Annex XXXIX

Original: English
April 2009

REPORT OF THE OIE ELECTRONIC CONSULTATION *AD HOC* GROUP ON POULTRY WELFARE

Paris, January–May 2009

As advised at the meeting of the Animal Welfare Working Group (AWWG), which was held in June 2008, the OIE Central Bureau consulted electronically a Group of Experts to Review of the existing OIE guidelines Slaughter, Killing for disease control and Transport of Poultry. The extract of the AWWG Report is presented in Appendix I.

An Electronic Consultation *ad hoc* Group was convened and they worked from January to May 2009 on the animal welfare relevant Chapters of the OIE *Terrestrial Animal Health Code*. The work from the Group included two rounds of electronic consultation and a final teleconference, which was held the 18 May 2009. The *ad hoc* Group Members list is presented in Appendix II.

The revised texts of the OIE animal welfare chapters are presented at Appendix III.

.../Appendices

2.5. Review of the existing OIE guidelines Slaughter, Killing and Transport of Poultry.

Dr. Wilkins presented a document containing an analysis of the gaps. There needs to be an update on the existing guidelines on poultry transport, slaughter and killing for disease control. In conclusion several aspects need to be reviewed.

Professor Fraser recommended revision of the sections covering the analysis of stunning methods and associated animal welfare issues, including animal welfare consequences of bleeding out.

It was agreed to seek input from recognised international experts on these issues along with scientific comment on foam based techniques for depopulation. It was subsequently agreed that Drs Wilkins and Fraser will propose appropriate experts to the Central Bureau. The Central Bureau will then coordinate this electronic consultation.

REPORT OF THE OIE ELECTRONIC CONSULTATION *AD HOC* GROUP ON POULTRY WELFARE

Paris, January–May 2009

List of participants

MEMBERS OF THE OIE *AD HOC* GROUP

Dr Temple Grandin
Grandin Livestock Handling Systems Inc
2918 Silver Plume Drive, Suite C3
Fort Collins Colorado 80526
UNITED STATES OF AMERICA
e-mail: Cheryl.Miller@ColoState.EDU

Dr Mohan Raj, BVSc MVSc PhD
Senior Research Fellow
Division of Farm Animal Science
School of Clinical Veterinary Science
University of Bristol, Langford BS40 5DU
UNITED KINGDOM
Phone / Fax (44) 0117 928 9241
e-mail: M.Raj@bristol.ac.uk

Dr Fabio Sandon de Oliveira
Fiscal Federal Agropecuário
Rua Treze de Maio, 1558 - 6o andar
01327-002 - São Paulo – SP
BRASIL
e-mail:fabio.sandon@agricultura.gov.br

Dr Laddawalaya Ratananakorn
Senior Veterinary Expert
Department of Livestock Development
Bangkok
THAILAND
e-mail: laddawalaya@yahoo.com

Dr Astrid Tripodi
Response Coordinator/Manager a.i.
Crisis Management Center-Animal Health
Food and Agriculture Organization
Room C644
Viale delle Terme di Caracalla
00153 Rome
ITALY
e-mail: Astrid.Tripodi@fao.org

OTHER PARTICIPANTS

Dr Alex Thiermann
President of the Terrestrial Animal Health Standards Commission
OIE
12, rue de Prony
75017 Paris
FRANCE
e-mail: a.thiermann@oie.int

Dr David Wilkins (OIE AWWG Member)
Secretary
ICFAW
c/o WSPA, 89, Albert Embankment
London SE1 7TP
UNITED KINGDOM
e- mail: wilkinsvet@btinternet.com

OIE HEADQUARTERS

Dr Bernard Vallat
Director General
12, rue de Prony
75017 Paris
FRANCE
Tel.: 33 - (0)1 44 15 18 88
Fax: 33 - (0)1 42 67 09 87
E-mail: oie@oie.int

Dr Sarah Kahn
Head of Department
International Trade Department
E-mail: s.kahn@oie.int

Dr Leopoldo Stuardo
Project Officer
International Trade Department
E-mail: l.stuardo@oie.int

Dr Wim Pelgrim
Project Officer
International Trade Department
E-mail: w.pelgrim@oie.int

Dr Terry Roberson
Intern
International Trade Department
E-mail: t.roberson@oie.int

Annex XXXIX (contd)

Annex III

CHAPTER 7.3.

TRANSPORT OF ANIMALS BY LAND

Preamble: These recommendations apply to the following live domesticated *animals*: cattle, buffaloes, camels, sheep, goats, pigs, *poultry* and equines. They will also be largely applicable to some other *animals* (e.g. deer, other camelids and ratites). Wild, feral and partly domesticated *animals* may need different conditions.

Article 7.3.1.

The amount of time *animals* spend on a *journey* should be kept to the minimum.

Article 7.3.2.

1. Animal behaviour

Animal handlers should be experienced and competent in handling and moving farm livestock and understand the behaviour patterns of *animals* and the underlying principles necessary to carry out their tasks.

The behaviour of individual *animals* or groups of *animals* will vary depending on their breed, sex, temperament and age and the way in which they have been reared and handled. Despite these differences, the following behaviour patterns, which are always present to some degree in domestic *animals*, should be taken into consideration in handling and moving the *animals*.

Most domestic livestock are kept in ~~herds~~ groups and follow a leader by instinct.

Animals which are likely to harm each other in a group situation should not be mixed.

The desire of some *animals* to control their personal space should be taken into account in designing *loading* and *unloading* facilities, transport *vessels* and *containers*.

Domestic *animals* will try to escape if any person approaches closer than a certain distance. This critical distance, which defines the flight zone, varies among species and individuals of the same species, and depends upon previous contact with humans. *Animals* reared in close proximity to humans (i.e. tame) have a smaller flight zone, whereas those kept in free range or extensive systems may have flight zones which may vary from one metre to many metres. *Animal handlers* should avoid sudden penetration of the flight zone which may cause a panic reaction which could lead to aggression or attempted escape and compromise the *welfare* of the *animals*.

Animal handlers should use the point of balance at the *animal*'s shoulder to move *animals*, adopting a position behind the point of balance to move an *animal* forward and in front of the point of balance to move it backward.

Domestic *animals* have a wide-angle vision but only have a limited forward binocular vision and poor perception of depth. This means that they can detect objects and movements beside and behind them, but can only judge distances directly ahead.

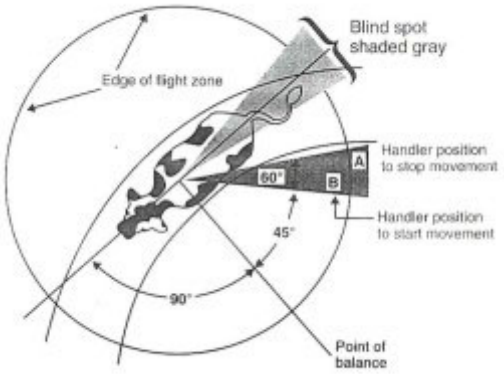
Although ~~all~~ most domestic *animals* have a highly sensitive sense of smell, they may react differently to the smells encountered during travel. Smells which cause negative responses should be taken into consideration when managing *animals*.

Annex XXXIX (contd)

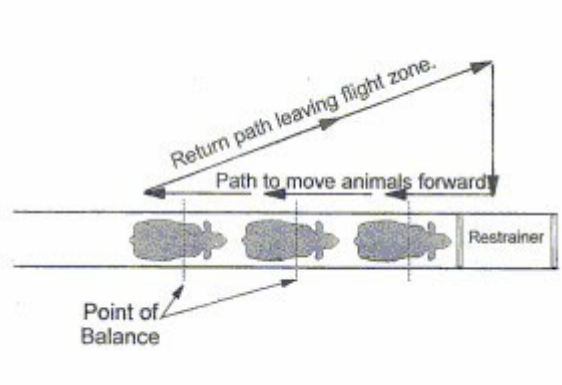
Annex III (contd)

Domestic *animals* can hear over a greater range of frequencies than humans and are more sensitive to higher frequencies. They tend to be alarmed by constant loud noises and by sudden noises, which may cause them to panic. Sensitivity to such noises should also be taken into account when handling *animals*.

An example of a flight zone (cattle)



Handler movement pattern to move cattle forward



2. Distractions and their removal

Design of new *loading* and *unloading* facilities or modification of existing facilities should aim to minimise the potential for distractions that may cause approaching *animals* to stop, baulk or turn back. Below are examples of common distractions and methods for eliminating them:

a) reflections on shiny metal or wet floors - move a lamp or change lighting;

b) dark entrances — illuminate with indirect lighting which does not shine directly into the eyes of approaching *animals*;

c) *animals* seeing moving people or equipment up ahead — install solid sides on chutes and races or install shields;

d) dead ends — avoid if possible by curving the passage, or make an illusory passage;

e) chains or other loose objects hanging in chutes or on fences — remove them;

f) uneven floors or a sudden drop in floor levels — avoid uneven floor surfaces or install a solid false floor to provide an illusion of a solid and continuous walking surface;

g) sounds of air hissing from pneumatic equipment — install silencers or use hydraulic equipment or vent high pressure to the external environment using flexible hosing;

h) clanging and banging of metal objects — install rubber stops on gates and other devices to reduce metal to metal contact;

i) air currents from fans or air curtains blowing into the face of *animals* — redirect or reposition equipment.

Article 7.3.3.

Responsibilities

Once the decision to transport the *animals* has been made, the *welfare* of the *animals* during their *journey* is the paramount consideration and is the joint responsibility of all people involved. The individual responsibilities of persons involved will be described in more detail in this Article.

The roles of each of those responsible are defined below:

1. The owners and managers of the *animals* are responsible for:

   a) the general health, overall *welfare* and fitness of the *animals* for the *journey*;

   b) ensuring compliance with any required veterinary or other certification;

   c) the presence of an *animal handler* competent for the species being transported during the *journey* with the authority to take prompt action; in case of transport by individual trucks, the truck driver may be the sole *animal handler* during the *journey*;

   d) the presence of an adequate number of *animal handlers* during *loading* and *unloading*;

   e) ensuring that equipment and veterinary assistance are provided as appropriate for the species and the *journey*.

2. Business agents or buying/selling agents are responsible for:

   a) selection of *animals* that are fit to travel;

   b) availability of suitable facilities at the start and at the end of the *journey* for the assembly; *loading*, transport, *unloading* and holding of *animals*, including for any stops at *resting points* during the *journey* and for emergencies.

3. *Animal handlers* are responsible for the humane handling and care of the *animals*, especially during *loading* and *unloading*, and for maintaining a *journey* log. To carry out their responsibilities, they should have the authority to take prompt action. In the absence of a separate *animal handler*, the driver is the *animal handler*.

4. Transport companies, *vehicle* owners and drivers are responsible for planning the *journey* to ensure the care of the *animals*; in particular they are responsible for:

Annex XXXIX (contd)

Annex III (contd)

a) choosing appropriate *vehicles* for the species transported and the *journey*;

b) ensuring that properly trained staff are available for *loading*/*unloading* of *animals*;

c) ensuring adequate competency of the driver in matters of *animal welfare* for the species being transported in case a separate *animal handler* is not assigned to the truck;

d) developing and keeping up-to-date contingency plans to address emergencies (including adverse weather conditions) and minimise stress during transport;

e) producing a *journey* plan which includes a *loading* plan, *journey* duration, itinerary and location of resting places;

f) *loading* only those *animals* which are fit to travel, for their correct *loading* into the *vehicle* and their inspection during the *journey*, and for appropriate responses to problems arising; if its fitness to travel is in doubt, the *animal* should be examined by a *veterinarian* in accordance with point 3a) of Article 7.3.7.;

g) *welfare* of the *animals* during the actual transport.

5. Managers of facilities at the start and at the end of the *journey* and at *resting points* are responsible for:

a) providing suitable premises for *loading*, *unloading* and securely holding the *animals*, with water and feed when required, and with protection from adverse weather conditions until further transport, sale or other use (including rearing or slaughter);

b) providing an adequate number of *animal handlers* to load, unload, drive and hold *animals* in a manner that causes minimum stress and injury; in the absence of a separate *animal handler*, the driver is the *animal handler*;

c) minimising the opportunities for disease transmission;

d) providing appropriate facilities, with water and feed when required;

e) providing appropriate facilities for emergencies;

f) providing facilities for washing and disinfecting *vehicles* after *unloading*;

g) providing facilities and competent staff to allow the humane *killing* of *animals* when required;

h) ensuring proper rest times and minimal delay during stops.

6. The responsibilities of *Competent Authorities* include:

a) establishing minimum standards for *animal welfare*, including requirements for inspection of *animals* before, during and after their travel, defining 'fitness to travel' and appropriate certification and record keeping;

b) setting standards for facilities, *containers* and *vehicles* for the transport of *animals*;

c) setting standards for the competence of *animal handlers*, drivers and managers of facilities in relevant issues in *animal welfare*;

d) ensuring appropriate awareness and training of *animal handlers*, drivers and managers of facilities in relevant issues in *animal welfare*;

e) implementation of the standards, including through accreditation of / interaction with other organisations;

f) monitoring and evaluating the effectiveness of standards of health and other aspects of *welfare*;

g) monitoring and evaluating the use of veterinary medications;

h) giving animal consignments priority at frontiers in order to allow them to pass without unnecessary delay.

7. All individuals, including *veterinarians*, involved in transporting *animals* and the associated handling procedures should receive appropriate training and be competent to meet their responsibilities.

8. The receiving *Competent Authority* should report back to the sending *Competent Authority* on significant *animal welfare* problems which occurred during the *journey*.

Article 7.3.4.

Competence

1. All people responsible for *animals* during *journeys*, should be competent according to their responsibilities listed in Article 7.3.3. Competence may be gained through formal training and/or practical experience.

2. The assessment of the competence of *animal handlers* should at a minimum address knowledge, and ability to apply that knowledge, in the following areas:

a) planning a *journey*, including appropriate *space allowance*, and feed, water and ventilation requirements;

b) responsibilities for *animals* during the *journey*, including *loading* and *unloading*;

c) sources of advice and assistance;

d) animal behaviour, general signs of *disease*, and indicators of poor *animal welfare* such as stress, pain and fatigue, and their alleviation;

e) assessment of fitness to travel; if fitness to travel is in doubt, the *animal* should be examined by a *veterinarian*;

f) relevant authorities and applicable transport regulations, and associated documentation requirements;

g) general disease prevention procedures, including cleaning and *disinfection*;

h) appropriate methods of animal handling during transport and associated activities such as assembling, *loading* and *unloading*;

i) methods of inspecting *animals*, managing situations frequently encountered during transport such as adverse weather conditions, and dealing with emergencies, including humane *killing*;

j) species-specific aspects and age-specific aspects of animal handling and care, including feeding, watering and inspection; and

k) maintaining a *journey* log and other records.

Annex XXXIX (contd)

Annex III (contd)

Article 7.3.5.

Planning the journey

1. General considerations

   a) Adequate planning is a key factor affecting the *welfare* of *animals* during a *journey*.

   b) Before the *journey* starts, plans should be made in relation to:

      i) preparation of *animals* for the *journey*;

      ii) choice of road, rail, roll-on roll-off vessels or *containers*;

      iii) nature and duration of the *journey*;

      iv) *vehicle* design and maintenance, including roll-on roll-off vessels;

      v) required documentation;

      vi) *space allowance*;

      vii) rest, water and feed;

      viii) observation of *animals* en route;

      ix) control of *disease*;

      x) emergency response procedures;

      xi) forecast weather conditions (e.g. conditions being too hot or too cold to travel during certain periods of the day);

      xii) transfer time when changing mode of transport, and

      xiii) waiting time at frontiers and inspection points.

   c) Regulations concerning drivers (for example, maximum driving periods) should take into account *animal welfare* whenever possible.

2. Preparation of animals for the journey

   a) When *animals* are to be provided with a novel diet or method of water provision during transport, an adequate period of adaptation should be planned. For all *animals* it is essential that the rest stops during long journeys are long enough to fulfil each *animal*'s need for feed and water. Species-specific short period of feed deprivation prior to *loading* may be desirable

   b) *Animals* more accustomed to contact with humans and with being handled are likely to be less fearful of being loaded and transported. *Animal handlers* should handle and load *animals* in a manner that reduces their fearfulness and improves their approachability.

   c) Behaviour-modifying compounds (such as tranquillisers) or other medication should not be used routinely during transport. Such compounds should only be administered when a problem exists in an individual *animal*, and should be administered by a *veterinarian* or other person who has been instructed in their use by a *veterinarian*.

3. Nature and duration of the journey

The maximum duration of a *journey* should be determined according to factors such as:

a) the ability of the *animals* to cope with the stress of transport (such as very young, old, lactating or pregnant *animals*);

b) the previous transport experience of the *animals*;

c) the likely onset of fatigue;

d) the need for special attention;

e) the need for feed and water;

f) the increased susceptibility to injury and *disease*;

g) *space allowance*, *vehicle* design, road conditions and driving quality;

h) weather conditions;

i) *vehicle* type used, terrain to be traversed, road surfaces and quality, skill and experience of the driver.

4. Vehicle and container design and maintenance

a) *Vehicles* and *containers* used for the transport of *animals* should be designed, constructed and fitted as appropriate for the species, size and weight of the *animals* to be transported. Special attention should be paid to avoid injury to *animals* through the use of secure smooth fittings free from sharp protrusions. The avoidance of injury to drivers and *animal handlers* while carrying out their responsibilities should be emphasised.

b) *Vehicles* and *containers* should be designed with the structures necessary to provide protection from adverse weather conditions and to minimise the opportunity for *animals* to escape.

c) In order to minimise the likelihood of the spread of infectious *disease* during transport, *vehicles* and *containers* should be designed to permit thorough cleaning and *disinfection*, and the containment of faeces and urine during a *journey*.

d) *Vehicles* and *containers* should be maintained in good mechanical and structural condition.

e) *Vehicles* and *containers* should have adequate ventilation to meet variations in climate and the thermo-regulatory needs of the animal species being transported; the ventilation system (natural or mechanical) should be effective when the *vehicle* is stationary, and the airflow should be adjustable.

f) *Vehicles* should be designed so that the faeces or urine from *animals* on upper levels do not soil *animals* on lower levels, nor their feed and water. This condition is not applicable for *poultry*. They are generally transported in plastic cages which are designed to let air flow through in all directions to obtain a better ventilation.

g) When *vehicles* are carried on board ferries, facilities for adequately securing them should be available.

h) If feeding or watering while the *vehicle* is moving is required, adequate facilities on the *vehicle* should be available.

Annex XXXIX (contd)

Annex III (contd)

i) When appropriate, suitable bedding should be added to *vehicle* floors to assist absorption of urine and faeces, to minimise slipping by *animals*, and protect *animals* (especially young *animals*) from hard flooring surfaces and adverse weather conditions.

5. Special provisions for transport in vehicles (road and rail) on roll-on/roll-off vessels or for containers

a) *Vehicles* and *containers* should be equipped with a sufficient number of adequately designed, positioned and maintained securing points enabling them to be securely fastened to the *vessel*.

b) *Vehicles* and *containers* should be secured to the *vessel* before the start of the sea *journey* to prevent them being displaced by the motion of the *vessel*.

c) Roll-on/roll-off *vessels* should have adequate ventilation to meet variations in climate and the thermo-regulatory needs of the animal species being transported, especially where the *animals* are transported in a secondary *vehicle/container* on enclosed decks.

6. Space allowance

a) The number of *animals* which should be transported on a *vehicle* or in a *container* and their allocation to compartments should be determined before *loading*.

b) The space required on a *vehicle* or in a *container* depends upon whether or not the *animals* need to lie down (for example, pigs, camels and *poultry*), or to stand (horses). *Animals* which will need to lie down often stand when first loaded or when the *vehicle* is driven with too much lateral movement or sudden braking.

c) When *animals* lie down, they should all be able to adopt a normal lying posture, without being on top of one another, and allowing necessary thermoregulation.

d) When *animals* are standing, they should have sufficient space to adopt a balanced position as appropriate to the climate and species transported.

e) The amount of headroom necessary depends on the species of *animal*. Each *animal* should be able to assume its natural standing position for transport (including during *loading* and *unloading*) without coming into contact with the roof or upper deck of the *vehicle*, and there should be sufficient headroom to allow adequate airflow over the *animals*. These conditions will not normally apply to *poultry*. However under tropical and subtropical conditions *poultry* benefit from having adequate head room to allow head cooling.

f) Calculations for the *space allowance* for each *animal* should be carried out using the figures given in a relevant national or international document. The number and size of pens on the *vehicle* should be varied to where possible accommodate already established groups of *animals* while avoiding group sizes which are too large.

g) Other factors which may influence *space allowance* include:

i) *vehicle/container* design;

ii) length of *journey*;

iii) need to provide feed and water on the *vehicle*;

iv) quality of roads;

v) expected weather conditions;

vi) category and sex of the *animals*.

7. Rest, water and feed

a) Suitable water and feed should be available as appropriate and needed for the species, age, and condition of the *animals*, as well as the duration of the *journey*, climatic conditions, etc.

b) *Animals* should be allowed to rest at *resting points* at appropriate intervals during the *journey*. The type of transport, the age and species of the *animals* being transported, and climatic conditions should determine the frequency of rest stops and whether the *animals* should be unloaded. Water and feed should be available during rest stops.

8. Ability to observe animals during the journey

a) *Animals* should be positioned to enable each *animal* to be observed regularly during the *journey* to ensure their safety and good *welfare*.

b) If the *animals* are in crates or on multi-tiered *vehicles* which do not allow free access for observation, for example where the roof of the tier is too low, *animals* cannot be inspected adequately, and serious injury or *disease* could go undetected. In these circumstances, a shorter *journey* duration should be allowed, and the maximum duration will vary according to the rate at which problems arise in the species and under the conditions of transport.

9. Control of disease

As animal transport is often a significant factor in the spread of infectious *diseases*, *journey* planning should take the following into account:

a) mixing of *animals* from different sources in a single consignment should be minimised;

b) contact at *resting points* between *animals* from different sources should be avoided;

c) when possible, *animals* should be vaccinated against *diseases* to which they are likely to be exposed at their destination;

d) medications used prophylactically or therapeutically should be approved by the *Veterinary Authority* of the *exporting country* and the *importing country* and should only be administered by a *veterinarian* or other person who has been instructed in their use by a *veterinarian*.

10. Emergency response procedures

There should be an emergency management plan that identifies the important adverse events that may be encountered during the *journey*, the procedures for managing each event and the action to be taken in an emergency. For each important event, the plan should document the actions to be undertaken and the responsibilities of all parties involved, including communications and record keeping.

Annex XXXIX (contd)

Annex III (contd)

11. Other considerations

a) Extreme weather conditions are hazardous for *animals* undergoing transport and require appropriate *vehicle* design to minimise risks. Special precautions should be taken for *animals* that have not been acclimatised or which are unsuited to either hot or cold conditions. In some extreme conditions of heat or cold, *animals* should not be transported at all.

b) In some circumstances, transportation during the night may reduce thermal stress or the adverse effects of other external stimuli.

Article 7.3.6.

Documentation

1. *Animals* should not be loaded until the documentation required to that point is complete.

2. The documentation accompanying the consignment should include:

a) *journey* travel plan and emergency management plan;

b) date, time and place of *loading* and *unloading*;

c) veterinary certification, when required;

d) *animal welfare* competencies of the driver (under study);

e) *animal identification* to allow *animal traceability* to the premises of departure and, where possible, to the premises of origin;

f) details of any *animals* considered at particular risk of suffering poor *welfare* during transport (point 3e) of Article 7.3.7.);

g) documentation of the period of rest, and access to feed and water, prior to the *journey*;

h) *stocking density* estimate for each load in the consignment;

i) the *journey* log - daily record of inspection and important events, including records of morbidity and mortality and actions taken, climatic conditions, rest stops, travel time and distance, feed and water offered and estimates of consumption, medication provided, and mechanical defects.

3. When veterinary certification is required to accompany consignments of *animals*, it should address:

a) fitness of *animals* to travel;

b) *animal identification* (description, number, etc.);

c) health status including any tests, treatments and vaccinations carried out;

d) when required, details of *disinfection* carried out.

At the time of certification, the *veterinarian* should notify the *animal handler* or the driver of any factors affecting the fitness of *animals* to travel for a particular *journey*.

Article 7.3.7.

Pre-journey period

1. General considerations

a) Pre-*journey* rest is necessary if the *welfare* of *animals* has become poor during the collection period because of the physical environment or the social behaviour of the *animals*. The need for rest should be judged by a *veterinarian* or other competent person.

b) Pre-*journey* assembly/holding areas should be designed to:

i) securely hold the *animals*;

ii) maintain a safe environment from hazards, including predators and *disease*;

iii) protect *animals* from exposure to severe weather conditions;

iv) allow for maintenance of social groups;

v) allow for rest, and appropriate water and feed.

c) Consideration should be given to the previous transport experience, training and conditioning of the *animals*, if known, as these may reduce fear and stress in *animals*.

d) Feed and water should be provided pre-*journey* if the *journey* duration is greater than the normal inter-feeding and drinking interval for the *animal*. Recommendations for specific-species are described in detail in Article 7.3.12.

e) When *animals* are to be provided with a novel diet or method of feed or water provision during the *journey*, an adequate period of adaptation should be allowed.

f) Before each *journey*, *vehicles* and *containers* should be thoroughly cleaned and, if necessary, treated for animal health and public health purposes, using methods approved by the *Competent Authority*. When cleaning is necessary during a *journey*, this should be carried out with the minimum of stress and risks to the *animals*.

g) Where an *animal handler* believes that there is a significant risk of *disease* among the *animals* to be loaded or significant doubt as to their fitness to travel, the *animals* should be examined by a *veterinarian*.

2. Selection of compatible groups

Compatible groups should be selected before transport to avoid adverse *animal welfare* consequences. The following recommendations should be applied when assembling groups of *animals*:

a) *Animals* reared together should be maintained as a group; *animals* with a strong social bond, such as a dam and offspring, should be transported together.

b) *Animals* of the same species can be mixed unless there is a significant likelihood of aggression; aggressive individuals should be segregated (recommendations for specific species are described in detail in Article 7.3.12.). For some species, *animals* from different groups should not be mixed because poor *welfare* occurs unless they have established a social structure.

c) Young or small *animals* should be separated from older or larger *animals*, with the exception of nursing mothers with young at foot.

Annex XXXIX (contd)

Annex III (contd)

d) *Animals* with horns or antlers should not be mixed with *animals* lacking horns or antlers unless judged to be compatible.

e) *Animals* of different species should not be mixed unless they are judged to be compatible.

