.4.2.

*Veterinary Administrations of importing countries* should require:

for equines

the presentation of an *international veterinary certificate* attesting that:

1. the animals showed no clinical sign of equine infectious anaemia (EIA) on the day of shipment and during the 48 hours prior to shipment; and
2. no case of EIA has been associated with any premises where the animals were kept during the 3 months prior to shipment; and
3. if imported on a permanent basis, the animals were subjected to a diagnostic test for EIA with negative results on blood samples collected during the 30 days prior to shipment; or
4. if imported on a temporary basis, ~~the animals are imported on a temporary basis, and the on~~ the animals were subjected to a diagnostic test for EIA with negative results on blood samples collected during the 90 days of export prior to shipment.

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CHAPTER 2.5.6.

**EQUINE PIROPLASMOSIS**

Article 2.5.6.1.

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

Article 2.5.6.2.

*Veterinary Administrations of importing countries* should require:

for equines

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of equine piroplasmosis on the day of shipment;
2. were subjected to diagnostic tests for equine piroplasmosis (*Theileria equi* and *Babesia caballi*) with negative results during the 30 days prior to shipment;
3. were maintained free from ticks, by preventive treatment where necessary, during the 30 days prior to shipment.

Article 2.5.6.3.

*Veterinary Administrations of importing countries* should consider the possibility of importing competition horses on a temporary basis and which are positive to the testing procedure referred to in point 2 of Article 2.5.6.2. under the following safeguards:

1. the horses are accompanied by a passport in conformity with the model contained in Appendix 4.1.5.;
  2. the *Veterinary Administrations of importing countries* require the presentation of an *international veterinary certificate* attesting that the animals:
    - a) showed no clinical sign of equine piroplasmosis on the day of shipment;
    - b) were treated against ticks within the 7 days prior to shipment;
  3. the horses are kept in an area where necessary precautions are taken to control ticks and that is under the direct supervision of the *Veterinary Authority*;
  4. the horses are regularly examined for the presence of ticks under the direct supervision of the *Veterinary Authority*.
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## CHAPTER 2.5.7.

**EQUINE RHINOPNEUMONITIS**  
(Equine herpes virus type 1 infection)

## Article 2.5.7.1.

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

## Article 2.5.7.2.

*Veterinary Administrations of importing countries* should require:

for equines

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of equine ~~rhinopneumonitis~~ herpes virus type 1 infection, on the day of shipment and during the 21 days prior to shipment;
2. were kept for the 21 days prior to shipment in an *establishment* where no *case* of equine ~~rhinopneumonitis~~ herpes virus type 1 infection, was reported during that period.

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## CHAPTER 2.5.8.

## GLANDERS

## Article 2.5.8.1.

For the purposes of this *Terrestrial Code*, the *incubation period* for glanders shall be 6 months.

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

## Article 2.5.8.2.

**Glanders free country**

A country may be considered free from glanders when:

1. glanders is notifiable in the country;
2. no case of glanders has been reported during ~~confirmed for at least the past 3 last 2 years, or no case has been reported for a period of at least 6 months and a surveillance programme is in place demonstrating the absence of the disease in accordance with general guidelines on animal health surveillance (Appendix 3.8.1).~~

~~When importing equines for immediate slaughter from an infected country (see Article 2.5.8.5), a glanders free country will not be considered as infected if one of the imported equines is found infected.~~

~~The conditions for such imports will require direct transport of the animals from the place of disembarkation to a designated abattoir and completion of cleansing and *disinfection* of the means of transport, the lairages and the abattoir immediately after use. These conditions should be prescribed and enforced by the *Veterinary Administration*.~~

## Article 2.5.8.3.

When importing from glanders free countries, *Veterinary Administrations* should require:

for equines

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical signs ~~evidence~~ of glanders on the day of shipment;
2. were kept ~~since birth, or for the past 6 months prior to shipment, or since birth if less than 6 months of age, in the exporting country, or~~
3. ~~were subjected to a test as prescribed in the *Terrestrial Manual* the mallein test and/or the complement-fixation test for glanders with negative results, during the 15 days prior to shipment.~~

Appendix XVII (contd)

## Article 2.5.8.4.

When importing from countries considered infected with glanders, *Veterinary Administrations* should require:

for equines

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of glanders on the day of shipment;
2. were kept for the 6 months prior to shipment in an *establishment* where no *case* of glanders was ~~officially~~ reported during that period;
3. were subjected to a test as prescribed in the *Terrestrial Manual* ~~the mallein test and the complement fixation test~~ for glanders with negative results, during the ~~15-30~~ 30 days prior to shipment.

~~Article 2.5.8.5.~~

~~When importing from countries considered infected with glanders, *Veterinary Administrations* should require:~~

~~for equines for immediate slaughter~~

~~the presentation of an *international veterinary certificate* attesting that the animals showed no clinical sign of glanders on the day of shipment. (See also Article 2.5.8.2.)~~

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## CHAPTER 2.5.10.

## EQUINE VIRAL ARTERITIS

## Article 2.5.10.1.

The *infective period* for equine viral arteritis (EVA) shall be 28 days for ~~mares, and geldings, and all categories of equine except uncastrated sexually immature equines stallion where the infective period may be for the life of the animal.~~ Because the *infective period* may be extended in the case of virus shedding in semen, the health status of seropositive stallions should be checked to ensure that they do not shed equine arteritis virus in their semen.

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

## Article 2.5.10.2.

*Veterinary Administrations of importing countries* should require:

for uncastrated male equines imported on a temporary basis for breeding or on a permanent basis

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of EVA on the day of shipment and during the 28 days prior to shipment;
2. were subjected to two tests a test for EVA, as prescribed in the *Terrestrial Manual*, carried out either diagnostic on blood samples collected at least 14 days apart with negative results, during the 28 days prior to shipment; or
  - a) on a single blood sample collected during the 28 days prior to shipment with negative result; or
  - b) on blood samples taken on two occasions at least 14 days apart within 28 days prior to shipment, which demonstrated stable or declining antibody titres; or
3. ~~were subjected between 6 and 12 months of age to a diagnostic test for EVA as prescribed in the *Terrestrial Manual* on a blood sample with negative results, immediately vaccinated for EVA and regularly revaccinated; or~~

were subjected between 6 and 9 months of age to a test for EVA, as prescribed in the *Terrestrial Manual*, carried out on two blood samples collected at least 10-14 days apart with stable or decreasing titre, immediately vaccinated for EVA and regularly revaccinated according to the manufacturer's instructions; or
4. were subjected to a test for EVA, as prescribed in the *Terrestrial Manual*, on a blood sample with negative results, immediately vaccinated for EVA, kept for 21 days following vaccination separated from other equidae and regularly revaccinated according to the manufacturer's instructions; or
45. have been subjected to a diagnostic test for EVA, as prescribed in the *Terrestrial Manual*, carried out on a blood sample with positive results and then: either

Appendix XVIII (contd)

- a) were subsequently test mated to two mares within 12 months prior to shipment which were subjected to two tests for EVA as prescribed in the *Terrestrial Manual* ~~diagnostic~~ with negative results on blood samples collected at the time of test mating and again 28 days after the mating; or
- b) were subjected to a ~~virus isolation~~ test for ~~EVA~~ equine arteritis virus as prescribed in the *Terrestrial Manual* with negative results ~~(under study)~~, carried out on semen collected during the 28 days prior to shipment.

## Article 2.5.10.3.

*Veterinary Administrations of importing countries* should require:

for uncastrated male equines imported on a temporary basis other than for breeding, and for equines other than uncastrated males

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of EVA on the day of shipment and were kept in an *establishment* where no animals have shown any signs of EVA for ~~during~~ the 28 days prior to shipment;
2. were subjected during the 28 days prior to shipment, to two diagnostic a tests for EVA, as prescribed in the *Terrestrial Manual*, carried out either:
  - a) on a single blood sample collected at least 14 days apart, which demonstrated during the 28 days prior to shipment with negative results, or
  - b) on blood samples collected on two occasions at least 14 days apart within 28 days prior to shipment, which demonstrated a stable or declining antibody titres;

OR

3. were subjected, between 6 and ~~12~~ 9 months of age, to a ~~diagnostic~~ diagnostic test for EVA, as prescribed in the *Terrestrial Manual*, carried out on a two blood samples collected at least 14 days apart with negative results or stable or declining titre, and immediately vaccinated for EVA and regularly revaccinated.

## Article 2.5.10.4.

*Veterinary Administrations of importing countries* should require:

for fresh semen

the presentation of an *international veterinary certificate* attesting that the donor animals:

1. were kept for the ~~28~~ 30 days prior to semen collection in an *establishment* where no equine has shown any clinical sign of EVA during that period;
2. showed no clinical sign of EVA on the day of semen collection;

3. were subjected between 6 and ~~12~~ 9 months of age to a ~~diagnostic~~ test for EVA as prescribed in the *Terrestrial Manual* on a blood sample with ~~negative results, stable or decreasing titre, and~~ immediately vaccinated for EVA and regularly revaccinated according to the manufacturer's instructions; or
- ~~4.~~ were subjected to a test for EVA as prescribed in the *Terrestrial Manual* on a blood sample with negative results, immediately vaccinated for EVA, kept for 21 days following vaccination separated from other equidae and regularly revaccinated according to the manufacturer's instructions; or
45. were subjected to a ~~diagnostic~~ test for EVA as prescribed in the *Terrestrial Manual* on a blood sample with negative results within 14 days prior to semen collection, and had ~~not been used for natural breeding~~ been separated from other equidae from the time of the taking of the blood sample to the time of semen collection; or
56. ~~have been~~ were subjected to a ~~diagnostic~~ test for EVA as prescribed in the *Terrestrial Manual* on a blood sample with positive results and then: either
  - a) were subsequently test mated to two mares within 12 months ~~one year~~ prior to semen collection, ~~to two mares which showed negative results to two diagnostic tests~~ were subjected to two tests for EVA as prescribed in the *Terrestrial Manual* with negative results on blood samples collected at the time of test mating and again 28 days after the test mating, or
  - b) were subjected to a ~~virus isolation~~ test for equine arteritis virus as prescribed in the *Terrestrial Manual* with negative results (under study), carried out on semen collected within one year prior to collection of the semen to be exported.

Article 2.5.10.5.

*Veterinary Administrations of importing countries should require:*

for frozen semen

the presentation of an *international veterinary certificate* attesting that the donor animals:

1. ~~showed no clinical sign of EVA on the day of semen collection;~~
2. ~~were subjected to a diagnostic test for EVA as prescribed in the *Terrestrial Manual* on a blood sample with negative results not less than 14 days after semen collection; or~~
3. ~~were subjected, between 6 and 12 months of age, to a diagnostic test for EVA as prescribed in the *Terrestrial Manual* on a blood sample with negative results, and immediately vaccinated for EVA and regularly revaccinated; or~~
4. ~~were subjected to a diagnostic test for EVA as prescribed in the *Terrestrial Manual* on a blood sample with positive results and then: either~~
  - a) ~~were test mated, within 12 months~~ one year prior to ~~or as soon as possible~~ after semen collection, to two mares which showed negative results to two diagnostic tests as prescribed in the *Terrestrial Manual* on blood samples collected at the time of test mating and again 28 days after the test mating, or

Appendix XVIII (contd)

- b) ~~were subjected to a virus isolation test as prescribed in the *Terrestrial Manual* with negative results (under study), carried out on semen collected within one year prior to collection of the semen to be exported.~~

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## CHAPTER 2.6.7.

## CLASSICAL SWINE FEVER

## Article 2.6.7.1.

The pig is the only natural host for classical swine fever (CSF) virus. The definition of pig includes all varieties of *Sus scrofa*, both domestic **breeds** and wild **boar**. For the purposes of this chapter, a distinction is made between domestic pigs (permanently captive and **owned** **farmed** free-range pigs) and wild pigs (including feral pigs).

Pigs exposed to CSF virus prenatally may be persistently infected throughout life and may have an *incubation period* of several months before showing signs of disease. Pigs exposed postnatally have an *incubation period* of 7-10 days, and are usually infective between post-infection days 5 and 14, but up to 3 months in cases of chronic infections.

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

## Article 2.6.7.2.

The CSF status of a country, *zone* or *compartment* can only be determined after considering the following criteria in domestic and wild pigs, as applicable:

- ~~1.~~ ~~a risk assessment has been conducted, identifying all potential factors for CSF occurrence and their historic perspective;~~
- 21.** CSF should be notifiable in the whole country, and all clinical signs suggestive of CSF should be subjected to field and/or laboratory investigations;
- 32.** an on-going awareness programme should be in place to encourage reporting of all *cases* suggestive of CSF;
- 43.** the *Veterinary Administration* should have current knowledge of, and authority over, all domestic pigs in the country, *zone* or *compartment*;
- 54.** the *Veterinary Administration* should have current knowledge about the population and habitat of wild pigs in the country or *zone*.

## Article 2.6.7.3.

**CSF free country, zone or compartment**

1. ~~CSF free status~~ **CSF free status** ~~in the absence of an outbreak~~

a) **a)** Historically free status

A country, ~~or zone or compartment~~ may be considered free from the disease ~~after conducting a risk assessment as referred to in Article 2.6.7.2. but~~ without formally applying a specific surveillance programme, if the provisions of Article 3.8.1.6. are complied with.

## Appendix XIX (contd)

b)

2. Free status as a result of a specific surveillance programme

A country, zone or compartment which does not meet the conditions of point 1 above may be considered free from CSF when a risk assessment as referred to in Article 2.6.7.2. has been conducted, surveillance in accordance with Appendix 3.8.8. has been in place for at least 12 months, and when no outbreak has been observed for at least 12 months.

3.2. CSF free status following an outbreak b) Free status as a result of an eradication programme

A country, or zone or compartment which does not meet the conditions of point a) a) 1 or b) 2 above or a compartment may be considered free from CSF when: if surveillance in accordance with Appendix 3.8.8. has been in place and after a risk assessment as referred to in Article 2.6.7.2. has been conducted, and

a) where a stamping out policy without vaccination is practised and no outbreak has been observed in domestic pigs for at least 6 months;

OR

b) where a stamping out policy with vaccination is practised, and either:

i) vaccinated pigs are slaughtered, and no outbreak has been observed in domestic pigs for at least 6 months after the last vaccinated pig was slaughtered; or

ii) where there are validated means of distinguishing between vaccinated and infected pigs, no outbreak has been observed in domestic pigs for at least 6 months;

OR

e) where a vaccination strategy is practised without a stamping out policy;

i) vaccination has been banned in all domestic pigs in the country, zone or compartment for at least 12 months, unless there are validated means of distinguishing between vaccinated and infected pigs;

ii) if vaccination has been practised within the past 5 years, surveillance in accordance with Appendix 3.8.8. has been in place for at least 6 months to demonstrate the absence of infection within the population of domestic pigs 6 months to one year old; and

iii) no outbreak has been observed in domestic pigs for at least 12 months;

**AND**

in all cases, based on surveillance in accordance with Appendix 3.8.8., CSF infection is not known to occur in any wild pig population in the country or zone

- i) there has been no outbreak of CSF during the past 12 months;
- ii) no evidence of CSFV infection has been found during the past 12 months;
- iii) no vaccination against CSF has been carried out during the past 12 months;
- iv) surveillance in accordance with Appendix 3.8.8. has been in place in domestic pigs for the past 12 months;

**AND**

in the case of a country or zone, surveillance in accordance with Appendix 3.8.8. has been in place to determine the CSF status of the wild pig population, and;

- v) there has been no clinical evidence or virological evidence of CSF in wild pigs during the past 12 months;
- vi) no seropositive wild pigs have been detected in the age class 6-12 months during the past 12 months;
- vii) there has been no vaccination in wild pigs for the past 12 months;
- viii) imported wild pigs comply with the relevant requirements in Article 2.6.7.7.

**Article 2.6.7.4.****Country or zone free of CSF in domestic pigs but with infection in the a wild pig population**

Requirements in points 23a to 23c of Article 2.6.7.3., as relevant, are complied with. As CSF infection may be present in the wild pig population, the following additional conditions are complied with:

1. a programme for the management of CSF in wild pigs is in place, taking into account the measures in place to manage the disease in the wild pig population, the presence of natural boundaries, the ecology of the wild pig population, and an assessment of the risk of disease spread;
2. zoning or compartmentalisation is applied the domestic pig population must be separated from the infected wild pig population through biosecurity measures to prevent transmission of CSF from wild pigs to domestic pigs.

## Appendix XIX (contd)

## Article 2.6.7.54.

**Recovery of free status**

Should a CSF *outbreak* occur in a previously free country, zone or compartment, the free status of the country, zone or compartment may be restored not less than 30 days after completion of a stamping-out policy where surveillance in accordance with Appendix 3.8.8. has been carried out with negative results, either:

~~If emergency vaccination has been practised within the CSF domestic pig control area, recovery of the free status cannot occur before all the vaccinated pigs have been slaughtered, unless there are validated means of distinguishing between vaccinated and infected pigs.~~

1. 3 months after the last case where a stamping-out policy without vaccination is practised;

OR

2. where a stamping-out policy with emergency vaccination is practised:

i) 3 months after the last case and the slaughter of all vaccinated animals, or

ii) 3 months after the last case without the slaughter of vaccinated animals where there are validated means of distinguishing between vaccinated and infected pigs;

OR

3. where a stamping-out policy is not practised, the provisions of point b) of Article 2.6.7.3 should be followed;

AND

in the case of a country or zones, based on surveillance in accordance with Appendix 3.8.8., CSFV infection is not known to occur in any wild pig population in the country or zone.

## Article 2.6.7.6.

**Country or zone free of CSF in wild pigs**

A country or zone may be considered free from CSF in wild pigs when:

1. the domestic pig population in the country or zone is free from CSF infection;

2. surveillance in accordance with Appendix 3.8.8. has been in place to determine the CSF status of the wild pig population in the country, and in the country or zone:

a) there has been no clinical evidence, nor virological evidence of CSF in wild pigs during the past 12 months;

b) no seropositive wild pigs have been detected in the age class 6-12 months during the past 12 months;

3. there has been no vaccination in wild pigs for the past 12 months;
4. the feeding of swill to wild pigs is forbidden, unless the swill has been treated to destroy any CSF virus that may be present, in conformity with one of the procedures referred to in Article 3.6.4.1.;
5. imported wild pigs comply with the relevant requirements set forth in the present chapter.

## Article 2.6.7.75.

When importing from countries, zones or compartments free of CSF, *Veterinary Administrations* should require:

for domestic pigs

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of CSF on the day of shipment;
2. were kept in a country, zone or compartment free of CSF since birth or for at least the past 3 months;
3. have not been vaccinated against CSF, nor are they the progeny of vaccinated sows, unless there are validated means of distinguishing between vaccinated and infected pigs.

## Article 2.6.7.8.

When importing from countries free of CSF in domestic pigs but with infection in the wild pig population, *Veterinary Administrations* should require:

for domestic pigs

the presentation of an *international veterinary certificate* attesting that the animals:

1. were kept in a country or zone free of CSF in domestic pigs since birth or for at least the past 3 months;
2. have not been vaccinated against CSF, nor are they the progeny of vaccinated sows, unless there are validated means of distinguishing between vaccinated and infected pigs;
3. come from a CSF free zone or compartment;
4. showed no clinical sign of CSF on the day of shipment.

## Article 2.6.7.96.

When importing from countries or zones with CSF infection in domestic pigs, *Veterinary Administrations* should require:

for domestic pigs

Appendix XIX (contd)

the presentation of an *international veterinary certificate* attesting that the animals:

1. ~~have not been vaccinated against CSF nor are they the progeny of vaccinated sows, unless there are validated means of distinguishing between vaccinated and infected pigs~~ showed no clinical sign of CSF on the day of shipment;
2. were kept since birth or for the past 3 months in a CSF free compartment;
3. ~~showed no clinical sign of CSF on the day of shipment~~ have not been vaccinated against CSF nor are they the progeny of vaccinated sows, unless there are validated means of distinguishing between vaccinated and infected pigs.

Article 2.6.7 ~~107~~.

When importing from countries or zones free of CSF, *Veterinary Administrations* should require:

for wild pigs

the presentation of an *international veterinary certificate* attesting that the animals:

1. showed no clinical sign of CSF on the day of shipment;
2. have been captured in a country or zone free from CSF;
3. have not been vaccinated against CSF, unless there are validated means of distinguishing between vaccinated and infected pigs;

and, if the *zone* where the animal has been captured is adjacent to a *zone* with infection in wild pigs:

4. were kept in a *quarantine station* for 40 days prior to shipment, and were subjected to a virological test and a serological test performed at least 21 days after entry into the *quarantine station*, with negative results.

Article 2.6.7 ~~118~~.

When importing from countries, zones or compartments free of CSF, *Veterinary Administrations* should require:

for semen of domestic pigs

the presentation of an *international veterinary certificate* attesting that:

1. the donor animals:
  - a) were kept in a country, zone or compartment free of CSF since birth or for at least 3 months prior to collection;
  - b) showed no clinical sign of CSF on the day of collection of the semen;
2. the semen was collected, processed and stored in conformity with the provisions of Appendix 3.2.2.

Article 2.6.7.12

When importing from countries free of CSF in domestic pigs but with infection in the wild pig population, *Veterinary Administrations* should require:

for semen of domestic pigs

the presentation of an *international veterinary certificate* attesting that:

1. the donor animals:

- a) were kept in a country, zone or compartment free of CSF in domestic pigs since birth or for at least 3 months prior to collection;
- b) showed no clinical sign of CSF on the day of collection of the semen and for the following 40 days;

2. the semen was collected, processed and stored in conformity with the provisions of Appendix 3.2.2.

Article 2.6.7.13

When importing from countries or zones considered infected with CSF in domestic pigs, *Veterinary Administrations* should require:

for semen of domestic pigs

the presentation of an *international veterinary certificate* attesting that:

1. the donor animals:

- a) were kept in a compartment free of CSF in domestic pigs since birth or for at least 3 months prior to collection;
- b) showed no clinical sign of CSF on the day of collection of the semen and for the following 40 days;
- c) have not been vaccinated against CSF, and were subjected to a serological test performed at least 21 days after collection, with negative results;

2. the semen was collected, processed and stored in conformity with the provisions of Appendix 3.2.2.

Article 2.6.7.14

When importing from countries, zones or compartments free of CSF, *Veterinary Administrations* should require:

for *in vivo* derived embryos of pigs

the presentation of an *international veterinary certificate* attesting that:

1. the donor females showed no clinical sign of CSF on the day of collection of the embryos;
2. the embryos were collected, processed and stored in conformity with the provisions of Appendix 3.3.1.

Appendix XIX (contd)Article 2.6.7.15.

~~When importing from countries free of CSF in domestic pigs but with infection in the wild pig population, *Veterinary Administrations* should require:~~

~~for *in vivo* derived embryos of pigs~~

~~the presentation of an *international veterinary certificate* attesting that:~~

~~1. the donor females:~~

- ~~a) were kept in a country, zone or compartment free of CSF in domestic pigs since birth or for at least 3 months prior to collection;~~
- ~~b) showed no clinical sign of CSF on the day of collection of the embryos;~~

~~2. the embryos were collected, processed and stored in conformity with the provisions of Appendix 3.3.1.~~

## Article 2.6.7.16.11.

When importing from countries or zones considered infected with CSF in domestic pigs, *Veterinary Administrations* should require:

for *in vivo* derived embryos of pigs

the presentation of an *international veterinary certificate* attesting that:

1. the donor females:

- a) were kept in a compartment free of CSF in domestic pigs since birth or for at least 3 months prior to collection;
- b) showed no clinical sign of CSF on the day of collection of the embryos and for the following 40 days;
- c) have not been vaccinated against CSF and were subjected, with negative results, to a serological test performed at least 21 days after collection;

2. the embryos were collected, processed and stored in conformity with the provisions of Appendix 3.3.1.

## Article 2.6.7.17.12.

When importing from countries, zones or compartments free of CSF, *Veterinary Administrations* should require:

for *fresh meat of domestic pigs*

the presentation of an *international veterinary certificate* attesting that the entire consignment of meat comes from animals which:

## Appendix XIX (contd)

1. have been kept in a country, zone or compartment free of CSF since birth or for at least the past 3 months;
2. have been slaughtered in an *approved abattoir*, have been subjected to ante-mortem and post-mortem inspections in accordance with Appendix 3.10.1 and have been found free of any sign suggestive of CSF.

Article 2.6.7.18.

When importing from countries or zones free of CSF in domestic pigs but with infection in the wild pig population, *Veterinary Administrations* should require:

for fresh meat of domestic pigs

the presentation of an *international veterinary certificate* attesting that the entire consignment of meat comes from animals which:

1. were kept in a country, zone or compartment free of CSF in domestic pigs since birth or for at least the past 3 months;
2. have been slaughtered in an *approved abattoir*, have been subjected to ante mortem and post mortem inspections as described in the Codex Alimentarius Code of Hygienic Practice for Meat and have been found free of any sign suggestive of CSF.

Article 2.6.7 1913.

When importing from countries or zones free of CSF, *Veterinary Administrations* should require:

for fresh meat of wild pigs

the presentation of an *international veterinary certificate* attesting that:

1. the entire consignment of meat comes from animals which:
  - a) have been killed in a country or zone free of CSF;
  - b) have been subjected to a post-mortem inspection as described in the Codex Alimentarius Code of Hygienic Practice for Meat in accordance with Appendix 3.10.1 in an approved examination centre, and have been found free of any sign suggestive of CSF;

and, if the *zone* where the animal has been killed is adjacent to a *zone* with infection in wild pigs:

2. a sample has been collected from every animal shot killed, and has been subjected to a virological test and a serological test for CSF, with negative results.

Appendix XIX (contd)Article 2.6.7 ~~2014~~

*Veterinary Administrations of importing countries* should require:

for meat products of pigs (either domestic or wild), or for products of animal origin (from fresh meat of pigs) intended for use in animal feeding, for agricultural or industrial use, or for pharmaceutical or surgical use, or for trophies derived from wild pigs

the presentation of an *international veterinary certificate* attesting that the products:

1. have been prepared:
  - a) exclusively from *fresh meat* meeting the conditions laid down in Articles 2.6.7. ~~1712~~, ~~2.6.7.18~~, or 2.6.7. ~~1913~~, as relevant;
  - b) in a processing establishment:
    - i) approved by the *Veterinary Administration* for export purposes;
    - ii) processing only meat meeting the conditions laid down in Articles 2.6.7. ~~1712~~, ~~2.6.7.18~~, or 2.6.7. ~~1913~~, as relevant;

OR

2. have been processed in an establishment approved by the *Veterinary Administration* for export purposes so as to ensure the destruction of the CSF virus in conformity with one of the procedures referred to in Article 3.6.4.2.

Article 2.6.7 ~~2415~~

*Veterinary Administrations of importing countries* should require:

for products of animal origin (from pigs, but not derived from fresh meat) intended for use in animal feeding and for agricultural or industrial use

the presentation of an *international veterinary certificate* attesting that the products:

1. have been prepared:
  - a) exclusively from products meeting the conditions laid down for *fresh meat* in Articles 2.6.7. ~~1712~~; ~~2.6.7.18~~; or 2.6.7. ~~1913~~, as relevant;
  - b) in a processing establishment:
    - i) approved by the *Veterinary Administration* for export purposes;
    - ii) processing only products meeting the conditions laid down in point a) above;

OR

2. have been processed in an establishment approved by the *Veterinary Administration* for export purposes so as to ensure the destruction of the CSF virus in conformity with one of the procedures referred to in Article 3.6.4.2.

Article 2.6.7 ~~2216~~.

*Veterinary Administrations of importing countries* should require:

for bristles (from pigs)

the presentation of an *international veterinary certificate* attesting that the products:

1. come from a country, zone or compartment free of CSF; or
2. have been processed in an establishment approved by the *Veterinary Administration* for export purposes so as to ensure the destruction of the CSF virus.

Article 2.6.7 ~~2317~~.

*Veterinary Administrations of importing countries* should require:

for litter and manure (from pigs)

the presentation of an *international veterinary certificate* attesting that the products:

1. come from a country, zone or compartment free of CSF; or
2. have been processed in an establishment approved by the *Veterinary Administration* for export purposes so as to ensure the destruction of the CSF virus.

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## APPENDIX 3.8.8.

**GUIDELINES ON SURVEILLANCE FOR  
CLASSICAL SWINE FEVER**

## Article 3.8.8.1.

**Introduction**

This Appendix defines the principles and provides a guide on surveillance for classical swine fever (CSF) in accordance with Appendix 3.8.1., applicable to countries seeking recognition of freedom from CSF. This may be for the entire country or a *zone* within the country. Guidance for countries seeking reestablishment of freedom from CSF for the whole country or a *zone*, following an *outbreak*, as well as guidelines for demonstrating the maintenance of CSF free status are also provided. This Appendix complements Chapter 2.6.7.

The impact and epidemiology of CSF differ widely in different regions of the world, and it is, therefore, impossible to provide specific guidelines for all situations. It is axiomatic that the surveillance strategies employed for demonstrating freedom from CSF at an acceptable level of confidence will need to be adapted to the local situation. For example, the approach must be tailored in order to prove freedom from CSF for a country or *zone* where wild pigs provide a potential reservoir of infection, or where CSF is present in adjacent countries. The method must examine the epidemiology of CSF in the region concerned and adapt to the specific risk factors encountered. This should include provision of scientifically based supporting data. There is, therefore, latitude available to Member Countries to provide a well-reasoned argument to prove that absence of classical swine fever virus (CSFV) infection is assured at an acceptable level of confidence.

Surveillance for CSF should be in the form of a continuing programme designed to establish that the whole country or a *zone* within the country is free from CSFV infection. Consideration should be given to the specific characteristics of CSF epidemiology which include: the role of swill feeding and the impact of different production systems on disease spread, the role of semen in transmission of the virus, the lack of pathognomonic gross lesions and clinical signs, the frequency of clinically inapparent infections, the occurrence of persistent and chronic infections, and the genotypic, antigenic, and virulence variability exhibited by different strains of CSFV. Serological cross-reactivity with other pestiviruses has to be taken into consideration when interpreting data from serological surveys. A common route by which ruminant pestiviruses can infect pigs is the use of vaccines contaminated with bovine viral diarrhoea virus (BVDV).

For the purposes of this Appendix, virus infection means presence of CSFV as demonstrated directly by virus isolation, the detection of virus antigen or virus nucleic acid, or indirectly by seroconversion which is not the result of vaccination.

## Article 3.8.8.2.

**General conditions and methods**

1. A surveillance system in accordance with Appendix 3.8.1. should be under the responsibility of the *Veterinary Administration*. A procedure should be in place for the rapid collection and transport of samples to an accredited laboratory as described in the *Terrestrial Manual*.

Appendix XX (contd)

## 2. The CSF surveillance programme should:

- a) include an early warning system throughout the production, marketing and processing chain for reporting suspicious cases. Farmers and workers, who have day-to-day contact with livestock, as well as diagnosticians, should report promptly any suspicion of CSF to the *Veterinary Authority*. They should be supported directly or indirectly (e.g. through private veterinarians or *veterinary para-professionals*) by government information programmes and the *Veterinary Administration*. Since many strains of CSFV do not induce pathognomonic gross lesions or clinical signs, cases in which CSF cannot be ruled out should be immediately investigated employing clinical, pathological, and laboratory diagnosis. This requires that sampling kits and other equipment are available to those responsible for surveillance. Personnel responsible for surveillance should be able to call for assistance from a team with expertise in CSF diagnosis, epidemiological evaluation, and control;
- b) implement, when relevant, regular and frequent clinical inspections and serological testing of high-risk groups of animals (for example, where swill feeding is practised), or those adjacent to a CSF infected country or zone (for example, bordering areas where infected wild pigs are present).

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

Article 3.8.8.3.

**Surveillance strategies**1. Introduction

The target population for surveillance aimed at identifying *disease* and *infection* should include domestic and wild pig populations within the country or zone to be recognised as free from CSFV infection. Such surveillance may involve opportunistic testing of samples submitted for other purposes, but a more efficient and effective strategy is one which includes targeted surveillance.

Depending on the local epidemiological situation, targeted surveillance could be considered as more effective than a randomized surveillance strategy. Surveillance is targeted to the pig population which presents the highest risk of infection (for example, swill fed farms, pigs reared outdoors or farms in proximity to infected wild pigs). Each country will need to identify its individual risk factors. These may include: temporal and spatial distribution of past *outbreaks*, pig movements and demographics, etc.

For reasons of cost, the longevity of antibody levels, as well as the existence of clinically inapparent infections and difficulties associated with differential diagnosis of other diseases, serology is often the most effective and efficient surveillance methodology. In some circumstances, which will be discussed later, clinical and virological surveillance may also have value.

The country should justify the surveillance strategy chosen as adequate to detect the presence of CSFV infection in accordance with Appendix 3.8.1. and the epidemiological situation. Cumulative survey results in combination with the results of passive surveillance, over time, will increase the level of confidence in the surveillance strategy. If a Member Country wishes to apply for recognition by other Member Countries of a specific *zone* within the country as being free from CSFV infection, the design of the surveillance strategy and the basis for any sampling process would need to be aimed at the population within the *zone*.

For random surveys, the design of the sampling strategy will need to incorporate epidemiologically appropriate design prevalence. The sample size selected for testing will need to be large enough to detect infection if it were to occur at a predetermined minimum rate. The sample size and expected disease prevalence determine the level of confidence in the results of the survey. The country must justify the choice of design prevalence and confidence level based on the objectives of surveillance and the epidemiological situation, in accordance with Appendix 3.8.1. Selection of the design prevalence in particular clearly needs to be based on the prevailing or historical epidemiological situation.

Irrespective of the survey design selected, the sensitivity and specificity of the diagnostic tests employed are key factors in the design, sample size determination and interpretation of the results obtained. Ideally, the sensitivity and specificity of the tests used should be validated for the vaccination/infection history and production class of animals in the target population.

Irrespective of the testing system employed, the surveillance system design should anticipate the occurrence of false positive reactions. This is especially true of the serological diagnosis of CSF because of the recognized cross-reactivity with ruminant pestiviruses. There needs to be an effective procedure for following up positives to ultimately determine with a high level of confidence, whether or not they are indicative of CSFV infection. This should involve confirmatory and differential tests for pestiviruses, as well as further investigations concerning the original sampling unit as well as animals which may be epidemiologically linked.

## 2. Clinical and virological surveillance

Beyond their role in targeted surveillance, clinical and virological surveillance for CSF has two aims: a) to shorten the period between introduction of CSF virus into a disease free country or *zone* and its detection, and b) to confirm that no unnoticed *outbreaks* have occurred.

One element of clinical surveillance involves the detection of clinical signs of CSF by close physical examination of susceptible animals. The spectrum of disease signs and gross pathology seen in CSF infections, along with the plethora of other agents that can mimic CSF, renders the value of clinical examination alone somewhat inefficient as a surveillance tool. Nevertheless, clinical presentation should not be ignored as a tool for early detection; in particular, any cases where clinical signs or lesions consistent with CSF are accompanied by high morbidity and/or mortality should be investigated without delay. In CSFV infections involving low virulence strains, high mortality may only be seen in young animals.

Appendix XX (contd)

In the past, clinical identification of cases was the cornerstone of early detection of CSF. However, emergence of low virulence strains of CSF, as well as new diseases - in particular post-weaning multisystemic wasting syndrome and porcine dermatitis and nephropathy syndrome have made such reliance less effective, and, in countries where such diseases are common, can add significant risk of masking the presence of CSF. In *zones* or countries where such diseases exist, careful clinical and virological surveillance of such cases should be applied.

Clinical signs and pathology of CSF infection will also vary considerably, depending on the strain of virus as well as host factors, such as age, nutrition and health status. These factors, along with the compounding effects of concurrent infections and disease caused by ruminant pestiviruses, dictate the need for laboratory testing in order to clarify the status of CSF suspects detected by clinical monitoring. The difficulties in detecting chronic disease manifested by non-specific clinical signs and delayed seroconversion and seronegativity, in persistently infected piglets, both of which may be clinically normal, makes virological investigation essential. As part of a herd investigation, such animals are likely to be in a minority and would not confound a diagnosis based on serology. Individually or as part of recently mixed batches, such animals may, however, escape detection by this method. A holistic approach to investigation, taking note of herd history, pig, personnel and vehicle movements and disease status in neighbouring *zones* or countries, can also assist in targeting surveillance in order to increase efficiency and enhance the likelihood of early detection.

The labour-intensive nature of clinical, pathological and virological investigations, along with the smaller 'window of opportunity' inherent in virus, rather than antibody detection, has, in the past, resulted in greater emphasis being placed on mass serological screening as the best method for surveillance. However, surveillance based on clinical and pathological inspection and virological testing should not be underrated. If targeted at high risk groups in particular, it provides an opportunity for early detection that can considerably reduce the subsequent spread of disease. Herds predominated by adult animals, such as nucleus herds and artificial insemination studs, are particularly useful groups to monitor, since infection by low virulence viruses in such groups may be clinically inapparent, yet the degree of spread may be high.

Clinical and virological monitoring may also provide a high level of confidence of rapid detection of disease if a sufficiently large number of clinically susceptible animals is examined. In particular, molecular detection methods are increasingly able to offer the possibility of such large-scale screening for the presence of virus, at reasonable cost.

Wild pigs and, in particular, those with a wholly free-living existence, rarely present the opportunity for clinical observation, but should form part of any surveillance scheme and should, ideally, be monitored for virus as well as antibody.

Vaccine design and diagnostic methodologies, and in particular methods of virus detection, are increasingly reliant on up-to-date knowledge of the molecular, antigenic and other biological characteristics of viruses currently circulating and causing disease. Furthermore, epidemiological understanding of the pathways of spread of CSFV can be greatly enhanced by molecular analyses of viruses in endemic areas and those involved in *outbreaks* in disease free areas. It is therefore essential that CSFV isolates are sent regularly to the regional OIE Reference Laboratory for genetic and antigenic characterisation.

### 3. Serological surveillance

Serological surveillance aims at detecting antibodies against CSFV. Positive CSFV antibody test results can have five possible causes:

- a) natural infection with CSFV;
- b) legal or illegal vaccination against CSF;
- c) maternal antibodies derived from an immune sow (maternal antibodies) are usually found only up to 4.5 months of age, but, in some individuals, maternal antibodies can be detected for considerably longer periods;
- d) cross-reactions with other pestiviruses;
- e) non-specific reactors.

The infection of pigs with other pestiviruses may complicate a surveillance strategy based on serology. Antibodies to bovine viral diarrhoea virus (BVDV) and Border disease virus (BDV) can give positive results in serological tests for CSF, due to common antigens. Such samples will require differential tests to confirm their identity. Although persistently infected immunotolerant pigs are themselves seronegative, they continuously shed virus, so the prevalence of antibodies at the herd level will be high. Chronically infected pigs may have undetectable or fluctuating antibody levels.

