Annex 1

MEETING OF THE OIE TERRESTRIAL ANIMAL HEALTH STANDARDS COMMISSION

Paris, 8–19 February 2016

List of participants

MEMBERS OF THE CODE COMMISSION

Dr Etienne Bonbon
President
Scientific Counsellor
EU Delegation to the International Organisations in Paris
12, avenue d’Eylau
75116 Paris
FRANCE
Tel.: +33 1 44 05 31 68
etienne.bonbon@eeas.europa.eu
e.bonbon@oie.int

Prof. Salah Hammami
Epidemiologist & Virologist
Services of Microbiology, Immunology & General Pathology
National School of Veterinary Medicine
Sidi Thabet -2020
TUNISIA
Tel.: + 216 71 552 200
hammami.salah@iresa.agrinet.tn
saleehhammami@yahoo.fr

Prof. Emmanuel Couacy-Hymann
Virologist - Epidemiologist
Laboratoire Centrale de Pathologie Animale
BP 206 - Bingerville
COTE D’IVOIRE
chymann@hotmail.com
chymann@gmail.com

Prof. Stuart MacDiarmid
Vice-President
Principal Adviser
Risk Analysis and Adjunct Professor in Veterinary Biosecurity
(Massey University)
Ministry for Primary Industries
P.O. Box 2526, Wellington
NEW ZEALAND
Tel.: +64-4 894.0420
Stuart.MacDiarmid@mpi.govt.nz

Dr Gaston Maria Funes
Vice-President
Embassy of Argentina to the EU
BELGIUM
funes@agrcola-ue.org

Dr Masatsugu Okita
Deputy Director, Animal Health Division
Ministry of Agriculture, Forestry and Fisheries
1-2-1 Kasumigaseki Chiyoda-ku Tokyo 100-8950
JAPAN
masatsugu.okita@nm.maff.go.jp

OIE HEADQUARTERS

Dr Derek Belton
Head
International Trade Department
d.belton@oie.int

Dr Tomoko Ishibashi
Senior Manager, Standards Development and Horizontal Management Framework International Trade Department
t.ishibashi@oie.int

Dr Gillian Mylrea
Deputy Head
International Trade Department
g.mylrea@oie.int

Dr Jae Myong Lee
Chargé de mission
International Trade Department
j.lee@oie.int

Dr Leopoldo Stuardo
Chargé de mission
International Trade Department
l.stuardo@oie.int

OIE Terrestrial Animal Health Standards Commission/February 2016
MEETING OF THE OIE TERRESTRIAL ANIMAL HEALTH STANDARDS COMMISSION

Paris, 8–19 February 2016

Agenda

A. MEETING WITH THE DIRECTOR GENERAL
   Welcome–Director General

B. ADOPTION OF THE AGENDA

C. MEETING WITH THE AQUATIC ANIMAL HEALTH STANDARDS COMMISSION

D. MEETING WITH THE BIOLOGICAL STANDARDS COMMISSION

E. REPORT ON THE JOINT MEETING OF THE CODE COMMISSION AND THE SCIENTIFIC COMMISSION

F. EXAMINATION OF MEMBER COUNTRIES' COMMENTS AND WORK OF RELEVANT EXPERT GROUPS

   Item 1 General comments of OIE Member Countries

   Item 2 Horizontal issues
   a) User’s guide
   b) Glossary
      - “acceptable risk”
      - “animal”
      - “appropriate level of protection”
      - “casings”
      - “equivalence of sanitary measures”
      - “ stamping-out policy”
      - “OIE standard”, “OIE guideline”
      - “zone”, “free zone”, “infected zone”, “containment zone”, “protection zone”
      - “vaccination”, “vaccination programme”, “routine vaccination”, “emergency vaccination”
   c) Convention for naming diseases used in the Terrestrial Code

   Item 3 Notification of diseases, infections and infestations, and provision of epidemiological information (Chapter 1.1.)

   Item 4 Listing diseases
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   b) Diseases listed by the OIE (Chapter 1.2.bis)
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Item 5 Prescribed and alternative diagnostic tests for OIE listed diseases (Chapter 1.3.)

Item 6 Animal health surveillance (Chapter 1.4.)

Item 7 Procedures for self-declaration and for official recognition by the OIE (Chapter 1.6.)

Item 8 Evaluation of Veterinary Services (Chapter 3.2.)

Item 9 Disease prevention and control
   a) Zoning and compartmentalisation (Chapter 4.3.)
   b) Collection and processing of bovine, small ruminant and porcine semen (Chapter 4.6.)
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   d) Restructuring of Terrestrial Code Section 4
   e) Report of the ad hoc Group on vaccination

Item 10 Trade measures
   a) OIE procedures relevant to the Agreement on the Application of Sanitary and Phytosanitary Measures of the World Trade Organization (Chapter 5.3.)
   b) Draft new chapter on criteria for assessing the safety of commodities (X.X.)

Item 11 Veterinary public health: antimicrobial resistance
   a) Harmonisation of national antimicrobial resistance surveillance and monitoring programmes (Chapter 6.7.)
   b) Monitoring of the quantities and usage patterns of antimicrobial agents used in food-producing animals (Chapter 6.8.)

Item 12 Veterinary public health: zoonoses and food safety
   a) Draft new chapter on prevention, detection and control of Salmonella in pigs (Chapter 6.X.)
   b) Draft new chapter on prevention, detection and control of Salmonella in cattle (Chapter 6.Y.)
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   d) Infection with Taenia solium (Chapter 15.3.)
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Item 13 Animal welfare
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   c) Animal welfare and broiler chicken production systems (Chapter 7.10.)
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e) Draft new chapter on the welfare of working equids (Chapter 7.X.)

f) Report of the ad hoc Group on slaughter of animals – water bath stunning method for poultry (Chapter 7.5. Article 7.5.7.)

Item 14 Vector-borne diseases

a) Infection with bluetongue virus (Chapter 8.3.)

b) Infection with epizootic hemorrhagic disease (Chapter 8.7.)

c) Infection with Rift Valley fever virus (Chapter 8.14.)

Item 15 Infection with foot and mouth disease virus (Chapter 8.8.)

Item 16 Infection with *Mycobacterium tuberculosis* complex (draft new Chapter 8.X.)

Item 17 Infection with avian influenza viruses (Chapter 10.4.)

Item 18 Lumpy skin disease (Chapter 11.11.)

Item 19 Infection with *Burkholderia mallei* (Glanders) (Chapter 12.10.)

Item 20 Infection with Peste des Petits Ruminants Virus (Chapter 14.7.)

Item 21 Infection with African swine fever virus (Chapter 15.1.)

Item 22 Draft new chapter on infection with porcine reproductive and respiratory syndrome (Chapter 15.X.)

F. OTHER ISSUES

Item 23 Update of the Code Commission’s work programme

Item 24 OIE Collaborating Centres

a) Renaming of New Zealand Australia Collaborating Centre (Animal Welfare Science and Bioethical Analysis)

b) Renaming of USA Collaborating Centre from “Online Veterinary Education” to “Distance Education Tools for OIE Day-One Veterinary Competencies and Continuing Education”

c) Application for recognition (Thailand)

Item 25 Scientific summary report on “Oral vaccination of dogs against rabies” (updating of Chapter 8.13.)
Report of the joint meeting between
the OIE Scientific Commission for Animal Diseases and the OIE Terrestrial Animal Health Standards Commission
Held at 9.00 am on 11 February 2016 at the OIE Headquarters in Paris

A joint meeting of the Scientific Commission for Animal Diseases (SCAD) and the Terrestrial Animal Health Standards Commission (TAHSC) was convened at the OIE Headquarters in Paris on 11 February 2016. The participants are listed in Appendix 1. The meeting was chaired by Dr Brian Evans, Deputy Director General of the OIE.

Opening of the meeting
Dr Evans on behalf of the Director General of the OIE welcomed the members of both Commissions, and reiterated the importance of regular exchange of views between the representatives of the Commissions to ensure good coordination. Dr Evans introduced Dr Tomoko Ishibashi who would in future be responsible for the internal coordination of the Commissions’ secretariats and Dr Maroussia Clavel, newly appointed Head of the Performance Management Unit.

Dr Evans thanked the secretariats of both Commissions for the preparation of the meeting.

Adoption of the agenda
The draft agenda was adopted (Appendix 2).

Summary of the discussions
1. Work programme presentation
The OIE Headquarters prepared a summary of both Commissions’ work programmes. The Commissions shared in detail with each other their actions and priorities.

Dr Evans welcomed the collaboration as a good initiative to improve coordination. Regarding the standards development cycle, he reminded the Commissions of the OIE Council’s commitment to maintain the two-year cycle for the presentation of standards for adoption. He also suggested that the secretariat plan ahead for the ad hoc Group meetings that will be requested for approval by the Director General for 2016.

The President of the TAHSC announced that the texts to be proposed for adoption at the General Session in May 2017 will be notified to the Member Countries after in its September 2016 meeting report, which would allow Member Countries to be timeously aware and to have more time to formulate comments and suggestions.

2. Coordination with the Biological Standards Commission (BSC)
The President of the TAHSC outlined the main outcomes of his meeting with the BSC to discuss both Commissions’ work programmes and in particular the progress made by the BSC on the revision of the BSE and scrapie chapters in the Manual, envisaging their adoption during the 84th General Session. He also noted that the BSC agreed to develop and share its work programme with the TAHSC and the SCAD. He added that the TAHSC and the BSC were working together to improve the recommendations on testing of embryos, especially in the context of in vitro produced embryos.

Dr Evans reiterated the Headquarters’ intention to facilitate a joint meeting of the four Specialist Commissions by overlapping their respective meeting periods.
Annex 3 (contd)

3. **Glossary**
   The President of the SCAD expressed his support for the proposed new definitions on zoning with minor modifications. The President of the TAHSC thanked the SCAD for its comments on the proposed text, and noted that the TAHSC would also carefully consider comments from other Commissions and that the amended text will be included in the February 2016 meeting report of the TAHSC.

4. **Horizontal chapters**
   a. **Convention on naming of diseases**
      The President of the TAHSC noted that in response to a Member Country’s comment, it will clarify the convention for naming diseases used in the *Terrestrial Code*, where the preferred format of the disease name of a chapter is ‘infection with [pathogenic agent]’. The President of the SCAD supported the proposal. Further details of the convention will be included in the TAHSC report.
   
   b. **Restructuring of Chapter 1.6.**
      The President of the TAHSC proposed to restructure Chapter 1.6. and highlighted some of the options under consideration. The President of the SCAD took note of the proposal to keep the chapter as ‘user friendly’ as possible for Member Countries. However, as the SCAD had begun the revision of all the questionnaires under Chapter 1.6., it was agreed that the restructuration will be postponed.

   Dr Evans informed the Commissions on the initiative of the OIE to establish a standard protocol for the procedure for self-declaration of disease freedom and an equine disease free zone (EDFZ).

   c. **Restructuring of Section 4 of the Terrestrial Code**
      The President of TAHSC described the TAHSC’s intention to modify the structure of Section 4 of the *Terrestrial Code*. He added that this initiative was prompted by the planned restructuring of Section 4 of the *Aquatic Code* by the Aquatic Animals Commission, and the TAHSC will reflect on how Section 4 of the *Terrestrial Code* may be also restructured for better logical flow and clarity. The other Specialist Commissions would be consulted in due time.

   d. **Vaccination chapter**
      Both Commissions reviewed and endorsed the outline of the draft new chapter on vaccination proposed by an *ad hoc* Group on vaccination that would be reconvened in March 2016 to finalise its task.

   e. **Zoning chapter**
      The Commissions discussed the requests from several Member Countries to modify the current containment zone concept to allow the occurrence of limited number of outbreaks within the containment zone. The Commissions agreed, in principle, on the modified concept as it would improve disease control and minimise the negative impact on trade. However, they expressed their concerns in the allowed extent of infection, the delimitation of the zone and in the surveillance requirements.

      The Commissions agreed that the concept would need to be further developed with the support of external experts.

   f. **HHP Handbook**
      Dr Evans recalled that, following the discussion during the last joint meeting in September 2015, it was decided that the HHP Veterinary Certificate would not be included in the *Terrestrial Code*, but instead be placed in part 3 of the HHP Handbook which was available on the OIE website. The Handbook should at this stage not be considered as an OIE standard but rather an OIE guideline, as per draft definitions currently being circulated for Member Countries’ comment, to support Member Countries in the implementation of the concept.
The HHP Handbook, including the certificate, would remain available on the OIE website. Member Countries are invited to contact the Scientific and Technical Department (scientific.dept@oie.int) to provide their feedback. The OIE would deal with the comments and would consult, where appropriate, with the relevant OIE Specialist Commissions.

The President of the TAHSC stated that Chapter 4.16. on High health status horse subpopulation will be rearranged within Section 4 of the Terrestrial Code.

5. Disease-specific chapters

The Commissions recalled the pending issues to be considered for amending Chapter 8.8. on Infection with foot and mouth disease virus, namely:

- A free compartment with vaccination;
- Concept of a containment zone allowing limited outbreaks;
- Emergency vaccination;
- Change of the status from free without vaccination to free with vaccination;
- Movement of vaccinated animals from a zone free with vaccination to a zone free without vaccination.

The President of the SCAD acknowledged with thanks the specific questions raised by the TAHSC based on Member Countries’ comments on the Terrestrial Code chapters on African swine fever, Mycobacterium tuberculosis complex and glanders.

The Commissions discussed the state of play of the revision of other Terrestrial Code chapters that were in the process of revision or drafting.

6. Upcoming ad hoc Groups

Dr Evans informed the Commissions that an ad hoc Group to consider all pending issues on Chapter 8.8. on Infection with foot and mouth disease virus would be convened this year. The Commissions agreed to participate in the ad hoc Group meeting as observers.

Dr Evans also informed the Commissions that ad hoc Groups would be convened in 2016 to update the Terrestrial Code chapters on BSE and CSF. It was also planned to convene ad hoc Groups on Theileria and on equine trypanosomosis.

It was agreed that the Commissions would be informed in advance of the detailed ad hoc Group plan for 2016 and a representative of the Commissions would be invited, as observer, to participate in the meetings, when considered appropriate by the Director General.

7. Other issues

The Commissions were informed of the progress made by the Headquarters to facilitate access of Member Countries to the ad hoc Group reports. The reports would be available on the OIE website once validated by the Specialist Commissions. The proposal would be presented to the next Council meeting for approval.

8. Dates of next meetings

The dates of the September 2016 Commission meetings were scheduled as from 5–16 September for the TAHSC and from 5–9 September for the SCAD. The dates of the February 2017 Commission meetings were scheduled as from 13 to 24 February 2017 for the TAHSC and from 13 to 17 February 2017 for the SCAD.

The Commissions agreed to have the joint meeting on the fourth day of the SCAD meeting.
List of participants

SCAD:

Dr Gideon Brückner, President of SCAD
Dr Kris de Clercq, the 1st Vice-President
Dr Jef Hammond, the 2nd Vice-President
Dr Silvia Bellini, Member

TAHSC:

Dr Etienne BONBON, President of TAHSC
Pr Stuart MacDiarmid, Vice-President
Dr Gaston Maria Funes, Vice-President
Pr Salah Hammami, Member
Dr Emmanuel Couacy-Hyman, Member
Dr Masatsugu Okita, Member

OIE Headquarters:

Dr Brian Evans, the Deputy Director General of the OIE
Dr Derek Belton, Head of the International Trade Department
Dr Tomoko Ishibashi, Senior Manager, International Trade Department
Dr Gregorio José Torres, Chargé de mission, Scientific and Technical Department
Dr Laure Weber-Vintzel, Officer in charge of the recognition of countries’ animal disease status
Dr Jae Myong Lee, Chargé de mission, International Trade Department
Draft Provisional Agenda

- Opening of the meeting
- Adoption of the agenda
- Work programme presentation
- Coordination with BSC
- Glossary
- Horizontal chapters
  - Convention on naming of diseases
  - Restructuring of Chapter 1.6.
  - Restructuring of Section 4
  - Vaccination chapter
  - Zoning chapter
  - HHP handbook
- Disease-specific chapters
- Upcoming Ad hoc Groups
- Other issues
- Dates of next meetings
A. Introduction

1) The OIE Terrestrial Animal Health Code (hereafter referred to as the Terrestrial Code) establishes standards for the improvement of terrestrial animal health and welfare and veterinary public health worldwide. The purpose of this guide is to advise the Veterinary Authorities of OIE Member Countries on how to use the Terrestrial Code.

2) Veterinary Authorities should use the standards in the Terrestrial Code to set up measures providing for early detection, internal reporting, notification and control of pathogenic agents, including zoonotic ones, in terrestrial animals (mammals, birds and bees) and preventing their spread via international trade in animals and animal products, while avoiding unjustified sanitary barriers to trade.

3) The OIE standards are based on the most recent scientific and technical information. Correctly applied, they protect animal health and welfare and veterinary public health during production and trade in animals and animal products, and in the use of animals.

4) The absence of chapters, articles or recommendations on particular aetiological agents or commodities does not preclude the application of appropriate sanitary measures by the Veterinary Authorities, provided they are based on risk analyses conducted in accordance with the Terrestrial Code.

5) The complete text of the Terrestrial Code is available on the OIE Web site and individual chapters may be downloaded from: http://www.oie.int.

B. Terrestrial Code content

1) Key terms and expressions used in more than one chapter in the Terrestrial Code are defined in the Glossary, in the case where common dictionary definitions are not deemed to be adequate. The reader should be aware of the definitions given in the Glossary when reading and using the Terrestrial Code. Defined terms appear in italics. In the on-line version of the Terrestrial Code, a hyperlink leads to the relevant definition.

2) The term '(under study)' is found in some rare instances, with reference to an article or part of an article. This means that this part of the text has not been adopted by the World Assembly of OIE Delegates and the particular provisions are thus not part of the Terrestrial Code.

3) The standards in the chapters of Section 1 are designed for the implementation of measures for the diagnosis, surveillance and notification of pathogenic agents. The standards include procedures for notification to the OIE, tests for international trade, and procedures for the assessment of the health status of a country, zone or compartment.

4) The standards in Section 2 are designed to guide the importing country in conducting import risk analysis in the absence of OIE recommendations on particular aetiological agents or commodities. The importing country should also use these standards to justify import measures which are more stringent than existing OIE standards.

5) The standards in the chapters of Section 3 are designed for the establishment, maintenance and evaluation of Veterinary Services, including veterinary legislation and communication. These standards are intended to assist the Veterinary Services of Member Countries to meet their objectives of improving terrestrial animal health and welfare and veterinary public health, as well as to establish and maintain confidence in their international veterinary certificates.

6) The standards in the chapters of Section 4 are designed for the implementation of measures for the prevention and control of pathogenic agents. Measures in this section include animal identification, traceability, zoning, compartmentalisation, disposal of dead animals, disinfection, dissection and general hygiene precautions. Some chapters address the specific sanitary measures to be applied for the collection and processing of semen and embryos of animals.
7) The standards in the chapters of Section 5 are designed for the implementation of general sanitary measures for trade. They address veterinary certification and the measures applicable by the exporting, transit and importing countries. A range of model veterinary certificates is provided to facilitate consistent documentation in international trade.

8) The standards in the chapters of Section 6 are designed for the implementation of preventive measures in animal production systems. These measures are intended to assist Member Countries in meeting their veterinary public health objectives. They include ante- and post-mortem inspection, control of hazards in feed, biosecurity at the animal production level, and the control of antimicrobial resistance in animals.

9) The standards in the chapters of Section 7 are designed for the implementation of animal welfare measures. The standards cover production, transport, and slaughter or killing, as well as the animal welfare aspects of stray dog population control and the use of animals in research and education.

10) The standards in each of the chapters of Sections 8 to 15 are designed to prevent the aetiological agents of OIE listed diseases, infections or infestations from being introduced into an importing country. The standards take into account the nature of the traded commodity, the animal health status of the exporting country, zone or compartment, and the risk reduction measures applicable to each commodity.

These standards assume that the agent is either not present in the importing country or is the subject of a control or eradication programme. Sections 8 to 15 each relate to the host species of the pathogenic agent: multiple species or single species of Apidae, Aves, Bovidae, Equidae, Leporidae, Caprinae and Suidae. Some chapters include specific measures to prevent and control the infections of global concern. Although the OIE aims to include a chapter for each OIE listed disease, not all OIE listed diseases have been covered yet by a specific chapter. This is work in progress, depending on available scientific knowledge and the priorities set by the World Assembly.

C. Specific issues

1. Notification

Chapter 1.1. describes Member Countries' obligations under OIE Organic Statutes. Listed and emerging diseases, as prescribed in Chapter 1.1., are compulsorily notifiable. Member Countries are encouraged to also provide information to the OIE on other animal health events of epidemiological significance.

Chapter 1.2. describes the criteria for the inclusion of a disease, infection or infestation in the OIE List and Chapter 1.2bis gives the current list. Diseases are divided into nine categories based on the host species of the aetiological agents.

2. Diagnostic tests and vaccines

It is recommended that specified diagnostic tests and vaccines in Terrestrial Code chapters be used with a reference to the relevant section in the OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (hereafter referred to as the Terrestrial Manual). Chapter 1.3. provides a table summarising the prescribed and alternative diagnostic tests for OIE listed diseases. Experts responsible for facilities used for disease diagnosis and vaccine production should be fully conversant with the standards in the Terrestrial Manual.

2bis. Freedom from a disease, infection or infestation

Article 1.4.6. provides general principles for declaring a country or zone free from a disease, infection or infestation. This article applies when there are no specific requirements in the disease-specific chapter.

3. Prevention and control

Chapters 4.3. and 4.4. describe the measures that should be implemented to establish zones and compartments. Zoning and compartmentalisation should be considered as tools used to control diseases and to facilitate safe trade.
Chapters 4.5. to 4.11. describe the measures which should be implemented during collection and processing of semen and embryos of animals, including micromanipulation and cloning, in order to prevent animal health risks, especially when trading these commodities. Although the measures relate principally to OIE listed diseases or infections, general standards apply to all infectious disease risks. Moreover, in Chapter 4.7. diseases that are not listed are marked as such but are included for the information of Member Countries.

Chapter 4.14. addresses the specific issue of the control of bee diseases and some of its trade implications. This chapter should be read in conjunction with the specific bee disease chapters in Section 9.

Chapter 6.4. is designed for the implementation of general biosecurity measures in intensive poultry production. Chapter 6.5. is an example of a specific on-farm prevention and control plan for the non-listed food-borne pathogen Salmonella in poultry.

Chapter 6.11. deals specifically with the zoonotic risk associated with the movements of non-human primates and gives standards for certification, transportation and import conditions for these animals.

4. Trade requirements

Animal health measures related to international trade should be based on OIE standards. A Member Country may authorise the importation of animals or animal products into its territory under conditions different from those recommended by the Terrestrial Code. To scientifically justify more stringent measures, the importing country should conduct a risk analysis in accordance with OIE standards, as described in Chapter 2.1. Members of the WTO should refer to the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement).

Chapters 5.1. to 5.3. describe the obligations and ethical responsibilities of importing and exporting countries in international trade. Veterinary Authorities and all veterinarians directly involved in international trade should be familiar with these chapters. Chapter 5.3. also describes the OIE informal procedure for dispute mediation.

The OIE aims to include an article listing the commodities that are considered safe for trade without the imposition of pathogen-specific sanitary need for risk mitigation measures specifically directed against a particular listed disease, infection or infestation, regardless of the status of the exporting country or zone of origin for the agent in question, at the beginning of each disease-specific chapter in Sections 8 to 15. This is work in progress and some chapters do not yet contain articles listing safe commodities. When a list of safe commodities is present in a chapter, importing countries should not apply trade restrictions to such commodities with respect to the agent in question.

5. International veterinary certificates

An international veterinary certificate is an official document that the Veterinary Authority of an exporting country issues in accordance with Chapters 5.1. and 5.2. It lists animal health requirements and, where appropriate, public health requirements for the exported commodity. The quality of the exporting country's Veterinary Services is essential in providing assurances to trading partners regarding the safety of exported animals and products. This includes the Veterinary Services' ethical approach to the provision of veterinary certificates and their history in meeting their notification obligations.

International veterinary certificates underpin international trade and provide assurances to the importing country regarding the health status of the animals and products imported. The measures prescribed should take into account the health status of both exporting and importing countries, and zones or compartments within them, and be based upon the standards in the Terrestrial Code.

The following steps should be taken when drafting international veterinary certificates:

a) identify the diseases, infections or infestations from which the importing country is justified in seeking protection because of its own health status. Importing countries should not impose measures in regards to diseases that occur in their own territory but are not subject to official control programmes;

b) for commodities capable of transmitting these diseases, infections or infestations through international trade, the importing country should apply the relevant articles in the disease-specific chapters. The application of the articles should be adapted to the disease status of the exporting country, zone or compartment of origin. Such status should be established according to Article 1.4.6. except when articles of the relevant disease chapter specify otherwise;
Annex 4 (contd)

c) when preparing international veterinary certificates, the importing country should endeavour to use terms and expressions in accordance with the definitions given in the Glossary. As stated in Article 5.2.3., international veterinary certificates should be kept as simple as possible and should be clearly worded, to avoid misunderstanding of the importing country's requirements;

d) Chapters 5.10. to 5.13. provide, as further guidance to Member Countries, model certificates that should be used as a baseline.

6. Guidance notes for importers and exporters

It is recommended that Veterinary Authorities prepare 'guidance notes' to assist importers and exporters understand trade requirements. These notes should identify and explain the trade conditions, including the measures to be applied before and after export and during transport and unloading, and the relevant legal obligations and operational procedures. The guidance notes should advise on all details to be included in the health certification accompanying the consignment to its destination. Exporters should also be reminded of the International Air Transport Association rules governing air transport of animals and animal products.

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GLOSSARY

ACCEPTABLE RISK
means a risk level judged by each Member Country to be compatible with the protection of animal and public health within its territory.

ANIMAL
means a mammal, reptile, bird or bee.

APPROPRIATE LEVEL OF PROTECTION
means the level of protection deemed appropriate by the country establishing a sanitary measure to protect human or animal life or health within its territory.

CASINGS
means intestines, oesophagus and bladders and intestines which, after cleaning, have been processed by tissue scraping, defatting and washing, and have been treated with salt or dried.

EQUIVALENCE OF SANITARY MEASURES
means the state wherein the sanitary measure(s) proposed by the exporting country as an alternative to those of the importing country, achieve(s) the same level of protection.

STAMPING-OUT POLICY
means a policy designed to eliminate an outbreak by carrying out under the authority of the veterinary authority the following:

a) the killing of the animals which are affected and those suspected of being affected in the herd and, where appropriate, those in other herds which have been exposed to infection by direct animal to animal contact, or by indirect contact with the causal pathogen; this includes all susceptible animals, vaccinated or unvaccinated, on infected establishments, animals should be killed in accordance with Chapter 7.6;

b) the destruction disposal of their carcasses, and where relevant, animal products, as relevant, by rendering, burning or burial, or by any other method described in Chapter 4.12;

c) the cleansing and disinfection of establishments through procedures defined in Chapter 4.13.

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CHAPTER 1.1.

NOTIFICATION OF DISEASES, INFECTIONS AND INFESTATIONS, AND PROVISION OF EPIDEMIOLOGICAL INFORMATION

Article 1.1.1.

For the purposes of the Terrestrial Code and in terms of Articles 5, 9 and 10 of the OIE Organic Statutes, Member Countries shall recognise the right of the Headquarters to communicate directly with the Veterinary Authority of its territory or territories.

All notifications and all information sent by the OIE to the Veterinary Authority shall be regarded as having been sent to the country concerned and all notifications and all information sent to the OIE by the Veterinary Authority shall be regarded as having been sent by the country concerned.