3. Fitness to travel

a) Each *animal* should be inspected by a *veterinarian* or an *animal handler* to assess fitness to travel. If its fitness to travel is in doubt, the *animal* should be examined by a *veterinarian*. *Animals* found unfit to travel should not be loaded onto a *vehicle*, except for transport to receive veterinary attention.

b) Humane and effective arrangements should be made by the owner and the agent for the handling and care of any *animal* rejected as unfit to travel.

c) *Animals* that are unfit to travel include, but may not be limited to:

i) those that are sick, injured, weak, disabled or fatigued;

ii) those that are unable to stand unaided and bear weight on each leg;

iii) those that are blind in both eyes;

iv) those that cannot be moved without causing them additional suffering;

v) newborn with an unhealed navel;

vi) pregnant *animals* which would be in the final 10% of their gestation period at the planned time of *unloading*;

vii) females travelling without young which have given birth within the previous 48 hours;

viii) those whose body condition would result in poor *welfare* because of the expected climatic conditions.

d) Risks during transport can be reduced by selecting *animals* best suited to the conditions of travel and those that are acclimatised to expected weather conditions.

e) *Animals* at particular risk of suffering poor *welfare* during transport and which require special conditions (such as in the design of facilities and *vehicles*, and the length of the *journey*) and additional attention during transport, may include:

i) large or obese individuals;

ii) very young or old *animals*;

iii) excitable or aggressive *animals*;

iv) *animals* which have had little contact with humans;

v) *animals* subject to motion sickness;

vi) females in late pregnancy or heavy lactation, dam and offspring;

vii) *animals* with a history of exposure to stressors or pathogenic agents prior to transport;

viii) *animals* with unhealed wounds from recent surgical procedures such as dehorning.

4. Specific species requirements

Transport procedures should be able to take account of variations in the behaviour of the species. Flight zones, social interactions and other behaviour vary significantly among species and even within species. Facilities and handling procedures that are successful with one species are often ineffective or dangerous with another.

Recommendations for specific species are described in detail in Article 7.3.12.

Article 7.3.8.

Loading

1. Competent supervision

a) *Loading* should be carefully planned as it has the potential to be the cause of poor *welfare* in transported *animals*.

b) *Loading* should be supervised and/or conducted by *animal handlers*. The *animals* are to be loaded quietly and without unnecessary noise, harassment or force. Untrained assistants or spectators should not impede the process.

c) When *containers* are loaded onto a *vehicle*, this should be carried out in such a way to avoid poor *animal welfare*.

2. Facilities

a) The facilities for loading including the collecting area, races and loading ramps should be designed and constructed to take into account the needs and abilities of the *animals* with regard to dimensions, slopes, surfaces, absence of sharp projections, flooring, etc.

b) Loading facilities should be properly illuminated to allow the *animals* to be observed by animal handler(s), and to allow the ease of movement of the *animals* at all times. Facilities should provide uniform light levels directly over approaches to sorting pens, chutes, loading ramps, with brighter light levels inside vehicles/containers, in order to minimise baulking. Dim light levels may be advantageous for the catching of *poultry* and some other *animals*. Artificial lighting may be required. Loading ramps and other facilities should have a non-slippery flooring.

c) Ventilation during loading and the journey should provide for fresh air, the removal of excessive heat, humidity and noxious fumes (such as ammonia and carbon monoxide), and the prevention of accumulations of ammonia and carbon dioxide. Under warm and hot conditions, ventilation should allow for the adequate convective cooling of each animal. In some instances, adequate ventilation can be achieved by increasing the space allowance for *animals*.

Annex XXXIX (contd)

Annex III (contd)

3. Goads and other aids

When moving *animals*, their species-specific behaviour should be used (see Article 7.3.12. If goads and other aids are necessary, the following principles should apply:

a) *Animals* that have little or no room to move should not be subjected to physical force or goads and other aids which compel movement. Electric goads and prods should only be used in extreme cases and not on a routine basis to move *animals*. The use and the power output should be restricted to that necessary to assist movement of an *animal* and only when an *animal* has a clear path ahead to move. Goads and other aids should not be used repeatedly if the *animal* fails to respond or move. In such cases it should be investigated whether some physical or other impediment is preventing the *animal* from moving.

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

c) Useful and permitted goads include panels, flags, plastic paddles, flappers (a length of cane with a short strap of leather or canvas attached), plastic bags and rattles; they should be used in a manner sufficient to encourage and direct movement of the *animals* without causing undue stress.

d) Painful procedures (including whipping, tail twisting, use of nose twitches, pressure on eyes, ears or external genitalia), or the use of goads or other aids which cause pain and suffering (including large sticks, sticks with sharp ends, lengths of metal piping, fencing wire or heavy leather belts), should not be used to move *animals*.

e) Excessive shouting at *animals* or making loud noises (e.g. through the cracking of whips) to encourage them to move should not occur, as such actions may make the *animals* agitated, leading to crowding or falling.

f) The use of well trained dogs to help with the *loading* of some species may be acceptable.

g) *Animals* should be grasped or lifted in a manner which avoids pain or suffering and physical damage (e.g. bruising, fractures, dislocations). In the case of quadrupeds, manual lifting by a person should only be used in young *animals* or small species, and in a manner appropriate to the species; grasping or lifting *animals* only by their wool, hair, feathers, feet, neck, ears, tails, head, horns, limbs causing pain or suffering should not be permitted, except in an emergency where *animal welfare* or human safety may otherwise be compromised.

h) Conscious *animals* should not be thrown, dragged or dropped.

i) Performance standards should be established in which numerical scoring is used to evaluate the use of such instruments, and to measure the percentage of *animals* moved with an electric instrument and the percentage of *animals* slipping or falling as a result of their usage.

Article 7.3.9.

Travel

1. General considerations

a) Drivers and *animal handlers* should check the load immediately before departure to ensure that the *animals* have been properly loaded. Each load should be checked again early in the trip and adjustments made as appropriate. Periodic checks should be made throughout the trip, especially at rest or refuelling stops or during meal breaks when the *vehicle* is stationary.

b) Drivers should utilise smooth, defensive driving techniques, without sudden turns or stops, to minimise uncontrolled movements of the *animals*.

2. Methods of restraining or containing animals

a) Methods of restraining *animals* should be appropriate to the species and age of *animals* involved and the training of the individual *animal*.

b) Recommendations for specific species are described in detail in Article 7.3.12.

3. Regulating the environment within vehicles or containers

a) *Animals* should be protected against harm from hot or cold conditions during travel. Effective ventilation procedures for maintaining the environment within *vehicles* or *containers* will vary according to whether conditions are cold, hot and dry or hot and humid, but in all conditions a build-up of noxious gases should be prevented.

b) The environment within *vehicles* or *containers* in hot and warm weather can be regulated by the flow of air produced by the movement of the *vehicle*. In warm and hot weather, the duration of *journey* stops should be minimised and *vehicles* should be parked under shade, with adequate and appropriate ventilation.

c) To minimise slipping and soiling, and maintain a healthy environment, urine and faeces should be removed from floors when necessary and disposed of in such a way as to prevent the transmission of *disease* and in compliance with all relevant health and environmental legislation.

4. Sick, injured or dead animals

a) A driver or an *animal handler* finding sick, injured or dead *animals* should act according to a predetermined emergency response plan.

b) Sick or injured *animals* should be segregated.

c) Ferries (roll-on roll-off) should have procedures to treat sick or injured *animals* during the *journey*.

d) In order to reduce the likelihood that animal transport will increase the spread of infectious *disease*, contact between transported *animals*, or the waste products of the transported *animals*, and other farm *animals* should be minimised.

e) During the *journey*, when disposal of a dead *animal* becomes necessary, this should be carried out in such a way as to prevent the transmission of *disease* and in compliance with all relevant health and environmental legislation.

f) When *killing* is necessary, it should be carried out as quickly as possible and assistance should be sought from a *veterinarian* or other person(s) competent in humane *killing* procedures. Recommendations for specific species are described in Chapter 7.6. on killing of *animals* for disease control purposes.

5. Water and feed requirements

a) If *journey* duration is such that feeding or watering is required or if the species requires feed or water throughout, access to suitable feed and water for all the *animals* (appropriate for their species and age) carried in the *vehicle* should be provided. There should be adequate space for all *animals* to move to the feed and water sources and due account taken of likely competition for feed.

b) Recommendations for specific species are described in detail in Article 7.3.12.

Annex XXXIX (contd)

Annex III (contd)

6. Rest periods and conditions

a) *Animals* that are being transported should be rested at appropriate intervals during the *journey* and offered feed and water, either on the *vehicle* or, if necessary, unloaded into suitable facilities.

b) Suitable facilities should be used en route, when resting requires the *unloading* of the *animals*. These facilities should meet the needs of the particular animal species and should allow access of all *animals* to feed and water.

7. In-transit observations

a) *Animals* being transported by road should be observed soon after a *journey* is commenced and whenever the driver has a rest stop. After meal breaks and refuelling stops, the *animals* should be observed immediately prior to departure.

b) *Animals* being transported by rail should be observed at each scheduled stop. The responsible rail transporter should monitor the progress of trains carrying *animals* and take all appropriate action to minimise delays.

c) During stops, it should be ensured that the *animals* continue to be properly confined, have appropriate feed and water, and their physical condition is satisfactory.

Article 7.3.10.

Unloading and post-journey handling

1. General considerations

a) The required facilities and the principles of animal handling detailed in Article 7.3.8. apply equally to *unloading*, but consideration should be given to the likelihood that the *animals* will be fatigued.

b) *Unloading* should be supervised and/or conducted by an *animal handler* with knowledge and experience of the behavioural and physical characteristics of the species being unloaded. *Animals* should be unloaded from the *vehicle* into appropriate facilities as soon as possible after arrival at the destination but sufficient time should be allowed for *unloading* to proceed quietly and without unnecessary noise, harassment or force.

c) Facilities should provide all *animals* with appropriate care and comfort, adequate space and ventilation, access to feed (if appropriate) and water, and shelter from extreme weather conditions.

d) For details regarding the *unloading* of *animals* at a *slaughterhouse*, see Chapter 7.5. on slaughter of animals for human consumption.

2. Sick or injured animals

a) An *animal* that has become sick, injured or disabled during a *journey* should be appropriately treated or humanely killed (see Chapter 7.6. on killing of *animals* for disease control purposes). If necessary, veterinary advice should be sought in the care and treatment of these *animals*. In some cases, where *animals* are non-ambulatory due to fatigue, injury or sickness, it may be in the best *welfare* interests of the *animal* to be treated or killed aboard the *vehicle*. Assistance should be sought from a *veterinarian* or other person(s) competent in humane *killing* procedures.

b) At the destination, the *animal handler* or the driver during transit should ensure that responsibility for the *welfare* of sick, injured or disabled *animals* is transferred to a *veterinarian* or other suitable person.

c) If treatment or humane *killing* is not possible aboard the *vehicle*, there should be appropriate facilities and equipment for the humane *unloading* of *animals* that are non-ambulatory due to fatigue, injury or sickness. These *animals* should be unloaded in a manner that causes the least amount of suffering. After *unloading*, separate pens and other appropriate facilities should be available for sick or injured *animals*.

d) Feed, if appropriate, and water should be available for each sick or injured *animal*.

3. Addressing disease risks

The following should be taken into account in addressing the greater risk of *disease* due to animal transport and the possible need for segregation of transported *animals* at the destination:

a) increased contact among *animals*, including those from different sources and with different disease histories;

b) increased shedding of pathogens and increased susceptibility to infection related to stress and impaired defences against disease, including immunosuppression;

c) exposure of *animals* to pathogens which may contaminate *vehicles*, *resting points*, *markets*, etc.

4. Cleaning and disinfection

a) *Vehicles*, crates, *containers*, etc. used to carry the *animals* should be cleaned before re-use through the physical removal of manure and bedding by scraping, washing and flushing with water and detergent. This should be followed by *disinfection* when there are concerns about disease transmission.

b) Manure, litter, bedding and the bodies of any *animals* which die during the *journey* should be disposed of in such a way as to prevent the transmission of *disease* and in compliance with all relevant health and environmental legislation.

c) Establishments like livestock *markets*, *slaughterhouses*, resting sites, railway stations, etc. where *animals* are unloaded should be provided with appropriate areas for the cleaning and *disinfection* of *vehicles*.

Article 7.3.11.

Actions in the event of a refusal to allow the completion of the journey

1. The *welfare* of the *animals* should be the first consideration in the event of a refusal to allow the completion of the *journey*.

2. When the *animals* have been refused import, the *Competent Authority* of the *importing country* should make available suitable isolation facilities to allow the *unloading* of *animals* from a *vehicle* and their secure holding, without posing a risk to the health of national herd or flock, pending resolution of the situation. In this situation, the priorities should be:

a) the *Competent Authority* of the *importing country* should provide urgently in writing the reasons for the refusal;

b) in the event of a refusal for animal health reasons, the *Competent Authority* of the *importing country* should provide urgent access to a *veterinarian*, where possible an OIE *veterinarian(s)* appointed by the Director General, to assess the health status of the *animals* with regard to the concerns of the *importing country*, and the necessary facilities and approvals to expedite the required diagnostic testing;

Annex XXXIX (contd)

Annex III (contd)

c) the *Competent Authority* of the *importing country* should provide access to allow continued assessment of the health and other aspects of the *welfare* of the *animals*;

d) if the matter cannot be promptly resolved, the *Competent Authorities* of the *exporting* and *importing countries* should call on the OIE to mediate.

3. In the event that a *Competent Authority* requires the *animals* to remain on the *vehicle*, the priorities should be:

a) to allow provisioning of the *vehicle* with water and feed as necessary;

b) to provide urgently in writing the reasons for the refusal;

c) to provide urgent access to an independent *veterinarian(s)* to assess the health status of the *animals*, and the necessary facilities and approvals to expedite the required diagnostic testing in the event of a refusal for animal health reasons;

d) to provide access to allow continued assessment of the health and other aspects of the *welfare* of the *animals*, and the necessary actions to deal with any animal issues which arise.

4. The OIE should utilise its informal procedure for dispute mediation to identify a mutually agreed solution which will address animal health and any other *welfare* issues in a timely manner.

Article 7.3.12.

Species-specific issues

Camelids of the new world in this context comprise llamas, alpacas, guanaco and vicuna. They have good eyesight and, like sheep, can negotiate steep slopes, though ramps should be as shallow as possible. They load most easily in a bunch as a single *animal* will strive to rejoin the others. Whilst they are usually docile, they have an unnerving habit of spitting in self-defence. During transport, they usually lie down. They frequently extend their front legs forward when lying, so gaps below partitions should be high enough so that their legs are not trapped when the *animals* rise.

Cattle are sociable *animals* and may become agitated if they are singled out. Social order is usually established at about two years of age. When groups are mixed, social order has to be re-established and aggression may occur until a new order is established. Crowding of cattle may also increase aggression as the *animals* try to maintain personal space. Social behaviour varies with age, breed and sex; *Bos indicus* and *B. indicus*-cross *animals* are usually more temperamental than European breeds. Young bulls, when moved in groups, show a degree of playfulness (pushing and shoving) but become more aggressive and territorial with age. Adult bulls have a minimum personal space of six square metres. Cows with young calves can be very protective, and handling calves in the presence of their mothers can be dangerous. Cattle tend to avoid "dead end" in passages.

Goats should be handled calmly and are more easily led or driven than if they are excited. When goats are moved, their gregarious tendencies should be exploited. Activities which frighten, injure or cause agitation to *animals* should be avoided. Bullying is particularly serious in goats and can reflect demands for personal space. Housing strange goats together could result in fatalities, either through physical violence, or subordinate goats being refused access to food and water.

Horses in this context include donkeys, mules and hinnies. They have good eyesight and a very wide angle of vision. They may have a history of *loading* resulting in good or bad experiences. Good training should result in easier *loading*, but some horses can prove difficult, especially if they are inexperienced or have associated *loading* with poor transport conditions. In these circumstances, two experienced *animal handlers* can load an *animal* by linking arms or using a strop below its rump. Blindfolding may even be considered. Ramps should be as shallow as possible. Steps are not usually a problem when horses mount a ramp, but they tend to jump a step when descending, so steps should be as low as possible. Horses benefit from being individually stalled, but may be transported in compatible groups. When horses are to travel in groups, their shoes should be removed. Horses are prone to respiratory *disease* if they are restricted by period by tethers that prevent the lowering and lifting of their heads.

Pigs have poor eyesight, and may move reluctantly in unfamiliar surroundings. They benefit from well lit loading bays. Since they negotiate ramps with difficulty, these should be as level as possible and provided with secure footholds. Ideally, a hydraulic lift should be used for greater heights. Pigs also negotiate steps with difficulty. A good 'rule-of-thumb' is that no step should be higher than the pig's front knee. Serious aggression may result if unfamiliar *animals* are mixed. Pigs are highly susceptible to heat stress. Pigs are susceptible to motion sickness when in transit. Feed deprivation prior to loading may be beneficial to prevent motion sickness.

Sheep are sociable *animals* with good eyesight, a relatively subtle and undemonstrative behaviour and a tendency to "flock together", especially when they are agitated. They should be handled calmly and their tendency to follow each other should be exploited when they are being moved. Crowding of sheep may lead to damaging aggressive and submissive behaviours as *animals* try to maintain personal space. Sheep may become agitated if they are singled out for attention, or kept alone, and will strive to rejoin the group. Activities which frighten, injure or cause agitation to sheep should be avoided. They can negotiate steep ramps.

- - - - - - - - - - - - - - -

– text deleted

CHAPTER 7.4.

TRANSPORT OF ANIMALS BY AIR

Article 7.4.1.

Livestock containers

1. Design

a) General principles of design

The *container* should:

- conform to the size of the standard pallet of the aircraft that will be used to transport *animals*; the common sizes are: 224 x 318 cm (88 x 125 in.) and 244 x 318 cm (96 x 125 in.);
- not be constructed of material that could be harmful to the *animals* health or *welfare*;
- allow observation of the *animals* and be marked on opposite sides with the International Air Transport Association (IATA) symbols which indicate *animals* and the upright position;
- allow emergency access to *animals*;
- allow the *animal* to stand in its normal position without touching the roof of the *container* or, in the case of open *containers*, the restraining nets, and provide at least 10 cm (4 in.) clearance above the *animal*'s head when standing in its normal position; in the case of horses, provide sufficient space above the horses head (21 cm, 8 in. recommended) to allow for the movement required to maintain the horses balance;
- protect the *animals* from adverse weather;
- ensure *animals* stand on a suitable floor to prevent slipping or injury;
- have adequate strength to ensure the safety of the *animals* and to prevent the *animals* from escaping;
- ensure doors can be opened and closed easily, but be secured so that they cannot be opened accidentally;
- be free of any nails, bolts and other protrusions or sharp edges that could cause injuries;
- be designed to minimise the risk of any opening or space entrapping any portion of the *animals* body;
- if reusable, crates should be constructed of impermeable material that is easily cleaned and disinfected;

Annex XXXIX (contd)

Annex III (contd)

- ensure faeces and urine cannot escape from the crate; this requires a minimum upturn of 20 cm but it must not block any ventilation openings;

- if designated for stacking be stable, not block any ventilation space and prevent urine and faeces from leaking into the *containers* below when stacked;

- allow for a facility for provision of water and possibly food during transportation of longer than 6 hours duration.

b) Ventilation

The *container* design should:

- provide adequate ventilation taking into consideration the species stocking density, maximum temperature and humidity of the points of departure, destination, and any interim technical stops;

- allow the normal resting or sleeping position to be assumed for certain species and juvenile *animals*;

- ensure there is no dead air space in the *container*;

- provide ventilation openings on the walls equal to at least 16% of the wall area; this may be reduced if the *container* has an open top;

- in the case of two-tiered *containers*, ventilation in the sides should be for cattle equivalent to not less than 20% of the floor area of each deck, and for pigs and sheep up to 40% of the floor area of each deck;

- have ventilation openings on all four sides of the crate except that two walls may have reduced ventilation space and the other walls have increased space where required by the positioning of the crates during transportation and/or the ventilation pattern of the aircraft;

- ensure that any internal supports or dividers do not block the cross ventilation;

- not have a solid wall above the height of the animal's head in normal resting position;

- in those species where the mouth is normally held near the floor, have at least 25 cm (10 in.) of ventilation space at the level of the *animal*'s head; this opening should be divided in two with a maximum height for any opening of 13 cm; in all *containers*, there should be a sufficiently large ventilation opening at a height of 25 cm to 30 cm (10 to 11 in.) above floor level on all four sides to allow for circulation;

- have some physical means of ensuring the ventilation space is not blocked, such as the use of cleats (wedges) or allowing space between the outside of the container and the pallet.

2. Species requirements

In general, fractious *animals* or *animals* in late pregnancy should not be transported by air (see Article 7.4.2.).

a) Horses

Should be transported in *containers* and be separated from each other if they are more than 145 cm (57 in.) in height.

Crates used to transport horses should:

- be strong enough to prevent unruly horses from breaking or escaping from the *container* under any circumstances;
- in the case of multi-horse *containers*, have partitions of sufficient strength and size to separate the horses and to support each horse's weight;
- adjust to allow mare and foal to travel together;
- provide the same percentage of open space for ventilation as required in point 1 above, divided between the two side walls; however, if the access doors are constructed in such a manner that they may be left open during the flight, the door space may be included in the ventilation space;
- be constructed to minimise noise;
- allow access to the head during the flight;
- have the front end notched and padded to accept the neck of the *animal*;
- have a secure point for attaching restraining devices;
- have a front and rear barrier that will restrict the movement of the horse and will ensure that liquids are deflected into the *container*;
- ensure horses cannot bite other *animals*;
- be constructed to resist kicking;
- have no fittings or projections in the area likely to be kicked, metal plates should be covered with a protective material;
- ramps shall be non-skid in nature, have foot battens, and be of a maximum slope of 25 degrees when the *container* is on a standard 50 cm (20 in.) dolly;
- not have a step up or down of more than 25 cm (10 in.).

b) Swine

- Crate design and shipment planning should recognize that swine are extremely susceptible to high heat and humidity and that they normally carry their head near the floor.
- In the use of multi-tiered crates, special attention should be paid to ensure air can move through the crate, in accordance with the aircraft's ventilation pattern and capacity to remove heat.
- Crate construction should take into consideration the tendency for mature swine to chew.
- Litter should be dust-free, shavings or other non toxic materials may be used but not sawdust.
- *Containers* for immature swine should only be constructed when flight is imminent, since rapid growth can result in undersized *containers* if the flight is delayed.
- In order to reduce fighting, swine shipped in group pens should be housed together as a group prior to shipment and not be mixed with other swine before *loading* on the aircraft.

Annex XXXIX (contd)

Annex III (contd)

- Mature boars and incompatible females should be shipped in individual crates.

- Individual crates should be 20 cm (8 in.) longer than the body, 15 cm (6 in.) higher than the loin of the pig and of sufficient width, to allow the pigs to lie on their side.

c) Cattle

Crates used to transport cattle should:

- if multi-tiered or roofed, have at least 33% of the roof and four walls as open space;

- have at least one ventilation opening 20-25 cm (8-10 in.) above the floor which is of such width that it will not cause injuries to the feet.

Adult bulls should be transported separately unless they have been accustomed to each other. Cattle with and without horns should be separated from each other.

d) Poultry

- Crates/containers containing *poultry* should be handled and carried carefully with now unnecessary tilting.

- The majority of birds transported by air will be newly hatched chicks. These *animals* are very vulnerable to sudden changes in temperature.

~~d~~c) Other species

- *Animals* that normally exhibit a herding instinct, including buffalo and deer, can be shipped in group *containers* providing the mental and physical characteristics of the species are taken into consideration.

- All crates used to move such *animals* should have a roof or other method of preventing the *animals* from escaping.

- *Animals* in which the horns or antler cannot be removed, should be transported individually.

- Deer should not be transported in velvet nor in rut.

Article 7.4.2.

Recommendations for pregnant animals

Heavily pregnant *animals* should not be carried except under exceptional circumstances. Pregnant *animals* should not be accepted when the last service or exposure to a male prior to departure has exceeded the following time given here for guidance only:

Females	Maximum number of days since the last service or successful mating
Horses	300
Cows	250
Deer (axis, fallow and sika)	170
(red deer, reindeer)	185
Ewes (sheep)	115
Nannies (goats)	115
Sows (pigs)	90

Where service dates or date of last ~~exposure to a male~~ successful mating are not available, the *animals* should be examined by a *veterinarian* to ensure that pregnancy is not so advanced that *animals* are likely to give birth during transport or suffer unnecessarily.

Any *animal* showing udder engorgement and slackening of the pelvic ligament should be refused.

Article 7.4.3.

Stocking density

The current *stocking densities* agreed by the International Air Transport Association (IATA) should continue to be accepted. However, the graphs giving the space requirements should be extended to take into account *animals* larger and smaller than those dealt with currently.

1. General considerations

   When calculating stocking rates, the following should be taken into account:

   a) it is essential that accurate weights of *animals* are obtained in view of the limitations imposed by the load capabilities of the aircraft and the space required per *animal*;

   b) in narrow bodied aircraft, there is a loss of floor area in the upper tier of two-tier penning due to the contours of the aircraft;

   c) space available should be calculated on the inside measurements of the crates or penning system used, not on the floor space of the aircraft;

   d) multi-tiered crates, high outdoor temperatures at departure, arrival or stopover points, or extreme length of the trip will require an increase in the amount of space per *animal*; a 10% decrease in *stocking density* is recommended for trips in excess of 24 hours;

   e) special attention should be paid to the transport of sheep in heavy wool which require an increase in space allotted per *animal* and to pigs which have limited ability to dissipate heat;

   f) *animals* confined in groups, especially in pens, should be stocked at a high enough density to prevent injuries at take-off, during turbulence and at landing, but not to the extent that individual *animals* cannot lie down and rise without risk of injury or crushing;

Annex XXXIX (contd)

Annex III (contd)

g) in multi-tiered shipments, it should be recognized that the ventilation and cooling capacity of the aircraft is the limiting factor, especially in narrow bodied aircraft. Ventilation capacity varies on each individual aircraft and between aircraft of the same model.

2. Recommendations for stocking densities

The following table gives *stocking density* recommendations for different domestic species. The values are expressed in kilograms and metres.