It may be possible to use sera collected for other survey purposes for CSF surveillance. However, the principles of survey design described in this Appendix and the requirement for statistical validity should not be compromised.

The discovery of clustering of seropositive reactions should be foreseen. It may reflect any of a series of events, including but not limited to the demographics of the population sampled, vaccinal exposure or the presence of infection by field strains or other pestiviruses. Because clustering may signal field strain infection, the investigation of all instances must be incorporated in the survey design. Clustering of positive animals is always epidemiologically significant and therefore should be investigated.

In countries or *zones* that are moving towards freedom, serosurveillance can provide valuable information on the disease status and efficacy of any control programme. Targeted serosurveillance of young stock will indicate whether newly circulating virus is present, although the presence of maternal antibody will also need to be considered. If conventional attenuated vaccine is currently being used or has been used in the recent past, serology aimed at detecting the presence of field virus will likewise need to be targeted at unvaccinated animals and after the disappearance of maternal antibody. General usage in such situations may also be used to assess levels of vaccine coverage.

Vaccines also exist which, when used in conjunction with dedicated serological tests, may allow discrimination between vaccinal antibody and that induced by field infection. Such tools, described in the *Terrestrial Manual*, will need to be fully validated. They do not confer the same degree of protection as that provided by conventional vaccines, particularly with respect to preventing transplacental infections. Furthermore, serosurveillance using such differentiation requires cautious interpretation on a herd basis.

Appendix XX (contd)

The results of random or targeted serological surveys are important in providing reliable evidence that no CSFV infection is present in a country or *zone*. It is therefore essential that the survey be thoroughly documented.

## Article 3.8.8.4.

**Country or zone historically free of CSF in domestic and wild pigs****1. Historically free status**

The free status should be reviewed whenever evidence emerges to indicate that changes which may alter the underlying assumption of continuing historical freedom, has occurred. Such changes include but are not limited to:

- a) an emergence or an increase in the prevalence of CSF in countries or *zones* from which live pigs or products are imported;
- b) an increase in the volume of imports or a change in their country or *zone* of origin;
- c) an increase in the prevalence of CSF in the domestic or wild pigs of adjacent countries or *zones*;
- d) an increased entry from, or exposure to, wild pig populations of adjacent countries or *zones*.

**2. Free status as a result of an eradication programme**

~~In addition to the general conditions described in Chapter 2.6.7., a Member Country seeking recognition of CSF freedom for the country or a *zone*, whether or not vaccination had been practised, should provide evidence for the existence of an effective surveillance programme. The strategy and design of the surveillance programme will depend on the prevailing epidemiological circumstances and will be planned and implemented according to the general conditions and methods described in this Appendix, to demonstrate the absence of CSFV infection in domestic and wild pig populations. This requires the support of a national or other laboratory able to undertake identification of CSFV infection through virus detection and serological tests described in the *Terrestrial Manual*.~~

## Article 3.8.8.5

**Countries, zones or compartments applying for freedom from CSF where vaccination is practised****1. Country or zone free of CSF**

In addition to the general conditions described in Chapter 2.6.7., a Member Country seeking recognition of CSF freedom for the country or a *zone*, whether or not vaccination had been practised, should provide evidence for the existence of an effective surveillance programme. The strategy and design of the surveillance programme will depend on the prevailing epidemiological circumstances in and around the country or *zone* and will be planned and implemented according to the general conditions and methods described in this Appendix, to demonstrate the absence of CSFV infection in domestic and wild pig populations. This requires the support of a national or other laboratory able to undertake identification of CSFV infection through virus detection and serological tests described in the *Terrestrial Manual*.

## 2. Compartment free of CSF

The objective of surveillance ~~in this instance is to demonstrate that the two subpopulations are effectively separated by measures that ensure the biosecurity of domestic pigs.~~ is to demonstrate the absence of CSFV infection in the compartment. The provisions of Chapter 1.3.5. should be followed. The effective separation of the two subpopulations should be demonstrated. To this end, a biosecurity ~~programme which plan that~~ includes but is not limited to the following provisions should be implemented:

- a) ~~a programme for the management of CSF in wild pigs;~~
- b) ~~delineation of CSF wild pig control areas around every CSF case reported in wild pigs;~~
- e) ~~assessment of the presence and mitigative role of natural boundaries;~~
- d) ~~documentation of the ecology of the wild pig population;~~
- e) ~~proper containment of domestic pigs;~~
- a) proper containment of domestic pigs;
- f**b)** control of movement of vehicles with cleaning and disinfection as appropriate;
- e**c)** control of personnel entering into the *establishments* and awareness of risk of fomite spread;
- h**d)** prohibition of introduction to the *establishments* of hunted wild caught animals and their products;
- i**e)** registry record of animal movements into and out of *establishments*;
- j**f)** information and training programmes for farmers, hunters, processors, veterinarians, etc.

~~3.~~ The biosecurity ~~programme plan~~ implemented ~~would~~ also require internal and external monitoring by the *Veterinary Authorities*. These elements This monitoring should include ~~but are not limited to:~~

- a) periodic clinical and serological monitoring of herds in the country or *zone*, and adjacent wild pig populations following these guidelines;
- b) herd registration;
- c) official accreditation of biosecurity programme plan;
- d) periodic monitoring and review.

~~4.~~ Monitoring the CSF status of wild and domestic pig populations outside the compartment will be of value in assessing the degree of risk they pose to the CSF free ~~domestic population compartment~~. The design of a monitoring system ~~for wild pig~~ is dependent on several factors such as the size and distribution of the population, the organisation of the *Veterinary Services* and resources available. The occurrence of CSF in wild and domestic pigs may vary considerably among countries. Surveillance design should be epidemiologically based, and the Member Country ~~must~~ should justify its choice of design prevalence and level of confidence based on Appendix 3.8.1.

Appendix XX (contd)

5. The geographic distribution and approximate size of wild pig populations need to be assessed as a prerequisite for designing a monitoring system. Sources of information may include wildlife conservation organisations, hunter associations and other available sources. The objective of a surveillance programme when the disease is already known to exist should be to determine the geographic distribution and the extent of the infection.

Article 3.8.8.6.

**Recovery of free status**1. Countries or zones seeking re-establishment of freedom from CSF following an outbreak

In addition to the general conditions described in Chapter 2.6.7., a country seeking reestablishment of country or *zone* freedom from CSF should show evidence of an active surveillance programme ~~for CSF as well as~~ to demonstrate absence of CSFV infection.

Populations under this surveillance programme should include, ~~but not be limited to:~~

- a) *establishments* in the area proximity of the *outbreak*;
- b) *establishments* epidemiologically linked to the *outbreak*;
- c) animals used to re-populate affected *establishments* and any *establishments* where contiguous culling is carried out;
- d) wild pig populations in the area of the *outbreak*.

In all circumstances, a Member Country seeking reestablishment of country or *zone* freedom from CSF with vaccination or without vaccination should report the results of an active and passive surveillance programme in which the pig population undergoes regular clinical, pathological, virological, and/or serological examination, planned and implemented according to the general conditions and methods described in these guidelines. The surveillance should be based on a statistically representative sample of the populations at risk.

~~2. Country or zone free of~~ Surveillance for CSF in wild pigs

While the same principles apply, surveillance in wild pigs presents challenges beyond those encountered in domestic populations in each of the following areas:

- a) determination of the distribution, size and movement patterns associated with the wild pig population;
- b) assessment of the possible presence of CSF within the population;
- ~~e) determination of the practicability of establishing *zone*.~~

## Appendix XX (contd)

The design of a monitoring system for wild pigs is dependent on several factors such as the organisation of the *Veterinary Services* and resources available. The geographic distribution and approximate size of wild pig populations need to be assessed as a prerequisite for designing a monitoring system. Sources of information may include wildlife conservation organisations, hunter associations and other available sources. The objective of a surveillance programme is to determine the geographic distribution and estimation of target population.

Estimates of wild pig populations can be made using advanced methods (radio tracking, linear transect method, capture/recapture) or traditional methods based on the number of animals that can be hunted to allow for natural restocking (hunting bags).

For implementation of the monitoring programme, it will be necessary to define the limits of the territory over which wild pigs range in order to delineate the epidemiological units within the monitoring programme. It is often difficult to define *epidemiological units* for wild animals. The most practical approach is based on natural and artificial barriers.

The monitoring programme should also include animals found dead, road kills, animals showing abnormal behaviour or exhibiting gross lesions during dressing.

There may be situations where a more targeted surveillance programme can provide additional assurance. The criteria to define high risk areas for targeted surveillance can be include:

- a) areas with past history of CSF;
- b) sub-regions with high wild pig density;
- c) border regions with CSF affected countries or zones;
- d) areas of contact interface between wild and domestic pig sub-populations;
- e) picnic and camping areas;
- f) around farms with free-ranging pigs;
- g) garbage dumps
- h) special other risk areas determined by local the *Veterinary Authorities*;
- g) garbage dumps.

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## CHAPTER 2.7.12.

## AVIAN INFLUENZA

## Article 2.7.12.1.

1. For the purposes of the Terrestrial Code international trade avian influenza in its notifiable form (NAI) is defined as an infection of poultry caused by any influenza A virus of the H5 or H7 subtypes or by any AI virus with an intravenous pathogenicity index (IVPI) greater than 1.2 (or as an alternative at least 75% mortality) as described below. NAI viruses can be divided into highly pathogenic notifiable avian influenza (HPNAI) and low pathogenicity notifiable avian influenza (LPNAI):
  - a) HPNAI viruses have an IVPI in 6-week-old chickens greater than 1.2 or, as an alternative, cause at least 75% mortality in 4-to 8-week-old chickens infected intravenously. H5 and H7 viruses which do not have an IVPI of greater than 1.2 or cause less than 75% mortality in an intravenous lethality test should be sequenced to determine whether multiple basic amino acids are present at the cleavage site of the haemagglutinin molecule (HA0); if the amino acid motif is similar to that observed for other HPNAI isolates, the isolate being tested should be considered as HPNAI;
  - b) LPNAI are all influenza A viruses of H5 and H7 subtype that are not HPNAI viruses.
2. Poultry is defined as 'all domesticated birds, including backyard poultry, used for the production of meat or eggs for consumption, for the production of other commercial products, for restocking supplies of game, or for breeding these categories of birds, as well as fighting cocks used for any purpose'
 

Birds that are kept in captivity for any reason other than those reasons referred to in point 2 the preceding paragraph, including those that are kept for shows, races, exhibitions, competitions, breeding or selling these categories of birds as well as pet birds, are not considered to be poultry.
3. For the purpose of *international trade*, this chapter deals not only with the occurrence of clinical signs caused by NAI virus, but also with the presence of infection with NAI virus in the absence of clinical signs.
4. For the purposes of *international trade*, a country should not impose immediate trade bans in response to interpret an occurrence a notification of infection with HPNAI virus in birds other than poultry according to Article 2.1.1.3 of the Terrestrial Code and should not impose immediate trade bans.
5. Antibodies to H5 or H7 subtype of NAI virus, which have been detected in poultry and are not a consequence of vaccination, have to be further investigated. In the case of isolated serological positive results, NAI infection may be ruled out on the basis of a thorough epidemiological investigation that does not demonstrate further evidence of NAI infection.

Appendix XXI (contd)

4.6 The following defines the occurrence of infection with NAI virus:

- a) HPNAI virus has been isolated and identified as such or viral RNA specific for HPNAI has been detected in poultry or a product derived from poultry; or
- b) LPNAI virus has been isolated and identified as such or viral RNA specific for LPNAI has been detected in poultry or a product derived from poultry; ~~or~~
- e) ~~antibodies to H5 or H7 subtype of NAI virus that are not a consequence of vaccination have been detected in poultry. In the case of isolated serological positive results, NAI infection may be ruled out on the basis of a thorough epidemiological investigation that does not demonstrate further evidence of NAI infection.~~

For the purposes of the *Terrestrial Code*, 'NAI free establishment' means an *establishment* in which the poultry have shown no evidence of NAI infection, based on surveillance in accordance with Appendix 3.8.9.

For the purposes of the *Terrestrial Code*, the *incubation period* for NAI shall be 21 days.

Standards for diagnostic tests, including pathogenicity testing, are described in the *Terrestrial Manual*. Any vaccine used should comply with the standards described in the *Terrestrial Manual*.

## Article 2.7.12.2.

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

1. the outcome of a *risk assessment* identifying all potential factors for NAI occurrence and their historic perspective;
2. NAI is notifiable in the whole country, an on-going NAI awareness programme is in place, and all notified suspect occurrences of NAI are subjected to field and, where applicable, laboratory investigations;
3. appropriate surveillance is in place to demonstrate the presence of infection in the absence of clinical signs in poultry, and the risk posed by birds other than poultry; this may be achieved through an NAI surveillance programme in accordance with Appendix 3.8.9.

## Article 2.7.12.3.

**NAI free country, zone or compartment**

A country, *zone* or *compartment* may be considered free from NAI when it has been shown that neither HPNAI nor LPNAI infection has been present in the country, *zone* or *compartment* for the past 12 months, based on surveillance in accordance with Appendix 3.8.9. The surveillance may need to be adapted to parts of the country or existing *zones* or *compartments* depending on historical or geographical factors, industry structure, population data, or proximity to recent outbreaks.

Appendix XXI (contd)

If infection has occurred in a previously free country, zone or compartment, NAI free status can be regained:

1. In the case of HPNAI infections, 3 months after a *stamping-out policy* (including *disinfection* of all affected *establishments*) is applied, providing that surveillance in accordance with Appendix 3.8.9. has been carried out during that three-month period.
2. In the case of LPNAI infections, poultry may be kept for slaughter for human consumption subject to conditions specified in Article 2.7.12.19. or 2.7.12.20. or a *stamping-out policy* may be applied; in either case, 3 months after the *disinfection* of all affected *establishments*, providing that surveillance in accordance with Appendix 3.8.9. has been carried out during that three-month period.

Article 2.7.12.4.

### **HPNAI free country, zone or compartment**

A country, *zone* or *compartment* may be considered free from HPNAI when it has been shown that HPNAI infection has not been present in the country, *zone* or *compartment* for the past 12 months, although its LPNAI status may be unknown, or when, based on surveillance in accordance with Appendix 3.8.9., it does not meet the criteria for freedom from NAI but any NAI virus detected has not been identified as HPNAI virus. The surveillance may need to be adapted to parts of the country or existing *zones* or *compartments* depending on historical or geographical factors, industry structure, population data, or proximity to recent *outbreaks*.

If infection has occurred in a previously free country, *zone* or *compartment*, HPNAI free status can be regained 3 months after a *stamping-out policy* (including *disinfection* of all affected *establishments*) is applied, providing that surveillance in accordance with Appendix 3.8.9. has been carried out during that three-month period.

Article 2.7.12.5.

When importing from an NAI free country, zone or compartment, *Veterinary Administrations* should require:

#### for live poultry (other than day-old poultry)

the presentation of an *international veterinary certificate* attesting that:

1. the poultry showed no clinical sign of NAI on the day of shipment;
2. the poultry were kept in an NAI free country, zone or compartment since they were hatched or for at least the past 21 days;
3. the required surveillance in accordance with Appendix 3.8.9. has been carried out on the *establishment* within at least the past 21 days;
4. if vaccinated, the poultry have been vaccinated in accordance with Appendix 3.8.9., and the relevant information is attached.

Article 2.7.12.6.

Regardless of the NAI status of the country, *zone* or *compartment* of origin, *Veterinary Administrations* should require:

Appendix XXI (contd)for live birds other than poultry

the presentation of an *international veterinary certificate* attesting that:

1. the birds showed no clinical sign of infection with a virus which would be considered NAI in poultry on the day of shipment;
2. the birds were kept in isolation approved by the *Veterinary Services* since they were hatched or for at least the 21 days prior to shipment and showed no clinical sign of infection with a virus which would be considered NAI in poultry during the isolation period;
3. the birds were subjected to a diagnostic test 7 to 14 days prior to shipment to demonstrate freedom from infection with a virus which would be considered NAI in poultry;
4. the birds are transported in new containers.

If the birds have been vaccinated, the relevant information should be attached to the certificate.

Article 2.7.12.7.

When importing from an NAI free country, zone or compartment, *Veterinary Administrations* should require:

for day-old live poultry

the presentation of an *international veterinary certificate* attesting that:

1. the poultry were kept in an NAI free country, zone or compartment since they were hatched;
2. the poultry were derived from parent flocks which had been kept in an NAI free country, zone or compartment for at least 21 days prior to and at the time of the collection of the eggs;
3. if the poultry or the parent flocks were vaccinated, vaccination was carried out in accordance with Appendix 3.8.9., and the relevant information is attached.

Article 2.7.12.8.

When importing from an HPNAI free country, zone or compartment, *Veterinary Administrations* should require:

for day-old live poultry

the presentation of an *international veterinary certificate* attesting that:

1. the poultry were kept in an HPNAI free country, zone or compartment since they were hatched;
2. the poultry were derived from parent flocks which had been kept in an NAI free *establishment* for at least 21 days prior to and at the time of the collection of the eggs;
3. the poultry are transported in new containers;

Appendix XXI (contd)

4. if the poultry or the parent flocks were vaccinated, vaccination was carried out in accordance with Appendix 3.8.9., and the relevant information is attached.

Article 2.7.12.9.

When importing from an NAI free country, zone or compartment, *Veterinary Administrations* should require:

for hatching eggs

the presentation of an *international veterinary certificate* attesting that:

1. the eggs came from an NAI free country, zone or compartment;
2. the eggs were derived from parent flocks which had been kept in an NAI free country, zone or compartment for at least 21 days prior to and at the time of the collection of the eggs;
3. if the parent flocks were vaccinated, vaccination was carried out in accordance with Appendix 3.8.9., and the relevant information is attached.

Article 2.7.12.10.

When importing from an HPNAI free country, zone or compartment, *Veterinary Administrations* should require:

for hatching eggs

the presentation of an *international veterinary certificate* attesting that:

1. the eggs came from an HPNAI free country, zone or compartment;
2. the eggs were derived from parent flocks which had been kept in an NAI free *establishment* for at least 21 days prior to and at the time of the collection of the eggs;
3. the eggs have had their surfaces sanitised (in accordance with Article 3.4.1.7) and are transported in new packing material;
4. if the parent flocks were vaccinated, vaccination was carried out in accordance with Appendix 3.8.9., and the relevant information is attached.

Article 2.7.12.11.

When importing from an NAI free country, zone or compartment, *Veterinary Administrations* should require:

for eggs for human consumption

the presentation of an *international veterinary certificate* attesting that the eggs come from an NAI free country, zone or compartment.

Appendix XXI (contd)

## Article 2.7.12.12.

When importing from an HPNAI free country, zone or compartment, *Veterinary Administrations* should require:

for eggs for human consumption

the presentation of an *international veterinary certificate* attesting that the eggs:

1. come from an HPNAI free country, zone or compartment;
2. have had their surfaces sanitised (in accordance with Article 3.4.1.7.) and are transported in new packing material.

## Article 2.7.12.13.

When importing from an NAI free country, zone or compartment, *Veterinary Administrations* should require:

for egg products

the presentation of an *international veterinary certificate* attesting that the egg products come from, and were processed in, an NAI free country, zone or compartment.

## Article 2.7.12.14.

Regardless of the NAI status of the country, *zone* or *compartment* of origin, *Veterinary Administrations* should require:

for egg products

the presentation of an *international veterinary certificate* attesting that:

1. the egg products are derived from eggs which meet the requirements of Articles 2.7.12.9., 2.7.12.10., 2.7.12.11. or 2.7.12.12.; or
2. the egg products were processed to ensure the destruction of NAI virus in accordance with Appendix 3.6.5.;
3. the necessary precautions were taken after processing to avoid contact of the *commodity* with any source of NAI virus.

## Article 2.7.12.15.

When importing from an NAI free country, zone or compartment, *Veterinary Administrations* should require:

for poultry semen

the presentation of an *international veterinary certificate* attesting that the donor poultry:

1. showed no clinical sign of NAI on the day of semen collection;

Appendix XXI (contd)

2. were kept in an NAI free country, zone or compartment for at least the 21 days prior to and at the time of semen collection.

Article 2.7.12.16.

When importing from an HPNAI free country, zone or compartment, *Veterinary Administrations* should require:

for poultry semen

the presentation of an *international veterinary certificate* attesting that the donor poultry:

1. showed no clinical sign of HPNAI on the day of semen collection;
2. were kept in an HPNAI free country, zone or compartment for at least the 21 days prior to and at the time of semen collection.

Article 2.7.12.17.

Regardless of the NAI status of the country, *zone* or *compartment* of origin, *Veterinary Administrations* should require:

for semen of birds other than poultry

the presentation of an *international veterinary certificate* attesting that the donor birds:

1. were kept in isolation approved by the *Veterinary Services* for at least the 21 days prior to semen collection;
2. showed no clinical sign of infection with a virus which would be considered NAI in poultry during the isolation period;
3. were tested between 7 and 14 days prior to semen collection and shown to be free of NAI infection.

Article 2.7.12.18.

When importing from an NAI free country, zone or compartment, *Veterinary Administrations* should require:

for fresh meat of poultry

the presentation of an *international veterinary certificate* attesting that the entire consignment of *fresh meat* comes from birds:

1. which have been kept in an NAI free country, zone or compartment since they were hatched or for at least the past 21 days;
2. which have been slaughtered in an *approved abattoir* and have been subjected to ante-mortem and post-mortem inspections for NAI with favourable results.

Appendix XXI (contd)

## Article 2.7.12.19.

When importing from an HPNAI free country, zone or compartment, *Veterinary Administrations* should require:

for fresh meat of poultry

the presentation of an *international veterinary certificate* attesting that the entire consignment of *fresh meat* comes from birds:

1. which have been kept in an HPNAI free country, zone or compartment since they were hatched or for at least the past 21 days;
2. which have been slaughtered in an *approved abattoir* and have been subjected to ante-mortem and post-mortem inspections for NAI with favourable results.

## Article 2.7.12.20.

Regardless of the NAI status of the country, *zone* or *compartment* of origin, *Veterinary Administrations* should require:

for meat products of poultry

the presentation of an *international veterinary certificate* attesting that:

1. the *commodity* is derived from *fresh meat* which meet the requirements of Articles 2.7.12.18. or 2.7.12.19.; or
2. the *commodity* has been processed to ensure the destruction of **NAI avian influenza** virus in accordance with Appendix 3.6.5.;
3. the necessary precautions were taken to avoid contact of the *commodity* with any source of NAI virus.

## Article 2.7.12.21.

Regardless of the NAI status of the country, *zone* or *compartment* of origin, *Veterinary Administrations* should require:

for products of poultry origin intended for use in animal feeding, or for agricultural or industrial use

the presentation of an *international veterinary certificate* attesting that:

1. these *commodities* come from poultry which have been kept in an NAI free country, zone or compartment since they were hatched or for at least the past 21 days; or
2. these *commodities* have been processed to ensure the destruction of **NAI avian influenza** virus (under study);
3. the necessary precautions were taken to avoid contact of the *commodity* with any source of NAI virus.

## Article 2.7.12.22.

Regardless of the NAI status of the country, *zone* or *compartment* of origin, *Veterinary Administrations* should require:

for feathers and down (from poultry)

the presentation of an *international veterinary certificate* attesting that:

1. these *commodities* come from poultry which have been kept in an NAI free country, zone or compartment since they were hatched or for at least the past 21 days; or
2. these *commodities* have been processed to ensure the destruction of **NAI avian influenza** virus (under study);
3. the necessary precautions were taken to avoid contact of the *commodity* with any source of NAI virus.

## Article 2.7.12.23.

Regardless of the NAI status of the country, *zone* or *compartment*, *Veterinary Administrations* should require for the importation of:

meat or other products from birds other than poultry

the presentation of an *international veterinary certificate* attesting that:

1. the *commodity* has been processed to ensure the destruction of **NAI avian influenza** virus (under study);
2. the necessary precautions were taken after processing to avoid contact of the *commodity* with any source of NAI virus.

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## APPENDIX 3.8.9.

**GUIDELINES ON SURVEILLANCE FOR  
AVIAN INFLUENZA**

## Article 3.8.9.1.

**Introduction**

This Appendix defines the principles and provides a guide on surveillance for notifiable avian influenza (NAI) in accordance with Appendix 3.8.1., applicable to countries seeking recognition for a declared NAI status, with or without the use of vaccination. This may be for the entire country, *zone* or *compartment*. Guidance for countries seeking free status following an *outbreak* and for the maintenance of NAI status are provided. This Appendix complements Chapter 2.7.12.

The presence of avian influenza viruses in wild birds creates a particular problem. In essence, no country can declare itself free from avian influenza (AI) in wild birds. However, the definition of NAI in Chapter 2.7.12. refers to the infection in poultry only, and this Appendix was developed under this definition.

The impact and epidemiology of NAI differ widely in different regions of the world and therefore it is impossible to provide specific guidelines for all situations. It is axiomatic that the surveillance strategies employed for demonstrating freedom from NAI at an acceptable level of confidence will need to be adapted to the local situation. Variables such as the frequency of contacts of poultry with wild birds, different biosecurity levels and production systems and the commingling of different susceptible species including domestic waterfowl require specific surveillance strategies to address each specific situation. It is incumbent upon the country to provide scientific data that explains the epidemiology of NAI in the region concerned and also demonstrates how all the risk factors are managed. There is therefore considerable latitude available to Member Countries to provide a well-reasoned argument to prove that absence of NAI virus (NAIV) infection is assured at an acceptable level of confidence.

Surveillance for NAI should be in the form of a continuing programme designed to establish that the country, *zone* or *compartment*, for which application is made, is free from NAIV infection.

## Article 3.8.9.2.

**General conditions and methods**

1. A surveillance system in accordance with Appendix 3.8.1. should be under the responsibility of the *Veterinary Administration*. In particular:
  - a) a formal and ongoing system for detecting and investigating *outbreaks of disease* or NAI *infection* should be in place;
  - b) a procedure should be in place for the rapid collection and transport of samples from suspect cases of NAI to a laboratory for NAI diagnosis as described in the *Terrestrial Manual*;
  - c) a system for recording, managing and analysing diagnostic and surveillance data should be in place.

Appendix XXII (contd)

## 2. The NAI surveillance programme should:

- a) include an early warning system throughout the production, marketing and processing chain for reporting suspicious cases. Farmers and workers, who have day-to-day contact with poultry, as well as diagnosticians, should report promptly any suspicion of NAI to the *Veterinary Authority*. They should be supported directly or indirectly (e.g. through private veterinarians or *veterinary para-professionals*) by government information programmes and the *Veterinary Administration*. All suspected cases of NAI should be investigated immediately. As suspicion cannot be resolved by epidemiological and clinical investigation alone, samples should be taken and submitted to an *approved laboratory*. This requires that sampling kits and other equipment are available for those responsible for surveillance. Personnel responsible for surveillance should be able to call for assistance from a team with expertise in NAI diagnosis and control. In cases where potential public health implications are suspected, notification to the appropriate public health authorities is essential;
- b) implement, when relevant, regular and frequent clinical inspection, serological and virological testing of high-risk groups of animals, such as those adjacent to an NAI infected country, *zone* or *compartment*, places where birds and poultry of different origins are mixed, such as live bird markets, poultry in close proximity to waterfowl or other sources of NAIV.

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

Article 3.8.9.3.

**Surveillance strategies**1. Introduction

The target population for surveillance aimed at identification of *disease* and *infection* should cover all the susceptible poultry species within the country, *zone* or *compartment*. Active and passive surveillance for NAI should be ongoing. The frequency of active surveillance should be at least every 6 months. Surveillance should be composed of random and targeted approaches using virological, serological and clinical methods.

The strategy employed may be based on randomised sampling requiring surveillance consistent with demonstrating the absence of NAIV infection at an acceptable level of confidence. The frequency of sampling should be dependent on the epidemiological situation. Random surveillance is conducted using serological tests described in the *Terrestrial Manual*. Positive serological results should be followed up with virological methods.

Targeted surveillance (e.g. based on the increased likelihood of *infection* in particular localities or species) may be an appropriate strategy. Virological and serological methods should be used concurrently to define the NAI status of high risk populations.

A country should justify the surveillance strategy chosen as adequate to detect the presence of NAIIV infection in accordance with Appendix 3.8.1. and the prevailing epidemiological situation, including cases of HPNAI detected in any birds. It may, for example, be appropriate to target clinical surveillance at particular species likely to exhibit clear clinical signs (e.g. chickens). Similarly, virological and serological testing could be targeted to species that may not show clinical signs (e.g. ducks).

If a Member Country wishes to declare freedom from NAIIV infection in a specific *zone* or *compartment*, the design of the survey and the basis for the sampling process would need to be aimed at the population within the *zone* or *compartment*.

For random surveys, the design of the sampling strategy will need to incorporate epidemiologically appropriate design prevalence. The sample size selected for testing will need to be large enough to detect *infection* if it were to occur at a predetermined minimum rate. The sample size and expected disease prevalence determine the level of confidence in the results of the survey. The applicant country must justify the choice of design prevalence and confidence level based on the objectives of surveillance and the epidemiological situation, in accordance with Appendix 3.8.1. Selection of the design prevalence in particular clearly needs to be based on the prevailing or historical epidemiological situation.

Irrespective of the survey approach selected, the sensitivity and specificity of the diagnostic tests employed are key factors in the design, sample size determination and interpretation of the results obtained. Ideally, the sensitivity and specificity of the tests used should be validated for the vaccination/infection history and the different species in the target population.

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

The principles involved in surveillance for *disease / infection* are technically well defined. The design of surveillance programmes to prove the absence of NAIIV infection/circulation needs to be carefully followed to avoid producing results that are either insufficiently reliable, or excessively costly and logistically complicated. The design of any surveillance programme, therefore, requires inputs from professionals competent and experienced in this field.

## 2. Clinical surveillance

Clinical surveillance aims at the detection of clinical signs of NAI at the flock level. Whereas significant emphasis is placed on the diagnostic value of mass serological screening, surveillance based on clinical inspection should not be underrated. Monitoring of production parameters, such as increased mortality, reduced feed and water consumption, presence of clinical signs of a respiratory disease or a drop in egg production, is important for the early detection of NAIIV infection. In some cases, the only indication of LPNAIV infection may be a drop in feed consumption or egg production.

Appendix XXII (contd)

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

Identification of suspect flocks is vital to the identification of sources of NAIV and to enable the molecular, antigenic and other biological characteristics of the virus to be determined. It is essential that NAIV isolates are sent regularly to the regional Reference Laboratory for genetic and antigenic characterization.

### 3. Virological surveillance

Virological surveillance using tests described in the *Terrestrial Manual* should be conducted:

- a) to monitor at risk populations;
- b) to confirm clinically suspect cases;
- c) to follow up positive serological results;
- d) to test 'normal' daily mortality, to ensure early detection of infection in the face of vaccination or in *establishments* epidemiologically linked to an *outbreak*.

### 4. Serological surveillance

Serological surveillance aims at the detection of antibodies against NAIV. Positive NAIV antibody test results can have four possible causes:

- a) natural infection with NAIV;
- b) vaccination against NAI;
- c) maternal antibodies derived from a vaccinated or infected parent flock are usually found in the yolk and can persist in progeny for up to 4 weeks;
- d) **false** positive results due to the lack of specificity of the test.

It may be possible to use serum collected for other survey purposes for NAI surveillance. However, the principles of survey design described in these guidelines and the requirement for a statistically valid survey for the presence of NAIV should not be compromised.

The discovery of clusters of seropositive flocks may reflect any of a series of events, including but not limited to the demographics of the population sampled, vaccinal exposure or infection. As clustering may signal infection, the investigation of all instances must be incorporated in the survey design. Clustering of positive flocks is always epidemiologically significant and therefore should be investigated.

If vaccination cannot be excluded as the cause of positive serological reactions, diagnostic methods to differentiate antibodies due to infection or vaccination should be employed.

The results of random or targeted serological surveys are important in providing reliable evidence that no NAIV infection is present in a country, *zone* or *compartment*. It is therefore essential that the survey be thoroughly documented.

5. Virological and serological surveillance in vaccinated populations

The surveillance strategy is dependent on the type of vaccine used. The protection against AI is haemagglutinin subtype specific. Therefore, two broad vaccination strategies exist: 1) inactivated whole AI viruses, and 2) haemagglutinin expression-based vaccines.

In the case of vaccinated populations, the surveillance strategy should be based on virological and/or serological methods and clinical surveillance. It may be appropriate to use sentinel birds for this purpose. These birds should be unvaccinated, AI virus antibody free birds and clearly and permanently identified. The interpretation of serological results in the presence of vaccination is described in Article 3.8.9.7.

Article 3.8.9.4.

**Documentation of NAI or HPNAI free status**

1. Countries declaring freedom from NAI or HPNAI for the country, zone or compartment

In addition to the general conditions described in the *Terrestrial Code*, a Member Country declaring freedom from NAI or highly pathogenic notifiable avian influenza (HPNAI) for the entire country, or a *zone* or a *compartment* should provide evidence for the existence of an effective surveillance programme. The strategy and design of the surveillance programme will depend on the prevailing epidemiological circumstances and should be planned and implemented according to general conditions and methods described in this Appendix, to demonstrate absence of NAIV or HPNAIV infection, during the preceding 12 months in susceptible poultry populations (vaccinated and non-vaccinated). This requires the support of a laboratory able to undertake identification of NAIV or HPNAIV infection through virus detection and antibody tests described in the *Terrestrial Manual*. This surveillance may be targeted to poultry population at specific risks linked to the types of production, possible direct or indirect contact with wild birds, multi-age flocks, local trade patterns including live bird markets, use of possibly contaminated surface water, and the presence of more than one species on the holding and poor biosecurity measures in place.

2. Additional requirements for countries, zones or compartments that practise vaccination

Vaccination to prevent the transmission of HPNAI virus may be part of a disease control programme. The level of flock immunity required to prevent transmission will depend on the flock size, composition (e.g. species) and density of the susceptible poultry population. It is therefore impossible to be prescriptive. The vaccine must also comply with the provisions stipulated for NAI vaccines in the *Terrestrial Manual*. Based on the epidemiology of NAI in the country, *zone* or *compartment*, it may be that a decision is reached to vaccinate only certain species or other poultry subpopulations.

In all vaccinated flocks there is a need to perform virological and serological tests to ensure the absence of virus circulation. The use of sentinel poultry may provide further confidence of the absence of virus circulation. The tests have to be repeated at least every 6 months or at shorter intervals according to the risk in the country, *zone* or *compartment*.

Appendix XXII (contd)

Evidence to show the effectiveness of the vaccination programme should also be provided.

Article 3.8.9.5.

**Countries, zones or compartments declaring that they have regained ~~regained~~ freedom from NAI or HPNAI following an outbreak**

In addition to the general conditions described in Chapter 2.7.12., a country declaring that it has regained ~~regained~~ country, zone or compartment freedom from NAI or HPNAI virus infection should show evidence of an active surveillance programme depending on the epidemiological circumstances of the outbreak to demonstrate the absence of the infection. This will require surveillance incorporating virus detection and antibody tests described in the *Terrestrial Manual*. The use of sentinel birds may facilitate the interpretation of surveillance results.

A Member Country declaring freedom of country, zone or compartment after an outbreak of NAI or HPNAI (with or without vaccination) should report the results of an active surveillance programme in which the NAI or HPNAI susceptible poultry population undergoes regular clinical examination and active surveillance planned and implemented according to the general conditions and methods described in these guidelines. The surveillance should at least give the confidence that can be given by a randomized representative sample of the populations at risk.

Article 3.8.9.6.

**NAI free establishments within HPNAI free compartments**

The declaration of NAI free establishments requires the demonstration of absence of NAI virus infection. Birds in these establishments should be randomly tested using virus detection or isolation tests, and serological methods, following the general conditions of these guidelines. The frequency of testing should be based on the risk of infection and at a maximum interval of 21 days.

Article 3.8.9.7.

**The use and interpretation of serological and virus detection tests**

Poultry infected with NAI virus produce antibodies to haemagglutinin (HA), neuraminidase (NA), nonstructural proteins (NSPs), nucleoprotein/matrix (NP/M) and the polymerase complex proteins. Detection of antibodies against the polymerase complex proteins will not be covered in this Appendix. Tests for NP/M antibodies include direct and blocking ELISA, and agar gel immunodiffusion (AGID) tests. Tests for antibodies against NA include the neuraminidase inhibition (NI), indirect fluorescent antibody and direct ELISA tests. For the HA, antibodies are detected in haemagglutination inhibition (HI) and neutralization (SN) tests. The HI test is reliable in avian species but not in mammals. The SN test can be used to detect subtype specific antibodies to the haemagglutinin and is the preferred test for mammals and some avian species. The AGID test is reliable for detection of NP/M antibodies in chickens and turkeys, but not in other avian species. As an alternative, blocking ELISA tests have been developed to detect NP/M antibodies in all avian species.

The HI and NI tests can be used to subtype AI viruses into 16 haemagglutinin and 9 neuraminidase subtypes. Such information is helpful for epidemiological investigations and in categorization of AI viruses.

Poultry can be vaccinated with a variety of AI vaccines including inactivated whole AI virus vaccines, and haemagglutinin expression-based vaccines. Antibodies to the haemagglutinin confer subtype specific protection. Various strategies can be used to differentiate vaccinated from infected birds including serosurveillance in unvaccinated sentinel birds or specific serological tests in the vaccinated birds.

AI virus infection of unvaccinated birds including sentinels is detected by antibodies to the NP/M, subtype specific HA or NA proteins, or NSP. Poultry vaccinated with inactivated whole AI vaccines containing an influenza virus of the same H sub-type but with a different neuraminidase may be tested for field exposure by applying serological tests directed to the detection of antibodies to the NA of the field virus. For example, birds vaccinated with H7N3 in the face of a H7N1 epidemic may be differentiated from infected birds (DIVA) by detection of subtype specific NA antibodies of the N1 protein of the field virus. Alternatively, in the absence of DIVA, inactivated vaccines may induce low titres of antibodies to NSP and the titre in infected birds would be markedly higher. Encouraging results have been obtained experimentally with this system, but it has not yet been validated in the field. In poultry vaccinated with haemagglutinin expression-based vaccines, antibodies are detected to the specific HA, but not any of the other AI viral proteins. Infection is evident by antibodies to the NP/M or NSP, or the specific NA protein of the field virus. Vaccines used should comply with the standards of the *Terrestrial Manual*.