For the purposes of this chapter, 'event' means a single outbreak or a group of epidemiologically related outbreaks of a given disease, infection or infestation that is the object of a notification. An event is specific to a pathogen and strain, when appropriate, and includes all related outbreaks reported from the time of the immediate notification through to the final report. Notification of an event includes host species, number and geographical distribution of affected animals and epidemiological units.

Article 1.1.2.

1) Member Countries shall make available to other Member Countries, through the OIE, whatever information is necessary to minimise the spread of important animal diseases, and their aetiological agents, and to assist in achieving better worldwide control of these diseases.

2) To achieve this, Member Countries shall comply with the notification requirements specified in Articles 1.1.3. and 1.1.4.

3) For the purposes of this chapter, an 'event' means a single outbreak or a group of epidemiologically related outbreaks of a given disease, infection or infestation that is the subject of a notification. An event is specific to a pathogen and strain, when appropriate, and includes all related outbreaks reported from the time of the immediate notification through to the final report. Reports of an event include susceptible species, number and geographical distribution of affected animals and epidemiological units.

4) To assist in the clear and concise exchange of information, reports shall conform as closely as possible to the official OIE disease reporting format.

5) The detection of the aetiological agent of a listed disease in an animal should be reported, even in the absence of clinical signs. Recognising that scientific knowledge concerning the relationship between diseases and their aetiological agents is constantly developing and that the presence of an aetiological agent does not necessarily imply the presence of a disease, Member Countries shall ensure, through their reports, that they comply with the spirit and intention of point 1 above.

6) In addition to notifying new findings in accordance with Articles 1.1.3. and 1.1.4., Member Countries shall also provide information on the measures taken to prevent the spread of diseases, infections and infestations. Information shall include quarantine measures and restrictions on applied to the movement of animals, animal products, biological products and other miscellaneous objects which could by their nature be responsible for their transmission of diseases, infections and infestations. In the case of diseases transmitted by vectors, the measures taken against such vectors shall also be specified.
Annex 6 (contd)

Article 1.1.3.

Veterinary Authorities shall, under the responsibility of the Delegate, send to the Headquarters:

1) in accordance with relevant provisions in the disease-specific chapters, notification, through the World Animal Health Information System (WAHIS) or by fax or e-mail email within 24 hours, of any of the following events:
   a) first occurrence of a listed disease, infection or infestation in a country, a zone or a compartment;
   b) re-occurrence recurrence of a listed disease, infection or infestation in a country, a zone or a compartment following the final report that declared the outbreak ended;
   c) first occurrence of a new strain of a pathogenic agent of a listed disease, infection or infestation in a country, a zone or a compartment;
   d) a sudden and unexpected change in the distribution or increase in incidence or virulence of, or morbidity or mortality caused by, the aetiological agent of a listed disease, infection or infestation present within a country, a zone or a compartment;
   e) occurrence of a listed disease, infection or infestation in an unusual host species;

2) weekly reports subsequent to a notification under point 1 above, to provide further information on the evolution of the event which justified the notification. These reports should continue until the disease, infection or infestation has been eradicated or the situation has become sufficiently stable so that six-monthly reporting under point 3 will satisfy the obligation of the Member Country; for each event notified, a final report on the event should be submitted;

3) six-monthly reports on the absence or presence, and evolution of listed diseases, infections or infestations and information of epidemiological significance to other Member Countries;

4) annual reports concerning any other information of significance to other Member Countries.

Article 1.1.4.

Veterinary Authorities shall, under the responsibility of the Delegate, send to the Headquarters:

1) a notification through WAHIS or by fax or e-mail email, when an emerging disease has been detected in a country, a zone or a compartment;

2) periodic reports subsequent to a notification of an emerging disease, as described under point 1, These should continue until:
   a) for the time necessary to have reasonable certainty that:
      1) the disease, infection or infestation has been eradicated; or
      2b) the situation has become sufficiently stable; or
   OR
   bc) until sufficient scientific information is available to determine whether it meets the criteria for listing inclusion in the OIE list as described in Chapter 1.2.;

3) a final report once point 2 a) or b) above is complied with, a final report should be submitted.
Article 1.1.5.

1) The Veterinary Authority of a country in which an infected zone was located shall inform the Headquarters when this zone or the entire country is becomes free from the disease, infection or infestation.

2) An infected zone for a particular disease, infection or infestation shall be considered as such until a period exceeding the infective period specified in the Terrestrial Code has elapsed after the last reported case, and when full prophylactic and appropriate animal health biosecurity measures and surveillance have been applied to prevent possible recurrence reappearance or spread of the disease, infection or infestation. These measures will be found are described in detail in the various relevant disease-specific chapters of Volume II of the Terrestrial Code.

3) A Member Country country or zone may be considered to have regained freedom from a specific disease, infection or infestation when all relevant conditions given in the Terrestrial Code have been fulfilled.

4) The Veterinary Authority of a Member Country which sets up establishes one or several free zones shall inform the Headquarters giving necessary details, including the criteria on which the free status is based, the requirements for maintaining the status and indicating clearly the location of the zones on a map of the territory of the Member Country.

Article 1.1.6.

1) Although Member Countries are only required to notify listed diseases, infections and infestations and emerging diseases, they are encouraged to provide information of other important animal health events.

2) The Headquarters shall communicate by e-mail or through the interface of the World Animal Health Information Database System (WAHID WAHIS) to Veterinary Authorities all notifications received as provided in Articles 1.1.2. to 1.1.5. and other relevant information.

— Text deleted.
CHAPTER 1.2.

CRITERIA FOR THE INCLUSION OF DISEASES, INFECTIONS AND INFESTATIONS IN THE OIE LIST

Article 1.2.1.

Introduction

The aim of this chapter is to describe the criteria for the inclusion of diseases, infections and infestations in the OIE list. The objective of listing diseases is to support Member Countries’ efforts to prevent the transboundary spread of important animal diseases, including zoonoses. This is achieved through transparent, timely and consistent notification reporting. Each listed disease normally has a corresponding chapter that assists Member Countries in the harmonisation of disease detection, prevention and control, and provides standards for safe international trade in animals and their products. The requirements for notification are detailed in Chapter 1.1, and notifications are to be made through WAHIS or, if not possible, by fax or e-mail as described in Article 1.1.3.

Principles for selection and methods of validation of diagnostic tests are described in Chapter 1.1.5 of the Terrestrial Manual.

Article 1.2.2.

The criteria for the inclusion of a disease, infection or infestation in the OIE list are as follows:

1) International spread of the pathogenic agent (via live animals or their products, vectors or fomites) has been proven.

AND

2) At least one country has demonstrated freedom or impending freedom from the disease, infection or infestation in populations of susceptible animals, based on the animal health surveillance provisions of the Terrestrial Code, in particular those contained in Chapter 1.4.

AND

2) A reliable means of detection and diagnosis exists and a precise case definition is available to clearly identify cases and allow them to be distinguished from other diseases, infections and infestations.

AND

3) The disease has been shown to cause a significant impact on the health of morbidity or mortality in domestic animals at the level of a country or a zone, taking into account the occurrence and severity of the clinical signs, including direct production losses and mortality.
Annex 7 (contd)

OR

c) The disease has been shown to, or scientific evidence indicates that it would, cause have a significant impact on the health of morbidity or mortality in wild wildlife animal populations taking into account the occurrence and severity of the clinical signs, including direct production economic losses and mortality, and ecological any threats to the viability of a wildlife population.

AND

4) A reliable means of detection and diagnosis exists and a precise case definition is available to clearly identify cases and allow them to be distinguished from other diseases, infections and infestations.

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— Text deleted.
CHAPTER 1.2.BIS

DISEASES, INFECTIONS AND INFESTATIONS
LISTED BY THE OIE

Article 1.2.3.

Preamble

The following diseases, infections and infestations are included in the OIE list.

In case of modifications of this list of animal diseases, infections and infestations adopted by the World Assembly, the new list comes into force on 1 January of the following year.

Article 1.2.bis.1.

1) The following are included within the category of multiple species diseases, infections and infestations:

- Anthrax
- Bluetongue
- Infection with Brucellosis (Brucella abortus, Brucella melitensis, Brucella suis)
- Brucellosis (Brucella melitensis)
- Brucellosis (Brucella suis)
- Crimean Congo haemorrhagic fever
- Epizootic haemorrhagic disease
- Equine encephalomyelitis (Eastern)
- Infection with Foot and mouth disease virus
- Heartwater
- Infection with Aujeszky’s disease virus
- Infection with Echinococcus granulosus
- Infection with Echinococcus multilocularis
- Infection with rabies virus
- Infection with Rift Valley fever virus
- Infection with rinderpest virus
- Infection with Trichinella spp.
- Japanese encephalitis
- New World screwworm (Cochliomyia hominivorax)
- Old World screwworm (Chrysomya bezziana)
- Paratuberculosis
- Q fever
- Surra (Trypanosoma evansi)
- Tularemia
- West Nile fever.
Annex 8 (contd)

Article 1.2.bis.2.

2) The following are included within the category of cattle diseases and infections:

– Bovine anaplasmosis
– Bovine babesiosis
– Bovine genital campylobacteriosis
– Bovine spongiform encephalopathy
– Bovine tuberculosis
– Bovine viral diarrhoea
– Enzootic bovine leukosis
– Haemorrhagic septicaemia
– Infectious bovine rhinotracheitis/infectious pustular vulvovaginitis
– Infection with *Mycoplasma mycoides* subsp. *mycoides* SC (Contagious bovine pleuropneumonia)
– Lumpy skin disease
– Theileriosis
– Trichomonomosis
– Trypanosomosis (tsetse-transmitted).

Article 1.2.bis.3.

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

– Caprine arthritis/encephalitis
– Contagious agalactia
– Contagious caprine pleuropneumonia
– Infection with *Chlamydophila abortus* (Enzootic abortion of ewes, ovine chlamydiosis)
– Infection with peste des petits ruminants virus
– Maedi–visna
– Nairobi sheep disease
– Ovine epididymitis (*Brucella ovis*)
– Salmonellosis (*S. abortus ovis*)
– Scrapie
– Sheep pox and goat pox.
4) The following are included within the category of equine diseases and infections:

- Contagious equine metritis
- Dourine
- Equine encephalomyelitis (Western)
- Equine infectious anaemia
- Equine influenza
- Equine piroplasmosis
- Glanders
- Infection with African horse sickness virus
- Infection with equid herpesvirus-1 (EHV-1)
- Infection with equine arteritis virus
- Venezuelan equine encephalomyelitis.

5) The following are included within the category of swine diseases and infections:

- African swine fever
- Infection with classical swine fever virus
- Nipah virus encephalitis
- Infection with Taenia solium Porcine cysticercosis
- Porcine reproductive and respiratory syndrome
- Transmissible gastroenteritis.

6) The following are included within the category of avian diseases and infections:

- Avian chlamydiosis
- Avian infectious bronchitis
- Avian infectious laryngotracheitis
- Avian mycoplasmosis (Mycoplasma gallisepticum)
- Avian mycoplasmosis (Mycoplasma synoviae)
- Duck virus hepatitis
- Fowl typhoid
- Infection with avian influenza viruses
- Infection with influenza A viruses of high pathogenicity in birds other than poultry, including wild birds
- Infection with Newcastle disease virus
- Infectious bursal disease (Gumboro disease)
- Pullorum disease
- Turkey rhinotracheitis.
Annex 8 (contd)

Article 1.2.bis.7.

7) The following are included within the category of lagomorph diseases and infections:

– Myxomatosis
– Rabbit haemorrhagic disease.

Article 1.2.bis.8.

8) The following are included within the category of bee diseases, infections and infestations:

– Infection of honey bees with *Melissococcus plutonius* (European foulbrood)
– Infection of honey bees with *Paenibacillus larvae* (American foulbrood)
– Infestation of honey bees with *Acarapis woodi*
– Infestation of honey bees with *Tropilaelaps* spp.
– Infestation of honey bees with *Varroa* spp. (Varroosis)
– Infestation with *Aethina tumida* (Small hive beetle).

Article 1.2.bis.9.

9) The following are included within the category of other diseases and infections:

– Camelpox
– Leishmaniosis.

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– Text deleted.
CHAPTER 1.3

PRESCRIBED AND ALTERNATIVE DIAGNOSTIC TESTS FOR OIE LISTED DISEASES

NOTE

In many of the Terrestrial Code chapters relating to specific diseases, the reader is referred to the Terrestrial Manual for information on OIE standards for the relevant diagnostic tests and vaccines.

However, some readers of the Terrestrial Code may need to know which diagnostic tests are recommended by the OIE for use in the international trade of animals or animal products, without requiring the details of how these tests should be performed.

The tables in this chapter have been included to meet this need. These tables show, for each OIE listed diseases, the diagnostic tests which can be used when the Terrestrial Code recommends a testing procedure.

These tests should be performed in accordance with the specifications in the Terrestrial Manual, in order to avoid any differences between the exporting and importing countries in the interpretation of results.

In the tables, the diagnostic tests have been divided into two categories - ‘prescribed tests’ and ‘alternative tests’ (a similar categorisation is made in the Terrestrial Manual). The ‘prescribed tests’ are those which are considered optimal for determining the health status of animals before shipment. ‘Alternative tests’ do not demonstrate the absence of infection in the tested animals with the same level of confidence as the prescribed tests do. However, the OIE Terrestrial Animal Health Standards Commission considers that an ‘alternative test’, chosen by mutual agreement between the importing and exporting countries, can provide valuable information for evaluating the risks of any proposed trade in animals or animal products. The disease for which the Terrestrial Code does not require any test are not included in the tables.

ABBREVIATIONS AND ACRONYMS

Agent id.— Agent identification
Agg.— Agglutination test
AGID— Agar-gel immunodiffusion
BBAT— Buffered Brucella antigen test
CF— Complement fixation (test)
DTH— Delayed-type hypersensitivity
ELISA— Enzyme-linked immunoabsorbent assay
FAVN— Fluorescent antibody virus neutralisation
FPA— Fluorescence polarisation assay
HI— Haemagglutination-inhibition
IFA— Indirect fluorescent antibody (test)
MAT— Microscopic agglutination test
NPLA— Neutralising peroxidase-linked assay
PCR— Polymerase chain reaction
PRN— Plaque reduction neutralisation
VN— Virus neutralisation
— No test designated yet
### OIE-listed diseases

#### Multiple species

<table>
<thead>
<tr>
<th>Terrestrial Code Chapter No.</th>
<th>Terrestrial Manual Chapter No.</th>
<th>Disease name</th>
<th>Prescribed tests</th>
<th>Alternative tests</th>
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<tr>
<td>8.2.</td>
<td>2.1.2.</td>
<td>Aujeszky's disease</td>
<td>ELISA, VN</td>
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<td>8.3.</td>
<td>2.1.3.</td>
<td>Bluetongue</td>
<td>Agent id., ELISA, PCR, VN</td>
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<td>8.8.</td>
<td>2.1.6.</td>
<td>Foot and mouth disease</td>
<td>ELISA, VN</td>
<td>CF</td>
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<tr>
<td>8.9.</td>
<td>2.1.6.</td>
<td>Heartwater</td>
<td>-</td>
<td>ELISA, IFA</td>
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<tr>
<td>2.1.9.</td>
<td></td>
<td>Leptospirosis</td>
<td>-</td>
<td>MAT</td>
</tr>
<tr>
<td>8.11.</td>
<td>2.1.10.</td>
<td>New world screwworm (Cochliomyia hominivorax) and old world screwworm (Chrysomya bezziana)</td>
<td>-</td>
<td>Agent id.</td>
</tr>
<tr>
<td>8.12.</td>
<td>2.1.11.</td>
<td>Paratuberculosis</td>
<td>-</td>
<td>DTH, ELISA</td>
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<tr>
<td>8.13.</td>
<td>2.1.13.</td>
<td>Rabies</td>
<td>ELISA, VN</td>
<td>-</td>
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<tr>
<td>8.15.</td>
<td>2.1.15.</td>
<td>Rinderpest</td>
<td>-</td>
<td>VN</td>
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<td>8.16.</td>
<td>2.1.16.</td>
<td>Trichinosis</td>
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<td>8.17.</td>
<td>2.1.18.</td>
<td>Tularemia</td>
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<td>Agent id.</td>
</tr>
<tr>
<td>2.1.19.</td>
<td></td>
<td>Vesicular stomatitis</td>
<td>CF, ELISA, VN</td>
<td>-</td>
</tr>
</tbody>
</table>
### Bovidae

| 11.1. | 2.4.1 | Bovine anaplasmosis | CAT, CF |
| 11.2. | 2.4.2 | Bovine babesiosis | PCR | CF, ELISA, IFA |
| 2.4.3. | Bovine brucellosis | BBAT, CF, ELISA, FPA | |
| 11.3. | 2.4.5. | Bovine genital campylobacteriosis | Agent id. | |
| 11.5. | 2.4.7. | Bovine tuberculosis | Tuberculin test | Interferon gamma release |
| 11.7. | 2.4.9. | Contagious bovine pleuropneumonia | CF, ELISA | |
| 11.8. | 2.4.11. | Enzootic bovine leucosis | AGID-ELISA | PCR |
| 11.9. | 2.4.12. | Haemorrhagic septicaemia | Agent id. | |
| 11.10. | 2.4.13. | Infectious bovine rhinotracheitis/ infectious pustular vulvovaginitis | Agent id. (semen-only), ELISA, PCR, VN | |
| 11.11. | 2.4.14. | Lumpy skin disease | VN |
| 11.12. | 2.4.16. | Theileriosis | Agent id., IFA | |
| 11.13. | 2.4.17. | Trichomonosis | Agent id. | Mucus agg. |

### Caprinae

| 14.1. | 2.7.3. | Caprine arthritis/encephalitis | AGID-ELISA | |
| 14.5. | 2.7.4. | Maedi-visna | AGID-ELISA | |
| 14.3. | 2.7.6. | Contagious caprine pleuropneumonia | Agent id. | |
| 14.4. | 2.7.7. | Enzootic abortion of ewes | CF |
| 14.6. | 2.7.9. | Ovine epididymitis (Brucellaovis) | CF | ELISA |
| 14.7. | 2.7.11. | Peste des petits ruminants | VN | ELISA |
| 14.9. | 2.7.14. | Sheep pox and goat pox | VN |
### Equidae

| 12.1 | 2.5.1 | African horse sickness | CF, ELISA | Agent id. (real-time PCR), VN |
| 12.2 | 2.5.2 | Contagious equine metritis | Agent id. | - |
| 12.3 | 2.5.3 | Dourine | CF | ELISA, IFA |
| 12.4 | 2.5.5 | Equine encephalomyelitis (Eastern and Western) | - | CF, HI, PRN |
| 12.5 | 2.5.6 | Equine infectious anaemia | AGID | ELISA |
| 12.6 | 2.5.7 | Equine influenza | - | HI |
| 12.7 | 2.5.8 | Equine piroplasmosis | ELISA, IFA | CF |
| 12.8 | 2.5.9 | Equine rhinopneumonitis | - | VN |
| 12.9 | 2.5.10 | Equine viral arteritis | Agent id. (sperm only), VN | - |
| 12.10 | 2.5.11 | Glanders | CF | - |
| 12.11 | 2.5.13 | Venezuelan equine encephalomyelitis | - | CF, HI, PRN |

### Suidae

| 15.1 | 2.8.1 | African swine fever | ELISA | IFA |
| 15.2 | 2.8.3 | Classical swine fever | ELISA, FAVN, NPLA | - |
| 15.4 | 2.8.5 | Porcine brucellosis | BBAT, CF, ELISA, FPA | - |
| 15.6 | 2.8.9 | Swine vesicular disease | VN | ELISA |
| 15.7 | 2.8.11 | Transmissible gastroenteritis | - | ELISA, VN |

### Aves

<p>| 10.2 | 2.3.2 | Avian infectious bronchitis | - | ELISA, HI, VN |
| 10.3 | 2.3.3 | Avian infectious laryngotracheitis | - | AGID, ELISA, VN |
| 10.4 | 2.3.4 | Avian influenza | Virus isolation with pathogenicity testing | AGID, HI |
| 10.5 | 2.3.5 | Avian mycoplasmosis (Mycoplasma gallisepticum) | - | Agg., HI |
| 10.7 | 2.3.11 | Fowl typhoid and Pullorum disease | - | Agent id., Agg. |
| 10.8 | 2.3.12 | Infectious bursal disease | - | AGID, ELISA |
| 10.9 | 2.3.13 | Marek's disease | - | AGID |
| 10.10 | 2.3.14 | Newcastle disease | Virus isolation | HI |</p>
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<tr>
<th>Leporidae</th>
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<td>13.1.</td>
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<td>13.2.</td>
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CHAPTER 3.2.

EVALUATION OF VETERINARY SERVICES

Article 3.2.14.

This article outlines appropriate information requirements for the self-evaluation or evaluation of the Veterinary Services of a country.

1. Organisation and structure of Veterinary Services

   a) National Veterinary Authority
      Organisational chart including numbers, positions and numbers of vacancies.

   b) Sub-national components of the Veterinary Authority
      Organisational charts including numbers, positions and number of vacancies.

   c) Other providers of veterinary services
      Description of any linkage with other providers of veterinary services.

2. National information on human resources

   a) Veterinarians
      i) Total numbers of veterinarians registered or licensed by the Veterinary statutory body of the country.

      ii) Numbers of:
         – full time government veterinarians: national and sub-national;
         – part time government veterinarians: national and sub-national;
         – private veterinarians authorised by the Veterinary Services to perform official veterinary functions [Describe accreditation standards, responsibilities and limitations applying to these private veterinarians.];
         – other veterinarians.

      iii) Animal health and welfare:
         Numbers associated with farm livestock sector on a majority time basis in a veterinary capacity, by geographical area [Show categories and numbers to differentiate staff involved in field service, laboratory, administration, import and export and other functions, as applicable.]:
         – full time government veterinarians: national and sub-national;
         – part time government veterinarians: national and sub-national;
         – other veterinarians.
iv) Veterinary public health:

Numbers employed in food inspection on a majority time basis, by commodity [Show categories and numbers to differentiate staff involved in inspection, laboratory and other functions, as applicable.]:

- full time government veterinarians: national and sub-national;
- part time government veterinarians: national and sub-national;
- other veterinarians.

v) Numbers of veterinarians relative to certain national indices:

- per total human population;
- per farm livestock population, by geographical area;
- per livestock farming unit, by geographical area.

vi) Veterinary education:

- number of veterinary schools;
- length of veterinary course (years);
- curriculum addressing the minimum competencies of day 1 veterinary graduates and the post-graduate and continuing education topics to assure the delivery of quality veterinary services, as described in the relevant chapter(s) of the Terrestrial Code;
- international recognition of veterinary degree.

vii) Veterinary professional associations.

b) Graduate personnel (non-veterinary)

Details to be provided by category (including biologists, biometricians, economists, engineers, lawyers, other science graduates and others) on numbers within the Veterinary Authority and available to the Veterinary Authority.

c) Veterinary para-professionals employed by the Veterinary Services

i) Animal health and welfare:

- Categories and numbers involved with farm livestock on a majority time basis:
- by geographical area;
- proportional to numbers of field Veterinary Officers in the Veterinary Services, by geographical area.
- Education or training details.

ii) Veterinary public health:

- Categories and numbers involved in food inspection on a majority time basis:
Annex 10 (contd)

- meat inspection: export meat establishments with an export function and domestic meat establishments (no export function);
- dairy inspection;
- other foods.
- Numbers in import and export inspection.
- Education or training details.

d) Support personnel

Numbers directly available to Veterinary Services per sector (administration, communication, transport).

e) Descriptive summary of the functions of the various categories of staff mentioned above

f) Veterinary, veterinary para-professionals, livestock owner, farmer and other relevant associations

g) Additional information or comments.

3. Financial management information

a) Total budgetary allocations to the Veterinary Authority for the current and past two fiscal years:

i) for the national Veterinary Authority;

ii) for each of any sub-national components of the Veterinary Authority;

iii) for other relevant government-funded institutions.

b) Sources of the budgetary allocations and amount:

i) government budget;

ii) sub-national authorities;

iii) taxes and fines;

iv) grants;

v) private services.

c) Proportional allocations of the amounts in a) above for operational activities and for the programme components of Veterinary Services.

d) Total allocation proportionate of national public sector budget. [This data may be necessary for comparative assessment with other countries which should take into account the contexts of the importance of the livestock sector to the national economy and of the animal health status of the country.]

e) Actual and proportional contribution of animal production to gross domestic product.
Annex 10 (contd)

4. Administration details
   a) Accommodation
      Summary of the numbers and distribution of official administrative centres of the Veterinary Services
      (national and sub-national) in the country.
   
   b) Communications
      Summary of the forms of communication systems available to the Veterinary Services on a nation-wide
      and local area bases.
   
   c) Transport
      i) Itemised numbers of types of functional transport available on a full-time basis for the Veterinary
         Services. In addition provide details of transport means available part-time.
         
      ii) Details of annual funds available for maintenance and replacement of motor vehicles.

5. Laboratories engaged in diagnosis
   a) Descriptive summary of the organisational structure and role of the government veterinary laboratory
      service in particular its relevance to the field Veterinary Services.
   
   b) Numbers of veterinary diagnostic laboratories operating in the country:
      
      i) government operated laboratories;
      
      ii) private laboratories authorised by Veterinary Authority for the purposes of supporting official or
          officially endorsed animal health control or public health testing and monitoring programmes and
          import and export testing.
   
   c) Descriptive summary of accreditation procedures and standards for private laboratories.
   
   d) Human and financial resources allocated to the government veterinary laboratories, including staff
      numbers, graduate and post-graduate qualifications and opportunities for further training.
   
   e) List of diagnostic methodologies available against major diseases of farm livestock (including poultry).
   
   f) List of related National Reference Laboratories, if any.
   
   g) Details of collaboration with external laboratories including international reference laboratories and
      details on numbers of samples submitted.
   
   h) Details of quality control and assessment (or validation) programmes operating within the veterinary
      laboratory service.
   
   i) Recent published reports of the official veterinary laboratory service which should include details of
      specimens received and foreign animal disease investigations made.
   
   j) Details of procedures for storage and retrieval of information on specimen submission and results.
   
   k) Reports of independent reviews of the laboratory service conducted by government or private
      organisations (if available).
   
   l) Strategic and operational plans for the official veterinary laboratory service (if available).
6. **Institutes engaged in research**
   
a) Numbers of veterinary research institutes operating in the country:
   
i) government operated institutes;
   
ii) private institutes involved in full time research directly related to animal health and welfare, and veterinary public health matters involving production animal species.
   
b) Summary of human and financial resources allocated by government to veterinary research.
   
c) Published programmes of future government sponsored veterinary research.
   
d) Annual reports of the government research institutes.

7. **Veterinary legislation, regulations and functional capabilities**
   
a) Animal health and animal welfare and veterinary public health
   
i) Assessment of the adequacy and implementation of relevant legislation (national or sub-national) concerning the following:
   
   – animal and veterinary public health controls at national frontiers;
   
   – control of endemic animal diseases, including *zoonoses*;
   
   – emergency powers for management of disasters which could have impact on animal health and *animal welfare*, and control of exotic disease *outbreaks*, including *zoonoses*;
   
   – inspection and registration of facilities;
   
   – animal feeding;
   
   – veterinary public health controls of the production, processing, storage and marketing of *meat* for domestic consumption;
   
   – veterinary public health controls of the production, processing, storage and marketing of fish, dairy products and other food of animal origin for domestic consumption;
   
   – registration and use of veterinary pharmaceutical products including vaccines;
   
   – *animal welfare*.
   
ii) Assessment of ability of *Veterinary Services* to enforce legislation.
   
b) Export and import inspection
   
i) Assessment of the adequacy and implementation of relevant national legislation concerning:
   
   – veterinary public health controls of the production, processing, storage and transportation of *meat* for export;
   
   – veterinary public health controls of production, processing, storage and marketing of fish, dairy products and other food of animal origin for export;
   
   – animal health and veterinary public health controls of the export and import of *animals*, animal genetic material, animal products, animal feedstuffs and other products subject to veterinary inspection;
Annex 10 (contd)

- animal welfare controls at export and import of animals;
- animal health controls of the importation, use and bio-containment of organisms which are aetiological agents of animal diseases, and of pathological material;
- animal health controls of importation of veterinary biological products including vaccines;
- administrative powers available to Veterinary Services for inspection and registration of facilities for veterinary control purposes (if not included under other legislation mentioned above);
- documentation and compliance.

ii) Assessment of ability of Veterinary Services to enforce legislation.