Species	Weight	Density	Space/ animal	No. of animals per	Animals per single tier pallet		
	kg	kg/m²	m²	10 m²	214x264 cm	214x308 cm	234x308 cm
Calves	50 70 80 90	220 246 266 280	0.23 0.28 0.30 0.32	43 35/6 33 31	24 20 18 17	28 23 21 20	31 25 24 22
Cattle	300 500 600 700	344 393 408 400	0.84 1.27 1.45 1.63	11-12 8 6-7 6	6 4 3-4 3	7 5 4 3-4	8 5 4-5 4
Sheep	25 70	147 196	0.17 0.36	59 27/8	32 15	37 18	42 20
Pigs	25 100	172 196	0.15 0.51	67 20	37 10	44 12	48 14

Article 7.4.4.

Preparation for air transport of livestock

1. Health and customs requirements

The legal requirements including animal health, *welfare* and species conservation, should be ascertained from the country of destination and any in *transit countries* before the *animals* are assembled or the transportation is arranged.

Contact the *Veterinary Authorities* in the country of origin regarding veterinary certification.

Planning of the transportation should take into account weekends, holidays and airport closures.

Verify that any proposed intransit stops or alternates will not jeopardise the importing or in *transit countries* health requirements.

Waiting time at customs (cargo handling and clearance) should be reduced as much as possible to avoid *welfare* problems.

2. Environment

Animals are affected by extremes of temperature. This is especially true of high temperature when compounded by high humidity. Temperature and humidity should therefore be taken into consideration when planning the shipment.

Times of arrival, departure and stopovers should be planned so that the aircraft lands during the coolest hours.

At outside temperatures of below 25°C at the landing point, the aircraft doors should be opened to ensure adequate ventilation. Confirmation should be received from government authorities that animal health legislation does not prevent opening of aircraft doors.

When outside temperatures at any landing point exceed 25°C, prior arrangements should be made to have an adequate air-conditioning unit available when the plane lands.

3. Facilities and equipment

Specific arrangements must be made to ensure that holding and *loading* facilities including ramps, trucks, and air-conditioning units are available at departure, all in transit and arrival airports. This should include identification of specific staff who are responsible and the method of contacting them, e.g. telephone number and address.

Specific notification must be given to all those responsible for providing facilities or equipment at the destination and in transit stops immediately before departure.

Containers should be loaded so as to ensure access can be made to the *animals* at all times.

4. Preparation of animals

Vaccination must be done far enough in advance of the departure date to allow for immunity to develop.

Veterinary certification and serological testing must be arranged several weeks in advance of livestock shipment.

Many *animals* require acclimatisation before they are transported. *Animals* such as swine and wild herbivores must be separated and held in the groups that will occupy *containers*. Mixing of such *animals* immediately before or during transport is extremely stressing and should be avoided.

Incompatible *animals* should be transported singly.

Article 7.4.5.

Disinfection and disinfestation

1. Disinfection

a) Those parts of the interior of the aircraft destined for the carriage of *animals* should be thoroughly cleaned of all foreign matters using methods acceptable to aircraft management before being loaded.

b) These parts should be sprayed with a disinfectant:

i) suitable for the *diseases* which could be carried by the *animals*;

Annex XXXIX (contd)

Annex III (contd)

ii) that does not cause problems with the aircraft;

iii) that will not leave a residue hazardous to the *animals* being transported.

If in doubt, the airline should be consulted on the suitability of the disinfectant. A mechanical nebuliser should be used to minimise the amount of disinfectant used.

Suggested disinfectants currently in use are:

iv) 4% sodium carbonate and 0.1% sodium silicate;

v) 0.2% citric acid.

c) All removeable equipment, penning and *containers* including loading ramps should be thoroughly cleaned and disinfected in accordance with the requirements of both the *exporting* and *importing countries*.

d) After *disinfection*, all equipment to be replaced in the aircraft should be washed with clean water to remove any traces of disinfectant to avoid any damage to the aircraft structures.

2. Disinfestation

Where *disinfestation* is required, the country requesting the action should be consulted for appropriate procedures.

The World Health Organisation (WHO) Recommendations on the Disinsectisation of Aircraft (*WHO Weekly Epidem. Rec.*, No. 7, 1985) are recognised as standard.

Article 7.4.6.

Radiation

Radioactive materials must be separated from live *animals* by a distance of at least 0.5 metre for journeys not exceeding 24 hours, and by a distance of at least 1.0 metre for journeys longer than 24 hours (reference: Technical instructions on storage and loading-separation of the International Civil Aviation Organisation). Special care should be taken with regard to pregnant *animals*, semen and embryos/ova.

Article 7.4.7.

Tranquilization

Experience has shown that there is considerable risk in sedating *animals* transported by air. Tranquilizers reduce the ability of the *animals* to respond to stress during transportation. In addition, the reaction of various species to tranquilization cannot always be foreseen. For these reasons, routine tranquilization is not recommended. Tranquilizers should only be used when a specific problem exists, and should be administered by a *veterinarian* or by a person who has been instructed in their use. Persons using these drugs should understand the full implications of the effects of the drug in air transport, e.g. certain *animals* such as horses and elephants should not go down in *containers*. Drugs should only be administered during the flight with the knowledge and consent of the captain.

In all cases, when tranquilizers are used, a note should be attached to the *container* stating the weight of the individual *animal*, the generic name of the drug used, the dose, the method and time of administration.

Article 7.4.8.

Destruction of carcasses

In the event of any animal *death* on board, the competent authority of the airport of destination should be notified in advance of landing.

Carcasses should be disposed of under the supervision of and to the satisfaction of the *Veterinary Authority* of the country the aircraft is in.

The method of disposal should be based on the risk of introducing a controlled *disease*.

For carcasses which represent a high risk of introducing *disease*, the following is recommended:

1. destruction by incineration, rendering or deep burial under the supervision of the *Veterinary Authority*;

2. if removed from the airport site, transportation in a closed, leakproof *container*.

Article 7.4.9.

Emergency slaughter

Emergency *slaughter* of *animals* in aircraft should, in general, only occur when the safety of the aircraft, crew or other *animals* are involved.

Every aircraft transporting *animals* should have a method of killing the *animals* with minimum pain and someone trained in that method.

In all cases when horses or other large *animals* are to be carried, the method of killing should be discussed with the airline during the planning stages. Suitable methods are:

1. Captive bolt stunner, followed by an injection of a lethal chemical

    a) Operator should be trained to use the captive bolt stunner on the species or type of *animal* being transported.

    b) An expert should determine that the type of captive bolt pistol is adequate for all the *animals* being transported.

    c) Some airlines and countries may prohibit the carriage of captive bolt pistols.

    d) The user should recognise that the noise associated with the captive bolt may excite other *animals*.

    e) The requirement that the captive bolt pistol is accurately centered may be difficult to achieve with an excited *animal*.

2. Injection of a chemical

    a) Various chemicals may be used to sedate, immobilize or kill *animals*.

    b) Central nervous system depressants such as barbiturate euthanasia solutions must be injected directly into a vein to be effective. This is not normally practical for anyone but an experienced *veterinarian* or an especially trained and experienced attendant, where the *animal* is sufficiently fractious to require euthanasia.

Annex XXXIX (contd)

Annex III (contd)

c) Sedatives such as promazine and its derivatives may make the *animal* more fractious (see Article 7.4.7.).

d) Immobilizing solutions such as succinylcholine are not humane.

3. Firearms

Airlines do not permit the use of firearms which discharge a free bullet because of the danger to the aircraft.

Article 7.4.10.

Handling of food and waste material

Waste material which contains anything of animal origin including food, litter, manure, or animal feed should be handled, collected and disposed of in a manner that ensures it will not be fed to livestock. It should be collected in specified areas, and stored and transported in closed, leakproof *containers*.

Some *importing countries* legislation may prohibit or restrict the use of hay or straw during the transportation period. Unloading of hay, straw, other animal feed and litter may be restricted or prohibited by in *transit countries*.

Article 7.4.11.

Disposal of food and waste material

Recommended methods of disposal are:

a) incineration to an ash;

b) heating at an internal temperature of at least of 100°C for 30 minutes, then disposal in a land fill site;

c) controlled burial in a land fill site.

- text deleted

CHAPTER 7.5.

SLAUGHTER OF ANIMALS

Article 7.5.1.

General principles

1. Object

These recommendations address the need to ensure the *welfare* of food *animals* during pre-slaughter and slaughter processes, until they are dead.

These recommendations apply to the *slaughter* in *slaughterhouses* of the following domestic *animals*: cattle, buffalo, bison, sheep, goats, camelids, deer, horses, pigs, ratites, rabbits and *poultry*. Other *animals*, wherever they have been reared, and all *animals* slaughtered outside *slaughterhouses* should be managed to ensure that their *transport*, *lairage*, *restraint* and *slaughter* is carried out without causing undue stress to the *animals*; the principles underpinning these recommendations apply also to these *animals*.

2. Personnel

Persons engaged in the *unloading*, moving, *lairage*, care, *restraint*, *stunning*, *slaughter* and bleeding of *animals* play an important role in the *welfare* of those *animals*. For this reason, there should be a sufficient number of personnel, who should be patient, considerate, competent and familiar with the recommendations outlined in the present Chapter and their application within the national context.

Competence may be gained through formal training and/or practical experience. This competence should be demonstrated through a current certificate from the *Competent Authority* or from an independent body accredited by the *Competent Authority*.

The management of the *slaughterhouse* and the *Veterinary Services* should ensure that *slaughterhouse* staff are competent and carry out their tasks in accordance with the principles of *animal welfare*.

3. Animal behaviour

Animal handlers should be experienced and competent in handling and moving farm livestock, and understand the behaviour patterns of *animals* and the underlying principles necessary to carry out their tasks.

The behaviour of individual *animals* or groups of *animals* will vary, depending on their breed, sex, temperament and age and the way in which they have been reared and handled. Despite these differences, the following behaviour patterns which are always present to some degree in domestic *animals*, should be taken into consideration in handling and moving the *animals*.

Most domestic livestock are kept in ~~herds~~ groups and follow a leader by instinct.

Animals which are likely to harm each other in a group situation should not be mixed at *slaughterhouses*.

The desire of some *animals* to control their personal space should be taken into account in designing facilities.

Annex XXXIX (contd)

Annex III (contd)

Domestic *animals* will try to escape if any person approaches closer than a certain distance. This critical distance, which defines the flight zone, varies among species and individuals of the same species, and depends upon previous contact with humans. *Animals* reared in close proximity to humans i.e. tame have a smaller flight zone, whereas those kept in free range or extensive systems may have flight zones which may vary from one metre to many metres. *Animal handlers* should avoid sudden penetration of the flight zone which may cause a panic reaction which could lead to aggression or attempted escape.

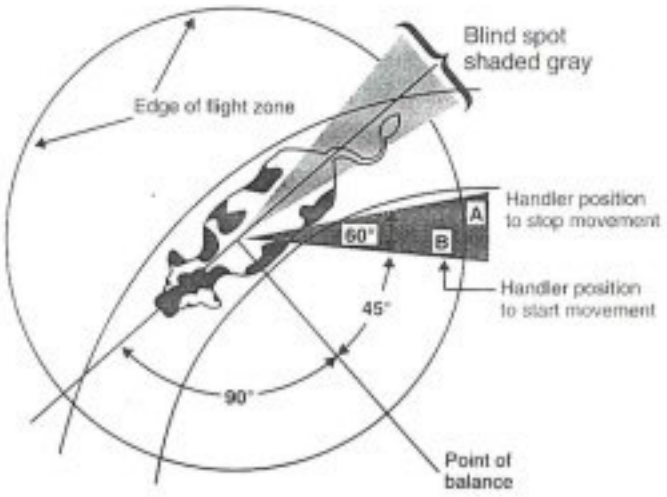
Animal handlers should use the point of balance at the *animal*'s shoulder to move *animals*, adopting a position behind the point of balance to move an *animal* forward and in front of the point of balance to move it backward.

Domestic *animals* have wide-angle vision but only have limited forward binocular vision and poor perception of depth. This means that they can detect objects and movements beside and behind them, but can only judge distances directly ahead.

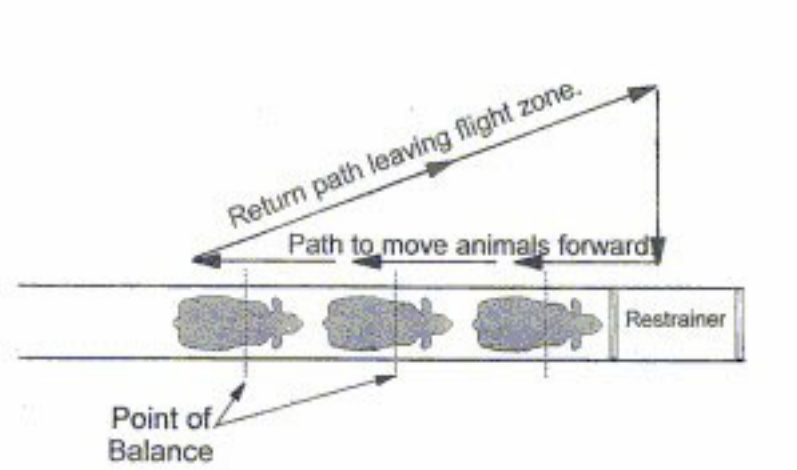
Although ~~all~~ most domestic *animals* have a highly sensitive sense of smell, they react in different ways to the smells of *slaughterhouses*. Smells which cause fear or other negative responses should be taken into consideration when managing *animals*.

Domestic *animals* can hear over a greater range of frequencies than humans and are more sensitive to higher frequencies. They tend to be alarmed by constant loud noise and by sudden noises, which may cause them to panic. Sensitivity to such noises should also be taken into account when handling *animals*.

An example of a flight zone (cattle)



Handler movement pattern to move cattle forward



4. Distractions and their removal

Distractions that may cause approaching *animals* to stop, baulk or turn back should be designed out from new facilities or removed from existing ones. Below are examples of common distractions and methods for eliminating them:

a) reflections on shiny metal or wet floors — move a lamp or change lighting;

b) dark entrances to chutes, races, stun boxes or conveyor restrainers — illuminate with indirect lighting which does not shine directly into the eyes of approaching *animals*;

c) *animals* seeing moving people or equipment up ahead — install solid sides on chutes and races or install shields;

d) dead ends — avoid if possible by curving the passage, or make an illusory passage;

e) chains or other loose objects hanging in chutes or on fences — remove them;

f) uneven floors or a sudden drop in floor levels at the entrance to conveyor restrainers — avoid uneven floor surfaces or install a solid false floor under the restrainer to provide an illusion of a solid and continuous walking surface. These *lairage* conditions may not apply to *poultry*;

g) sounds of air hissing from pneumatic equipment — install silencers or use hydraulic equipment or vent high pressure to the external environment using flexible hosing;

h) clanging and banging of metal objects — install rubber stops on gates and other devices to reduce metal to metal contact;

i) air currents from fans or air curtains blowing into the face of *animals* — redirect or reposition equipment. These conditions may not apply to *poultry*.

Annex XXXIX (contd)

Annex III (contd)

Article 7.5.2.

Moving and handling animals

1. General considerations

Animals should be transported to *slaughter* in a way that minimises adverse animal health and *welfare* outcomes, and the transport should be conducted in accordance with the OIE recommendations for the transportation of *animals* (Chapters 7.2. and 7.3.).

The following principles should apply to *unloading animals*, moving them into *lairage* pens, out of the *lairage* pens and up to the *slaughter* point:

a) The conditions of the *animals* should be assessed upon their arrival for any *animal welfare* and health problems.

b) Injured or sick *animals*, requiring immediate slaughter, should be killed humanely and without delay, in accordance with the recommendations of the OIE.

c) *Animals* should not be forced to move at a speed greater than their normal walking pace, in order to minimise injury through falling or slipping. Performance standards should be established where numerical scoring of the prevalence of *animals* slipping or falling is used to evaluate whether animal moving practices and/or facilities should be improved. In properly designed and constructed facilities with competent *animal handlers*, it should be possible to move 99% of *animals* without their falling. These conditions may not apply to *poultry*.

d) *Animals* for *slaughter* should not be forced to walk over the top of other *animals*.

e) *Animals* should be handled in such a way as to avoid harm, distress or injury. Under no circumstances should *animal handlers* resort to violent acts to move *animals*, such as crushing or breaking tails of *animals*, grasping their eyes or pulling them by the ears. *Animal handlers* should never apply an injurious object or irritant substance to *animals* and especially not to sensitive areas such as eyes, mouth, ears, anogenital region or belly. The throwing or dropping of *animals*, or their lifting or dragging by body parts such as their tail, head, horns, ears, limbs, wool, hair or feathers, should not be permitted. The manual lifting of small *animals* is permissible.

f) When using goads and other aids, the following principles should apply:

   i) *Animals* that have little or no room to move should not be subjected to physical force or goads and other aids which compel movement. Electric goads and prods should only be used in extreme cases and not on a routine basis to move *animals*. The use and the power output should be restricted to that necessary to assist movement of an *animal* and only when an *animal* has a clear path ahead to move. Goads and other aids should not be used repeatedly if the *animal* fails to respond or move. In such cases it should be investigated whether some physical or other impediment is preventing the *animal* from moving.

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

   iii) Useful and permitted goads include panels, flags, plastic paddles, flappers (a length of cane with a short strap of leather or canvas attached), plastic bags and metallic rattles; they should be used in a manner sufficient to encourage and direct movement of the *animals* without causing undue stress.

iv) Painful procedures (including whipping, tail twisting, use of nose twitches, pressure on eyes, ears or external genitalia), or the use of goads or other aids which cause pain and suffering (including large sticks, sticks with sharp ends, lengths of metal piping, fencing wire or heavy leather belts), should not be used to move *animals*.

v) Excessive shouting at *animals* or making loud noises (e.g. through the cracking of whips) to encourage them to move should not occur, as such actions may make the *animals* agitated, leading to crowding or falling.

vi) *Animals* should be grasped or lifted in a manner which avoids pain or suffering and physical damage (e.g. bruising, fractures, dislocations). In the case of quadrupeds, manual lifting by a person should only be used in young *animals* or small species, and in a manner appropriate to the species; grasping or lifting such *animals* only by their wool, hair, feathers, feet, neck, ears, tails, head, horns, limbs causing pain or suffering should not be permitted, except in an emergency where *animal welfare* or human safety may otherwise be compromised.

vii) Conscious *animals* should not be thrown, dragged or dropped.

viii) Performance standards should be established to evaluate the use of such instruments. Numerical scoring may be used to measure the percentage of *animals* moved with an electric instrument and the percentage of *animals* slipping or falling at a point in the *slaughterhouse*. Any risk of compromising *animal welfare*, for example slippery floor, should be investigated immediately and the defect rectified to eliminate the problem.

2. Specific considerations for poultry

Stocking density in transport crates should be optimum to suit climatic conditions and maintain species-specific thermal comfort within containers.

Care is especially necessary during *loading* and *unloading* to avoid wings being caught, leading to dislocated or broken wing bones in conscious birds. Such injuries will adversely affect carcass and *meat* quality.

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

Birds may get trapped or their wings or claws may get caught in the fixtures, mesh or holes in the poorly designed and/or constructed transport systems. Under this situation, operator unloading birds should ensure gentle release of trapped birds.

Drawers in modular systems and crates should be stacked and destacked carefully so as to avoid injury to birds.

All birds should be sufficient space to all lie down at the same time without being on top of each other.

Birds with broken bone(s) and/or dislocated joint(s) should be humanely killed before being hung on shackles for processing.

The number of *poultry* arriving at the processing plant with dislocated joint(s) and/or broken bone(s) should be recorded verifiably. For *poultry*, the percentage of chickens with broken or dislocated wings should not exceed 2%. A frequency of less than 1% should be the goal.

Annex XXXIX (contd)

Annex III (contd)

3. ~~2.~~ Provisions relevant to animals delivered in containers

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

b) *Animals* delivered in *containers* with perforated or flexible bottoms should be unloaded with particular care in order to avoid injury. Where appropriate, *animals* should be unloaded from the *containers* individually.

c) *Animals* which have been transported in *containers* should be slaughtered as soon as possible; mammals and ratites which are not taken directly upon arrival to the place of *slaughter* should have drinking water available to them from appropriate facilities at all times. Delivery of *poultry* for *slaughter* should be scheduled such that they are not deprived of water at the premises for longer than 12 hours. *Animals* which have not been slaughtered within 12 hours of their arrival should be fed, and should subsequently be given moderate amounts of food at appropriate intervals.

4. ~~3.~~ Provisions relevant to restraining and containing animals

a) Provisions relevant to *restraining animals* for *stunning* or *slaughter* without *stunning*, to help maintain *animal welfare*, include:

i) provision of a non-slippery floor;

ii) avoidance of excessive pressure applied by *restraining* equipment that causes struggling or vocalisation in *animals*;

iii) equipment engineered to reduce noise of air hissing and clanging metal;

iv) absence of sharp edges in *restraining* equipment that would harm *animals*;

v) avoidance of jerking or sudden movement of *restraining* device.

b) Methods of *restraint* causing avoidable suffering should not be used in conscious *animals* because they cause severe pain and stress:

i) suspending or hoisting *animals* (other than *poultry*) by the feet or legs;

ii) indiscriminate and inappropriate use of *stunning* equipment;

iii) mechanical clamping of the legs or feet of the *animals* (other than shackles used in *poultry* and ostriches) as the sole method of *restraint*;

iv) breaking legs, cutting leg tendons or blinding *animals* in order to immobilise them;

v) severing the spinal cord, for example using a puntilla or dagger, to immobilise *animals* using electric currents to immobilise *animals*, except for proper *stunning*.

Article 7.5.3.

Lairage design and construction

1. General considerations

The *lairage* should be designed and constructed to hold an appropriate number of *animals* in relation to the throughput rate of the *slaughterhouse* without compromising the *welfare* of the *animals*.

In order to permit operations to be conducted as smoothly and efficiently as possible without injury or undue stress to the *animals*, the *lairage* should be designed and constructed so as to allow the *animals* to move freely in the required direction, using their behavioural characteristics and without undue penetration of their flight zone.

The following recommendations may help to achieve this. Some of these conditions may not apply to *poultry*.

2. Design of lairage

a) The *lairage* should be designed to allow a one-way flow of *animals* from *unloading* to the point of *slaughter*, with a minimum number of abrupt corners to negotiate.

b) In red meat *slaughterhouses*, pens, passageways and races should be arranged in such a way as to permit inspection of *animals* at any time, and to permit the removal of sick or injured *animals* when considered to be appropriate, for which separate appropriate accommodation should be provided.

c) Each *animal* should have room to stand up and lie down and, when confined in a pen, to turn around, except where the *animal* is reasonably restrained for safety reasons (e.g. fractious bulls). Fractious *animals* should be slaughtered as soon as possible after arrival at the *slaughterhouse* to avoid *welfare* problems. The *lairage* should have sufficient accommodation for the number of *animals* intended to be held. Drinking water should always be available to the *animals*, and the method of delivery should be appropriate to the type of *animal* held. Troughs should be designed and installed in such a way as to minimise the risk of fouling by faeces, without introducing risk of bruising and injury in *animals*, and should not hinder the movement of *animals*.

d) Holding pens should be designed to allow as many *animals* as possible to stand or lie down against a wall. Where feed troughs are provided, they should be sufficient in number and feeding space to allow adequate access of all *animals* to feed. The feed trough should not hinder the movement of *animals*.

e) Where tethers, ties or individual stalls are used, these should be designed so as not to cause injury or distress to the *animals* and should also allow the *animals* to stand, lie down and access any food or water that may need to be provided.

f) Passageways and races should be either straight or consistently curved, as appropriate to the animal species. Passageways and races should have solid sides, but when there is a double race, the shared partition should allow adjacent *animals* to see each other. For pigs and sheep, passageways should be wide enough to enable two or more *animals* to walk side by side for as long as possible. At the point where passageways are reduced in width, this should be done by a means which prevents excessive bunching of the *animals*.

g) *Animal handlers* should be positioned alongside races and passageways on the inside radius of any curve, to take advantage of the natural tendency of *animals* to circle an intruder. Where one-way gates are used, they should be of a design which avoids bruising. Races should be horizontal but where there is a slope, they should be constructed to allow the free movement of *animals* without injury.

Annex XXXIX (contd)

Annex III (contd)

h) There should be a waiting pen, with a level floor and solid sides, between the holding pens and the race leading to the point of *stunning* or *slaughter*, to ensure a steady supply of *animals* for *stunning* or *slaughter* and to avoid having *animal handlers* trying to rush *animals* from the holding pens. The waiting pen should preferably be circular, but in any case, so designed that *animals* cannot be trapped or trampled.

i) Ramps or lifts should be used for the *loading* and *unloading* of *animals* where there is a difference in height or a gap between the floor of the *vehicle* and the *unloading* area. Unloading ramps should be designed and constructed so as to permit *animals* to be unloaded from *vehicles* on the level or at the minimum gradient achievable. Lateral side protection should be available to prevent *animals* escaping or falling. They should be well drained, with secure footholds and adjustable to facilitate easy movement of *animals* without causing distress or injury.

3. Construction of lairage

a) *Lairages* should be constructed and maintained so as to provide protection from unfavourable climatic conditions, using strong and resistant materials such as concrete and metal which has been treated to prevent corrosion. Surfaces should be easy to clean. There should be no sharp edges or protuberances which may injure the *animals*.

b) Floors should be well drained and not slippery; they should not cause injury to the feet of the *animals*. Where necessary, floors should be insulated or provided with appropriate bedding. Drainage grids should be placed at the sides of pens and passageways and not where *animals* would have to cross them. Discontinuities or changes in floor patterns or texture which could cause baulking in the movement of *animals* should be avoided.

c) *Lairages* should be provided with adequate lighting, but care should be taken to avoid harsh lights and shadows, which frighten the *animals* or affect their movement. The fact that *animals* will move more readily from a darker area into a well-lit area might be exploited by providing for lighting that can be regulated accordingly.

d) *Lairages* should be adequately ventilated to ensure that waste gases (e.g. ammonia) do not build up and that draughts at animal height are minimised. Ventilation should be able to cope with the range of expected climatic conditions and the number of *animals* the *lairage* will be expected to hold.

e) Care should be taken to protect the *animals* from excessively or potentially disturbing noises, for example by avoiding the use of noisy hydraulic or pneumatic equipment, and muffling noisy metal equipment by the use of suitable padding, or by minimising the transmission of such noises to the areas where *animals* are held and slaughtered.

f) Where *animals* are kept in outdoor *lairages* without natural shelter or shade, they should be protected from the effects of adverse weather conditions.

Article 7.5.4.

Care of animals in lairages

Animals in *lairages* should be cared for in accordance with the following recommendations:

1. As far as possible, established groups of *animals* should be kept together. Each *animal* should have enough space to stand up, lie down and turn around. *Animals* hostile to each other should be separated.