All flocks with seropositive results should be investigated. Epidemiological and supplementary laboratory investigation results should document the status of NAI infection/circulation for each positive flock.

A confirmatory test should have a higher specificity than the screening test and sensitivity at least equivalent than that of the screening test.

Information should be provided on the performance characteristics and validation of tests used.

1. The follow-up procedure in case of positive test results if vaccination is used

In case of vaccinated populations, one has to exclude the likelihood that positive test results are indicative of virus circulation. To this end, the following procedure should be followed in the investigation of positive serological test results derived from surveillance conducted on NAI-vaccinated poultry. The investigation should examine all evidence that might confirm or refute the hypothesis that the positive results to the serological tests employed in the initial survey were not due to virus circulation. All the epidemiological information should be substantiated, and the results should be collated in the final report.

Knowledge of the type of vaccine used is crucial in developing a serological based strategy to differentiate infected from vaccinated animals.

- a) Inactivated whole AI virus vaccines can use either homologous or heterologous neuraminidase subtypes between the vaccine and field strains. If poultry in the population have antibodies to NP/M and were vaccinated with inactivated whole AI virus vaccine, the following strategies should be applied:
  - i) sentinel birds should remain NP/M antibody negative. If positive for NP/M antibodies, indicating AI virus infection, specific HI tests should be performed to identify H5 or H7 AI virus infection;

Appendix XXII (contd)

- ii) if vaccinated with inactivated whole AI virus vaccine containing homologous NA to field virus, the presence of antibodies to NSP could be indicative of infection. Sampling should be initiated to exclude the presence of NAIV by either virus isolation or detection of virus specific genomic material or proteins;
  - iii) if vaccinated with inactivated whole AI virus vaccine containing heterologous NA to field virus, presence of antibodies to the field virus NA or NSP would be indicative of infection. Sampling should be initiated to exclude the presence of NAIV by either virus isolation or detection of virus specific genomic material or proteins.
- b) Haemagglutinin expression-based vaccines contain the HA protein or gene homologous to the HA of the field virus. Sentinel birds as described above can be used to detect AI infection. In vaccinated or sentinel birds, the presence of antibodies against NP/M, NSP or field virus NA is indicative of infection. Sampling should be initiated to exclude the presence of NAIV by either virus isolation or detection of virus specific genomic material or proteins.
2. The follow-up procedure in case of positive test results indicative of infection for determination of infection due to HPNAI or LPNAI virus

The detection of antibodies indicative of a NAI virus infection as indicated in point a)i) above will result in the initiation of epidemiological and virological investigations to determine if the infections are due to HPNAI or LPNAI viruses.

Virological testing should be initiated in all antibody-positive and at risk populations. The samples should be evaluated for the presence of AI virus, by virus isolation and identification, and/or detection of influenza A specific proteins or nucleic acids (Figure 2). Virus isolation is the gold standard for detecting infection by AI virus and the method is described in the *Terrestrial Manual*. All AI virus isolates should be tested to determine HA and NA subtypes, and *in vivo* tested in chickens and/or sequencing of HA proteolytic cleavage site of H5 and H7 subtypes for determination of classification as HPNAI, LPNAI or LPAI (not notifiable) viruses. As an alternative, nucleic acid detection tests have been developed and validated; these tests have the sensitivity of virus isolation, but with the advantage of providing results within a few hours. Samples with detection of H5 and H7 HA subtypes by nucleic acid detection methods should either be submitted for virus isolation, identification, and *in vivo* testing in chickens, or sequencing of nucleic acids for determination of proteolytic cleavage site as HPNAI or LPNAI viruses. The antigen detection systems, because of low sensitivity, are best suited for screening clinical field cases for infection by Type A influenza virus looking for NP/M proteins. NP/M positive samples should be submitted for virus isolation, identification and pathogenicity determination.

Laboratory results should be examined in the context of the epidemiological situation. Corollary information needed to complement the serological survey and assess the possibility of viral circulation includes but is not limited to:

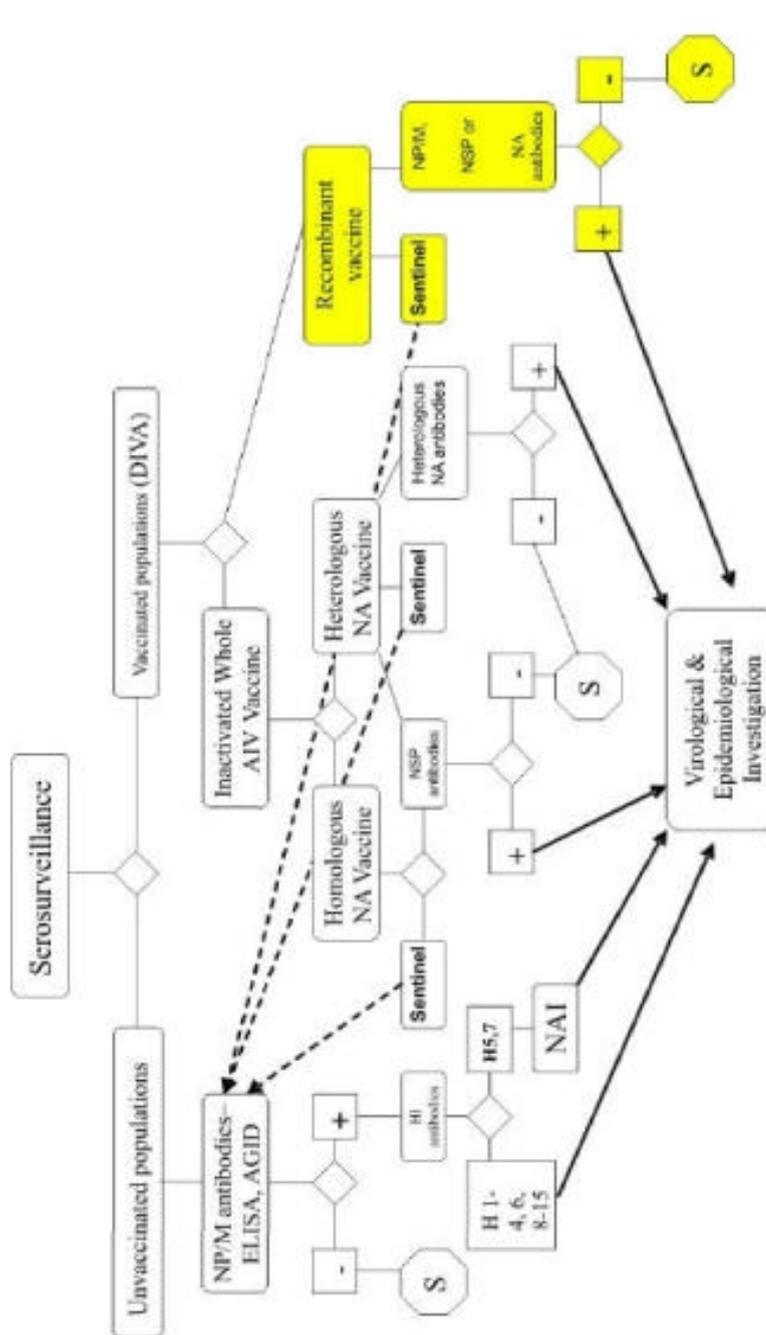
- a) characterization of the existing production systems;
- b) results of clinical surveillance of the suspects and their cohorts;
- c) quantification of vaccinations performed on the affected sites;

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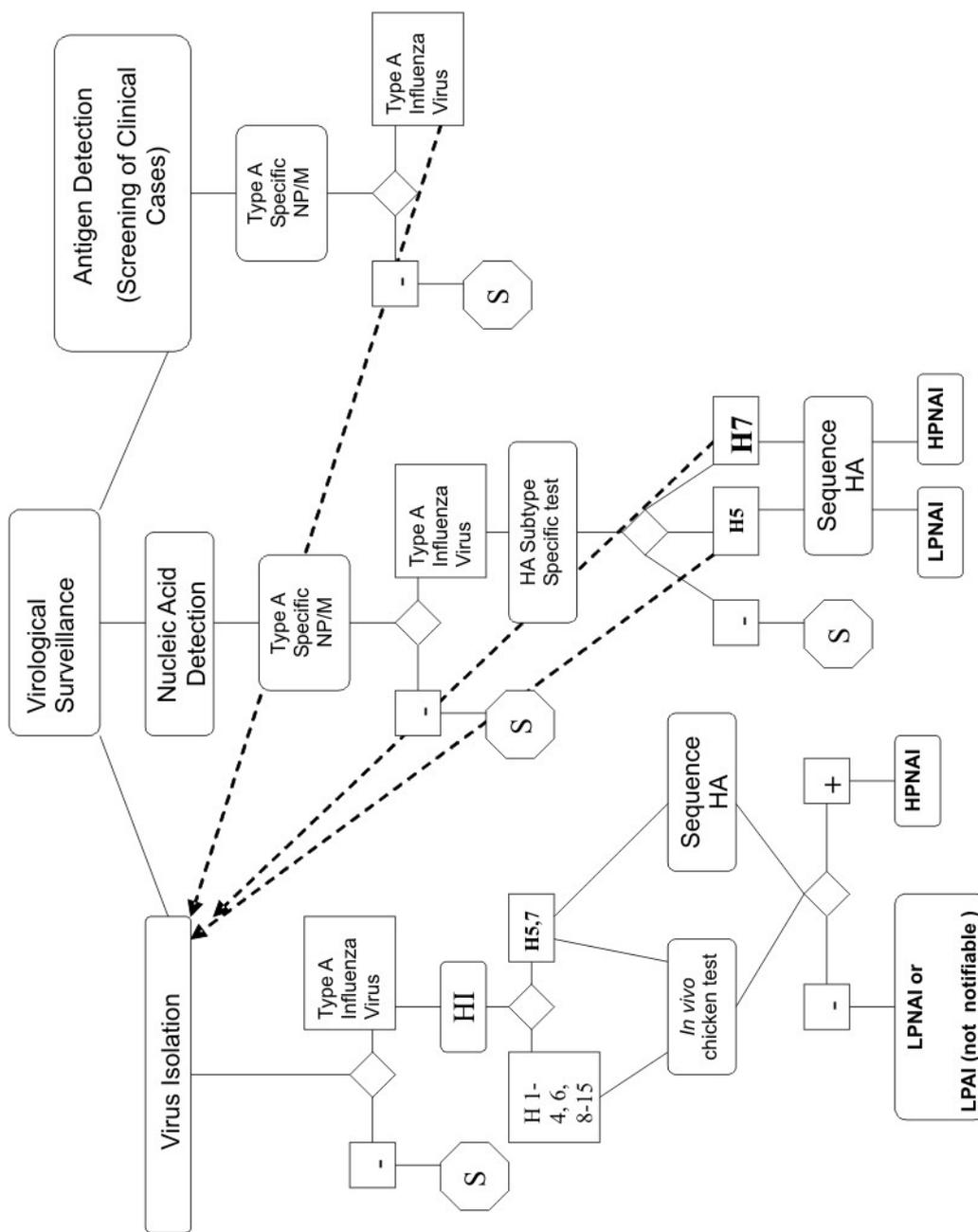
- d) sanitary protocol and history of the affected *establishments*;
- e) control of animal identification and movements;
- f) other parameters of regional significance in historic NAIIV transmission.

The entire investigative process should be documented as standard operating procedure within the epidemiological surveillance programme.

Fig. 1. Schematic representation of laboratory tests for determining evidence of NAI infection through or following serological surveys



**Figure 2.** - Schematic representation of laboratory tests for determining evidence of NAI infection using virological methods



Appendix XXII (contd)

The above diagram indicates the tests which are recommended for use in the investigation of poultry flocks.

Key:

AGID	Agar gel immunodiffusion
DIVA	Differentiating infected from vaccinated animals
ELISA	Enzyme-linked immunosorbant assay
HA	Haemagglutinin
HI	Haemagglutination inhibition
NA	Neuraminidase
NP/M	Nucleoprotein and matrix protein
NSP	Nonstructural protein
S	No evidence of NAIV

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## APPENDIX 3.6.5.

## GUIDELINES FOR THE INACTIVATION OF THE AVIAN INFLUENZA VIRUS

## Article 3.6.5.1.

**Eggs and egg products**

The following times for industry standard temperatures are suitable for the inactivation of highly pathogenic notifiable avian influenza (HPNAI) virus present in eggs and egg products:

	<b>Temperature (°C)</b>	<b>Time</b>
Whole egg	60	188 seconds
Whole egg blends	60	188 seconds
Whole egg blends	61.1	94 seconds
Liquid egg white	55.6	<del>256</del> <u>870</u> seconds
Liquid egg white	56.7	<del>228</del> <u>232</u> seconds
10% salted yolk	62.2	138 seconds
Dried egg white	67	0.83 days
Dried egg white	54.4	21.38 days

The listed temperatures are indicative of a range that achieves a 7-log kill. Where scientifically documented, variances from these times and temperatures may also be suitable when they achieve the inactivation of the virus.

## Article 3.6.5.2.

**Meat**

A procedure which produces a core temperature of 70°C for ~~one~~ 3.5 seconds is suitable for the inactivation of HPNAI virus present in meat.

	<b><u>Temperature (°C)</u></b>	<b><u>Time</u></b>
<u>Poultry meat</u>	<u>60.0</u>	<u>507 seconds</u>
	<u>65.0</u>	<u>42 seconds</u>
	<u>70.0</u>	<u>3.5 seconds</u>
	<u>73.9</u>	<u>0.51 seconds</u>

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## APPENDIX 3.2.1.

**BOVINE AND SMALL RUMINANT SEMEN**

.../...

Article 3.2.1.6.

**Conditions applicable to testing of rams/bucks and teaser animals**

Rams/bucks and teaser animals can enter an *artificial insemination centre* only if they fulfil the following requirements.

**1. Pre-quarantine**

The animals should comply with the following requirements prior to entry into isolation at the *quarantine station*.

## a) Caprine and ovine brucellosis

The animals should comply with Article 2.4.2.6.

## b) Ovine epididymitis

The animals should comply with Article 2.4.1.3.

## c) Contagious agalactia

The animals should comply with points 1 and 2 of Article 2.4.3.1.

## d) Peste des petits ruminants

The animals should comply with points 1, 2, and 4 or 5 of Article 2.4.9.7.

## e) Contagious caprine pleuropneumonia

The animals should comply with Article 2.4.6.5. or Article 2.4.6.7., depending on the CCPP status of the country of origin of the animals.

## f) Paratuberculosis

The animals should be free from clinical signs for the past 2 years.

## g) Scrapie

If the animals do not originate from a scrapie free country or zone as defined in Article 2.4.8.3., the animals should comply with points 1 and 2 of Article 2.4.8.8.

## h) Maedi-visna

The animals should comply with Article 2.4.5.2.

Appendix XXIV (contd)

## i) Caprine arthritis/encephalitis

In the case of goats, the animals should comply with Article 2.4.4.2.

## j) Bluetongue

The animals should comply with Article 2.2.13.6., 2.2.13.7. or 2.2.13.8., depending on the bluetongue status of the country of origin of the animals.

## k) Tuberculosis

In the case of goats, the animals should be subject to a single or comparative tuberculin test, with negative results.

m) Border disease

The animals should be subject to a viral agent isolation test with negative results.

2. Testing in the quarantine station prior to entering the semen collection facilities

Prior to entering the semen collection facilities of the *artificial insemination centre*, rams/bucks and teasers should be kept in a *quarantine station* for at least 28 days. The animals should be subjected to diagnostic tests as described below a minimum of 21 days after entering the *quarantine station*, with negative results.

## a) Caprine and ovine brucellosis

The animals should be subject to testing as described in point 1 b) or c) of Article 2.4.2.8.

## b) Ovine epididymitis

The animals and semen should be subject to testing as described in points 1d) and 2 of Article 2.4.1.4.

## c) Maedi-visna and caprine arthritis/encephalitis

The animals should be subjected to a serological test.

## d) Bluetongue

The animals should comply with the provisions referred to in Article 2.2.13.9., 2.2.13.10. or 2.2.13.11., depending on the bluetongue status of the country of origin of the animals.

3. Testing programme for rams/bucks and teasers resident in the semen collection facilities

All rams/bucks and teasers resident in the semen collection facilities should be tested at least annually for the following diseases, with negative results, where the country of origin is not free:

## a) caprine and ovine brucellosis;

## b) ovine epididymitis;

## c) Maedi-visna and caprine arthritis/encephalitis;

Appendix XXIV (contd)

d) tuberculosis (for goats only);

e) bluetongue.

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APPENDIX 3.2.2.  
**PORCINE SEMEN**

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Article 3.2.2.3.

**Testing programme for boars**

1. Definitions

Prescribed tests cover a minimal range of diseases from which all boars on an *artificial insemination centre* must be free.

Routine tests are tests applied at regular intervals to confirm the continued freedom from disease of the stud.

2. Prescribed tests

a) Bovine tuberculosis

Boars to give negative results to intradermal tuberculin tests with mammalian tuberculin in accordance with the *Terrestrial Manual*.

b) <sup>1</sup>Brucellosis (*B. abortus*, *B. suis*)

Boars to give negative results to serological tests in accordance with the *Terrestrial Manual*.

3. Routine tests

a) <sup>1</sup>Swine vesicular disease

Boars to give negative results to a serum-neutralisation test in accordance with the *Terrestrial Manual* (see also Articles 2.6.5.9. and 2.6.5.10. of this *Terrestrial Code*).

Routine tests to be applied at least every 12 months.

b) <sup>1</sup>African swine fever

Boars to give negative results to enzyme-linked immunoabsorbent assay and indirect immunofluorescent tests in accordance with the *Terrestrial Manual* (see also Articles 2.6.6.10. and 2.6.6.11. of this *Terrestrial Code*).

Routine tests to be applied at least every 6 months.

Appendix XXV (contd)

- c) <sup>1</sup>Enterovirus encephalomyelitis (ex Teschen disease)

Boars to meet certification standards in Articles 2.6.3.9. or 2.6.3.10. of this *Terrestrial Code*.

Routine tests to be applied at least every 12 months.

- d) <sup>1</sup>Vesicular stomatitis

~~Boars to give negative results to a complement fixation test in accordance with the *Terrestrial Manual*.~~

~~Routine tests to be applied at least every 12 months.~~

Claims of country freedom from some viral and bacterial infections of swine may be given consideration providing such claims are backed by serological survey data and epidemiological investigation.

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## APPENDIX 3.5.1.

## GENERAL PRINCIPLES

## Article 3.5.1.1.

1. Animal identification and animal traceability are tools for addressing animal health (including zoonoses) and food safety issues. These tools may significantly improve the effectiveness of activities such as: the management of disease outbreaks and food safety incidents, vaccination programmes, herd/flock husbandry, zoning/compartimentalisation, surveillance, early response and notification systems, animal movement controls, inspection, certification, fair practices in trade and the utilisation of veterinary drugs, feed and pesticides at farm level.
2. There is a strong ~~critical~~ relationship between *animal identification* and the traceability of animals and products of animal origin.
3. *Animal traceability* and traceability of products of animal origin should have the capability to be linked to achieve traceability throughout the animal production and food chain taking into account relevant OIE and Codex Alimentarius standards.
3. ~~Animal identification and animal traceability are tools for addressing animal health (including zoonoses) and food safety issues. These tools may significantly improve the effectiveness of activities such as: the management of disease outbreaks and food safety incidents, vaccination programmes, herd/flock husbandry, zoning/compartimentalisation, surveillance, early response and notification systems, animal movement controls, inspection, certification, fair practices in trade and the utilisation of veterinary drugs, feed and pesticides at farm level.~~
4. The objective(s) ~~and outcomes~~ of *animal identification* and *animal traceability* for a particular country, *zone* or *compartment* and the approach used should be clearly defined following an assessment of the risks to be addressed and a consideration of the factors listed below. They should be defined through consultation between the *Veterinary Administration* and relevant sectors/stakeholders prior to implementation, and periodically reviewed.
5. There are various factors which may determine the system chosen ~~system~~ for *animal identification* and *animal traceability*. Factors such as the outcomes of the risk assessment, the animal and public health situation (including zoonoses) and related programmes, animal population parameters (such as species and breeds, numbers and distribution), types of production, animal movement patterns, available technologies, trade in animals and animal products, cost/benefit analysis and other economic, geographical and environmental considerations, and cultural aspects, should be taken into account when designing the system. Whatever system is used, it should comply with relevant OIE standards to ensure that the defined objectives are able to be achieved.
6. *Animal identification* and *animal traceability* should be under the responsibility of the *Veterinary Administration*, notwithstanding the responsibilities of other Competent Authorities having jurisdiction throughout the food chain. It is recognised that other Authorities may have jurisdiction over other aspects of the food chain, including the traceability of food.

Appendix XXVI (contd)

7. The *Veterinary Administration*, with relevant governmental agencies and in consultation with the private sector, should establish a legal framework for the implementation and enforcement of *animal identification* and *animal traceability* in the country. In order to facilitate compatibility and consistency, relevant international standards and obligations should be taken into account. This legal framework should include elements such as the objectives, scope, organisational arrangements including the choice of technologies used for identification and *registration*, obligations of all the parties involved including third parties implementing traceability systems, confidentiality, accessibility issues and the efficient exchange of information.
8. Whatever the specific objectives of the chosen *animal identification system* and *animal traceability*, there is a series of common basic factors, and these must be considered before implementation, such as the legal framework, procedures, the *Competent Authority*, identification of *establishments/owners*, *animal identification* and animal movements.
9. The equivalent outcomes based on {performance criteria} rather than identical systems based on {design criteria} should be the basis for comparison of *animal identification systems* and *animal traceability*.

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## APPENDIX 3.6.6.

## GENERAL GUIDELINES FOR THE DISPOSAL OF DEAD ANIMALS

## Article 3.6.6.1.

### Introduction

The mass disposal of dead animals associated with an animal *disease outbreak* is often subject to intense public and media scrutiny thereby obligating the *Veterinary Administration* of a Member Country to not only conduct disposal operations within acceptable scientific principles to destroy the causative pathogen but also to address public and environmental concerns.

The guidelines in this Appendix are general in nature. The choice of one or more of the recommended methods should be in compliance with relevant local and national legislation and be attainable with the resources available. The guidelines should also be applied in conjunction with the procedures described for the killing of animals in Appendix 3.7.6.

Strategies for the disposal of dead animals (entire animals or parts thereof) should be prepared well in advance of any emergency. Major issues related to the disposal of dead animals include the number of animals involved, biosecurity concerns over the movement of infected or exposed animals, people and equipment, environmental concerns, and the psychological distress experienced by farmers and animal handlers.

## Article 3.6.6.2.

### Regulations and jurisdiction

The legislation regulating animal health and the organisation of the *Veterinary Administration* should give the *Veterinary Services* the authority and the legal powers to carry out the activities necessary for the efficient and effective disposal of dead animals. Cooperation between the *Veterinary Service* and other relevant government bodies is necessary to developing a coherent set of legal measures for the disposal of dead animals in advance of any emergency. In this context the following aspects should be regulated:

1. Powers of *Veterinary Services* (inspectors, veterinary officers, etc.) to effect controls and direct persons as well as the right of entry to an *establishment* for the *Veterinary Services* and associated personnel;
2. movement controls and the authority to make exemptions under certain biosecurity conditions, for example for transport of dead animals to another location for disposal;
3. the obligation on the involved farmer and *animal handler* to cooperate with the *Veterinary Services*;
4. any need to transfer the ownership of animals to the competent authority;
5. the determining of the method and location of disposal, and the necessary equipment and facilities, by the *Veterinary Services*, in consultation with other involved authorities including national and local governmental organisations competent for the protection of human health and of the environment.

Appendix XXVII (contd)

Should the chosen option for the disposal of dead animals be applied near the border of a neighbouring country, the competent authorities of that country should be consulted.

Article 3.6.6.3.

## **Preparedness**

The mass killing and disposal of animals in the event of a *disease outbreak* or disposal of animals in the event of natural disasters such as floods, usually must proceed with the minimum delay. The success is determined by the structures, policies and infrastructure established in advance:

### 1. ~~Technical preparedness~~ Relationship with industry

A relationship with industry organisations, such as farmer associations, commodity representatives, animal welfare organisations, security services, media and consumer representatives is essential to obtain compliance with animal health policies.

### 2. ~~Standard operating procedures~~

Standard operating procedures should be developed, (including documented decision-making processes, training of staff). ~~A relationship with industry is essential to obtain compliance with animal health policies – farmer associations, commodity representatives, animal welfare organisations, support structures such as security services, relevant government agencies, the media and consumer representatives.~~

### ~~3.~~ Financial preparedness

Financial preparedness means a compensation or insurance mechanism, an access to emergency funding and an access to personnel through agreements with private veterinarians

### ~~3.~~ Communication plan

Information sharing with officials involved in the *outbreak*, affected farmers, professional organizations, politicians and the media is essential. A well informed spokesperson should be available at all times to answer enquiries.

### 4.5. Resources

The management of resources should address such items as personnel, transport, storage facilities, equipment (such as mobile handling facilities for animals, disinfection equipment), fuel, protective and disposable material and logistical support.

### 5.6. ~~Heavy~~ Special equipment

Heavy Availability of s Special equipment including, such as trucks, tractors, bulldozers, and front-end loaders should be available.

## Article 3.6.6.4.

**Critical elements**

Critical elements which need to be taken into account considered in planning and implementation include:  
~~The list of critical elements, which has not the pretension to be complete, needs to be taken into account in planning and implementation.~~

1. Timeliness

Early detection of new infections, immediate killing of infected animals and rapid removal of the dead animals with inactivation of the pathogen are important. Spread of the pathogen from the dead animals and their surroundings should be blocked as soon and as effectively as possible.

2. Occupational health and safety

Disposal should be organised in such a way that the workers are safeguarded against the risks of handling decomposing dead animals. Special attention should be given to zoonotic aspects. Workers should receive appropriate training and be sufficiently protected against infection with protective clothing, gloves, face masks, effective respirators, spectacles, goggles, vaccination, and effective anti viral medicines, and Workers should also receive regular health checks.

3. Pathogen inactivation

The disposal procedure should be selected to result in inactivation of the pathogen.

4. Environmental concerns

Different methods of the disposal of dead animals have different effects on the environment. For instance, pyre burning will produce smoke and smells; burial might lead to gas and leachate production resulting in potential ~~and also a risk of~~ contamination of air, soil, surface and sub surface water.

5. Availability of capacity

An assessment of capacities of different methods of disposal should be made prior to any emergency. Temporary storage of dead animals in cold stores may relieve a lack of processing capacity.

6. ~~In~~ Adequate funding

Adequacy of funding for the options chosen must be ascertained and committed at the earliest possible stage.

7. Staff resources

For extended and /or large operations. Particularly important for technical and inspectorial personnel who are usually in short supply

Appendix XXVII (contd)

Availability of sufficient and well trained staff resources in particular for extended and /or large operations should be ensured. This is particularly important for technical and inspection personnel who are usually in short supply.

7.8. Public reaction Societal acceptance

Societal acceptance is an important point in choosing the method to use a disposal method.

8.9. Acceptance by farmers

Farmers will be sensitive to the safety measures taken to prevent spread of the disease by disposal method selected and the transport of the dead animals to the disposal site. Adequate compensation of owners for the loss of animals or for burial or burning sites will improve acceptability.

9.10. Equipment

Equipment used in the disposal of dead animals can transfer infection to other premises. The cleaning and disinfection of the outside surfaces of equipment such as cranes, containers and trucks, and the departure of vehicles from the farm should receive special attention. Trucks transporting dead animals should be leak proof.

10.11. Wildlife Scavengers and vectors

When disposing of dead animals, full attention should be given to preventing scavengers and vectors gaining access to dead animals, which might cause spread of disease.

12. Economic impact (short and long term including recovery)

The method of disposal used has a significant bearing on economic impact. the potential to influence significantly many aspects economically. This excludes operational costs, subsequent monitoring and re-establishment.

Article 3.6.6.5.

**Practical considerations**1. Selection of disposal site

Sufficient top soil to cover the site; soil type; water drainage; prevailing wind conditions; easy access to transport; availability of meteorological data; separation from sensitive public sites, and the effect on future use.

2. Selection of c\_Contractors for transport

Selection of c\_Contractors for transport — availability of manpower, materials and equipment including transport vehicles; can they supply in all the needs; exclusive use of vehicles or would they also be used for other purposes (risk of disease transmission); access to available roads; suitable for the purpose to be used.

3. Logistical preparedness for the appropriate technology

Availability of fuel (~~wood, old tyres~~); sufficient manual labour available; sites and availability of disinfection tents for personnel; storage and disposal of protective clothing; housing for personnel to minimise the spread of infection; facilities for entry and exit control; availability of electricity for night operations; personal facilities for personnel such as toilets, drinking water; availability of communication — mobile phone reception; protection (e.g. vaccination) of personnel; rendering capacity at rendering plants; ~~arms and ammunition~~, arms and ammunition, additional cold storage and holding facilities at rendering plants and abattoirs.

4. Procedures and policies for disposal of other possibly contaminated products

Animal products such as litter, Mmanure, wool, eggs and milk; non animal products; animal feed; non-animal products such as protective clothing.

5. Wildlife

Need to address risk posed; expertise availability for capture/culling of wildlife. minimise the risks posed by wildlife, including by excluding or repelling them from disposal site.

Article 3.6.6.6.

### **Recommended methods for the disposal of dead animals**

The method(s) chosen should be based on local conditions and circumstances the required capacity and speed of outcome and on the conditions required for the inactivation of the causative agent.

Some of the methods below may require on-farm pre-processing prior to transportation of dead animals to central facilities for rendering or incineration. Preprocessing could include the grinding of dead animals which can then be transported in sealed containers, or be subjected to fermentation, composting or freezing.

1. Rendering

This is a closed system for mechanical and thermal treatment of animal tissues leading to stable, sterilized products, e.g. animal fat and dried animal protein. The technology exists in dedicated facilities. It produces an effective inactivation of all pathogens with the exception of prions where infectivity is reduced. The availability of the capacity should be determined in advance.

2. Incineration in a dedicated facility

In such a facility, whole dead animals or parts of animals can be completely burned and reduced to ash, often in conjunction with other substances (such as municipal waste, hazardous waste or hospital waste). Effective inactivation of pathogens, including spores, occurs. Fixed facility incineration is wholly contained and has some advantages from the environmental viewpoint as the exhausts may be fitted with afterburner chambers to completely burn hydrocarbon gases and particulate matter from the main combustion chamber.

Appendix XXVII (contd)3. Rendering and incineration

These may be combined for improved security and to provide additional fuel for furnaces in facilities used for other purposes such as in cement kilns and electricity generation plants.

4. Air curtain incineration

This process fan-forces a mass of air through a manifold, thereby creating a turbulent environment in which incineration is accelerated up to six times for example in a burn-pit. The equipment can be mobile and, because it can be used on site, there is no requirement for transportation of the animal material. It also produces effective inactivation of pathogens.

5. Pyre burning

This open system of burning dead animals is a well established procedure that can be conducted on site with no requirement for transportation of animal material. However, it takes an extended period of time and has no way of verifying pathogen inactivation, and there may be particulate dissemination from incomplete combustion. Further, because the process is open to view, there may be a lack of acceptance by the public.

6. Composting

Composting is a natural biological decomposition process that takes place in the presence of oxygen. In the first phase, the temperature of the compost pile increases, organic materials break down into relatively small compounds, soft tissue decomposes, and bones soften partially. In the second phase, the remaining materials, mainly bones, break down fully to a dark brown or black humus containing primarily non-pathogenic bacteria and plant nutrients. However, some viruses and spore forming bacteria, such as *Bacillus anthracis*, and other pathogens such as *Mycobacterium tuberculosis* may survive.

7. Trench b-Burial

In this method, whole dead animals are buried and covered by soil. Burial is an established procedure which may be conducted on site. It may not inactivate all pathogens. In some circumstances, dead animals may be disposed of by mounding whereby they are covered by a layer of soil above ground.

8. Biogas production

This is a closed system of anaerobic fermentation which would require for the disposal of dead animals or their parts prior mechanical and thermal treatment of the input material (such as the liquid product of rendering plants). This process may not inactivate all pathogens.

9. Alkaline hydrolysis

This method uses sodium hydroxide or potassium hydroxide to catalyse the hydrolysis of biological material into a sterile aqueous solution consisting of small peptides, amino acids, sugars, and soaps. Heat is applied (150°C) to accelerate the process. The only solid byproducts are the mineral constituents of bones and teeth. This residue (2% of the original weight of the animal) is sterile and easily crushed into a powder. The temperature and alkali conditions of the process destroy the protein coats of viruses and the peptide bonds of prions. Both lipids and nucleic acids are degraded. The process is carried out in an insulated steam-jacketed, stainless steel pressure vessel.

#### 10. Bio-refining

This is a high pressure, high temperature hydrolytic process, conducted in a sealed pressurised vessel. The waste material is treated at 180°C at 12 bar pressure for 40 minutes, heated by the indirect application of steam kj, other compostable material, paper and comparable materials, and cereal straws either alone or in combination. The process inactivates all microbiological agents.

#### 11. Dead animal disposal at sea

International Conventions define the conditions to be met for the disposal of dead animals at sea.

Article 3.6.6.7.

### **Guidelines for decision-making for the disposal of dead animals**

~~Strategies for dead animal disposal require preparation well in advance of an emergency in order to maximize the efficiency of the response. Major issues related to dead animal disposal can include the number of animals involved, bio-security concerns over movement of infected and exposed animals, people and equipment, environmental concerns, and the extreme psychological distress and anxiety experienced by producers and emergency workers.~~

The disposal of large numbers of dead animals will be expensive. As well, fixed and variable costs will vary with the choice of the disposal method. Each method used will result in indirect costs on the environment, local economies, producers, and the livestock industry. Decision makers, in addition to biosecurity considerations, decision makers need to understand the economic, social, environmental protection and aesthetic impact of various disposal technologies.

A disposal option hierarchy may be incapable of fully capturing and systematizing the relevant dimensions at stake, and decision makers may be forced to consider the least preferred means. It therefore requires a comprehensive understanding of any array of dead animal disposal technologies and must reflect a balance between the scientific, economic, and social issues at stake. Timely slaughter, maintenance of security and prevention of further spread of disease, are the essential considerations in terms of disease control.

The following is an example of a possible process for aiding decision-making by comparing the suitability of various disposal options against factors that are considered important for the specific disposal event in question:

1. Step 1 - Define the factors to be considered. Include all relevant factors and allow enough flexibility to permit modifications for different situations and locations. Examples of possible factors include operator safety, community concerns, international acceptance, transport availability, industry standards, cost effectiveness and speed of resolution. These factors can be modified or changed, as is shown in the following example, to best fit the situation of event involved.
2. Step 2 - Assess the relative importance of the factors by weighting each on their considered importance to addressing the event in question. The sum of all the weightings, regardless of the number of factors, must total 100.
3. Step 3 - Identify and list all disposal options under consideration. Rate each disposal option against each factor and assign a Utility Rating of between 1 to 10 to each comparison. The Utility Rating (U) is a number between 1 and 10 which is allocated according to how well the option achieves the ideal with respect to each factor (eg 1 = the worst possible fit, and 10 = the best fit).

Appendix XXVII (contd)

4. Step 4 - For each factor and each disposal option, multiply the Factor Weight (F) x Utility Rating (U) to yield a numeric Balanced Value (V), (eg  $V = F \times U$ ).
5. Step 5 - By adding the Balanced Values to a sum for each disposal option, it is possible to compare the suitability of disposal options by numerically ranking the sums of the Balanced Values for each disposal option. The largest sum would suggest that disposal option is the best balanced choice.

An example of the use of this process follows in Table 1. In this example, rendering achieved the highest sum and would be considered as the best balanced choice and the most suitable disposal option for the factors considered.

## Appendix XXVII (contd)

Table 1: Decision Making Process

Method	Rendering		Fixed Incineration		Pyre Burning		Composting		Mass Burial		On-Farm Burial		Commercial Landfill		
	Weight	Utility	Value	Utility	Value	Utility	Value	Utility	Value	Utility	Value	Utility	Value	Utility	Value
Factors															
Operator Safety	20	7	140	4	80	8	160	3	60	7	140	8			
Speed of Resolution	20	8	160	8	160	2	40	5	100	5	100	6			
Pathogen Inactivation	15	10	150	10	150	8	120	5	75	4	60	4			
Impact on Environment	10	10	100	8	80	3	30	10	100	3	30	3			
Reaction of the Public	10	10	100	7	70	1	10	9	90	3	30	4			
Transport Availability	5	1	5	1	5	8	40	5	25	3	15	8			
Acceptable to Industry	5	7	35	7	35	7	35	7	35	6	30	7			
Cost	5	4	20	1	5	6	30	9	45	8	40	9			
Risk to Wildlife	5	10	50	10	50	5	25	4	20	5	25	5			
Capacity to Meet Requirements	5	5	25	3	15	9	45	9	45	9	45	9			
Total Weight to Equal 100 Units	100	sum	785	sum	650	sum	535	sum	595	sum	515	sum		sum	

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## APPENDIX 3.10.2.

**GUIDELINES ON THE DETECTION, CONTROL AND PREVENTION OF *SALMONELLA* ENTERITIDIS AND *S. TYPHIMURIUM* IN POULTRY PRODUCING EGGS FOR HUMAN CONSUMPTION**

## Article 3.10.2.1.

**Introduction**

The aim of the *Terrestrial Code* is to assist Member Countries in the management and control of significant animal diseases, including diseases with zoonotic potential, and in developing animal health measures applicable to trade in terrestrial animals and their products. This guideline provides recommendations on the detection, control and prevention of *Salmonella Enteritidis* and *S. Typhimurium* in poultry producing eggs for human consumption.

*S. Enteritidis* and *S. Typhimurium* belong to the species of *S. Enterica*. In most food animal species, *S. Enteritidis* and *S. Typhimurium* can establish a clinically inapparent infection in poultry, of variable duration, which is significant as a potential zoonosis. Such animals may be important in relation to the spread of infection between flocks and as causes of human food poisoning. In the latter case, this can occur when these animals, or their products, enter the food chain thus producing contaminated food products.

Salmonellosis is one of the most common food-borne bacterial diseases in the world. It is estimated that over 90% of *Salmonella* infections in humans are food-borne with *S. Enteritidis* and *S. Typhimurium* accounting for major part of the problem. Egg-associated salmonellosis, particularly *S. Enteritidis*, is an important public health problem worldwide.