8. Animal health, animal welfare and veterinary public health controls

a) Animal health

i) Description of and sample reference data from any national animal disease reporting system controlled and operated or coordinated by the Veterinary Services.

ii) Description of and sample reference data from other national animal disease reporting systems controlled and operated by other organisations which make data and results available to Veterinary Services.

iii) Description and relevant data of current official control programmes including:
- epidemiological surveillance or monitoring programmes;
- officially approved industry administered control or eradication programmes for specific diseases.

iv) Description and relevant details of animal disease emergency preparedness and response plans.

v) Recent history of animal disease status:
- animal diseases eradicated nationally or from defined sub-national zones in the last ten years;
- animal diseases of which the prevalence has been controlled to a low level in the last ten years;
- animal diseases introduced to the country or to previously free sub national regions in the last ten years;
- emerging diseases in the last ten years;
- animal diseases of which the prevalence has increased in the last ten years.

b) Animal welfare

i) Description of major animal welfare issues.

ii) Description of specific official programmes initiated by the Veterinary Services to address animal welfare problems.
c) Veterinary public health

i) Food hygiene

- Annual national slaughter statistics for the past three years according to official data by species of animals (bovine, ovine, porcine, caprine, poultry, farmed game, wild game, equine, other).
- Estimate of total annual slaughterings which occur but are not recorded under official statistics.
- Proportion of total national slaughter which occurs in registered export establishments, by category of animal.
- Proportion of total national slaughter which occurs under veterinary control, by category of animal.
- Numbers of commercial fresh meat establishments in the country which are registered for export by the Veterinary Authority:
  - slaughterhouses/abattoir (indicate species of animals);
  - cutting or packing plants (indicate meat type);
  - meat processing establishments (indicate meat type);
  - cold stores.
- Numbers of commercial fresh meat establishments in the country approved by other importing countries which operate international assessment inspection programmes associated with approval procedures.
- Numbers of commercial fresh meat establishments under direct public health control of the Veterinary Services (including details of category and numbers of inspection staff associated with these premises).
- Description of the veterinary public health programme related to production and processing of animal products for human consumption (including fresh meat, poultry meat, meat products, game meat, dairy products, fish, fishery products, molluscs and crustaceans and other foods of animal origin) especially including details applying to exports of these commodities.
- Descriptive summary of the roles and relationships of other official organisations in public health programmes for the products listed above if the Veterinary Authority does not have responsibility for those programmes which apply to national production destined to domestic consumption or exports of the commodities concerned.

ii) Zoonoses

- Descriptive summary of the numbers and functions of staff of the Veterinary Authority involved primarily with monitoring and control of zoonotic diseases.
- Descriptive summary of the role and relationships of other official organisations involved in monitoring and control of zoonoses to be provided if the Veterinary Authority does not have these responsibilities.

iii) Chemical residue testing programmes

- Descriptive summary of national surveillance and monitoring programmes for environmental and chemical residues and contaminants applied to animal-derived foodstuffs, animals and animal feedstuffs.
- Role and function in these programmes of the Veterinary Authority and other Veterinary Services to be described in summary form.
Annex 10 (contd)

- Descriptive summary of the analytical methodologies used and their consistency with internationally recognised standards.

iv) Veterinary medicines

- Descriptive summary of the administrative and technical controls involving registration, supply and use of veterinary pharmaceutical products especially including biological products. This summary should include a focus on veterinary public health considerations relating to the use of these products in food-producing animals.

- Role and function in these programmes of the Veterinary Authority and other Veterinary Services to be described in summary form.

9. Quality systems

a) Accreditation

Details and evidence of any current, formal accreditation by external agencies of the Veterinary Services of any components thereof.

b) Quality manuals

Documented details of the quality manuals and standards which describe the accredited quality systems of the Veterinary Services.

c) Audit

Details of independent (and internal) audit reports which have been undertaken of the Veterinary Services of components thereof.

10. Performance assessment and audit programmes

a) Strategic plans and review

i) Descriptive summary and copies of strategic and operational plans of the Veterinary Services organisation.

ii) Descriptive summary of corporate performance assessment programmes which relate to the strategic and operational plans - copies of recent review reports.

b) Compliance

Descriptive summary of any compliance unit which monitors the work of the Veterinary Services (or elements thereof).

c) Annual reports of the Veterinary Authority

Copies of official annual reports of the national (sub-national) Veterinary Authority.

d) Other reports

i) Copies of reports of official reviews into the function or role of the Veterinary Services which have been conducted within the past three years.

ii) Descriptive summary (and copy of reports if available) of subsequent action taken on recommendations made in these reviews.

e) Training

i) Descriptive summary of in-service and development programmes provided by the Veterinary Services (or their parent Ministries) for relevant staff.
ii) Summary descriptions of training courses and duration.

iii) Details of staff numbers (and their function) who participated in these training courses in the last three years.

f) Publications

   Bibliographical list of scientific publications by staff members of Veterinary Services in the past three years.

g) Sources of independent scientific expertise

   List of local and international universities, scientific institutions and recognised veterinary organisations with which the Veterinary Services have consultation or advisory mechanisms in place.

11. Membership of the OIE

   State if country is a member of the OIE and period of membership.

   _____________________

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   - Text deleted.
CHAPTER 6.8.

MONITORING OF THE QUANTITIES AND USAGE PATTERNS OF ANTIMICROBIAL AGENTS IN FOOD-PRODUCING ANIMALS

Article 6.8.1.

Definition and purpose

For the purposes of this chapter, therapeutic use of antimicrobial agents means the administration of antimicrobial agents to animals for treating and controlling infectious diseases.

The purpose of these recommendations is to describe an approach to the monitoring of the quantities of antimicrobial agents used in food-producing animals.

In order to evaluate antimicrobial exposure in food-producing animals, quantitative information should be collected to monitor usage patterns by animal species, antimicrobial agents or class, type of use (therapeutic or non-therapeutic) and route of administration.

Article 6.8.2.

Objectives

The information provided in these recommendations is essential for antimicrobial resistance risk analyses and planning purposes and should be read in conjunction with Chapters 6.7. and 6.10. This information is necessary for interpreting antimicrobial resistance surveillance data and can assist in responding to problems of antimicrobial resistance in a precise and targeted way. The continued collection of this basic information will also help to give an indication of trends in the use of antimicrobial agents in animals over time and potential associations with antimicrobial resistance in animals. This information may also assist in risk management to evaluate the effectiveness of efforts to ensure responsible and prudent use and mitigation strategies (for example, by identifying changes in veterinary prescribing practices) and to indicate where change of antimicrobial usage practices might be appropriate. The publication of these data is important to ensure transparency and to allow all interested parties to assess trends, to perform risk assessments and for risk communication purposes.

Article 6.8.3.

Development and standardisation of antimicrobial monitoring systems

Systems to monitor antimicrobial usage consist of the following elements:

1. Sources of antimicrobial data
   a) Basic sources

   Sources of data will vary from country to country. Such sources may include customs, import and export data, manufacturing and sales data.
Annex 11 (contd)

b) Direct sources

Data from veterinary medicinal product registration authorities, wholesalers, retailers, pharmacists, veterinarians, feed stores, feed mills and pharmaceutical industry associations can be efficient and practical sources. A possible mechanism for the collection of this information is to make the provision of appropriate information by pharmaceutical manufacturers to the regulatory authority one of the requirements of antimicrobial registration.

c) End-use sources (veterinarians and food animal producers)

This may be appropriate when basic or direct sources cannot be used for the routine collection of the information or when more accurate and locally specific information is required (such as off label use).

Periodic collection of this type of information may be sufficient.

Collection, storage and processing of data from end-use sources should be carefully designed, well managed and have the capability to produce accurate and targeted information.

d) Other sources

Non-conventional sources including Internet sales data related to antimicrobial agents could be collected where available.

Member Countries may wish to consider, for reasons of cost and administrative efficiency, collecting medical, food-producing animal, agricultural and other antimicrobial use data in a single programme. A consolidated programme would also facilitate comparisons of animal use with human use data for risk analysis purposes and help to promote optimal usage of antimicrobial agents.

2. Types and reporting formats of antimicrobial usage data

a) Type of antimicrobial use data

The data collected at minimum should be the weight in kilograms of the active ingredient of the antimicrobial(s) used in food-producing animals per year. It is possible to estimate total usage by collecting sales data, prescribing data, manufacturing data, import and export data or any combination of these.

The total number of food-producing animals by species, type of production and their weight in kilograms for food production per year (as relevant to the country of production) is essential basic information.

Information on dosage regimens (dose, dosing interval and duration of the treatment) and route of administration are elements to include when estimating antimicrobial usage in food-producing animals.

b) Reporting formats of antimicrobial use data

The antimicrobial agents, classes or sub-classes to be included in data reporting should be based on current known mechanisms of antimicrobial activity and antimicrobial resistance data.

Nomenclature of antimicrobial agents should comply with international standards where available.

For active ingredients present in the form of compounds or derivatives, the mass of active entity of the molecule should be recorded. For antimicrobial agents expressed in International Units, the factor used to convert these units to mass of active entity should be stated.
The reporting of antimicrobial use data may be further organised by species, by route of administration (specifically in-feed, in-water, injectable, oral, intramammary, intra-uterine and topical) and by type of use (therapeutic or non-therapeutic).

Regarding data coming from end-use sources, further breakdown of data for analysis of antimicrobial use at the regional, local, herd and individual veterinarian or veterinary practice levels may be possible.

Article 6.8.4.

Interpretation

According to the OIE risk assessment guidelines (refer to Chapter 6.10.), factors such as the number or percentage of animals treated, treatment regimes, type of use and route of administration are key elements to consider.

When comparing antimicrobial use data over time, changes in the size and composition of animal populations should also be taken into account.

The interpretation and communication of results should take into account factors such as seasonality and disease conditions, animal species and age affected, agricultural systems (e.g. extensive range conditions and feedlots), animal movements, and dosage regimens with antimicrobial agents.

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Text deleted.
CHAPTER 8.16.
INFECTION WITH TRICHINELLA SPP.

Article 8.16.1.

General provisions

Trichinellosis is a widely distributed zoonosis caused by eating raw or undercooked meat from Trichinella infected food-producing animals or wildlife. Given that clinical signs of trichinellosis are not generally recognised in animals, the importance of trichinellosis lies exclusively in the risk posed to humans and costs of control in slaughter populations.

The adult parasite and the larval forms live in the small intestine and muscles (respectively) of many mammalian, avian and reptile host species. Within the genus Trichinella, twelve genotypes have been identified, eight of which have been designated as species. There is geographical variation amongst the genotypes.

Prevention of infection in susceptible species of domestic animals intended for human consumption relies on the prevention of exposure of those animals to the meat and meat products of Trichinella infected animals. This includes consumption of food waste of domestic animal origin, rodents and wildlife.

Meat and meat products derived from wildlife should be considered a potential source of infection for humans. Therefore untested meat and meat products of wildlife may pose a public health risk.

For the purposes of the Terrestrial Code, infection with Trichinella spp. infection is defined as an infection of suids or equids by parasites of the genus Trichinella.

This chapter provides recommendations for on-farm prevention of Trichinella infection in domestic pigs (Sus scrofa domesticus), and safe trade of meat and meat products derived from suids and equids. This chapter should be read in conjunction with the Codex Alimentarius Code of Hygienic Practice for Meat (CAC/RCP 58-2005) and Guidelines for the control of Trichinella spp. in meat of Suidae (CAC/GL 86-2015).

Methods for the detection of Trichinella infection in pigs and other animal species include direct demonstration of Trichinella larvae in muscle samples. Demonstration of the presence of Trichinella-specific circulating antibodies using a validated serological test may be useful for epidemiological purposes.

When authorising the import or transit of the commodities covered in this chapter, with the exception of those listed in Article 8.16.2., Veterinary Authorities should apply the recommendations in this chapter.

Standards for diagnostic tests are described in the Terrestrial Manual.

Article 8.16.2.

Safe commodities

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

1) hides, skins, hair and bristles;
2) semen, embryos and oocytes.
Annex 12 (contd)

**Article 8.16.3.**

**Measures to prevent infection in domestic pig herds kept under controlled management conditions**

1) **Prevention of infection** is dependent on minimising exposure to potential sources of *Trichinella*:

   a) facilities and the surrounding environment should be managed to prevent exposure of pigs to rodents and *wildlife*;

   b) raw food waste of animal origin should not be present *at the farm level on pig establishments* and should not be fed to pigs;

   c) feed should comply with the requirements in Chapter 6.3. and should be stored in a manner to prevent access by rodents and *wildlife*;

   d) a rodent control programme should be in place;

   e) dead *animals* should be immediately removed and disposed of in accordance with Chapter 4.12.;

   f) introduced pigs should originate from *herds* officially recognised as being under controlled management conditions as described in point 2, or from *herds* of a *compartment* with a negligible risk of *Trichinella infection*, as described in Article 8.16.5.

2. The *Veterinary Authority* may officially recognise pig *herds* as being under controlled management conditions if:

   a) all management practices described in point 1 are complied with and recorded;

   b) visits by approved auditors have been made periodically to verify compliance with good management practices described in point 1; the frequency of inspections should be *risk*-based, taking into account historical information, *slaughterhouse* monitoring results, knowledge of established farm management practices and the presence of susceptible *wildlife*;

   c) a subsequent programme of audits is conducted, taking into account the factors described in point b.

**Article 8.16.4.**

**Prerequisite criteria for the establishment of compartments with a negligible risk of *Trichinella* infection in domestic pigs kept under controlled management conditions**

*Compartment* with a negligible risk of *Trichinella* infection in domestic pigs kept under controlled management conditions can only be established in countries, in which the following criteria, as applicable, are met:

1) *Trichinella infection* is notifiable in the whole territory and communication procedures on the occurrence of *Trichinella infection* are established between the *Veterinary Authority* and the public health authority;

2) the *Veterinary Authority* has knowledge of, and authority over, all domestic pigs;

3) the *Veterinary Authority* has current knowledge of the distribution of susceptible species of *wildlife*;

4) an *animal identification* and *animal traceability* system for domestic pigs is implemented in accordance with Chapters 4.1. and 4.2.;

5) *Veterinary Services* have the capability to assess the epidemiological situation, detect the presence of *Trichinella infection* (including genotype, if relevant) in domestic pigs and identify exposure pathways.
Article 8.16.5.

Compartment with a negligible risk of Trichinella infection in domestic pigs kept under controlled management conditions

The Veterinary Authority may recognise a compartment in accordance with Chapter 4.4. as having negligible risk of Trichinella infection in domestic pigs kept under controlled management conditions if the following conditions are met:

1) all herds of the compartment comply with the requirements in Article 8.16.3.
2) Article 8.16.4. has been complied with for at least 24 months;
3) the absence of Trichinella infection in the compartment has been demonstrated by a surveillance programme which takes into account current and historical information, and slaughterhouse monitoring results, as appropriate, in accordance with Chapter 1.4.;
4) once a compartment is established, a subsequent programme of audits of all herds within the compartment is in place to ensure compliance with Article 8.16.3.;
5) if an audit identifies a lack of compliance with the criteria described in Article 8.16.3. and the Veterinary Authority determines this to be a significant breach of biosecurity, the herd(s) concerned should be removed from the compartment until compliance is re-established.

Article 8.16.6.

Recommendations for the importation of meat or meat products of domestic pigs

Veterinary Authorities of importing countries should require the presentation of an international veterinary certificate attesting that the entire consignment of meat or meat products:

1) has been produced in accordance with the Codex Code of Hygienic Practice for Meat (CAC/RCP 58-2005);
AND
2) either:
   a) comes from domestic pigs originating from a compartment with a negligible risk for Trichinella infection in accordance with Article 8.16.5.;
   OR
   b) comes from domestic pigs that tested negative by an approved method for the detection of Trichinella larvae;
   OR
   c) was processed to ensure the inactivation of Trichinella larvae in accordance with the Codex Guidelines for the control of Trichinella spp. in meat of Suidae (CAC/GL 86-2015) the recommendations of the Codex Alimentarius (under study).

Article 8.16.7.

Recommendations for the importation of meat or meat products of wild or feral pigs

Veterinary Authorities of importing countries should require the presentation of an international veterinary certificate attesting that the entire consignment of meat or meat products:

1) has been produced in accordance with the Codex Code of Hygienic Practice for Meat (CAC/RCP 58-2005);
Annex 12 (contd)

AND

2) either:

   a) comes from wild or feral pigs that tested negative by an approved method for the detection of *Trichinella* larvae;

   OR

   b) was processed to ensure the inactivation of *Trichinella* larvae in accordance with the Codex Guidelines for the control of *Trichinella* spp. in meat of Suidae (CAC/GL 86-2015), the recommendations of the Codex Alimentarius (under study).

Article 8.16.8.

**Recommendations for the importation of meat or meat products of domestic equids**

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

1) has been produced in accordance with the Codex Code of Hygienic Practice for Meat (CAC/RCP 58-2005);

AND

2) comes from domestic equids that tested negative by an approved method for the detection of *Trichinella* larvae.

Article 8.16.9.

**Recommendations for the importation of meat or meat products of wild and feral equids**

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

1) has been inspected in accordance with Chapter 6.2.;

AND

2) comes from wild or feral equids that tested negative by an approved method for the detection of *Trichinella* larvae.

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**CHAPTER 15.3.**

**INFECTION WITH *TAENIA SOLIUM* (PORCINE CYSTICERCOSIS)**

Article 15.3.1.

**General provisions**

*Infection with Taenia solium* is a zoonotic parasitic infection parasite of pigs and occasionally other animals. *T. solium* is a cestode (tapeworm) that is endemic in large areas of Latin America, Asia and sub-Saharan Africa. The adult cestode occurs in the small intestine of humans (definitive host) causing taeniosis. The larval stage (cysticercus) occurs in striated muscles, subcutaneous tissues and central nervous system of pigs (intermediate hosts), causing cysticercosis. Other suids and dogs can be infected but are not epidemiologically significant. Humans may also become infected with the larval stage through the ingestion of eggs shed in faeces of infected humans. The most severe form of the human infection by the larval stage in humans is neurocysticercosis which causes neurological disorders including seizures (epilepsy) and sometimes death. Cysticercosis, although normally clinically inapparent in pigs, is associated with significant economic losses due to carcass condemnation and decreased value of pigs, and causes a major disease burden in humans.

In humans, taeniosis occurs following ingestion of pig *meat* containing viable cysticeri and can be prevented by avoiding consumption of raw or undercooked contaminated pig *meat*. In humans, cysticercosis occurs following ingestion of *T. solium* eggs and can be prevented by avoiding exposure to *T. solium* eggs through detection and treatment of human tapeworm carriers, community health education, appropriate sanitation, personal hygiene, and good food hygiene. Collaboration between the Veterinary Authority and the public health authority is essential in preventing and controlling *T. solium* transmission.

In pigs, cysticercosis occurs by ingestion of *T. solium* eggs from faeces, or environments contaminated with faeces of humans harbouring adult *T. solium*.

For the purposes of the Terrestrial Code, *infection with T. solium* is defined as an *infection of pigs*.

The aim of this chapter is to reduce the risk of *infection with T. solium* of humans and pigs and to minimise the international spread of *T. solium*. The chapter provides recommendations for prevention, control, and surveillance of *infection with T. solium* in pigs.

This chapter should be read in conjunction with the Codex Alimentarius Code of Hygienic Practice for Meat (CAC/RCP 58-2005).

When authorising the import or transit of the *commodities* covered in this chapter, with the exception of those listed in Article 15.3.2. *Veterinary Authorities* should apply the recommendations in this chapter.

Standards for diagnostic tests are described in the Terrestrial Manual.

Article 15.3.2.

**Safe commodities**

When authorising import or transit of the following *commodities* of pigs, *Veterinary Authorities* should not require any *T. solium* related conditions regardless of the status of the animal population of the *exporting country*:

1) processed fat;
2) casings;
3) semi-processed skins which have been submitted to the usual chemical and mechanical processes in use in the tanning industry;
4) bristles, hooves and bones;
5) embryos and semen.
Annex 13 (contd)

Article 15.3.3.

Measures to prevent and control infection with *T. solium*

The Veterinary Authority and other Competent Authorities should carry out community awareness and education programmes on the risk factors associated with transmission of *T. solium* emphasising the role of pigs and humans.

The Veterinary Authority or other Competent Authorities should promote the following measures:

1. Prevention of infection in pigs
   
   Transmission of *T. solium* eggs from humans to pigs can be avoided by:
   
   a) preventing the exposure of pigs to environments contaminated with human faeces;
   
   b) preventing the deliberate use of human faeces as pig feed or the use of pigs as a means of human faeces disposal;
   
   c) preventing the use of untreated sewage effluent to irrigate or fertilise land to be used by pigs for forage and or for food crops;
   
   d) ensuring that any treated sewage effluent used to irrigate or fertilise land to be used by pigs for forage or for food crops has been treated in a manner shown to inactivate *T. solium* eggs;
   
   e) providing adequate toilet and sanitation facilities for people in pig rearing establishments to prevent the exposure of pigs and their environment to human faeces.

2. Control of infection in pigs

   a) The Veterinary Authority should ensure that all slaughtered pigs are subjected to post-mortem meat inspection in accordance with Chapter 6.2., and with reference to Chapter 2.9.5. of the Terrestrial Manual.

   b) When cysticerci are detected during post-mortem meat inspection:

      i) if 20 or more cysticerci are detected in a carcass of a pig in multiple locations (systemic infection), that carcass and its viscera, as well as all pigs from the same establishment of origin should be disposed of in accordance with Article 4.12.6.;

      ii) if fewer than 20 only localised cysticerci are detected in a carcass of a pig, the meat from that carcass and from all pigs from the same establishment of origin should be treated in accordance with Article 15.3.6. or may be disposed of in accordance with Article 4.12.6.;

      iii) an investigation should be carried out by the Veterinary Authority and the public health authority to identify the possible source of the infection in order to target an intervention;

      iv) post-mortem examination of pigs at slaughter from known infected establishments should be intensified until sufficient evidence has been obtained indicating that the infection has been eliminated from the establishment.

An optimal control programme should include detection and treatment of human tapeworm carriers and control of sewage used for agricultural production.
Article 15.3.4.

Surveillance for infection with *T. solium* in pigs

Communication procedures on the occurrence of *T. solium* should be established between the Veterinary Authority and public health authorities.

The Veterinary Authority should use information from public health authorities and other sources on human cases of taeniosis or cysticercosis in the initial design and any subsequent modification of surveillance programmes.

**Surveillance** can be conducted by:

1) meat inspection at slaughterhouses/abattoirs;
2) tongue inspection of live pigs at markets provided that the methods used do not cause injury and avoid unnecessary suffering;
3) other diagnostic tests on live pigs.

The data collected should be used for investigations and for the design or amendment of control programmes as described in Article 15.3.3.

**Animal identification** and **animal traceability** systems should be implemented in accordance with the provisions of Chapters 4.1. and 4.2.

Article 15.3.5.

**Recommendations for the importation of meat and meat products of pigs**

Veterinary Authorities of importing countries should require the presentation of an international veterinary certificate attesting that the entire consignment of meat or meat products:

1) has been produced in accordance with the Codex Code of Hygienic Practice for Meat (CAC/RCP 58-2005);

AND

2) comes from pigs which have been slaughtered in an approved slaughterhouse/abattoir;

AND

3) either
   a) comes from pigs born and raised in a country, zone or compartment demonstrated to be free from *T. solium* in accordance with Article 1.4.6.;

   or

   b) comes from pigs which have been subjected to post-mortem inspections for *T. solium* cysticerci with favourable results;

   or

   c) has been processed to ensure the inactivation of the *T. solium* cysticerci in accordance with one of the procedures referred to in Article 15.3.6.
Annex 13 (contd)

Article 15.3.6.

Procedures for the inactivation of *T. solium* cysticerci in meat of pigs

For the inactivation of *T. solium* cysticerci in meat of pigs, one of the following procedures should be used:

1) heat treatment to a core temperature of at least 80 °C; or

2) freezing to minus 10°C or less for at least ten days or any time and temperature equivalent.

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Text deleted.
CHAPTER 7.5.
SLAUGHTER OF ANIMALS

[Article 7.5.1.]
[Article 7.5.2.]
[Article 7.5.3.]
[Article 7.5.4.]
[Article 7.5.5.]
[Article 7.5.6.]
Article 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 equipment is applied correctly;

e) stunned animals are bled out (slaughtered) as soon as possible;

f) animals are not 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.

Provision of a manual inspection area and simple intervention like captive bolt or cervical dislocation for poultry would help prevent potential welfare problems.

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. For a more detailed explanation on the different methods for mechanical stunning, see Chapter 7.6. and Articles 7.6.6., 7.6.7. and 7.6.8. The following diagrams illustrate the proper application of the device for certain species.
Annex 14 (contd)

Signs of correct **stunning** using a mechanical **instrument device** 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;

c) normal rhythmic breathing stops; and

d) the eyelid is open with the eyeball facing straight ahead and is not rotated.

Captive bolts powered by cartridges, compressed air or spring can be used for **poultry**. The optimum position for **poultry** species is at a right angle to the frontal surface.

Firing of a captive bolt in accordance with the manufacturers’ instructions should lead to immediate destruction of the skull and the brain and, as a result, immediate **death**.

3. […]

4. […]

5. […]

**Figure 1.** 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.

**Cattle**


**Figure 2.** The optimum position for pigs is on the midline just above eye level, with the shot directed down the line of the spinal cord.

**Pigs**

Figure 3. The optimum position for hornless sheep and goats is on the midline.

Sheep

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).

Figure 4. The optimum position for heavily horned sheep and horned goats is behind the poll, aiming towards the angle of the jaw.

Goats

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).
Figure 5. 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.

**Horses**

Signs of correct stunning using a mechanical instrument are as follows:

1) the animal collapses immediately and does not attempt to stand up;

2) the body and muscles of the animal become tonic (rigid) immediately after the shot;

3) normal rhythmic breathing stops; and

4) the eyelid is open with the eyeball facing straight ahead and is not rotated.

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).
Captive bolts powered by cartridges, compressed air or spring can be used for poultry. The optimum position for poultry species is at right angles to the frontal surface.

Firing of a captive bolt according to the manufacturers’ instructions should lead to immediate destruction of the skull and the brain and, as a result, immediate death.
Annex 14 (contd)

[Article 7.5.8.]

Text deleted.
CHAPTER 7.6.

KILLING OF ANIMALS FOR DISEASE CONTROL PURPOSES

[Article 7.6.1.]
[Article 7.6.2.]
[Article 7.6.3.]
[Article 7.6.4.]

Article 7.6.5.

Table summarising killing methods described in Articles 7.6.6.-7.6.18.

The methods are described in the order of mechanical, electrical and gaseous, not in an order of desirability from an animal welfare viewpoint.