Annex XXXIX (contd)

Annex III (contd)

2. Where tethers, ties or individual stalls are used, they should allow *animals* to stand up and lie down without causing injury or distress.

3. Where bedding is provided, it should be maintained in a condition that minimises risks to the health and safety of the *animals*, and sufficient bedding should be used so that *animals* do not become soiled with manure.

4. *Animals* should be kept securely in the *lairage*, and care should be taken to prevent them from escaping and from predators.

5. Suitable drinking water should be available to the *animals* on their arrival and at all times to *animals* in *lairages* unless they are to be slaughtered without delay.

6. If *animals* are not to be slaughtered as soon as possible, suitable feed should be available to the *animals* on arrival and at intervals appropriate to the species. Unweaned *animals* should be slaughtered as soon as possible.

7. In order to prevent heat stress, *animals* subjected to high temperatures, particularly pigs and *poultry*, should be cooled by the use of water sprays, fans or other suitable means. However, the potential for water sprays to reduce the ability of *animals* to thermoregulate (especially *poultry*) should be considered in any decision to use water sprays. The risk of *animals* being exposed to very cold temperatures or sudden extreme temperature changes should also be considered.

8. The *lairage* area should be well lit in order to enable the *animals* to see clearly without being dazzled. During the night, the lights should be dimmed. Lighting should also be adequate to permit inspection of all *animals*. Subdued lighting, and for example blue light, may be useful in *poultry lairages* in helping to calm birds.

9. The condition and state of health of the *animals* in a *lairage* should be inspected at least every morning and evening by a *veterinarian* or, under the *veterinarian*'s responsibility, by another competent person, such as an *animal handler*. *Animals* which are sick, weak, injured or showing visible signs of distress should be separated, and veterinary advice should be sought immediately regarding treatment or the *animals* should be humanely killed immediately if necessary.

10. Lactating dairy *animals* should be slaughtered as soon as possible. Dairy *animals* with obvious udder distension should be milked to minimise udder discomfort.

11. *Animals* which have given birth during the *journey* or in the *lairage* should be slaughtered as soon as possible or provided with conditions which are appropriate for suckling for their *welfare* and the *welfare* of the newborn. Under normal circumstances, *animals* which are expected to give birth during a *journey* should not be transported.

12. *Animals* with horns, antlers or tusks capable of injuring other *animals*, if aggressive, should be penned separately.

13. *Poultry* awaiting *slaughter* should be protected from adverse weather conditions and provided with adequate ventilation.

14. Lairage duration for *poultry* should be kept to the minimum and it should not exceed 12 hours.

15. *Poultry* in transport *containers* should be examined at the time of arrival. *Containers* should be stacked with sufficient gap between the columns so as to facilitate inspection of birds and movement of air through them.

16. Forced ventilation or other cooling systems may be necessary under certain conditions to avoid build up of temperature and humidity.

Annex XXXIX (contd)

Annex III (contd)

Recommendations for specific species are described in detail in Articles 7.5.5. to 7.5.8.

Article 7.5.5.

Management of foetuses during slaughter of pregnant animals

Under normal circumstances, pregnant *animals* that would be in the final 10% of their gestation period at the planned time of *unloading* at the *slaughterhouse* should be neither transported nor slaughtered. If such an event occurs, an *animal handler* should ensure that females are handled separately, and the specific procedures described below are applied. In all cases, the *welfare* of foetuses and dams during *slaughter* should be safeguarded.

Foetuses should not be removed from the uterus sooner than 5 minutes after the maternal neck or chest cut, to ensure absence of consciousness. A foetal heartbeat will usually still be present and foetal movements may occur at this stage, but these are only a cause for concern if the exposed foetus successfully breathes air.

If a live mature foetus is removed from the uterus, it should be prevented from inflating its lungs and breathing air (e.g. by clamping the trachea).

When uterine, placental or foetal tissues, including foetal blood, are not to be collected as part of the post-*slaughter* processing of pregnant *animals*, all foetuses should be left inside the unopened uterus until they are dead. When uterine, placental or foetal tissues are to be collected, where practical, foetuses should not be removed from the uterus until at least 15-20 minutes after the maternal neck or chest cut.

If there is any doubt about consciousness, the foetus should be killed with a captive bolt of appropriate size or a blow to the head with a suitable blunt instrument.

The above recommendations do not refer to foetal rescue. Foetal rescue, the practice of attempting to revive foetuses found alive at the evisceration of the dam, should not be attempted during normal commercial *slaughter* as it may lead to serious *welfare* complications in the newborn *animal*. These include impaired brain function resulting from oxygen shortage before rescue is completed, compromised breathing and body heat production because of foetal immaturity, and an increased incidence of infections due to a lack of colostrum.

Article 7.5.6.

Summary analysis of handling and restraining methods and the associated animal welfare issues

	Presentation of animals	**Specific procedure**	**Specific purpose**	**Animal welfare concerns/ implications**	**Key animal welfare requirements**	**Applicable species**
No restraint	Animals are grouped	Group container	Gas stunning	Specific procedure is suitable only for gas stunning	Competent animal handlers in lairage; facilities; stocking density	Pigs, poultry
		In the field	Free bullet	Inaccurate targeting and inappropriate ballistics not achieving outright kill with first shot	Operator competence	Deer
		Group stunning pen	Head-only electrical Captive bolt	Uncontrolled movement of animals impedes use of hand operated electrical and mechanical stunning methods	Competent animal handlers in lairage and at stunning point	Pigs, sheep, goats, calves
	Individual animal confinement	Stunning pen/box	Electrical and mechanical stunning methods	Loading of animal; accuracy of stunning method, slippery floor and animal falling down	Competent animal handlers	Cattle, buffalo, sheep, goats, horses, pigs, deer, camelids, ratites

Annex XXXIX (contd)

Annex III (contd)

	Presentation of animals	Specific procedure	Specific purpose	Animal welfare concerns/ implications	Key animal welfare requirements	Applicable species
Restraining methods	Head restraint, upright	Halter/ head collar/bridle	Captive bolt Free bullet	Suitable for halter-trained animals; stress in untrained animals	Competent animal handlers	Cattle, buffalo, horses, camelids
	Head restraint, upright	Neck yoke	Captive bolt Electrical-head only Free bullet Slaughter without stunning	Stress of loading and neck capture; stress of prolonged restraint, horn configuration; unsuitable for fast line speeds, animals struggling and falling due to slippery floor, excessive pressure	Equipment; competent animal handlers, prompt stunning or slaughter	Cattle
	Leg restraint	Single leg tied in flexion (animal standing on 3 legs)	Captive bolt Free bullet	Ineffective control of animal movement, misdirected shots	Competent animal handler	Breeding pigs (boars and sows)
	Upright restraint	Beak holding	Captive bolt Electrical-head only	Stress of capture	Sufficient competent animal handlers	Ostriches
		Head restraint in electrical stunning box	Electrical-head only	Stress of capture and positioning	Competent animal handler	Ostriches
	Holding body upright- manual	Manual restraint	Captive bolt Electrical-head only Slaughter without stunning	Stress of capture and restraint; accuracy of stunning/ slaughter	Competent animal handlers	Sheep, goats, calves, ratites, small camelids, poultry
	Holding body upright mechanical	Mechanical clamp / crush / squeeze/ V-restrainer (static)	Captive bolt Electrical methods Slaughter without stunning	Loading of animal and overriding; excessive pressure	Proper design and operation of equipment	Cattle, buffalo, sheep, goats, deer, pigs, ostriches
	Lateral restraint – manual or mechanical	Restrainer/ cradle/crush	Slaughter without stunning	Stress of restraint	Competent animal handlers	Sheep, goats, calves, camelids, cattle
	Upright restraint mechanical	Mechanical straddle (static)	Slaughter without stunning Electrical methods Captive bolt	Loading of animal and overriding	Competent animal handlers	Cattle, sheep, goats, pigs
	Upright restraint – manual or mechanical	Wing shackling	Electrical	Excessive tension applied prior to stunning	Competent animal handlers	Ostriches
Restraining and /or conveying methods	Mechanical - upright	V-restrainer	Electrical methods Captive bolt Slaughter without stunning	Loading of animal and overriding; excessive pressure, size mismatch between restrainer and animal	Proper design and operation of equipment	Cattle, calves, sheep, goats, pigs
	Mechanical- upright	Mechanical straddle – band restrainer (moving)	Electrical methods Captive bolt Slaughter without stunning	Loading of animal and overriding, size mismatch between restrainer and animal	Competent animal handlers, proper design and layout of restraint	Cattle, calves, sheep, goats, pigs
	Mechanical - upright	Flat bed/deck Tipped out of containers on to conveyors	Presentation of birds for shackling prior to electrical stunning Gas stunning	Stress and injury due to tipping in dump-module systems height of tipping conscious poultry broken bones and dislocations	Proper design and operation of equipment	Poultry

Annex XXXIX (contd)

Annex III (contd)

	Presentation of animals	Specific procedure	Specific purpose	Animal welfare concerns/ implications	Key animal welfare requirements	Applicable species
Restraining and /or conveying methods (contd)	Suspension and/or inversion	Poultry shackle	Electrical stunning Slaughter without stunning	Inversion stress; pain from compression on leg bones; Keep restraint as short as possible	Competent animal handlers; proper design and operation of equipment; birds should be hung by both legs	Poultry
	Suspension and/or inversion	Cone	Electrical – head-only Captive bolt Slaughter without stunning	Inversion stress	Competent animal handlers; proper design and operation of equipment	Poultry
	Upright restraint	Mechanical leg clamping	Electrical – head-only	Stress of resisting restraint in ostriches	Competent animal handlers; proper equipment design and operation	Ostriches
Restraining by inversion	Rotating box	Fixed side(s) (e.g. Weinberg pen)	Slaughter without stunning	Inversion stress; stress of resisting restraint, prolonged restraint, inhalation of blood and ingesta Keep restraint as brief as possible	Proper design and operation of equipment	Cattle
		Compressible side(s)	Slaughter without stunning	Inversion stress, stress of resisting restraint, prolonged restraint Preferable to rotating box with fixed sides Keep restraint as brief as possible	Proper design and operation of equipment	Cattle
Body restraint	Casting/ hobbling	Manual	Mechanical stunning methods Slaughter without stunning	Stress of resisting restraint; animal temperament; bruising. Keep restraint as short as possible	Competent animal handlers	Sheep, goats, calves, small camelids, pigs
Leg restraints		Rope casting	Mechanical stunning methods Slaughter without stunning	Stress of resisting restraint; prolonged restraint, animal temperament; bruising Keep restraint as short as possible	Competent animal handlers	Cattle, camelids
		Tying of 3 or 4 legs	Mechanical stunning methods Slaughter without stunning	Stress of resisting restraint; prolonged restraint, animal temperament; bruising Keep restraint as short as possible	Competent animal handlers	Sheep, goats, small camelids, pigs

Article 7.5.7.

Stunning methods

1. General considerations

The competence of the operators, and the appropriateness, and effectiveness of the method used for *stunning* and the maintenance of the equipment are the responsibility of the management of the *slaughterhouse*, and should be checked regularly by a *Competent Authority*.

Persons carrying out *stunning* should be properly trained and competent, and should ensure that:

a) the *animal* is adequately restrained;

b) *animals* in *restraint* are stunned as soon as possible;

c) the equipment used for *stunning* is maintained and operated properly in accordance with the manufacturer's recommendations, in particular with regard to the species and size of the *animal*;

d) the ~~instrument~~ 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 neck 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. The following diagrams illustrate the proper application of the device for certain species.

Cattle

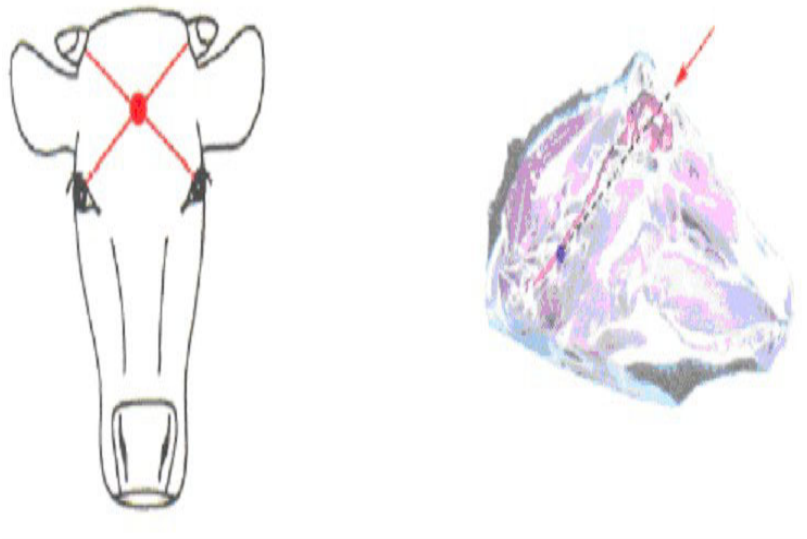


Figure source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire AL4 8AN, United Kingdom (www.hsa.org.uk).

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.

Annex XXXIX (contd)

Annex III (contd)

Pigs

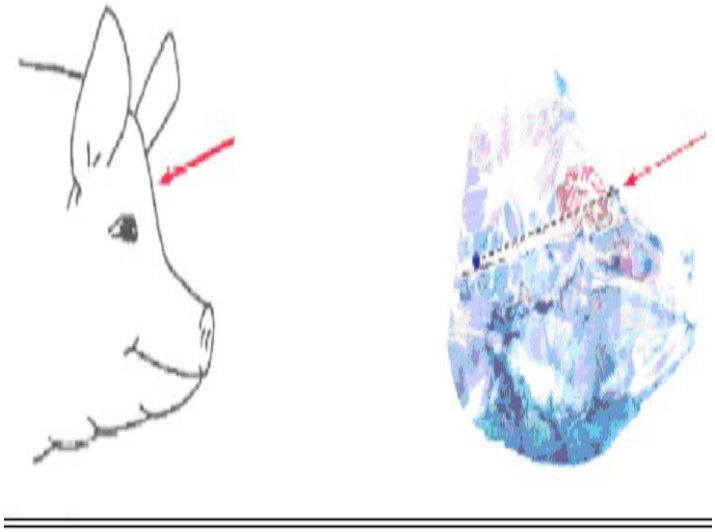


Figure source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire AL4 8AN, United Kingdom (www.hsa.org.uk).

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

Sheep

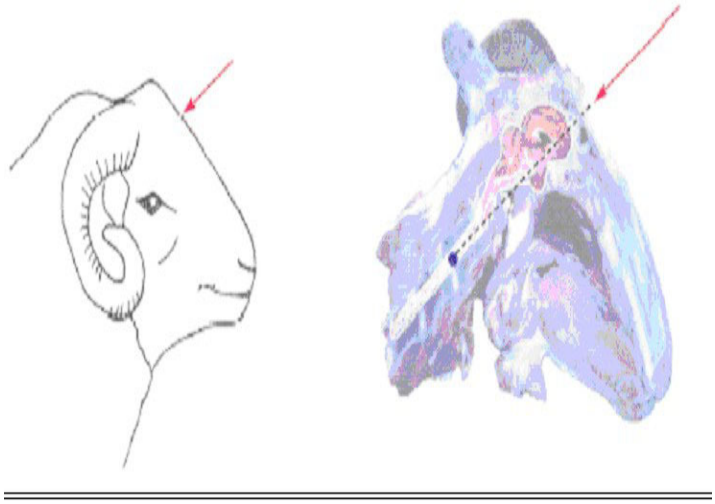


Figure source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire AL4 8AN, United Kingdom (www.hsa.org.uk).

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

Goats

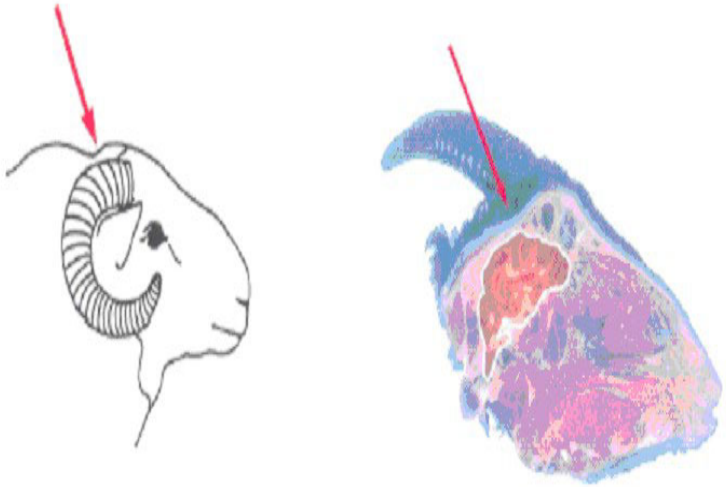


Figure Source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire AL4 8AN, United Kingdom (www.hsa.org.uk).

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

Horses

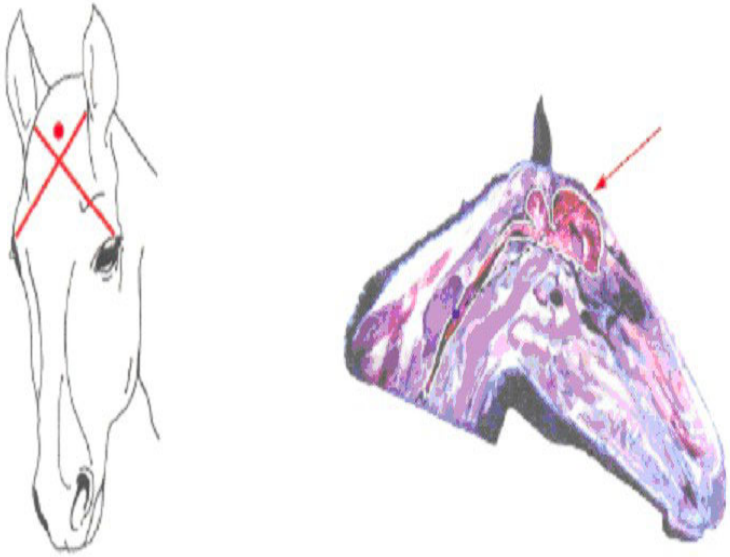


Figure Source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire AL4 8AN, United Kingdom (www.hsa.org.uk).

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.

Annex XXXIX (contd)

Annex III (contd)

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

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

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

c) normal rhythmic breathing stops; and

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

Poultry

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 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 manufacturers' instruction should lead to immediate destruction of the skull and the brain and, as a result, immediate *death*.

3. Electrical stunning

a) General considerations

An electrical device should be applied to the *animal* in accordance with the following recommendations.

Electrodes should be designed, constructed, maintained and cleaned regularly to ensure that the flow of current is optimal and in accordance with manufacturing specifications. They should be placed so that they span the brain. The application of electrical currents which bypass the brain is unacceptable unless the *animal* has been stunned. The use of a single current leg-to-leg is unacceptable as a *stunning* method.

If, in addition, it is intended to cause cardiac arrest, the electrodes should either span the brain and immediately thereafter the heart, on the condition that it has been ascertained that the *animal* is adequately stunned, or span brain and heart simultaneously.

Electrical *stunning* equipment should not be applied on *animals* as a means of guidance, movement, *restraint* or immobilisation, and shall not deliver any shock to the *animal* before the actual *stunning* or *killing*.

Annex XXXIX (contd)

Annex III (contd)

Electrical *stunning* apparatus should be tested prior to application on *animals* using appropriate resistors or dummy loads to ensure the power output is adequate to stun *animals*.

The electrical *stunning* apparatus should incorporate a device that monitors and displays voltage (true RMS) and the applied current (true RMS) and that such devices are regularly calibrated at least annually.

Appropriate measures, such as removing excess wool or wetting the skin only at the point of contact, can be taken to minimise impedance of the skin and facilitate effective *stunning*.

The *stunning* apparatus required for electrical *stunning* should be provided with adequate power to achieve continuously the minimum current level recommended for *stunning* as indicated in the table below.

In all cases, the correct current level shall be attained within one second of the initiation of stun and maintained at least for between one and three seconds and in accordance with the manufacturer's instructions. Minimum current levels for head-only *stunning* are show in the following table.

Species	Minimum current levels for head-only stunning
Cattle	1.5 amps
Calves (bovines of less than 6 month of age)	1.0 amps
Pigs	1.25 amps
Sheep and goats	1.0 amps
Lambs	0.7 amps
Ostriches	0.4 amps

b) Electrical stunning of birds using a waterbath

There should be no sharp bends or steep gradients in the shackle line and the shackle line should be as short as possible consistent with achieving acceptable line speeds, and ensuring that birds have settled by the time they reach the water bath. A breast comforter can be used effectively to reduce wing flapping and calm birds. The angle at which the shackle line approaches the entrance to the water bath, and the design of the entrance to the water bath, and the draining of excess 'live' water from the bath are all important considerations in ensuring birds are calm as they enter the bath, do not flap their wings, and do not receive pre-stun electric shocks.

In the case of birds suspended on a moving line, measures should be taken to ensure that the birds are not wing flapping at the entrance of the stunner. The birds should be secure in their shackle, but there should not be undue pressure on their shanks. The shackle size should be appropriate to fit the size of the shanks (Meta tarsal bones) of birds.

Birds should be hung on shackles by both legs.

Birds with dislocated or broken legs and wings should not be shackled, instead humanely killed.

The duration between hanging on shackles and *stunning* should be kept to the minimum. In any event, the time between shackling and *stunning* should not exceed one minute.

Waterbaths for *poultry* should be adequate in size and depth for the type of bird being slaughtered, and their height should be adjustable to allow for the head of each bird to be immersed. The electrode immersed in the bath should extend the full length of the waterbath. Birds should be immersed in the bath up to the base of their wings.

The waterbath should be designed and maintained in such a way that when the shackles pass over the water, they are in continuous contact with the earthed rubbing bar.

The control box for the waterbath stunner should incorporate an ammeter which displays the total current flowing through the birds.

The shackle-to-leg contact should be wetted preferably before the birds are inserted in the shackles. In order to improve electrical conductivity of the soft water, it is recommended that salt be added in the waterbath as necessary. Additional salt should be added regularly as a solution to maintain suitable constant concentrations in the waterbath.

Using waterbaths, birds are stunned in groups and different birds will have different impedances. The voltage should be adjusted so that the total current is the required current per bird as shown in the table hereafter, multiplied by the number of birds in the waterbath at the same time. The following values have been found to be satisfactory when employing a 50 Hertz sinusoidal alternating current.

Birds should receive the current for at least 4 seconds.

While a lower current may also be satisfactory, the current shall in any case be such as to ensure that unconsciousness occurs immediately and lasts until the bird has been killed by cardiac arrest or by bleeding. When higher electrical frequencies are used, higher currents may be required.

Every effort shall be made to ensure that no conscious or live birds enter the scalding tank.

In the case of automatic systems, until fail-safe systems of *stunning* and bleeding have been introduced, a manual back-up system should be in place to ensure that any birds which have missed the waterbath stunner and/or the automatic neck-cutter are immediately stunned and/or killed immediately, and they are dead before entering scald tank.

To lessen the number of birds that have not been effectively stunned reaching neck cutters, steps should be taken to ensure that small birds do not go on the line amongst bigger birds and that these small birds are stunned separately. Height of the waterbath stunner should be adjusted according to the size of birds being stunned and slaughtered to ensure even the small birds are immersed in the water bath up to the base of the wings.

Minimum currents for stunning poultry when using 50Hz

Species	Minimum current (milliamperes per bird)
Broilers	100
Layers (spent hens)	100
Turkeys	150
Ducks and geese	130

Annex XXXIX (contd)

Annex III (contd)

Minimum currents for stunning poultry when using high frequencies

	Minimum currents (milliamperes per bird	
Frequency (Hz)	**Chickens**	**Turkeys**
< 200 Hz	100 mA	250 mA
From 200 to 400 Hz	150 mA	400 mA
From 400 to 1500 Hz	200 mA	400 mA

High frequency electrical *stunning* seldom enduces cardiac arrest, and so it is potentially suitable as an alternative to slaughter without *stunning*.

4. Gas stunning (under study)

a) Stunning of pigs by exposure to carbon dioxide (CO_2)

The concentration of CO_2 for *stunning* should be preferably 90% by volume but in any case no less than 80% by volume. After entering the *stunning* chamber, the *animals* should be conveyed to the point of maximum concentration of the gas as rapidly as possible and be kept until they are dead or brought into a state of insensibility which lasts until *death* occur due to bleeding. Ideally, pigs should be exposed to this concentration of CO_2 for 3 minutes. Sticking should occur as soon as possible after exit from the gas chamber.

In any case, the concentration of the gas should be such that it minimises as far as possible all stress of the *animal* prior to loss of consciousness.

The chamber in which *animals* are exposed to CO_2 and the equipment used for conveying them through it shall be designed, constructed and maintained in such a way as to avoid injury or unnecessary stress to the *animals*. The animal density within the chamber should be such to avoid stacking *animals* on top of each others.

The conveyor and the chamber shall be adequately lit to allow the *animals* to see their surroundings and, if possible, each other.

It should be possible to inspect the CO_2 chamber whilst it is in use, and to have access to the *animals* in emergency cases.

The chamber shall be equipped to continuously measure and display register at the point of *stunning* the CO_2 concentration and the time of exposure, and to give a clearly visible and audible warning if the concentration of CO_2 falls below the required level.

Emergency *stunning* equipment should be available at the point of exit from the *stunning* chamber and used on any pigs that do not appear to be dead or completely stunned.

b) Inert gas mixtures for stunning pigs

Inhalation of high concentration of carbon dioxide is aversive and can be distressing to *animals*. Therefore, the use of non-aversive gas mixtures is being developed.

Such gas mixtures include:

i) a maximum of 2% by volume of oxygen in argon, nitrogen or other inert gases, or

ii) to a maximum of 30% by volume of carbon dioxide and a maximum of 2% by volume of oxygen in mixtures with carbon dioxide and argon, nitrogen or other inert gases.

Exposure time to the gas mixtures should be sufficient to ensure that no pigs regain consciousness before *death* supervenes through bleeding or cardiac arrest is induced.

c) Gas stunning of poultry

The main objective of gas *stunning* is to avoid the pain and suffering associated with shackling conscious *poultry* under water bath *stunning* and *killing* systems. Therefore, gas *stunning* should be limited to birds contained in crates or on conveyors only. Inhalation of high concentrations (40% or more) of carbon dioxide can be aversive to birds and ideally the gas mixture should be non-aversive to *poultry*.

Live *poultry* contained within transport modules or crates may be exposed to gradually increasing concentrations of CO_2 until the birds are properly stunned. No bird should recover consciousness or sensibility during bleeding.