## Article 3.10.2.2.

**Purpose and scope**

This guideline deals with methods for on farm detection, control and prevention of *S. Enteritidis* and *S. Typhimurium* in poultry producing eggs for human consumption. This guideline complements the Codex Alimentarius draft Code of hygienic practice for eggs and egg products (ALINORM 07/28/13, appendix II). It covers the preharvest part of the production chain from elite flock to the commercial layer farm. The objective is to control *Salmonella* in poultry with the goal of producing *Salmonella* free eggs.

The scope covers chickens and other domesticated birds used for the production of eggs for human consumption. The recommendations presented in this guideline are also relevant to the control of other *Salmonella* serotypes.

## Article 3.10.2.3.

**Definitions (for this chapter only)****Peak of lay**

means the time in the laying cycle (normally expressed as age in weeks) when the production of the flock is highest.

**Pullet flock**

means a flock of poultry prior to the period of laying eggs for human consumption.

**Layer flock**

means a flock of poultry during the period of laying eggs for human consumption.

**Competitive exclusion**

means the administration of bacterial flora to poultry to prevent gut colonisation by enteropathogens, including *Salmonellae*.

**Culling**

means the depopulation of a flock before the end of its normal production period.

## Article 3.10.2.4.

**Hazards in poultry breeding flocks, hatcheries and poultry producing eggs for human consumption**

All measures to be implemented in breeding flocks and hatcheries are described in Chapter 2.10.2. on *Salmonella Enteritidis* and *Salmonella Typhimurium* in Poultry and in Appendix 3.4.1. on hygiene and disease security procedures in poultry breeding flocks and hatcheries.

This guideline deals with poultry producing eggs for human consumption. The rest of the food chain is addressed by the Codex Alimentarius draft code of hygienic practice for eggs and egg products.

## Article 3.10.2.5.

**Biosecurity recommendations applicable to pullet and layer flocks**

1. Access to the *establishment* should be controlled to ensure only authorized persons and conveyances enter the site. This may require that the *establishment* be surrounded by a security fence. The choice of a suitably isolated geographical location, taking into account the direction of the prevailing winds, facilitates hygiene and disease control. A sign indicating restricted entry should be posted at the entrance.
2. *Establishments* should operate on an 'all in - all out' single age group whenever possible.
3. Where several flocks are maintained on one *establishment*, each flock should be managed as separate entities.
4. Poultry houses and buildings used to store feed or eggs should be pest proof and not accessible to wild birds.

Appendix XXVIII (contd)

5. Poultry houses should be constructed so that cleaning and *disinfection* can be carried out adequately and preferably of smooth impervious materials.
6. *Establishments* should be free from unwanted vegetation and debris. The area immediately surrounding the poultry houses ideally should consist of concrete or other material to facilitate cleaning. An exception to this would be trees for heat control, with the exception of fruit trees which could be attractive to birds.
7. Domestic animals, other than poultry, should not be permitted access to poultry houses and buildings used to store feed or eggs.
8. Clean coveralls or overalls, hats and footwear should be provided for all personnel and visitors entering the poultry house. A disinfectant foot-bath should be provided, and the disinfectant solution should be changed regularly as recommended by the manufacturer. Personnel and visitors should wash their hands with soap and water or in a disinfectant solution before and after entering the layer house.
9. When a poultry house is depopulated, all faeces and litter should be removed from the house and disposed of in a manner approved by the *Veterinary Services*. After removal of faeces and litter, cleaning and *disinfection* of the building and equipment should be applied in accordance with Appendix 3.6.1.

Bacteriological monitoring of the efficacy of *disinfection* procedures is recommended when *S. Enteritidis* and/or *S. Typhimurium* have been detected in the flock. Routine pest control procedures should also be carried out at this time.

10. Birds used to stock a pullet house should be obtained from breeding flocks that are certified as free from *S. Enteritidis* and *S. Typhimurium* and have been monitored according to Article 3.4.1.9.
11. Layer flocks should be stocked from pullet flocks that are certified as free from *S. Enteritidis* and *S. Typhimurium* and have been monitored according to this guideline.
12. While *S. Enteritidis* and *S. Typhimurium* are not normally found as a contaminant in feed, it is nonetheless recommended to monitor the salmonella status of feed used in poultry houses. The use of pelletised feeds or feeds subjected to other bactericidal treatment is recommended. Feed should be stored in clean closed containers to prevent access by birds and pests. Spilled feed should be cleaned up regularly to remove attractants for wild birds and pests.
13. The water supply to poultry houses should be potable according to the World Health Organization or to the relevant national standard, and microbiological quality should be monitored if there is any reason to suspect contamination.
14. Sick or dead birds should be removed from poultry houses as soon as possible and at least daily, and effective and safe disposal procedures implemented.
15. Records of flock history and performance, surveillance, treatment and vaccinations in regard to *Salmonella* should be maintained on an individual flock basis within the establishment. Such records should be readily available for inspection.

Appendix XXVIII (contd)

16. There should be good communication and interaction between all involved in the food chain so that control can be maintained from breeding to egg production and consumption. Farmers should have access to basic training on hygiene and biosecurity measures relevant to egg production and food safety.

17. For poultry flocks that are allowed to range outdoors, the following provisions apply:

Attractants to wild birds should be minimised (e.g. commercial feed and watering points should be kept inside the poultry house if possible). Poultry should not be allowed access to sources of contamination (e.g. household rubbish, other farm animals, surface water and manure storage areas). The nesting area should be inside the poultry house.

Article 3.10.2.6.

**Recommendations applicable to egg hygiene and collection**

1. Cages should be maintained in good condition and kept clean. The litter in the poultry house should be kept dry and in good condition. The nest box litter should be kept clean and an adequate quantity maintained.
2. Eggs should be collected at frequent intervals, not less than twice per day, and placed in new or clean and disinfected trays.
3. Dirty, broken, cracked, leaking or dented eggs should be collected separately and should not be used as table eggs.
4. Eggs should be stored in a cool and dry room used only for this purpose. Storage conditions should minimise the potential for microbial contamination and growth. The room should be kept clean and regularly sanitised.
5. Records of egg production should be kept to assist traceability and veterinary investigations.
6. If eggs are cleaned on the farm, this should be done in accordance with the requirements of the Competent Authority.

Article 3.10.2.7.

**Surveillance of pullet and layer flocks for *S. Enteritidis* and *S. Typhimurium***

Surveillance should be performed to identify infected flocks in order to take measures that will reduce transmission of *S. Enteritidis* and *S. Typhimurium* to humans and to reduce the prevalence in poultry. Microbiological testing is preferred to serological testing because of its higher sensitivity and specificity. In the framework of regulatory programmes for the control of *S. Enteritidis* and *S. Typhimurium*, confirmatory testing may be appropriate to ensure that decisions are soundly based.

## Sampling

### 1. Time and frequency of testing

- a) Pullet flock testing
  - i) Four weeks before being moved to another house, or before going into production if the animals will remain in the same house for the production period.
  - ii) At the end of the first week of life when the status of breeding farm and hatchery is not known or does not comply with Chapter 2.10.2.
  - iii) One or more times during the growing period if there is a *culling* policy in place. The frequency would be determined on commercial considerations.
- b) Layer flock testing
  - i) At expected *peak of lay* for each production cycle.
  - ii) One or more times if there is a *culling* policy in place or if eggs are diverted to processing for the inactivation of the pathogen. The minimal frequency would be determined by the *Veterinary Services*.
- c) Empty building testing

Environmental sampling of the empty building after depopulation, cleaning and *disinfection*, following a *S. Enteritidis* and *S. Typhimurium* positive flock.

### 2. Available methods for sampling

Drag swabs: Sampling is done by dragging swabs around the poultry building.

Boot swabs: Sampling is done by walking around the poultry building with absorbent material placed over the footwear of the sampler.

Faecal samples: Multiple samples of fresh faeces collected from different areas in the poultry building.

### 3. Number of samples to be taken according to the chosen method

Recommendation is 5 pair of boot swabs or 10 drag swabs. These swabs may be pooled into no less than 2 samples. 5 Pair of boot swabs correspond to 300 faeces samples.

The total number of faecal samples to be taken on each occasion is shown in Table I and is based on the random statistical sample required to give a probability of 95% to detect one positive sample given that infection is present in the population at a level of 5% or greater.

Table I

Number of birds in the flock	Number of samples to be taken on each occasion
25-29	20
30-39	25
40-49	30
50-59	35
60-89	40
90-199	50
200-499	55
500 or more	60

#### 4. Laboratory methods

Refer to the *Terrestrial Manual*.

Article 3.10.2.8.

### **Control measures**

*Salmonella* control can be achieved by adopting the management practices mentioned above in combination with the following measures. No single measure used alone will achieve effective *S. Enteritidis* and *S. Typhimurium* control.

Currently available control measures are: vaccination, *competitive exclusion*, flock *culling* and product diversion to processing. Antimicrobials, *competitive exclusion* and live vaccination are used in elite flocks.

Antimicrobials are not recommended to control *S. Enteritidis* and *S. Typhimurium* in poultry producing eggs for human consumption because the effectiveness of the therapy is limited; it has the potential to produce residues in the eggs and can contribute to the development of antimicrobial resistance.

#### 1. Vaccination

Many inactivated vaccines are used against *Salmonella* infections caused by different serovars in various poultry species, including a single or combined vaccine against *S. Enteritidis* and *S. Typhimurium*.

Live vaccines are also used in a number of countries to prevent *Salmonella* infections in poultry. It is important that field and vaccine strains can easily be differentiated in the laboratory. Vaccines produced according to the *Terrestrial Manual* should be used.

Vaccination can be used as part of an overall *Salmonella* control programme. Vaccination should never be used as the sole control measure.

When the status of breeding farm and hatchery from which the *pullet flock* originates is not known or does not comply with Chapter 2.10.2., vaccination of *pullet flocks*, starting with day-old chicks, against *S. Enteritidis* or *S. Enteritidis/S. Typhimurium* should be considered.

Vaccination should be considered when moving day-old chicks to a previously contaminated shed so as to minimize the risk of the birds contracting infection with *S. Enteritidis* and *S. Typhimurium*.

When used, vaccination should be performed according to the instructions provided by the manufacturer and in accordance with the directions of the *Veterinary Services*.

## 2. Competitive exclusion

*Competitive exclusion* can be used in day old chicks to reduce colonisation by *S. Enteritidis* and *S. Typhimurium*.

## 3. Culling

Depending on animal health and public health policies, culling is an option to manage infected flocks. If poultry are not culled, eggs should be sent for processing for inactivation of pathogens. Infected flocks should be destroyed or slaughtered and processed in a manner that minimises human exposure to pathogens.

Before restocking, the poultry house should be cleaned, disinfected and tested to verify that the cleaning has been effective (see above).

Farmers should be educated on how to handle *Salmonella* infected flocks in order to prevent spread to adjacent farms and human exposure.

Article 3.10.2.9.

## **Prevention of Salmonella spread**

When a *layer flock* or *pullet flock* is found infected with *S. Enteritidis* and *S. Typhimurium*, management procedures should be implemented.

In addition to the general control measures described previously, management procedures should be adjusted to effectively isolate the infected flock from other flocks on the farm, adjacent farms and from other farms under common management.

1. Personnel should observe standard disease control procedures (e.g. handle infected flock separately/last in sequence and use of dedicated personnel and clothing and, if possible equipment).
2. Pest control measures should be observed stringently
3. Epidemiological investigations should be carried out to determine the origin of new infections as appropriate to the epidemiological situation.
4. Movement of *culled* poultry or layers at the end of the production cycle should only be allowed for slaughter or destruction.

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5. Poultry litter/faeces and other potentially contaminated farm waste should be disposed of in a safe manner to prevent the spread of infections with *S. Enteritidis* and *S. Typhimurium*. Particular care needs to be taken in regard to poultry litter/faeces used to fertilise plants intended for human consumption.
  6. After depopulation of an infected flock the poultry house should be thoroughly cleaned and disinfected, with special attention to feed equipment and water systems.
  7. Before restocking bacteriological examination should be carried out, if possible, to verify that the cleaning has been effective.
-

## APPENDIX 3.7.2.

## GUIDELINES FOR THE TRANSPORT OF ANIMALS BY SEA

**Preamble:** These guidelines apply to the following live domesticated animals: cattle, buffalo, deer, camelids, sheep, goats, pigs and equines. They may also be applicable to other domesticated animals.

Article 3.7.2.1.

The amount of time animals spend on a *journey* should be kept to the minimum.

Article 3.7.2.1. bis

### 1. Animal behaviour

Animal handlers should be experienced and competent in handling and moving farm livestock and understand the behaviour patterns of animals and the underlying principles necessary to carry out their tasks.

The behaviour of individual animals or groups of animals will vary depending on their breed, sex, temperament and age and the way in which they have been reared and handled. Despite these differences, the following behaviour patterns, which are always present to some degree in domestic animals, should be taken into consideration in handling and moving the animals.

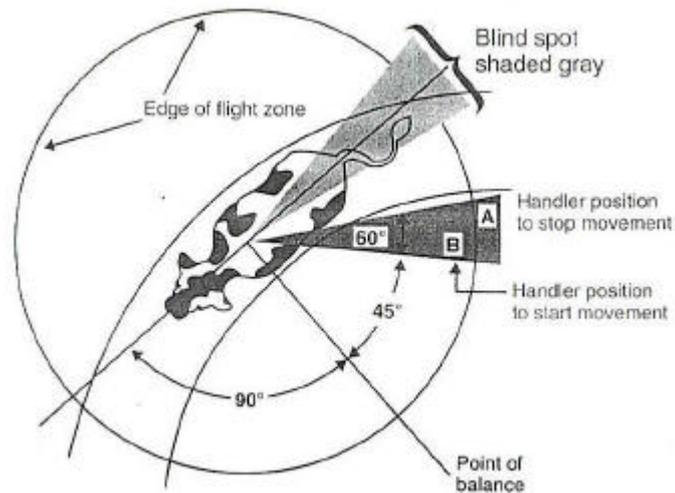
Most domestic livestock are kept in herds and follow a leader by instinct.

Animals which are likely to be hostile to each other in a group situation should not be mixed.

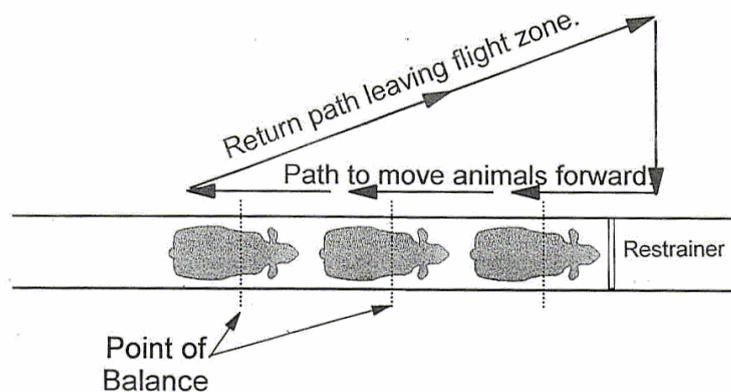
The desire of some animals to control their personal space should be taken into account in designing loading and unloading facilities, transport vessels and containers.

Domestic animals will try to escape if any person approaches closer than a certain distance. This critical distance, which defines the flight zone, varies among species and individuals of the same species, and depends upon previous contact with humans. Animals reared in close proximity to humans (i.e. tame) have a smaller flight zone, whereas those kept in free range or extensive systems may have flight zones which may vary from one metre to many metres. Animal handlers should avoid sudden penetration of the flight zone which may cause a panic reaction which could lead to aggression or attempted escape.

**An example of a flight zone (cattle)**



**Animal handler movement pattern to move cattle forward**



Animal handlers should use the point of balance at the animal's shoulder to move animals, adopting a position behind the point of balance to move an animal forward and in front of the point of balance to move it backward.

Domestic animals have a wide-angle vision but only have a limited forward binocular vision and poor perception of depth. This means that they can detect objects and movements beside and behind them, but can only judge distances directly ahead.

Although all domestic animals have a highly sensitive sense of smell, they may react differently to the smells encountered during travel. Smells which cause fear or other negative responses should be taken into consideration when managing animals.

Domestic animals can hear over a greater range of frequencies than humans and are more sensitive to higher frequencies. They tend to be alarmed by constant loud noises and by sudden noises, which may cause them to panic. Sensitivity to such noises should also be taken into account when handling animals.

## 2. Distractions and their removal

Design of new loading and unloading facilities or modification of existing facilities should aim to minimise the potential for distractions that may cause approaching animals to stop, baulk or turn back should be designed out from new loading and unloading facilities or removed from existing ones. Below are examples of common distractions and methods for eliminating them:

- a) reflections on shiny metal or wet floors - move a lamp or change lighting;
- b) dark entrances - illuminate with indirect lighting which does not shine directly into the eyes of approaching animals;
- c) animals seeing moving people or equipment up ahead - install solid sides on chutes and races or install shields;
- d) dead ends-avoid if possible by curving the passage, or make an illusory passage;
- e) chains or other loose objects hanging in chutes or on fences - remove them;
- f) uneven floors or a sudden drop in floor levels – avoid uneven floor surfaces or install a solid false floor to provide an illusion of a solid and continuous walking surface;
- g) sounds of air hissing from pneumatic equipment - install silencers or use hydraulic equipment or vent high pressure to the external environment using flexible hosing;
- h) clanging and banging of metal objects - install rubber stops on gates and other devices to reduce metal to metal contact;
- i) air currents from fans or air curtains blowing into the face of animals - redirect or reposition equipment. Dead ends - avoid if possible by curving the passage, or make an illusory passage

Article 3.7.2.2.

## **Responsibilities**

Once the decision to transport the animals by sea has been made, the welfare of the animals during their *journey* is the paramount consideration and is the joint responsibility of all people involved, ~~with~~ the individual responsibilities of ~~those~~ involved ~~being~~ will be described in more detail in this Article. These guidelines may also be applied to the transport of animals by water within a country.

The management of animals at post-discharge facilities is outside the scope of this Appendix.

~~The roles of each of those responsible are defined below:~~

Appendix XXIX (cond)1. General considerations

- ~~4-a)~~ Exporters, importers, owners of animals, business or buying/selling agents, shipping companies, masters of vessels and managers of facilities are jointly responsible for the general health of the animals and their fitness for the *journey*, and for their overall welfare during the *journey*, regardless of whether duties are subcontracted to other parties during transport.
- ~~5-b)~~ ~~The~~ Exporters, the shipping companies, business or buying/selling agents, and the masters of the vessels are jointly responsible for planning the *journey* to ensure the care of the animals, including:
- ~~i)a)~~ choosing appropriate *vessels* and ensuring that *animal handlers* are available to care for the animals;
  - ~~ii)b)~~ developing and keeping up to date contingency plans to address emergencies (including adverse weather conditions) and minimise stress during transport;
  - ~~iii)c)~~ correct *loading* of the ship, provision of appropriate food, water, ventilation and protection from adverse weather, regular inspections during the *journey* and for appropriate responses to problems arising;
  - ~~iv)d)~~ disposal of carcasses according to international law.
- ~~6-c)~~ To carry out ~~these~~ the above mentioned responsibilities, the ~~people~~ parties involved should be competent regarding transport regulations, equipment usage, and the humane handling and care of animals.

~~2.~~ ~~The exporter has overall responsibility for the organisation, carrying out and completion of the journey, regardless of whether duties are subcontracted to other parties during transport. The exporter is also responsible for ensuring that equipment and medication are provided as appropriate for the species and journey, and for the presence during the journey of at least one animal handler competent for the species being transported. The exporter is also responsible for ensuring compliance of the animals with any required veterinary certification and, in the case of animals for export, any other requirements of the importing and exporting countries.~~

2. Specific considerations

- a) The responsibilities of the exporters include:
- i) the organisation, carrying out and completion of the journey, regardless of whether duties are subcontracted to other parties during transport;
  - ii) ensuring that equipment and medication are provided as appropriate for the species and the journey;
  - iii) securing the presence of the appropriate number of animal handlers competent for the species being transported;
  - iv) ensuring compliance of the animals with any required veterinary certification, and their fitness to travel;

- v) in case of animals for export, ensuring compliance with any requirements of the *importing and exporting countries*.
- b) The responsibilities of the importers include:  
(under study)
- c) The responsibilities of the owners of the animals include the selection of animals that are fit to travel based on veterinary recommendations.
3. ~~Business or buying/selling agents have a joint responsibility with owners for the selection of animals that are fit to travel. They have a joint responsibility with masters of vessels and managers of facilities at the start and at the end of the journey for the availability of suitable facilities for the assembly, loading, transport, unloading and holding of animals, and for emergencies.~~
- d) The responsibilities of the business or buying/selling agent include:
- i) selection of animals that are fit to travel based on veterinary recommendations;
- ii) availability of suitable facilities for the assembly, loading, transport, unloading and holding of animals at the start and at the end of the *journey*, and for emergencies.
- e) The responsibilities of shipping companies include:  
(under study)
- f) The responsibilities of masters of *vessels* include the provision of suitable premises for animals on the *vessel*.
- g) The responsibilities of managers of facilities during *loading* include:
7. ~~Managers of facilities during *loading* of the animals are responsible for:~~
- i) ~~a) providing suitable premises for *loading* the animals;~~
- ii) ~~b) providing an appropriate number of *animal handlers* to load the animals with minimum stress and the avoidance of injury;~~
- iii) minimising the opportunities for disease transmission while the animals are in the facilities;
- iv) ~~c) providing appropriate facilities for emergencies;~~
- v) ~~d) providing facilities, *veterinarians* or *animal handlers* capable of *killing* animals humanely when required.~~

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- h) The responsibilities of managers of facilities during unloading include:
- ~~8. Managers of facilities at the end of the journey are responsible for:~~
- ~~i) a) providing suitable facilities for unloading the animals onto transport vehicles for immediate movement or securely holding the animals in lairage, with shelter, water and feed, when required, for transit;~~
  - ~~ii) b) providing animal handlers to unload the animals with minimum stress and injury;~~
  - ~~iii) c) minimising the opportunities for disease transmission while the animals are in the facilities;~~
  - ~~iv) d) providing appropriate facilities for emergencies;~~
  - ~~v) e) providing facilities, and veterinarians or animal handlers capable of killing animals humanely when required.~~
4. ~~Animal handlers are responsible for the humane handling and care of animals, especially during loading and unloading. To carry out these responsibilities, they should have the authority to take prompt action.~~
- i) The responsibilities of the animal handlers include humane handling and care of the animals, especially during loading and unloading.
- ~~9. i) The responsibilities of the Competent Authority of the exporting country include:~~
- ~~i) a) establishing minimum standards for animal welfare, including requirements for inspection of animals before and during their travel, and for certification and record keeping;~~
  - ~~ii) b) approving facilities, containers, vehicles/vessels for the holding and transport of animals, including that of the importing country;~~
  - ~~iii) c) setting competence standards for animal handlers and managers of facilities;~~
  - ~~d) ensuring that the vessel transporting animals meets the required standards, including those of the importing country;~~
  - ~~v) e) implementation of the standards, including through accreditation of / interaction with other organisations and Competent Authorities;~~
  - ~~vi) f) monitoring and evaluating health and welfare performance, including the use of any veterinary medications.~~
- ~~10. k) The responsibilities of the Competent Authority of the importing country include:~~
- ~~i) a) establishing minimum standards for animal welfare, including requirements for inspection of animals after their travel, and for certification and record keeping;~~
  - ~~ii) b) approving facilities, containers, vehicles/vessels for the holding and transport of animals;~~
  - ~~iii) c) setting competence standards for animal handlers and managers of facilities;~~

- ~~iv)~~ d) implementation of the standards, including through accreditation of / interaction with other organisations and *Competent Authorities*;
- ~~v)~~ e) ensuring that the *exporting country* is aware of the required standards for the *vessel* transporting the animals;
- ~~vi)~~ f) ~~monitoring and evaluating~~ health and welfare performance, including the use of any veterinary medications.
- vii) give animal consignments priority to allow import procedures to be completed without unnecessary delay.

~~11. When travelling on vessels with the animals, veterinarians are responsible for the humane handling and treatment of the animals during the journey. To carry out these responsibilities, they should have the authority to act and report independently. The veterinarian should meet with the Master, Chief Officer and the senior animal handler on a daily basis.~~

- m) The responsibilities of veterinarians or in the absence of a veterinarian, the animal handlers travelling on the vessel with the animals include:
  - i) humane handling and treatment of animals during the journey, including in emergencies, such as euthanasia humane killing of the animals;
  - ii) possess ability to report and act independently;
  - iii) meet daily with the master of the vessel to obtain up-to-date information on animal health and welfare status.

~~12.~~ n) The receiving *Competent Authority* should report back to the sending *Competent Authority* on significant animal welfare problems which occurred during the *journey*.

Article 3.7.2.3.

## Competence

1. All people responsible for animals during *journeys*, should be competent ~~according to their~~ to carry out the relevant responsibilities listed in Article 3.7.2.2. Competence in areas other than animal welfare would need to be addressed separately. Competence may be gained through formal training and/or practical experience.
- ~~2.~~ The competence of *animal handlers* should be demonstrated through a current certificate from the *Competent Authority* or from an independent body accredited by the *Competent Authority*. The certificate should be in one of the OIE official languages if the international transport of animals is involved.
- ~~3.~~ 2. The assessment of competence of *animal handlers* should at a minimum address knowledge, and ability to apply that knowledge, in the following areas:
  - a) planning a journey, including appropriate space allowance, feed, water and ventilation requirements;
  - b) responsibilities for the welfare of animals during the journey, including loading and unloading;

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- c)h) sources of advice and assistance;
- d)e) animal behaviour, general signs of disease, and indicators of poor animal welfare such as stress, pain and fatigue, and their alleviation;
- e)d) assessment of fitness to travel; if fitness to travel is in doubt, the animal should be examined by a veterinarian;
- f)e) relevant authorities and applicable transport regulations, and associated documentation requirements;
- g)f) general disease prevention procedures, including cleaning and *disinfection*;
- h)g) appropriate methods of animal handling during transport and associated activities such as assembling, *loading*, and *unloading*;
- i)h) methods of inspecting animals, managing situations frequently encountered during transport such as adverse weather conditions, and dealing with emergencies, including euthanasia;
- i)h) species-specific aspects and age-specific aspects of animal handling and care, including feeding, watering and inspection; and
- k)i) maintaining a *journey* log and other records.

4.5. Assessment of competence for exporters should at a minimum address knowledge, and ability to apply that knowledge, in the following areas:

- a) planning a *journey*, including appropriate *space allowances*, and feed, water and ventilation requirements;
- b) relevant authorities and applicable transport regulations, and associated documentation requirements;
- c) appropriate methods of animal handling during transport and associated activities such as cleaning and *disinfection*, assembling, *loading*, and *unloading*;
- d) species-specific aspects of animal handling and care, including appropriate equipment and medication;
- e) sources of advice and assistance;
- f) appropriate record keeping; and
- g) managing situations frequently encountered during transport, such as adverse weather conditions, and dealing with emergencies.

Article 3.7.2.4.

### **Planning the journey**

#### 1. General considerations

- a) Adequate planning is a key factor affecting the welfare of animals during a *journey*.

- b) Before the *journey* starts, plans should be made in relation to:
- i) preparation of animals for the *journey*;
  - ii) type of transport *vessel* required;
  - iii) route, taking into account distance, expected weather and sea conditions;
  - iv) nature and duration of *journey*;
  - v) daily care and management of the animals, including the appropriate number of *animal handlers*, to help ensure the health and welfare of all the animals;
  - vi) avoiding the mixing of animals from different sources in a single pen group;
  - vii) provision of appropriate equipment and medication for the numbers and species carried; and
  - viii) emergency response procedures.

## 2. Preparation of animals for the journey

- a) When animals are to be provided with a novel diet or unfamiliar methods of supplying of feed or water, they should be preconditioned.
- b) There should be planning for water and feed availability during the *journey*. Feed should be of appropriate quality and composition for the species, age, condition of the animals, etc.
- c) Extreme weather conditions are hazards for animals undergoing transport and require appropriate *vessel* design to minimise risks. Special precautions should be taken for animals that have not been acclimatised or which are unsuited to either hot or cold conditions. In some extreme conditions of heat or cold, animals should not be transported at all.
- d) Animals more accustomed to contact with humans and with being handled are likely to be less fearful of being loaded and transported. Animals should be handled and loaded in a manner that reduces their fearfulness and improves their approachability.
- e) Behaviour-modifying (such as tranquillisers) or other medication should not be used routinely during transport. Such medicines should only be administered when a problem exists in an individual animal, and should be administered by a *veterinarian* or other person who has been instructed in their use by a *veterinarian*. Treated animals should be placed in a dedicated area.

## 3. Control of disease

As animal transport is often a significant factor in the spread of infectious diseases, *journey* planning should take into account the following:

- a) When possible and agreed by the *Veterinary Authority* of the *importing country*, animals should be vaccinated against diseases to which they are likely to be exposed at their destination.

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- b) Medications used prophylactically or therapeutically should only be administered by a *veterinarian* or other person who has been instructed in their use by a *veterinarian*.
  - c) Mixing of animals from different sources in a single consignment should be minimized.
4. Vessel and container design and maintenance
- a) *Vessels* used for the sea transport of animals should be designed, constructed and fitted as appropriate to the species, size and weight of the animals to be transported. Special attention should be paid to the avoidance of injury to animals through the use of secure smooth fittings free from sharp protrusions and the provision of non-slip flooring. The avoidance of injury to *animal handlers* while carrying out their responsibilities should be emphasised.
  - b) *Vessels* should be properly illuminated to allow animals to be observed and inspected.
  - ~~b)c)~~ *Vessels* should be designed to permit thorough cleaning and *disinfection*, and the management of faeces and urine.
  - ~~e)d)~~ *Vessels* and their fittings should be maintained in good mechanical and structural condition.
  - ~~e)e)~~ *Vessels* should have adequate ventilation to meet variations in climate and the thermo-regulatory needs of the animal species being transported. The ventilation system should be effective when the *vessel* is stationary. An emergency power supply should be available to maintain ventilation in the case of primary machinery breakdown.
  - ~~e)f)~~ The feeding and watering system should be designed to permit adequate access to feed and water appropriate to the species, size and weight of the animals, and to minimise soiling of pens.
  - ~~f)g)~~ *Vessels* should be designed so that the faeces or urine from animals on upper levels do not soil animals on lower levels, or their feed or water.
  - ~~g)h)~~ *Loading* and stowage of feed and bedding should be carried out in such a way to ensure protection from fire hazards, the elements and sea water.
  - ~~h)i)~~ Where appropriate, suitable bedding, such as straw or sawdust, should be added to *vessel* floors to assist absorption of urine and faeces, provide better footing for animals and protect animals (especially young animals) from hard or rough flooring surfaces and adverse weather conditions.
  - ~~h)j)~~ The above principles apply also to *containers* used for the transport of animals.
5. Special provisions for transport in road vehicles on roll-on/roll-off vessels or for containers
- a) Road *vehicles* and *containers* should be equipped with a sufficient number of adequately designed, positioned and maintained securing points enabling them to be securely fastened to the *vessel*.
  - b) Road *vehicles* and *containers* should be secured to the ship before the start of the sea *journey* to prevent them being displaced by the motion of the *vessel*.

- c) *Vessels* should have adequate ventilation to meet variations in climate and the thermo-regulatory needs of the animal species being transported, especially where the animals are transported in a secondary *vehicle/container* on enclosed decks.
- d) Due to the risk of limited airflow on certain ~~vessels'~~ decks of a vessel, a road *vehicle* or *container* may require a forced ventilation system of greater capacity than that provided by natural ventilation.

#### 6. Nature and duration of the journey

The maximum duration of a *journey* should be determined ~~according to~~ taking into account factors that determine the overall welfare of animals, such as:

- a) the ability of the animals to cope with the stress of transport (such as very young, old, lactating or pregnant animals);
- b) the ~~animals'~~ previous transport experience of the animals;
- c) the likely onset of fatigue;
- d) the need for special attention;
- e) the need for feed and water;
- f) the increased susceptibility to injury and disease;
- g) *space allowance* and *vessel* design;
- h) weather conditions;
- i) vessel type used, method of propulsion and risks associated with particular sea conditions.

#### 7. Space allowance

- a) The number of animals which should be transported on a *vessel* and their allocation to different pens on the *vessel* should be determined before *loading*.
- b) The amount of space required, including headroom, depends on the species of animal and should allow the necessary thermoregulation. Each animal should be able to assume its natural position for transport (including during *loading* and *unloading*) without coming into contact with the roof or upper deck of the *vessel*. When animals lie down, there should be enough space for every animal to adopt a normal lying posture.
- c) Calculations for the *space allowance* for each animal should be carried out, using the figures given in Appendix X.X.X. or, in their absence, in reference to a relevant national or international document. The size of pens will affect the number of animals in each.
- d) The same principles apply when animals are transported in *containers*.

Appendix XXIX (cond)8. Ability to observe animals during the journey

Animals should be positioned to enable each animal to be observed regularly and clearly by *animal handler* or other responsible person, during the *journey* to ensure their safety and good welfare.

9. Emergency response procedures

There should be an emergency management plan that identifies the important adverse events that may be encountered during the *journey*, the procedures for managing each event and the action to be taken in an emergency. For each important event, the plan should document the actions to be undertaken and the responsibilities of all parties involved, including communications and record keeping.

Article 3.7.2.5.

**Documentation**

1. Animals should not be loaded until the documentation required to that point is complete.
2. The documentation accompanying the consignment should include:
  - a) *journey* travel plan (~~including~~ and an emergency management plan);
  - b) time, date and place of *loading*;
  - c) the *journey* log – a daily record of inspection and important events which includes records of morbidity and mortality and actions taken, climatic conditions, food and water consumed, medication provided, mechanical defects;
  - d) expected time, date and place of arrival and *unloading*;
  - e) veterinary certification, when required;
  - f) *animal identification* to allow ~~traceback~~ animal traceability of individual animals to the premises of departure, and, where possible, to the premises of origin;
  - g) details of any animals considered '~~at risk~~' at particular risk of suffering poor welfare during transport (point 3e) of Article 3.7.2.6.;
  - h) number of *animal handlers* on board, and their competencies; and
  - i) *stocking density* estimate for each load in the consignment.
3. When veterinary certification is required to accompany consignments of animals, it should address:
  - a) when required, details of *disinfection* carried out;
  - b) fitness of the animals to travel;
  - c) *animal identification* (description, number, etc.); and

- d) health status including any tests, treatments and vaccinations carried out.

Article 3.7.2.6.

## **Pre-journey period**

### **1. General considerations**

- a) Before each *journey*, *vessels* should be thoroughly cleaned and, if necessary, treated for animal and public health purposes, using chemicals approved by the *Competent Authority*. When cleaning is necessary during a *journey*, this should be carried out with the minimum of stress to the animals.
- b) In some circumstances, animals may require pre-*journey* assembly. In these circumstances, the following points should be considered:
- i) Pre-*journey* rest is necessary if the welfare of animals has become poor during the collection period because of the physical environment or the social behaviour of the animals.
  - ii) For animals such as pigs which are susceptible to motion sickness, and in order to reduce urine and faeces production during the *journey*, a species-specific short period of feed deprivation prior to *loading* is desirable.
  - iii) When animals are to be provided with a novel diet or unfamiliar methods of supplying feed or water, they should be preconditioned.
- c) Where an *animal handler* believes that there is a significant risk of disease among the animals to be loaded or significant doubt as to their fitness to travel, the animals should be examined by a *veterinarian*.
- d) Pre-*journey* assembly / holding areas should be designed to:
- i) securely contain the animals;
  - ii) maintain an environment safe from hazards, including predators and disease;
  - iii) protect animals from exposure to adverse weather conditions;
  - iv) allow for maintenance of social groups; and
  - v) allow for rest, watering and feeding.

### **2. Selection of compatible groups**

Compatible groups should be selected before transport to avoid adverse animal welfare consequences. The following guidelines should be applied when assembling groups of animals:

- a) animals of different species should not be mixed unless they are judged to be compatible;

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- b) animals of the same species can be mixed unless there is a significant likelihood of aggression; aggressive individuals should be segregated (recommendations for specific species are described in detail in Article 3.7.2.11.). For some species, animals from different groups should not be mixed because poor welfare occurs unless they have established a social structure;
  - c) young or small animals may need to be separated from older or larger animals, with the exception of nursing mothers with young at foot;
  - d) animals with horns or antlers should not be mixed with animals lacking horns or antlers, unless judged to be compatible; and
  - e) animals reared together should be maintained as a group; animals with a strong social bond, such as a dam and offspring, should be transported together.
3. Fitness to travel
- a) Animals should be inspected by a *veterinarian* or an *animal handler* to assess fitness to travel. If its fitness to travel is in doubt, ~~the animal should be examined by a veterinarian~~ it is the responsibility of a veterinarian to determine its ability to travel. Animals found unfit to travel should not be loaded onto a *vessel*.
  - b) Humane and effective arrangements should be made by the owner or agent for the handling and care of any animal rejected as unfit to travel.
  - c) Animals that are unfit to travel include, but may not be limited to:
    - i) those that are sick, injured, weak, disabled or fatigued;
    - ii) those that are unable to stand unaided or bear weight on each leg;
    - iii) those that are blind in both eyes;
    - iv) those that cannot be moved without causing them additional suffering;
    - v) newborn with an unhealed navel;
    - vi) females travelling without young which have given birth within the previous 48 hours;
    - vii) pregnant animals which would be in the final 10% of their gestation period at the planned time of *unloading*.
    - viii) animals with unhealed wounds from recent surgical procedures such as dehorning.
  - d) Risks during transport can be reduced by selecting animals best suited to the conditions of travel and those that are acclimatised to expected weather conditions.
  - e) Animals at particular risk of suffering poor welfare during transport and which require special conditions (such as in the design of facilities and vehicles, and the length of the journey) and additional attention during transport, may include: Animals at risk and requiring better conditions and additional attention during transport include:

- i) very large or obese individuals;
  - ii) very young or old animals;
  - iii) excitable or aggressive animals;
  - iv) animals subject to motion sickness;
  - v) animals which have had little contact with humans;
  - vi) females in the last third of pregnancy or in heavy lactation.
- f) Hair or wool length should be considered in relation to the weather conditions expected during transport.

Article 3.7.2.7.

## **Loading**

### 1. Competent supervision

- a) *Loading* should be carefully planned as it has the potential to be the cause of poor welfare in transported animals.
- b) *Loading* should be supervised by the *Competent Authority* and conducted by *animal handler(s)*. *Animal handlers* should ensure that animals are loaded quietly and without unnecessary noise, harassment or force, and that untrained assistants or spectators do not impede the process.