<table>
<thead>
<tr>
<th>Species</th>
<th>Age range</th>
<th>Procedure</th>
<th>Restraint necessary</th>
<th>Animal welfare concerns with inappropriate application</th>
<th>Article reference</th>
</tr>
</thead>
<tbody>
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<td>Cattle</td>
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<td>free bullet</td>
<td>no</td>
<td>non-lethal wounding</td>
<td>Article 7.6.6.</td>
</tr>
<tr>
<td></td>
<td>all except neonates</td>
<td>penetrating captive bolt - followed by pithing or bleeding</td>
<td>yes</td>
<td>ineffective stunning, regaining of consciousness before death</td>
<td>Article 7.6.7.</td>
</tr>
<tr>
<td></td>
<td>adults only</td>
<td>non-penetrating captive bolt, followed by bleeding</td>
<td>yes</td>
<td>ineffective stunning, regaining of consciousness before killing death</td>
<td>Article 7.6.8.</td>
</tr>
<tr>
<td></td>
<td>calves only</td>
<td>electrical, two-stage application</td>
<td>yes</td>
<td>pain associated with cardiac arrest after ineffective stunning</td>
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<tr>
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<td>calves only</td>
<td>electrical, single application (method 1)</td>
<td>yes</td>
<td>ineffective stunning</td>
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<tr>
<td></td>
<td>all</td>
<td>injection with barbiturates and other drugs</td>
<td>yes</td>
<td>non-lethal dose, pain associated with injection site</td>
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</table>
### Annex 15 (contd)

<table>
<thead>
<tr>
<th>Species</th>
<th>Age range</th>
<th>Procedure</th>
<th>Restraint necessary</th>
<th>Animal welfare concerns with inappropriate application</th>
<th>Article reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheep and goats</td>
<td>all</td>
<td>free bullet</td>
<td>no</td>
<td>non-lethal wounding</td>
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<td></td>
<td>all except neonates</td>
<td>penetrating captive bolt, followed by pithing or bleeding</td>
<td>yes</td>
<td>ineffective stunning, non-lethal wounding, regaining of consciousness before death</td>
<td>Article 7.6.7.</td>
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<tr>
<td></td>
<td>all except neonates</td>
<td>non-penetrating captive bolt, followed by bleeding</td>
<td>yes</td>
<td>ineffective stunning, regaining of consciousness before death</td>
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</tr>
<tr>
<td></td>
<td>neonates</td>
<td>non-penetrating captive bolt</td>
<td>yes</td>
<td>non-lethal wounding</td>
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</tr>
<tr>
<td></td>
<td>all</td>
<td>electrical, two-stage application</td>
<td>yes</td>
<td>pain associated with cardiac arrest after ineffective stunning</td>
<td>Article 7.6.10.</td>
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<tr>
<td></td>
<td>all</td>
<td>electrical, single application (method 1)</td>
<td>yes</td>
<td>ineffective stunning</td>
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<td>neonates only</td>
<td>CO₂/air mixture</td>
<td>yes</td>
<td>slow induction of unconsciousness, aversiveness of induction</td>
<td>Article 7.6.12.</td>
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<td>neonates only</td>
<td>nitrogen and/or inert gas mixed with CO₂</td>
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<td>slow induction of unconsciousness, aversiveness of induction</td>
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<td>slow induction of unconsciousness</td>
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<td>all</td>
<td>injection of barbiturates and other drugs</td>
<td>yes</td>
<td>non-lethal dose, pain associated with injection site</td>
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<td>Pigs</td>
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<td>free bullet</td>
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<td>non-lethal wounding</td>
<td>Article 7.6.6.</td>
</tr>
<tr>
<td>Species</td>
<td>Age range</td>
<td>Procedure</td>
<td>Restraint necessary</td>
<td>Animal welfare concerns with inappropriate application</td>
<td>Article reference</td>
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<td>--------------------------------------------------------</td>
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<td>Pigs (contd)</td>
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<td>penetrating captive bolt, followed by pithing or bleeding</td>
<td>yes</td>
<td>ineffective stunning, non-lethal wounding, regaining of consciousness before death</td>
<td>Article 7.6.7.</td>
</tr>
<tr>
<td></td>
<td>neonates only</td>
<td>non-penetrating captive bolt</td>
<td>yes</td>
<td>non-lethal wounding</td>
<td>Article 7.6.8.</td>
</tr>
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<td>electrical, two-stage application</td>
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<td>pain associated with cardiac arrest after ineffective stunning; design of the stunning tongs not appropriate for the small head or body of neonates</td>
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<td>slow induction of unconsciousness, aversiveness of induction</td>
<td>Article 7.6.12.</td>
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<td>day-olds and eggs only</td>
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### Annex 15 (contd)

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<tr>
<th>Species</th>
<th>Age range</th>
<th>Procedure</th>
<th>Restraint necessary</th>
<th>Animal welfare concerns with inappropriate application</th>
<th>Article reference</th>
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<td>CO₂ / air mixture</td>
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<td>slow induction of unconsciousness, aversiveness of induction</td>
<td>Article 7.6.12.</td>
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<td>nitrogen and/or inert gas mixed with CO₂</td>
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<td>slow induction of unconsciousness, aversiveness of induction</td>
<td>Article 7.6.13.</td>
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<td>nitrogen and/or inert gases</td>
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<td>Article 7.6.14.</td>
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<td>injection of barbiturates and other drugs</td>
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<td>non-lethal dose, pain associated with injection site</td>
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<td>cervical dislocation</td>
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<td>decapitation</td>
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<td>addition of anaesthetics to feed or water, followed by an appropriate killing method</td>
<td>no</td>
<td>ineffective or slow induction of unconsciousness</td>
<td>Article 7.6.16.</td>
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<td>Equids</td>
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<td>free bullet</td>
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<td>non-lethal wounding</td>
<td>Article 7.6.6.</td>
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<td></td>
<td>all, except neonates</td>
<td>penetrating captive bolt followed by pithing or bleeding</td>
<td>yes</td>
<td>ineffective stunning, non-lethal wounding, regaining of consciousness before killing death</td>
<td>Article 7.6.7</td>
</tr>
<tr>
<td></td>
<td>all</td>
<td>injection of barbiturates and other drugs</td>
<td>yes</td>
<td>non-lethal dose, pain associated with injection site</td>
<td>Article 7.6.15.</td>
</tr>
</tbody>
</table>
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 animals (high neck shot) and 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 head of the animals.
   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.

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 used 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.

5. Conclusion
   The method is suitable for cattle, sheep, goats and equids including large animals in open spaces.
Annex 15 (contd)

**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 1: Optimum shooting position for cattle](image1)

*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).*

**Figure 2.** The optimum position for hornless sheep and goats is on the midline.

![Figure 2: Optimum position for hornless sheep and goats](image2)

*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).*
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 4. The optimum shooting position for pigs is just above eye level, with the shot directed down the line of the spinal cord.

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. Shooting poultry species with the captive bolts results in immediate destruction of the skull and brain, causing death. For a detailed description on the use of this method, see Chapter 7.5.
Annex 15 (contd)

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 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 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.
   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 poultry, cattle, sheep, goats, and pigs and equids (except neonates), when followed by pithing or bleeding.
Article 7.6.8.

Non-penetrating captive bolt

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 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 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 head of the animal is accessible.

   f) The operator should fire the captive bolt at a right angle 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 neonates.

   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**

The method is suitable for killing poultry, and neonate sheep, goats and pigs up to a maximum weight of 10 kg.
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.

2. **Requirements for effective use**

   a) The stunner control device should generate a low frequency (AC sine wave 50 Hz) current with a minimum voltage and current as set out in the following table:

<table>
<thead>
<tr>
<th>Animal</th>
<th>Minimum voltage (V)</th>
<th>Minimum current (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>220</td>
<td>1.5</td>
</tr>
<tr>
<td>Sheep</td>
<td>220</td>
<td>1.0</td>
</tr>
<tr>
<td>Pigs over 6 weeks of age</td>
<td>220</td>
<td>1.3</td>
</tr>
<tr>
<td>Pigs less than 6 weeks of age</td>
<td>125</td>
<td>0.5</td>
</tr>
</tbody>
</table>

   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 should 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.

5. Conclusion

   The method is suitable for calves, sheep and goats, and especially for pigs (over one week of age).

Figure 5. Scissor-type tongs.
Nitrogen and/or inert gas mixed with CO₂

1. Introduction

CO₂ 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%, or <5% for chickens. Various mixtures of CO₂ and nitrogen or an inert gas can be administered to kill birds using Methods 1 and 2 described under Article 7.6.12. Whole house gassing with mixtures of CO₂ and nitrogen, or an inert gas, has not been tested owing to the complex issues presented by mixing gases in large quantities. Such mixtures however do not induce immediate loss of consciousness, therefore the aversiveness of various gas mixtures containing high concentrations of CO₂ and the respiratory distress occurring during the induction phase, are important animal welfare considerations.

Pigs and poultry appear not to find low concentrations of CO₂ strongly aversive, and a mixture of nitrogen or argon with ≤30% CO₂ by volume and ≤2% O₂ by volume can be used for killing poultry, neonatal sheep, goats and pigs.

2. Method 1

The animals are placed in a gas-filled container or apparatus.

a) Requirements for effective use

i) Containers or apparatus should allow the required gas concentrations to be maintained, and the O₂ and CO₂ concentrations accurately measured during the killing procedure.

ii) 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.

iii) Animals should be introduced into the container or apparatus after it has been filled with the required gas concentrations (with ≤2% O₂), and held in this atmosphere 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.

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

b) Advantages

Low concentrations of CO₂ cause little aversiveness and, in combination with nitrogen or an inert gas, produces a fast induction of unconsciousness.

c) Disadvantages

i) A properly designed container or apparatus is needed.

ii) It is difficult to verify death while the animals are in the container or apparatus.

iii) There is no immediate loss of consciousness.

iv) Exposure times required to kill are considerable.

d) Conclusion

The method is suitable for poultry, and for neonatal sheep, goats and pigs.
3. Method 2

In this method, the crates or modules holding the birds are loaded into a container and gas is introduced into the container (refer to Figures under Article 7.6.12.). As shown in the example below, each containerised gassing unit (CGU) typically comprises a gas-tight chamber designed to accommodate poultry transport crates or a module. The container or chamber is fitted with gas lines and diffusers, with silencers, which in turn are connected via a system of manifolds and gas regulators to gas cylinders. There is a hole at the top of the unit to permit displaced air to escape when filling the container with gas.

Procedures involved in the operation of CGU include: (a) position the container on a level, solid, open ground; (b) connect gas cylinder to the container; (c) load a module of birds into the container; (d) shut and secure the door; (e) deliver the gas to the point where less than 2% by volume of oxygen is found at the top of the container; (f) allow time for the birds to become unconscious and die; (g) open the door and allow the gas to be dispersed in air; (h) remove the module; (i) check each drawer for survivors; (j) humanely kill survivors, if any; and (k) dispose carcasses appropriately.

a) Requirements for effective use of containerised gassing units (CGU)

i) The birds should be caught gently and placed in crates or modules of appropriate size and at appropriate stocking densities to allow all birds to sit down.

ii) The crates or module of birds should be placed inside the container and the door shut only when the operator is ready to administer the gas mixture.

iii) Ensure the container door is locked and administer the gas mixture until <2% residual oxygen is achieved at the top of the crates.

iv) An appropriate gas meter should be used to ensure a concentration of oxygen <2% is achieved and maintained until it can be confirmed that the birds have been killed.

v) Sufficient exposure time should be allowed for birds to die before the door is opened. In the absence of a viewing window, which allows direct observation of birds during killing, cessation of vocalisation and wing flapping sounds can be observed by standing close to the container and used to determine the onset of death in birds. Remove the crates or modules from the container and leave them in the open air.

vi) Each crate or module should be examined and birds checked to ensure they are dead. Dilated pupils and absence of breathing movements indicate death.

vii) Any survivors should be humanely killed.

viii) Ducks and geese do not appear to be resilient to the effects of a mixture of 20% carbon dioxide and 80% nitrogen or argon.

b) Advantages

i) The gas mixture is introduced quickly and quietly resulting in less turbulence and disturbance to the birds.

ii) The use of transport crates or modules to move birds minimises handling. Birds should be handled by trained, experienced catching teams at the time of depopulation of the poultry house.

iii) The modules are loaded mechanically into the CGU and a lethal mixture of gas is rapidly introduced into the chamber immediately after sealing.

iv) Mixtures containing up to 20% carbon dioxide in argon are readily available as welding gas cylinders.

v) Birds are exposed to gas in a more uniform manner and they do not smother each other when compared with Method 1.

vi) Two CGU can be operated in tandem and throughputs of up to 4,000 chickens per hour are possible.

vii) The volume of gas required can be readily calculated.
viii) As the units are operated outdoor the gas is dispersed quickly at the end of each cycle by opening the door, improving operators’ health and safety.

ix) The system uses skilled catching teams and equipment in daily use by the industry.

x) Metal *containers* can be readily cleansed and disinfected.

c) Disadvantages

i) Requires trained operators, trained catchers, transport modules and a fork lift. However, such equipment and suitable outdoor areas with a hard surface are usually available.

ii) The main limiting factors are speed of catching birds and availability of gas mixtures.

iii) In the absence of a viewing window, visual confirmation of death while the birds are still in the container is difficult. However, cessation of vocalisation and convulsive wing flapping can be used to determine the onset of death.

iv) CGU could be used to kill *poultry* on small to medium farms, e.g. up to 25 thousand birds on a single farm.

d) Conclusion

i) Method 2 is suitable for use in *poultry* and in neonatal sheep, goats and pigs.

ii) Method 2 is suitable for use in *poultry* in a wide range of *poultry* systems providing that these have access to *vehicles* to carry *containers* and equipment.

iii) Animals should be introduced into the container or apparatus, which is then sealed and filled as quickly as possible with the gas mixture. A residual oxygen concentration of less than 2% should be achieved and maintained and birds should be held in this atmosphere until death is confirmed.
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 does not induce any signs of respiratory distress prior to loss of consciousness.

2. Requirements for effective use

a) Containers or apparatus should allow the required gas concentrations to be maintained, and the $O_2$ 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.
Annex 15 (contd)

c) Animals should be introduced into the container or apparatus after it has been filled with the required gas concentrations (with <2% O₂), 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 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.

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

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 and training required may restrict use to veterinarians.
   d) Contaminated carcasses may present a risk to other wild animals or domestic animals.

5. Conclusion
   The method is suitable for killing small numbers of cattle, sheep, goats, pigs, equids and poultry.

Pithing and bleeding
1. 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.
      ii) The working area is contaminated with body fluids, which increases biosecurity risks.

2. 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.
Annex 15 (contd)

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

i) A delayed and/or ineffective bleeding due to convulsions may occur.

ii) The working area is contaminated with body fluids, which increases biosecurity risks.

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1 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 or body.
CHAPTER 7.10.

ANIMAL WELFARE AND BROILER CHICKEN PRODUCTION SYSTEMS

[Article 7.10.1.]

[Article 7.10.2.]

[Article 7.10.3.]

Article 7.10.4.

Recommendations

1. Biosecurity and animal health
   a) Biosecurity and disease prevention

      Biosecurity means a set of measures designed to maintain a flock at a particular health status and to prevent the entry (or exit) of specific infectious agents.

      Biosecurity programmes should be designed and implemented, commensurate with the best possible flock health status and current disease risk (endemic and exotic or transboundary) that is specific to each epidemiological group of broilers and in accordance with relevant recommendations found in the Terrestrial Code.

      These programmes should address the control of the major routes for disease and pathogen transmission:

      i) direct transmission from other poultry, domesticated and wild animals and humans,

      ii) fomites, such as equipment, facilities and vehicles,

      iii) vectors (e.g. arthropods and rodents),

      iv) aerosols,

      v) water supply,

      vi) feed.


   b) Animal health management, preventive medicine and veterinary treatment

      Animal health management means a system designed to optimise the health and welfare of the broilers. It includes prevention, treatment and control of diseases and adverse conditions.

      Those responsible for the care of broilers should be aware of the signs of ill-health or distress, such as a change in feed and water intake, reduced growth, changes in behaviour, abnormal appearance of feathers, faeces, or other physical features.
Annex 16 (contd)

If persons in charge are not able to identify the causes of diseases, ill-health or distress, or to correct these, or if they suspect the presence of a reportable disease, they should seek advice from veterinarians or other qualified advisers. Veterinary treatments should be prescribed by a veterinarian.

There should be an effective programme for the prevention and treatment of diseases consistent with the programmes established by Veterinary Services as appropriate.

Vaccinations and treatments should be administered, on the basis of veterinary or other expert advice, by personnel skilled in the procedures and with consideration for the welfare of the broilers.

Sick or injured broilers should be humanely killed as soon as possible. Similarly, killing broilers for diagnostic purposes should be done in a humane manner according to Chapter 7.6.

Outcome-based measurables: incidence of diseases, metabolic disorders and parasitic infestations, mortality, performance, gait.

2. Environment and management
   a) Thermal environment

   Thermal conditions for broilers should be appropriate for their stage of development, and extremes of heat, humidity and cold should be avoided. For the growing stage, a heat index can assist in identifying the comfort zones for the broilers at varying temperature and relative humidity levels.

   When environmental conditions move outside these zones, strategies should be used to mitigate the adverse effects on the broilers. These may include adjusting air speed, provision of heat, evaporative cooling and adjusting stocking density.

   Management of the thermal environment should be checked frequently enough so that failure of the system would be noticed before it caused a welfare problem.

   Outcome-based measurables: behaviour, mortality, contact dermatitis, water and feed consumption, performance, feather condition.

   b) Lighting

   There should be also an adequate period of continuous light.

   The light intensity during the light period should be sufficient and homogeneously distributed to allow the broilers to find feed and water after they are placed in the poultry house, to stimulate activity, and allow adequate inspection.

   There should also be an adequate period of continuous darkness during each 24-hour period to allow the broilers to rest, to reduce stress and to promote normal behaviour, gait and good leg health.

   There should be a period for gradual adjustment to lighting changes.

   Outcome-based measurables: gait, metabolic disorders, performance, behaviour, eye condition, injury rate.

   c) Air quality

   Adequate ventilation is required at all times to provide fresh air, to remove waste gases such as carbon dioxide and ammonia, dust and excess moisture content from the environment.

   Ammonia concentration should not routinely exceed 25 ppm at broiler level.

   Dust levels should be kept to a minimum. Where the health and welfare of broilers depend on an artificial ventilation system, provision should be made for an appropriate back-up power and alarm system.

   Outcome-based measurables: incidence of respiratory diseases, metabolic disorders, eye conditions, performance, contact dermatitis and behaviour.
d) Noise

Broilers are adaptable to different levels and types of noise. However, exposure of broilers to sudden or loud noises should be minimised where possible to prevent stress and fear reactions, such as piling. Ventilation fans, feeding machinery or other indoor or outdoor equipment should be constructed, placed, operated and maintained in such a way that they cause the least possible amount of noise.

Location of farms should, where possible, take into account existing local sources of noise.

Outcome-based measurables: daily mortality rate, morbidity, performance, injury rate, fear behaviour.

e) Nutrition

Broilers should always be fed a diet appropriate to their age and genetics, which contains adequate nutrients to meet their requirements for good health and welfare.

Feed and water should be acceptable to the broilers and free from contaminants at a concentration hazardous to broiler health.

The water system should be cleaned regularly to prevent growth of hazardous microorganisms.

Broilers should be provided with adequate access to feed on a daily basis. Water should be available continuously. Special provision should be made to enable young chicks access to appropriate feed and water.

Broilers that are physically unable to access feed or water should be humanely killed as soon as possible.

Outcome-based measurables: feed and water consumption, performance, behaviour, gait, incidence of diseases, metabolic disorders and parasitic infestations, mortality, injury rate.

f) Flooring, bedding, resting surfaces and litter quality

The floor of a poultry house should preferably be easy to clean and disinfect.

The provision of loose and dry bedding material is desirable in order to insulate the chicks from the ground and to encourage dust bathing and foraging.

Litter should be managed to minimise any detrimental effects on welfare and health. Poor litter quality can lead to contact dermatitis and breast blisters. Litter should be replaced or adequately treated when required to prevent diseases in the next flock.

Litter quality is partly related to the type of substrate used and partly to different management practices. The type of substrate should be chosen carefully. Litter should be maintained so that it is dry and friable and not dusty, caked or wet. Poor litter quality can result from a range of factors including water spillage, inappropriate feed composition, enteric infections, poor ventilation and overcrowding.

If broilers are kept on slatted floors, where a very humid climate precludes the use of other flooring substrates, the floors should be designed, constructed and maintained to adequately support the broilers, prevent injuries and ensure that manure can fall through or be adequately removed.

To prevent injury and keep them warm, day-old birds should be placed on an appropriate type of flooring suitable for their size. If day-old birds are housed on litter, before they enter the poultry house, a layer of uncontaminated substrate, such as wood shavings, straw, rice husk, shredded paper, treated used litter should be added to a sufficient depth to allow normal behaviour and to separate them from the floor.

Outcome-based measurables: contact dermatitis, feather condition, gait, behaviour (dust bathing and foraging), eye conditions, incidence of diseases, metabolic disorders and parasitic infestations, performance.
g) Prevention of feather pecking and cannibalism

Feather pecking and cannibalism are rarely seen in broilers because of their young age. However, management methods, such as reducing light intensity, providing foraging materials, nutritional modifications, reducing stocking density, selecting the appropriate genetic stock should be implemented where feather pecking and cannibalism are a potential problem.

If these management strategies fail, therapeutic beak trimming is the last resort.

Outcome-based measurable: injury rate, behaviour, feather condition, mortality.

h) Stocking density

Broilers should be housed at a stocking density that allows them to access feed and water and to move and adjust their posture normally. The following factors should be taken into account: management capabilities, ambient conditions, housing system, production system, litter quality, ventilation, biosecurity strategy, genetic stock, and market age and weight.

Outcome-based measurable: injury rate, contact dermatitis, mortality, behaviour, gait, incidence of diseases, metabolic disorders and parasitic infestations, performance, feather condition.

i) Outdoor areas

Broilers can be given access to outdoor areas as soon as they have sufficient feather cover and are old enough to range safely. There should be sufficient exit areas to allow them to leave and re-enter the poultry house freely.

Management of outdoor areas is important in partially housed and completely outdoors production systems. Land and pasture management measures should be taken to reduce the risk of broilers being infected by pathogens or infested by parasites. This might include limiting the stocking density or using several pieces of land consecutively in rotation.

Outdoor areas should be placed on well drained ground and managed to minimise swampy conditions and mud.

Outdoor areas should provide shelter for broilers and be free from poisonous plants and contaminants.

Protection from adverse climatic conditions should be provided in completely outdoors systems.

Outcome-based measurable: behaviour, incidence of disease, metabolic disorders and parasitic infestations, performance, contact dermatitis, feather condition, injury rate, mortality, morbidity.

j) Protection from predators

Broilers should be protected from predators.

Outcome-based measurable: fear behaviour, mortality, injury rate.

k) Choice of broiler strain

Welfare and health considerations, should balance any decisions on in addition to productivity and growth rate, should be taken into account when choosing a broiler strain for a particular location or production system.

Outcome-based measurable: gait, metabolic disorders, contact dermatitis, mortality, behaviour, performance.

l) Painful interventions

Painful interventions, such as beak trimming, toe trimming and dubbing, should not be routinely practised on broilers.
If therapeutic beak trimming is required, it should be carried out by trained and skilled personnel at as early an age as possible and care should be taken to remove the minimum amount of beak necessary using a method which minimises pain and controls bleeding.

Surgical caponisation should not be performed without adequate pain and infection control methods and should only be performed by veterinarians or trained and skilled personnel under veterinary supervision.

Outcome-based measurables: mortality, culling and morbidity, behaviour.

m) Handling and inspection

Broilers should be inspected at least daily. Inspection should have three main objectives: to identify sick or injured broilers to treat or cull them, to detect and correct any welfare or health problem in the flock, and to pick up dead broilers.

Inspection should be done in such a way that broilers are not unnecessarily disturbed, for example animal handlers should move quietly and slowly through the flock.

When broilers are handled, they should not be injured or unnecessarily frightened or stressed.

Broilers which have an incurable illness, significant deformity or injury should be removed from the flock and killed humanely as soon as possible as described in Chapter 7.6.

Cervical dislocation is an accepted method for killing individual broilers if carried out competently as described in Article 7.6.17.

Outcome-based measurables: behaviour, performance, injury rate, mortality, vocalisation, morbidity.

n) Personnel training

All people responsible for the broilers should have received appropriate training or be able to demonstrate that they are competent to carry out their responsibilities and should have sufficient knowledge of broiler behaviour, handling techniques, emergency killing procedures, biosecurity, general signs of diseases, and indicators of poor animal welfare and procedures for their alleviation.

Outcome-based measurables: all measurables could apply.

o) Emergency plans

Broiler producers should have emergency plans to minimise and mitigate the consequences of natural disasters, disease outbreaks and the failure of mechanical equipment. Planning may include the provision of fail-safe alarm devices to detect malfunctions, backup generators, access to maintenance providers, alternative heating or cooling arrangements, ability to store water on farm, access to water cartage services, adequate on farm storage of feed and alternative feed supply and a plan for managing ventilation emergencies.

The emergency plans should be consistent with national programmes established or recommended by Veterinary Services. Humane killing procedures should be part of the emergency plan.

p) Location, construction and equipment of farms

The location of broiler farms should be chosen to be safe from the effects of fires and floods and other natural disasters to the extent practical. In addition farms should be sited to avoid or minimise biosecurity risks, exposure of broilers to chemical and physical contaminants, noise and adverse climatic conditions.

Broiler houses, outdoor areas and equipment to which broilers have access should be designed and maintained to avoid injury or pain to the broilers.

Broiler houses should be constructed and electrical and fuel installations should be fitted to minimise the risk of fire and other hazards.

Broiler producers should have a maintenance programme in place for all equipment the failure of which can jeopardise broiler welfare.
Annex 16 (contd)

q) On farm harvesting

Broilers should not be subject to an excessive period of feed withdrawal prior to the expected slaughter time.

Water should be available up to the time of harvesting.

Broilers that are not fit for loading or transport because they are sick or injured should be killed humanely.

Catching should be carried out by skilled animal handlers and every attempt should be made to minimise stress and fear reactions, and injury. If a broiler is injured during catching, it should be killed humanely.

Broilers should not be picked up by their neck or wings.

Broilers should be carefully placed in the transport container.

Mechanical catchers, where used, should be designed, operated and maintained to minimise injury, stress and fear to the broilers. A contingency plan is advisable in case of mechanical failure.

Catching should preferably be carried out under dim or blue light to calm the broilers.

Catching should be scheduled to minimise the time to slaughter as well as climatic stress during catching, transport and holding.

Stocking density in transport containers should suit climatic conditions and maintain comfort.

Containers should be designed and maintained to avoid injury, and they should be cleaned and, if necessary, disinfected regularly.

Outcome-based measurables: behaviour, vocalisation, injury rate, mortality rate at harvesting and on arrival at the slaughterhouse/abattoir.
CHAPTER 7.11.

ANIMAL WELFARE AND DAIRY CATTLE PRODUCTION SYSTEMS

Article 7.11.1.

Definition

Dairy cattle production systems are defined as all commercial cattle production systems where the purpose of the operation includes some or all of the breeding, rearing and management of cattle intended for production of milk.

Article 7.11.2.

Scope

This chapter addresses the welfare aspects of dairy cattle production systems.

Article 7.11.3.

Commercial dairy cattle production systems

Dairy cattle in commercial production may be kept in housed or pastured systems, or a combination of both:

1. Housed

   These are systems where cattle are kept on a formed surface, indoors or outdoors, and are fully dependent on humans to provide for basic animal needs such as food, shelter and water. The type of housing will depend on the environment, climatic conditions and management system. The animals may be housed unrestrained or tethered, within this housing system.

2. Pastured

   These are systems where cattle live outdoors, and have some autonomy over diet selection, water consumption and access to shelter. Pastured systems do not involve any housing except that required for milking.

3. Combination systems

   These are systems where cattle are managed in any combination of housed and pasture production systems, either simultaneously, or varied in accordance with weather or physiological state of the cattle.