Gas *stunning* of *poultry* in their transport *containers* will eliminate the need for live birds' handling at the processing plant and all the problems associated with the electrical *stunning*. Gas *stunning* of *poultry* on a conveyor eliminates the problems associated with the electrical water bath *stunning*.

Live *poultry* should be conveyed into the gas mixtures either in transport crates or on conveyor belts.

The following gas procedures have been properly documented for chickens and turkeys but do not necessarily apply for other domestic birds. In any case the procedure should be designed as to ensure that all *animals* are properly stunned without unnecessary suffering. Some monitoring points for gas *stunning* could be the following:

- ensure smooth entry and passage of crates or birds through the system
- avoid bunching of birds in crates or conveyors
- gas concentrations should be continuously monitored and maintained during operation
- provide visible and audible alarm systems if gas concentrations are inappropriate to the species
- calibrate of gas monitors and maintain verifiable records
- duration of exposure should be adequate to prevent recovery of consciousness in birds
- provision to monitor and deal with recovery of consciousness
- blood vessels cut should induce *death* in unconscious birds
- all birds should be dead before entering scalding tank
- emergency procedures in the event of system failure.

i) Gas mixtures used for stunning poultry could include:

- a minimum of 2 minutes exposure to 40% carbon dioxide, 30% oxygen and 30% nitrogen, followed by a minimum of one minute exposure to 80% carbon dioxide in air; or

Annex XXXIX (contd)

Annex III (contd)

- a minimum of 2 minutes exposure to any mixture of argon, nitrogen or other inert gases with atmospheric air and carbon dioxide, provided that the carbon dioxide concentration does not exceed 30% by volume and the residual oxygen concentration does not exceed 2% by volume; or

- a minimum of 2 minutes exposure to argon, nitrogen, other inert gases or any mixture of these gases in atmospheric air with a maximum of 2% residual oxygen by volume; or

- a minimum of 2 minutes exposure to a minimum of 55% carbon dioxide in air; or

- a minimum of one minute exposure to 30% carbon dioxide in air, followed by a minimum of one minute exposure to at least 60% carbon dioxide in air.

ii) Requirements for effective use are as follows:

- Compressed gases should be vaporised prior to administration into the chamber and should be at room temperature to prevent any thermal shock; under no circumstances, should solid gases with freezing temperatures enter the chamber.

- Gas mixtures should be humidified.

- Appropriate gas concentrations of oxygen and carbon dioxide should be monitored and displayed continuously at the level of the birds inside the chamber to ensure that anoxia ensues.

Under no circumstances, should birds exposed to gas mixtures be allowed to regain consciousness. If necessary, the exposure time should be extended.

5. Bleeding

From the point of view of *animal welfare*, *animals* which are stunned with a reversible method should be bled without delay. Maximum stun-stick interval depends on the parameters of the *stunning* method applied, the species concerned and the bleeding method used (full cut or chest stick when possible). As a consequence, depending on those factors, the *slaughterhouse* operator should set up a maximum stun-stick interval that ensures that no *animals* recover consciousness during bleeding. In any case the following time limits should be applied.

All *animals* should be bled out by incising both carotid arteries, or the vessels from which they arise (e.g. chest stick). However, when the *stunning* method used causes cardiac arrest, the incision of all of these vessels is not necessary from the point of view of *animal welfare*.

It should be possible for staff to observe, inspect and access the *animals* throughout the bleeding period. Any *animal* showing signs of recovering consciousness should be re-stunned.

After incision of the blood vessels, no scalding carcass treatment or dressing procedures should be performed on the *animals* for at least 30 seconds, or in any case until all brain-stem reflexes have ceased.

Stunning method	**Maximum delay for bleeding to be started**
Electrical methods and non-penetrating captive bolt	20 seconds
CO_2	60 seconds (after leaving the chamber)

Annex XXXIX (contd)

Annex III (contd)

Article 7.5.8.

Summary analysis of stunning methods and the associated animal welfare issues

Method	Specific method	Animal welfare concerns/ implications	Key animal welfare requirements applicable	Species	Comment
Mechanical	Free bullet	Inaccurate targeting and inappropriate ballistics	Operator competence; achieving outright kill with first shot	Cattle, calves, buffalo, deer, horses, pigs (boars and sows)	Personnel safety
	Captive bolt - penetrating	Inaccurate targeting, velocity and diameter of bolt	Competent operation and maintenance of equipment; restraint; accuracy	Cattle, calves, buffalo, sheep, goats, deer, horses, pigs, camelids, ratites, poultry	(Unsuitable for specimen collection from TSE suspects). A back-up gun should be available in the event of an ineffective shot
	Captive bolt - non-penetrating	Inaccurate targeting, velocity of bolt, potentially higher failure rate than penetrating captive bolt	Competent operation and maintenance of equipment; restraint; accuracy	Cattle, calves, sheep, goats, deer, pigs, camelids, ratites, poultry	Presently available devices are not recommended for young bulls and animals with thick skull. This method should only be used for cattle and sheep when alternative methods are not available.
	Manual percussive blow	Inaccurate targeting; insufficient power; size of instrument	Competent animal handlers; restraint; accuracy. Not recommended for general use	Young and small mammals, ostriches and poultry	Mechanical devices potentially more reliable. Where manual percussive blow is used, unconsciousness should be achieved with single sharp blow delivered to central skull bones
Electrical	Split application: 1. across head then head to chest; 2. across head then across chest	Accidental pre-stun electric shocks; electrode positioning; application of a current to the body while animal conscious; inadequate current and voltage	Competent operation and maintenance of equipment; restraint; accuracy	Cattle, calves, sheep, goats and pigs, ratites and poultry	Systems involving repeated application of head-only or head-to-leg with short current durations (<1 second) in the first application should not be used.
	Single application: 1. head only; 2. head to body; 3. head to leg	Accidental pre-stun electric shocks; inadequate current and voltage; wrong electrode positioning; recovery of consciousness	Competent operation and maintenance of equipment; restraint; accuracy	Cattle, calves, sheep, goats, pigs, ratites, poultry	
	Waterbath	Restraint, accidental pre-stun electric shocks; inadequate current and voltage; recovery of consciousness	Competent operation and maintenance of equipment	Poultry only	
Gaseous	CO_2 air/O_2 mixture; CO_2 inert gas mixture	Aversiveness of high CO_2; respiratory distress; inadequate exposure	Concentration; duration of exposure; design, maintenance and operation of equipment; stocking density management	Pigs, poultry	
	Inert gases	Recovery of consciousness	Concentration; duration of exposure; design, maintenance and operation of equipment; stocking density management	Pigs, poultry	

Annex XXXIX (contd)

Annex III (contd)

Article 7.5.9.

Summary analysis of slaughter methods and the associated animal welfare issues

Slaughter methods	Specific method	Animal welfare concerns/ implications	Key requirements	Species	Comments
Bleeding out by severance of blood vessels in the neck without stunning	Full frontal cutting across the throat	Failure to cut both common carotid arteries; occlusion of cut arteries; pain during and after the cut	High level of operator competency. A very sharp blade or knife of sufficient length so that the point of the knife remains outside the incision during the cut; the point of the knife should not be used to make the incision. The incision should not close over the knife during the throat cut.	Cattle, buffalo, horses, camelids, sheep, goats, poultry, ratites	No further procedure should be carried out before the bleeding out is completed (i.e. at least 30 seconds for mammals). The practice to remove hypothetical blood clots just after the bleeding should be discouraged since this may increase animal suffering.
Bleeding with prior stunning	Full frontal cutting across the throat	Failure to cut both common carotid arteries; occlusion of cut arteries; pain during and after the cut.	A very sharp blade or knife of sufficient length so that the point of the knife remains outside the incision during the cut; the point of the knife should not be used to make the incision. The incision should not close over the knife during the throat cut.	Cattle, buffalo, horses, camelids, sheep, goats	
	Neck stab followed by forward cut	Ineffective stunning; failure to cut both common carotid arteries; impaired blood flow; delay in cutting after reversible stunning	Prompt and accurate cutting	Camelids, sheep, goats, poultry, ratites	
	Neck stab alone	Ineffective stunning; failure to cut both common carotid arteries; impaired blood flow; delay in cutting after reversible stunning	Prompt and accurate cutting	Camelids, sheep, goats, poultry, ratites	
	Chest stick into major arteries or hollow-tube knife into heart	Ineffective stunning; inadequate size of stick wound inadequate length of sticking knife; delay in sticking after reversible stunning	Prompt and accurate sticking	Cattle, sheep, goats, pigs	
	Neck skin cut followed by severance of vessels in the neck	Ineffective stunning; inadequate size of stick wound; inadequate length of sticking knife; delay in sticking after reversible stunning	Prompt and accurate cutting of vessels	Cattle	
	Automated mechanical cutting	Ineffective stunning; failure to cut and misplaced cuts. Recovery of consciousness following reversible stunning systems	Design, maintenance and operation of equipment; accuracy of cut; manual back-up	Poultry only	
	Manual neck cut on one side	Ineffective stunning; recovery of consciousness following reversible stunning systems	Prior non-reversible stunning	Poultry only	N.B. slow induction of unconsciousness under slaughter without stunning

Slaughter methods	Specific method	Animal welfare concerns/ implications	Key requirements	Species	Comments
Bleeding with prior stunning (contd)	Oral cut	Ineffective stunning; recovery of consciousness following reversible stunning systems	Prior non-reversible stunning	Poultry only	N.B. slow induction of unconsciousness in non-stun systems
Other methods without stunning	Decapitation with a sharp knife	Pain due to loss of consciousness not being immediate		Sheep, goats, poultry	This method is only applicable to Jhatka slaughter
	Manual neck dislocation and decapitation	Pain due to loss of consciousness not being immediate; difficult to achieve in large birds	Neck dislocation should be performed in one stretch to sever the spinal cord	Poultry only	Slaughter by neck dislocation should be performed in one stretch to sever the spinal cord. Acceptable only when slaughtering small numbers of small birds.
Cardiac arrest in a waterbath electric stunner	Bleeding by evisceration		Induction of cardiac arrest	Quail	
	Bleeding by neck cutting			Poultry	

Article 7.5.10.

Methods, procedures or practices unacceptable on animal welfare grounds

1. The restraining methods which work through immobilisation by injury such as breaking legs, leg tendon cutting, and severing the spinal cord (e.g. using a puntilla or dagger) cause severe pain and stress in *animals*. Those methods are not acceptable in any species.

2. The use of the electrical *stunning* method with a single application leg to leg is ineffective and unacceptable in any species.

3. The *slaughter* method of brain stem severance by piercing through the eye socket or skull bone without prior *stunning* is not acceptable in any species.

- - - - - - - - - - - - - - -

– text deleted

CHAPTER 7.6.

KILLING OF ANIMALS FOR DISEASE CONTROL PURPOSES

Article 7.6.1.

General principles

These recommendations are based on the premise that a decision to kill the *animals* has been made, and address the need to ensure the *welfare* of the *animals* until they are dead.

1. All personnel involved in the humane *killing* of *animals* should have the relevant skills and competencies. Competence may be gained through formal training and/or practical experience.

2. As necessary, operational procedures should be adapted to the specific circumstances operating on the premises and should address, apart from *animal welfare*, aesthetics of the method of euthanasia, cost of the method, operator safety, biosecurity and environmental aspects, aesthetics of the method of euthanasia and cost of the method.

3. Following the decision to kill the *animals*, *killing* should be carried out as quickly as possible, and normal husbandry should be maintained until the *animals* are killed.

4. The handling and movement of *animals* should be minimised and when done, it should be done in accordance with the recommendations described below.

5. Animal *restraint* should be sufficient to facilitate effective *killing*, and in accordance with *animal welfare* and operator safety requirements; when *restraint* is required, *killing* should follow with minimal delay.

6. When *animals* are killed for disease control purposes, methods used should result in immediate *death* or immediate loss of consciousness lasting until *death*; when loss of consciousness is not immediate, induction of unconsciousness should be non-aversive and should not cause anxiety, pain, distress or suffering in *animals*.

7. For *animal welfare* considerations, young *animals* should be killed before older *animals*; for biosecurity considerations, infected *animals* should be killed first, followed by in-contact *animals*, and then the remaining *animals*.

8. There should be continuous monitoring of the procedures by the *Competent Authorities* to ensure they are consistently effective with regard to *animal welfare*, operator safety and biosecurity.

9. When the operational procedures are concluded, there should be a written report describing the practices adopted and their effect on *animal welfare*, operator safety and biosecurity.

10. These general principles should also apply when *animals* need to be killed for other purposes such as after natural disasters or for culling animal populations.

Annex XXXIX (contd)

Annex III (contd)

Article 7.6.2.

Organisational structure

Disease control contingency plans should be in place at a national level and should contain details of management structure, disease control strategies and operational procedures; *animal welfare* considerations should be addressed within these disease control contingency plans. The plans should also include a strategy to ensure that an adequate number of personnel competent in the humane *killing* of *animals* is available. Local level plans should be based on national plans and be informed by local knowledge.

Disease control contingency plans should address the *animal welfare* issues that may result from animal movement controls.

The operational activities should be led by an *official Veterinarian* who has the authority to appoint the personnel in the specialist teams and ensure that they adhere to the required *animal welfare* and biosecurity standards. When appointing the personnel, he/she should ensure that the personnel involved have the required competencies.

The *official Veterinarian* should be responsible for all activities across one or more affected premises and should be supported by coordinators for planning (including communications), operations and logistics to facilitate efficient operations.

The *official Veterinarian* should provide overall guidance to personnel and logistic support for operations on all affected premises to ensure consistency in adherence to the OIE *animal welfare* and animal health recommendations.

A specialist team, led by a team leader answerable to the *official Veterinarian*, should be deployed to work on each affected premises. The team should consist of personnel with the competencies to conduct all required operations; in some situations, personnel may be required to fulfil more than one function. Each team should contain a *veterinarian* or have access to veterinary advice at all times.

In considering the *animal welfare* issues associated with *killing animals*, the key personnel, their responsibilities and competencies required are described in Article 7.6.3.

Article 7.6.3.

Responsibilities and competencies of the specialist team

1. Team leader

    a) Responsibilities

        i) plan overall operations on affected premises;

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

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

        iv) determine logistics required;

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

vi) report upwards on progress and problems;

vii) provide a written report at the conclusion of the *killing*, describing the practices adopted and their effect on the *animal welfare*, operator safety and biosecurity outcomes.

b) Competencies

i) appreciation of normal animal husbandry practices;

ii) appreciation of *animal welfare* and the underpinning behavioural, anatomical and physiological processes involved in the *killing* process;

iii) skills to manage all activities on premises and deliver outcomes on time;

iv) awareness of psychological effects on farmer, team members and general public;

v) effective communication skills;

vi) appreciation of the environmental impacts caused by their operation.

2. Veterinarian

a) Responsibilities

i) determine and supervise the implementation of the most appropriate *killing* method to ensure that *animals* are killed without avoidable pain and distress;

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

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

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

v) continuously monitor *animal welfare* and biosecurity procedures;

vi) in cooperation with the leader, prepare a written report at the conclusion of the *killing*, describing the practices adopted and their effect on *animal welfare*.

b) Competencies

i) ability to assess *animal welfare*, especially the effectiveness of *stunning* and *killing* and to correct any deficiencies;

ii) ability to assess biosecurity risks.

Annex XXXIX (contd)

Annex III (contd)

3. Animal handlers

   a) Responsibilities

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

      ii) design and construct temporary animal handling facilities, when required;

      iii) move and restrain *animals*;

      iv) continuously monitor *animal welfare* and biosecurity procedures.

   b) Competencies

      i) animal handling in emergency situations and in close confinement is required;

      ii) an appreciation of biosecurity and containment principles.

4. Animal killing personnel

   a) Responsibilities

      Humane *killing* of the *animals* through effective *stunning* and *killing* should be ensured.

   b) Competencies

      i) when required by regulations, licensed to use necessary equipment;

      ii) competent to use and maintain relevant equipment;

      iii) competent to use techniques for the species involved;

      iv) competent to assess effective *stunning* and *killing*.

5. Carcass disposal personnel

   a) Responsibilities

      An efficient carcass disposal (to ensure *killing* operations are not hindered) should be ensured.

   b) Competencies

      The personnel should be competent to use and maintain available equipment and apply techniques for the species involved.

6. Farmer/owner/manager

   a) Responsibilities

      i) assist when requested.

   b) Competencies

      i) specific knowledge of his/her *animals* and their environment.

Article 7.6.4.

Considerations in planning the humane killing of animals

Many activities will need to be conducted on affected premises, including the humane *killing* of *animals*. The team leader should develop a plan for humanely *killing animals* on the premises which should include consideration of:

1. minimising handling and movement of *animals*;

2. *killing* the *animals* on the affected premises; however, there may be circumstances where the *animals* may need to be moved to another location for *killing*; when the *killing* is conducted at an *abattoir*, the recommendations in Chapter 7.5. on the *slaughter* of *animals* should be followed;

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

4. methods of *killing* the *animals*, and their cost;

5. housing, husbandry, location of the *animals* as well as accessibility of the farm;

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

7. the facilities available on the premises that will assist with the *killing* including any additional facilities that may need to be brought on and then removed from the premises;

8. biosecurity and environmental issues;

9. the health and safety of personnel conducting the *killing*;

10. any legal issues that may be involved, for example where restricted veterinary drugs or poisons may be used, or where the process may impact on the environment;

11. the presence of other nearby premises holding *animals*;

12. possibilities for removal, disposal and destruction of carcasses.

The plan should minimise the negative *welfare* impacts of the *killing* by taking into account the different phases of the procedures to be applied for *killing* (choice of the *killing* sites, *killing* methods, etc.) and the measures restricting the movements of the *animals*.

Competences and skills of the personnel handling and *killing animals*.

In designing a *killing* plan, it is essential that the method chosen be consistently reliable to ensure that all *animals* are humanely and quickly killed.

Annex XXXIX (contd)

Annex III (contd)

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.

Species	Age range	Procedure	Restraint necessary	Animal welfare concerns with inappropriate application	Article reference
Cattle	all	free bullet	no	non-lethal wounding	7.6.6.
	all except neonates	penetrating captive bolt - followed by pithing or bleeding	yes	ineffective stunning	7.6.7.
	adults only	non-penetrating captive bolt, followed by bleeding	yes	ineffective stunning, regaining of consciousness before killing	7.6.8.
	calves only	electrical, two-stage application	yes	pain associated with cardiac arrest after ineffective stunning	7.6.10.
	calves only	electrical, single application (method 1)	yes	ineffective stunning	7.6.11.
	all	injection with barbiturates and other drugs	yes	non-lethal dose, pain associated with injection site	7.6.15.
Sheep and goats	all	free bullet	no	non-lethal wounding	7.6.6.
	all except neonates	penetrating captive bolt, followed by pithing or bleeding	yes	ineffective stunning, regaining of consciousness before death	7.6.7.
	all except neonates	non-penetrating captive bolt, followed by bleeding	yes	ineffective stunning, regaining of consciousness before death	7.6.8.
	neonates	non-penetrating captive bolt	yes	non-lethal wounding	7.6.8.
	all	electrical, two-stage application	yes	pain associated with cardiac arrest after ineffective stunning	7.6.10.
	all	electrical, single application (method 1)	yes	ineffective stunning	7.6.11.
	neonates only	CO_2 / air mixture	yes	slow induction of unconsciousness, aversiveness of induction	7.6.12.
	neonates only	nitrogen and/or inert gas mixed with CO_2	yes	slow induction of unconsciousness, aversiveness of induction	7.6.13.
	neonates only	nitrogen and/or inert gases	yes	slow induction of unconsciousness	7.6.14.
	all	injection of barbiturates and other drugs	yes	non-lethal dose, pain associated with injection site	7.6.15.
Pigs	all, except neonates	free bullet	no	non-lethal wounding	7.6.6.
	all except neonates	penetrating captive bolt, followed by pithing or bleeding	yes	ineffective stunning, regaining of consciousness before death	7.6.7.
	neonates only	non-penetrating captive bolt	yes	non-lethal wounding	7.6.8.
	all[1]	electrical, two-stage application	yes	pain associated with cardiac arrest after ineffective stunning	7.6.10.
	all	electrical, single application (method 1)	yes	ineffective stunning	7.6.11.
	neonates only	CO_2 / air mixture	yes	slow induction of unconsciousness, aversiveness of induction	7.6.12.
	neonates only	nitrogen and/or inert gas mixed with CO_2	yes	slow induction of unconsciousness, aversiveness of induction	7.6.13.
	neonates only	nitrogen and/or inert gases	yes	slow induction of unconsciousness	7.6.14.
	all	injection with barbiturates and other	yes	non-lethal dose, pain associated with injection site	7.6.15.
Poultry	adults only	~~non~~-penetrating captive bolt	yes	ineffective stunning	7.6.8.

Species	Age range	Procedure	Restraint necessary	Animal welfare concerns with inappropriate application	Article reference
Poultry (contd)	day-olds and eggs only	maceration	no	non-lethal wounding, non- immediacy	7.6.9.
	adults only	electrical, single application (method 2)	yes	ineffective stunning	7.6.11.
	adults only	electrical, single application, followed by killing (method 3)	yes	ineffective stunning; regaining of consciousness before death	7.6.11.
	all	CO_2 / air mixture Method 1 Method 2	 yes no	slow induction of unconsciousness, aversiveness of induction	7.6.12.
	all	nitrogen and/or inert gas mixed with CO_2	yes	slow induction of unconsciousness, aversiveness of induction	7.6.13.
	all	nitrogen and/or inert gases	yes	slow induction of unconsciousness	7.6.14.
	all	injection of barbiturates and other drugs	yes	non-lethal dose, pain associated with injection site	7.6.15.
	adults only	addition of anaesthetics to feed or water, followed by an appropriate killing method	no	ineffective or slow induction of unconsciousness	7.6.16.

Article 7.6.6.

Free bullet

1. Introduction

   a) A free bullet is a projectile fired from a shotgun, rifle, handgun or purpose-made humane killer.

   b) The most commonly used firearms for close range use are:

      i) humane killers (specially manufactured/adapted single-shot weapons);

      ii) shotguns (12, 16, 20, 28 bore and .410);

      iii) rifles (.22 rimfire);

      iv) handguns (various calibres from .32 to .45).

   c) The most commonly used firearms for long range use are rifles (.22, .243, .270 and .308).

   d) A free bullet used from long range should be aimed to penetrate the skull or soft tissue at the top of the neck of the *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.

Annex XXXIX (contd)

Annex III (contd)

3. Advantages

a) Used properly, a free bullet provides a quick and effective method for *killing*.

b) It requires minimal or no *restraint* and can be use to kill from a distance by properly trained and competent marksmen.

c) It is suitable for *killing* agitated *animals* in open spaces.

4. Disadvantages

a) The method is potentially dangerous to humans and other *animals* in the area.

b) It has the potential for non-lethal wounding.

c) Destruction of brain tissue may preclude diagnosis of some *diseases*.

d) Leakage of bodily fluids may present a biosecurity risk.

e) Legal requirements may preclude or restrict use.

f) There is a limited availability of competent personnel.

5. Conclusion

The method is suitable for cattle, sheep, goats and pigs, including large *animals* in open spaces.

Figure 1. The optimum shooting position for cattle is at the intersection of two imaginary lines drawn from the rear of the eyes to the opposite horn buds.

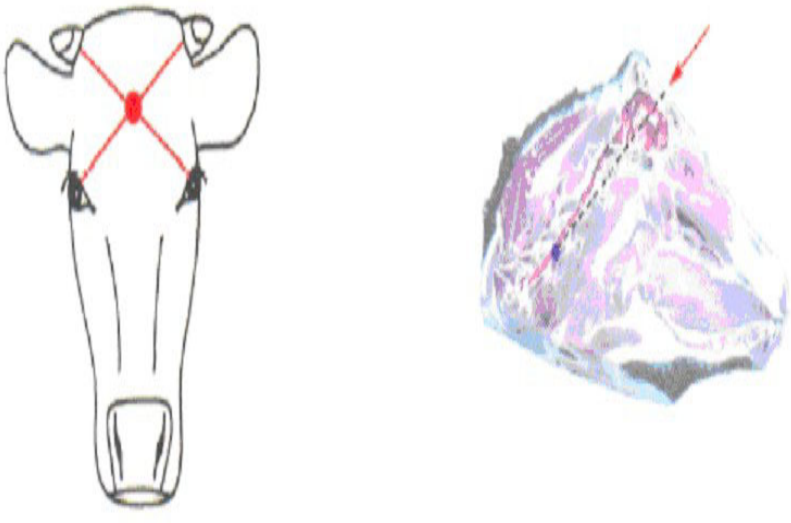


Figure source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire AL4 8AN, United Kingdom (www.hsa.org.uk).

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

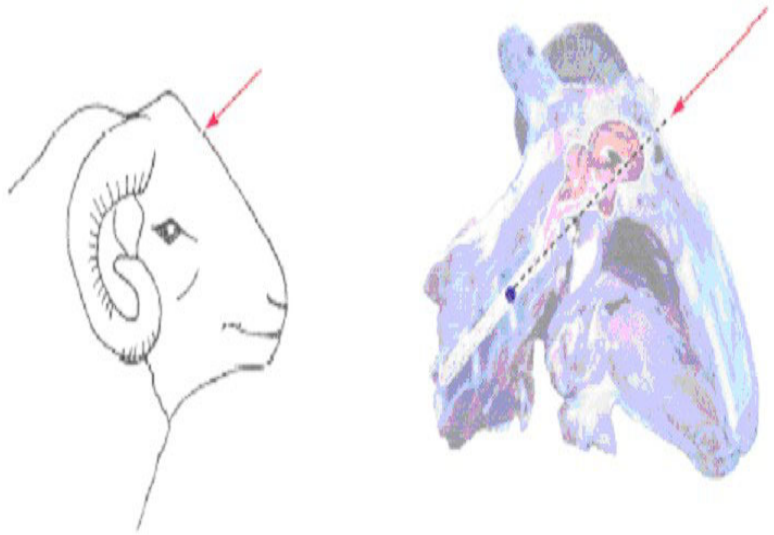


Figure source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire AL4 8AN, United Kingdom (www.hsa.org.uk).

Figure 3. The optimum shooting position for heavily horned sheep and horned goats is behind the poll aiming towards the angle of the jaw.