### 2. Facilities

- a) The facilities for *loading*, including the collecting area at the wharf, races and loading ramps should be designed and constructed to take into account ~~of~~ the needs and abilities of the animals with regard to dimensions, slopes, surfaces, absence of sharp projections, flooring, sides, etc.
- b) Ventilation during *loading* and the *journey* should provide for fresh air, and the removal of excessive heat, humidity and noxious fumes (such as ammonia and carbon monoxide). Under warm and hot conditions, ventilation should allow for the adequate convective cooling of each animal. In some instances, adequate ventilation can be achieved by increasing the *space allowance* for animals.
- c) *Loading* facilities should be properly illuminated to allow the animals to be easily inspected by *animal handlers*, and to allow the ~~animals~~ ease of movement of animals at all times. Facilities should provide uniform ~~lighting~~ light levels directly over approaches to sorting pens, chutes, loading ramps, with brighter ~~lighting~~ light levels inside *vehicles/containers*, in order to minimise baulking. Dim ~~lighting~~ light levels may be advantageous for the catching of some animals. Artificial lighting may be required.

### 3. Goads and other aids

When moving animals, their species specific behaviour should be used (see Article 3.7.2.11.). If goads and other aids are necessary, the following principles should apply:

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- a) ~~Animals that have little or no room to move should not be subjected to physical force or goads and other aids which compel movement.~~
- b) ~~Useful and permitted goads include panels, flags, plastic paddles, flappers (a length of cane with a short strap of leather or canvas attached), plastic bags and metallic rattles; they should be used in a manner sufficient to encourage and direct movement of the animals.~~
- c) ~~Painful procedures (including whipping, tail twisting, use of nose twitches, pressure on eyes, ears or external genitalia), or the use of unsuitable goads or other aids (including sticks with sharp ends, lengths of metal piping, fencing wire or heavy leather belts), should not be used to move animals.~~
- d) ~~The use of goads which administer electric shocks should be discouraged, and restricted to that necessary to assist movement of the animal. Such use should be limited to battery powered goads on the hindquarters of pigs and large ruminants, and never on sensitive areas such as the eyes, mouth, ears, anogenital region or belly. Such instruments should not be used on horses, sheep and goats of any age, or on calves or piglets.~~
- e) ~~Shouting or yelling at animals or making loud noises (e.g., through the cracking of whips) to encourage them to move should not occur, as such actions may make the animals agitated, leading to crowding or falling.~~
- f) ~~The use of well trained dogs to help with the *loading* of some species may be acceptable.~~
- g) ~~Manual lifting is permissible for young animals that may have difficulty negotiating ramps, but the lifting of animals by body parts such as their tail, head, horns, ears, limbs, wool or hair should not be permitted. The throwing or dropping of animals should not be permitted.~~
- a) Animals that have little or no room to move should not be subjected to physical force or goads and other aids which compel movement. Electric goads and prods should only be used in extreme cases and not on a routine basis to move animals. The use and the power output should be restricted to that necessary to assist movement of an animal and only when an animal has a clear path ahead to move. Goads and other aids should not be used repeatedly if the animal fails to respond or move. In such cases it should be investigated whether some physical or other impediment is preventing the animal from moving.
- b) The use of such devices should be limited to battery-powered goads on the hindquarters of pigs and large ruminants, and never on sensitive areas such as the eyes, mouth, ears, anogenital region or belly. Such instruments should not be used on horses, sheep and goats of any age, or on calves or piglets.
- c) Useful and permitted goads include panels, flags, plastic paddles, flappers (a length of cane with a short strap of leather or canvas attached), plastic bags and **metallic** rattles; they should be used in a manner sufficient to encourage and direct movement of the animals without causing undue stress.
- d) Painful procedures (including whipping, tail twisting, use of nose twitches, pressure on eyes, ears or external genitalia), or the use of goads or other aids which cause pain and suffering (including large sticks, sticks with sharp ends, lengths of metal piping, fencing wire or heavy leather belts), should not be used to move animals.

- e) Excessive shouting at animals or making loud noises (e.g. through the cracking of whips) to encourage them to move should not occur as such actions may make the animals agitated, leading to crowding or falling.
- f) The use of well trained dogs to help with the *loading* of some species may be acceptable.
- g) Animals should be grasped or lifted in a manner which avoids pain or suffering and physical damage (e.g. bruising, fractures, dislocations). In the case of quadrupeds, manual lifting by a person should only be used in young animals or small species, and in a manner appropriate to the species; grasping or lifting ~~such~~ animals only by their wool, hair, feathers, feet, neck, ears, tails, head, horns, limbs causing pain or suffering should not be permitted, except in an emergency where animal welfare or human safety may otherwise be compromised.
- h) Conscious animals should not be thrown, dragged or dropped.
- i) Performance standards should be established in which numerical scoring is used to evaluate the use of such instruments, and to measure the percentage of animals moved with an electric instrument and the percentage of animals slipping or falling as a result of their usage.

Article 3.7.2.8.

## Travel

### 1. General considerations

- a) *Animal handler(s)* should check the consignment immediately before departure to ensure that the animals have been loaded according to the load plan. Each consignment should be checked following any incident or situation likely to affect their welfare and in any case within 12 hours of departure ~~again within 12 hours.~~
- b) If necessary and where possible Adjustments should be made to the *stocking density* as appropriate during the *journey*.
- c) Each pen of animals should be observed on a daily basis for normal behaviour, health and welfare, and the correct operation of ventilation, watering and feeding systems. There should also be a night patrol. Any necessary corrective action should be undertaken promptly.
- d) Adequate access to suitable feed and water should be ensured for all animals in each pen.
- e) Where cleaning or *disinfestation* is necessary during travel, it should be carried out with the minimum of stress to the animals.

### 2. Sick ~~and~~ or injured animals

- a) Sick ~~and~~ or injured animals should be segregated ~~if possible~~.

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- b) Sick ~~and~~ or injured animals should be appropriately treated or humanely killed, in accordance with a predetermined emergency response plan (Article 3.7.2.4.). Veterinary advice should be sought if necessary. All drugs and products should be used according to recommendations from a veterinarian and in accordance with the manufacturer's ~~or veterinarian's recommendations~~ instructions.
- c) A record of treatments carried out and their outcomes should be kept.
- d) When humane killing euthanasia is necessary, the ~~person responsible for the animals the veterinarian~~ animal handler must ensure that it is carried out humanely. ~~Assistance should be sought from a veterinarian or other person(s) competent in euthanasia procedures.~~ Recommendations for specific species are described in Appendix 3.7.6. on killing of animals for disease control purposes. Veterinary advice regarding the appropriateness of a particular method of euthanasia should be sought as necessary.

Article 3.7.2.9.

## Unloading and post-journey handling

### 1. General considerations

- a) The required facilities and the principles of animal handling detailed in Article 3.7.2.7. apply equally to *unloading*, but consideration should be given to the likelihood that the animals will be fatigued.
- b) *Unloading* should be carefully planned as it has the potential to be the cause of poor welfare in transported animals.
- c) A livestock *vessel* should have priority attention when arriving in port and have priority access to a berth with suitable *unloading* facilities. As soon as possible after the ~~ship's vessel's~~ arrival at the port and acceptance of the consignment by the *Competent Authority*, animals should be unloaded into appropriate facilities.
- d) The accompanying veterinary certificate and other documents should meet the requirements of the *importing country*. Veterinary inspections should be completed as quickly as possible.
- e) *Unloading* should be supervised by the *Competent Authority* and conducted by ~~an~~ *animal handler(s)*. The *animal handlers* should ensure that animals are unloaded as soon as possible after arrival but sufficient time should be allowed for *unloading* to proceed quietly and without unnecessary noise, harassment or force, and that untrained assistants or spectators do not impede the process.

### 2. Facilities

- a) The facilities for *unloading* including the collecting area at the wharf, races and unloading ramps should be designed and constructed to take into account of the needs and abilities of the animals with regard to dimensions, slopes, surfaces, absence of sharp projections, flooring, sides, etc.
- b) All *unloading* facilities should have sufficient lighting to allow the animals to be easily inspected by the *animal handlers*, and to allow the ~~animals~~ ease of movement of animals at all times.

- c) There should be facilities to provide animals with appropriate care and comfort, adequate space, access to quality feed and clean drinking water, and shelter from extreme weather conditions.
3. Sick ~~and~~ or injured animals
- a) An animal that has become sick, injured or disabled during a *journey* should be appropriately treated or humanely killed euthanised (see Appendix 3.7.6.). When necessary, veterinary advice should be sought in the care and treatment of these animals.
- b) In some cases, where animals are non-ambulatory due to fatigue, injury or sickness, it may be in the best welfare interests of the animal to be treated or humanely killed euthanised aboard the *vessel*.
- c) If *unloading* is in the best welfare interests of animals that are fatigued, injured or sick, there should be appropriate facilities and equipment for the humane *unloading* of such animals. These animals should be unloaded in a manner that causes the least amount of suffering. After *unloading*, separate pens and other appropriate facilities and treatments should be provided for sick or injured animals.
4. Cleaning and disinfection
- a) *Vessels* and *containers* used to carry the animals should be cleaned before re-use through the physical removal of manure and bedding, by scraping, washing and flushing *vessels* and *containers* with water until visibly clean. This should be followed by *disinfection* when there are concerns about disease transmission.
- b) Manure, litter and bedding should be disposed of in such a way as to prevent the transmission of disease and in compliance with all relevant health and environmental legislation.
- e) ~~Where cleaning or disinfection is necessary during travel, it should be carried out with the minimum of stress to the animals.~~

Article 3.7.2.10.

### **Actions in the event of a refusal to allow the importation of a shipment**

1. The welfare of the animals should be the first consideration in the event of a refusal to import.
2. When animals have been refused import, the *Competent Authority* of ~~that~~ the *importing country* should make available suitable isolation facilities to allow the *unloading* of animals from a *vessel* and their secure holding, without posing a risk to the health of the national herd, pending resolution of the situation. In this situation, the priorities should be:
  - a) The *Competent Authority* of the *importing country* should provide urgently in writing the reasons for the refusal.
  - b) In the event of a refusal for animal health reasons, the *Competent Authority* of the *importing country* should provide urgent access to an OIE-appointed *veterinarian(s)* to assess the ~~animals'~~ health status of the animals with regard to the ~~importing country's~~ concerns of the importing country, and the necessary facilities and approvals to expedite the required diagnostic testing.
  - c) The *Competent Authority* of the *importing country* should provide access to allow continued assessment of the ongoing health and welfare situation.

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- d) If the matter cannot be promptly resolved, the *Competent Authority* of the *exporting* and *importing countries* should call on the OIE to mediate.
3. In the event that the animals are required to remain on the *vessel*, the priorities should be:
- a) The *Competent Authority* of the *importing country* should allow ~~reprovision~~ provisioning of the *vessel* with water and feed as necessary.
- b) The *Competent Authority* of the *importing country* should provide urgently in writing the reasons for the refusal.
- c) In the event of a refusal for animal health reasons, the *Competent Authority* of the *importing country* should provide urgent access to an OIE-appointed *veterinarian(s)* to assess the ~~animals'~~ animals' health status of the animals with regard to the ~~importing country's~~ concerns of the importing country, and the necessary facilities and approvals to expedite the required diagnostic testing.
- d) The *Competent Authority* of the *importing country* should provide access to allow continued assessment of the ongoing health and other aspects of the welfare of the animals, and the necessary actions to deal with any issues which arise.
- e) If the matter cannot be urgently resolved, the *Competent Authorities* of the *exporting* and *importing countries* should call on the OIE to mediate.
4. The OIE should utilise its dispute settlement mechanism to identify a mutually agreed solution which will address the animal health and welfare issues in a timely manner.

Article 3.7.2.11.

### **Species specific issues**

**Camelids** of the new world in this context comprise llamas, alpacas, guanaco and vicuna. They have good eyesight and, like sheep, can negotiate steep slopes, though ramps should be as shallow as possible. They load most easily in a bunch as a single animal will strive to rejoin the others. Whilst they are usually docile, they have an unnerving habit of spitting in self-defence. During transport, they usually lie down. They frequently extend their front legs forward when lying, so gaps below partitions should be high enough so that their legs are not trapped when the animals rise.

**Cattle** are sociable animals and may become agitated if they are singled out. Social order is usually established at about two years of age. When groups are mixed, social order has to be re-established and aggression may occur until a new order is established. Crowding of cattle may also increase aggression as the animals try to maintain personal space. Social behaviour varies with age, breed and sex; *Bos indicus* and *B. indicus*-cross animals are usually more temperamental than European breeds. Young bulls, when moved in groups, show a degree of playfulness (pushing and shoving) but become more aggressive and territorial with age. Adult bulls have a minimum personal space of six square metres. Cows with young calves can be very protective, and handling calves in the presence of their mothers can be dangerous. Cattle tend to avoid "dead end" in passages.

**Goats** should be handled calmly and are more easily led or driven than if they are excited. When goats are moved, their gregarious tendencies should be exploited. Activities which frighten, injure or cause agitation to animals should be avoided. Bullying is particularly serious in goats. Housing strange goats together could result in fatalities, either through physical violence, or subordinate goats being refused access to food and water.

**Horses** in this context include all solipeds, donkeys, mules, hinnies and zebra. They have good eyesight and a very wide angle of vision. They may have a history of *loading* resulting in good or bad experiences. Good training should result in easier *loading*, but some horses can prove difficult, especially if they are inexperienced or have associated *loading* with poor transport conditions. In these circumstances, two experienced animal handlers can load an animal by linking arms or using a strop below its rump. Blindfolding may even be considered. Ramps should be as shallow as possible. Steps are not usually a problem when horses mount a ramp, but they tend to jump a step when descending, so steps should be as low as possible. Horses benefit from being individually stalled, but may be transported in compatible groups. When horses are to travel in groups, their shoes should be removed.

**Pigs** have poor eyesight, and may move reluctantly in unfamiliar ~~strange~~ surroundings. They benefit from well lit *loading* bays. Since they negotiate ramps with difficulty, these should be as level as possible and provided with secure footholds. Ideally, a hydraulic lift should be used for greater heights. Pigs also negotiate steps with difficulty. A good 'rule-of-thumb' is that no step should be higher than the pig's front knee. Serious aggression may result if unfamiliar animals are mixed. Pigs are highly susceptible to heat stress.

**Sheep** are sociable animals with good eyesight and tend to "flock together", especially when they are agitated. They should be handled calmly and their tendency to follow each other should be exploited when they are being moved. Sheep may become agitated if they are singled out for attention and will strive to rejoin the group. Activities which frighten, injure or cause agitation to sheep should be avoided. They can negotiate steep ramps.

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## APPENDIX 3.7.3.

## GUIDELINES FOR THE TRANSPORT OF ANIMALS BY LAND

**Preamble:** These guidelines apply to the following live domesticated animals: cattle, buffalo, camels, sheep, goats, pigs, poultry and equines. They will also be largely applicable to some other animals (e.g., deer, other camelids and ratites). Wild, feral and partly domesticated animals may need different conditions.

## Article 3.7.3.1.

The amount of time animals spend on a *journey* should be kept to the minimum.

Article 3.7.3.1. bis1. Animal behaviour

Animal handlers should be experienced and competent in handling and moving farm livestock and understand the behaviour patterns of animals and the underlying principles necessary to carry out their tasks.

The behaviour of individual animals or groups of animals will vary, depending on their breed, sex, temperament and age and the way in which they have been reared and handled. Despite these differences, the following behaviour patterns which are always present to some degree in domestic animals, should be taken into consideration in handling and moving the animals.

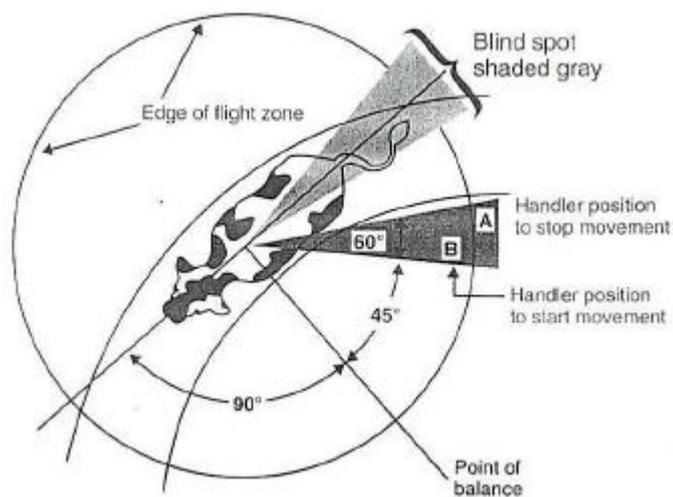
Most domestic livestock are kept in herds and follow a leader by instinct.

Animals which are likely to be hostile to harm each other in a group situation should not be mixed.

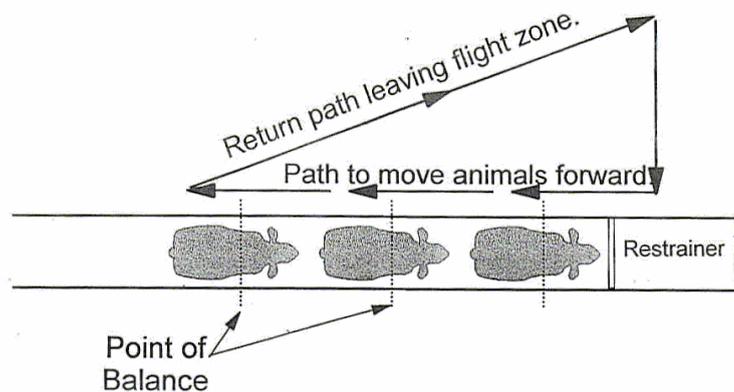
The desire of some animals to control their personal space should be taken into account in designing loading and unloading facilities, transport vehicles and containers.

Domestic animals will try to escape if any person approaches closer than a certain distance. This critical distance, which defines the flight zone, varies among species and individuals of the same species, and depends upon previous contact with humans. Animals reared in close proximity to humans (i.e. tame) have a smaller flight zone, whereas those kept in free range or extensive systems may have flight zones which may vary from one metre to many metres. Animal handlers should avoid sudden penetration of the flight zone which may cause a panic reaction which could lead to aggression or attempted escape.

### An example of a flight zone (cattle)



### Animal handler movement pattern to move cattle forward



Animal handlers should use the point of balance at the animal's shoulder to move animals, adopting a position behind the point of balance to move an animal forward and in front of the point of balance to move it backward.

Domestic animals have wide-angle vision but only have limited forward binocular vision and poor perception of depth. This means that they can detect objects and movements beside and behind them, but can only judge distances directly ahead.

Although all domestic animals have a highly sensitive sense of smell, they may react differently to the smells encountered during travel. Smells which cause fear or other negative responses should be taken into consideration when managing animals.

Domestic animals can hear over a greater range of frequencies than humans and are more sensitive to higher frequencies. They tend to be alarmed by constant loud noise and by sudden noises, which may cause them to panic. Sensitivity to such noises should also be taken into account when handling animals.

## 2. Distractions and their removal

Distractions that may cause approaching animals to stop, baulk or turn back should be designed out from new loading and unloading facilities or removed from existing ones. Below are examples of common distractions and methods for eliminating them:

- a) reflections on shiny metal or wet floors - move a lamp or change lighting;
- b) dark entrances - illuminate with indirect lighting which does not shine directly into the eyes of approaching animals;
- c) animals seeing moving people or equipment up ahead - install solid sides on chutes and races or install shields;
- d) dead ends-avoid if possible by curving the passage, or make an illusory passage;
- e) chains or other loose objects hanging in chutes or on fences - remove them;
- f) uneven floors or a sudden drop in floor levels – avoid uneven floor surfaces or install a solid false floor to provide an illusion of a solid and continuous walking surface;
- g) sounds of air hissing from pneumatic equipment - install silencers or use hydraulic equipment or vent high pressure to the external environment using flexible hosing;
- h) clanging and banging of metal objects - install rubber stops on gates and other devices to reduce metal to metal contact;
- i) air currents from fans or air curtains blowing into the face of animals - redirect or reposition equipment.

Article 3.7.3.2.

## **Responsibilities**

Once the decision to transport the animals has been made, the welfare of the animals during their *journey* is the paramount consideration and is the joint responsibility of all people involved, with the individual responsibilities of ~~those~~ persons involved being will be described in more detail in this Article.

The roles of each of those responsible are defined below:

- ~~1. The owners and managers of the animals are responsible for the general health of the animals and their fitness for the journey, and for their overall welfare during the journey. They are also responsible for ensuring compliance with any required veterinary or other certification, and for the presence during the journey of at least one *animal handler* competent for the species being transported, with the authority to take prompt action. They are also responsible for ensuring that equipment and veterinary assistance are provided as appropriate for the species and journey. These responsibilities should apply regardless of whether duties are subcontracted to other parties during transport.~~
1. The owners and managers of the animals are responsible for:
  - a) the general health, overall welfare and fitness of the animals for the *journey*;
  - b) ensuring compliance with any required veterinary or other certification;

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- c) the presence of an *animal handler* competent for the species being transported during the *journey* with the authority to take prompt action; in case of transport by individual trucks, the truck driver may be the sole *animal handler* during the *journey*;
  - d) the presence of an adequate number of *animal handlers* during *loading* and *unloading*;
  - e) ensuring that equipment and veterinary assistance are provided as appropriate for the species and the *journey*;
2. ~~Business agents or buying/selling agents have a joint responsibility with owners for the selection of animals that are fit to travel. They have a joint responsibility with market owners and managers of facilities at the start and at the end of the journey for the availability of suitable facilities for the assembly, *loading*, transport, *unloading* and holding of animals, including for any stops at resting points during the journey and for emergencies.~~
2. Business agents or buying/selling agents are responsible for:
- a) selection of animals that are fit to travel;
  - b) availability of suitable facilities at the start and at the end of the *journey* for the assembly; *loading*, transport, *unloading* and holding of animals, including for any stops at *resting points* during the *journey* and for emergencies.
3. Animal handlers are responsible for the humane handling and care of the animals, especially during *loading* and *unloading*, and for maintaining a journey log. To carry out their responsibilities, they should have the authority to take prompt action. In the absence of a separate *animal handler*, the driver is the *animal handler*.
4. Transport companies, *vehicle* owners and drivers are responsible for planning the *journey* to ensure the care of the animals; in particular they are responsible for:
- a) ~~transport companies and vehicle owners are responsible for~~ choosing appropriate *vehicles* for the species transported and the *journey*;
  - b) ~~and~~ ensuring that properly trained staff are available for *loading* ~~and caring for~~ *unloading* of animals;
  - c) ensuring adequate competency of the driver in matters of animal welfare for the species being transported in case a separate *animal handler* is not assigned to the truck;
  - ~~b)d) transport companies and vehicle owners are responsible for~~ developing and keeping up-to-date contingency plans to address emergencies (including adverse weather conditions) and minimise stress during transport;
  - ~~ec) transport companies and vehicle owners are responsible for~~ producing a *journey* plan which includes a *loading* plan, *journey* duration, itinerary and location of resting places;
  - ~~ef) drivers are responsible for~~ *loading* only those animals which are fit to travel, for their correct *loading* into the *vehicle* and their inspection during the *journey*, and for appropriate responses to problems arising. If its fitness to travel is in doubt, the animal should be examined by a *veterinarian* in accordance with point 5 a) of Article 3.7.3.6;
  - g) welfare of the animals during the actual transport.

5. Managers of facilities at the start and at the end of the *journey* and at *resting points* are responsible for:
  - a) providing suitable premises for *loading, unloading* and securely holding the animals, with water and feed when required, until further transport, sale or other use (including rearing or slaughter);
  - b) providing an adequate number of animal handlers to load, unload, drive and hold animals in a manner that causes minimum stress and injury; in the absence of a separate animal handler, the driver is the animal handler.
  - c) minimising the opportunities for disease transmission;
  - d) providing appropriate facilities, with water and feed when required;
  - e) providing appropriate facilities for emergencies;
  - f) providing facilities for washing and disinfecting *vehicles* after *unloading*;
  - g) providing facilities and competent staff to allow the humane killing of animals when required
  - h) ensuring proper rest times and minimal delay during stops.
  
6. The responsibilities of *Competent Authorities* include:
  - a) establishing minimum standards for animal welfare, including requirements for inspection of animals before, during and after their travel, defining 'fitness to travel' and appropriate certification and record keeping;
  - b) setting standards for facilities, *containers* and *vehicles* for the transport of animals;
  - c) setting standards for the competence of *animal handlers*, drivers and managers of facilities in relevant issues in animal welfare;
  - d) ensuring appropriate awareness and training of *animal handlers*, drivers and managers of facilities in relevant issues in animal welfare;
  - e) implementation of the standards, including through accreditation of / interaction with other organisations;
  - f) monitoring and evaluating the effectiveness of standards of health **and other aspects of welfare;**
  - g) monitoring and evaluating the use of veterinary medications;
  - h) ~~expediting the passage of animal consignments at frontiers~~ giving animal consignments priority at frontiers in order to allow them to pass without unnecessary delay.
  
7. All individuals, including *veterinarians*, involved in transporting animals and the associated handling procedures should receive appropriate training and be competent to meet their responsibilities.
  
8. The receiving *Competent Authority* should report back to the sending *Competent Authority* on significant animal welfare problems which occurred during the *journey*.

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## Article 3.7.3.3.

**Competence**

1. All people responsible for animals during *journeys*, should be competent according to their responsibilities listed in Article 3.7.3.2. Competence may be gained through formal training and/or practical experience. ~~Competence in areas other than animal welfare would need to be addressed separately.~~
2. ~~The competence of *animal handlers* should be demonstrated through a current certificate from the *Competent Authority* or an independent body, accredited by the *Competent Authority*. The certificate should be in one of the OIE official languages if the international transport of animals is involved.~~
3. The assessment of the competence of *animal handlers* should at a minimum address knowledge, and ability to apply that knowledge, in the following areas:
  - a) planning a *journey*, including appropriate *space allowance*, and feed, water and ventilation requirements;
  - b) responsibilities for animals during the *journey*, including loading and unloading;
  - c) sources of advice and assistance;
  - d) animal behaviour, general signs of disease, and indicators of poor animal welfare such as stress, pain and fatigue, and their alleviation;
  - e) assessment of fitness to travel: if fitness to travel is in doubt, the animal should be examined by a veterinarian;
  - f) relevant authorities and applicable transport regulations, and associated documentation requirements;
  - g) general disease prevention procedures, including cleaning and *disinfection*;
  - h) appropriate methods of animal handling during transport and associated activities such as assembling, *loading*, and *unloading*;
  - i) methods of inspecting animals, managing situations frequently encountered during transport such as adverse weather conditions, and dealing with emergencies, including euthanasia humane killing;
  - j) species-specific aspects and age-specific aspects of animal handling and care, including feeding, watering and inspection; and
  - k) maintaining a *journey* log and other records.

## Article 3.7.3.4.

**Planning the journey**

1. General considerations
  - a) Adequate planning is a key factor affecting the welfare of animals during a *journey*.

- b) Before the *journey* starts, plans should be made in relation to:
- i) preparation of animals for the *journey*;
  - ii) choice of road, ~~or rail~~; roll-on roll-off vessels or containers
  - iii) nature and duration of the *journey*;
  - iv) *vehicle/ container* design and maintenance, including roll-on roll-off *vessels*;
  - v) required documentation;
  - vi) *space allowance*;
  - vii) rest, water and feed;
  - viii) observation of animals en route;
  - ix) control of disease; ~~and~~
  - x) emergency response procedures;
  - xi) forecast weather conditions (e.g. conditions being too hot or too cold to travel during certain periods of the day);
  - xii) transfer time when changing mode of transport, and
  - xiii) waiting time at frontiers and inspection points.
- c) Regulations concerning drivers (for example, maximum driving periods) should be harmonised with maximum transport ~~journey intervals appropriate for the species~~ take into account animal welfare whenever is possible.

## 2. Preparation of animals for the journey

- a) When animals are to be provided with a novel diet or method of water provision during transport, an adequate period of adaptation should be planned. ~~For animals such as pigs which are susceptible to motion sickness, and in order to reduce urine and faeces production during the journey, a~~ Species-specific short period of feed deprivation prior to *loading* may be desirable.
- b) Animals more accustomed to contact with humans and with being handled are likely to be less fearful of being loaded and transported. ~~People handling animals~~ Animal handlers should handle and load animals in a manner that reduces their fearfulness and improves their approachability.
- c) Behaviour-modifying compounds (such as tranquillisers) or other medication should not be used routinely during transport. Such compounds should only be administered when a problem exists in an individual animal, and should be administered by a *veterinarian* or other person who has been instructed in their use by a *veterinarian*.

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3. Nature and duration of the journey

The maximum duration of a *journey* should be determined ~~according to~~ taking into account factors ~~that determine the overall welfare of animals~~, such as:

- a) the ability of the animals to cope with the stress of transport (such as very young, old, lactating or pregnant animals);
- b) the ~~animals'~~ previous transport experience of the animals;
- c) the likely onset of fatigue;
- d) the need for special attention;
- e) the need for feed and water;
- f) the increased susceptibility to injury and disease;
- g) *space allowance*, *vehicle* design, road conditions and driving quality;
- h) weather conditions;
- i) *vehicle type used*, *terrain to be traversed*, *road surfaces and quality*, *skill and experience of the driver*.

4. Vehicle and container design and maintenance

- a) *Vehicles* and *containers* used for the transport of animals should be designed, constructed and fitted as appropriate ~~to~~ for the species, size and weight of the animals to be transported. Special attention should be paid to ~~the avoidance~~ avoid ~~of the~~ injury to animals through the use of secure smooth fittings free from sharp protrusions. The avoidance of injury to drivers, and *animal handlers* while carrying out their responsibilities should be emphasised.
- b) *Vehicles* and *containers* should be designed with the structures necessary to provide protection from adverse weather conditions and to minimise the opportunity for animals to escape.
- c) In order to minimise the likelihood of the spread of infectious disease during transport, *vehicles* and *containers* should be designed to permit thorough cleaning and *disinfection*, and the containment of faeces and urine during a *journey*.
- d) *Vehicles* and *containers* should be maintained in good mechanical and structural condition.
- e) *Vehicles* and *containers* should have adequate ventilation to meet variations in climate and the thermo-regulatory needs of the animal species being transported; the ventilation system (natural or mechanical) should be effective when the *vehicle* is stationary, and the airflow should be adjustable.
- f) *Vehicles* should be designed so that the faeces or urine from animals on upper levels do not soil animals on lower levels, nor their feed and water.
- g) When *vehicles* are carried on board ferries, facilities for adequately securing them should be available.

- h) If feeding or watering while the *vehicle* is moving is required, adequate facilities on the *vehicle* should be available.
- i) When appropriate, suitable bedding should be added to *vehicle* floors to assist absorption of urine and faeces, to minimise slipping by animals, and protect animals (especially young animals) from hard flooring surfaces and adverse weather conditions.
5. Special provisions for transport in vehicles (road and rail) on roll-on/roll-off vessels or for containers
- a) *Vehicles* and *containers* should be equipped with a sufficient number of adequately designed, positioned and maintained securing points enabling them to be securely fastened to the *vessel*.
- b) *Vehicles* and *containers* should be secured to the ~~ship~~ vessel before the start of the sea *journey* to prevent them being displaced by the motion of the *vessel*.
- c) Roll-on/roll-off *vessels* should have adequate ventilation to meet variations in climate and the thermo-regulatory needs of the animal species being transported, especially where the animals are transported in a secondary *vehicle/ container* on enclosed decks.
6. Space allowance
- a) The number of animals which should be transported on a *vehicle* or in a *container* and their allocation to compartments should be determined before *loading*.
- b) The space required on a *vehicle* or in a *container* depends upon whether or not the animals need to lie down (for example, pigs, camels and poultry), or to stand (horses). Animals which will need to lie down often stand when first loaded or when the *vehicle* is driven with too much lateral movement or sudden braking.
- c) When animals lie down, they should all be able to adopt a normal lying posture which allows necessary thermoregulation.
- d) When animals are standing, they should have sufficient space to adopt a balanced position as appropriate to the climate and species transported (Article Appendix X.X.X.).
- e) The amount of headroom necessary depends on the species of animal. Each animal should be able to assume its natural position for transport (including during *loading* and *unloading*) without coming into contact with the roof or upper deck of the *vehicle*, and there should be sufficient headroom to allow adequate airflow over the animals.
- f) Calculations for the *space allowance* for each animal should be carried out using the figures given in Appendix X.X.X. or, in their absence, in a relevant national or international document. The number and size of pens on the *vehicle* should be varied to where possible accommodate already established groups of animals while avoiding group sizes which are too large.
- g) Other factors which may influence *space allowance* include:
- i) *vehicle/ container* design;
  - ii) length of *journey*;
  - iii) need to provide feed and water on the *vehicle*;
  - iv) quality of roads;

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v) expected weather conditions;

vi) category and sex of the animals.

7. Rest, water and feed

- a) ~~There should be planning for the availability of~~ Suitable water and feed should be available as appropriate and needed for the species, age, and condition of the animals, as well as the duration of the *journey*, climatic conditions, etc.
- b) ~~There should be planning for the resting of animals at~~ Animals should be allowed to rest at resting points at appropriate intervals during the *journey*. The type of transport, the age and species of the animals being transported, and climatic conditions should determine the frequency of rest stops and whether the animals should be unloaded. ~~There should be planning for~~ Water and feed should be available ~~availability~~ during rest stops.

8. Ability to observe animals during the journey

- a) Animals should be positioned to enable each animal to be observed regularly during the *journey* to ensure their safety and good welfare.
- b) If the animals are in crates or on multi-tiered *vehicles* which do not allow free access for observation, for example where the roof of the tier is too low (~~i.e. less than 1.3 m~~), animals cannot be inspected adequately, and serious injury or disease could go undetected. In these circumstances, a shorter *journey* duration should be allowed, and the maximum duration will vary according to the rate at which problems arise in the species and under the conditions of transport.

9. Control of disease

As animal transport is often a significant factor in the spread of infectious diseases, *journey* planning should take the following into account:

- a) mixing of animals from different sources in a single consignment should be minimised;
- b) contact at *resting points* between animals from different sources should be avoided;
- c) when possible, animals should be vaccinated against diseases to which they are likely to be exposed at their destination;
- d) medications used prophylactically or therapeutically should be approved by the *Veterinary Authority* of the *importing country* and should only be administered by a *veterinarian* or other person who has been instructed in their use by a *veterinarian*.

10. Emergency response procedures

There should be an emergency management plan that identifies the important adverse events that may be encountered during the *journey*, the procedures for managing each event and the action to be taken in an emergency. For each important event, the plan should document the actions to be undertaken and the responsibilities of all parties involved, including communications and record keeping.

## 11. Other considerations

- a) Extreme weather conditions are hazardous for animals undergoing transport and require appropriate *vehicle* design to minimise risks. Special precautions should be taken for animals that have not been acclimatised or which are unsuited to either hot or cold conditions. In some extreme conditions of heat or cold, animals should not be transported at all.
- b) In some circumstances, transportation during the night may reduce thermal stress or the adverse effects of other external stimuli.

Article 3.7.3.5.

## Documentation

1. Animals should not be loaded until the documentation required to that point is complete.
2. The documentation accompanying the consignment should include:
  - a) *journey* travel plan ~~(including and~~ an emergency management plan);
  - b) date, time, and place of *loading* and *unloading*;
  - c) veterinary certification, when required;
  - d) driver's animal welfare competencies of the driver; (under study)
  - e) ~~identities of the *animal identification* transported~~ to allow ~~traceback~~ animal traceability ~~of individual animals~~ to the premises of departure and, where possible, to the premises of origin;
  - f) details of any animals considered ~~'at risk'~~ at particular risk of suffering poor welfare during transport (point 3e) of Article 3.7.3.6.;
  - g) documentation of the period of rest, and access to feed and water, prior to the *journey*;
  - h) *stocking density* estimate for each load in the consignment;
  - i) the *journey* log - daily record of inspection and important events, including records of morbidity and mortality and actions taken, climatic conditions, rest stops, travel time and distance, feed and water offered and estimates of consumption, medication provided, and mechanical defects.
3. When veterinary certification is required to accompany consignments of animals, it should address:
  - a) fitness of animals to travel;
  - b) *animal identification* (description, number, etc.);
  - c) health status including any tests, treatments and vaccinations carried out;
  - d) when required, details of *disinfection* carried out.

At the time of certification, the *veterinarian* should notify *animal handler* or the driver of any factors affecting the ~~animals'~~ fitness of animals to travel for a particular *journey*.

**Pre-journey period**1. General considerations

- a) Pre-*journey* rest is necessary if the welfare of animals has become poor during the collection period because of the physical environment or the social behaviour of the animals. The need for rest should be judged by a *veterinarian* or other competent person.
- b) Pre-*journey* assembly/holding areas should be designed to:
  - i) securely hold the animals;
  - ii) maintain a safe environment from hazards, including predators and disease;
  - iii) protect animals from exposure to severe weather conditions;
  - iv) allow for maintenance of social groups; ~~and~~
  - v) allow for rest, and appropriate water and feed;
- c) Consideration should be given to ~~an animal's~~ the previous transport experience, training and conditioning of the animals, if known, as these may reduce fear and stress in animals.
- d) Feed and water should be provided pre-*journey* if the *journey* duration is greater than the normal inter-feeding and drinking interval for the animal. Recommendations for specific species are described in detail in Article 3.7.3.11.
- e) When animals are to be provided with a novel diet or method of feed or water provision during the *journey*, an adequate period of adaptation should be ~~planned~~ allowed.
- f) Before each *journey*, *vehicles* and *containers* should be thoroughly cleaned and, if necessary, treated for animal health and public health purposes, using methods approved by the *Competent Authority*. When cleaning is necessary during a *journey*, this should be carried out with the minimum of stress to the animals.
- g) Where an *animal handler* believes that there is a significant risk of disease among the animals to be loaded or significant doubt as to their fitness to travel, the animals should be examined by a *veterinarian*.

2. Selection of compatible groups

Compatible groups should be selected before transport to avoid adverse animal welfare consequences. The following guidelines should be applied when assembling groups of animals:

- a) Animals reared together should be maintained as a group; animals with a strong social bond, such as a dam and offspring, should be transported together.
- b) Animals of the same species can be mixed unless there is a significant likelihood of aggression; aggressive individuals should be segregated (recommendations for specific species are described in detail in Article 3.7.3.11.). For some species, animals from different groups should not be mixed because poor welfare occurs unless they have established a social structure.