Article 7.11.4.

Criteria (or measurables) for the welfare of dairy cattle

The following outcome-based criteria, specifically animal-based criteria, can be useful indicators of animal welfare. Consideration should also be given to the design of the system and animal management practices. The use of these indicators and their appropriate thresholds should be adapted to the different situations where dairy cattle are managed. These criteria can be considered as a tool to monitor the impact of design and management, given that both of these can affect animal welfare.

1. Behaviour

   Certain behaviours could indicate an animal welfare problem. These include decreased feed intake, altered locomotory behaviour and posture, altered lying time, altered respiratory rate and panting, coughing, shivering and huddling, excessive grooming and the demonstration of stereotypic, agonistic, depressive or other abnormal behaviours.
2. **Morbidity rate**

Morbidity rates, including for infectious and metabolic diseases, lameness, peri-partum and post-procedural complications and injury rates, above recognised thresholds, may be direct or indirect indicators of the *animal welfare* status of the whole herd. Understanding the aetiology of the *disease* or syndrome is important for detecting potential *animal welfare* problems. Mastitis, and hoof, reproductive and metabolic diseases are also particularly important animal health problems for adult dairy cows. Scoring systems, such as for body condition, lameness and milk quality, can provide additional information.

Both clinical examination and pathology should be utilised as an indicator of *disease*, injuries and other problems that may compromise *animal welfare*.

3. **Mortality and culling rates**

Mortality and culling rates affect the length of productive life and, like morbidity rates, may be direct or indirect indicators of the *animal welfare* status. Depending on the production system, estimates of mortality and culling rates can be obtained by analysing the *causes of death* and culling and their temporal and spatial patterns of occurrence. Mortality and culling rates, and their causes, should be recorded regularly, e.g. daily, monthly, annually or with reference to key husbandry activities within the production cycle.

Necropsy is useful in establishing the cause of *death*.

4. **Changes in body weight, body condition and milk yield**

In growing animals, body weight changes outside the expected growth rate, especially excessive sudden loss, are indicators of poor animal health or *animal welfare*. Future performance, including milk yield and fertility, of replacement heifers can be affected by under- or over-nutrition at different stages of rearing.

In lactating animals, body condition outside an acceptable range, significant body weight change and significant decrease in milk yield may be indicators of compromised welfare.

In non-lactating animals, including and bulls, body condition outside an acceptable range and significant body weight change may be indicators of compromised welfare.

5. **Reproductive efficiency**

Reproductive efficiency can be an indicator of animal health and *animal welfare* status. Poor reproductive performance, compared with the targets expected for a particular breed, can indicate *animal welfare* problems.

Examples may include:

- anoestrus or extended post-partum interval,
- low conception rates,
- high abortion rates,
- high rates of dystocia,
- retained placenta,
- metritis,
- loss of fertility in breeding bulls.
6. **Physical appearance**

Physical appearance may be an indicator of animal health and *animal welfare*, as well as the conditions of management. Attributes of physical appearance that may indicate compromised welfare include:

- presence of ectoparasites,
- abnormal coat colour, texture or hair loss,
- excessive soiling with faeces, mud or dirt (cleanliness),
- swellings, injuries or lesions,
- discharges (e.g. from nose, eyes, reproductive tract),
- feet abnormalities,
- abnormal posture (e.g. rounded back, head low),
- emaciation or dehydration.

7. **Handling responses**

Improper handling can result in fear and distress in cattle. Indicators include:

- evidence of poor human-animal relationship, such as excessive flight distance,
- negative behaviour at milking time, such as reluctance to enter the milking parlour, kicking, vocalisation,
- animals striking restraints or gates,
- injuries sustained during handling, such as bruising, lacerations, broken horns or tails and fractured legs,
- animals vocalising abnormally or excessively during restraint and handling,
- disturbed behaviour in the chute or race such as repeated reluctance to enter,
- animals slipping or falling.

8. **Complications from common procedures**

Surgical and non-surgical procedures may be performed in dairy cattle for facilitating management, improving human safety and *animal welfare* (e.g. disbudding, hoof trimming), and treatment of certain conditions (e.g. displaced abomasum). However, if these procedures are not performed properly, *animal welfare* can be compromised. Indicators of such problems could include:

- post procedure infection, swelling and pain behaviour,
- reduced feed and water intake,
- post procedure body condition and weight loss,
- morbidity and mortality.
Annex 17 (contd)

Article 7.11.5.

Provisions for good animal welfare Recommendations

Ensuring good welfare of dairy cattle is contingent on several management factors, including system design, environmental management, and animal management practices which include responsible husbandry and provision of appropriate care. Serious problems can arise in any system if one or more of these elements are lacking.

Articles 7.11.6. and 7.11.7. provide recommendations for measures applied to dairy cattle.

Each recommendation includes a list of relevant outcome-based measurables derived from Article 7.11.4. This does not exclude other measures being used where appropriate.

Article 7.11.6.

Recommendations on system design and management including physical environment

1. Recommendations on system design and management including physical environment

When new facilities are planned or existing facilities are modified, professional advice on design in regards to animal health and welfare should be sought.

Many aspects of the environment can impact the health and welfare of dairy cattle. These include thermal environment, air quality, lighting, noise, etc.

1.a) Thermal environment

Although cattle can adapt to a wide range of thermal environments particularly if appropriate breeds are used for the anticipated conditions, sudden fluctuations in weather can cause heat or cold stress.

a)i) Heat stress

The risk of heat stress for cattle is influenced by environmental factors including air temperature, relative humidity, wind speed, animal density (area and volume available per animal), shade availability, animal factors including breed, age, body condition, metabolic rate and stage of lactation, and coat colour and density.

Animal handlers should be aware of the risk that heat stress poses to cattle and of the thresholds in relation to heat and humidity that may require action. As conditions change, routine daily activities that require moving cattle should be amended appropriately. If the risk of heat stress reaches very high levels the animal handlers should institute an emergency action plan that gives priority to access to additional water and could include provision of shade, fans, reduction of animal density, and provision of cooling systems as appropriate for the local conditions.

Outcome-based measurables: feed and water intake, behaviour, especially respiratory rate and panting, physical appearance, especially dehydration, morbidity rate, mortality rate, changes in milk yield.

b)ii) Cold stress

Protection from extreme weather conditions should be provided when these conditions are likely to create a serious risk to the welfare of cattle, particularly in neonates and young cattle and others that are physiologically compromised. This could be provided by extra bedding and natural or man-made shelters.

During extreme cold weather conditions, animal handlers should institute an emergency action plan to provide cattle with shelter, adequate feed and water.

Outcome-based measurables: mortality and morbidity rates, physical appearance, behaviour, especially abnormal postures, shivering and huddling, growth rate, body condition and weight loss.
2.b) Lighting

Housed cattle that do not have sufficient access to natural light should be provided with supplementary lighting which follows natural periodicity sufficient for their health and welfare, to facilitate natural behaviour patterns and to allow adequate and safe inspection of the cattle. The lighting should not cause discomfort to the animals. Housed dairy cows should be provided with subdued night time lighting. Entrance to and exit from restraint facilities and their surrounding area should be well lit.

Outcome-based measurables: behaviour, especially altered locomotory behaviour, morbidity, physical appearance.

3.c) Air quality

Good air quality and ventilation are important for the health and welfare of cattle and reduce the risk of respiratory discomfort and diseases. Air quality is affected by air constituents such as gases, dust and micro-organisms, and is influenced strongly by management and building design in housed systems. Air composition is influenced by animal density, the size of the cattle, flooring, bedding, waste management, building design and ventilation system.

Proper ventilation is important for effective heat dissipation in cattle and to prevent the build-up of effluent gases (e.g. ammonia and hydrogen sulphide), including those from manure and dust in the housing unit. The ammonia level in enclosed housing should not exceed 25 ppm. A useful indicator is that if air quality is unpleasant for humans it is also likely to be a problem for cattle.

Outcome-based measurables: morbidity rate, mortality rate, behaviour, especially respiratory rate or panting, coughing, changes in weight and body condition or growth rate, physical appearance, especially wet coat.

4.d) Noise

Cattle are adaptable to different levels and types of noise. However, exposure of cattle to sudden and unexpected noises, including from personnel, should be minimised where possible to prevent stress and fear reactions. Ventilation fans, alarms, feeding machinery or other indoor or outdoor equipment should be constructed, placed, operated and maintained in a manner that minimises noise.

Outcome-based measurables: behaviour especially agitation and nervousness, changes in milk yield.

5.e) Flooring, bedding, resting surfaces and outdoor areas

In all production systems cattle need a well-drained and comfortable place to rest. All cattle in a group should have sufficient space to lie down and rest at the same time.

Particular attention should be given to the provisions for areas used for calving. The environment in such areas (e.g. floors, bedding, temperature, calving pen and hygiene) should be appropriate to ensure the welfare of calving cows and new born calves.

In housed systems calving areas should be thoroughly cleaned and provided with fresh bedding between each calving. Group pens for calving should be managed based on the principle 'all in - all out'. The group calving pen should be thoroughly cleaned and provided with fresh bedding between each animal group. The time interval between first and last calving of cows kept in the same group calving pen should be minimised.

Outdoor calving pens and fields should be selected to provide the cow with a clean and comfortable environment.

Floor management in housed production systems can have a significant impact on cattle welfare. Areas that compromise welfare and are not suitable for resting (e.g. places with excessive faecal accumulation, or wet bedding) should not be included in the determination of the area available for cattle to lie down.

Slopes of the pens should allow water to drain away from feed troughs and not pool the pens.
Flooring, bedding, resting surfaces and outdoor yards should be cleaned as conditions warrant, to ensure good hygiene, comfort and minimise risk of diseases and injuries.

In pasture systems, stock should be rotated between fields to ensure good hygiene and minimise risk of diseases and injuries.

Bedding should be provided to all animals housed on concrete. In straw, sand or other bedding systems such as rubber mats, crumbled-rubber-filled mattresses and waterbeds, the bedding should be suitable (e.g. hygienic, non-toxic) and maintained to provide cattle with a clean, dry and comfortable place in which to lie.

The design of a standing, or cubicle, or free stall, should be such that the animals can stand and lie comfortably on a solid surface (e.g. length, width and height should be appropriate for the size of the largest animal). There should be sufficient room for the animal to rest and to rise adopting normal postures, to move its head freely as it stands up, and to groom itself without difficulty. Where individual spaces are provided for cows to rest, there should be at least one space per cow.

Alleys and gates should be designed and operated to allow free movement of cattle. Floors should be designed to minimise slipping and falling, promote foot health, and reduce the risk of claw injuries.

If a housing system includes areas of slatted floor, cattle, including replacement stock, should have access to a solid lying area. The slat and gap widths should be appropriate to the hoof size of the cattle to prevent injuries.

If cattle have to be tethered whether indoors or outdoors, they should, as a minimum, be able to lie down, stand up, maintain normal body posture and groom themselves unimpeded. Cows kept in tie stall housing should be allowed sufficient untethered exercise to prevent welfare problems. When tethered outdoors they should be able to walk. Animal handlers should be aware of the higher risks of welfare problems where cattle are tethered.

Where breeding bulls are in housing systems, care should be taken to ensure that they have sight of other cattle with sufficient space for resting and exercise. If used for natural mating, the floor should not be slatted or slippery.

Outcome-based measurables: morbidity rates, especially lameness and injuries (e.g. hock and knee injuries and skin lesions), behaviour (e.g. especially altered locomotion and posture, altered lying time, grooming and locomotory behaviour (e.g. not using the intended lying areas), changes in weight and body condition, physical appearance (e.g. hair loss, cleanliness score), growth rate.

Location, construction and equipment

The impacts of climate and geographical factors on dairy cattle should be evaluated when farms are established. Efforts should be made to mitigate any negative impacts of those factors, including matching dairy breed to location and consideration of alternate sites.

All facilities for dairy cattle should be constructed, maintained and operated to minimise the risk to the welfare of the cattle.

In pasture and combination systems tracks and races between the milking area and fields should be laid out and managed so as to minimise the overall distances walked. Construction and maintenance of tracks and races, including their surface, should minimise any risk to the welfare of the cattle, especially from foot health problems.

Equipment for milking, handling and restraining dairy cattle should be constructed and used in a way that minimises the risk of injury, pain or distress. Manufacturers of such equipment should consider animal welfare when designing it and when preparing operating instructions.

Electrified equipment designed to control animal behaviour (e.g. cow trainer) may cause welfare problems if not designed, used and maintained properly.
Electrified fences and gates should be well-designed and maintained to avoid welfare problems, and used only in accordance with manufacturer's instructions.

Where access to an outdoor area, including pasture, is possible, there may be additional benefits to dairy cattle from the opportunity to graze and exercise, especially a decreased risk of lameness.

In all production systems, feed and water provision should allow all cattle to have access to feed and water. Feeding systems should be designed to minimise agonistic behaviour. Feeders and water providers should be easy to clean and properly maintained.

Milking parlours, free stalls, standings, cubicles, races, chutes and pens should be properly maintained and be free from sharp edges and protrusions to prevent injury to cattle.

There should be a separated area where individual animals can be examined closely and which has restraining facilities.

When relevant, sick and injured animals should be treated away from healthy animals. When a dedicated space is provided this should accommodate all the needs of the animal e.g. recumbent animals may require additional bedding or an alternative floors surface.

Hydraulic, pneumatic and manual equipment should be adjusted, as appropriate, to the size of cattle to be handled. Hydraulic and pneumatic operated restraining equipment should have pressure limiting devices to prevent injuries. Regular cleaning and maintenance of working parts is essential to ensure the system functions properly and is safe for the cattle.

Mechanical and electrical devices used in facilities should be safe for cattle.

Dipping baths and spray races used for ectoparasite control should be designed and operated to minimise the risk of crowding and to prevent injury and drowning.

Collecting yards (e.g. entry to the milking parlour) should be designed and operated to minimise stress and prevent injuries and lameness.

The loading areas and ramps, including the slope of the ramp, should be designed to minimise stress and injuries for the animals and ensure the safety of the animal handlers, in accordance with Chapters 7.2., 7.3. and 7.4.

Outcome-based measurables: handling response, morbidity rate, especially lameness, mortality rate, behaviour, especially altered locomotory behaviour, injury rate, changes in weight and body condition, physical appearance, growth rate.

Emergency plans

The failure of power, water and feed supply systems could compromise animal welfare. Dairy producers should have contingency plans to cover the failure of these systems. These plans may include the provision of fail-safe alarms to detect malfunctions, back-up generators, contact information for key service providers, ability to store water on farm, access to water cartage services, adequate on-farm storage of feed and alternative feed supply, and emergency killing of animals according to chapter 7.6.

Preventive measures for emergencies should be input-based rather than outcome based. Contingency plans should include an evacuation plan and be documented and communicated to all responsible parties. Alarms and back-up systems should be checked regularly.
Recommendations on animal management practices

2. Recommendations on animal management practices

Good animal management practices are critical to providing an acceptable level of animal welfare. Personnel involved in handling and caring for dairy cattle should be competent with relevant experience or training to equip them with the necessary practical skills and knowledge of dairy cattle behaviour, handling, health, biosecurity, physiological needs and welfare. There should be a sufficient number of animal handlers to ensure the health and welfare of the cattle.

1.a) Biosecurity and animal health

   a)i) Biosecurity and disease prevention

   For the purpose of this chapter, biosecurity means a set of measures designed to maintain a herd at a particular health status and to prevent the entry or spread of infectious agents.

   Biosecurity plans should be designed, implemented and maintained, commensurate with the best possible herd health status, available resources and infrastructure, and current disease risk and, for listed diseases in accordance with relevant recommendations in the Terrestrial Code.

   These biosecurity plans should address the control of the major sources and pathways for spread of pathogens:

   – cattle, including introductions to the herd,
   – calves coming from different sources,
   – other domestic animals, wildlife, and pests,
   – people including sanitation practices,
   – equipment, tools and facilities,
   – vehicles,
   – air,
   – water supply, feed and bedding,
   – manure, waste and dead stock disposal,
   – semen and embryos.

   Outcome-based measurables: morbidity rate, mortality rate, reproductive efficiency, changes in weight and body condition, changes in milk yield.

   b)ii) Animal health management

   Animal health management should optimise the physical and behavioural health and welfare of the dairy herd. It includes the prevention, treatment and control of diseases and conditions affecting the herd (in particular mastitis, lameness, reproductive and metabolic diseases).
There should be an effective programme for the prevention and treatment of diseases and conditions, formulated in consultation with a veterinarian, where appropriate. This programme should include the recording of production data (e.g. number of lactating cows, births, animal movements in and out of the herd, milk yield), morbidities, mortalities, culling rate and medical treatments. It should be kept up to date by the animal handler. Regular monitoring of records aids management and quickly reveals problem areas for intervention.

For parasitic burdens (e.g. endoparasites, ectoparasites and protozoa), a programme should be implemented to monitor, control and treat, as appropriate.

Lameness can be a problem in dairy cattle. Animal handlers should monitor the state of feet, hooves and claws, and take measures to prevent lameness and maintain foot health.

Those responsible for the care of cattle should be aware of early specific signs of disease or distress (e.g. coughing, ocular discharge, changes in milk appearance, changes in locomotory behaviour), and non-specific signs such as reduced feed and water intake, reduction of milk production, changes in weight and body condition, changes in behaviour or abnormal physical appearance.

Cattle at higher risk of disease or distress will require more frequent inspection by animal handlers. If animal handlers suspect the presence of a disease or are not able to correct the causes of disease or distress, they should seek advice from those having training and experience, such as veterinarians or other qualified advisers, as appropriate.

Vaccinations and other treatments administered to cattle should be carried out by veterinarians or other people skilled in the procedures and on the basis of veterinary or other expert advice and with consideration for the welfare of the dairy cattle.

Animal handlers should be competent in identifying and appropriately managing chronically ill or injured cattle, for instance in recognising and dealing with non-ambulatory cattle, especially those that have recently calved. Veterinary advice should be sought as appropriate.

Non-ambulatory cattle should have access to water at all times and be provided with feed at least once daily and milked as necessary. They should be provided shade and protected from predators. They should not be transported or moved unless absolutely necessary for treatment or diagnosis. Such movements should be done carefully using methods that avoid dragging the animal or excessive lifting it in a way that might exacerbate injuries.

Animal handlers should also be competent in assessing fitness to transport, as described in Chapter 7.3.

In case of disease or injury, when treatment has failed or recovery is unlikely (e.g. cattle that are unable to stand up, unaided or refuse to eat or drink), the animal should be humanely killed as soon as possible in accordance with Chapter 7.6.

Animals suffering from photosensitisation should be provided with shade and where possible the cause should be identified.

Outcome-based measurables: morbidity rate, mortality rate, reproductive efficiency, depressive behaviour, altered locomotory behaviour, physical appearance and changes in weight and body condition changes in milk yield.

c)iii) Emergency plans for disease outbreaks

Emergency plans should cover the management of the farm in the face of an emergency disease outbreak, consistent with national programmes and recommendations of Veterinary Services as appropriate.
Annex 17 (contd)

2.b) Nutrition

The nutrient requirements of dairy cattle have been well defined. Energy, protein, mineral and vitamin content of the diet are major factors determining milk production and growth, feed efficiency, reproductive efficiency, and body condition.

Cattle should be provided with access to an appropriate quantity and quality of balanced nutrition that meets their physiological needs.

Where cattle are maintained in outdoor conditions, short term exposure to climatic extremes may prevent access to nutrition that meets their daily physiological needs. In such circumstances the animal handler should ensure that the period of reduced nutrition is not prolonged and that extra food and water supply are provided if welfare would otherwise be compromised.

Animal handlers should have adequate knowledge of appropriate body condition scoring systems for their cattle and should not allow body condition to go outside an acceptable range in accordance with breed and physiological status.

Feedstuffs and feed ingredients should be of satisfactory quality to meet nutritional needs and stored to minimise contamination and deterioration. Where appropriate, feed and feed ingredients should be tested for the presence of substances that would adversely impact on animal health. Control and monitoring of animal feed should be implemented in accordance with relevant recommendations in Chapter 6.3.

The relative risk of digestive upset in cattle increases as the proportion of grain increases in the diet or if quality of silage is poor. Grain or new diets should be introduced slowly and palatable fibrous feed such as silage, grass and hay, should be available ad libitum to meet metabolic requirements in a way that promotes digestion and ensures normal rumen function.

Animal handlers should understand the impact of cattle size and age, weather patterns, diet composition and sudden dietary changes in respect to digestive upsets and their negative consequences (displaced abomasum, sub-acute ruminal acidosis, bloat, liver abscess, lamineits). Where appropriate, dairy producers should consult a cattle nutritionist for advice on ration formulation and feeding programmes.

Particular attention should be paid to nutrition in the last month of pregnancy, with regards to energy balance, roughage and micronutrients, in order to minimise calving and post-calving diseases and body condition loss.

Liquid milk (or milk replacer) is essential for healthy growth and welfare of calves. However, feeding calves all-liquid diets as the sole source of nutrition after 4-6 weeks of age limits the physiological development of the rumen. Calves over two weeks old should have a sufficient daily ration of fibrous feed and starter ration (concentrate) to promote rumen development and to reduce abnormal oral behaviours.

Dairy producers should become familiar with potential micronutrient deficiencies or excesses for production systems in their respective geographical areas and use appropriately formulated supplements where necessary.

All cattle, including unweaned calves, need an adequate supply and access to palatable water that meets their physiological requirements and is free from contaminants hazardous to cattle health.

Outcome-based measurables: mortality rates, morbidity rates, behaviour, especially agonistic behaviour (at the feeding area), changes in weight and body condition, reproductive efficiency, changes in milk yield, growth rate and vocalisation.

2.c) Social environment

Management of cattle should take into account their social environment as it relates to animal welfare, particularly in housed systems. Problem areas include: agonistic and oestrus activity, mixing of heifers and cows, feeding cattle of different size and age in the same pens, decreased space allowance, insufficient space at the feeder, insufficient water access and mixing of bulls.
Management of cattle in all systems should take into account the social interactions of cattle within groups. The animal handler should understand the dominance hierarchies that develop within different groups and focus on high risk animals, such as sick or injured, very young, very old, small or large size for cohort group, for evidence of agonistic behaviour and excessive mounting behaviour. The animal handler should understand the risks of increased agonistic interactions between animals, particularly after mixing groups.

When other measures have failed, cattle that are expressing excessive agonistic activity or excessive mounting behaviour should be removed from the group.

Animal handlers should be aware of the animal welfare problems that may be caused by mixing of inappropriate groups of cattle and provide adequate measures to minimise them (e.g. introduction of heifers in a new group, mixing of animals at different production stages that have different dietary needs).

Horned and non-horned cattle should not be mixed because of the risk of injury.

Outcome-based measurables: behaviour, especially lying times, physical injuries and lesions, changes in weight and body condition, physical appearance (e.g. cleanliness), lameness scores, changes in milk yield, morbidity rate, mortality rate, growth rate, vocalisation.

4.4) Space allowance

Cattle in all production systems should be offered adequate space for comfort and socialisation.

Insufficient and inadequate space allowance may increase the occurrence of injuries and have an adverse effect on growth rate, feed efficiency, and behaviour such as locomotion, resting, feeding and drinking.

Space allowance should be managed taking into account different areas for lying, standing and feeding. Crowding should not adversely affect normal behaviour of cattle and durations of time spent lying.

All cattle should be able to rest simultaneously, and each animal lie down, stand up and move freely. In growing animals, space allowance should also be managed such that weight gain is not adversely affected.

If abnormal behaviour is seen, corrective measures should be taken, such as increasing space allowance, redefining the areas available for lying, standing and feeding.

In pastured systems, stocking density should depend on the available feed and water supply and pasture quality.

Outcome-based measurables: behaviour, especially agonistic or depressive behaviour, morbidity rate, mortality rate, changes in weight and body condition, physical appearance, changes in milk yield, parasite burden, growth rate.

5.6) Protection from predators

Cattle should be protected from predators.

Outcome-based measurables: mortality rate, morbidity rate (injury rate), behaviour, physical appearance.

6.4) Genetic selection

Welfare and health considerations, in addition to productivity, should be taken into account when choosing a breed or subspecies for a particular location or production system.

In breeding programmes, attention should be paid to criteria conducive to the improvement of cattle welfare, including health. The conservation and development of genetic lines of dairy cattle, which limit or reduce animal welfare problems, should be encouraged. Examples of such criteria include nutritional maintenance requirement, disease resistance and heat tolerance.
Annex 17 (contd)

Individual animals within a breed should be selected to propagate offspring that exhibit traits beneficial to animal health and welfare by promoting robustness and longevity. These include resistance to infectious and production related diseases, ease of calving, fertility, body conformation and mobility, and temperament.

Outcome-based measurables: morbidity rate, mortality rate, length of productive life, behaviour, physical appearance, reproductive efficiency, lameness, human-animal relationship, growth rate, body condition outside an acceptable range.

7 g) Artificial insemination, pregnancy diagnosis and embryo transfer

Semen collection should be carried out by a trained operator in a manner that does not cause pain or distress to the bull and any teaser animal used during collection and in accordance with Chapter 4.6.

Artificial insemination and pregnancy diagnosis should be performed by a competent operator in a manner that does not cause pain or distress.

Embryo transfer should be performed under an epidural or other anaesthesia by a trained operator, preferably a veterinarian or a veterinary para-professional and in accordance with the provisions of Chapter 4.7. and Chapter 4.8.

Outcome-based measurables: behaviour, morbidity rate, reproductive efficiency.

8 h) Dam and sire selection and calving management

Dystocia is a welfare risk to dairy cattle. Heifers should not be bred before they reach the stage of physical maturity sufficient to ensure the health and welfare of both dam and calf at birth. The sire has a highly heritable effect on final calf size and as such can have a significant impact on ease of calving. Sire selection for embryo implantation, insemination or natural mating, should take into account the maturity and size of the female.

Pregnant cows and heifers should be managed during pregnancy so as to achieve an appropriate body condition range for the breed. Excessive fatness increases the risk of dystocia and metabolic disorders during late pregnancy or after parturition.

Cows and heifers should be monitored when they are close to calving. Animals observed to be having difficulty in calving should be assisted by a competent handler as soon as possible after they are detected. When a caesarean section is required, it must be carried out by a veterinarian.

Outcome-based measurables: morbidity rate, mortality rate (cow and calf), reproductive efficiency, especially rate of dystocia, retained placenta and metritis, body condition.

9 i) Newborn calves

Calving aids should not be used to speed the birthing process, only to assist in cases of dystocia, and should not cause undue pain, distress, or further medical problems.

Newborn calves are susceptible to hypothermia. The temperature and ventilation of the birthing area should consider the needs of the newborn calf. Soft, dry bedding and supplemental heat can help prevent cold stress.

Receiving adequate immunity from colostrum generally depends on the volume and quality of colostrum ingested, and how soon after birth the calf receives it.

Animal handlers should ensure that calves receive sufficient colostrum of a satisfactory quality, preferably from their own dam, and within 24 hours of birth, and in sufficient quantity to provide passive immunity. Colostrum is most beneficial if received during the first six hours after birth. Where there is risk of disease transfer from the dam, colostrum from a healthy cow should be used. Where possible, calves should continue to receive colostrum or equivalent for at least five days after birth.
Recently born calves should not be transported until the navel is dry, and after which time any transport required should be carried out in accordance with Chapter 7.3.

Calves should be handled and moved in a manner which minimises distress and avoids pain and injury.

Outcome-based measurables: physical appearance, mortality rate, morbidity rate, growth rate.

10.j) Cow-calf separation and weaning

Different strategies to separate the calf from the cow are utilised in dairy cattle production systems. These include early separation (usually within 48 hours of birth) or a more gradual separation (leaving the calf with the cow for a longer period so it can continue to be suckled). Separation is stressful for both cow and calf.