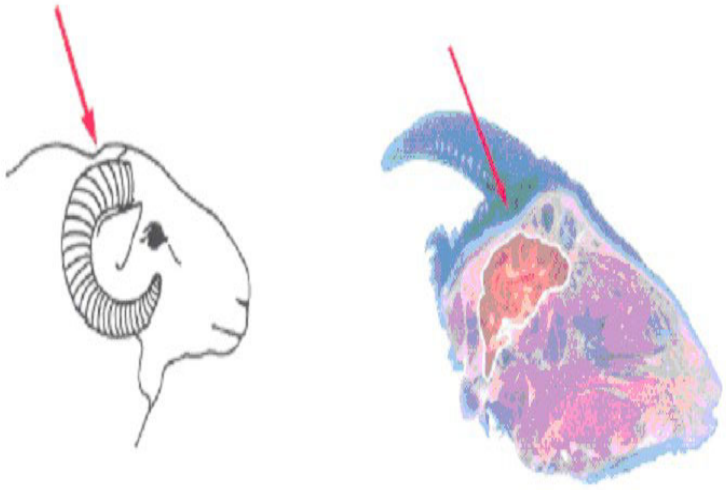


Figure Source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire AL4 8AN, United Kingdom (www.hsa.org.uk).

Annex XXXIX (contd)

Annex III (contd)

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

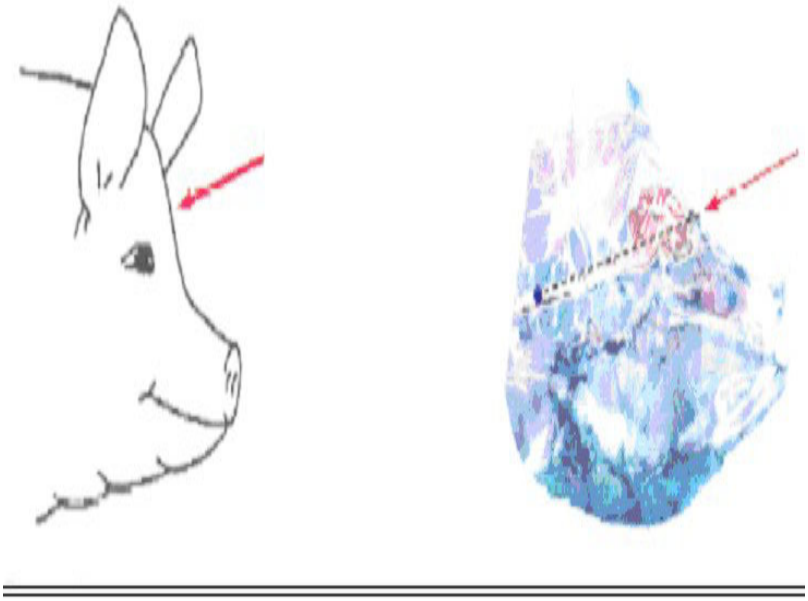


Figure source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire AL4 8AN, United Kingdom (www.hsa.org.uk).

Article 7.6.7.

Penetrating captive bolt

1. Introduction

A penetrating captive bolt is fired from a gun powered by either compressed air or a blank cartridge. There is no free projectile.

The captive bolt should be aimed on the skull in a position to penetrate the cortex and mid-brain of the *animal*. The impact of the bolt on the skull produces unconsciousness. Physical damage to the brain caused by penetration of the bolt may result in *death*; however, pithing or bleeding should be performed as soon as possible after the shot to ensure the *death* of the *animal*. Shooting *poultry* species with the captive bolts results in immediate destruction of the skull and brain, causing *death*.

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 (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*.

Annex XXXIX (contd)

Annex III (contd)

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 right angles to the skull in the optimal position (figures 1-4).

   g) To ensure *death* in non-neonate mammals, bleeding should be performed as soon as possible after *stunning*.

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

3. Advantages

   a) The method induces an immediate onset of unconsciousness, and *death* in birds and 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.

Article 7.6.9.

Maceration

1. Introduction

Maceration, utilising a mechanical apparatus with rotating blades or projections, causes immediate fragmentation and *death* in ~~day-old~~ newly hatched *poultry* and embryonated eggs.

2. Requirements

a) Maceration requires specialised equipment which should be kept in excellent working order.

b) The rate of introducing the birds should not allow the equipment to jam, birds to rebound from the blades or the birds to suffocate before they are macerated.

3. Advantages

a) Procedure results in immediate *death*.

b) Large numbers can be killed quickly.

4. Disadvantages

a) Specialised equipment is required.

b) Macerated tissues may present biosecurity or human health risks.

c) The cleaning of the equipment can be a source of contamination.

5. Conclusion

The method is suitable for *killing* day-old *poultry* and embryonated eggs.

Article 7.6.10.

Electrical – two-stage application

1. Introduction

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

The application of sufficient electric current to the head will induce 'tonic/clonic' epilepsy and unconsciousness. Once the *animal* is unconscious, the second stage will induce ventricular fibrillation (cardiac arrest) resulting in *death*. The second stage (the application of low frequency current across the chest) should only be applied to unconscious *animals* to prevent unacceptable levels of pain.

Annex XXXIX (contd)

Annex III (contd)

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:

Animal	Minimum voltage (V)	Minimum current (A)
Cattle	220	1.5
Sheep	220	1.0
Pigs over 6 weeks of age	220	1.3
Pigs less than 6 weeks of age	125	0.5

b) Appropriate protective clothing (including rubber gloves and boots) should be worn.

c) *Animals* should be restrained, at a minimum free-standing in a pen, close to an electrical supply.

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

e) A *stunning* current should be applied via scissor-type *stunning* tongs in a position that spans the brain for a minimum of 3 seconds; immediately following the application to the head, the electrodes should be transferred to a position that spans the heart and the electrodes applied for a minimum of 3 seconds.

f) Electrodes should be cleaned regularly and after use, to enable optimum electrical contact to be maintained.

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

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

3. Advantages

a) The application of the second stage minimises post-stun convulsions and therefore the method is particularly effective with pigs.

b) Non-invasive technique minimises biosecurity risk.

4. Disadvantages

a) The method requires a reliable supply of electricity.

b) The electrodes must be applied and maintained in the correct positions to produce an effective stun and kill.

c) Most stunner control devices utilise low voltage impedance sensing as an electronic switch prior to the application of high voltages; in unshorn sheep, contact impedance may be too high to switch on the required high voltage (especially during stage two).

d) The procedure may be physically demanding, leading to operator fatigue and poor electrode placement.

5. Conclusion

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

Article 7.6.11.

Electrical – single application

1. Method 1

Method 1 comprises the single application of sufficient electrical current to the head and back, to simultaneously stun the *animal* and fibrillate the heart. Provided sufficient current is applied in a position that spans both the brain and heart, the *animal* will not recover consciousness.

a) Requirements for effective use

i) The stunner control device should generate a low frequency (30–60 Hz) current with a minimum voltage of 250 volts true RMS under load.

ii) Appropriate protective clothing (including rubber gloves and boots) should be worn.

iii) *Animals* should be individually and mechanically restrained close to an electrical supply as the maintenance of physical contact between the *stunning* electrodes and the *animal* is necessary for effective use.

iv) The rear electrode should be applied to the back, above or behind the heart, and then the front electrode in a position that is forward of the eyes, with current applied for a minimum of 3 seconds.

v) Electrodes should be cleaned regularly between *animals* and after use, to enable optimum electrical contact to be maintained.

vi) Water or saline may be necessary to improve electrical contact with sheep.

vii) An effective stun and kill should be verified by the absence of brain stem reflexes.

b) Advantages

i) Method 1 stuns and kills simultaneously.

ii) It minimises post-stun convulsions and therefore is particularly effective with pigs.

iii) A single team member only is required for the application.

iv) Non-invasive technique minimises biosecurity risk.

Annex XXXIX (contd)

Annex III (contd)

c) Disadvantages

i) Method 1 requires individual mechanical animal *restraint*.

ii) The electrodes must be applied and maintained in the correct positions to produce an effective stun and kill.

iii) Method 1 requires a reliable supply of electricity.

d) Conclusion

Method 1 is suitable for calves, sheep, goats, and pigs (over one week of age).

2. Method 2

Method 2 stuns and kills by drawing inverted and shackled *poultry* through an electrified waterbath stunner. Electrical contact is made between the 'live' water and earthed shackle and, when sufficient current is applied, *poultry* will be simultaneously stunned and killed.

a) Requirements for effective use

i) A mobile waterbath stunner and a short loop of processing line are required.

ii) A low frequency (50-60 Hz) current applied for a minimum of 3 seconds is necessary to stun and kill the birds.

iii) *Poultry* need to be manually removed from their cage, house or yard, inverted and shackled onto a line which conveys them through a waterbath stunner with their heads fully immersed.

iv) The required minimum currents to stun and kill dry birds are:

- Quails - 100 mA/bird
- Chickens – 160 mA/bird
- Ducks & geese – 200 mA/bird
- Turkeys – 250 mA/bird.

A higher current is required for wet birds.

v) An effective stun and kill should be verified by the absence of brain stem reflexes.

b) Advantages

i) Method 2 stuns and kills simultaneously.

ii) It is capable of processing large numbers of birds reliably and effectively.

iii) This non-invasive technique minimises biosecurity risk.

c) Disadvantages

i) Method 2 requires a reliable supply of electricity.

ii) Handling, inversion and shackling of birds are required.

d) Conclusion

Method 2 is suitable for large numbers of *poultry*.

3. Method 3

Method 3 comprises the single application of sufficient electrical current to the head of *poultry* in a position that spans the brain, causing unconsciousness; this is followed by a *killing* method (see Article 7.6.17.).

a) Requirements for effective use

i) The stunner control device should generate sufficient current (more than 600 mA/duck and more than 300 mA/bird) to stun.

ii) Appropriate protective clothing (including rubber gloves and boots) should be worn.

iii) Birds should be restrained, at a minimum manually, close to an electrical supply.

iv) Electrodes should be cleaned regularly and after use, to enable optimum electrical contact to be maintained.

v) Birds should be monitored continuously after *stunning* until *death* to ensure the absence of brain stem reflexes.

b) Advantages

Non-invasive technique (when combined with cervical dislocation) minimises biosecurity risk.

c) Disadvantages

i) Method 3 requires a reliable supply of electricity and is not suitable for large-scale operations.

ii) The electrodes must be applied and maintained in the correct position to produce an effective stun.

iii) Birds must be individually restrained.

iv) It must be followed by a *killing* method.

d) Conclusion

Method 3 is suitable for small numbers of *poultry*.

Annex XXXIX (contd)

Annex III (contd)

Article 7.6.12.

CO_2 / air mixture (under study)

1. Introduction

Controlled atmosphere *killing* is performed by exposing *animals* to a predetermined gas mixture, either by placing them in a gas-filled container or apparatus (Method 1) or by the gas being introduced into a *poultry* house (Method 2) or by placing transport modules or crates containing birds in a gas tight container and introducing a gas mixture (Method 3). Method 2 should be used whenever possible, as it eliminates *welfare* issues resulting from the need to manually remove live birds. Although Method 3 requires handling and crating of the birds, it benefits overall bird *welfare* as it eliminates chances of causing *death* by smothering or suffocation when compared with Method 1.

Inhalation of carbon dioxide (CO_2) induces respiratory and metabolic acidosis and hence reduces the pH of cerebrospinal fluid (CSF) and neurones thereby causing unconsciousness and, after prolonged exposure, *death*. Exposure to carbon dioxide does not induce immediate loss of consciousness; therefore the aversiveness of various gas mixtures containing high concentrations of CO_2 and the respiratory distress occurring during the induction phase, are important *animal welfare* considerations.

2. Method 1

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

a) Requirements for effective use in a *container* or apparatus

i) *Containers* or apparatus should allow the required gas concentration to be maintained and accurately measured.

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

iii) *Animals* can also be introduced to low concentrations (as low concentrations are not aversive) and the concentration could be increased afterwards and the *animals* then held in the higher concentration until *death* is confirmed.

iv) Team members should ensure that there is sufficient time allowed for each batch of *animals* to die before subsequent ones are introduced into the *container* or apparatus.

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

i) CO_2 is readily available.

ii) Application methods are simple.

c) Disadvantages

i) The need for properly designed *container* or apparatus.

ii) The aversive nature of high CO_2 concentrations.

iii) No immediate loss of consciousness.

iv) The risk of suffocation due to overcrowding.

v) Difficulty in verifying *death* while the *animals* are in the container or apparatus.

d) Conclusion

Method 1 is suitable for use in *poultry*, and neonatal sheep, goats and pigs. But CO_2 is likely to cause a period of distress in the *animals* before they lose consciousness.

3. Method 2

In this method, the crates or modules full of birds are loaded into a chamber and gas is introduced into the chamber. As shown in the example below, each containerised gassing unit (CGU) typically consists of a gas-tight chamber designed to accommodate *poultry* transport crates or a module. The 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 to permit displaced air to escape during filling the container with gas.

Procedures involved in the operation of CGU includes (a) position the container on a level solid open ground; (b) connect gas cylinder to the container (c) load a module full of birds into the container, (d) shut and secure the door, (e) deliver the gas until 45% by volume of carbon dioxide was achieved at the top of the container, (f) allow time for the birds to become unconscious and die, (g) open the door, allow 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.

Figure source: Department of Clinical Veterinary Science, University of Bristol, United Kingdom.

Annex XXXIX (contd)

Annex III (contd)

Figure source: Department of Clinical Veterinary Science, University of Bristol, United Kingdom.

Figure source: Department of Clinical Veterinary Science, University of Bristol, Langford, Bristol, United Kingdom.

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

i) The birds should be gently caught 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 full of birds should be placed inside the container and the door shut only when the operator is ready to administer the gas.

iii) Ensure the container door is locked and administer the gas until a minimum of 40% carbon dioxide is achieved on top of the crates.

iv) Appropriate gas meter should be used to monitor and maintain the level of carbon dioxide continuously during the operation.

v) Sufficient exposure time should be allowed for birds to die before the door is opened. Cessation of vocalisation and convulsive wing flapping sounds, which can be listened to by standing couple of metres away from the container, can be used to determine the presence of unconsciousness, and *death* will be imminent. Remove the crates or modules out of the container and leave them in atmospheric air.

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

vii) Any survivors should be humanely killed.

viii) Ducks and geese are resilient to the effects of carbon dioxide and therefore require a minimum of 80% CO_2 and longer exposure time to die.

b) Advantages

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

ii) Gradual rising of CO_2 concentration minimises the aversiveness of the induction of unconsciousness with this gas.

iii) 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.

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

v) CO_2 is readily available.

vi) Birds are exposed to gas more uniformly and they do not smother each other when compared with Method 1.

vi) The volume of gas required can be readily calculated.

vii) As the units are operated outdoors, the gas is dispersed quickly at the end of each cycle by opening the door, improving operators health and safety.

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

ix) Metal containers can be readily cleansed and disinfected.

c) Disadvantages

i) Requires trained operators, trained catchers, transport modules and fork lift but such equipment is usually available and suitable area with hard surface.

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

iii) It is difficult to visually confirm *death* while the birds are still in the container (however, cessation of vocalisations can be used to determine onset of *death*).

Annex XXXIX (contd)

Annex III (contd)

d) Conclusion

i) Method 3 is suitable for use in *poultry* in a wide range of *poultry* systems which have access to vehicles to carry containers and handling equipment.

ii) *Animals* should be introduced into the container or apparatus, which is then sealed and filled as quickly as possible thereafter with the required gas concentrations, i.e. more than 40% CO_2 and held in this atmosphere until *death* is confirmed.

iii) Method 3 is suitable for use in *poultry*, and neonatal sheep, goats and pigs. But CO_2 is likely to cause a period of distress in the *animals* before they lose consciousness.

~~2~~4. Method ~~2~~ 3

The gas is introduced into a *poultry* house.

a) Requirements for effective use in a poultry house

i) Prior to introduction of the CO_2, the *poultry* house should be appropriately sealed to allow control over the gas concentration. The interval between sealing and gas administration should be kept to the minimum so as to avoid overheating.

Forced ventilation systems, where fitted, will have to be switched off prior to gas administration.

Mains water supply to the house may have to be turned off and water drained to avoid freezing and bursting of water pipes.

Feeders and water troughs will have to be lifted to avoid obstruction and prevent injury to birds.

ii) Gas delivery pipes or lancets should be positioned appropriately such that birds are not hit directly by the very cold gas delivered at high pressures. It may be necessary that birds are excluded at the front of the delivery pipes for a distance of about 20 meters by partitioning the house with nets, wire mesh or similarly perforated materials.

iii) The house should be gradually filled with CO_2 so that all birds are exposed to a concentration of >40% until they are dead; a vaporiser may be required to prevent freezing.

iv) Devices should be used to accurately measure the gas concentration at the maximum height accommodation of birds.

b) Advantages

i) Applying gas to birds *in situ* eliminates the need to manually remove live birds.

ii) CO_2 is readily available.

iii) Gradual raising of CO_2 concentration minimises the aversiveness of the induction of unconsciousness.

c) Disadvantages

i) It is difficult to determine volume of gas required to achieve adequate concentrations of CO_2 in some *poultry* houses.

ii) It is difficult to verify *death* while the birds are in the *poultry* house.

iii) The extremely low temperature of liquid CO_2 entering the house and formation of solid CO_2 (dry ice) are also bird *welfare* concerns.

d) Conclusion

Method 2 is suitable for use in *poultry* in closed-environment sheds. This method could be developed for killing pigs. But CO_2 is likely to cause a period of distress in the birds before they lose consciousness.

Article 7.6.13.

Nitrogen and/or inert gas mixed with CO_2

1. Introduction

CO_2 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%. Various mixtures of CO_2 and nitrogen or an inert gas can be administered to kill birds using Methods 1 and 3 described under Article 7.6.12. Whole house gassing with mixtures of CO_2 and nitrogen or an inert gas has not been tested owing to the complexity of 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 CO_2 and the respiratory distress occurring during the induction phase, are important *animal welfare* considerations.

Pigs and *poultry* appear not to find low concentrations of CO_2 strongly aversive, and a mixture of nitrogen or argon with <30% CO_2 by volume and <2% O_2 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 O_2 and CO_2 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.

ii) *Animals* should be introduced into the *container* or apparatus after it has been filled with the required gas concentrations (with <2% O_2), 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.

~~5.~~ b) Advantages

Low concentrations of CO_2 cause little aversiveness and, in combination with nitrogen or an inert gas, produces a fast induction of unconsciousness.

Annex XXXIX (contd)

Annex III (contd)

~~4.~~ 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.

~~5.~~ 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 full of 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 consists of 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 to permit displaced air to escape during filling the container with gas.

Procedures involved in the operation of CGU includes (a) position the container on a level solid open ground; (b) connect gas cylinder to the container (c) load a module full of birds into the container, (d) shut and secure the door, (e) deliver the gas until <2% by volume of oxygen was achieved at the top of the container, (f) allow time for the birds to become unconscious and die, (g) open the door, allow 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 gently caught 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 full 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 on top of the crates.

iv) Appropriate gas meter should be used to monitor and maintain the level of oxygen continuously during the operation.

v) Sufficient exposure time should be allowed for birds to die before the door is opened. Cessation of vocalisation and wing flapping sounds, which can be listened to by standing couple of metres away from the container,, can be used to determine the onset of *death* in birds. Remove the crates or modules out of the container and leave them in atmospheric air.

vi) Each crate or module should be examined and birds checked to ensure they are dead. Dilated pupils and absence of breathing movements under this situation 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 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 more uniformly 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 outdoors 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 fork lift but such equipment is usually available and suitable area with hard surface.

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

iii) It is difficult to visually confirm *death* while the birds are still in the container (however cessation of localisations can be used to determine onset of *death*).

d) Conclusion

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

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

iii) *Animals* should be introduced into the container or apparatus, which is then sealed and filled as quickly as possible thereafter with the gas mixtures and a residual oxygen of less than 2% should be achieved and maintained, and birds should be held in this atmosphere until *death* is confirmed.

Annex XXXIX (contd)

Annex III (contd)

Article 7.6.14.

Nitrogen and/or inert gases

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.

c) *Animals* should be introduced into the *container* or apparatus after it has been filled with the required gas concentrations (with <2% O_2), 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.

Whole house gassing of *poultry* with nitrogen has been tested in Denmark and Sweden. Nitrogen can also be used in containerised gassing systems however evidence is lacking. Therefore, these two methods of administration could be described as under development.

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.

3. Advantages

a) The method can be used in all species.

b) *Death* can be induced smoothly.

4. Disadvantages

a) *Restraint* and/or sedation may be necessary prior to injection.

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

c) Legal requirements and skill/training required may restrict use to veterinarians.

d) Contaminated carcasses may present a risk to other wild or domestic *animals*.

5. Conclusion

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

Article 7.6.16.

Addition of anaesthetics to feed or water

1. Introduction

An anaesthetic agent which can be mixed with *poultry* feed or water may be used to kill *poultry* in houses. *Poultry* which are only anaesthetised need to be killed by another method such as cervical dislocation.

Annex XXXIX (contd)

Annex III (contd)

2. Requirements for effective use

   a) Sufficient quantities of anaesthetic need to be ingested rapidly for effective response.

   b) Intake of sufficient quantities is facilitated if the birds are fasted or water is withheld.

   c) Must be followed by *killing* (see Article 7.6.17.) if birds are anaesthetised only.

3. Advantages

   a) Handling is not required until birds are anaesthetised.

   b) There may be biosecurity advantages in the case of large numbers of diseased birds.

4. Disadvantages

   a) Non-target *animals* may accidentally access the medicated feed or water when provided in an open environment.

   b) Dose taken is unable to be regulated and variable results may be obtained.

   c) *Animals* may reject adulterated feed or water due to illness or adverse flavour.

   d) The method may need to be followed by *killing*.

   e) Care is essential in the preparation and provision of treated feed or water, and in the disposal of uneaten treated feed/water and contaminated carcasses.

5. Conclusion

   The method is suitable for *killing* large numbers of *poultry* in houses, provided a back-up method is available to kill birds that are only anaesthetised.

Article 7.6.17.

Cervical dislocation and decapitation

1. Cervical dislocation (manual and mechanical)

   a) Introduction

      Unconscious *poultry* may be killed by either manual cervical dislocation (stretching) or mechanical neck crushing with a pair of pliers. Both methods result in *death* from cerebral anoxia due to cessation of breathing and/or blood supply to the brain.

      When the number of birds to be killed is small, and other methods of *killing* are not available, or are impracticable, conscious birds ~~of less than 3 kilograms~~ may be killed using cervical dislocation in a way that the blood vessels of the neck are severed. ~~and *death* is instantaneous.~~

   b) Requirements for effective use

      i) *Killing* should be performed either by manually or mechanically stretching the neck to sever the spinal cord or by using mechanical pliers to crush the cervical vertebrae with consequent major damage to the spinal cord.

ii) Consistent results require strength and skill so team members should be rested regularly to ensure consistently reliable results.

iii) Birds should be monitored continuously until *death* to ensure the absence of brain stem reflexes.

c) Advantages

i) It is a non-invasive *killing* method.

ii) It can be performed manually on small birds.

d) Disadvantages

i) Operator fatigue.

ii) The method is more difficult in larger birds.

iii) Requires trained personnel to perform humanely.

iv) Human health and safety concerns due to handling of the birds.

v) Additional stress to the *animals* from handling.

2. Decapitation

a) Introduction

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

b) Requirements for effective use

i) The required equipment should be kept in good working order.

c) Advantages

i) The technique is effective and does not require monitoring.

d) Disadvantages

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

ii) Pain due to loss of consciousness not being immediate.

Article 7.6.18.

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.

Annex XXXIX (contd)

Annex III (contd)

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.

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.

Article 7.6.19. (under study)

Foam as a killing method for poultry

1. Introduction

In fire fighting terms, foam is usually defined, on the basis of volume of foam produced to the volume of liquid used as low (20:1), medium (up to 200:1) and high (over 200:1) expansion foam. Medium expansion fire fighting foam made using air bubble has been used to create a blanket over live birds in order to deprive them of oxygen, and causing *death*. It was concluded that birds died due to occlusion of the upper respiratory tract with the foam. A physiological definition of suffocation is the physical separation of the upper respiratory tract from the atmospheric air, and therefore, occlusion of the upper respiratory tract with foam or water would amount to *death* due to suffocation or asphyxiation, which are unacceptable from *animal welfare* point of view.

Therefore, high expansion foam made with 100% carbon dioxide or nitrogen has been tested for killing *poultry*. Research has shown that birds do not show any aversive reactions to high expansion foam with large diameter (10 to 50 mm) made using gases. Therefore, high expansion foam with large diameter and made using industrial gases such as carbon dioxide or nitrogen has potential to be an acceptable method of killing *poultry*.

2. Requirements for effective use

a) Foam expansion ratio should be at least 300:1.

b) Diameter of foam should be at least 10mm.

c) Foam should be made using 100% carbon dioxide, nitrogen or inert gases (argon) or mixtures of these gases.

d) Surfactant used in foam making should be non-irritant, non-corrosive and the surfactant and water mixture should be buffered adequately to avoid causing discomfort to birds.

v) Foam should be administered into *poultry* houses as rapidly as possible in a calm manner, without causing distress or panic among the birds.

3. Advantages

a) Foam can be administered without entering *poultry* houses.

b) Administration of a gas in foam will minimise disturbances to live birds.

c) *Poultry* houses may not have to be sealed for the purpose containing gases.

d) Standard firefighting foam makers can be deployed.

4. Disadvantages

i) Availability of foam making devices, surfactants and gas in large quantities.

ii) Surface run-off and its consequences for biosecurity.

4. Conclusion

High expansion foam with large diameter and made using industrial gases such as carbon dioxide or nitrogen has potential to be an acceptable method of killing *poultry*.

Article 7.6.20.(under study)

Use of carbon monoxide for killing poultry.

1. Introduction

Inhalation of carbon monoxide leads to unconsciousness and *death*. However, some argue that convulsions may occur prior to loss of consciousness. It is also lethal at low concentrations and highly explosive at concentrations above 12.5% by volume.