- c) Young or small animals should be separated from older or larger animals, with the exception of nursing mothers with young at foot.
  - d) Animals with horns or antlers should not be mixed with animals lacking horns or antlers unless judged to be compatible.
  - e) Animals of different species should not be mixed unless they are judged to be compatible.
3. Fitness to travel
- a) Each animal should be inspected by a *veterinarian* or an *animal handler* to assess fitness to travel. If its fitness to travel is in doubt, the animal should be examined by a *veterinarian*. Animals found unfit to travel should not be loaded onto a *vehicle*, except for transport to receive veterinary treatment.
  - b) Humane and effective arrangements should be made by the owner ~~or~~ and the agent for the handling and care of any animal rejected as unfit to travel.
  - c) Animals that are unfit to travel include, but may not be limited to:
    - i) those that are sick, injured, weak, disabled or fatigued;
    - ii) those that are unable to stand unaided and bear weight on each leg;
    - iii) those that are blind in both eyes;
    - iv) those that cannot be moved without causing them additional suffering;
    - v) newborn with an unhealed navel;
    - vi) pregnant animals which would be in the final 10% of their gestation period at the planned time of *unloading*;
    - vii) females travelling without young which have given birth within the previous 48 hours;
    - viii) those whose body condition would result in poor welfare because of the expected climatic conditions.
  - d) Risks during transport can be reduced by selecting animals best suited to the conditions of travel and those that are acclimatised to expected weather conditions.
  - e) Animals ~~'at risk'~~ at particular risk of suffering poor welfare during transport and which require special conditions (such as in the design of facilities and *vehicles*, and the length of the *journey*) and additional attention during transport, may include:
    - i) large or obese individuals;
    - ii) very young or old animals;
    - iii) excitable or aggressive animals;

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- iv) animals which have had little contact with humans;
- v) animal subject to motion sickness;
- vi) females in late pregnancy or heavy lactation, dam and offspring;
- vii) animals with a history of exposure to stressors or pathogenic agents prior to transport;
- viii) animals with unhealed wounds from recent surgical procedures such as dehorning.

4. Specific species requirements

Transport procedures should be able to take account of variations in the behaviour of the species. Flight zones, social interactions and other behaviour vary significantly among species and even within species. Facilities and handling procedures that are successful with one species are often ineffective or dangerous with another.

Recommendations for specific species are described in detail in Article 3.7.3.11.

Article 3.7.3.7.

**Loading**1. Competent supervision

- a) *Loading* should be carefully planned as it has the potential to be the cause of poor welfare in transported animals.
- b) *Loading* should be supervised and/or conducted by *animal handlers*. ~~These animal handlers should ensure that~~ The animals are to be loaded quietly and without unnecessary noise, harassment or force, ~~and that~~ Untrained assistants or spectators do should not impede the process.
- c) When *containers* are loaded onto a *vehicle*, this should be carried out in such a way to avoid poor animal welfare.

2. Facilities

- a) The facilities for *loading* including the collecting area, races and loading ramps should be designed and constructed to take into account the needs and abilities of the animals with regard to dimensions, slopes, surfaces, absence of sharp projections, flooring, etc.
- b) *Loading* facilities should be properly illuminated to allow the animals to be observed by *animal handler(s)*, and to allow the ~~animals'~~ ease of movement of the animals at all times. Facilities should provide uniform light levels directly over approaches to sorting pens, chutes, loading ramps, with brighter light levels inside *vehicles/containers*, in order to minimise baulking. Dim light levels may be advantageous for the catching of poultry and some other animals. Artificial lighting may be required.

- c) Ventilation during *loading* and the *journey* should provide for fresh air, the removal of excessive heat, humidity and noxious fumes (such as ammonia and carbon monoxide), and the prevention of accumulations of ammonia and carbon dioxide. Under warm and hot conditions, ventilation should allow for the adequate convective cooling of each animal. In some instances, adequate ventilation can be achieved by increasing the *space allowance* for animals.

### 3. Goads and other aids

When moving animals, their species specific behaviour should be used (see Article 3.7.3.11). If goads and other aids are necessary, the following principles should apply:

- a) ~~Animals which have little or no room to move should not be subjected to physical force or goads and other aids which compel movement.~~
- b) ~~Useful and permitted aids include panels, flags, plastic paddles, flappers (a length of cane with a short strap of leather or canvas attached), plastic bags and metallic rattles; they should be used in a manner sufficient to encourage and direct movement of the animals.~~
- e) ~~Painful procedures (including whipping, tail twisting, use of nose twitches, pressure on eyes, ears or external genitalia), or the use of unsuitable goads or other aids (including sticks with sharp ends, lengths of metal piping, fencing wire or heavy leather belts), should not be used to move animals.~~
- d) ~~The use of goads which administer electric shocks should be discouraged, and restricted to that necessary to assist movement of the animal. Such use should be limited to battery powered goads on the hindquarters of adult pigs and cattle, and never on sensitive areas such as the eyes, mouth, ears, anogenital region or belly. Such instruments should not be used on other animals.~~
- e) ~~The use of well trained dogs to help with the *loading* of some species may be acceptable.~~
- f) ~~The throwing or dropping of animals, or their lifting or dragging by body parts such as their tail, head, horns, ears, limbs, wool, hair or feathers, should not be permitted. The manual lifting of small animals is permissible.~~
- g) ~~Shouting or yelling at animals or making loud noises e.g. through the cracking of whips to encourage them to move should not occur, as such actions may make the animals agitated, leading to crowding or falling.~~
- a) Animals that have little or no room to move should not be subjected to physical force or goads and other aids which compel movement. Electric goads and prods should only be used in extreme cases and not on a routine basis to move animals. The use and the power output should be restricted to that necessary to assist movement of an animal and only when an animal has a clear path ahead to move. Goads and other aids should not be used repeatedly if the animal fails to respond or move. In such cases it should be investigated whether some physical or other impediment is preventing the animal from moving.
- b) The use of such devices should be limited to battery-powered goads on the hindquarters of pigs and large ruminants, and never on sensitive areas such as the eyes, mouth, ears, anogenital region or belly. Such instruments should not be used on horses, sheep and goats of any age, or on calves or piglets.

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- c) Useful and permitted goads include panels, flags, plastic paddles, flappers (a length of cane with a short strap of leather or canvas attached), plastic bags and **metallic** rattles; they should be used in a manner sufficient to encourage and direct movement of the animals without causing undue stress.
- d) Painful procedures (including whipping, tail twisting, use of nose twitches, pressure on eyes, ears or external genitalia), or the use of goads or other aids which cause pain and suffering (including large sticks, sticks with sharp ends, lengths of metal piping, fencing wire or heavy leather belts), should not be used to move animals.
- e) Excessive shouting at animals or making loud noises (e.g., through the cracking of whips) to encourage them to move should not occur, as such actions may make the animals agitated, leading to crowding or falling.
- f) The use of well trained dogs to help with the *loading* of some species may be acceptable.
- g) Animals should be grasped or lifted in a manner which avoids pain or suffering and physical damage (e.g. bruising, fractures, dislocations). In the case of quadrupeds, manual lifting by a person should only be used in young animals or small species, and in a manner appropriate to the species; grasping or lifting **such** animals only by their wool, hair, feathers, feet, neck, ears, tails, head, horns, limbs causing pain or suffering should not be permitted, except in an emergency where animal welfare or human safety may otherwise be compromised.
- h) Conscious animals should not be thrown, dragged or dropped.
- i) Performance standards should be established in which numerical scoring is used to evaluate the use of such instruments, and to measure the percentage of animals moved with an electric instrument and the percentage of animals slipping or falling as a result of their usage.

Article 3.7.3.8.

**Travel**1. General considerations

- a) Drivers and *animal handlers* should check the load immediately before departure to ensure that the animals have been properly loaded. Each load should be checked again early in the trip and adjustments made as appropriate. Periodic checks should be made throughout the trip, **especially at rest or refuelling stops or during meal breaks when the *vehicle* is stationary.**
- b) Drivers should utilise smooth, defensive driving techniques, without sudden turns or stops, to minimise uncontrolled movements of the animals.

2. Methods of restraining or containing animals

- a) Methods of restraining animals should be appropriate to the species and age of animals involved and the training of the individual animal.
- b) Recommendations for specific species are described in detail in Article 3.7.3.11.

### 3. Regulating the environment within vehicles or containers

- a) Animals should be protected against harm from hot or cold conditions during travel. Effective ventilation procedures for maintaining the ~~animals'~~ environment within *vehicles* or *containers* will vary according to whether conditions are cold, hot and dry or hot and humid, but in all conditions a build-up of noxious gases should be prevented. Specific temperature and humidity parameters are described in detail in Appendix X.X.X.
- b) The ~~animals'~~ environment within *vehicles* or *containers* in hot and warm weather can be regulated by the flow of air produced by the movement of the *vehicle*. In warm and hot weather, the duration of *journey* stops should be minimised and *vehicles* should be parked under shade, with adequate and appropriate ventilation.
- c) To minimise slipping and soiling, and maintain a healthy environment, urine and faeces should be removed from floors when necessary and disposed of in such a way as to prevent the transmission of disease and in compliance with all relevant health and environmental legislation.

### 4. Sick, injured or dead animals

- a) A driver or *animal handler* finding sick, injured or dead animals should act according to a predetermined emergency response plan.
- b) ~~If possible,~~ Sick or injured animals should be segregated.
- c) Ferries (roll-on roll-off) should have procedures to treat sick or injured animals during the *journey*.
- d) In order to reduce the likelihood that animal transport will increase the spread of infectious disease, contact between transported animals, or the waste products of the transported animals, and other farm animals should be minimised.
- e) During the *journey*, when disposal of a dead animal becomes necessary, this should be carried out in such a way as to prevent the transmission of disease and in compliance with all relevant health and environmental legislation.
- f) When euthanasia killing is necessary, ~~the driver or animal handler should ensure that it is~~ should be carried out as quickly as possible and assistance should be sought from a *veterinarian* or other person(s) competent in humane euthanasia killing procedures. Recommendations for specific species are described in Appendix 3.7.6. on killing of animals for disease control purposes.

### 5. Water and feed requirements

- a) If *journey* duration is such that feeding or watering is required or if the species requires feed or water throughout, access to suitable feed and water for all the animals (appropriate for their species and age) carried in the *vehicle* should be provided. There should be adequate space for all animals to move to the feed and water sources and due account taken of likely competition for feed.
- b) Recommendations for specific species are described in detail in Article 3.7.3.11.

Appendix XXX (contd)6. Rest periods and conditions including hygiene

- a) Animals that are being transported should be rested at appropriate intervals during the *journey* and offered feed and water, either on the *vehicle* or, if necessary, unloaded into suitable facilities.
- b) Suitable facilities should be used en route, when resting requires the *unloading* of the animals. These facilities should meet the needs of the particular animal species and should allow access of all animals to feed and water.

7. In-transit observations

- a) Animals being transported by road should be observed soon after a *journey* is commenced and whenever the driver has a rest stop ~~(with a maximum interval of 5 hours)~~. After meal breaks and refuelling stops, the animals should be observed immediately prior to departure.
- b) Animals being transported by rail should be observed at each scheduled stop ~~nearest to 5 hours since the last observation~~. The responsible rail transporter should monitor the progress of trains carrying animals and take all appropriate action to minimise delays.
- c) During stops, it should be ensured that the animals continue to be properly confined, have appropriate feed and water, and their physical condition is satisfactory.

Article 3.7.3.9.

**Unloading and post-journey handling**1. General considerations

- a) The required facilities and the principles of animal handling detailed in Article 3.7.3.7. apply equally to *unloading*, but consideration should be given to the likelihood that the animals will be fatigued.
- b) *Unloading* should be supervised and/or conducted by an *animal handler* with knowledge and experience of the behavioural and physical characteristics of the species being unloaded. Animals should be unloaded from the *vehicle* into appropriate facilities as soon as possible after arrival at the destination but sufficient time should be allowed for *unloading* to proceed quietly and without unnecessary noise, harassment or force.
- c) Facilities should provide all animals with appropriate care and comfort, adequate space and ventilation, access to feed (if appropriate) and water, and shelter from extreme weather conditions.
- d) For details regarding the *unloading* of animals at a *slaughterhouse*, see Appendix 3.7.5. on slaughter of animals for human consumption.

2. Sick ~~and~~ or injured animals

- a) An animal that has become sick, injured or disabled during a *journey* should be appropriately treated or humanely killed (see Appendix 3.7.6. on killing of animals for disease control purposes). ~~When~~ If necessary, veterinary advice should be sought in the care and treatment of these animals. In some cases, where animals are non-ambulatory due to fatigue, injury or sickness, it may be in the best welfare interests of the animal to be treated or **ethanized killed** aboard the *vehicle*. Assistance should be sought from a *veterinarian* or other person(s) competent in humane **ethanasia** **killing** procedures.

- b) At the destination, the *animal handler* or the driver during transit should ensure that responsibility for the welfare of sick, injured or disabled animals is transferred to a veterinarian or other suitable person.
- c) If treatment or euthanasia humane killing is not possible aboard the *vehicle*, there should be appropriate facilities and equipment for the humane *unloading* of animals that are non-ambulatory due to fatigue, injury or sickness. These animals should be unloaded in a manner that causes the least amount of suffering. After *unloading*, separate pens and other appropriate facilities should be available for sick or injured animals.
- d) Feed, if appropriate, and water should be available for each sick or injured animal.

### 3. Addressing disease risks

The following should be taken into account in addressing the greater risk of disease due to animal transport and the possible need for segregation of transported animals at the destination:

- a) increased contact among animals, including those from different sources and with different disease histories;
- b) increased shedding of pathogens and increased susceptibility to infection related to stress and impaired defences against disease, including immunosuppression;
- c) exposure of animals to pathogens which may contaminate *vehicles, resting points, markets, etc.*

### 4. Cleaning and disinfection

- a) *Vehicles, crates, containers, etc.* used to carry the animals should be cleaned before re-use through the physical removal of manure and bedding by scraping, washing and flushing ~~vehicles and containers~~ with water and detergent. This should be followed by *disinfection* when there are concerns about disease transmission.
- b) Manure, litter, bedding and the bodies of any animals which die during the *journey* should be disposed of in such a way as to prevent the transmission of disease and in compliance with all relevant health and environmental legislation.
- c) Establishments like livestock *markets, slaughterhouses, resting sites*, railway stations, etc. where animals are unloaded should be provided with appropriate areas for the cleaning and *disinfection* of *vehicles*.
- d) ~~Where *disinfection* is necessary, it should be carried out with the minimum stress to the animals.~~

Article 3.7.3.10.

### **Actions in the event of a refusal to allow the completion of the journey**

1. The welfare of the animals should be the first consideration in the event of a refusal to allow the completion of the *journey*.

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2. When the animals have been refused import, the *Competent Authority* of ~~that~~ the importing country should make available suitable isolation facilities to allow the *unloading* of animals from a *vehicle* and their secure holding, without posing a risk to the health of national herd or flock, pending resolution of the situation. In this situation, the priorities should be:
  - a) The *Competent Authority* of the *importing country* should provide urgently in writing the reasons for the refusal.
  - b) In the event of a refusal for animal health reasons, the *Competent Authority* of the *importing country* should provide urgent access to a *veterinarian*, where possible an OIE *veterinarian(s)* appointed by the Director General, to assess the ~~animals'~~ animals' health status of the animals with regard to the concerns of the importing country's concerns, and the necessary facilities and approvals to expedite the required diagnostic testing.
  - c) The *Competent Authority* of the *importing country* should provide access to allow continued assessment of the health and other aspects of the welfare of the animals.
  - d) If the matter cannot be promptly resolved, the *Competent Authorities* of the *exporting* and *importing countries* should call on the OIE to mediate.
3. In the event that a *Competent Authority* requires the animals to remain on the *vehicle*, the priorities should be:
  - a) ~~The *Competent Authority* should~~ to allow reprovisioning of the *vehicle* with water and feed as necessary;
  - b) ~~The *Competent Authority* should~~ to provide urgently in writing the reasons for the refusal;
  - c) ~~In the event of a refusal for animal health reasons, the *Competent Authority* should~~ to provide urgent access to an independent *veterinarian(s)* to assess the ~~animals'~~ animals' health status of the animals, and the necessary facilities and approvals to expedite the required diagnostic testing in the event of a refusal for animal health reasons;
  - d) ~~The *Competent Authority* should~~ to provide access to allow continued assessment of the health and other aspects of the welfare of the animals, and the necessary actions to deal with any animal issues which arise.
4. The OIE should utilise its dispute settlement mechanism to identify a mutually agreed solution which will address animal health and any other welfare issues in a timely manner.

Article 3.7.3.11.

### **Species specific issues**

(To be developed)

**Camelids of the new world** in this context comprise llamas, alpacas, guanaco and vicuna. They have good eyesight and, like sheep, can negotiate steep slopes, though ramps should be as shallow as possible. They load most easily in a bunch as a single animal will strive to rejoin the others. Whilst they are usually docile, they have an unnerving habit of spitting in self-defence. During transport, they usually lie down. They frequently extend their front legs forward when lying, so gaps below partitions should be high enough so that their legs are not trapped when the animals rise.

**Cattle** are sociable animals and may become agitated if they are singled out. Social order is usually established at about two years of age. When groups are mixed, social order has to be re-established and aggression may occur until a new order is established. Crowding of cattle may also increase aggression as the animals try to maintain personal space. Social behaviour varies with age, breed and sex; *Bos indicus* and *B. indicus*-cross animals are usually more temperamental than European breeds. Young bulls, when moved in groups, show a degree of playfulness (pushing and shoving) but become more aggressive and territorial with age. Adult bulls have a minimum personal space of six square metres. Cows with young calves can be very protective, and handling calves in the presence of their mothers can be dangerous. **Cattle tend to avoid “dead end” in passages.**

**Goats** should be handled calmly and are more easily led or driven than if they are excited. When goats are moved, their gregarious tendencies should be exploited. Activities which frighten, injure or cause agitation to animals should be avoided. Bullying is particularly serious in goats **and can reflect demands for personal space.** Housing strange goats together could result in fatalities, either through physical violence, or subordinate goats being refused access to food and water.

**Horses** in this context include **all solipedes**, donkeys, mules and hinnies **and zebra**. They have good eyesight and a very wide angle of vision. They may have a history of *loading* resulting in good or bad experiences. Good training should result in easier *loading*, but some horses can prove difficult, especially if they are inexperienced or have associated *loading* with poor transport conditions. In these circumstances, two experienced *animal handlers* can load an animal by linking arms or using a strop below its rump. Blindfolding may even be considered. Ramps should be as shallow as possible. Steps are not usually a problem when horses mount a ramp, but they tend to jump a step when descending, so steps should be as low as possible. Horses benefit from being individually stalled, but may be transported in compatible groups. When horses are to travel in groups, their shoes should be removed. **Horses are prone to respiratory disease if they are restricted by period by tethers that prevent the lowering and lifting of their heads.**

**Pigs** have poor eyesight, and may move reluctantly in strange surroundings. They benefit from well lit loading bays. Since they negotiate ramps with difficulty, these should be as level as possible and provided with secure footholds. Ideally, a hydraulic lift should be used for greater heights. Pigs also negotiate steps with difficulty. A good ‘rule-of-thumb’ is that no step should be higher than the pig’s front knee. Serious aggression may result if unfamiliar animals are mixed. Pigs are highly susceptible to heat stress.

**Sheep** are sociable animals with good eyesight, a **relatively subtle and undemonstrative behaviour and a tendency tend to “flock together”**, especially when they are agitated. They should be handled calmly and their tendency to follow each other should be exploited when they are being moved. **Crowding of sheep may lead to damaging aggressive and submissive behaviours as animals try to maintain personal space.** Sheep may become agitated if they are singled out for attention, **or kept alone**, and will strive to rejoin the group. Activities which frighten, injure or cause agitation to sheep should be avoided. They can negotiate steep ramps.

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## APPENDIX 3.7.5.

## GUIDELINES FOR THE SLAUGHTER OF ANIMALS

## Article 3.7.5.1.

**General principles**1. Object

These guidelines address the need to ensure the welfare of food animals during pre-*slaughter* and *slaughter* processes, until they are dead.

These guidelines apply to the *slaughter* in *slaughterhouses* of the following domestic animals: cattle, buffalo, bison, sheep, goats, camelids, deer, horses, pigs, raites, rabbits and poultry. Other animals, wherever they have been reared, and all animals slaughtered outside *slaughterhouses* should be managed to ensure that their *transport*, ~~lairaging~~ lairage, *restraint* and *slaughter* is carried out without causing undue stress to the animals; the principles underpinning these guidelines apply also to these animals.

2. Personnel

Persons engaged in the *unloading*, moving, ~~lairaging~~ lairage care, ~~restraining~~ restraint, *stunning*, *slaughter* and bleeding of animals play an important role in the welfare of those animals. For this reason, there should be a sufficient number of personnel, who should be patient, considerate, competent and familiar with the guidelines outlined in the present Appendix and their application within the national context.

Competence may be gained through formal training and/or practical experience. This competence should be demonstrated through a current certificate from the *Competent Authority* or from an independent body accredited by the *Competent Authority*.

The management of the *slaughterhouse* and the *Veterinary Services* should ensure that *slaughterhouse* staff are competent and carry out their tasks in accordance with the principles of animal welfare.

~~The management of the slaughterhouse and the Veterinary Services should ensure that slaughterhouse staff carry out their tasks in accordance with the principles of animal welfare.~~

3. Animal behaviour

*Animal handlers* should be experienced and competent in handling and moving farm livestock and understand the behaviour patterns of animals and the underlying principles necessary to carry out their tasks.

The behaviour of individual animals or groups of animals will vary, depending on their breed, sex, temperament and age and the way in which they have been reared and handled. Despite these differences, the following behaviour patterns which are always present to some degree in domestic animals, should be taken into consideration in handling and moving the animals.

Most domestic livestock are kept in herds and follow a leader by instinct.

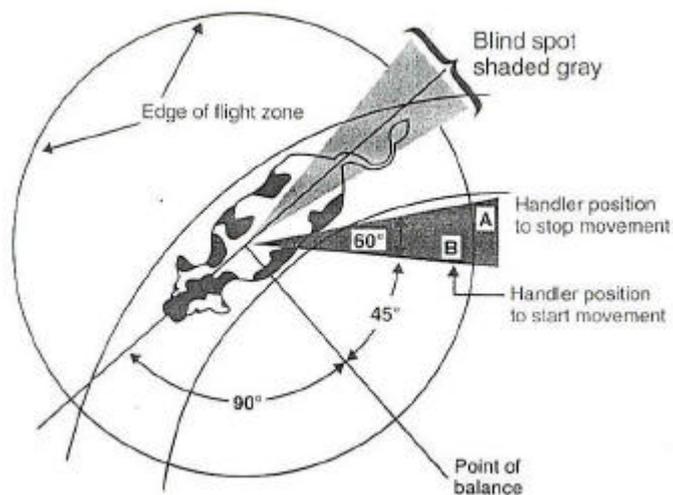
Animals which are likely to be hostile to harm each other in a group situation should not be mixed at *slaughterhouses*.

Appendix XXXI (contd)

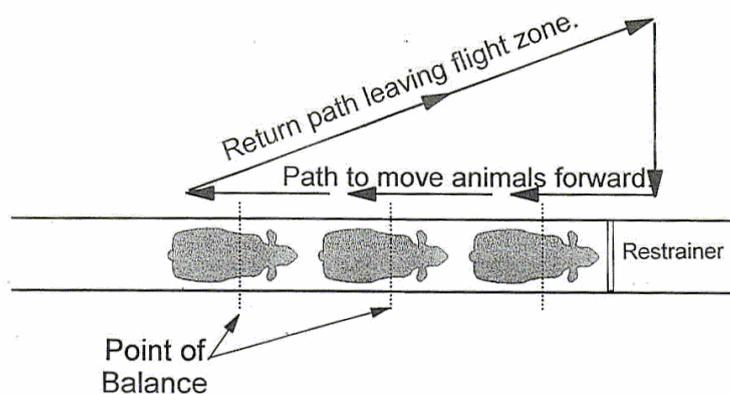
The desire of some animals to control their personal space should be taken into account in designing facilities.

Domestic animals will try to escape if ~~animal handler~~ any person approaches closer than a certain distance. This critical distance, which defines the flight zone, varies among species and individuals of the same species, and depends upon previous contact with humans. Animals reared in close proximity to humans (i.e., tame) have a ~~small~~ smaller flight zone, whereas those kept in free range or extensive systems may have flight zones which may vary from one metre to many metres. *Animal handlers* should avoid sudden penetration of the flight zone which may cause a panic reaction which could lead to aggression or attempted escape.

### An example of a flight zone (cattle)



### Animal handler movement pattern to move cattle forward



*Animal handlers* should use the point of balance at ~~an~~ the animal's shoulder to move animals, adopting a position behind the point of balance to move an animal forward and in front of the point of balance to move it backward.

Domestic animals have wide-angle vision but only have limited forward binocular vision and poor perception of depth. This means that they can detect objects and movements beside and behind them, but can only judge distances directly ahead.

Although all domestic animals have a highly sensitive sense of smell, they react in different ways to the smells of *slaughterhouses*. Smells which cause fear or other negative responses should be taken into consideration when managing animals.

Domestic animals can hear over a greater range of frequencies than humans and are more sensitive to higher frequencies. They tend to be alarmed by constant loud noise and by sudden noises, which may cause them to panic. Sensitivity to such noises should also be taken into account when handling animals.

#### 4. Distractions and their removal

Distractions that may cause approaching animals to stop, baulk or turn back should be designed out from new facilities or removed from existing ones. Below are examples of common distractions and methods for eliminating them:

- a) reflections on shiny metal or wet floors - move a lamp or change lighting;
- b) dark entrances to chutes, races, stun boxes or conveyor restrainers - illuminate with indirect lighting which does not shine directly into the eyes of approaching animals;
- c) animals seeing moving people or equipment up ahead - install solid sides on chutes and races or install shields;
- d) dead ends-avoid if possible by curving the passage, or make an illusory passage;
- ~~e)~~e) chains or other loose objects hanging in chutes or on fences - remove them;
- ~~f)~~f) uneven floors or a sudden drop in floor levels at the entrance to conveyor restrainers – avoid uneven floor surfaces or install a solid false floor under the restrainer to provide an illusion of a solid and continuous walking surface;
- ~~g)~~g) sounds of air hissing from pneumatic equipment - install silencers or use hydraulic equipment or vent high pressure to the external environment using flexible hosing;
- ~~h)~~h) clanging and banging of metal objects - install rubber stops on gates and other devices to reduce metal to metal contact;
- ~~i)~~i) air currents from fans or air curtains blowing into the face of animals - redirect or reposition equipment.

Article 3.7.5.2.

### **Moving and handling animals**

#### 1. General considerations

Animals should be transported to *slaughter* in a way that minimises adverse animal health and welfare outcomes, and the transport should be conducted in accordance with the OIE guidelines for the transportation of animals (Appendices 3.7.2 and 3.7.3).

## Appendix XXXI (contd)

The following principles should apply to *unloading* animals, moving them into *lairage* pens, out of the *lairage* pens and up to the *slaughter* point:

- a) The conditions of the animals should be assessed upon their arrival for any animal welfare and health problems.
- b) Injured or sick animals, requiring immediate *slaughter*, should be killed humanely and without delay, preferably at the site where they are found in accordance with the OIE guidelines for the killing of animals for disease control purposes (Appendix 3.7.6).
- ~~e) The use of force on animals that have little or no room to move should not occur.~~
- ~~e) The use of instruments which administer electric shocks (e.g., goads and prods) and their power output should be restricted to that necessary to assist movement of an animal and only when an animal has a clear path ahead to move. If such use is necessary, it should be limited to the hindquarters of pigs and large ruminants, and never on sensitive areas such as the eyes, mouth, ears, anogenital region or belly. Such instruments should not be used on horses, sheep and goats of any age, or on calves or piglets, nor on animals that have little or no room to move.~~
- ~~e) Performance standards should be established in which numerical scoring is used to evaluate the use of such instruments, and to measure the percentage of animals moved with an electric instrument and the percentage of animals slipping or falling at a point in the slaughterhouse; the slaughterhouse should be investigated for faults in flooring, raceway design, lighting or handling, and these should be rectified to enable free movement of the animals without the need to use such instruments.~~
- ~~f) Aids for moving animals such as panels, flags, plastic paddles, flappers (a length of cane with a short strap of leather or canvas attached), plastic bags and metallic rattles should be used in a manner sufficient to encourage and direct movement of the animals.~~
- ~~g) Shouting or yelling at animals or making loud noises e.g. through the cracking of whips to encourage them to move should not occur as such actions may make the animals agitated, leading to crowding or falling.~~
- ~~h) Implements which cause pain and suffering such as large sticks, sticks with sharp ends, metal piping, fencing wire or heavy leather belts should not be used to move animals.~~
- ~~i) Animals should be grasped or lifted in a manner which avoids pain or suffering and physical damage (e.g. bruising, fractures, dislocations). In the case of quadrupeds, manual lifting by a person should only be used in young animals or small species, and in a manner appropriate to the species; grasping or lifting such animals only by their wool, hair, feet, neck, ears or tails causing pain or suffering should not be permitted, except in an emergency where animal welfare or human safety may otherwise be compromised.~~
- ~~j) Conscious animals should not be thrown or dragged.~~
- ~~k) Animals should not be forced to move at a speed greater than their normal walking pace, in order to minimise injury through falling or slipping. Performance standards should be established where numerical scoring of the prevalence of animals slipping or falling is used to evaluate whether animal moving practices and/or facilities should be improved. In properly designed and constructed facilities with competent *animal handlers*, it should be possible to move 99% of animals without their falling.~~
- ~~l) Animals for slaughter should not be forced to walk over the top of other animals.~~

- m) ~~Animals should be handled in such a way as to avoid harm, distress or injury. Under no circumstances should *animal handlers* resort to violent acts to move animals, such as crushing or breaking animals' tails, grasping animals' eyes or pulling them by their ears. *animal handlers* should never apply an injurious object or irritant substance to animals and especially not to sensitive areas such as eyes, mouth, ears, anogenital region or belly. The throwing or dropping of animals, or their lifting or dragging by body parts such as their tail, head, horns, ears, limbs, wool, hair or feathers, should not be permitted. The manual lifting of small animals is permissible.~~
- c) Animals should not be forced to move at a speed greater than their normal walking pace, in order to minimise injury through falling or slipping. Performance standards should be established where numerical scoring of the prevalence of animals slipping or falling is used to evaluate whether animal moving practices and/or facilities should be improved. In properly designed and constructed facilities with competent *animal handlers* it should be possible to move 99% of animals without their falling.
- d) Animals for slaughter should not be forced to walk over the top of other animals.
- e) Animals should be handled in such a way as to avoid harm, distress or injury. Under no circumstances should *animal handlers* resort to violent acts to move animals, such as crushing or breaking tails of animals, grasping their eyes or pulling them by the ears. *Animal handlers* should never apply an injurious object or irritant substance to animals and especially not to sensitive areas such as eyes, mouth, ears, anogenital region or belly. The throwing or dropping of animals, or their lifting or dragging by body parts such as their tail, head, horns, ears, limbs, wool, hair or feathers, should not be permitted. The manual lifting of small animals is permissible.
- f) When using goads and other aids, the following principles should apply:
- i) Animals that have little or no room to move should not be subjected to physical force or goads and other aids which compel movement. Electric goads and prods should only be used in extreme cases and not on a routine basis to move animals. The use and the power output should be restricted to that necessary to assist movement of an animal and only when an animal has a clear path ahead to move. Goads and other aids should not be used repeatedly if the animal fails to respond or move. In such cases it should be investigated whether some physical or other impediment is preventing the animal from moving.
  - ii) The use of such devices should be limited to battery-powered goads on the hindquarters of pigs and large ruminants, and never on sensitive areas such as the eyes, mouth, ears, anogenital region or belly. Such instruments should not be used on horses, sheep and goats of any age, or on calves or piglets.
  - iii) Useful and permitted goads include panels, flags, plastic paddles, flappers (a length of cane with a short strap of leather or canvas attached), plastic bags and metallic rattles; they should be used in a manner sufficient to encourage and direct movement of the animals without causing undue stress.
  - iv) Painful procedures (including whipping, tail twisting, use of nose twitches, pressure on eyes, ears or external genitalia), or the use of goads or other aids which cause pain and suffering (including large sticks, sticks with sharp ends, lengths of metal piping, fencing wire or heavy leather belts), should not be used to move animals.
  - v) Excessive shouting at animals or making loud noises (e.g. through the cracking of whips) to encourage them to move should not occur, as such actions may make the animals agitated, leading to crowding or falling.

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- vi) Animals should be grasped or lifted in a manner which avoids pain or suffering and physical damage (e.g. bruising, fractures, dislocations). In the case of quadrupeds, manual lifting by a person should only be used in young animals or small species, and in a manner appropriate to the species; grasping or lifting such animals only by their wool, hair, feathers, feet, neck, ears, tails, head, horns, limbs causing pain or suffering should not be permitted, except in an emergency where animal welfare or human safety may otherwise be compromised.
  - vii) Conscious animals should not be thrown, dragged or dropped.
  - viii) Performance standards should be established in which numerical scoring is used to evaluate the use of such instruments. Numerical scoring may be used to measure the percentage of animals moved with an electric instrument and the percentage of animals slipping or falling at a point in the slaughterhouse. Any risk of compromising animal welfare, for example slippery floor, should be investigated immediately and the defect rectified to eliminate the problem. The slaughterhouse should be investigated for faults in flooring, raceway design, lighting or handling, and these should be rectified to enable free movement of the animals without the need to use such instruments.
2. Provisions relevant to animals delivered in containers
- a) Containers in which animals are transported should be handled with care, and should not be thrown, dropped or knocked over. Where possible, they should be horizontal while being loaded and unloaded mechanically, and stacked to ensure ventilation. In any case they should be moved and stored in an upright position as indicated by specific marks.
  - b) Animals delivered in *containers* with perforated or flexible bottoms should be unloaded with particular care in order to avoid injury. Where appropriate, animals should be unloaded from the *containers* individually.
  - c) Animals which have been transported in *containers* should be slaughtered as soon as possible; mammals and ratites which are not taken directly upon arrival to the place of slaughter should have drinking water available to them from appropriate facilities at all times. Delivery of poultry for slaughter should be scheduled such that they are not deprived of water at the premises for longer than 12 hours. Animals which have not been slaughtered within 12 hours of their arrival should be fed, and should subsequently be given moderate amounts of food at appropriate intervals.
3. Provisions relevant to restraining and containing animals
- a) Provisions relevant to restraining animals for *stunning* or slaughter without *stunning*, to help maintain animal welfare, include:
    - i) provision of a non-slip floor;
    - ii) avoidance of excessive pressure applied by restraining equipment that causes struggling or vocalisation in animals;
    - iii) equipment engineered to reduce noise of air hissing and clanging metal;
    - iv) absence of sharp edges in restraining equipment that would harm animals;
    - v) avoidance of jerking or sudden movement of restraining device.

- b) Methods of *restraint* causing avoidable suffering ~~such as the following~~ should not be used in conscious animals. Such methods include the following:
- i) suspending or hoisting animals (other than poultry) by the feet or legs;
  - ii) indiscriminate and inappropriate use of *stunning* equipment;
  - iii) mechanical clamping of ~~an animal's~~ the legs or feet of the animals (other than shackles used in poultry and ostriches) as the sole method of *restraint*;
  - iv) breaking legs, cutting leg tendons or blinding animals in order to immobilise them;
  - v) severing the spinal cord, for example using a puntilla or dagger, to immobilise animals; using electric currents to immobilise animals, except for proper *stunning*.

Article 3.7.5.3.

## Lairage design and construction

### 1. General considerations

The *lairage* should be designed and constructed to hold an appropriate number of animals in relation to the throughput rate of the *slaughterhouse* without compromising the welfare of the animals.

In order to permit operations to be conducted as smoothly and efficiently as possible without injury or undue stress to the animals, the *lairage areas* should be designed and constructed so as to allow the animals to move freely in the required direction, using their behavioural characteristics and without undue penetration of their flight zone.

The following guidelines may help to achieve this.

### 2. Design of lairages

- a) The *lairage* should be designed to allow a one-way flow of animals from *unloading* to the point of *slaughter*, with a minimum number of abrupt corners to negotiate.
- b) In red meat *slaughterhouses*, pens, passageways and races should be arranged in such a way as to permit inspection of animals at any time, and to permit the removal of sick or injured animals when considered to be appropriate, for which separate appropriate accommodation should be provided.
- c) Each animal should have room to stand up and lie down and, when confined in a pen, to turn around, except where the animal is reasonably restrained for safety reasons (e.g. fractious bulls). Fractious animals should be slaughtered as soon as possible after arrival at the *slaughterhouse* to avoid welfare problems.

The *lairage* should have sufficient accommodation for the number of animals intended to be held. Drinking water should always be available to the animals, and the method of delivery should be appropriate to the type of animal held. Troughs should be designed and installed in such a way as to minimise the risk of fouling by faeces, without introducing risk of bruising and injury in animals, and should not hinder the movement of animals.

Appendix XXXI (contd)

- d) Holding pens should be designed to allow as many animals as possible to stand or lie down against a wall. Where feed troughs are provided, they should be sufficient in number and feeding space to allow adequate access of all animals to feed. The feed trough should not hinder the movement of animals.
  - e) Where tethers, ties or individual stalls are used, these should be designed so as not to cause injury or distress to the animals and should also allow the animals to stand, lie down and access any food or water that may need to be provided.
  - f) Passageways and races should be either straight or consistently curved, as appropriate to the animal species. Passageways and races should have solid sides, but when there is a double race, the shared partition should allow adjacent animals to see each other. For pigs and sheep, passageways should be wide enough to enable two or more animals to walk side by side for as long as possible. At the point where passageways are reduced in width, this should be done by a means which prevents excessive bunching of the animals.
  - g) *Animal handlers* should be positioned alongside races and passageways on the inside radius of any curve, to take advantage of the natural tendency of animals to circle an intruder. Where one-way gates are used, they should be of a design which avoids bruising. Races should be horizontal but where there is a slope, they should be constructed to allow the free movement of animals without injury.
  - h) There should be a waiting pen, with a level floor and solid sides, between the holding pens and the race leading to the point of *stunning* or *slaughter*, to ensure a steady supply of animals for *stunning* or *slaughter* and to avoid having *animal handlers* trying to rush animals from the holding pens. The waiting pen should preferably be circular, but in any case, so designed that animals cannot be trapped or trampled.
  - i) Ramps or lifts should be used for *loading* and *unloading* of animals where there is a difference in height or a gap between the floor of the *vehicle* and the unloading area. Unloading ramps should be designed and constructed so as to permit animals to be unloaded from *vehicles* on the level or at the minimum gradient achievable. Lateral side protection should be available to prevent animals escaping or falling. They should be well drained, with secure footholds and adjustable to facilitate easy movement of animals without causing distress or injury.
3. Construction of lairages
- a) *Lairages* should be constructed and maintained so as to provide protection from unfavourable climatic conditions, using strong and resistant materials such as concrete and metal which has been treated to prevent corrosion. Surfaces should be easy to clean. There should be no sharp edges or protuberances which may injure the animals.
  - b) Floors should be well drained and not slippery; they should not cause injury to the ~~animals'~~ feet of the animals. Where necessary, floors should be insulated or provided with appropriate bedding. Drainage grids should be placed at the sides of pens and passageways and not where animals would have to cross them. Discontinuities or changes in floor patterns or texture which could cause baulking in the movement of animals should be avoided.
  - c) *Lairages* should be provided with adequate lighting, but care should be taken to avoid harsh lights and shadows, which frighten the animals or affect their movement. The fact that animals will move more readily from a darker area into a well-lit area might be exploited by providing for lighting that can be regulated accordingly.