For the purposes of this chapter, weaning means the change from a milk-based diet to a fibrous diet and the weaned calf no longer receives milk in its diet. This change should be made gradually and calves should be weaned only when their ruminant digestive system has developed sufficiently to enable them to maintain growth, health and good welfare.

Dairy cattle producers should seek expert advice on the most appropriate time and method of weaning for their type of cattle and production system.

Outcome-based measurables: morbidity rate, mortality rate, behaviour after separation (vocalisation, activity of the cow and calf), physical appearance, changes in weight and body condition, growth rate.

11.k) Rearing of replacement stock

Young calves are at particular risk of thermal stress. Special attention should be paid to management of the thermal environment (e.g. provision of additional bedding, nutrition or protection to maintain warmth and appropriate growth).

Individual calf-housing may facilitate monitoring of health of very young calves and minimise the risk of disease spread, but replacement stock should then be reared in groups. Animals in groups should be of similar age and physical size.

Whether reared individually or in group pens, each calf should have enough space to be able to turn around, rest, stand up and groom comfortably and see other animals.

Replacement stock should be monitored for cross-sucking and appropriate measures taken to prevent this occurring (e.g. provide sucking devices, revise or modify feeding practices, provide other environmental enrichments).

Particular attention should be paid to the nutrition, including trace elements, of growing replacement stock to ensure good health and that they achieve an appropriate growth curve for the breed and farming objectives.

Outcome-based measurables: morbidity rate, mortality rate, behaviour, especially cross-sucking, altered grooming and lying behaviours, injuries, physical appearance, changes in weight and body condition, growth rate.

12.l) Milking management

Milking, whether by hand or machine, should be carried out in a calm and considerate manner in order to avoid pain and distress. Special attention should be paid to the hygiene of personnel, the udder and milking equipment. All cows should be checked for abnormal milk at every milking.

Milking machines, especially automated milking systems, should be used and maintained in a manner which minimises injury to teats and udders. Manufacturers of such equipment should provide operating instructions that consider animal welfare.

A regular milking routine should be established relevant to the stage of lactation and the capacity of the system.
Animal handlers should regularly check the information provided by the milking system and act accordingly to protect the welfare of the cows.

Special care should be paid to animals being milked for the first time. They should be familiarised with the milking facility prior to giving birth.

Long waiting times before and after milking can lead to health and welfare problems (e.g. lameness, reduced time to eat). Management should ensure that waiting times are minimised.

Outcome-based measurables: morbidity rate (e.g. udder health, milk quality), behaviour, changes in milk yield, physical appearance (e.g. lesions).

Painful husbandry procedures

Husbandry practices are routinely carried out in cattle for reasons of management, animal welfare and human safety. Those practices that have the potential to cause pain should be performed in such a way as to minimise any pain and stress to the animal. Such procedures should be performed at as early an age as possible or using anaesthesia or analgesia under the recommendation or supervision of a veterinarian.

Options for enhancing animal welfare in relation to these procedures include: ceasing the procedure and addressing the need for the operation through management strategies; breeding cattle that do not require the procedure; or replacing the current procedure with a non-surgical alternative that has been shown to enhance animal welfare.

Disbudding and dehorning

Horned dairy cattle are commonly disbudded or dehorned in order to reduce animal injuries and hide damage, improve human safety, reduce damage to facilities and facilitate transport and handling. The selection of polled cattle is preferable to dehorning.

Performing disbudding at an early age is preferred, rather than dehorning older cattle.

Thermal cauterity of the horn bud by a trained operator with proper equipment is the recommended method in order to minimise post-operative pain. This should be done at an appropriate age before the horn bud has attached to the skull.

Guidance from a veterinarian or veterinary para-professional as to the optimum method and timing for the type of cattle and production system should be sought. The use of anaesthesia and analgesia are strongly recommended when performing disbudding, and should always be used when dehorning. Appropriate restraint systems and procedures are required when disbudding or dehorning.

Other methods of disbudding include: removal of the horn buds with a knife and the application of chemical paste to cauterise the horn buds. Where chemical paste is used, special attention should be paid to avoid chemical burns to other parts of the calf or to other calves. This method is not recommended for calves older than two weeks.

Operators should be trained and competent in the procedure used, and be able to recognise the signs of pain and complications that may include excessive bleeding or sinus infection.

Methods of dehorning when horn development has commenced involve the removal of the horn by cutting or sawing through the base of the horn close to the skull.

Tail docking

Tail docking does not improve the health and welfare of dairy cattle and therefore it is not recommended. As an alternative, trimming of tail hair should be considered where maintenance of hygiene is a problem.
Identification

Ear-tagging, ear-notching, tattooing, branding and radio frequency identification devices (RFID) are methods of permanently identifying dairy cattle. The least invasive approach should be adopted whichever method is chosen (e.g. the least number of ear tags per ear and the smallest notch practical). It should be accomplished quickly, expertly and with proper equipment.

Freeze branding and branding with a hot iron should be avoided where alternative identification methods exist (e.g. electronic identification or ear-tags). When branding is used, the operator should be competent in procedures used and be able to recognise signs of complications.

Identification systems should be established also in accordance with Chapter 4.1.

Outcome-based measurables: morbidity rate (post-procedural complications), abnormal behaviour, vocalisation, physical appearance.

Inspection and handling

Dairy cattle should be inspected at intervals appropriate to the production system and the risks to the health and welfare of the cattle. Lactating cows should be inspected at least once a day. Some animals should be inspected more frequently, for example, neonatal calves, cows in late gestation, newly weaned calves, cattle experiencing environmental stress and those that have undergone painful husbandry procedures or veterinary treatment.

Dairy cattle identified as sick or injured should be given appropriate treatment at the first available opportunity by competent animal handlers. If animal handlers are unable to provide appropriate treatment, the services of a veterinarian should be sought.

Recommendations on the handling of cattle are also found in Chapter 7.5. In particular handling aids that may cause pain and distress (e.g. electric goads) should be used only in extreme circumstances and provided that the animal can move freely. Dairy cattle should not be prodded in sensitive areas including the udder, face, eyes, nose or ano-genital region. Electric prods should not be used on calves (see also point 3 of Article 7.3.8.).

Where dogs are used as an aid for cattle herding they should be properly trained. Animal handlers should be aware that presence of dogs can stress the cattle and cause fear and should keep them under control at all times. The use of dogs is not appropriate in housed systems, collection yards or other small enclosures where the cattle cannot move freely away.

Cattle are adaptable to different visual environments. However, exposure of cattle to sudden movement or changes in visual contrasts should be minimised where possible to prevent stress and fear reactions.

Electroimmobilisation should not be used.

Outcome-based measurables: handling responses, morbidity rate, mortality rate, behaviour, especially altered locomotory behaviour and vocalisation.

Personnel training

All people responsible for dairy cattle should be competent in accordance with their responsibilities and should understand cattle husbandry, animal handling, milking routines, reproductive management techniques, behaviour, biosecurity, signs of disease, and indicators of poor animal welfare such as stress, pain and discomfort, and their alleviation.

Competence may be gained through formal training or practical experience.

Outcome-based measurables: handling responses, morbidity rate, mortality rate, behaviour, reproductive efficiency, changes in weight and body condition, changes in milk yield.
16. p) Disaster management

Plans should be in place to minimise and mitigate the effect of disasters (e.g. earthquake, fire, drought, flooding, blizzard, hurricane). Such plans may include evacuation procedures, identifying high ground, maintaining emergency feed and water stores, destocking and humane *killing* when necessary.

In times of drought, animal management decisions should be made as early as possible and these should include a consideration of reducing cattle numbers.

Humane *killing* procedures for sick or injured cattle should be part of the disaster management plan.

Reference to emergency plans can also be found in points 7.4.4 and 2.5.iii) of Article 7.115 and point 1.c) of Article 7.117.

17. q) Humane killing

For sick and injured cattle a prompt diagnosis should be made to determine whether the animal should be treated or humanely killed.

The decision to kill an animal humanely and the procedure itself should be undertaken by a competent person.

Reasons for humane *killing* may include:

- severe emaciation, weak cattle that are non-ambulatory or at risk of becoming non ambulatory;
- non-ambulatory cattle that will not stand up, refuse to eat or drink, have not responded to therapy;
- rapid deterioration of a medical condition for which therapies have been unsuccessful;
- severe, debilitating pain;
- compound (open) fracture;
- spinal injury;
- central nervous system *disease*;
- multiple joint *infections* with chronic weight loss;
- calves that are premature and unlikely to survive, have a debilitating congenital defect, or otherwise unwanted; and
- as part of disaster management response.

For a description of acceptable methods for humane *killing* of dairy cattle see Chapter 7.6.

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WELFARE OF WORKING EQUIDS

Article 7.X.1.

Preamble

Introduction

In many countries, working equids, used for transport and traction, contribute directly and indirectly to households’ livelihoods and benefit communities as a whole. Working equids may be of direct or indirect use in production and commercial activities.

More specifically, they contribute to agricultural production and food security by transporting, for instance, water and fodder for other livestock, firewood and other daily needs to the homestead, and agricultural products to the market. They provide draught power for agricultural work such as ploughing, harrowing and seeding, weeding and transport. They may supply manure and, in some cases, milk, meat and hides for household use or income (FAO, 2014). Working equids may be of direct or indirect use in production and commercial activities.

Working equids may be of direct or indirect use in commercial activities such as taxi services, construction, tourism and transporting goods. They can also be rented out and provide an income for the equid’s owner and a small business opportunity for the hirer (FAO, 2014). In the case of the latter there can potentially be an increased animal welfare risk.

Finally, working equids relieve the physical burden of women and children and less able people in transport of domestic needs; they may strengthen social relationships within extended families and communities through sharing working animals at times of need, for example during ploughing and harvesting seasons. They transport people to health centres and medical supplies to remote areas and may also form an important part of weddings or ceremonial occasions (FAO, 2014) (The Brooke, 2014).

The welfare of these working equids is often poor and this may be as a result of because their ownership owners lack by poor and marginalised communities who are unable to sufficiently sufficient resources to meet their needs, or who have insufficient knowledge of the appropriate care of equids. Certain working contexts, such as working in construction industries or in harsh environments, may present a particular risk to their welfare such as working within construction industries (e.g. brick kilns).

Article 7.X.2.

Scope and definition

This chapter applies to the following working animals: horses, donkeys and mules and donkeys that are destined, used for and or retired from for traction and, transport, for and generation of income generation as well as domestic use (non-commercial work). Equids used in sports or competitions, leisure riding activities, production of biopharmaceuticals or research are excluded.

For the purposes of this chapter, harness means all parts of the driving harness, saddle, bridle and bit that are used work to control the working equid, act as a braking system when pulling a cart, hold loads in place and transfer power to attached carts or agricultural implements.
Responsibilities and competencies

All those organisations with a defined responsibility as outlined below should have personnel with the requisite knowledge and skill to perform their duties.

1. Veterinary Authority

The Veterinary Authority is the responsible for implementation of animal health and welfare legislations, policies and programmes. However, in the case of working equids, the responsibility may be shared with other government agencies, and institutions and relevant stakeholders as listed below and including but is not limited to those responsible for agriculture and transport.

2. Other government agencies

The responsibilities of other government agencies will depend on the range of working equid uses and contexts.

For example those agencies responsible for regulating industrial and construction activities (brick kilns) whether for environmental or labour compliance, may also have a responsibility for the working equids involved in the industry.

Particularly in urban areas, the transport or other responsible agency may have legislative authority in dealing with traffic circulation and have a role to play in ensuring a safe environment for working equids as well as other road users.

Environmental protection agencies may regulate and enforce measures to prevent working equids from accessing rubbish or garbage sites or other potential sources of contamination (such as agricultural chemicals or cadavers).

The agency responsible for public health may have legislative authority in dealing with zoonosies such as glanders.

Education authorities have a responsibility in schools and through agricultural, veterinary para-professional para-veterinary and veterinary training institutions, appropriate education and training can will prevent many welfare problems from occurring.

3. Local government authorities

Local government authorities are responsible for many services and programmes that relate to health, safety and public good within their jurisdiction. In many countries the legislative framework gives authority to local government agencies with regard to aspects of transport, agriculture, public health, environmental health and inspection, and compliance activities including those in relation to animal health measures, quarantine and responsibility for abandoned and stray animals.

In many countries local government agencies are responsible for the development and enforcement of legislation relating to equine drawn carts and carried loads in traffic, animal identification (registration), licensing and disposal of dead animals.
4. Private sector veterinarians

The private sector veterinarians are responsible for providing services and advice to working equid owners or handlers and can play an important role in disease surveillance because they may be the first to see an equid suffering from a notifiable disease. The private sector veterinarians should follow the procedure established by the Veterinary Authority for reporting a suspected notifiable disease. Private sector veterinarians. They may also play a role (often in liaison with the police or other local authorities) in dealing with cases of neglect that can lead to welfare problems.

The private veterinarians should have competence in clinical examination, diagnosis and treatment, preventive procedures such as vaccination (which may include contracted services from the government in the case of certain diseases), animal identification, nutrition, and management advice provision, surgical procedures and euthanasia. Two-way communication between the private sector veterinarians and Veterinary Authority, often via the medium of a veterinary professional organisation, is important and the Veterinary Authority is responsible for setting up appropriate mechanisms for this interaction.

Private veterinarians may also have a responsibility in supervising and coordination of veterinary para-professionals involved in delivering animal health services.

5. Non-governmental organisations

Relevant non-governmental organisations (NGOs) and intergovernmental organisations should understand the role of working equids and may help to collect and provide information to support policy formulation, to advocate for and promote health and welfare of working equids.

Local NGOs are potential partners of the Veterinary Services in the development and implementation of working equid health and welfare programmes.

NGOs may also contribute, together with veterinarians and Competent Authorities, in educating the public in the importance of animal welfare of working equids.

6. Working equid owners and users

Owners and users are ultimately responsible for the welfare of their working equids by ensuring their animals’ “five freedoms” (Article 7.1.2), should ensure that the welfare of the equid, including behavioural needs, is respected and the equid is protected, as far as possible, from injuries, harm, neglect and infectious diseases (e.g. through vaccination and parasite control). Provision of appropriate feed, water and shelter is also a responsibility of the equid owner.

Article 7.X.4.

Criteria or measurables for the welfare of working equids

Although there is no single measure of animal welfare, focusing on issues that improve animal health and cater for the needs of working equids will bring about improvements in animal welfare in practice and ensure that legislators can make evidence-based decisions (Dawkins, 2006).

The following outcome-based measurables can be useful indicators of animal welfare. The use of these indicators and the appropriate thresholds should be adapted to the different situations where working equids are used.
Annex 18 (contd)

1. Behaviour

Presence or absence of certain equine behaviours could indicate an animal welfare problem, including fear, depression or pain. Non-specific behavioural indicators of pain include aggression, restlessness, agitation, a reluctance to move and a lowered head carriage. Other behaviours have been well documented (at least for horses) for abdominal, limb and dental pain (Ashley et al., 2005). Behaviours differ between donkeys, horses, and mules and a good understanding of normal behaviour of each species is required.

Some behaviours may not be uniquely indicative of one type of problem; they may be exhibited for a variety of different welfare causes. Depression, apathy, dullness and lethargy in equids that are usually normally active and alert can be indicative of a welfare problem. Changes in eating or drinking patterns may indicate a welfare problem, especially a decreased feed intake. This might also be an indicator of dental problems, poor feed quality or even feed contamination.

Behaviours indicating discomfort or pain:

- Head pressing, teeth grinding, grunting, food dropping, and inability to eat normally. Such behaviours may indicate disease process or pain.
- Depression, circling, foot pawing, flank watching, inability to stand up, rolling. Such behaviour may indicate abdominal or other discomfort.
- Disturbance of ground or bedding. Such behaviours may indicate disease process, abdominal pain, malnutrition.
- Weight shifting, foot pawing, reluctance to move or abnormal movement. Such behaviours may indicate leg, foot, spinal or abdominal pain.
- Head shaking or avoidance of head contact. Such behaviours may indicate head, ear or ocular discomfort.
- Itching, rubbing, self-inflicted abrasions. Such behaviours may indicate skin problems or parasites.
- Restlessness, agitation and anxiety, rigid stance and reluctance to move, lowered head carriage, fixed stare and dilated nostrils, clenched jaw, aggression and reluctance to be handled, may indicate non-specific pain in horses. In donkeys, these behaviours are more subtle and may not be recognised.
- Vocalisation, rolling, kicking at abdomen, flank watching and stretching may indicate abdominal pain in horses. In donkeys, dullness and depression.
- Weight-shifting, limb guarding, abnormal weight distribution, pointing, hanging and rotating limbs, abnormal movement and reluctance to move may indicate limb and foot pain in horses. These signs are more subtle in donkeys, although repeated episodes of lying down are reportedly more indicative.
- Headshaking, abnormal bit behaviour, altered eating, anorexia and quidding may indicate head and dental pain (Ashley et al., 2005).

Behaviours indicating fear or anxiety:

- Unusual Avoidance avoidance of humans, especially when handlers or objects associated with their handling come close;
- A reluctance by the working equids to engage in their use for traction or transport or even a cessation and aggressive behaviour, especially when fitting equipment or loading is undertaken.

Behaviours indicating stress:

- Oral stereotypies: crib bitting, aerophagia (“wind sucking”);
- Locomotive stereotypies: stable walking, weaving.
2. Morbidity

Morbidity, including incidence of disease, lameness, injuries or post-procedural complications, may be a direct or indirect indicator of the animal welfare status.

Understanding the aetiology of the disease or syndrome is important for detecting potential animal welfare problems. Scoring systems, such as those used to score lameness and body condition, can provide additional information.

Post-mortem examination is useful to establish causes of death. Both clinical and post-mortem pathology may be utilised as indicators of disease, injuries and other problems that may compromise animal welfare.

3. Mortality

Mortality, like morbidity, may be a direct or indirect indicator of the animal welfare status. Depending on the context, causes of mortality should be investigated including as well as temporal and spatial patterns of mortality and possible relation relationship associated with husbandry and handling practices. Necropsy is useful in establishing the cause of death.

4. Body condition

Poor or changing body condition may be an indicator of compromised animal health and welfare and scoring systems help provide objectivity (Kay G., Pearson R.A. & Ouassat M. (2004); Pearson R. A. & Ouassat M., 1996; Carroll C. L. & Huntington P. J., 1988).

45. Body condition and Physical appearance

Poor or changing body condition or physical appearance may be an indicator of compromised animal welfare and health and scoring systems help to provide objectivity (Kay G., Pearson R.A. & Ouassat M. (2004); Pearson R. A. & Ouassat M., 1996; Carroll C. L. & Huntington P. J., 1988).

Observation of physical appearance will often provide an indication of animal welfare and health. Attributes of physical appearance that may indicate compromised welfare include:

- feet or limb abnormalities,
- wounds or injuries,
- dehydration (measured by drinking behaviour) or signs of heat stress,
- abnormal discharges,
- presence of parasites,
- abnormal coat texture or hair loss,
- excessive soiling with faeces, mud or dirt,
- emaciation,
- abnormal behaviour, postures and gait.
Annex 18 (contd)

56. Handling responses

Poor human-animal interactions can lead to or be caused by improper handling. This may include inappropriate poor bad driving and inappropriate restraint methods such as or the inappropriate misuse of whips and sticks, and can result in fear and distress.

Indicators could include:

- aversive or apathetic responses to fitting of equipment and loads,
- defensive responses from the equid to the owner or user such as threatening facial expressions, kicking, biting and avoiding human contact.
- injuries to animals resulting from improper handling.

57. Complications due to management practices

Some management practices, such as castration and hoof care, are commonly performed in working equids for improving animal performance, to facilitating handling, and improving human safety and animal welfare.

Working equids are shod for two main reasons; to prevent hoof wear and to improve performance. Many equids cope well without shoes and, if they are coping well, are best unshod. However, poor hoof care and farriery predisposes the working equid to injury and infection, and can result in changes to the size, shape and function of the hoof. Untreated abnormalities of the foot can create long-term problems in other parts of the leg and body due to change in gait and weight bearing.

They should be accomplished quickly, expertly and with the proper equipment. If these such management practices procedures such as these are not performed properly, animal welfare can may be compromised.

Indicators of such problems could include:

- post-procedure infection and swelling;
- post-procedure lameness;
- myiasis;
- behaviour indicating pain or fear;
- mortality.

It is important to note that some “management practices” are not based on evidence and are inherently bad for welfare. Evidence of firing, nasal slitting, lampas cutting and harmful substances applied to put on wounds should be identified as indicators of poor welfare.

78. Lameness (Gait)

Traditionally, lameness has been defined as any alteration of the horse's gait. In addition, lameness can be manifest in such ways as a change in attitude or performance. These abnormalities can be caused by pain in the neck, withers, shoulders, back, loin, hips, legs or feet. Identifying the source of the problem is essential to proper treatment (AAEP, 2014). Lameness or gait abnormalities are the most common presenting signs of working equids to seen by veterinarians. Various scoring systems are available to assess the degree of lameness. Ninety to ninety-nine per cent of working equids may have hoof and limb problems (Burn et al., 2010; Pritchard et al., 2005).
Indicators of such problems could include:

– hoof conformation abnormalities;

– unequal weight bearing;

– hoof and pastern axis and angles;

– lameness grades: there are various gait or lameness scoring systems, an example is one developed by the American Association of Equine Practitioners (AAEP).

The scale ranges from zero to five, with zero being no perceptible lameness, and five being most extreme:

0: Lameness not perceptible under any circumstances.

1: Lameness is difficult to observe and is not consistently apparent, regardless of circumstances (e.g. under saddle, circling, inclines, hard surface, etc.).

2: Lameness is difficult to observe at a walk or when trotting in a straight line but consistently apparent under certain circumstances (e.g. weight-carrying, circling, inclines, hard surface, etc.).

3: Lameness is consistently observable at a trot under all circumstances.

4: Lameness is obvious at a walk.

5: Lameness produces minimal weight bearing.

98. Fitness to work

Fitness to work is defined as the state or condition of being physically sound and healthy, especially as a result of exercise and proper nutrition, to perform work well (Saunders Comprehensive Veterinary Dictionary, 3 ed. Elsevier). Various factors such as the animal’s age, breed or physiological state (e.g. pregnancy) may influence its fitness to work.

Indicators of an equid’s inability to carry out the work demanded of it include the presence of heat stress, lameness, poor body condition or weight loss, harness related wounds and aversive behavioural responses to, for example, harness or equipment fitting.

Article 7.X.5.

Recommendations

Articles 7.X.67 to 7.X.134 provide recommendations for measures applied to working equids.

Each recommendation includes a list of relevant outcome-based measurables derived from Article 7.X.4. This does not exclude other measures being used when appropriate.
Nutrition, and feeding Feeding and provision of watering

1. Feeding

Working equids Equids are natural grazers that eat little and small amounts often. Their natural diet is mainly grasses, which have a high roughage content. Horses in particular should be provided fed frequently with a predominantly fibre-based diet: either grass, hay or a suitable and safe alternative in order to mimic their natural feeding pattern as closely as possible.

Energy, fibre, protein, mineral (including trace minerals) and vitamin contents in the diet of working equids, their balance, safety, digestibility and availability are major factors determining the traction power of the animals, their growth and overall productivity and their health and welfare (FAO, 2014; Pearson, 2005).

Working equids should be provided with access to an appropriate quantity of balanced and safe feed, and water which is safe (edible and with no biological, chemical and physical contaminants) and of adequate quality to meet their specific physiological and working needs. In case of feed shortages, the animal handler should ensure that the period of reduced feeding is as short as possible and that mitigation strategies are implemented if welfare and health are at risk of being compromised (NRC, 2007).

If supplementary feed is not available, steps should be taken to avoid starvation, including slaughter, sale or relocation of the animals, or humane killing.

Working equids need some of their nutrient requirements to be met by fresh, green forage. For this purpose, owners and handlers should allow working equids to forage whenever possible and allow for an adequate number of working breaks to allow the animals to eat (Heleski et al., 2010). Cut green forage should be provided when grazing is not possible. Long fibre forage is important and should be provided when adequate as well as -green forage and should also be provided even when green forage is not available. Long fibre hay is better than chopped forage to prevent ulcers.

Inadequate diets and feeding systems that may contribute to diseases, stress, discomfort or to abnormal behaviour in working animals equids and should be avoided. Animal handlers should be aware of the importance of the animals’ nutritional needs and consult an expert for advice on ration formulation and feeding programmes when needed.

2. Provision of water

However, the most important nutrient for the welfare of working equids is water (Heleski et al., 2010). Working equids need regular and adequate supply and access to palatable, safe water that meets their physiological, and work, and environmental requirements which may vary (e.g. increased water need in hot weather).

Outcome-based measurables: behaviour, morbidity, mortality, and morbidity rates, behaviour, changes in weight and body condition and physical appearance, and fitness to work, dehydration (as measured by drinking behaviour), signs of heat stress.
Article 7.X.7.

Shelter: homestead housing, workplace shelter, environmental considerations, protection from predators

Effective shelter should be provided for working equids both in the resting and working environments. Shelter should provide protection against adverse weather conditions and against predators and injury as well as good ventilation and the ability to rest comfortably. Resting space should be dry, clean and large enough for the equid to lie down, get up and turn around easily comfortably and turn round.

1. Heat stress

Heat stress is a common condition in working equids which are often working in hot, humid environments and animal handlers should be aware of the risk that heat stress poses. Equid owners and handlers should be aware of how to prevent it through provision of appropriate shade or shelter along with sufficient drinking water and avoiding work at extreme high temperatures (The Brooke, 2013). Owners may also be trained in effective treatment of hyperthermia as timely veterinary assistance may not be available.

Behaviours which indicate heat stress include increased respiratory rate and effort; flared nostrils; increased head movement and lack of response to the environment (Pritchard et al., 2006)

Outcome-based measurables: largely behavioural, morbidity, mortality, body condition and physical appearance and fitness to work including increased respiratory rate and effort; flared nostrils; increased head movement and lack of response to environment (Pritchard et al., 2006).

2. Cold

Protection from extreme cold weather conditions should be provided when these are likely to create a serious risk to the welfare of equids, particularly of neonates and young animals and others that are physiologically compromised. Such a protection could be provided by extra bedding, blankets or natural or man-made shelter structures. Care must be taken that, in an attempt to protect against the cold, ventilation and air quality are not compromised. Animal handlers should also ensure that equids have access to adequate feed and water during cold weather (The Brooke WEVM, 2013).

Behaviour which indicates suffering from cold stress includes shivering and huddling together.

Outcome-based measurables: behaviour, mortality rates, and body condition and physical appearance, behaviour including abnormal postures and huddling.

3. Protection against from predators and injury

Good shelter is required to keep Working equids should be kept safe from predators and from road accidents, which are a common occurrence if equids are left free to roam. If working equids are housed alongside other domestic livestock horned cattle, care must be taken to protect them from injury by horned cattle (The Brooke WEVM, 2013). Enclosures used should be structurally sound and free of sharp edges, protrusions and other features that could cause injury.

Outcome based measurables: behaviour, morbidity (injury rate) and, mortality rates, body condition and physical appearance and lameness— behaviour.
Annex 18 (contd)

Article 7.X.8.

**Disease and injury management:** Management of endemic disease, infectious disease, work-related wounds and injuries, planning for disease outbreaks, health service provision

1. **Biosecurity and disease prevention**

   For the purpose of this chapter, biosecurity means a set of measures designed to maintain an equid population or herd at a particular health status and to prevent the entry or spread of infectious agents. Biosecurity plans should be designed, promoted with and implemented by stakeholders, commensurate with the desired health status of the equid population or herd and current disease risk. and for listed diseases, in accordance with relevant recommendations of the Terrestrial Code. These biosecurity plans should be promoted with stakeholders for effective implementation and should address the control of the major sources and pathways for spread of pathogens by:

   a) equids,
   b) other animals and disease vectors,
   c) people,
   d) equipment (e.g. harnessing, handling and grooming equipment, feeding utensils),
   e) vehicles,
   f) air,
   g) water supply,
   h) feed.