Annex XXXIX (contd)

Annex III (contd)

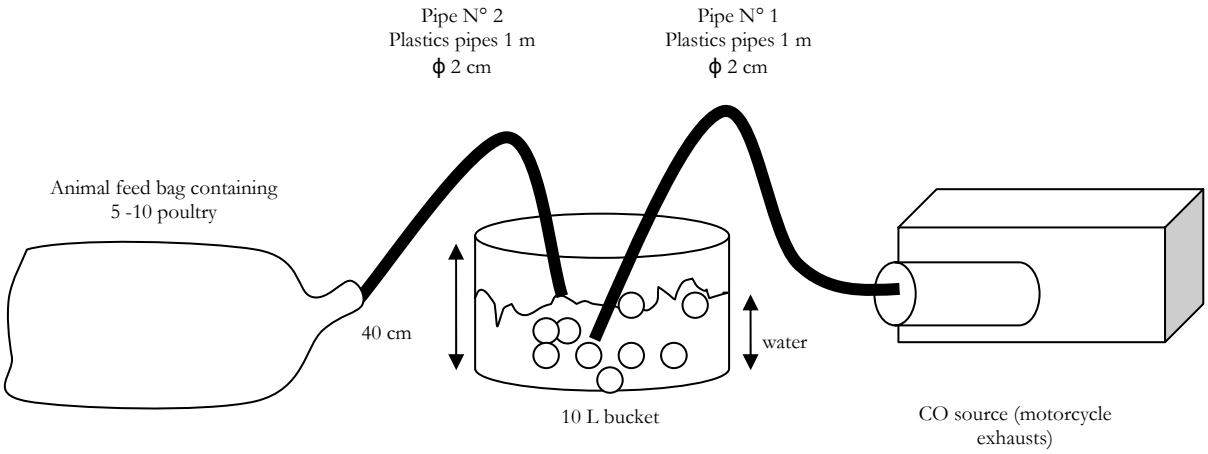
There are two methods of application: Method 1 involves the introduction of *poultry* into a container or apparatus containing carbon monoxide; Method 2 involves administration of carbon monoxide into *poultry* houses.

Carbon monoxide could be delivered from a pure (100%) source or as a mixture of gases generated by using a petrol engine. The concentration required to killing *poultry* has been estimated to be 1.5 to 2.0% in air.

a) Method 1 :

Exhaust gas from a badly tuned motorcyle engines has been used to generate carbon monoxide, however in low concentrations. An example is presented in the schematic diagram below.

Schema of Method 1



b) Method 2 : administration into poultry houses

Carbon monoxide can be delivered using a pure source and it is being lighter than air may diffuse very rapidly throughout the house.

2. Requirements for effective use

Carbon monoxide concentration should be measured in both Methods.

a) Method 1:

i) The time to attain a lethal concentration of this gas in the container (or bag) will depend upon the generator or engine.

ii) The exhaust gas should be cooled and filtered prior to administration.

iii) *Poultry* should be introduced into the container or apparatus after it has been filled with the required gas concentration, and held in this atmosphere until *death* is confirmed.

iv) Team members should ensure that there is sufficient time allowed for each batch of *poultry* to die before subsequent ones are introduced into the container or apparatus.

v) Containers or apparatus should not be overcrowded.

vi) Operators' health and safety should not be compromised.

b) Method 2

An exclusion zone of several meters around the vicinity of the house may ensure human safety and the explosive nature of the gas require the presence of fire brigade.

i) Carbon monoxide should be delivered using a pure source.

3. Conclusion

Carbon monoxide is suitable for *poultry*.

Article 7.6.21.

Prohibited methods include ventilation shut down as a sole method of killing *poultry*.

---

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/body.

- - - - - - - - - - - - - - -

– text deleted

Annex XL (contd)

Original: English
June 2009

AD HOC GROUP ON PRIVATE STANDARDS AND INTERNATIONAL TRADE IN ANIMALS AND ANIMAL PRODUCTS

Paris, 4–5 June 2009

The OIE *ad hoc* Group on Private Standards and International Trade in Animals and Animal Products (hereinafter referred to as the *ad hoc* Group) met at the OIE Headquarters from 4 to 5 June 2009.

The members of the *ad hoc* Group and other participants at the meeting are listed at Appendix I. The adopted Agenda is at Appendix II.

1. Agenda Item 1

Dr Bernard Vallat, Director General of the OIE, welcomed all members and thanked them for their agreement to work with the OIE on this important topic. He stated that he was very pleased to see the range of participation, including from non-governmental organisations (NGO) and industry organisations having an official agreement with the OIE. Dr Vallat recalled that the OIE takes care to ensure balanced regional and public/private sector representation at all *ad hoc* Group and Working Group meetings as well as in elected Commissions.

Dr Vallat recalled the history of discussions within the OIE on the issue of private standards and reminded the *ad hoc* Group members that the WTO SPS Committee has a working group on this issue, in which the OIE continues to participate. The SPS Committee working group will next meet on 29 June and the OIE will convey the outcomes of this *ad hoc* Group meeting to ensure that SPS Committee Members are informed of the issues relevant to the sanitary standards of the OIE. Dr Vallat noted that animal welfare is not currently covered by the SPS Agreement and therefore not directly relevant to the work of the SPS Committee working group. However, the increasing coverage of animal welfare by private standards remains important for OIE Members. Noting that animal welfare is in principle covered by the WTO Agreement on Technical Barriers to Trade (TBT Agreement) and that the disciplines established by the TBT Agreement are not as clear as those of the SPS Agreement, Dr Vallat conveyed his opinion that most OIE Members are now much more sympathetic to the view that animal welfare should be addressed under the SPS Agreement.

Dr Vallat stated that as one of the outcomes of this *ad hoc* Group meeting he will provide advice on the OIE position to the General Assembly of the Codex Alimentarius Commission (Codex), which he will address at the end of June. Dr Vallat also commented on the discussion paper on private standards, which was prepared by consultants for the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) and had been provided to the members of the *ad hoc* group for background information. Dr Vallat noted that the report's general conclusions are not in line with the current OIE position on private standards, in particular the proposition that private standards can be useful where official standards cannot be developed quickly enough to satisfy the needs of member countries.

In regard to the terms of reference of the *ad hoc* Group, Dr Vallat noted that the priorities for this first meeting were 1) the definition of private standards to be used officially by the OIE and 2) the development of a questionnaire, which is needed to gather information on the impact that private standards are having on the trade interests of OIE Members. The questionnaire would be sent to National Delegates and to the relevant organizations having an official agreement with the OIE, including WSPA and the industry organisations, some of whom were participating in the *ad hoc* Group. Dr Vallat noted that the questionnaire circulated by the SPS Committee secretariat to WTO Members had gathered some useful information on sanitary standards but that it did not address animal welfare. For the future work of the *ad hoc* Group, Dr Vallat underlined the importance of differentiating between recommendations dealing with standards for sanitary safety (animal health, zoonoses and animal production food safety) and those dealing with animal welfare, as the WTO legal base for these two groups of standards is different and the recommendations should address these differences in an appropriate manner. Dr Vallat noted that a second meeting of the *ad hoc* Group would be convened in order to analyse the replies to the questionnaire and to develop a strategy for the OIE, and that the issue of private standards would be considered by the OIE Terrestrial Animal Health Standards Code ("Code Commission") at its meeting in September 2009 if possible.

Dr Vallat drew to the attention of the ad hoc Group the ongoing discussion within the OIE about the difference (if any) between OIE standards, recommendations and guidelines. This issue will be discussed by the Terrestrial Code Commission and the OIE Council (formerly the Administrative Commission) and appropriate definitions, alongside the definition of private standard, may be developed for inclusion in the OIE *Terrestrial Animal Health Code* ("*Terrestrial Code*") and the OIE *Aquatic Animal Health Code*.

In regard to the implementation of the OIE standards, both for sanitary safety and for animal welfare, Dr Vallat reminded participants that the OIE is not mandated to enforce or police the application of the OIE standards. Rather, the OIE encourages Members to adopt the standards and provides technical advice and support to this end. The legal base is provided in the SPS Agreement, for sanitary standards, with the ultimate tool being for Members to initiate WTO dispute settlement proceedings. Dr Thierman said that the focus should be on incentives for implementation, especially in regard to the OIE animal welfare standards.

2. Agenda Item 2

The *ad hoc* Group adopted the proposed TOR (see Appendix III) and briefly discussed aspects of the background papers that had been provided by the secretariat to the meeting ie:

a) Resolution No. XXXII (General Session 2008);

b) Report of the OIE meeting on private standards, including for animal welfare, Paris 17 March 2009; (see Appendix IV)

c) The impact of Private Food Safety Standards on the Food Chain and on Public Standard-Setting Processes (Codex Alimentarius document, May 2009).

d) ICFAW position statement on private standards.

These last two document were send to the participants by email and distributed as a hard copy before the meeting.

3. Agenda Item 3 - General discussion

The above mentioned documents were discussed:

The chair of the meeting, Mr. Michael Scannell (EC), explained that he was not representing the European Commission and that he would chair the meeting independently. The other members of the *ad hoc* group introduced themselves (see Appendix I). Apologies were received from Prof. Harry Blokhuis who could not attend the meeting due to conflicting missions.

Mr. Scannell introduced the topic of private standards, stating that it is only a few years ago that this subject became a concern to the OIE and WTO, mainly because of the presumed negative effects for developing countries, potential conflicts with official standards, and inconsistency with the rights and obligations of WTO Members under the SPS Agreement. Concerns had been expressed by some WTO Members that private standards may raise unjustified trade barriers. Many developing countries share the view that private standards can cause trade problems. Many developed countries consider that private companies and national or international organizations have the right to establish commercial conditions for trade without interference from governments.

Some of the claimed problems of private standards are: the lack of transparency, that these are not always based on science or risk analysis, that they may be used to charge higher prices than is justified by the alleged benefits and they can undermine the official international standards.

The OIE has been very active in the discussions about private standards and take its responsibility as the international standard setting organisation for animal diseases (including zoonoses) and animal welfare very seriously.

It is generally agreed that private standards are a reality and that governments do not have the power to remove private standards from the market place. Many consider that the most important problem with private standards is that they could undermine the international standards, as countries will not see the sense in applying official standards if this is insufficient to gain access to international markets due to the predominance of private standards.

Dr Kahn clarified that the questionnaire mentioned in the terms of reference should address both animal health and animal welfare, separately. The OIE would take into account information provided in response to the WTO questionnaire. However, the focus of the OIE questionnaire is more targeted than that of the SPS Committee questionnaire (which addressed animal and plant health and food safety, consistent with the mandate of all three international standard setting organisations).

It is important to develop a clear and practical definition of private standards for use by the OIE in this work. This meeting should provide clear advice on the matter for consideration by the Terrestrial Code Commission at its meeting in September 2009.

Dr Thierman, President of the Code Commission, commented that in WTO legal terms OIE standards, recommendations and guidelines are of equal weight. He expressed the view that the OIE should support private standards that complement OIE standards and should attempt to discourage those that conflict with OIE standards. Mr. Scannell mentioned that the main area for concern regarding private standards is in the field of animal welfare, as relatively few private standards deal with sanitary safety (ie animal health, zoonoses, animal production food safety). He added that there was no place for private standards in the field of sanitary safety, where official standards have established that a product is safe. The adoption of private standards implying that certain products are ‘safer’ is counterproductive and should be discouraged. Dr. Janning, representing the International Poultry Council (IPC), stated that the IPC strongly supports a single, harmonized international standard for both sanitary safety and animal welfare. Dr. Wilkins, representing the World Society for the Protection of Animals (WSPA) and the International Coalition for Animal Welfare (ICFAW), supported both OIE standards and private standards, if they improve animal welfare. He confirmed that the existing OIE animal welfare standards are fully supported by NGOs and that the development by the OIE of animal welfare standards for production systems is strongly supported. Mr. Robach (representing the Coalition for the Safe Supply of Affordable Food for Everyone (SSAFE) added that private standards should be based on OIE international standards and that they should be audited or benchmarked against the OIE standards. Standards should be ‘outcome based’ and they should not be overly prescriptive.

Mr Scannell concluded that it is important for the OIE to be ambitious, especially for animal welfare standards. Dr. Wilkins agreed and added that the OIE has done very well in establishing animal welfare standards to date and that the future animal welfare standards for animal production systems would be watched with interest by NGOs.

Dr Thierman commented that the OIE does everything within its power to ensure that its Members apply the official standards and that it is a concern that private standards might undermine this process. Mr. Scannell added that if OIE members were more active in enforcing existing OIE standards, the drive to introduce private standards might be less. Dr Messuti, President of the OIE World Assembly (formerly the International Committee), reminded members that the OIE *PVS Tool* is an important mechanism for strengthening veterinary services and empowering them to implement the OIE standards. Dr Gavinelli (European Commission) asked about the implication of implementing the animal welfare standards for the workload of the veterinary services. Dr Messuti expressed the view that OIE *PVS Tool* should be strengthened in regard to the assessment of Members' enforcement of the OIE animal welfare standards and Dr Kahn confirmed that this would be dealt with later by the OIE *ad hoc* Group on the Evaluation of Veterinary Services, which would meet in December 2009.

The *ad hoc* Group discussed animal welfare and the WTO SPS agreement. Should the questionnaire ask Delegates for their views on including animal welfare in the WTO SPS Agreement? There were different points of view, with some concerns that the pros and cons of opening the SPS Agreement is a complex political issue that is not dependent solely on technical considerations.

It was agreed to continue discussion by focusing on the following questions:

a) Is transparency a problem and what can be done about this?

b) Are there mechanisms for collaboration?

c) Should sanitary safety be covered by private standards?

d) What possibilities exist for harmonization?

e) Should guidelines be developed for organisations setting private standards?

f) What about costs?

The *ad hoc* group generally agreed that the following disciplines should apply:

private standards should be published; it must be clear who are the relevant stakeholders; reference should be made to existing official standards; and private standards should be regularly reviewed. Private standards should aim to reduce costs and to improve efficiency, particularly in the approach to certification. In addition, harmonization, both amongst private standards and between private standards and official standards, is an important goal.

It was agreed that far too many private standards exist and that transparency would benefit if there were fewer private standards. On the question of dialogue between official standard setting organisations and those setting private standards, it could be useful to invite certain organisations as observers to the OIE but this would need to be subject to the established procedures, which normally require that only organisations with a truly global membership are invited to enter into agreements with the OIE and to participate at the General Assembly.

The *ad hoc* group agreed that the role of private standards in sanitary safety, where the clear mandate of the international standards setting bodies (the 'three sisters') has been recognised under the WTO SPS Agreement, should be limited to supporting the implementation of the official standards. Greater emphasis on communication about the existing international standards and the safety achieved by these standards could help to improve the situation.

The *ad hoc* Group discussed the question of whether guidelines should be established for those setting private standards, either by the OIE or by another organisation but there was no clear conclusion that this could assist in resolving the concerns of Members.

The *ad hoc* group concluded as follows:

a) Private standards are a fact and it is probably beyond the power of governments to abolish them.

b) The ad hoc group strongly supports the OIE international standards for animal health (including zoonoses and animal production food safety) and animal welfare.

c) Developing countries have real concerns about the impact of private standards on their international trade interests and these should be addressed by the OIE.

d) For sanitary safety, where the mandate of the international standard setting organizations is clearly recognized under the WTO SPS Agreement the role of private standards should be limited to supporting the implementation of official standards.,.

4. Agenda item 4 - A definition of 'private standard'

Private Standard means: commercial requirements developed, owned and implemented by non governmental entities, with which suppliers must comply to have access to specific markets for animals and animal products. They sometimes include sanitary safety and animal welfare issues.

OIE standards as an example of official standards are:

a) elaborated democratically and according to an agreed framework;

b) based on science and risk analysis and regularly reviewed;

c) adopted, published and applied transparently;

d) non discriminatory, but take into account the needs of developing countries and

e) for sanitary safety, consistent with the rights and obligations of WTO members as established under the WTO SPS Agreement.

Private standards may share some or many of the above features.

5. Agenda Item 5 - Development questionnaire on private standards

There was a discussion about what is exactly meant by "exceeding" or "conflicting with" OIE standards. As this point may not be clear to all Members, the *ad hoc* group agreed that the questionnaire should contain some practical examples of where a private standard is considered to exceed and/or to conflict with OIE standards.

The *ad hoc* group developed a first draft questionnaire for distribution to OIE Members.

The questionnaire will be sent to National Delegates and to the relevant organizations having an official agreement with the OIE in July. Respondents will be asked to provide replies by 26 September. The results will be discussed at the next meeting of the *ad hoc* Group, which is proposed to take place on 9/10 November 2009 (starting at 14:00 on 9/11/2009).

_____

.../Appendices

Appendix I

AD HOC GROUP ON PRIVATE STANDARDS AND INTERNATIONAL TRADE IN ANIMALS AND ANIMAL PRODUCTS

Paris, 4-5 June 2009

_____

List of participants

MEMBERS OF THE *AD HOC* GROUP

Mr Michael Scannell (chair)
Advisor
Directorate general for health
and consumer protection
European Commission
B-1049 - Brussels
BELGIUM
michael.scannell@ec.europa.eu

Dr David Wilkins
International coalition for farm
animal welfare (icfaw)
secretary
89 albert embankment
london se1 7tp
England
Tel.: 44 (0) 12 43 58 50 11
Fax: 44 (0) 20 75 87 50 57
wilkinsvet@btinternet.com

Dr Thomas Janning
German poultry association –
representing ipc
claire-waldoff-straße 7
10117 berlin
GEMANY
Tel:030-288831-30
Fax: 030-288831-50
Mobile: 0172-2120607
dr.th.janning@zdg-online.de

Prof. Harry Blokhuis (absent)
Department of animal
environment and health
Swedish university of
agricultural sciences
box 7038
750 07 uppsala
SWEDEN
Tel +46 (0) 18 67 16 27
Mob +46 (0) 70 24 64 255
Fax +46 (0) 18 67 29 19
harry.blokhuis@hmh.slu.se

Dr Andrea Gavinelli
Head of unit
Unit d5 - animal welfare
European Commission
Health and consumers dg
rue Froissart 101 – 2 / 54
1040 Brussels
BELGIUM
Tel.: 322 296 64 26
Fax: 322 295 31 44
andrea.gavinelli@ec.europa.eu

Mr Michael C. Robach
vice president
corporate food safety and
regulatory affairs
cargill, inc.
minneapolis, minnesota
united states of america
mike_robach@cargill.com

Mr Laurence Wrixon
Secretary General
International meat secretariat -
IMS
6, rue de la Victoire
75009 PARIS
FRANCE
Tel: 33.1 45 26 68 97
Fax : 33 1 45 26 68 98
info@meat-ims.org

Mrs Anne Legentil
Familles rurales (association de
consommateurs)
7, cité d'Antin
75009 Paris
FRANCE
Tel: 33 1 44 91 88 88
anne.legentil@famillesrurales.org

Dr Carlos A. Correa Messuti
Ministerio de ganadería,
agricultura y pesca
constituyente 1476
Montevideo
URUGUAY
ccorream@multi.com.uy

Dr David Bowles
Royal society for the prevention
of cruelty to animals
Wilberforce way
Southwater, Horsahm
West Sussex, rh13 9rs
UNIDED KINGDOM
Tel.: 44 300 123 02 72
dbowles@rspca.org.uk

Annex XL (contd)

Appendix I (contd)

OTHER PARTICIPANTS

Dr Alex Thiermann
President of the OIE Terrestrial
Animal Health Standards
Commission
E-mail: a.thiermann@oie.int

OIE HEADQUARTERS

Dr Bernard Vallat
Director General
OIE
12, rue de Prony
75017 Paris
FRANCE
Tel: 33-(0)1 44 15 18 88
Fax: 33-(0)1 42 67 09 87
E-mail: oie@oie.int

Dr Leopoldo Stuardo
Project Officer
International Trade Department
OIE
E-mail: l.stuardo@oie.int

Dr Sarah Kahn
Head
International Trade Department
OIE
E-mail: s.kahn@oie.int

Dr Wim Pelgrim
Project Officer
International Trade Department
OIE
E-mail: w.pelgrim@oie.int

AD HOC GROUP ON PRIVATE STANDARDS AND INTERNATIONAL TRADE IN ANIMALS AND ANIMAL PRODUCTS

Paris, 4-5 June 2009

Adopted Agenda

1. Welcome and introduction – Dr. Vallat
2. Confirmation of Terms of Reference and comments from Chair of the *ad hoc* Group
3. Discussion of working documents and other relevant documents provided by the *ad hoc* Group Members
4. Development definition of private standard
5. Development questionnaire on private standards

Appendix III

TERMS OF REFERENCE

AD HOC GROUP ON PRIVATE STANDARDS AND INTERNATIONAL TRADE

IN ANIMALS AND ANIMAL PRODUCTS

Paris, 4-5 June 2009

Taking into account:

- Resolution No. XXXII *Implications of private standards in international trade of animals and animal products* (General Session 2008);
- that the OIE International Committee has adopted separate international standards for animal welfare, animal production food safety and animal health;
- that the World Trade Organization, under the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement), formally recognises the OIE as the organisation responsible for establishing international standards relating to animal diseases, including zoonotic diseases;
- the role of the OIE in facilitating safe international trade in animals and animal products;
- that it is of concern to OIE Members that some private standards for sanitary safety and animal welfare relating to animal products are not consistent with the OIE standards and
- that the OIE has no objection to private standards for animal products that relate to matters other than sanitary safety and animal welfare.

1. **The *ad hoc* Group should propose an OIE strategy to help Members avoid or minimise current or potential negative effects of private standards.**

2. **The *ad hoc* Group should develop a definition of 'private standards' for use by the OIE, taking into account the following considerations:**

Official (OIE) standards are:

- adopted democratically
- based on science and risk analysis
- elaborated with reference to existing standards

- adopted, published and applied transparently
- non discriminatory
- consistent with the rights and obligations of WTO Members as established under the WTO SPS Agreement.

3. As a basis for its recommendations, the ad hoc Group should develop a questionnaire for distribution by the Director General to OIE Members and relevant organisations having an official agreement with the OIE.

The questionnaire should seek:

- information on the negative (and/or positive) effects of private standards in the animal health and public health field to the trading interests of OIE Members;
- information on the negative (and/or positive) effects of private standards in the animal welfare field to the trading interests of OIE Members;

For both animal health and animal welfare, the questionnaire should aim to collect relevant information, including on regional and international trade; costs of compliance with private standards; information on recognition of the standards; identification and/or characterization of businesses that meet private standards; technical or financial assistance received to assist compliance with private standards and benefits (for producers, retailers and consumers) provided by complying with private standards.

_____

RESOLUTION No. XXXII

Implications of private standards in international trade of animals and animal products

CONSIDERING

That the World Trade Organization, under the Agreement on the Application of Sanitary and Phytosanitary Measures, formally recognises the OIE as the reference organisation responsible for establishing international standards relating to animal diseases, including zoonotic diseases

That the OIEs current 172 Members and the international community at large recognise the OIE as the organisation responsible for setting standards for animal disease surveillance and animal health and welfare, with the objective of providing a scientific basis for safe international trade in animals and animal products and improving animal health and welfare worldwide,

That the OIE International Committee has adopted international standards for animal welfare during transport, slaughter and killing for sanitary purposes, and the OIE is developing new standards in the animal welfare domain, and

NOTING

That commercial standards, established by private companies without direct involvement of governments, are increasingly coming into play in international trade, and are of great concern for a majority of OIE Members

THE COMMITTEE

DECIDES

1. To reaffirm the standards published by the OIE in the field of animal health including zoonoses, as the global official sanitary guarantees for preventing the risks associated with international trade in animals and animal products, while avoiding unjustified sanitary barriers to trade, and promoting the prevention and control of animal diseases worldwide.
2. To reaffirm the standards published by the OIE in the field of animal welfare as the global reference standard for OIE Members.
3. To ask the Director General to work with relevant public and private international organisations with the objective that concerns of Members are taken into consideration and that private standards, where used, are consistent with and do not conflict with those of the OIE.
4. To ask the Director General to support Members in taking whatever steps are available to them to ensure that private animal health and animal welfare standards, where used, are consistent with and do not conflict with those of the OIE.
5. To ask the Director General to continue with the relevant activities to further strengthen the OIE's work in standard setting for animal health, including zoonotic diseases, and animal welfare and to continue to implement and reinforce capacity building programmes to assist Members in implementing OIE standards. Capacity building includes communication for Veterinary Services in order to convince consumers on the efficiency of OIE standards to protect health and animal welfare.

(Adopted by the International Committee of the OIE on 29 May 2008)

Annex XL (contd)

Appendix IV.2

Original: English
March 2009

REPORT OF THE OIE MEETING ON
PRIVATE STANDARDS, INCLUDING FOR ANIMAL WELFARE

Paris, 17 March 2009

The agenda for the meeting is at Annex 1, the list of participants at Annex 2 and the list of documents distributed to participants at Annex 3.

Dr Bernard Vallat, Director General of the OIE, opened the meeting. Dr Vallat recalled the recent developments on the issue of private standards, with particular reference to the World Trade Organization (WTO) SPS Committee's consideration of the impact of private standards on international trade, based on the information provided by WTO Members. Dr Vallat indicated that this issue was discussed very recently with Mr Pascal Lamy, Director General of the WTO, who confirmed that the issue of private standards is a possible source of concern to the WTO. Dr Vallat also made reference to the discussion on the issue of private standards at the OIE General Session in May 2008 and drew the attention of participants to Resolution XXXII Implications of Private Standards in International Trade of Animals and Animal Products.

In this resolution, the OIE International Committee asked the Director General: *to support Members in taking whatever steps are available to them to ensure that private animal health and animal welfare standards, where used, are consistent with and do not conflict with those of the OIE.*

Dr Vallat informed participants that he had convened this meeting as part of the process of responding to the resolution. Taking into account the views of participants at the meeting, the OIE may undertake further work, which would be done according to established OIE procedures, which involve convening *ad hoc* expert groups to draft science based standards taking account of stakeholder views.

After Dr Vallat's opening speech, the meeting continued with presentations by four key speakers. Key points are presented below and the texts of presentations may be found in the annexes to this report.

Dr David Wilkins (WSPA/ICFAW)

NGOs generally consider that private standards for animal welfare should be considered separately from such standards in the domain of animal health, as they feel private animal welfare standards can contribute to the improvement of animal welfare globally. This does not detract from the central role and leadership of the OIE in setting international animal welfare standards.

Annex XL (contd)

Ms Gretchen Stanton (WTO)

Ms Stanton indicated that the legal position on the coverage of animal welfare under the WTO Agreements is still unclear. A definitive understanding may only be obtained at such time as a Member invokes the dispute settlement procedures in regard to animal welfare measures.

It is generally agreed that animal welfare is not specifically covered under the SPS Agreement, because the scope of this agreement is defined as risks to animal health from pests or diseases or contaminated feed, along with food safety , plant protection and public health. However, if animal welfare is related to protecting animal health from pests or diseases, some aspects of animal welfare may in fact fall within the scope of the SPS Agreement.

The TBT Agreement is relevant to public and private standards but it is not clear that this agreement applies to animal welfare. This agreement covers product requirements and processing methods only to the extent that these relate to the final product characteristics. The objective of TBT measures should be 'legitimate' and if a 'relevant international standard' is available, it should be used.