- d) *Lairages* should be adequately ventilated to ensure that waste gases (e.g. ammonia) do not build up and that draughts at animal height are minimised. Ventilation should be able to cope with the range of expected climatic conditions and the number of animals the *lairage* will be expected to hold.
- e) Care should be taken to protect the animals from excessively or potentially disturbing noises, for example by avoiding the use of noisy hydraulic or pneumatic equipment, and muffling noisy metal equipment by the use of suitable padding, or by minimising the transmission of such noise to the areas where animals are held and slaughtered.
- f) Where animals are kept in outdoor *lairages* without natural shelter or shade, they should be protected from the effects of adverse weather conditions.

Article 3.7.5.4.

### Care of animals in lairages

Animals in *lairages* should be cared for in accordance with the following guidelines:

1. As far as possible, established groups of animals should be kept together. Each animal should have enough space to stand up, lie down and turn around. Animals hostile to each other should be separated.
2. Where tethers, ties or individual stalls are used, they should allow animals to stand up and lie down without causing injury or distress.
3. Where bedding is provided, it should be maintained in a condition that minimises risks to the health and safety of the animals, and sufficient bedding should be used so that animals do not become soiled with manure.
4. Animals should be kept securely in the *lairage*, and care should be taken to prevent them from escaping and from predators.
5. Suitable drinking water should be available to the animals on their arrival and at all times to animals in *lairages* unless they are to be slaughtered without delay.
6. If animals are not to be slaughtered as soon as possible, suitable feed should be available to the animals on arrival and at intervals appropriate to the species. Unweaned animals should be slaughtered as soon as possible.
7. In order to prevent heat stress, animals subjected to high temperatures, particularly pigs and poultry, should be cooled by the use of water sprays, fans or other suitable means. However, the potential for water sprays to reduce the ability of animals to thermoregulate (especially poultry) should be considered in any decision to use water sprays. The risk of animals being exposed to very cold temperatures or sudden extreme temperature changes should also be considered.
8. The *lairage* area should be well lit in order to enable the animals to see clearly without being dazzled. During the night, the lights should be dimmed. Lighting should also be adequate to permit inspection of all animals. Subdued lighting, and for example, blue light may be useful in poultry *lairages* in helping to calm birds.

Appendix XXXI (contd)

9. The condition and state of health of the animals in a *lairage* should be inspected at least every morning and evening by a *veterinarian* or, under the ~~latter's~~ *veterinarian's* responsibility, by another competent person, such as an *animal handler*. Animals which are sick, weak, injured or showing visible signs of distress should be separated, and veterinary advice should be sought immediately regarding treatment or euthanasia, and treated or humanely killed immediately.
10. Lactating dairy animals should be slaughtered as soon as possible. Dairy animals with obvious udder distension should be milked to minimise udder discomfort.
11. Animals which have given birth during the *journey* or in the *lairage* should be slaughtered as soon as possible or provided with conditions which are appropriate for suckling, for ~~its~~ their welfare and the welfare of the newborn. Under normal circumstances, animals which are expected to give birth during a *journey* should not be transported.
12. Animals with horns, antlers or tusks capable of injuring other animals, if aggressive, should be penned separately.

Recommendations for specific species are described in detail in Articles 3.7.5.5. to 3.7.5.8.

Article 3.7.5.5.

### **Management of foetuses during slaughter of pregnant animals ~~(under study)~~**

~~The welfare of foetuses during slaughter of pregnant animals needs to be safeguarded.~~

Under normal circumstances, pregnant animals that would be in the final 10% of their gestation period at the planned time of *unloading* at the *slaughterhouse* should neither be transported nor slaughtered. ~~When~~ If such an event occurs, an *animal handler* should ensure that females are handled separately and the specific procedures described below are applied. In all cases, the welfare of foetuses and dams during slaughter should be safeguarded.

1. Foetuses should not be removed from the uterus sooner than five minutes after the maternal neck or chest cut, to ensure absence of consciousness. A foetal heartbeat will usually still be present and foetal movements may occur at this stage, but these are only a cause for concern if the exposed foetus successfully breathes air.
2. If a live mature foetus is removed from the uterus, it should be prevented from inflating its lungs and breathing air (e.g. by clamping the trachea).
3. When uterine, placental or foetal tissues, including foetal blood, are not to be collected as part of the post-slaughter processing of pregnant animals, all foetuses should be left inside the unopened uterus until they are dead. When uterine, placental or foetal tissues are to be collected, where practical, foetuses should not be removed from the uterus until at least 15-20 minutes after the maternal neck or chest cut.
4. If there is any doubt about consciousness, the foetus should be killed with a captive bolt of appropriate size or a blow to the head with a suitable blunt instrument.

The above guidelines do not refer to foetal rescue. Foetal rescue, the practice of attempting to revive foetuses found alive at evisceration of the dam, should not be attempted during normal commercial slaughter as it may lead to serious welfare complications in the newborn animal. These include impaired brain function resulting from oxygen shortage before rescue is completed, compromised breathing and body heat production because of foetal immaturity, and an increased incidence of infections due to a lack of colostrum.

Article 3.7.5.6.

**Summary analysis of acceptable handling and restraining methods and the associated animal welfare issues**

	<b>Presentation of animals</b>	<b>Specific procedure</b>	<b>Specific purpose</b>	<b>AW concerns/implications</b>	<b>Key AW requirements</b>	<b>Applicable species</b>
No restraint	Animals are grouped	Group container	Gas stunning	Specific procedure is suitable only for gas stunning	Competent animal handlers in lairage; facilities; stocking density	Pigs, poultry
		In the field	Free bullet	Inaccurate targeting and inappropriate ballistics not achieving outright kill with first shot	Operator competence	Deer
		Group stunning pen	Head-only electrical Captive bolt	Uncontrolled movement of animals impedes use of hand operated electrical and mechanical stunning methods	Competent animal handlers in lairage and at stunning point	Pigs, sheep, goats, calves
	Individual animal confinement	Stunning pen/box	Electrical and mechanical stunning methods	Loading of animal; accuracy of stunning method, slippery floor and animal falling down	Competent animal handlers	Cattle, buffalo, sheep, goats, horses, pigs, deer, camelids, ratites
Restraining methods	Head restraint, upright	Halter/ head collar/bridle	Captive bolt Free bullet	Suitable for halter-trained animals; stress in untrained animals	Competent animal handlers	Cattle, buffalo, horses, camelids
	Head restraint, upright	Neck yoke	Captive bolt Electrical-head-only Free bullet Slaughter without stunning	Stress of loading and neck capture; stress of prolonged restraint, horn configuration; unsuitable for fast line speeds, animals struggling and falling due to slippery floor, excessive pressure	Equipment; competent animal handlers, prompt stunning or slaughter	Cattle
	Leg restraint	Single leg tied in flexion (animal standing on 3 legs)	Captive bolt Free bullet	Ineffective control of animal movement, misdirected shots	Competent animal handlers	Breeding pigs (boars and sows)

## Appendix XXXI (contd)

**Summary analysis of acceptable handling and restraining methods and the associated animal welfare issues (contd)**

	<b>Presentation of animals</b>	<b>Specific procedure</b>	<b>Specific purpose</b>	<b>AW concerns/implications</b>	<b>Key AW requirements</b>	<b>Applicable species</b>
Restraining methods	Upright restraint	Beak holding	Captive bolt Electrical-head-only	Stress of capture	Sufficient Competent-animal handlers	Ostriches
		Head restraint in electrical stunning box	Electrical-head-only	Stress of capture and positioning	Competent animal handlers	Ostriches
	Holding body upright- manual	Manual restraint	Captive bolt Electrical-head-only Slaughter without stunning	Stress of capture and restraint; accuracy of stunning/slaughter	Competent animal handlers	Sheep, goats, calves, raites, small camelids, poultry
	Holding body upright mechanical	Mechanical clamp / crush / squeeze/ V-restrainer (static)	Captive bolt Electrical methods Slaughter without stunning	Loading of animal and overriding; excessive pressure	Proper design and operation of equipment	Cattle, buffalo, sheep, goats, deer, pigs, ostriches
	Lateral restraint – manual or mechanical	Restrainer/cradle/crush	Slaughter without stunning	Stress of restraint	Competent animal handlers	Sheep, goats, calves, camelids, cattle
	Upright restraint mechanical	Mechanical straddle (static)	Slaughter without stunning Electrical methods Captive bolt	Loading of animal and overriding	Competent animal handlers	Cattle, sheep, goats, pigs
	Upright restraint – manual or mechanical	Wing shackling	Electrical	Excessive tension applied prior to stunning	Competent animal handlers	Ostriches

**Summary analysis of acceptable handling and restraining methods and the associated animal welfare issues (contd)**

	<b>Presentation of animals</b>	<b>Specific procedure</b>	<b>Specific purpose</b>	<b>AW concerns/implications</b>	<b>Key AW requirements</b>	<b>Applicable species</b>
Restraining and /or conveying methods	Mechanical - upright	V-restrainer	Electrical methods Captive bolt Slaughter without stunning	Loading of animal and overriding; excessive pressure, size mismatch between restrainer and animal	Proper design and operation of equipment	Cattle, calves, sheep, goats, pigs
	Mechanical - upright	Mechanical straddle – band restrainer (moving)	Electrical methods Captive bolt Slaughter without stunning	Loading of animal and overriding, size mismatch between restrainer and animal	Competent animal handlers, proper design and layout of restraint	Cattle, calves, sheep, goats, pigs
	Mechanical - upright	Flat bed/deck Tipped out of <i>containers</i> on to conveyors	Presentation of birds for shackling prior to electrical stunning Gas stunning	Stress and injury due to tipping in dump-module systems height of tipping conscious poultry broken bones and dislocations	Proper design and operation of equipment	Poultry
	Suspension and/or inversion	Poultry shackle	Electrical stunning Slaughter without stunning	Inversion stress; pain from compression on leg bones	Competent animal handlers; proper design and operation of equipment	Poultry
	Suspension and/or inversion	Cone	Electrical – head-only Captive bolt Slaughter without stunning	Inversion stress	Competent animal handlers; proper design and operation of equipment	Poultry
	Upright restraint	Mechanical leg clamping	Electrical – head-only	Stress of resisting restraint in ostriches	Competent animal handlers; proper equipment design and operation	Ostriches

## Appendix XXXI (contd)

**Summary analysis of acceptable handling and restraining methods and the associated animal welfare issues (contd)**

	<b>Presentation of animals</b>	<b>Specific procedure</b>	<b>Specific purpose</b>	<b>AW concerns/implications</b>	<b>Key AW requirements</b>	<b>Applicable species</b>
Restraining by inversion	Rotating box	Fixed side(s) (e.g. Weinberg pen)	Slaughter without stunning	Inversion stress; stress of resisting restraint, prolonged restraint, inhalation of blood and ingesta. Keep restraint as brief as possible	Proper design and operation of equipment	Cattle
		Compressible side(s)	Slaughter without stunning	Inversion stress, stress of resisting restraint, prolonged restraint Preferable to rotating box with fixed sides Keep restraint as brief as possible	Proper design and operation of equipment	Cattle
Body restraint	Casting/hobbling	Manual	Mechanical stunning methods Slaughter without stunning	Stress of resisting restraint; animal temperament; bruising. Keep restraint as short as possible	Competent animal handlers	Sheep, goats, calves, small camelids, pigs
Leg restraints		Rope casting	Mechanical stunning methods Slaughter without stunning	Stress of resisting restraint; prolonged restraint, animal temperament; bruising Keep restraint as short as possible	Competent animal handlers	Cattle, camelids
		Tying of 3 or 4 legs	Mechanical stunning methods Slaughter without stunning	Stress of resisting restraint; prolonged restraint, animal temperament; bruising Keep restraint as short as possible	Competent animal handlers	Sheep, goats, small camelids, pigs

## Article 3.7.5.7.

**Stunning methods**1. General considerations

The competence of the operators, and the appropriateness, and effectiveness of the method used for *stunning* and the maintenance of the equipment are the responsibility of the management of the *slaughterhouse*, and should be checked regularly by a *Competent Authority*.

Persons carrying out *stunning* should be properly trained and competent, and should ensure that:

- a) the animal is adequately restrained;
- b) animals in *restraint* are stunned as soon as possible;
- c) the equipment used for *stunning* is maintained and operated properly in accordance with the manufacturer's recommendations, in particular with regard to the species and size of the animal;
- d) the instrument is applied correctly;
- e) stunned animals are bled out (slaughtered) as soon as possible;
- f) animals should not be stunned when slaughter is likely to be delayed; and
- g) backup *stunning* devices are available for immediate use if the primary method of *stunning* fails.

In addition, such persons should be able to recognise when an animal is not correctly stunned and should take appropriate action.

2. Mechanical stunning

A mechanical device should be applied usually to the front of the head and perpendicular to the bone surface. The following diagrams illustrate the proper application of the device for certain species.

**Cattle**

Figure source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire AL4 8AN, United Kingdom ([www.hsa.org.uk](http://www.hsa.org.uk)).

The optimum position for cattle is at the intersection of two imaginary lines drawn from the rear of the eyes to the opposite horn buds.

Appendix XXXI (contd)**Pigs**

Figure source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire AL4 8AN, United Kingdom ([www.hsa.org.uk](http://www.hsa.org.uk)).

The optimum position for pigs is on the midline just above eye level, with the shot directed down the line of the spinal cord.

**Sheep**

The optimum position for hornless sheep and goats is on the midline.

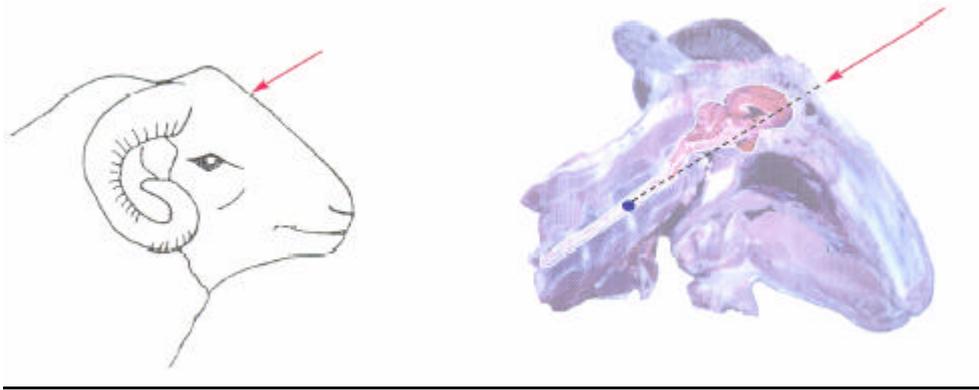


Figure source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire AL4 8AN, United Kingdom ([www.hsa.org.uk](http://www.hsa.org.uk)).

The optimum position for hornless sheep and goats is on the midline.

### Goats

The optimum position for heavily horned sheep and horned goats is behind the poll, aiming towards the angle of the jaw.

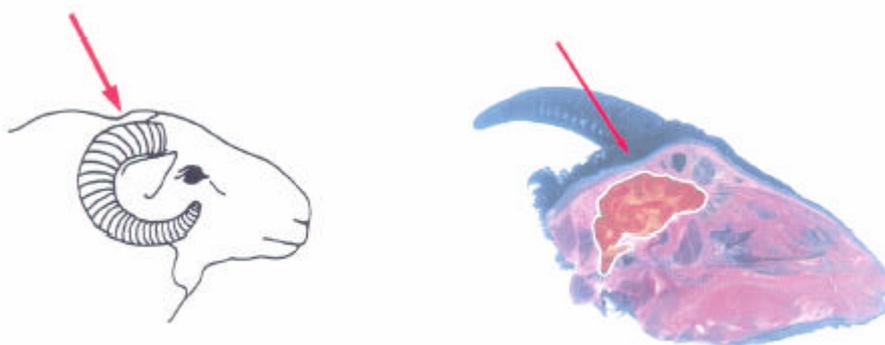


Figure Source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire AL4 8AN, United Kingdom ([www.hsa.org.uk](http://www.hsa.org.uk)).

### Horses



Figure source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire AL4 8AN, United Kingdom ([www.hsa.org.uk](http://www.hsa.org.uk)).

The optimum position for horses is at right angles to the frontal surface, well above the point where imaginary lines from eyes to ears cross.

Signs of correct *stunning* using a mechanical instrument are as follows:

- a) the animal collapses immediately and does not attempt to stand up;
- b) the body and muscles of the animal become tonic (rigid) immediately after the shot;

Appendix XXXI (contd)

- c) normal rhythmic breathing stops; and
- d) the eyelid is open with the eyeball facing straight ahead and is not rotated.

3. Electrical stunning

- a) General considerations

An electrical device should be applied to the animal in accordance with the following guidelines.

Electrodes should be designed, constructed, maintained and cleaned regularly to ensure that the flow of current is optimal and in accordance with manufacturing specifications. They should be placed so that they span the brain. The application of electrical currents which bypass the brain is unacceptable unless the animal has been stunned. The use of a single current leg-to-leg is unacceptable as a *stunning* method.

If, in addition, it is intended to cause cardiac arrest, the electrodes should either span the brain and immediately thereafter the heart, on the condition that it has been ascertained that the animal is adequately stunned, or span brain and heart simultaneously.

Electrical *stunning* equipment should not be applied on animals as a means of guidance, movement, *restraint* or immobilisation, and shall not deliver any shock to the animal before the actual *stunning* or *killing*.

Electrical *stunning* apparatus should be tested prior to application on animals using appropriate resistors or dummy loads to ensure the power output is adequate to stun animals.

~~The apparatus should incorporate a device which monitors and displays *stunning* current delivered to the animals.~~ The electrical *stunning* apparatus should incorporate a device that monitors and displays voltage (true RMS) and the applied current (true RMS) and that such devices are regularly calibrated at least annually.

Appropriate measures, such as removing excess wool or wetting the skin only at the point of contact, can be taken to minimise impedance of the skin and facilitate effective *stunning*.

The *stunning* apparatus required for electrical *stunning* should be provided with adequate power to achieve continuously the minimum current level recommended for *stunning* as indicated in the table below:

Species	<del>Minimum current levels</del> <u>Minimum current levels for head-only stunning</u>
Cattle	1.5 amps
Calves ( <u>bovines of less than 6 month of age</u> )	1.0 amps
Pigs	1.25 amps
Sheep and goats	1.0 amps
Lambs	0.7 amps
Ostriches	0.4 amps

In all cases, the correct current level shall be attained within one second of the initiation of stun and maintained at least for three seconds and in accordance with the manufacturer's instructions.

b) Electrical *stunning* of birds using a waterbath

There should be no sharp bends or steep gradients in the shackle line and the shackle line should be as short as possible consistent with achieving acceptable line speeds, and ensuring that birds have settled by the time they reach the water bath. A breast comforter can be used effectively to reduce wing flapping and calm birds. The angle at which the shackle line approaches the entrance to the water bath, and the design of the entrance to the water bath, and the draining of excess 'live' water from the bath are all important considerations in ensuring birds are calm as they enter the bath, do not flap their wings, and do not receive pre-stun electric shocks.

In the case of birds suspended on a moving line, measures should be taken to ensure that the birds are not wing flapping at the entrance of the stunner. The birds should be secure in their shackle, but there should not be undue pressure on their shanks.

Waterbaths for poultry should be adequate in size and depth for the type of bird being slaughtered, and their height should be adjustable to allow for the head of each bird to be immersed. The electrode immersed in the bath should extend the full length of the waterbath.. Birds should be immersed in the bath up to the base of their wings.

The waterbath should be designed and maintained in such a way that when the shackles pass over the water, they are in continuous contact with the earthed rubbing bar.

The control box for the waterbath stunner should incorporate an ammeter which displays the total current flowing through the birds.

The shackle-to-leg contact should be wetted preferably before the birds are inserted in the shackles. In order to improve electrical conductivity of the water it is recommended that salt be added in the waterbath as necessary. Additional salt should be added regularly as a solution to maintain suitable constant concentrations in the waterbath.

Using waterbaths, birds are stunned in groups and different birds will have different impedances. The voltage should be adjusted so that the total current is the required current per bird as shown in the table hereafter, multiplied by the number of birds in the waterbath at the same time. The following values have been found to be satisfactory when employing a 50 Hertz sinusoidal alternating current.

Birds should receive the current for at least 4 seconds.

<b>Species</b>	<b>Current (milliamperes per bird)</b>
Broilers	<del>120</del> 100
Layers (spent hens)	<del>120</del> 100
Turkeys	150
Ducks and Geese	130

While a lower current may also be satisfactory, the current shall in any case be such as to ensure that unconsciousness occurs immediately and lasts until the bird has been killed by cardiac arrest or by bleeding. When higher electrical frequencies are used, higher currents may be required.

## Appendix XXXI (contd)

<u>Frequency (Hz)</u>	<u>Chickens</u>	<u>Turkeys</u>
<u>&lt; 200 Hz</u>	<u>100 mA</u>	<u>250 mA</u>
<u>From 200 to 400 Hz</u>	<u>150 mA</u>	<u>400 mA</u>
<u>From 400 to 1500 Hz</u>	<u>200 mA</u>	<u>400 mA</u>

Every effort shall be made to ensure that no conscious or live birds enter the scalding tank.

In the case of automatic systems, until fail-safe systems of *stunning* and bleeding have been introduced, a manual back-up system should be in place to ensure that any birds which have missed the waterbath stunner and/or the automatic neck-cutter are immediately stunned and/or killed immediately, and they are dead before entering scald tank.

To lessen the number of ~~unstunned~~ birds that have not been effectively stunned reaching neck cutters, steps should be taken to ensure that small birds do not go on the line amongst bigger birds and that these small birds are stunned separately.

#### 4. Gas stunning (under study)

##### a) Stunning of pigs by exposure to carbon dioxide (CO<sub>2</sub>)

The concentration of CO<sub>2</sub> for *stunning* should be preferably 90% by volume but in any case no less than 80% by volume. After entering the *stunning* chamber, the animals should be conveyed to the point of maximum concentration of the gas as rapidly as possible and be kept until they are dead or brought into a state of insensibility which lasts until *death* occurs due to bleeding. Ideally, pigs should be exposed to this concentration of CO<sub>2</sub> for 3 minutes. Sticking should occur as soon as possible after exit from the gas chamber.

In any case, the concentration of the gas should be such that it minimises as far as possible all stress of the animal prior to loss of consciousness.

The chamber in which animals are exposed to CO<sub>2</sub> and the equipment used for conveying them through it shall be designed, constructed and maintained in such a way as to avoid injury or unnecessary stress to the animals. The animal density within the chamber should be such to avoid stacking animals on top of each others.

The conveyor and the chamber shall be adequately lit to allow the animals to see their surroundings and, if possible, each other.

It should be possible to inspect the CO<sub>2</sub> chamber whilst it is in use, and to have access to the animals in emergency cases.

The chamber shall be equipped to continuously measure and display register at the point of *stunning* the CO<sub>2</sub> concentration and the time of exposure, and to give a clearly visible and audible warning if the concentration of CO<sub>2</sub> falls below the required level.

Emergency stunning equipment should be available at the point of exit from the *stunning* chamber and used on any pigs that do not appear to be dead or completely stunned.

##### b) Inert gas mixtures for stunning pigs

Inhalation of high concentrations of carbon dioxide is aversive and can be distressing to animals. Therefore, the use of non-aversive gas mixtures is being developed.

Such gas mixtures include:

- i) a maximum of 2% by volume of oxygen in argon, nitrogen or other inert gases, or
- ii) ~~to~~ a maximum of 30% by volume of carbon dioxide and a maximum of 2% by volume of oxygen in mixtures with carbon dioxide and argon, nitrogen or other inert gases.

Exposure time to the gas mixtures should be sufficient to ensure that no pigs regain consciousness before *death* supervenes through bleeding or cardiac arrest is induced.

c) Gas stunning of poultry

The main objective of gas *stunning* is to avoid the pain and suffering associated with shackling conscious poultry under water bath *stunning* and *killing* systems. Therefore, gas *stunning* should be limited to birds contained in crates or on conveyors only. The gas mixture should be non-aversive to poultry.

Gas *stunning* of poultry in their transport *containers* will eliminate the need for live bird handling at the processing plant and all the problems associated with the electrical *stunning*. Gas *stunning* of poultry on a conveyor eliminates the problems associated with the electrical water bath *stunning*.

Live poultry should be conveyed into the gas mixtures either in transport crates or on conveyor belts.

The following gas procedures have been properly documented for chickens and turkeys but do not necessarily apply for other domestic birds. In any case the procedure should be designed as to ensure that all animals are properly stunned without unnecessary suffering.

- i) Gas mixtures used for *stunning* poultry include:
  - a minimum of 2 minutes exposure to 40% carbon dioxide, 30% oxygen and 30% nitrogen, followed by a minimum of one minute exposure to 80% carbon dioxide in air; or
  - a minimum of 2 minutes exposure to any mixture of argon, nitrogen or other inert gases with atmospheric air and carbon dioxide, provided that the carbon dioxide concentration does not exceed 30% by volume and the residual oxygen concentration does not exceed 2% by volume; or
  - a minimum of 2 minutes exposure to argon, nitrogen, other inert gases or any mixture of these gases in atmospheric air with a maximum of 2% residual oxygen by volume; or
  - a minimum of 2 minutes exposure to a minimum of 55% carbon dioxide in air.
- ii) Requirements for effective use are as follows:
  - Compressed gases should be vaporised prior to administration into the chamber and should be at room temperature to prevent any thermal shock. Under no circumstances, should solid gases with freezing temperatures enter the chamber.
  - Gas mixtures should be humidified.

## Appendix XXXI (contd)

- Appropriate gas concentrations of oxygen and carbon dioxide should be monitored and displayed continuously at the level of the birds inside the chamber to ensure that anoxia ensues.

Under no circumstances, should birds exposed to gas mixtures be allowed to regain consciousness. If necessary, the exposure time should be extended.

5. Bleeding

From the point of view of animal welfare, animals which are stunned with a reversible method should be bled without delay ~~and in any case within the following time limits:~~ Maximum stun-stick interval depends on the parameters of the *stunning* method applied, the species concerned and the bleeding method used (full cut or chest stick when possible). As a consequence, depending on those factors, the slaughterhouse operator should set up a maximum stun-stick interval that ensures that no animals recover consciousness during bleeding. In any case the following time limits should be applied.

<b>Stunning method</b>	<b>Maximum delay for bleeding to be started</b>
Electrical methods and non penetrating captive bolt	20 seconds
CO <sub>2</sub>	60 seconds (after leaving the chamber)

All animals should be bled out by incising both carotid arteries, or the vessels from which they arise (e.g., chest stick). However, when the *stunning* method used cardiac arrest, the incision of all of these *vessels* is not necessary from the point of view of animal welfare.

It should be possible for staff to observe, inspect and access the animals throughout the bleeding period. Any animal showing signs of recovering consciousness should be re-stunned ~~restunned~~.

After incision of the blood vessels, no scalding carcass treatment or dressing procedures should be performed on the animals for at least 30 seconds, or in any case until all brain-stem reflexes have ceased.

## Article 3.7.5.8.

**Summary analysis of acceptable stunning methods and the associated animal welfare issues**

Method	Specific method	AW concerns/implications	Key AW requirements applicable	Species	Comment
Mechanical	Free bullet	Inaccurate targeting and inappropriate ballistics	Operator competence, achieving outright kill with first shot	Cattle, calves, buffalo, deer, horses, pigs (boars and sows)	Personnel safety
	Captive bolt - penetrating	Inaccurate targeting, velocity and diameter of bolt	Competent operation and maintenance of equipment; restraint; accuracy	Cattle, calves, buffalo, sheep, goats, deer, horses, pigs, camelids, ratites	(Unsuitable for specimen collection from TSE suspects). A back-up gun should be available in the event of an ineffective shot
	Captive bolt - non-penetrating	Inaccurate targeting, velocity of bolt, potentially higher failure rate than penetrating captive bolt	Competent operation and maintenance of equipment; restraint; accuracy	Cattle, calves, sheep, goats, deer, pigs, camelids, ratites	Presently available devices are not recommended for young bulls and animals with thick skull. <u>This method should only be used for cattle and sheep when alternative methods are not available.</u>
	Manual percussive blow	Inaccurate targeting; insufficient power; size of instrument	Competent animal handlers; restraint; accuracy. Not recommended for general use	Young and small mammals, ostriches and poultry	Mechanical devices potentially more reliable. Where manual percussive blow is used, unconsciousness should be achieved with single sharp blow delivered to central skull bones
Electrical	Split application: 1. across head then head to chest; 2. across head then across chest	Accidental pre-stun electric shocks; electrode positioning; application of a current to the body while animal conscious; inadequate current and voltage	Competent operation and maintenance of equipment; restraint; accuracy	Cattle, calves, sheep, goats and pigs, ratites and poultry	Systems involving repeated application of head-only or head-to-leg with short current durations (<1 second) in the first application should not be used.

## Appendix XXXI (contd)

**Summary analysis of acceptable stunning methods and the associated animal welfare issues**

<b>Method</b>	<b>Specific method</b>	<b>AW concerns/implications</b>	<b>Key AW requirements applicable</b>	<b>Species</b>	<b>Comment</b>
Electrical	Single application: 1. head only; 2. head to body; 3. head to leg	Accidental pre-stun electric shocks; inadequate current and voltage; wrong electrode positioning; recovery of consciousness	Competent operation and maintenance of equipment; restraint; accuracy	Cattle, calves, sheep, goats, pigs, ratites, poultry	
	Waterbath	Restraint, accidental pre-stun electric shocks; inadequate current and voltage; recovery of consciousness	Competent operation and maintenance of equipment	Poultry only	
Gaseous	CO <sub>2</sub> air/O <sub>2</sub> mixture; CO <sub>2</sub> inert gas mixture	Aversiveness of high CO <sub>2</sub> concentrations, respiratory distress; inadequate exposure	Concentration; duration of exposure; design, maintenance and operation of equipment; stocking density management	Pigs, poultry	
	Inert gases	Recovery of consciousness	Concentration; duration of exposure; design, maintenance and operation of equipment; stocking density management	Pigs, poultry	

## Article 3.7.5.9.

**Summary analysis of acceptable slaughter methods and the associated animal welfare issues**

<b>Slaughter methods</b>	<b>Specific method</b>	<b>AW concerns / implications</b>	<b>Key requirements</b>	<b>Species</b>	<b>Comments</b>
Bleeding out by severance of blood vessels in the neck without stunning	Full frontal cutting across the throat	Failure to cut both common carotid arteries; occlusion of cut arteries.	<u>High level of operator competency.</u> A very sharp blade or knife, of sufficient length so that the point of the knife remains outside the incision during the cut; the point of the knife should not be used to make the incision. An incision which does not close over the knife during the throat cut.	Cattle, buffalo, horses, camelids, sheep, goats, poultry, ratites	<u>No further procedure should be carried out before the bleeding out is completed (i.e. at least 60 seconds for mammals).</u> <u>The practice to remove hypothetical blood clots just after the bleeding should be discouraged since this may increase animal suffering.</u>
Bleeding with prior stunning	Full frontal cutting across the throat	Failure to cut both common carotid arteries; occlusion of cut arteries; pain during and after the cut.	A very sharp blade or knife, of sufficient length so that the point of the knife remains outside the incision during the cut; the point of the knife should not be used to make the incision. An incision which does not close over the knife during the throat cut.	Cattle, buffalo, horses, camelids, sheep, goats,	
	Neck stab followed by forward cut	Ineffective stunning; failure to cut both common carotid arteries; impaired blood flow; delay in cutting after reversible stunning	Prompt and accurate cutting	Camelids, sheep, goats, poultry, ratites	
	Neck stab alone	Ineffective stunning; failure to cut both common carotid arteries; impaired blood flow; delay in cutting after reversible stunning	Prompt and accurate cutting	Camelids, sheep, goats, poultry, ratites	

## Appendix XXXI (contd)

**Summary analysis of acceptable slaughter methods and the associated animal welfare issues (contd)**

<b>Slaughter methods</b>	<b>Specific method</b>	<b>AW concerns / implications</b>	<b>Key requirements</b>	<b>Species</b>	<b>Comments</b>
Bleeding with prior stunning (contd)	Chest stick into major arteries or hollow-tube knife into heart	Ineffective stunning; Inadequate size of stick wound inadequate length of sticking knife; delay in sticking after reversible stunning	Prompt and accurate sticking	Cattle, sheep, goats, pigs	
	Neck skin cut followed by severance of vessels in the neck	Ineffective stunning; Inadequate size of stick wound; Inadequate length of sticking knife; delay in sticking after reversible stunning	Prompt and accurate cutting of vessels	Cattle	
Bleeding with prior stunning	Automated mechanical cutting	Ineffective stunning; failure to cut and misplaced cuts. Recovery of consciousness following reversible stunning systems	Design, maintenance and operation of equipment; accuracy of cut; manual back-up	Poultry only	
	Manual neck cut on one side	Ineffective stunning; recovery of consciousness following reversible stunning systems	Prior non-reversible stunning	Poultry only	N.B. slow induction of unconsciousness under slaughter without stunning
	Oral cut	Ineffective stunning; recovery of consciousness following reversible stunning systems	Prior non-reversible stunning	Poultry only	N.B. slow induction of unconsciousness in non-stun systems

**Summary analysis of acceptable slaughter methods and the associated animal welfare issues**

<b>Slaughter methods</b>	<b>Specific method</b>	<b>AW concerns / implications</b>	<b>Key requirements</b>	<b>Species</b>	<b>Comments</b>
Other methods without stunning	Decapitation with a sharp knife	Pain due to loss of consciousness not being immediate		Sheep, goats, poultry	This method is only applicable to Jhatka slaughter
	Manual neck dislocation and decapitation	Pain due to loss of consciousness not being immediate; difficult to achieve in large birds	Neck dislocation should be performed in one stretch to sever the spinal cord	Poultry only	Slaughter by neck dislocation should be performed in one stretch to sever the spinal cord. <u>Acceptable only when slaughtering small numbers of small birds</u>
Cardiac arrest in a waterbath electric stunner	Bleeding by evisceration		Induction of cardiac arrest	Quail	
	Bleeding by neck cutting			Poultry	

**Methods, procedures or practices unacceptable on animal welfare grounds**

1. The restraining methods which work through immobilisation by injury such as breaking legs, ~~and~~ leg tendon cutting, and severing the spinal cord (e.g. using a puntilla or dagger) cause severe pain and stress in animals. Those methods are not acceptable in any species.
2. The use of the electrical *stunning* method with a single application leg to leg is ineffective and unacceptable in any species. ~~as it is likely to be painful. The animal welfare concerns are:~~
  - a) ~~accidental pre-stun electric shocks;~~
  - b) ~~inadequate current and voltage;~~
  - e) ~~wrong electrode positioning;~~
  - d) ~~recovery of consciousness.~~
3. The slaughter method of brain stem severance by piercing through the eye socket or skull bone without prior *stunning*, is not acceptable in any species.

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## APPENDIX 3.7.6.

**GUIDELINES FOR THE KILLING OF ANIMALS FOR DISEASE CONTROL PURPOSES**

## Article 3.7.6.1.

**General principles**

These guidelines are based on the premise that a decision to kill the animals has been made, and address the need to ensure the welfare of the animals until they are dead.

1. All personnel involved in the humane *killing* of animals should have the relevant skills and competencies. Competence may be gained through formal training and/or practical experience.
2. As necessary, operational procedures should be adapted to the specific circumstances operating on the premises and should address, apart from animal welfare, aesthetics of the method of euthanasia, cost of the method, operator safety, biosecurity and environmental aspects, aesthetics of the method of euthanasia and cost of the method.
3. Following the decision to kill the animals, *killing* should be carried out as quickly as possible and normal husbandry should be maintained until the animals are killed.
4. The handling and movement of animals should be minimised and when done, it should be done in accordance with the guidelines described below.
5. Animal *restraint* should be sufficient to facilitate effective *killing*, and in accordance with animal welfare and operator safety requirements; when *restraint* is required, *killing* should follow with minimal delay.
6. When animals are killed for disease control purposes, methods used should result in immediate death or immediate loss of consciousness lasting until death; when loss of consciousness is not immediate, induction of unconsciousness should be non-aversive and should not cause anxiety, pain, distress or suffering in the animals.
7. For animal welfare considerations, young animals should be killed before older animals; for biosecurity considerations, infected animals should be killed first, followed by in-contact animals, and then the remaining animals.
8. There should be continuous monitoring of the procedures by the *Competent Authorities* to ensure they are consistently effective with regard to animal welfare, operator safety and biosecurity.
9. When the operational procedures are concluded, there should be a written report describing the practices adopted and their effect on animal welfare, operator safety and biosecurity.
10. These general principles should also apply when animals need to be killed for other purposes such as after natural disasters or for culling animal populations.

Appendix XXXII (contd)

## Article 3.7.6.2.

**Organisational structure**

Disease control contingency plans should be in place at a national level and should contain details of management structure, disease control strategies and operational procedures; animal welfare considerations should be addressed within these disease control contingency plans. The plans should also include a strategy to ensure that an adequate number of personnel competent in the humane *killing* of animals is available. Local level plans should be based on national plans and be informed by local knowledge.

Disease control contingency plans should address the animal welfare issues that may result from animal movement controls.

The operational activities should be led by an *official veterinarian* who has the authority to appoint the personnel in the specialist teams and ensure that they adhere to the required animal welfare and biosecurity standards. When appointing the personnel, he/she should ensure that the personnel involved ~~has~~ have the required competencies.

The *official veterinarian* should be responsible for all activities across one or more affected premises and should be supported by coordinators for planning (including communications), operations and logistics to facilitate efficient operations.

The *official veterinarian* should provide overall guidance to personnel and logistic support for operations on all affected premises to ensure consistency in adherence to the OIE animal welfare and animal health guidelines.