   Outcome-based measurables: morbidity rate, mortality rate, reproductive efficiency, changes in body condition and physical appearance.

2. **Animal health management**

   Animal health management means a system designed to optimise the physical and behavioural health and welfare of the working equid. It includes the prevention, treatment and control of diseases and conditions affecting the individual animal and herd, including the recording of illnesses, injuries, mortalities and medical treatments where appropriate.

   There should be an effective national programmes for the prevention and treatment of working equid diseases and conditions require with clear roles and responsibilities to be defined for official and private animal health service personnel as well as for owners.

   Owners and handlers of working equids should be aware of signs of ill-health, disease, distress and injuries. If they suspect the presence of disease and are not able to manage it, they should seek advice from veterinarians or other qualified persons.

   Those responsible for the care of working equids should be aware of the signs of ill-health or distress, such as reduced feed and water intake, changes in weight and body condition, changes in behaviour or abnormal physical appearance.
Working equids at higher risk of disease or distress will require more frequent inspection by animal handlers. If animal handlers suspect the presence of a disease or are not able to correct the causes of disease or distress they should seek advice from those having training and experience, such as veterinarians or other qualified advisers. Vaccinations and other treatments administered to equids should be undertaken by people skilled in the procedures and on the basis of veterinary or other expert advice.

Animal handlers should have experience in recognising and managing chronically ill or injured equids, including those that are non-ambulatory.

Non-ambulatory working equids should have access to feed and water at all times and be provided with concentrated feed at least once daily and hay or forage ad libitum. They should not be transported or moved unless absolutely necessary for treatment or diagnosis. Such movements should be done carefully using methods that avoid dragging or excessive lifting.

When treatment is attempted, equids that are unable to stand up unaided and refuse to eat or drink should be euthanised in accordance with the methods indicated in Chapter 7.6., as soon as recovery is deemed unlikely.

Outcome-based measurables: morbidity rate, mortality rate, reproductive efficiency, behaviour, body condition and physical appearance, and changes in body condition.

Health is a major component of the welfare of an animal, as an animal in poor health is necessarily in a state of decreased well-being. Health may be assessed by:

a) The general appearance of the equid

This is a simple to evaluate and revealing parameter, it suffices to observe the posture, and demeanour of the animal, its body condition, and the appearance of its coat.

b) The absence of injury

A wounded animal is suffering. Pain from wounds decreases welfare. Injuries may result from inappropriate external factors; they may result from a poorly adapted environment (e.g. hobble, bit wounds or harness wounds); they may also be indicative of poor human-animal interactions.

c) The absence of disease

Evolution of diseases: disease patterns change with time and in working equids, overt clinical signs of infectious disease may often be difficult to detect. More commonly seen are multi-factorial syndromes or conditions involving multiple pathogens as well as environmental and management factors.

d) The effects of stress

Stress has a deleterious effect on the immune system; a high incidence of disease may be indicative of too much stress.
Annex 18 (contd)

Article 7.X.9.

Handling and driving practice, handling facilities, personnel expertise and training, mutilations and other management practices

Management practices should be accomplished expertly and with the proper equipment and pain relief if appropriate. Painful husbandry procedures should be performed under the recommendation or supervision of a veterinarian.

Drivers and handlers should be trained to acquire good management practice skills.

Poor management practices include bad handling, inappropriate restraint such as too tight tethering or hobbling, the working of animals that are unfit or immature, poor housing that does not protect the equids from adverse weather conditions (heat stress), inadequate handling equipment, excessive number of working hours, being underfed, lack of access to water, lack of resting periods, working under heat stress, overloads, overloading, beating or whipping and some traditional practices such as firing or nostril slitting.

Some traditional beliefs encourage unsafe, non-effective and inhumane handling of working equids. Firing is carried out in the mistaken belief that it will cure problems such as lameness or respiratory disease and nostrils may be slit in an attempt to increase airflow in hot climates. Competent Authorities and veterinarians have a role in should educating educate owners and handlers of working equids to cease these unsafe, non-effective, ineffective and inhumane, inappropriate and ineffective practices and also in encouraging encourage good management and handling skills.

Education of veterinarians on working equid health, handling, use and management is currently inadequately covered in most veterinary curricula and training programmes for drivers and operators and this should be addressed if such people are to fulfil their responsibility to train others.

Working equids should not be kept confined indoors for long periods.

Working equids should not be tethered or hobbled continuously permanently; they should not be hobbled for continuous periods of more than 12 hours in any 24-hour period. In situations where temporary hobbling is necessary, the animal handlers should ensure sufficient distance between the two hobbled legs is required to allow the equid to stand as naturally as possible and move without risk of injury.

When temporary tethering is necessary working equids should be able to lie down, and if tethered outdoors, turn around and walk. The tethering site should have a minimum radius of nine metres, and should be free from obstructions that may entangle the tether. Adequate water, and feed and frequent supervision should be provided; if necessary, action may should be taken if necessary by moving the animals to areas providing shade or shelter.

Mares in season should not be tethered near stallions; mares about to foal or with a foal should not be tethered.

Equipment used to hobble must should be designed for hobbling that purpose. The parts of the hobbles which are in contact with the skin should not be made from material that causes pain or injury (Burn et al., 2008).

Harness injury should be prevented through daily checking of harness for damage and prompt, effective repair as necessary. Equids should be checked after work for signs of rubbing and hair loss and the source of any problems should be removed through maintenance and padding where required. Bits in particular should have no sharp edges and should be of the appropriate size for the animal.

Owners and users of working equids should be discouraged from using whips and harmful goads such as sticks. Instead humane training practices for equids should be promoted which focus on developing good driving practices.
Outcome based measurables: behaviour, morbidity, mortality, and morbidity rates, body condition and physical appearance, lameness and fitness to work (firing, harness and hobbling wounds and lameness), behavioural signs.

Article 7.X.10.

**Behaviour and social interactions**

Natural behaviours and social interactions differ between horses, mules and donkeys, and Animal handlers should be familiar with normal and abnormal behaviour of each type of working equid to interpret the welfare implications of what is being observed.

Good Human animal interaction should be positive in order not to compromise the welfare of the working equid.

Different natural behaviours and social interactions between horses, mules and donkeys should be taken into account.

Some behaviours may indicate an animal welfare problem but may not be uniquely indicative of one type of problem; they may be exhibited for a variety of different welfare causes. Depression, apathy, dullness and lethargy in equids which are usually active and alert can be indicative of a welfare problem. Changes in eating or drinking habits may indicate a welfare problem, especially a decreased feed intake. This might also be an indicator of dental problems, poor feed quality or even feed contamination.

A variety of other behaviours may also be observed in working equids.

**Behaviours indicating discomfort or pain such as:**

- Head pressing, stable walking, weaving, teeth grinding, grunting, food dropping, and inability to eat normally. Such behaviours may indicate disease process, abdominal or cranial pain.
- Depression, circling, foot pawing, flank watching, inability to stand up, trashing, rolling. Such behaviour may indicate abdominal or other discomfort.
- Disturbance of ground or bedding. Such behaviours may indicate disease process, abdominal pain, malnutrition.
- Weight shifting, foot pawing, reluctance to move or abnormal movement. Such behaviours may indicate leg, foot or abdominal pain.
- Head shaking, discharges or avoidance of head contact. Such behaviours may indicate head, ear or ocular discomfort.
- Itching, rubbing, self-inflicted abrasions. Such behaviours may indicate skin problems, parasites.
- Non-specific pain in horses: restlessness, agitation and anxiety, rigid stance and reluctance to move, lowered head carriage, fixed stare and dilated nostrils, clenched jaw, aggression and reluctance to be handled. In donkeys these behaviours are more subtle and may not be recognised.
- Abdominal pain in horses: vocalisation, rolling, kicking at abdomen, flank watching, stretching. In donkeys, dullness and depression.
- Limb and foot pain in horses: weight shifting, limb guarding, abnormal weight distribution, pointing, hanging and rotating limbs, abnormal movement, reluctance to move. These signs are more subtle in donkeys, although repeated episodes of lying down are reportedly more indicative.
- Head and dental pain: headshaking, abnormal bit behaviour, altered eating, anorexia, quidding, food pocketing (Ashley et al., 2005).
Annex 18 (contd)

Behaviours indicating fear or anxiety such as:

— Avoidance of humans, especially when handlers or objects associated with their handling come close.
— A reluctance by the working equids to engage in their use for traction or transport or even a cessation and aggressive behaviour especially when fitting equipment or loading is undertaken.

Outcome-based measurables: behaviours, of discomfort or pain, sociability with humans and other equids, alertness, injuries, changes in weight and body condition and physical appearance, and fitness to work willingness to accept equipment and loading for work.

Article 7.X.11.

End of life issues: euthanasia, slaughter (including end of working life, abandonment)

Consideration should be given to end of life issues.

Abandonment of equids should be discouraged. The Competent Authorities should be responsible for developing and implementing guidance or legislation to prevent abandonment while taking steps to make provision for abandoned animals which would ensure their welfare.

When working equids need to be euthanasia of slaughtered or killed is practised in working equids, the general principles in the recommendations in Chapters 7.5 and 7.6 of the Terrestrial Code should be followed to avoid. Euthanasia is the humane method of ending an animal’s life in the most pain-free and least stressful way possible. Otherwise the working equids may suffering a prolonged and painful death by abandonment, neglect or disease or acute, painful death such as being eaten by wild animals, or hit by a road vehicle.

Article 7.X.12.

Appropriate workloads

No equid under the age of four years should be worked. They are under developed and their bones have not had time to mature sufficiently to cope with the rigours of work. In horses upper fore and hind limb growth plates do not close until four years of age and spinal ones not until five years of age. Equids continue to develop until over the age of five years so consideration should be given, according to workload, as to when working life commences. In general this should be three years of age or more but never less than two years of age. Animals that are subjected to excessive work too young in life will usually suffer from leg and back injuries in later life, resulting in a much-reduced working life.

No Mares should not be ridden or worked within three months before and after of foaling.

Special considerations should be given to old animals.

Animals should work a maximum of six hours per day and should be given at least one, preferably two, full day’s rest in every seven-day period (preferably two). Consideration should be given to the animal’s physical condition and age and the work load should be adjusted accordingly.

Consideration should be given to the weather conditions (work should be reduced in very hot weather). Breaks should be given at least every two hours and fresh drinkable water should be provided available.

All animals should receive sufficient good quality feed corresponding to their individual requirements. Fresh drinkable water and roughage should be available to aid digestion.

Sick or injured animals should not be worked. Any animal that has been under veterinary treatment should not be returned to work until advised by from the veterinarian is received.

Animals should be in good health and fit to do the work that is required of them.

Outcome based measurables: behaviour, body condition and physical appearance, dehydration, handling response, gait and lameness and fitness to work.
Farriery and harnessing

1. Farriery

Owners and handlers should routinely clean and check the hooves of the working equid before and after work.

Hoof trimming and shoeing of working equids should only be performed by persons with the necessary knowledge and skills.

Equids are shod for two main reasons: to prevent hoof wear and to improve performance. Many equids cope well without shoes and, if they are coping well, are best unshod. However, poor hoof care and farriery predisposes the working equid to injury and infection, and can result in changes to the size, shape and function of the hoof. Untreated abnormalities of the foot can create long term problems in other parts of the leg due to change in gait and weight bearing. Such problems could include:

a) Conditions of the hoof wall and horn-producing tissues: hoof wall defects, such as cracks that involve the sensitive tissue; laminitis, laminar tearing (local, due to hoof imbalance), separation or inflammation of the sensitive laminae from the insensitive laminae; abscess formation; contusions of the hoof causing bruising or corn formation; neoplasia, and pododermatitis (thrush or canker).

b) Conditions of the third phalanx: third phalanx problems include fractures of the coffin bone, deep digital flexor insertional tendinopathy, pedal osteitis (generalised or localised inflammation of the bone), and disruption of the insertions of the collateral ligaments, cyst-like lesion formation, and remodeling disease.

c) Conditions of the podotrochlear region: these include distal interphalangeal synovitis or capsulitis, deep digital flexor tendinitis, desmitis of the impar (distal navicular ligament) or collateral sesamoidean ligaments, navicular osteitis or osteopathy, and vascular disease of the navicular arteries, and navicular fractures.

These conditions are all characterised by pain that can be localised in the hoof (Turner, 2013).

Outcome based measurables: Behaviour, body condition and physical appearance, lameness and fitness to work.

2. Harnessing

For the purpose of this chapter, harnessing includes all parts of the driving harness, saddle, bridle and bit. They work to control the working equid, act as a braking system when pulling a cart, hold loads in place and transfer power to attached carts or agricultural implements.

A properly designed, well-fitted and comfortable harness allows the working equid to pull the equipment to the best of its ability, efficiently and without risk of pain or injuries. A poorly designed or ill-fitted harness can cause injury and discomfort to the animal as well as inefficient transfer of power from the animal to the implement or cart and can also be a danger for the handler and other road users.

Harness injury should be prevented through by using properly fitted and adjusted harness which is checked daily for damage and repaired promptly as necessary. Equids should be checked after work for signs of rubbing and hair loss and the source of any problems should be removed through maintenance and padding where required.
Annex 18 (contd)

There should be enough clean padding on harnesses so the animals do not have to work with open sores.

A good harness Harness: does should not have sharp edges which could cause injury to the equids; should fit well so that it does not cause wounds or chafing caused by excess movement; is should be smoothly shaped or padded so that loads imposed on the working equids’ bodies are spread over a large area; and does should not impede the animal’s movement or normal breathing or restrict blood supply. Good harnessing also maximizes the efficiency of transfer of draught energy from animal to load so that minimum effort is required by the working equid.

Carts should be maintained to ensure accurate balancing and appropriate tyre pressure. For draught animals equids the use of swingletrees is recommended so as to balance the pull and thus as a result reduce the risk of sores from the harness.

Owners are responsible for ensuring that effective welfare-friendly harnessing and is accompanied by good riding and driving practices.

Bits should be ideally of a simple type (such as a straight bar snaffle), depending on work, but should always be smooth, appropriately sized for the equid and kept clean. Inappropriate materials such as thin cord or wire should never be used as bits or to repair bits.

Wounds caused by poorly maintained or inappropriate harnessing are common in working equids and attention should be paid to prevention of harness related injuries. (Pearson et al., 2003).

Outcome based measurables: lesions at sites of harness abrasion including abrasion of eye area associated with blinkers, lesions at lip commissures or other parts of the mouth associated with biting; lesions on tail, hindquarters, hind limbs or hocks associated with contact with cart. Behaviour, body condition and physical appearance, lameness and fitness to work.

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— Text deleted.
References


Annex 18 (contd)


- Turner (2013): Examination of the Equine Foot. In Proceedings of the AAEP Focus on the Foot - AAEP Focus Meeting. AAEP web site


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CHAPTER 8.3.

INFECTION WITH BLUETONGUE VIRUS

Article 8.3.1.

General provisions

For the purposes of the Terrestrial Code, bluetongue is defined as an infection of ruminants and camelids with bluetongue virus (BTV) that is transmitted by Culicoides vectors.

The following defines the occurrence of infection with BTV:

1) BTV has been isolated from a ruminant or camelid or a product derived from that ruminant or camelid, or
2) viral antigen or viral ribonucleic acid specific to BTV has been identified in samples from a ruminant or camelid showing clinical signs consistent with bluetongue, or epidemiologically linked to a suspected or confirmed case, or
3) antibodies to structural or nonstructural proteins of BTV that are not a consequence of vaccination have been identified in a ruminant or camelid that either shows clinical signs consistent with bluetongue, or is epidemiologically linked to a suspected or confirmed case.

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

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

When authorising import or transit of the commodities covered in the chapter, with the exception of those listed in Article 8.3.2., Veterinary Authorities should require the conditions prescribed in this chapter relevant to the BTV status of the ruminant and camelid populations of the exporting country or zone.

Article 8.3.2.

Safe commodities

When authorising import or transit of the following commodities, Veterinary Authorities should not require any BTV bluetongue-related conditions regardless of the bluetongue BTV status of the exporting country:

1) milk and milk products;
2) meat and meat products;
3) hides and skins;
4) wool and fibre;
5) in vivo derived bovine embryos collected, processed and stored in accordance with Chapter 4.7.
Annex 19 (contd)

Article 8.3.3.

BTV free country. Country or zone free from bluetongue

1) Historical freedom as described in Chapter 1.4. does not apply to *bluetongue infection with BTV*.

2) A country or a zone may be considered free from bluetongue infection with BTV is notifiable in the whole entire country and either:
   a) a surveillance programme in accordance with Articles 8.3.14. to 8.3.17. has demonstrated no evidence of infection with BTV in the country or zone during the past two years; or
   b) an ongoing surveillance programme has found no *Culicoides* for at least two years in the country or zone.

3) A *BTV free* country or zone free from bluetongue in which ongoing vector surveillance, performed in accordance with point 5 of Article 8.3.16., has found no *Culicoides* will not lose its free status through the introduction of vaccinated, seropositive or infective ruminants or camelids, or their semen, or embryos or *oocytes* from infected countries or infected zones.

4) A *BTV free* country or zone free from bluetongue in which surveillance has found evidence that *Culicoides* are present will not lose its free status through the introduction of seropositive or vaccinated ruminants or camelids, or semen, or embryos or *oocytes* from infected countries or infected zones, provided:
   a) an ongoing surveillance programme focused on BTV transmission of BTV and a consideration of the epidemiology of infection with BTV, in accordance with Articles 8.3.14. to 8.3.17. and Chapter 4.3., has demonstrated no evidence of BTV transmission of BTV in the country or zone; or
   b) the ruminants or camelids, their semen, and embryos or *oocytes* were introduced in accordance with this chapter.

5) A *BTV free* country or zone free from bluetongue adjacent to an infected country or infected zone should include a zone in which surveillance is conducted in accordance with Articles 8.3.14. to 8.3.17.

Article 8.3.4.

BTV seasonally free zone. Zone seasonally free from bluetongue

A *BTV seasonally free* zone seasonally free from bluetongue is a part of an infected country or an infected zone for which surveillance demonstrates no evidence either of BTV transmission of BTV or of adult *Culicoides* for part of a year.

For the application of Articles 8.3.7., 8.3.9. and 8.3.11., the seasonally free period is taken to commence the day following the last evidence of BTV transmission of BTV (as demonstrated by the surveillance programme), and of the cessation of activity of adult *Culicoides*.

For the application of Articles 8.3.7., 8.3.9. and 8.3.11., the seasonally free period is taken to conclude either:

1) at least 28 days before the earliest date that historical data show BTV transmission of BTV may recommence; or

2) immediately if current climatic data or data from a surveillance programme indicate an earlier resurgence of activity of adult *Culicoides*. 
A BTV seasonally free zone in which ongoing surveillance has found no evidence that Culicoides are present will not lose its free status through the introduction of vaccinated, seropositive or infective ruminants or camelids, or semen, or embryos or oocytes from infected countries or infected zones.

Article 8.3.5.

**BTV infected country** Country or zone infected with BTV

For the purposes of this chapter, a BTV infected country or infected zone infected with BTV is one that does not fulfill the requirements to qualify as either BTV free country or zone or BTV seasonally free zone from bluetongue.

Article 8.3.6.

**Recommendations for importation from BTV free countries or zones free from bluetongue**

For ruminants and camelids

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

1) the animals showed no clinical sign of BTV bluetongue on the day of shipment;

2) the animals were kept in a BTV free country or zone free from bluetongue since birth or for at least 60 days prior to shipment; or

3) the animals were kept in a BTV free country or zone free from bluetongue for at least 28 days, then were subjected, with negative results, to a serological test to detect antibodies to the BTV group and remained in the BTV free country or zone until shipment; or

4) the animals were kept in a BTV free country or zone free from bluetongue for at least 14 days, then were subjected, with negative results, to an agent identification test, and remained in the BTV free country or zone until shipment; or

5) the animals:
   a) were kept in a BTV free country or zone free from bluetongue for at least seven days;
   b) were vaccinated, at least 60 days before the introduction into the free country or zone, against all serotypes demonstrated to be present in the source population through a surveillance programme as described in Articles 8.3.14. to 8.3.17.;
   c) were identified as having been vaccinated;
   d) remained in the BTV free country or zone until shipment;

AND

6) if the animals were exported from a free zone within an infected country, either:
   a) did not transit through an infected zone during transportation to the place of shipment; or
   b) were protected from attacks from Culicoides at all times when transiting through an infected zone; or
   c) had been vaccinated in accordance with point 5 above.
Annex 19 (contd)

Article 8.3.7.

Recommendations for importation from BTV zones seasonally free zones from bluetongue

For ruminants and camelids

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

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

2) 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

3) 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 antibodies to the BTV group, with negative results, carried out at least 28 days after the commencement of the residence period; or

4) 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, with negative results, carried out at least 14 days after the commencement of the residence period; or

5) were kept during the seasonally free period in a BTV seasonally free zone and were vaccinated, at least 60 days before the introduction into the free country or zone, against all serotypes demonstrated to be present in the source population through a surveillance programme in accordance with Articles 8.3.14. to 8.3.17. and were identified as having been vaccinated and remained in the BTV seasonally free country or zone until shipment;

AND

6) either:
   a) did not transit through an infected zone during transportation to the place of shipment; or
   b) were protected from attacks from Culicoides at all times when transiting through an infected zone; or
   c) were vaccinated in accordance with point 5 above.

Article 8.3.8.

Recommendations for importation from BTV infected countries or zones infected with BTV

For ruminants and camelids

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

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

2) were protected from attacks from Culicoides in a vector-protected establishment for at least 60 days prior to shipment and during transportation to the place of shipment; or
Annex 19 (contd)

3) were protected from attacks from *Culicoides* in a vector-protected establishment for at least 28 days prior to shipment and during transportation to the place of shipment, and were subjected during that period to a serological test to detect antibodies to the BTV group, with negative results, carried out at least 28 days after introduction into the vector-protected establishment; or

4) were protected from attacks from *Culicoides* in a vector-protected establishment for at least 14 days prior to shipment and during transportation to the place of shipment, and were subjected during that period to an agent identification test, with negative results, carried out at least 14 days after introduction into the vector-protected establishment; or

5) were vaccinated, at least 60 days before shipment, against all serotypes demonstrated to be present in the source population through a surveillance programme in accordance with Articles 8.3.14. to 8.3.17.; or

6) were demonstrated to have antibodies for at least 60 days prior to dispatch against all serotypes demonstrated to be present in the source population through a surveillance programme in accordance with Articles 8.3.14. to 8.3.17.

Article 8.3.9.

**Recommendations for importation from BTV free countries or zones free or from BTV zones seasonally free zones from bluetongue**

For semen of ruminants and camellids

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

1) the donor males:
   a) showed no clinical sign of bluetongue on the day of collection;
   b) were kept in a BTV-free country or zone free from bluetongue or in a seasonally free zone during the BTV seasonally free period in a BTV seasonally free zone for at least 60 days before commencement of, and during, collection of the semen; or
   c) were subjected to a serological test to detect antibodies to the BTV group, with negative results, between 28 and 60 days after the last collection for this consignment, and, in case of a BTV seasonally free zone, at least every 60 days throughout the collection period; or
   d) were subjected to an agent identification test 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 accordance with Chapters 4.5. and 4.6.

Article 8.3.10.

**Recommendations for importation from BTV infected countries or zones infected with BTV**

For semen of ruminants and camellids

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

1) the donor males:
   a) showed no clinical sign of bluetongue on the day of collection;
   b) were kept in a vector-protected establishment for at least 60 days before commencement of, and during, collection of the semen; or
Annex 19 (contd)

c) were subjected to a serological test to detect antibodies to the BTV group, with negative results, at least every 60 days throughout the collection period and between 28 and 60 days after the final collection for this consignment; or
d) were subjected to an agent identification test 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 accordance with Chapters 4.5. and 4.6.

Article 8.3.11.

Recommendations for importation from BTV-free countries or zones free or zones from BTV seasonally free zones from bluetongue

For in vivo derived embryos of ruminants (other than bovine embryos) and other BTV susceptible herbivores and for in vitro produced bovine embryos

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

1) the donor females:
   a) showed no clinical sign of bluetongue on the day of collection;
   b) were kept in a BTV-free country or zone free from bluetongue or in a seasonally free zone during the seasonally free period in a seasonally free zone for at least the 60 days prior to, and at the time of, collection of the embryos; or
   c) were subjected to a serological test to detect antibodies to the BTV group, between 28 and 60 days after collection, with negative results; or
   d) were subjected to an agent identification test on a blood sample taken on the day of collection, with negative results;

2) the embryos were collected, processed and stored in accordance with Chapters 4.7., 4.8. and 4.9., as relevant.

Article 8.3.12.

Recommendations for importation from BTV-infected countries or zones infected with BTV

For in vivo derived embryos or oocytes of ruminants (other than bovine embryos) and other BTV susceptible animals and for in vitro produced bovine embryos

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

1) the donor females:
   a) showed no clinical sign of bluetongue on the day of collection;
   b) were kept in a vector-protected establishment for at least 60 days before commencement of, and during, collection of the embryos or oocytes; or
   c) were subjected to a serological test to detect antibodies to the BTV group, between 28 and 60 days after collection, with negative results; or
Annex 19 (contd)

d) were subjected to an agent identification test on a blood sample taken on the day of collection, with negative results;

2) the embryos or oocytes were collected, processed and stored in accordance with Chapters 4.7., 4.8. and 4.9., as relevant;

3) the semen used to fertilise the oocytes complied with Article 8.3.9.

Article 8.3.13.

Protecting animals from *Culicoides* attacks

1. **Vector-protected establishment or facility**

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

   a) appropriate physical barriers at entry and exit points, e.g. such as double-door entry-exit system;

   b) openings of the building are vector screened with mesh of appropriate gauge impregnated regularly with an approved insecticide in accordance with manufacturers’ instructions;

   c) vector surveillance and control within and around the building;

   d) measures to limit or eliminate breeding sites for vectors in the vicinity of the establishment or facility;

   e) standard operating procedures, including description of back-up and alarm systems, for operation of the establishment or facility and transport of animals to the place of loading.

2. **During transportation**

   When transporting animals through BTV infected countries or infected zones, Veterinary Authorities should require strategies to protect animals from attacks from *Culicoides* during transport, taking into account the local ecology of the vector.

   a) Transport by road

      *Risk management* strategies may include:

      i) treating animals with insect repellents prior to and during transportation;

      ii) *loading*, transporting and *unloading* animals at times of low vector activity (i.e. bright sunshine, low temperature);

      iii) ensuring *vehicles* do not stop en route during dawn or dusk, or overnight, unless the animals are held behind insect proof netting;

      iv) darkening the interior of the *vehicle*, for example by covering the roof or sides of *vehicles* with shade cloth;

      v) *surveillance* for *vectors* at common stopping and *unloading* points to gain information on seasonal variations;

      vi) using historical information or information from appropriately verified and validated bluetongue epidemiological models to identify low risk ports and transport routes.
Annex 19 (contd)

b) Transport by air

Prior to loading the animals, the crates, containers or jet stalls should be sprayed with an insecticide approved in the country of dispatch.

Crates, containers or jet stalls in which animals are being transported and the cargo hold of the aircraft should be sprayed with an approved insecticide when the doors have been closed and prior to take-off. All possible insect harbourage should be treated. The spray containers should be retained for inspection on arrival.

In addition, during any stopover in countries or zones not free from bluetongue, prior to the opening of any aircraft door and until all doors are closed, netting of appropriate gauge impregnated with an approved insecticide should be placed over crates, containers or jet stalls.

Article 8.3.14.

Introduction to surveillance

Articles 8.3.14. to 8.3.17. define the principles and provide guidance on surveillance for infection with BTV, complementary to Chapter 1.4. and for vectors complementary to Chapter 1.5.

Bluetongue is a vector-borne infection transmitted by different various species of Culicoides in a range of ecosystems.

The purpose of surveillance is the detection of BTV transmission of BTV in a country or zone and not determination of the status of an individual animal or herds. Surveillance deals with the evidence of infection with BTV in the presence or absence of clinical signs.

An important component of the epidemiology of bluetongue is the capacity of its vector, 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 bluetongue should focus on transmission of BTV in domestic ruminants and camels.

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

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

Article 8.3.15.

General conditions and methods for surveillance

1) A surveillance system in accordance with Chapter 1.4. should be under the responsibility of the Veterinary Authority. 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 suspected cases of infection with BTV to a laboratory for diagnosis;

   c) a system for recording, managing and analysing diagnostic and surveillance data should be in place.
2) The bluetongue surveillance programme should:

a) in a free country or zone or seasonally free country or zone, have an early warning system which obliges farmers and workers, who have regular contact with domestic ruminants, as well as diagnosticians, to report promptly any suspicion of bluetongue infection with BTV to the Veterinary Authority.

An effective surveillance system will periodically identify suspicious suspected cases that require follow-up and investigation to confirm or exclude whether the cause of the condition is bluetongue BTV. The rate at which such suspected cases are likely to occur will differ between epidemiological situations and cannot therefore be predicted reliably. All suspected cases of bluetongue should be investigated immediately and samples should be taken and submitted to a laboratory. This requires that sampling kits and other equipment be available for those responsible for surveillance;

AND

b) conduct random or targeted serological and virological surveillance appropriate to the status of the country or zone.

Surveillance strategies

The target population for surveillance aimed at identification of disease or infection should cover susceptible domestic ruminants and camels, and other susceptible herbivores of epidemiological significance within the country or zone. Active and passive surveillance for bluetongue should be ongoing as epidemiologically appropriate. Surveillance should be composed of random or targeted approaches using virological, serological and clinical methods appropriate for the status of the country or zone.

It may be appropriate to focus surveillance in an area adjacent to a border of an infected country or infected zone for up to 100 kilometres, taking into account relevant ecological or geographical features likely to interrupt the transmission of BTV or the presence in the bordering infected country or infected zone of a bluetongue surveillance programme (in accordance with Articles 8.3.14. to 8.3.17.) that supports a lesser distance.

A Member Country should justify the surveillance strategy chosen as being adequate to detect the presence of infection with BTV in accordance with Chapter 1.4. and the prevailing epidemiological situation. It may, for example, be appropriate to target clinical surveillance at particular species likely to exhibit clinical signs (e.g. 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 bluetongue infection with BTV in a specific zone, the design of the surveillance strategy should be aimed at the population within the zone.

For random surveys, the design of the sampling strategy should incorporate epidemiologically appropriate design prevalence. The sample size selected for testing should be large enough to detect 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 Member Country should justify the choice of design prevalence and confidence level based on the objectives of surveillance and the epidemiological situation, in accordance with Chapter 1.4. Selection of the design prevalence in particular should be based on the prevailing or historical epidemiological situation.
Irrespective of the survey approach selected, the sensitivity and specificity of the diagnostic tests employed are key factors in the design, sample size determination and interpretation of the results obtained. Ideally, the sensitivity and specificity of the tests used should be validated for the vaccination and infection history and the different species in the target population.

Irrespective of the testing system employed, surveillance system design should anticipate the occurrence of false positive reactions. If the characteristics of the testing system are known, the rate at which these false positives are likely to occur can be calculated in advance. There should be an effective procedure for following up positive reactions 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 or infection are technically well defined. The design of surveillance programmes to prove the absence of infection with BTV and transmission of BTV should be carefully followed to avoid producing results that are either insufficiently reliable to be accepted by international trading partners, or excessively costly and logistically complicated.

1. Clinical surveillance

Clinical surveillance aims to detect clinical signs of bluetongue at the flock or herd level, particularly during a newly introduced infection. In sheep and occasionally goats, clinical signs may include oedema, hyperaemia of mucosal membranes, coronitis and cyanotic tongue.

Suspected cases of bluetongue 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 of BTV is essential to establish the bluetongue BTV status of a country or zone. Serological testing of ruminants is one of the most effective methods of detecting the presence of BTV. The species tested should reflect the epidemiology of bluetongue. 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.

Samples should be examined for antibodies against BTV. Positive test results can have four possible causes:

a) natural infection,

b) vaccination,

c) maternal antibodies,

d) the lack of specificity of the test.

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

The results of random or targeted serological surveys are important in providing reliable evidence that no infection with BTV is present in a country or zone. It is, therefore, essential that the survey is thoroughly documented. It is critical to interpret the results in light of the movement history of the animals being sampled.
Serological surveillance in a free zone should target those areas that are at highest risk of BTV transmission of BTV 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 bluetongue infection with BTV, either random or targeted sampling is suitable to select herds or animals for testing.

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 bluetongue infection with BTV, either random or targeted sampling is suitable.

3. Virological surveillance

Isolation and genetic analysis of BTV from a proportion of infected animals provides information on serotype and genetic characteristics of the viruses concerned.

Virological surveillance can be conducted:

a) to identify virus transmission in at risk populations,

b) to confirm clinically suspected cases,

c) to follow up positive serological results,

d) to better characterise the genotype of circulating virus in a country or zone.

4. Sentinel animals

Sentinel animals are a form of targeted surveillance with a prospective study design. They are the preferred strategy for bluetongue surveillance. They comprise groups of unexposed animals that have not been vaccinated and are managed at fixed locations and sampled regularly to detect new infections with BTV.

The primary purpose of a sentinel animal programme is to detect infections with BTV 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 animal programmes allow the timing and dynamics of infections to be observed.

A sentinel 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 bluetongue 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 transmission of BTV 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 bias, sentinel groups should comprise animals selected to be of similar age and susceptibility to infection with BTV. 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 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 uninfected areas can be defined by serological detection of infective period. Monthly sampling intervals are frequently used. Sentinels in declared free zones add to confidence that infection with BTV is not occurring unobserved. In such cases, sampling prior to and after the possible period of transmission is sufficient.
Annex 19 (contd)

Definitive information on BTV 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 species of Culicoides which vary around the world. It is therefore important to be able to identify potential vector species accurately although many such species are closely related and difficult to differentiate with certainty.

Vector surveillance aims to demonstrate the absence of vectors or to determine areas of different levels of risk and local details of seasonality by determining the various vector species present in an area, their respective seasonal occurrence, and abundance. Vector surveillance has particular relevance to potential areas of spread.

Long term surveillance can also be used to assess vector abatement measures or to confirm continued absence of vectors.

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

Vector surveillance should be based on scientific sampling techniques. The choice of the number and type of traps to be used and the frequency of their use should take into account the size and ecological characteristics of the area to be surveyed.

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

The use of a vector surveillance system to detect the presence of circulating virus is not recommended as a routine procedure as the typically low vector infection rates mean that such detections can be rare.

Animal-based surveillance strategies are preferred to detect virus transmission.

Article 8.3.17.

Documentation of BTV infection bluetongue free status

1. Additional surveillance requirements for Member Countries declaring freedom from bluetongue infection with BTV

In addition to the general requirements described above, a Member Country declaring freedom from bluetongue infection with BTV for the entire country or a zone should provide evidence for the existence of an effective surveillance programme. The strategy and design of the surveillance programme will depend on the prevailing epidemiological circumstances and should be planned and implemented in accordance with general conditions and methods described in this chapter, to demonstrate absence of infection with BTV during the preceding 24 months in susceptible domestic ruminant populations. This requires the support of a laboratory able to undertake identification of infection with BTV through virus detection and antibody tests. This surveillance should be targeted to unvaccinated animals. Clinical surveillance may be effective in sheep while serological surveillance is more appropriate in cattle.
2. Additional requirements for countries or zones 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 should also comply with the provisions stipulated for BTV vaccines in the Terrestrial Manual. Based on the epidemiology of bluetongue infection with BTV in the country or zone, it may be decided to vaccinate only certain species or other subpopulations.

In countries or zones that practise vaccination, virological and serological tests should be carried out to ensure the absence of virus transmission. These tests should be performed on unvaccinated subpopulations or on sentinels. The tests should be repeated at appropriate intervals in accordance with 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.

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CHAPTER 8.7.

INFECTION WITH EPIZOOTIC HEMORRHAGIC DISEASE VIRUS

Article 8.7.1.

General provisions

For the purposes of the Terrestrial Code, epizootic hemorrhagic disease (EHD) is defined as an infection of cervids and bovids with epizootic hemorrhagic disease virus (EHDV) that is transmitted by Culicoides vectors.

The following defines the occurrence of an infection with EHDV:

1) EHDV has been isolated from a sample from a cervid or bovid; or

2) viral antigen or viral ribonucleic acid specific to EHDV has been identified in samples from a cervid or bovid showing clinical signs consistent with EHD, or epidemiologically linked to a suspected or confirmed case; or

3) antibodies to structural or nonstructural proteins of EHDV that are not a consequence of vaccination have been identified in a cervid or bovid that either shows clinical signs consistent with EHD, or is epidemiologically linked to a suspected or confirmed case.

For the purposes of the Terrestrial Code, the infective period for EHDV shall be 60 days.

In the absence of clinical disease in a country or zone, its EHD status should be determined by an ongoing surveillance programme in accordance with Article 8.7.14.

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

Article 8.7.2.

Safe commodities

When authorising import or transit of the following commodities, Veterinary Authorities should not require any EHD-related conditions regardless of the EHD status of the ruminant population of the exporting country:

1) milk and milk products;

2) meat and meat products;

3) hides, skins, antlers and hooves;

4) wool and fibre.

Article 8.7.3.

Country or zone free from EHD

1) Historical freedom as described in Chapter 1.4. does not apply to EHD.
Annex 20 (contd)

2) A country or a zone may be considered free from EHD when infection with EHDV is notifiable in the entire country, importation of animals and their semen, or embryos or oocytes is carried out in accordance with this chapter and either:

a) a surveillance programme in accordance with Article 8.7.14. has demonstrated no evidence of EHDV transmission in the country or zone during the past two years; or

b) an ongoing surveillance programme in accordance with Article 8.7.14. and Chapter 4.3. has found no Culicoides for at least two years in the country or zone.

3) A country or zone free from EHD in which ongoing vector surveillance has found no evidence of Culicoides will not lose its free status through the introduction of seropositive or infective animals, or semen, or embryos or oocytes from countries or zones infected with EHDV.

4) A country or zone free from EHD in which Culicoides are present will not lose its free status through the introduction of seropositive animals, or semen, or embryos or oocytes provided that:

a) an ongoing surveillance programme has focused on EHDV transmission in domestic bovids and farmed cervids and has demonstrated no evidence of EHDV transmission in the country or zone; or

b) the animals, semen, and embryos and oocytes were introduced in accordance with this chapter.

Article 8.7.4.

Zone seasonally free from EHD

A seasonally free zone is a part of an infected country or an infected zone in which for part of a year, surveillance demonstrates no evidence either of EHDV transmission of EHDV or of adult Culicoides.

For the application of Articles 8.7.7., 8.7.9. and 8.7.11., the seasonally free period is taken to commence the day following the last evidence of EHDV transmission (as demonstrated by the surveillance programme), and of the cessation of activity of adult Culicoides.

For the application of Articles 8.7.7., 8.7.9. and 8.7.11., the seasonally free period is taken to conclude either:

1) at least 28 days before the earliest date that historical data show vector activity may recommence; or

2) immediately if current climatic data or data from a surveillance programme indicate an earlier resurgence of activity of adult Culicoides.

A seasonally free zone in which ongoing surveillance has found no evidence that Culicoides are present will not lose its free status through the introduction of vaccinated, seropositive or infective animals, or semen, or embryos or oocytes from countries or zones infected with EHDV.

Article 8.7.5.

Country or zone infected with EHDV

For the purposes of this chapter, a country or zone infected with EHDV is one that does not fulfil the requirements to qualify as either a country or zone free from EHD or a zone seasonally free from EHD.
Article 8.7.6.

Recommendations for importation from countries or zones free from EHD

For bovids and cervids

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

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

2) the animals were kept in a country or zone free from EHD since birth or for at least 60 days prior to shipment; or

3) the animals were kept in a country or zone free from EHD for at least 28 days, then were subjected, with negative results, to a serological test to detect antibody to the EHDV group and remained in the free country or zone free from EHD until shipment; or

4) the animals were kept in a country or zone free from EHD for at least 14 days, then were subjected, with negative results, to an agent identification test and remained in the free country or zone free from EHD until shipment; or

5) the animals:
   a) were kept in a country or zone free from EHD for at least seven days;
   b) were vaccinated at least 60 days before the introduction into the free country or zone free from EHD against all serotypes demonstrated to be present in the source population through a surveillance programme as described in Article 8.7.14.;
   c) were identified as having been vaccinated;
   d) remained in the free country or zone free from EHD until shipment;

AND

6) if the animals were exported from a free zone within an infected country either:
   a) did not transit through an infected zone during transportation to the place of shipment; or
   b) were protected from attacks from Culicoides at all times when transiting through an infected zone.

Article 8.7.7.

Recommendations for importation from zones seasonally free from EHD

For bovids and cervids

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

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

2) were kept during the seasonally free period in a zone seasonally free from EHD during the seasonally free period since birth or for at least 60 days prior to shipment; or
Annex 20 (contd)

3) were kept during the seasonally free period in a zone seasonally free from EHD during the seasonally free period for at least 28 days prior to shipment, and were subjected during the residence period in the zone to a serological test to detect antibodies to the EHDV group with negative results, carried out at least 28 days after the commencement of the residence period; or

4) were kept during the seasonally free period in a zone seasonally free from EHD during the seasonally free period for at least 14 days prior to shipment, and were subjected during the residence period in the zone to an agent identification test with negative results, carried out at least 14 days after the commencement of the residence period; or

5) were kept during the seasonally free period in a zone seasonally free from EHD during the seasonally free period and were vaccinated, at least 60 days before the introduction into the free country or zone, against all serotypes the presence of which in the source population has been demonstrated through a surveillance programme in accordance with Article 8.7.14, and were identified as having been vaccinated and remained in the free country or zone free from EHD until shipment;

AND

6) either:
   a) did not transit through an infected zone during transportation to the place of shipment; or
   b) were protected from attacks from Culicoides at all times when transiting through an infected zone; or
   c) were vaccinated in accordance with point 5 above.

Article 8.7.8.

Recommendations for importation from countries or zones infected with EHDV

For bovids and cervids

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

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

2) were protected from attacks from Culicoides in a vector-protected establishment for at least 60 days prior to shipment and during transportation to the place of shipment; or

3) were protected from attacks from Culicoides in a vector-protected establishment for at least 28 days prior to shipment and during transportation to the place of shipment, and were subjected during that period to a serological test to detect antibodies to the EHDV group, with negative results, carried out at least 28 days after introduction into the vector-protected establishment; or

4) were protected from attacks from Culicoides in a vector-protected establishment for at least 14 days prior to shipment and during transportation to the place of shipment, and were subjected during that period to an agent identification test with negative results, carried out at least 14 days after introduction into the vector-protected establishment; or

5) were demonstrated to have antibodies for at least 60 days prior to dispatch against all serotypes whose presence has been demonstrated in the source population through a surveillance programme in accordance with Article 8.7.14.
Article 8.7.9.

Recommendations for importation from countries or zones free or zones seasonally free from EHD

For semen of bovids and cervids

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

1) the donor males:
   a) showed no clinical sign of EHD on the day of collection;
   b) were kept in a country or zone free from EHD or in a seasonally free zone during the seasonally free period for at least 60 days before commencement of, and during, collection of the semen; or
   c) were subjected to a serological test to detect antibodies to the EHDV group, between 28 and 60 days after the last collection for this consignment, with negative results; or
   d) were subjected to an agent identification test on blood samples collected at commencement and conclusion of, and at least every seven 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 accordance with Chapters 4.5. and 4.6.

Article 8.7.10.

Recommendations for importation from countries or zones infected with EHDV

For semen of bovids and cervids

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

1) the donor males:
   a) showed no clinical sign of EHD on the day of collection;
   b) were kept in a vector-protected establishment for at least 60 days before commencement of, and during, collection of the semen; or
   c) were subjected to a serological test to detect antibodies to the EHDV group, with negative results, at least every 60 days throughout the collection period and between 28 and 60 days after the final collection for this consignment; or
   d) were subjected to an agent identification test on blood samples collected at commencement and conclusion of, and at least every seven 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 accordance with Chapters 4.5. and 4.6.

Article 8.7.11.

Recommendations for importation from countries or zones free or zones seasonally free from EHD

For embryos or oocytes of bovids and cervids
Annex 20 (contd)

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

1) the donor females:
   a) showed no clinical sign of EHD on the day of collection;
   b) were kept in a country or zone free from EHD or in a seasonally free zone during the seasonally free period for at least the 60 days prior to, and at the time of, collection of the embryos or oocytes; or
   c) were subjected to a serological test to detect antibodies to the EHDV group, between 28 and 60 days after collection, with negative results; or
   d) were subjected to an agent identification test on a blood sample taken on the day of collection, with negative results;

2) the embryos or oocytes were collected, processed and stored in accordance with Chapters 4.7., 4.8. and 4.9., as relevant.

Article 8.7.12.

Recommendations for importation from countries or zones infected with EHDV

For embryos or oocytes of bovids and cervids

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

1) the donor females:
   a) showed no clinical sign of EHD on the day of collection;
   b) were kept in a vector-protected establishment for at least 60 days before commencement of, and during, collection of the embryos or oocytes; or
   c) were subjected to a serological test to detect antibodies to the EHDV group, between 28 and 60 days after collection, with negative results; or
   d) were subjected to an agent identification test on a blood sample taken on the day of collection, with negative results;

2) the embryos or oocytes were collected, processed and stored in accordance with Chapters 4.7., 4.8. and 4.9., as relevant.

Article 8.7.13.

Protecting animals from Culicoides attacks

1. Vector-protected establishment or facility

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

a) appropriate physical barriers at entry and exit points, such as for example, double-door entry-exit system;
b) openings of the building are vector screened with mesh of appropriate gauge impregnated regularly with an approved insecticide in accordance with the instructions of the manufacturers’ instructions;

c) vector surveillance and control within and around the building;

d) measures to limit or eliminate breeding sites for vectors in the vicinity of the establishment or facility;

e) standard operating procedures, including description of back-up and alarm systems, for operation of the establishment or facility and transport of animals to the place of loading.

2. During transportation

When transporting animals through countries or zones infected with EHDV, Veterinary Authorities should require strategies to protect animals from attacks from Culicoides during transport, taking into account the local ecology of the vector.

a) Transport by road

Risk management strategies may include:

i) treating animals with insect repellents prior to and during transportation;

ii) loading, transporting and unloading animals at times of low vector activity (i.e. bright sunshine, low temperature);

iii) ensuring vehicles do not stop en route during dawn or dusk, or overnight, unless the animals are held behind insect-proof netting;

iv) darkening the interior of the vehicle, for example by covering the roof or sides of vehicles with shade cloth;

v) surveillance for vectors at common stopping and unloading points to gain information on seasonal variations;

vi) using historical information or information from appropriately verified and validated EHD epidemiological models to identify low risk ports and transport routes.

b) Transport by air

Prior to loading the animals, the crates, containers or jet stalls should be sprayed with an insecticide approved in the country of dispatch.

Crates, containers or jet stalls in which animals are being transported and the cargo hold of the aircraft should be sprayed with an approved insecticide when the doors have been closed and prior to take-off. All possible insect harbourage should be treated. The spray containers should be retained for inspection on arrival.

In addition, during any stopover in countries or zones not free from EHD, prior to the opening of any aircraft door and until all doors are closed, netting of appropriate gauge impregnated with an approved insecticide should be placed over crates, containers or jet stalls.
Annex 20 (contd)

Article 8.7.14.

Surveillance

This article is complementary to Chapter 1.4. and, for vectors, complementary to Chapter 1.5. and outlines the principles for surveillance for EHD applicable to Member Countries seeking to determine the EHD status of a country or a zone.

EHD is a vector-borne infection transmitted by different species of Culicoides in a range of ecosystems.

An important component of the epidemiology of EHD is the capacity of its vector, which provides a measure of disease risk that incorporates vector competence, abundance, seasonal incidence, 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 EHD should focus on transmission of EHDV in domestic bovids and farmed cervids.

The purpose of surveillance is the detection of transmission of EHDV in a country or zone and not determination of the status of an individual animal or herd.

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

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

General provisions on surveillance for arthropod vectors are in Chapter 1.5.

More specific approaches to surveillance for Culicoides transmitted Orbivirus infections are described in Chapters 8.3. and 12.1. Passive surveillance for clinical cases of EHD in wild cervids can be a useful tool for detecting disease, based on lesions of haemorrhagic disease combined with appropriate diagnostic tests.

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CHAPTER 8.14.

INFECTION WITH RIFT VALLEY FEVER VIRUS


General provisions

1) The aim of this chapter is to mitigate the animal and public health risks posed by Rift Valley fever (RVF) and to prevent its international spread.

2) Humans and many animal species are susceptible to infection. For the purpose of the Terrestrial Code, RVF is defined as an infection of ruminants with Rift Valley fever virus (RVFV).

3) The following defines the occurrence of RVFV infection with RVFV:
   a) RVFV, excluding vaccine strains, has been isolated and identified as such from a sample from a ruminant; or
   b) antigen or ribonucleic acid specific to RVFV, excluding vaccine strains, has been identified in a sample from a ruminant epidemiologically linked to a confirmed or suspected case of RVF, or giving cause for suspicion of association or contact with RVFV; or
   c) antibodies to RVFV antigens which are not the consequence of vaccination, have been identified in a sample from a ruminant with either epidemiological links to a confirmed or suspected case of RVF, or giving cause for suspicion of association or contact with RVFV.

4) For the purposes of the Terrestrial Code, the infective period for RVF shall be 14 days.

5) In areas where RVFV is present, epizootics of RVF may occur following favourable climatic, environmental conditions and availability of susceptible host and competent vector populations. Epizootics are separated by inter-epizootic periods.

6) For the purposes of this chapter:
   a) 'area' means a part of a country that experiences epizootics and inter-epizootic periods, but which does not correspond to the definition of zone;
   b) 'epizootic of RVF' means the occurrence of outbreaks at an incidence substantially exceeding that during an inter-epizootic period;
   c) 'inter-epizootic period' means the period of variable duration, often long, with intermittent low level of vector activity and low rate of virus transmission, which is often not detected;
   d) ruminants include dromedary camels.

7) The historical distribution of RVF has been parts of the African continent, Madagascar, some other Indian Ocean Islands and the south western Arabian Peninsula. However, vectors, environmental and climatic factors, land-use dynamics, and animal movements may modify the temporal and spatial distribution of the infection.

8) When authorising import or transit of the commodities covered in the chapter, with the exception of those listed in Article 8.14.2., Veterinary Authorities should require the conditions prescribed in this chapter relevant to the RVF status of the ruminant population of the exporting country.

9) Standards for diagnostic tests and vaccines are described in the Terrestrial Manual.
Annex 21 (contd)

Article 8.14.2.

Safe commodities

When authorising import or transit of the following commodities and any products made from them, Veterinary Authorities should not require any RVF related conditions, regardless of the RVF status of the ruminant population of the exporting country:

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

Article 8.14.3.

Country or zone free from RVFV infection

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

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

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

Article 8.14.4.

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

A country or zone infected with RVFV, during the inter-epizootic period, is one in which virus activity is present at a low level but the factors predisposing to an epizootic are absent.

Article 8.14.5.

Country or zone infected with RVFV during an epizootic

A country or zone infected with RVFV, during an epizootic, is one in which outbreaks of RVF are occurring at an incidence substantially exceeding that of the inter-epizootic period.


Strategies to protect from vector attacks during transport

Strategies to protect animals from vector attacks during transport should take into account the local ecology of the vectors and potential risk management measures include:

1) treating animals with insect repellents prior to and during transportation;
2) loading, transporting and unloading animals at times of low vector activity;
3) ensuring vehicles do not stop en route during dawn or dusk, or overnight, unless the animals are held behind insect-proof netting;

4) using historical and current information to identify low risk ports and transport routes.

Article 8.14.7.

Recommendations for importation from countries or zones free from RVFV infection

For ruminants

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

1) were kept in a country or zone free from RVFV infection since birth or for at least 14 days prior to shipment; AND

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


Recommendations for importation from countries or zones infected with RVFV during the inter-epizootic period

For ruminants

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

1) showed no sign of RVF on the day of shipment;

2) met one of the following conditions:
   a) were vaccinated against RVF at least 14 days prior to shipment with a modified live virus vaccine; or
   b) were held for at least 14 days prior to shipment in a mosquito-proof vector-protected quarantine station, which is located in an area of demonstrated low vector activity. During this period the animals showed no clinical sign of RVFV infection; AND

3) either:
   a) did not transit through an area experiencing an epizootic during transportation to the place of shipment; or
   b) were protected from vector attacks when transiting through an area experiencing an epizootic.
Annex 21 (contd)


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

For ruminants

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

1) showed no sign of RVF on the day of shipment;
2) did not originate in the area of the epizootic;
3) were vaccinated against RVF at least 14 days prior to shipment;
4) were held for at least 14 days prior to shipment in a vector-protected quarantine station, which is located in an area of demonstrated low vector activity outside the area of the epizootic. During this period the animals showed no sign of RVF;
5) either:
   a) did not transit through an area experiencing an epizootic during transportation to the place of shipment; or
   b) were protected from vector attacks when transiting through an area experiencing an epizootic.

Article 8.14.10.

Recommendations for importation from countries or zones not free from infection with RVFV

For semen and in vivo derived embryos of ruminants

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

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

AND

2) either:
   a) were vaccinated against RVF at least 14 days prior to collection; or
   b) were demonstrated to be seropositive on the day of collection; or
   c) testing of paired samples has demonstrated that seroconversion did not occur between semen or embryo collection and 14 days after.

Article 8.14.11.

Recommendations for importation of fresh meat and meat products from ruminants from countries or zones not free from infection with RVFV

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that the entire consignment of meat comes from:

1) ruminants which showed no clinical sign of RVF within 24 hours before slaughter;
Annex 21 (contd)

2) ruminants which were slaughtered in an approved slaughterhouse/abattoir and were subjected to ante- and post-mortem inspections with favourable results;

3) carcasses which were submitted to maturation at a temperature above 2°C for a minimum period of 24 hours following slaughter.


Recommendations for importation from countries or zones not free from infection with RVFV

For milk and milk products

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

1) was subjected to pasteurisation; or

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


Surveillance

Surveillance should be carried out in accordance with Chapter 1.4.

1) During an epizootic, surveillance should be conducted to define the extent of the affected area.

2) During the inter-epizootic period, surveillance and monitoring of climatic factors predisposing an epizootic should be carried out in countries or zones infected with RVFV.

3) Countries or zones adjacent to a country or zone in which epizootics have been reported should determine their RVFV status through an on-going surveillance programme.

To determine areas of low vector activity (see Articles 8.14.8. and 8.14.9.) surveillance for arthropod vectors should be carried out in accordance with Chapter 1.5.

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

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CHAPTER 14.7.

INFECTION WITH PESTE DES PETITS RUMINANTS VIRUS

[Article 14.7.1.]

[...]

[Article 14.7.20.]

Article 14.7.21.

Recommendations for importation from PPR free countries or zones

For products of sheep and goats, other than milk, fresh meat and their products

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that the products are derived from animals:

1) which have been kept in a PPR free country or zone since birth or for at least the past 21 days;

2) which have been slaughtered in an approved slaughterhouse/abattoir and have been subjected to ante- and post-mortem inspections with favourable results.

[...]