A specialist team, led by a team leader answerable to the *official veterinarian*, should be deployed to work on each affected premises. The team should consist of personnel with the competencies to conduct all required operations; in some situations, personnel may be required to fulfil more than one function. Each team should contain a *veterinarian* or have access to veterinary advice at all times.

In considering the animal welfare issues associated with the *killing* of animals, the key personnel, their responsibilities and competencies required are described in Article 3.7.6.3.

## Article 3.7.6.3.

**Responsibilities and competencies of the specialist team**1. Team leader

## a) Responsibilities:

- i) plan overall operations on ~~an~~ affected premises;
- ii) determine and address requirements for animal welfare, operator safety and biosecurity;
- iii) organise, brief and manage team of people to facilitate humane *killing* of the relevant animals on the premises in accordance with national regulations and these guidelines;
- iv) determine logistics required;
- v) monitor operations to ensure animal welfare, operator safety and biosecurity requirements are met;

- vi) report upwards on progress and problems;
  - vii) provide a written report at the conclusion of the *killing*, describing the practices adopted and their effect on the animal welfare, operator safety and biosecurity outcomes.
- b) Competencies
- i) appreciation of normal animal husbandry practices;
  - ii) appreciation of animal welfare and the underpinning behavioural, anatomical and physiological processes involved in the *killing* process;
  - iii) skills to manage all activities on premises and deliver outcomes on time;
  - iv) awareness of psychological effects on farmers, team members and general public;
  - v) effective communication skills;
  - vi) appreciation of the environmental impacts caused by their operation.
2. Veterinarian
- a) Responsibilities
- i) determine and ~~implement~~ supervise the implementation of the most appropriate *killing* method to ensure that animals are killed without avoidable pain and distress;
  - ii) determine and implement the additional requirements for animal welfare, including the order of *killing*;
  - iii) ensure that confirmation of animals deaths is carried out by competent persons at appropriate times after the *killing* procedure;
  - iv) minimise the risk of disease spread within and from the premises through the supervision of biosecurity procedures;
  - v) continuously monitor animal welfare and biosecurity procedures;
  - vi) in cooperation with the leader, prepare a written report at the conclusion of the *killing*, describing the practices adopted and their effect on animal welfare.
- b) Competencies
- i) ability to assess animal welfare, especially the effectiveness of *stunning* and *killing*, and to correct any deficiencies;
  - ii) ability to assess biosecurity risks.
3. Animal handlers
- a) Responsibilities
- i) review on-site facilities in terms of their appropriateness;

Appendix XXXII (contd)

- ii) design and construct temporary animal handling facilities, when required;
  - iii) move and restrain animals;
  - iv) continuously monitor animal welfare and biosecurity procedures.
- b) Competencies
- i) animal handling in emergency situations and in close confinement is required;
  - ii) an appreciation of biosecurity and containment principles.
4. Animal killing personnel
- a) Responsibilities
- Humane *killing* of the animals through effective *stunning* and *killing* should be ensured.
- b) Competencies
- i) when required by regulations, licensed to use necessary equipment;
  - ii) competent to use and maintain relevant equipment;
  - iii) competent to use techniques for the species involved;
  - iv) competent to assess effective *stunning* and *killing*.
5. Carcass disposal personnel
- a) Responsibilities
- An efficient carcass disposal (to ensure *killing* operations are not hindered) should be ensured.
- b) Competencies
- The personnel should be competent to use and maintain available equipment and apply techniques for the species involved.
6. Farmer/owner/manager
- a) Responsibilities
- i) assist when requested.
- b) Competencies
- i) specific knowledge of his/her animals and their environment.

Article 3.7.6.4.

### **Considerations in planning the humane killing of animals**

Many activities will need to be conducted on affected premises, including the humane *killing* of animals. The team leader should develop a plan for humanely *killing* animals on the premises which should include consideration of:

1. minimising handling and movement of animals;
2. *killing* the animals on the affected 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 an *abattoir*, the guidelines in Appendix 3.7.6. on *slaughter* of animals ~~for human consumption~~ should be followed;
3. the species, number, age and size of animals to be killed, and the order of *killing* them;
4. methods of *killing* the animals, and their cost;
5. housing, husbandry, ~~and~~ location of the animals, as well as accessibility of the farm;
6. 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;
7. the facilities available on the premises that will assist with the *killing* including any additional facilities that may need to be brought on and then removed from the premises;
8. biosecurity and environmental issues;
9. the health and safety of personnel conducting the *killing*;
10. any legal issues that may be involved, for example where restricted veterinary drugs or poisons may be used, or where the process may impact on the environment; ~~and~~
11. the presence of other nearby premises holding animals;
12. possibilities for removal, disposal and destruction of carcasses.

The plan should minimise the negative welfare impacts of the killing by taking into account the different phases of the procedures to be applied for killing (choice of the killing sites, killing methods, etc.) and the measures restricting the movements of the animals.

#### Competences and skills of the personnel handling and killing animals

In designing a *killing* plan, it is essential that the method chosen be consistently reliable to ensure that all animals are humanely and quickly killed.

## Appendix XXXII (contd)

## Article 3.7.6.5.

**Table summarising killing methods described in Articles 3.7.6.6.-3.7.6.17.**

Species	Age range	Procedure	Restraint necessary	Animal welfare concerns with inappropriate application	Article reference
Cattle	all	free bullet	no	non-lethal wounding	3.7.6.6.
	all except neonates	captive bolt - penetrating, followed by pithing or bleeding	yes	ineffective stunning	3.7.6.7.
	adults only	captive bolt - non-penetrating, followed by bleeding	yes	ineffective stunning, regaining of consciousness before killing	3.7.6.8.
	calves only	electrical, two stage application	yes	pain associated with cardiac arrest after ineffective stunning	3.7.6.10.
	calves only	electrical, single application (method 1)	yes	ineffective stunning	3.7.6.11.
	all	injection with barbiturates and other drugs	yes	non-lethal dose, pain associated with injection site	3.7.6.15.
Sheep and goats	all	free bullet	no	non-lethal wounding	3.7.6.6.
	all except neonates	captive bolt - penetrating, followed by pithing or bleeding	yes	ineffective stunning, regaining of consciousness before death	3.7.6.7.
	all except neonates	captive bolt - non-penetrating, followed by bleeding	yes	ineffective stunning, regaining of consciousness before death	3.7.6.8.
	neonates	captive bolt - non-penetrating	yes	non-lethal wounding	3.7.6.8.
	all	electrical, two stage application	yes	pain associated with cardiac arrest after ineffective stunning	3.7.6.10.
	all	electrical, single application (Method 1)	yes	ineffective stunning	3.7.6.11.
	neonates only	CO <sub>2</sub> / air mixture	yes	slow induction of unconsciousness, aversiveness of induction	3.7.6.12.
	neonates only	nitrogen and/or inert gas mixed with CO <sub>2</sub>	yes	slow induction of unconsciousness, aversiveness of induction	3.7.6.13.

## Appendix XXXII (contd)

Species	Age range	Procedure	Restraint Necessary	Animal welfare concerns with inappropriate application	Article reference
Sheep and goats (contd)	neonates only	nitrogen and/or inert gases	yes	slow induction of unconsciousness,	3.7.6.14.
	all	injection of barbiturates and other drugs	yes	non-lethal dose, pain associated with injection site	3.7.6.15.
Pigs	all, <u>except neonates</u>	free bullet	no	Non-lethal wounding	3.7.6.6.
	all except neonates	captive bolt - penetrating, followed by pithing or bleeding	yes	ineffective stunning, regaining of consciousness before death	3.7.6.7.
	neonates only	captive bolt - non-penetrating	yes	Non-lethal wounding	3.7.6.8.
	all §	electrical, two stage application	yes	pain associated with cardiac arrest after ineffective stunning	3.7.6.10.
	all	electrical, single application (Method 1)	yes	ineffective stunning	3.7.6.11.
	neonates only	CO <sub>2</sub> / air mixture	yes	slow induction of unconsciousness, aversiveness of induction	3.7.6.12.
	neonates only	nitrogen and/or inert gas mixed with CO <sub>2</sub>	yes	slow induction of unconsciousness, aversiveness of induction	3.7.6.13.
	neonates only	nitrogen and/or inert gases	yes	slow induction of unconsciousness,	3.7.6.14.
	all	injection with barbiturates and other drugs	yes	non-lethal dose, pain associated with injection site	3.7.6.15.
Poultry	adults only	captive bolt - non-penetrating	yes	ineffective stunning	3.7.6.8.
	day-olds and eggs only	Maceration	no	non-lethal wounding, non-immediacy;	3.7.6.9.
	adults only	electrical single application (Method 2)	yes	ineffective stunning	3.7.6.11.
	adults only	electrical single application, followed by killing (Method 3)	yes	ineffective stunning; regaining of consciousness before death	3.7.6.11.

Appendix XXXII (contd)

Species	Age range	Procedure	Restraint necessary	Animal welfare concerns with inappropriate application	Article reference
Poultry (contd)	all	CO <sub>2</sub> / air mixture Method 1 Method 2	yes no	slow induction of unconsciousness, aversiveness of induction	3.7.6.12.
	all	nitrogen and/or inert gas mixed with CO <sub>2</sub>	yes	slow induction of unconsciousness, aversiveness of induction	3.7.6.13.
	all	nitrogen and/or inert gases	yes	slow induction of unconsciousness	3.7.6.14.
	all	injection of barbiturates and other drugs	yes	Non-lethal dose, pain associated with injection site	3.7.6.15.
	adults only	addition of anaesthetics to feed or water, followed by an appropriate killing method	no	ineffective or slow induction of unconsciousness	3.7.6.16.

- The methods are described in the order of mechanical, electrical and gaseous, not in an order of desirability from an animal welfare viewpoint.
- § The only preclusion against the use of this method for neonates is the design of the stunning tongs that may not facilitate their application across such a small-sized head/body.

Article 3.7.6.6.

### Free bullet

#### 1. Introduction

- a) A free bullet is a projectile fired from a shotgun, rifle, handgun or purpose-made humane killer.
- b) The most commonly used firearms for close range use are:
  - i) humane killers (specially manufactured/adapted single-shot weapons);
  - ii) shotguns (12, 16, 20, 28 bore and .410);
  - iii) rifles (.22 rimfire);
  - iv) handguns (various calibres from .32 to .45).
- c) The most commonly used firearms for long range use are rifles (.22, .243, .270 and .308).
- d) A free bullet used from long range should be aimed to penetrate the skull or soft tissue at the top of the neck of the animal (high neck shot), to cause irreversible concussion and death and should only be used by properly trained and competent marksmen.

## 2. Requirements for effective use

- a) The marksman should take account of human safety in the area in which he/she is operating. Appropriate vision and hearing protective devices should be worn by all personnel involved.
- b) The marksman 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 ~~animal's~~ head of the animal.
- c) The correct cartridge, calibre and type of bullet for the different species age and size should be used. Ideally the ammunition should expand upon impact and dissipate its energy within the cranium.
- d) Shot animals should be checked to ensure the absence of brain stem reflexes.

**Figure 1.** The optimum shooting position for cattle is at the intersection of two imaginary lines drawn from the rear of the eyes to the opposite horn buds.



Figure Source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire, AL4 8AN, United Kingdom ([www.hsa.org.uk](http://www.hsa.org.uk)).

**Figure 2** The optimum position for hornless sheep and goats is on the midline, with the shot aiming at the angle of the jaw.

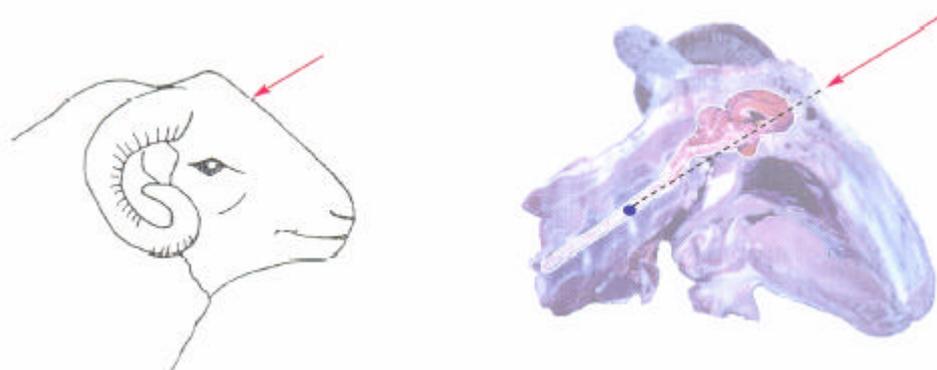


Figure Source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire, AL4 8AN, United Kingdom ([www.hsa.org.uk](http://www.hsa.org.uk)).

Appendix XXXII (contd)

**Figure 3.** The optimum shooting position for heavily horned sheep and horned goats is behind the poll aiming towards the angle of the jaw.

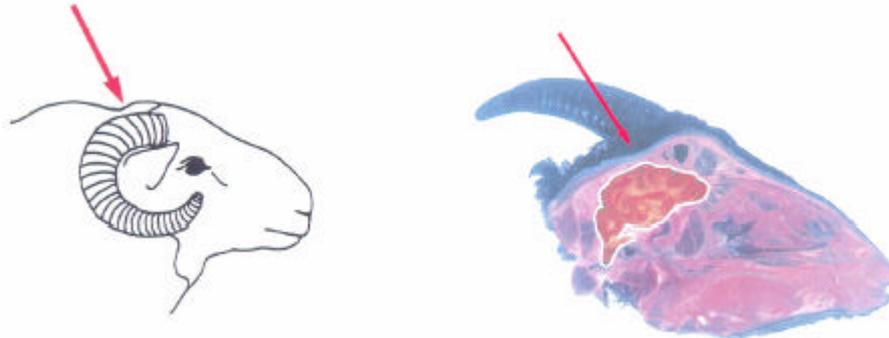


Figure Source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire, AL4 8AN, United Kingdom ([www.hsa.org.uk](http://www.hsa.org.uk)).

**Figure 4.** The optimum shooting position for pigs is just above eye level, with the shot directed down the line of the spinal cord.



Figure Source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire, AL4 8AN, United Kingdom ([www.hsa.org.uk](http://www.hsa.org.uk)).

### 3. Advantages

- a) Used properly, a free bullet provides a quick and effective method for *killing*.
- b) It requires minimal or no *restraint* and can be use to kill from a distance by properly trained and competent marksmen.
- c) It is suitable for *killing* agitated animals in open spaces.

#### 4. Disadvantages

- a) The method is potentially dangerous to humans and other animals in the area.
- b) It has the potential for non-lethal wounding.
- c) Destruction of brain tissue may preclude diagnosis of some diseases.
- d) Leakage of bodily fluids may present a biosecurity risk.
- e) Legal requirements may preclude or restrict use.
- f) There is a limited availability of competent personnel.

#### 4. Conclusions

The method is suitable for cattle, sheep, goats and pigs, including large animals in open spaces.

Article 3.7.6.7.

### **Penetrating captive bolt**

#### 1. Introduction

A penetrating captive bolt is fired from a gun powered by either compressed air or a blank cartridge. There is no free projectile.

The captive bolt should be aimed on the skull in a position to penetrate the cortex and mid-brain of the animal. The impact of the bolt on the skull produces unconsciousness. Physical damage to the brain caused by penetration of the bolt may result in death, however pithing or bleeding should be performed as soon as possible after the shot to ensure the death of the animal.

#### 2. Requirements for effective use

- a) 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 ~~manufacturer's~~ recommendations of the manufacturer.
- b) Captive bolt guns should be frequently cleaned and maintained in good working condition.
- c) 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.
- d) Animals should be restrained; at a minimum they should be penned for cartridge powered guns and in a race for compressed air guns.
- e) The operator should ensure that the ~~animal's~~ head of the animal is accessible.
- f) The operator should fire the captive bolt at right angles to the skull in the optimal position (see figures 1, 3 & 4. The optimum shooting position for hornless sheep is on the highest point of the head, on the midline and aim towards the angle of the jaw).
- g) To ensure the death of the animal, pithing or bleeding should be performed as soon as possible after *stunning*.

Appendix XXXII (contd)

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

3. Advantages

- a) Mobility of cartridge powered equipment reduces the need to move animals.
- b) The method induces an immediate onset of a sustained period of unconsciousness.

4. Disadvantages

- a) Poor gun maintenance and misfiring, and inaccurate gun positioning and orientation may result in poor animal welfare.
- b) Post stun convulsions may make pithing difficult and hazardous.
- c) The method is difficult to apply in agitated animals.
- d) Repeated use of a cartridge powered gun may result in over-heating.
- e) Leakage of bodily fluids may present a biosecurity risk.
- f) Destruction of brain tissue may preclude diagnosis of some diseases.

5. Conclusions

The method is suitable for cattle, sheep, goats and pigs (except neonates), when followed by pithing or bleeding.

Article 3.7.6.8.

**Captive bolt – non-penetrating**1. Introduction

A non-penetrating captive bolt is fired from a gun powered by either compressed air or a blank cartridge. There is no free projectile.

The gun should be placed on the front of the skull to deliver a percussive blow which produces unconsciousness in cattle (adults only), sheep, goats and pigs, and death in poultry and neonate sheep, goats and pigs. Bleeding should be performed as soon as possible after the blow to ensure the death of the animal.

2. Requirements for effective use

- a) For cartridge powered and compressed air guns, the bolt velocity should be appropriate to the species and type of animal, in accordance with the ~~manufacturer's~~ recommendations of the manufacturer.
- b) Captive bolt guns should be frequently cleaned and maintained in good working condition.
- c) 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.

Appendix XXXII (contd)

- d) Animals should be restrained; at a minimum mammals should be penned for cartridge powered guns and in a race for compressed air guns; birds should be restrained in cones, shackles, crushes or by hand.
- e) The operator should ensure that the ~~animal's~~ head of the animal is accessible.
- f) The operator should fire the captive bolt at right angles to the skull in the optimal position (figures 1-4).
- g) To ensure death in non-neonate mammals, bleeding should be performed as soon as possible after *stunning*.
- h) Animals should be monitored continuously after *stunning* until death to ensure the absence of brain stem reflexes.

3. Advantages

- a) The method induces an immediate onset of unconsciousness, and death in birds and neonate mammals.
- b) Mobility of equipment reduces the need to move animals.

4. Disadvantages

- a) As consciousness can be regained quickly in non-neonate mammals, they should be bled as soon as possible after *stunning*.
- b) Laying hens in cages have to be removed from their cages and most birds have to be restrained.
- c) Poor gun maintenance and misfiring, and inaccurate gun positioning and orientation may result in poor animal welfare.
- d) Post stun convulsions may make bleeding difficult and hazardous.
- e) Difficult to apply in agitated animals; such animals may be sedated in advance of the *killing* procedure.
- f) Repeated use of a cartridge powered gun may result in over-heating.
- g) Bleeding may present a biosecurity risk.

5. Conclusions

- a) The method is suitable for poultry, and neonate sheep, goats and pigs up to a maximum weight of 10 kg.
- b) ~~If bleeding does not present a biosecurity issue, this is a suitable method for cattle (adults only), and non-neonatal sheep, goats and pigs when followed by bleeding.~~

Appendix XXXII (contd)

## Article 3.7.6.9.

**Maceration**1. Introduction

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

2. Requirements

- a) Maceration requires specialised equipment which should be kept in excellent working order.
- b) The rate of introducing the birds should not allow the equipment to jam, birds to rebound from the blades or the birds to suffocate before they are macerated.

3. Advantages

- a) Procedure results in immediate death.
- b) Large numbers can be killed quickly.

4. Disadvantages

- a) Specialised equipment is required.
- b) Macerated tissues may present a biosecurity ~~issue~~ or human health risks.
- c) The cleaning of the equipment can be a source of contamination.

5. Conclusion

The method is suitable for *killing* day-old poultry and embryonated eggs.

## Article 3.7.6.10.

**Electrical – two-stage application**1. Introduction

A two stage application of electric current comprises firstly an application of current to the head by scissor-type tongs, 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. The second stage (the application of low frequency current across the chest) should only be applied to unconscious animals to prevent unacceptable levels of pain.

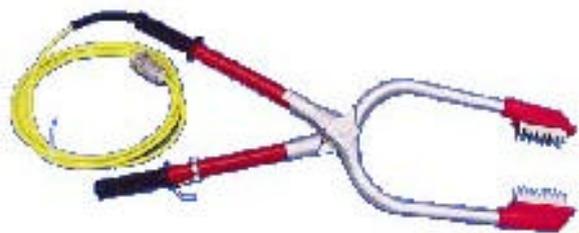


Figure 5. Scissor-type stunning tongs.

## 2. Requirements for effective use

- a) The stunner control device should generate a low frequency ~~(30—60 Hz)~~ (AC sine wave 50 Hz) current with a minimum voltage of ~~250 volts true RMS under load~~. and current as set out in the following table:

<u>Animal</u>	<u>Minimum voltage (V)</u>	<u>Minimum current (A)</u>
<u>Cattle</u>	<u>220</u>	<u>1.5</u>
<u>Sheep</u>	<u>220</u>	<u>1.0</u>
<u>Pigs &gt; 6 weeks</u>	<u>220</u>	<u>1.3</u>
<u>Pigs &lt; 6 weeks</u>	<u>125</u>	<u>0.5</u>

- b) Appropriate protective clothing (including rubber gloves and boots) should be worn.
- c) Animals should be restrained, at a minimum free-standing in a pen, close to an electrical supply.
- d) Two team members are required, the first to apply the electrodes and the second to manipulate the position of the animal to allow the second application to be made.
- e) A *stunning* current should be applied via scissor-type stunning tongs in a position that spans the brain for a minimum of 3 seconds; immediately following the application to the head, the electrodes should be transferred to a position that spans the heart and the electrodes applied for a minimum of 3 seconds.
- f) Electrodes should be cleaned regularly and after use, to enable optimum electrical contact to be maintained.
- g) Animals should be monitored continuously after *stunning* until death to ensure the absence of brain stem reflexes.
- h) Electrodes should be applied firmly for the intended duration of time and pressure not released until the stun is complete.

## 3. Advantages

- a) The application of the second stage minimises post-stun convulsions and therefore the method is particularly effective with pigs.
- b) Non-invasive technique minimises biosecurity risk.

## 4. Disadvantages

- a) The method requires a reliable supply of electricity.
- b) The electrodes must be applied and maintained in the correct positions to produce an effective stun and kill.
- c) Most stunner control devices utilise low voltage impedance sensing as an electronic switch prior to the application of high voltages; in unshorn sheep, contact impedance may be too high to switch on the required high voltage (especially during stage two).
- d) The procedure may be physically demanding, leading to operator fatigue and poor electrode placement.

Appendix XXXII (contd)5. Conclusion

The method is suitable for calves, sheep and goats, and especially for pigs (over one week of age).

Article 3.7.6.11.

**Electrical – single application**1. Method 1

Method 1 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, the animal will not recover consciousness.

- a) Requirements for effective use
  - i) The stunner control device should generate a low frequency (30 – 60 Hz) current with a minimum voltage of 250 volts true RMS under load.
  - ii) Appropriate protective clothing (including rubber gloves and boots) should be worn.
  - iii) Animals should be individually and mechanically restrained close to an electrical supply as the maintenance of physical contact between the *stunning* electrodes and the animal is necessary for effective use.
  - iv) The rear electrode should be applied to the back, above or behind the heart, and then the front electrode in a position that is forward of the eyes, with current applied for a minimum of 3 seconds.
  - v) Electrodes should be cleaned regularly between animals and after use, to enable optimum electrical contact to be maintained.
  - vi) Water or saline may be necessary to improve electrical contact with sheep.
  - vii) An effective stun and kill should be verified by the absence of brain stem reflexes.
- b) Advantages
  - i) Method 1 stuns and kills simultaneously.
  - ii) It minimises post-stun convulsions and therefore is particularly effective with pigs.
  - iii) A single team member only is required for the application.
  - iv) Non-invasive technique minimises biosecurity risk.
- c) Disadvantages
  - i) Method 1 requires individual mechanical animal *restraint*.
  - ii) The electrodes must be applied and maintained in the correct positions to produce an effective stun and kill.

iii) Method 1 requires a reliable supply of electricity.

d) Conclusion

Method 1 is suitable for calves, sheep, goats, and pigs (over 1 week of age).

2. Method 2

Method 2 stuns and kills by drawing inverted and shackled poultry through an electrified waterbath stunner. Electrical contact is made between the 'live' water and earthed shackle and, when sufficient current is applied, poultry will be simultaneously stunned and killed.

a) Requirements for effective use

i) A mobile waterbath stunner and a short loop of processing line are required.

ii) A low frequency (~~30~~50-60 Hz) current applied for a minimum of 3 seconds is necessary to stun and kill the birds.

iii) Poultry need to be manually removed from their cage, house or yard, inverted and shackled onto a line which conveys them through a waterbath stunner with their heads fully immersed.

iv) The required minimum currents to stun and kill dry birds are:

- Quail - 100 mA/bird
- Chickens – 160 mA/bird
- Ducks & Geese – 200 mA/bird
- Turkeys – 250 mA/bird.

A higher current is required for wet birds.

v) An effective stun and kill should be verified by the absence of brain stem reflexes.

b) Advantages

i) Method 2 stuns and kills simultaneously.

ii) It is capable of processing large numbers of birds reliably and effectively.

iii) This non-invasive technique minimises biosecurity risk.

c) Disadvantages

i) Method 2 requires a reliable supply of electricity.

ii) Handling, inversion and shackling of birds are required.

d) Conclusion

Method 2 is suitable for large numbers of poultry.

Appendix XXXII (contd)3. Method 3

Method 3 comprises the single application of sufficient electrical current to the head of poultry in a position that spans the brain, causing unconsciousness; this is followed by a *killing* method (Article 3.7.6.17.).

## a) Requirements for effective use

- i) The stunner control device should generate sufficient current (more than 600 mA/ duck, more than 300 mA/bird) to stun.
- ii) Appropriate protective clothing (including rubber gloves and boots) should be worn.
- iii) Birds should be restrained, at a minimum manually, close to an electrical supply.
- ~~iv) A *stunning* current should be applied in a position that spans the brain for a minimum of 3 seconds; immediately following this application, the birds should be killed (Article 3.7.6.17.).~~
- iv) Electrodes should be cleaned regularly and after use, to enable optimum electrical contact to be maintained.
- vi) Birds should be monitored continuously after *stunning* until death to ensure the absence of brain stem reflexes.

## b) Advantages

Non-invasive technique (when combined with cervical dislocation) minimises biosecurity risk.

## c) Disadvantages

- i) Method 3 requires a reliable supply of electricity and is not suitable for large-scale operations.
- ii) The electrodes must be applied and maintained in the correct position to produce an effective stun.
- iii) Birds must be individually restrained.
- iv) It must be followed by a *killing* method.

## d) Conclusion

Method 3 is suitable for small numbers of poultry.

Article 3.7.6.12.  
(under study)

## CO<sub>2</sub> / air mixture

### 1. Introduction

Controlled atmosphere *killing* is performed by exposing animals to a predetermined gas mixture, either by placing them in a gas-filled *container* or apparatus (Method 1) or by the gas being introduced into a poultry house (Method 2). Method 2 should be used whenever possible, as it eliminates welfare issues resulting from the need to manually remove live birds.

Inhalation of carbon dioxide (CO<sub>2</sub>) induces respiratory and metabolic acidosis and hence reduces the pH of cerebrospinal fluid (CSF) and neurones thereby causing unconsciousness and, after prolonged exposure, death.

### 2. Method 1

The animals are placed in a gas-filled *container* or apparatus.

- a) Requirements for effective use in a *container* or apparatus
  - i) *Containers* or apparatus should allow the required gas concentration to be maintained and accurately measured.
  - ii) When animals are exposed to the gas individually or in small groups in a *container* or apparatus, 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.
  - iii) ~~Animals should be~~ can also be introduced ~~into the container or apparatus after it has been filled with the required CO<sub>2</sub> concentration, and held in this atmosphere until death is confirmed.~~ to low concentrations [as low concentrations are not aversive] and the concentration could be increased afterwards and the animals then held in the higher concentration until death is confirmed.
  - iv) Team members should ensure that there is sufficient time allowed for each batch of animals to die before subsequent ones are introduced into the *container* or apparatus.
  - iv) *Containers* or apparatus should not be overcrowded and measures are needed to avoid animals suffocating by climbing on top of each other.
- b) Advantages
  - i) CO<sub>2</sub> is readily available.
  - ii) Application methods are simple.
- c) Disadvantages
  - i) The need for properly designed *container* or apparatus.
  - ii) The aversive nature of high CO<sub>2</sub> concentrations.

Appendix XXXII (contd)

- iii) No immediate loss of consciousness.
- iv) The risk of suffocation due to overcrowding.
- v) Difficulty in verifying death while the animals are in the *container* or apparatus.

## d) Conclusion

Method 1 is suitable for use in poultry and neonatal sheep, goats and pigs.

3. Method 2

The gas is introduced into a poultry house.

## a) Requirements for effective use in a poultry house

- i) Prior to introduction of the CO<sub>2</sub> the poultry house should be appropriately sealed to allow control over the gas concentration.
- ii) The house should be gradually filled with CO<sub>2</sub> so that all birds are exposed to a concentration of >40% until they are dead; a vaporiser may be required to prevent freezing.
- iii) Devices should be used to accurately measure the gas concentration at the maximum height accommodation of birds.

## b) Advantages

- i) Applying gas to birds *in situ* eliminates the need to manually remove live birds.
- ii) CO<sub>2</sub> is readily available.
- iii) Gradual raising of CO<sub>2</sub> concentration minimises the aversiveness of the induction of unconsciousness.

## c) Disadvantages

- i) It is difficult to determine volume of gas required to achieve adequate concentrations of CO<sub>2</sub> in some poultry houses.
- ii) It is difficult to verify death while the birds are in the poultry house.

## d) Conclusion

Method 2 is suitable for use in poultry in closed-environment sheds.

Article 3.7.6.13.

**Nitrogen and/or inert gas mixed with CO<sub>2</sub>**1. Introduction

CO<sub>2</sub> may be mixed in various proportions with nitrogen or an inert gas (e.g., argon), and the inhalation of such mixtures leads to hypercapnic-hypoxia and death when the oxygen concentration by volume is =2%. This method involves the introduction of animals into a *container* or apparatus containing the gases. Such mixtures do not induce immediate loss of consciousness, therefore the aversiveness of various gas mixtures containing high concentrations of CO<sub>2</sub> and the respiratory distress occurring during the induction phase, are important animal welfare considerations.

Pigs and poultry appear not to find low concentrations of CO<sub>2</sub> strongly aversive, and a mixture of nitrogen or argon with =30% CO<sub>2</sub> by volume and =2% O<sub>2</sub> by volume can be used for *killing* poultry and neonatal sheep, goats and pigs.

## 2. Requirements for effective use

- a) *Containers* or apparatus should allow the required gas concentrations to be maintained, and the O<sub>2</sub> and CO<sub>2</sub> concentrations accurately measured during the *killing* procedure.
- b) When animals are exposed to the gases individually or in small groups in a *container* or apparatus, 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.
- c) Animals should be introduced into the *container* or apparatus after it has been filled with the required gas concentrations (with =2% O<sub>2</sub>), and held in this atmosphere until death is confirmed.
- d) Team members should ensure that there is sufficient time allowed for each batch of animals to die before subsequent ones are introduced into the *container* or apparatus.
- e) *Containers* or apparatus should not be overcrowded and measures are needed to avoid animals suffocating by climbing on top of each other.

## 3. Advantages

Low concentrations of CO<sub>2</sub> cause little aversiveness and, in combination with nitrogen or an inert gas, produces a fast induction of unconsciousness.

## 4. Disadvantages

- a) A properly designed *container* or apparatus is needed.
- b) It is difficult to verify death while the animals are in the *container* or apparatus.
- c) There is no immediate loss of consciousness.
- d) Exposure times required to kill are considerable.

## 5. Conclusion

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

Article 3.7.6.14.

## **Nitrogen and/or inert gasses**

### 1. Introduction

This method involves the introduction of animals into a *container* or apparatus containing nitrogen or an inert gas such as argon. The controlled atmosphere produced leads to unconsciousness and death from hypoxia.

Research has shown that hypoxia is not aversive to pigs and poultry, and it ~~doesn't~~ does not induce any signs of respiratory distress prior to loss of consciousness.

Appendix XXXII (contd)2. Requirements for effective use

- a) *Containers* or apparatus should allow the required gas concentrations to be maintained, and the O<sub>2</sub> concentration accurately measured.
- b) When animals are exposed to the gases individually or in small groups in a *container* or apparatus, 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.
- c) Animals should be introduced into the *container* or apparatus after it has been filled with the required gas concentrations (with ≈2% O<sub>2</sub>), and held in this atmosphere until death is confirmed.
- d) Team members should ensure that there is sufficient time allowed for each batch of animals to die before subsequent ones are introduced into the *container* or apparatus.
- e) *Containers* or apparatus should not be overcrowded and measures are needed to avoid animals suffocating by climbing on top of each other.

3. Advantages

Animals are unable to detect nitrogen or inert gases, and the induction of hypoxia by this method is not aversive to animals.

4. Disadvantages

- a) A properly designed *container* or apparatus is needed.
- b) It is difficult to verify death while the animals are in the *container* or apparatus.
- c) There is no immediate loss of consciousness.
- d) Exposure times required to kill are considerable.

5. Conclusion

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

Article 3.7.6.15.

**Lethal injection**1. Introduction

A lethal injection using high doses of anaesthetic and sedative drugs causes CNS depression, unconsciousness and death. In practice, barbiturates in combination with other drugs are commonly used.

2. Requirements for effective use

- a) Doses and routes of administration that cause rapid loss of consciousness followed by death should be used.
- b) Prior sedation may be necessary for some animals.

- c) Intravenous administration is preferred, but intraperitoneal or intramuscular administration may be appropriate, especially if the agent is non-irritating.
  - d) Animals should be restrained to allow effective administration.
  - e) Animals should be monitored to ensure the absence of brain stem reflexes.
3. Advantages
- a) The method can be used in all species.
  - b) Death can be induced smoothly.
4. Disadvantages
- a) *Restraint* and/or sedation may be necessary prior to injection.
  - b) Some combinations of drug type and route of administration may be painful, and should only be used in unconscious animals.
  - c) Legal requirements and skill/training required may restrict use to *veterinarians*.
  - d) Contaminated carcasses may present a risk to other wild or domestic animals.
5. Conclusion

The method is suitable for *killing* small numbers of cattle, sheep, goats, pigs and poultry.

Article 3.7.6.16.

#### **Addition of anaesthetics to feed or water**

1. Introduction

An anaesthetic agent which can be mixed with poultry feed or water may be used to kill poultry in houses. Poultry which are only anaesthetised need to be killed by another method such as cervical dislocation.

2. Requirements for effective use

- a) Sufficient quantities of anaesthetic need to be ingested rapidly for effective response.
- b) Intake of sufficient quantities is facilitated if the birds are fasted or water is withheld.
- c) Must be followed by *killing* (see Article 3.7.6.17) if birds are anaesthetised only.

3. Advantages

- a) Handling is not required until birds are anaesthetised.
- b) There may be biosecurity advantages in the case of large numbers of diseased birds.

Appendix XXXII (contd)4. Disadvantages

- a) Non-target animals may accidentally access the medicated feed or water when provided in an open environment.
- b) Dose taken is unable to be regulated and variable results may be obtained.
- c) Animals may reject adulterated feed or water due to illness or adverse flavour.
- d) The method may need to be followed by *killing*.
- e) Care is essential in the preparation and provision of treated feed or water, and in the disposal of uneaten treated feed/water and contaminated carcasses.

5. Conclusion

The method is suitable for *killing* large numbers of poultry in houses.

Article 3.7.6.17.

**Killing methods in unconscious animals Cervical dislocation and decapitation**1. Method 1: Cervical dislocation (manual and mechanical)

## a) Introduction

Unconscious Poultry may be killed by either manual cervical dislocation (stretching) or mechanical neck crushing with a pair of pliers. Both methods result in death from cerebral anoxia due to cessation of breathing and/or blood supply to the brain asphyxiation and/or cerebral anoxia.

## b) Requirements for effective use

- i) *Killing* should be performed either by manually or mechanically stretching the neck to sever the spinal cord or by using mechanical pliers to crush the cervical vertebrae with consequent major damage to the spinal cord.
- ii) Consistent results require strength and skill so team members should be rested regularly to ensure consistently reliable results.
- iii) Birds should be monitored continuously until death to ensure the absence of brain stem reflexes.

## c) Advantages

- i) It is a non-invasive *killing* method.
- ii) It can be performed manually on small birds.

## d) Disadvantages

- i) Operator fatigue.
- ii) The method is more difficult in larger birds.

iii) Requires trained personnel to perform humanely.

e) ~~Conclusion~~

~~This method is suitable for killing unconscious poultry.~~

## 2. Method 2: Decapitation

a) Introduction

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

b) Requirements for effective use

The required equipment should be kept in good working order.

c) Advantages

The technique is effective and does not require monitoring.

d) Disadvantages

The working area is contaminated with body fluids, which increases biosecurity risks.

e) ~~Conclusion~~

~~This method is suitable for killing unconscious poultry.~~

Article 3.7.6.18.

## **Pithing and bleeding**

### 31. Method 3: Pithing

a) Introduction

Pithing is a method of *killing* animals which have been stunned by a penetrating captive bolt, without immediate death. Pithing results in the physical destruction of the brain and upper regions of the spinal cord, through the insertion of a rod or cane through the bolt hole.

b) Requirements for effective use

i) Pithing cane or rod is required.

ii) An access to the head of the animal and to the brain through the skull is required.

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

c) Advantages

The technique is effective in producing immediate death.

d) Disadvantages

i) A delayed and/or ineffective pithing due to convulsions may occur.

Appendix XXXII (contd)

ii) The working area is contaminated with body fluids, which increases biosecurity risks.

e) ~~Conclusion~~

~~This method is suitable for *killing* unconscious animals which have been stunned by a penetrating captive bolt.~~

42. Method 4: Bleeding

a) Introduction

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.

b) Requirements for effective use

- i) A sharp knife is required.
- ii) An access to the neck or chest of the animal is required.
- iii) Animals should be monitored continuously until death to ensure the absence of brain stem reflexes.

c) Advantages

The technique is effective in producing death after an effective *stunning* method which does not permit pithing.

d) Disadvantages

- a) A delayed and/or ineffective bleeding due to convulsions may occur.
- b) The working area is contaminated with body fluids, which increases biosecurity risks.

e) ~~Conclusion~~

~~This method is suitable for *killing* unconscious animals.~~

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