The over-arching General Agreement on Tariffs and Trade (GATT) allow governments to establish rules for imported products subject to the discipline that the import measures should not require more of imported products vis-à-vis domestic 'like products'. The extent to which consumers consider the products to be 'like products' is a relevant consideration. There is a general exception to the GATT rules (Article 20.b), which is based on the need to protect animal health and life.

It remains to be determined whether private standards are subject to WTO disciplines and perhaps this will only be established if and when a Member takes dispute settlement action in relation to a private standard. Mindful that Members have expressed concerns, particularly about private standards that establish more stringent health requirements than those established by the international standard setting organisations, the SPS Committee has convened an informal working group to examine the matter with reference to the specific problems faced by Members.

Dr. Andrea Gavinelli (EC)

In the EU private standards play an important role in the relationship between consumers and retailers.

Several surveys have been conducted to define public opinion on animal welfare. Market distortions due to imported products coming from 'low welfare' systems is an important concern. It appears that consumers do not have a clear understanding of the objectives of private standards. Animal welfare NGOs are concerned about the lack of official standards and of a clear policy on labelling

Dr Carlos Correa Messuti (Deputy President of the OIE International Committee and OIE National Delegate for Uruguay)

The main concern of developing countries is that private standards can limit access to markets, even when countries have fully satisfied the relevant official standards. Private standards present particular problems for small and medium producers who may be unaware and may lack the means to meet these standards. Dr Correa Messuti considered that the OIE should undertake some work to clarify the implications of these standards and identify possible conflicts with the existing OIE standards.

Representatives of stakeholder organisations made statements and comments on private standards.

Mr. Luc Mirabito (IDF) commented that the IDF supports the OIE's work on animal welfare standards with the objective of improving animal welfare worldwide and that the IDF is also in favour of communication and consultation involving all stakeholders. Extensive communications activities are needed, especially to provide consumers with a better understanding of industrial farming practices. The record of commercial dairy farming is good, the availability and quality of dairy products confirms this. The IDF has recently published Guidelines on Animal Welfare in Dairy Production with input from OIE and FAO.

Farmers need full transparency on certification and trade requirements.

Dr Nils Beaumond (IMS) advised that IMS recognises the need for clear minimum standards and that these should be elaborated by the OIE and not via private standards. The IMS recommends that such minimum standards focus on objectives and the retention of flexibility in approaches and appropriate methods to implementation to deal with the diverse circumstances of OIE Members.

Dr Beaumond cautioned against developing standards that are highly prescriptive, indicating that more general principles and guidelines are more appropriate.

Dr Klaas Johan Osinga (IFAP) noted that suppliers (retailers and farmers) have for many years used brands as a means to address the consumer demand for products of a particular quality and that consumers may be interested in many attributes, including food safety and animal welfare. The members of IFAP understand and expect this. However, they recognise the key role of the OIE in setting science based standards as a basis for international trade and feel that it is important to avoid conflict between official and private standards. Members of IFAP ask that governments and the OIE do not hinder efforts to add value to products, on the basis that producers and retailers need to respond to consumer requirements.

Dr Thomas Janning (IPC) pointed out that the significant growth of the world population, which leads to an increasing demand for food, particularly for highly nutritious food like poultry meat. This points to a need for intensive food production based on intensive farming. Nonetheless, animal welfare requirements need to be considered on a global basis and more than in the past. Dr Janning underlined that all animal welfare requirements should be based on scientific knowledge and established experience. He affirmed the support of the IPC for the standard setting work of the OIE with particular reference to animal welfare

Mr Julian Madeley (IEC) commented that private standards should be science based, transparent, non trade-distorting, practical and voluntary. They should respond to consumer requirements and should not generate significantly higher costs, as these are normally passed on to consumers.

Mr Mike Robach (SSAFE) outlined the background to the formation of SSAFE, which entered into a formal agreement with the OIE in 2007. The objective is to develop platforms for communication and consultation with stakeholders with the objective of better aligning decision makers and the private sector, with regard to food safety, food security and sustainable food production, distribution and retail practices globally.

Mr Robach recommended that private standards be based upon the science based standards of the OIE and Codex. He commented that some private standards raise concerns because they are based on marketing rather than on science. Members of SSAFE consider it important that approaches to establishing standards by the private sector and the public sector be aligned to support sustainable approaches to the global supply of food and do not contradict SPS standards..

Mr Peter Stevenson (CIWF) advised that the work of the OIE in setting baseline standards for animal welfare is welcomed and supported. However, CIWF believes that private standards in animal welfare have their place alongside official standards and can be complementary to them. Mr Stevenson commented that food industry companies regard their animal welfare standards as an important part of their policies for corporate social responsibility. He added that the International Finance Corporation and the FAO stress that compliance with animal welfare standards can open access to international markets for products from less developed countries.. Moreover, the OIE standards have not yet been implemented in all countries of the world. Mr Stevenson reminded the meeting of the fundamental rights of WTO Members to apply the standards that they consider appropriate.

Annex XL (contd)

Dr David Bowles (RSPCA) made a presentation on the UK Freedom Foods programme, which is science based and has achieved very good market penetration in the UK. Positive developments have also been noted in the USA. This illustrates the benefits that can come from the implementation of private standards. Dr Bowles also commented that developing countries can benefit from the implementation of private standards, citing the example of the Namibian beef industry, which has increased its access to EU markets by the improvement of animal welfare practices to meet private standards.

In summary, Dr Bowles stated the view that the OIE standards are important to establish a baseline and to encourage countries that do not have animal welfare standards to commence the process of implementing them. Dr Bowles recommended that private standards should be transparent and open to all; they fill a desire from consumers to change behaviour; and they can bring market opportunities for developing countries.

Mr Keith Kenny (McDonalds) commented that McDonalds supports private standards, although there are associated 'pros and cons'. It is important to meet consumer expectations in order to support the brand's market share. Consumers in some countries have very high expectations of McDonalds in the domains of food safety and social responsibility. McDonalds' private standards are developed with input from scientific experts and stakeholders. The implementation of private standards is gradual and involves training, communication and auditing post- implementation. The costs of implementation are generally borne by McDonalds in accordance with the 'cost +' principle. On the 'down side', Mr Kenny made reference to the possibility of multiple requirements arising from the private standards of different companies and the costs of certification and compliance.

Mrs Anne Legentil (Familles Rurales) commented that there is a need for better transparency, i.e. that consumers need to understand brands and label claims represent, and that information provided to consumers is as reliable as possible using official standards as a priority when possible.

Professor Harry Blokhuis gave an overview of the European Animal Welfare Quality Project (www.welfarequality.net).

Mr Michael Scannell (EC) made a short presentation on the state of play with private standards in European Union and the factors driving their proliferation. For the EC, it is important to allow markets to function according to commercial realities. However, some disciplines must be established, particularly in relation to food safety. The EC is concerned about retailers making unfounded claims about food safety. These claims are often confused with food quality and it is likely that the EC will establish guidelines on private certification schemes in relation to the latter during the next year. Private standards do not replace official standards. For example, in regard to health certification, private certifying agencies are not allowed to substitute for government certification. Private standards can only address a relatively small part of the market, due to the higher costs associated with them. Official standards are more democratic and should be the baseline. Official standards are the best basis for improving animal welfare globally.

Mr Scannell mentioned that private standards cover a range of 'legitimate factors', including animal welfare. The question of what factors are 'legitimate' (in terms of WTO agreements) needs to be explored.

Mr Scannell noted that the world has a huge and growing need for food and that, realistically, this can only be met through the further development of intensive farming and through promoting trade. The international standard setting bodies have a dual role, not only for setting international standards but also for promoting trade and improving food security. For this reason, Mr Scannell recommended that the work of the OIE in setting animal health and animal welfare standards should be strongly supported.

Dr Vallat then summarised the OIE position in response to the points made by participants. He recalled the decision of the OIE Members to grant the OIE a mandate in animal welfare and highlighted the rapid progress made to date in having five animal welfare standards already adopted by the International Committee. Dr Vallat reminded participants that the OIE has taken this opportunity to establish global animal welfare standards and that the next step is to support Members, especially the poorest countries, in implementing the standards.

Dr Vallat explained to participants that good veterinary governance and the provision of resources, including legislation, is key to the implementation of international standards and made some brief comments on the activities of the OIE, working with partners and donors, to secure the investments needed to strengthen veterinary services. Dr Vallat emphasised that without these programmes and subsequent investments including using donor resources, it would be difficult for the poorer countries to implement international standards.

With respect to the WTO, Dr Vallat acknowledged that the legal position is not clear regarding the situation where private standards conflict with official standards. How would such a situation be resolved by the WTO? While there is a legal basis and strong disciplines regarding health standards, this is not the case for animal welfare. Dr Vallat considered that this imbalance should be addressed and recommended that the inclusion of animal welfare in the scope of the SPS Agreement be considered by WTO Members.

Dr Vallat indicated that the OIE would convene a small group to discuss in detail the issue of private standards and make recommendations for consideration by the OIE and other global organisations using its established democratic procedures, involving elected commissions and working groups.

In regard to health certification, Dr Vallat noted that private individuals may issue health certification, subject to the delegation of relevant responsibilities by the veterinary authority. However, the responsibility for providing final credible health certification remains with government and should continue to be the subject of official standards.

The meeting agreed that the subject of private standards should be further examined by a small group (6 - 8 members), to be convened by the OIE. This group should examine the private standards for animal health and animal welfare that are currently in existence and evaluate the nature of potential conflict, with the OIE standards.

The group will draft a report for consideration by the OIE Terrestrial Animal Health Standards Commission, which will develop advice to the OIE International Committee.

———————

Annex XL (contd)

Annex 1

Agenda
Brainstorming session on private standards, including animal welfare
OIE Headquarters - 12 rue de Prony, 75017 Paris
Tuesday 17 March 2009

9:30 – 10:00	Welcome and outline of objectives for the meeting Dr Bernard Vallat, Director General, World Organisation for Animal Health (OIE)
10:00 – 10:15	Dr. David Wilkins. CVA of World Society for the Protection of Animals (WSPA) and member of OIE AWWG.
10:15 – 10:30	Ms Gretchen Stanton, Senior Counsellor, Agriculture and Commodities Division, World Trade Organisation (WTO)
10:30 – 10:45	Dr. Andrea Gavinelli, Head of Unit, Unit D5 - Animal Welfare EC and Member of OIE AWWG
10:45 – 11:00	Dr. Carlos Correa Messuti, Vice President of the OIE International Committee and Delegate of Uruguay
11:00- 11:20	Coffee Break
11:20 – 12:20	Comments from organisations with which OIE has an Agreement (10 mins each speaker) o International Dairy Federation (IDF) o International Meat Secretariat (IMS) o International Federation of Agricultural Producers (IFAP) o International Poultry Council (IPC) o International Egg Commission (IEC) o Safe Supply of Affordable Food Everywhere (SSAFE)
12:20 – 13:20	Working Lunch
13:20 – 14:30	Comments from representatives of other organisations (10 mins each speaker) o The Royal Society for the Prevention of Cruelty to Animals (RSPCA) o Humane Society of the United States/ Humane Society International (HSUS/HIS) o Compassion in World Farming (CIWF) o McDonald's o Prof. Harry Blokhuis, Animal Science Expertise Group, Uppsala o Michael Scannell, Advisor DG SANCO
14:30 -15:30	General discussion Chaired by Dr Sarah Kahn, Head of OIE International Trade Department
15:30 -15:45	Coffee Break
15:45 – 16:30	General discussion - continued
16:30 -17:00	Conclusions and next steps - Dr Bernard Vallat/Dr Sarah Kahn

Annex XL (contd)

Annex 2

List of participants
Brainstorming session on private standards, including animal welfare
OIE Headquarters
12 rue de Prony, 75017 Paris, France
17 March 2009

NGOs

1. **Dr David Bowles**
   Royal Society for the Prevention of Cruelty to Animals
   Wilberforce Way
   Southwater, Horsahm
   West Sussex, RH13 9RS
   UNITED KINGDOM
   Tel.: 44 300 123 02 72
   dbowles@rspca.org.uk

2. **Mr Peter Stevenson**
   Chief policy advisor
   Compassion in World Farming
   River Court, Mill Lane Godalming GU7 1EZ
   UNITED KINGDOM
   Tel.: 4477 65 84 46 23
   Fax: 4414 83 86 16 39
   petersteve.aw@virgin.net

3. **Dr David Wilkins**
   International Coalition for Farm Animal Welfare (ICFAW) - Secretary
   89 Albert Embankment
   London SE1 7TP
   UNITED KINGDOM
   Tel.: 44 (0) 12 43 58 50 11
   Fax: 44 (0) 20 75 87 50 57
   wilkinsvet@btinternet.com

Industry organisations

4. **Mr Keith Kenny**
   Senior Director McDonald's Supply Chain Europe
   Tel: +44 208 700 7310
   Mobile; +44 7802 885284
   UNITED KINGDOM
   Keith.Kenny@uk.mcd.com

5. **Dr. Linda Detwiler**
   Consultant (McDonald's)
   UNITED STATES OF AMERIC
   Tel:+1 (732) 741-2290
   Mobile: +1 (732) 580-9391
   lavet22@aol.com

6. **Dr Nils Beaumond**
   International Meat Secretariat - IMS
   6 rue de la Victoire
   75009 Paris
   FRANCE
   n.beaumond@interbev.asso.fr

7. **Mr Julian Madelay**
   The International Egg Commission - IEC
   Director-General
   89 Charterhouse Street
   London EC1M 6HR
   UNITED KINGDOM
   julian@internationalegg.com

8. **Dr Thomas Janning**
   German Poultry Association – Representing IPC
   Claire-Waldoff-Straße 7 - 10117 Berlin
   GERMANY
   Tel: 030-288831-30 Fax 030-288831-50
   Mobil: 0172-2120607
   dr.th.janning@zdg-online.de

   Mr. Luc Mirabito
   Chef de projet "Bien être animal" - Representing IDF
   Institut de l'Elevage
   149 rue de Bercy
   75013 Paris
   FRANCE
   Tel: +33 1 40 04 52 35
   luc.mirabito@inst-elevage.asso.fr

9. **Dr Klaas Johan Osinga**
   Policy Adviser on animal health and animal welfare issues – Representing IFAP
   Federatie van Land- en Tuinbouworganisaties (LTO)
   THE NETHERLANDS
   kjosinga@ltonoord.nl

10. **Ms Fabienne Derrien**
    IFAP
    Senior Policy Officer
    60 rue Saint Lazare
    75009 Paris
    FRANCE
    fabienne.derrien@ifap.org

Other organisations

11. **Prof. Harry Blokhuis**
    Department of Animal Environment and Health

Swedish University of Agricultural Sciences
Box 7038 - 750 07 Uppsala
SWEDEN
Tel +46 (0) 18 67 16 27
Mob +46 (0) 70 24 64 255
Fax +46 (0) 18 67 29 19
Harry.Blokhuis@hmh.slu.se

12. **Dr. Andrea Gavinelli**
Head of Unit
Unit D5 - Animal Welfare
European Commission
Health and Consumers DG
Rue Froissart 101 – 2 / 54
1040 Brussels
BELGIUM
Tel.: 322 296 64 26
Fax: 322 295 31 44
Andrea.Gavinelli@ec.europa.eu

13. **Mr Michael Scannell**
Advisor
Directorate General for Health and Consumer Protection
European Commission -
B-1049 - Brussels
BELGIUM
michael.scannell@ec.europa.eu

14. Dr. Carlos Correa Messuti
National OIE Delegate
Ministerio de Ganadería, Agricultura y Pesca
Constituyente 1476
Montevideo
URUGUAY
ccorream@multi.com.uy

15. **Ms Gretchen Stanton**
Division de l'Agriculture
Centre William Rappard 154 rue de Lausanne
CH-1211 Genève 21
SWITZERLAND
Gretchen.Stanton@wto.org

16. **Mr Michael C. Robach**
Vice President
Corporate Food Safety and Regulatory Affairs - Cargill, Inc.
Minneapolis, Minnesota
UNITED STATES OF AMERICA
Mike_Robach@cargill.com

17. **Mme Anne Legentil**
Familles rurales (asso consommateurs)
7 ncite d'antin
75009 Paris
FRANCE
Tel: 01 44 91 88 88
anne.legentil@famillesrurales.org

18. **M. Mathieu PECQUEUR**
Conseiller en charge des filières agricoles
Fédération des entreprises du commerce et de la distribution (FECD)
12 rue Euler
75008 Paris
FRANCE
Tel: 01 44 43 99 20
Fax: 01 47 20 53 53
pecqueur@fecd.eu

OIE

19. **Dr Bernard Vallat**
General Director
12 Rue de Prony
75017 Paris
FRANCE
oie@oie.int

20. **Dr Sarah Kahn**
Head International Trade Department
s.kahn@oie.int

21. **Dr Jean-Luc Angot**
Deputy Director General
oie@oie.int

22. **Dr Gaston Funes**
OIE Head Regional Activities
g.funes@oie.int

23. **Dr Leopoldo Stuardo**
Project Officer - International Trade
l.stuardo@oie.int

Annex 3

List of documents distributed to participants
Brainstorming session on private standards, including animal welfare
OIE Headquarters
12 rue de Prony, 75017 Paris
Tuesday 17 March 2009.

List of Documents

1. Draft Agenda
2. Provisional list of participants
3. OIE General Session Resolution No. XXXII. Implications of private standards in international trade of animals and animal products
4. G/SPS/R/49, 18 June 2008. World Trade Organization. Committee on Sanitary and Phytosanitary Measures. Summary of the Meeting of 2-3 April 2008.
5. Implication of Private Standards in International Trade of Animals and Animal Products. Christiane Wolff and Michael Scannell. Private Standards and the WTO Committee on Sanitary and Phytosanitary Measures. OIE 76th International Committee. Paris, 25-30 May 2008.
6. G/SPS/W/230, 25 September 2008. World Trade Organization. Committee on Sanitary and Phytosanitary Measures. Private Standards - Identifying Practical Actions for the SPS Committee – SUMMARY OF RESPONSES
7. http://www.wto.org/english/news_e/news09_e/sps_25feb09_e.htm2009. News Items. 25 and 26 February 2009. Sanitary and Phytosanitary Measures. Work on private food safety and health standards moves to new phase.

Annex 4

List of documents provided by participants
Brainstorming session on private standards, including animal welfare
OIE Headquarters
12 rue de Prony, 75017 Paris
Tuesday 17 March 2009.

List of Documents

1. Dr. Carlos Correa Messuti presentation at the OIE Meeting on Private Standards and Animal Welfare
2. IDF – Position of the International Dairy Federation (IDF) on Private Standards and International Trade in animal and Animal Products
3. IMS - Position of the International Meat Secretariat (IMS) on Private Standards
4. IPC – Power Point presentation of Dr Thomas Janning
5. IFAP presentation in the OIE meeting on private standards and animal welfare
6. ICFAW – Position on private standards
7. CIWF presentation "The OIE and Private standards on Animal Welfare"
8. Prof. Harry Blockhuis - Animal welfare's impact on the food chain

Annex XLI

Original: English
August 2009

OIE *AD HOC* GROUP ON IMPORT RISK ANALYSIS FOR ANIMALS AND ANIMAL PRODUCTS

Paris, 18–20 August 2009

———

The *ad hoc* Group to review the OIE *Handbook on Import Risk Analysis for Animals and Animal Products* (the *ad hoc* Group) met at the OIE Headquarters from 18 to 20 August 2009.

The members of the *ad hoc* Group and other participants are listed at Annex I and the adopted Agenda at Annex II.

Dr Sarah Kahn, Head of the OIE International Trade Department, on behalf of the Director General, welcomed members and thanked them for their participation and support for the OIE in this important area of work. Dr Gideon Brückner chaired the meeting of the *ad hoc* Group.

The *ad hoc* Group considered and made some amendments to the draft Terms of Reference (TOR). The adopted TOR are at Annex III.

Issues relating to the availability of the OIE *Handbook on Import Risk Analysis for Animals and Animal Products*

The *ad hoc* Group discussed the lack of availability of the OIE *Handbook on Import Risk Analysis for Animals and Animal Products* (*Handbook*), which is currently out of print, and recommended that the current edition (Volumes I and II) be made available electronically as a downloadable pdf file and free of charge. The *ad hoc* Group recommended that this be done immediately. The OIE should make it clear that Volume I is currently being revised. The *ad hoc* Group also recommended that the revised edition be made available electronically and in hard copy for possible sale.

The *ad hoc* Group recommended that the revised edition of Volume I be translated into the official languages of the OIE to ensure wider accessibility and usage.

Revision of the OIE *Handbook on Import Risk Analysis for Animals and Animal Products*

The *ad hoc* Group reviewed Volume I and agreed that the contents were basically sound but the *Handbook* should be rearranged to facilitate understanding and make it more useful as a training tool. Members recommended that Volume II remain unchanged.

The *ad hoc* Group recommended that the revised edition of Volume 1 include a checklist, a template for the presentation of results and several worked examples, to reflect the use and justification of OIE standards. An example of a risk analysis on an aquatic animal product should be provided. Members considered that it was important not to over-simplify the *Handbook*, as it was critical that it provide guidance for the development of valid risk analyses which meet minimum standards and can withstand critical scrutiny.

Training

The *ad hoc* Group recommended that the OIE expand the use of training workshops on risk analysis, building on the activities of OIE Regional and Sub-Regional Representations and relevant OIE Collaborating Centres. The revised *Handbook* will be a valuable tool for use in these workshops. Members considered that the provision of a well developed training programme was critical to improving OIE Members' capacity to conduct risk analysis.

The *ad hoc* Group recommended that the Director General convene an *ad hoc* group to develop standardized training materials for OIE workshops to ensure consistency in approach among OIE Members.

Next steps

The *ad hoc* Group agreed to finalise revision of the manuscript via electronic communication and will only meet should the need arise. Finalisation of the manuscript is anticipated by the end of 2009.

Summary of recommendations

1. Current Volumes I and II be made available electronically as a downloadable pdf file, as soon as possible, and free of charge.

2. The revised edition of Volume I be translated into the official languages of the OIE.

3. The OIE further expand the use of training workshops on risk analysis, drawing on the activities of OIE Regional and Sub-Regional Representatives and relevant Collaborating Centres and using the revised OIE *Handbook on Import Risk Analysis for Animals and Animal Products* as a training tool.

4. The Director General convene an *ad hoc* group to develop training material for OIE risk analysis workshops.

…/Annexes

Annex I

OIE *AD HOC* GROUP ON IMPORT RISK ANALYSIS FOR ANIMALS AND ANIMAL PRODUCTS

Paris, 18–20 August 2009

_____

List of participants

MEMBERS OF THE *AD HOC* GROUP

Dr Gideon Brückner (Chair)
30 Schoongezicht
1 Scholtz Street - The Links
Somerset West 7130
SOUTH AFRICA
Home +27 21 851 6444
Mobile/Fax +27 83 310 2587
gkbruckner@gmail.com

Dr Franck Berthe
Senior Scientific Officer
European Food Safety Authority - EFSA
Animal Health and Animal Welfare Unit
Largo N. Palli 5/A, 43100 Parma
ITALY
Tel.: + 39 0521 036 870
Fax: + 39 0521 036 0870
Franck.Berthe@efsa.europa.eu

Prof. S.C. MacDiarmid
Principal International Adviser
Risk Analysis, International Coordination
Biosecurity New Zealand
P.O. Box 2526
Wellington
NEW ZEALAND
Tel.: +64 48940420
Stuart.MacDiarmid@maf.govt.nz

Dr Christine Müller-Graf
Head of Unit
Epidemiology, Biostatistics, Mathematical Modelling
Federal Institute for Risk Assessment
Thielallee 88-92
D14195 Berlin
GERMANY
Tel.: +49-30 18412 1912
Fax: +49-30 18412 2961
Christine.Mueller-Graf@bfr.bund.de

Dr Noel Murray
Senior Adviser, Risk Analysis
Canadian Food Inspection Agency
1400 Merivale Road
Ottawa
Ontario, K1A 0Y9
CANADA
Tel.: +613 773 5904
Fax: +613 773 5959
noel.murray@inspection.gc.ca

Dr Marna Sinclair (Absent)
Chief State Vet Epidemiology
P.O.Box 2451
Mossel Bay
6500
SOUTH AFRICA
Tel.: +27 44 690 5682
Fax: +27 44 690 4286
Cell: +27 83 642 0610
MarnaS@elsenburg.com

Dr Katsuaki Sugiura
Vice-President
Food and Agricultural Materials Inspection Center
Shin-toshin 2-1, Chuo-ku, Saitama-shi
Saitama-prefecture, 330-9731
JAPAN
Tel.: +8148-600-2369
Fax: +8148-600-2372
katsuaki_sugiura@nm.famic.go.jp

Dr Cristóbal Zepeda
Coordinator of International Activities
Centers for Epidemiology and Animal Health,
OIE Collaborating Center
for Animal Disease Surveillance Systems and Risk Analysis
USDA-APHIS-VS-CEAH
2150 Centre Ave, Building B
Fort Collins, CO 80526-8117
UNITED STATES
Tel.: (970) 217-8587
Fax: (970) 472-2668
cristobal.zepeda@aphis.usda.gov

Annex XLI (contd)

Annex I (contd)

OIE HEADQUARTERS

Dr Bernard Vallat
Director General
OIE
12, rue de Prony
75017 Paris
FRANCE
Tel.: 33-(0)1 44 15 18 88
Fax: 33-(0)1 42 67 09 87
E-mail: oie@oie.int

Dr Sarah Kahn
Head
International Trade Department
OIE
E-mail: s.kahn@oie.int

Dr Gillian Mylrea
Project Officer
International Trade Department
OIE
E-mail: g.mylrea@oie.int

Annex XLI (contd)

Annex II

OIE *AD HOC* GROUP ON IMPORT RISK ANALYSIS FOR ANIMALS AND ANIMAL PRODUCTS

Paris, 18–20 August 2009

_____

Adopted Agenda

1. Welcome
2. Adoption of the Agenda
3. Discussion of the Terms of Reference
4. Draft text for revised edition of the OIE *Handbook on Import Risk Analysis for Animals and Animal Products*
5. Next steps.

_____

Annex XLI (contd)

Annex III

Terms of Reference:

1. Take account of availability and usage of the OIE *Handbook on Import Risk Analysis for Animals and Animal Products* (Volume I), and experience and practices of OIE Members in international trade and relevant standards and guidelines of international organisations[1].

2. Consider the development of a revised second edition of the OIE *Handbook on Import Risk Analysis for Animals and Animal Products* (Volume I).

3. Draft a revised first edition (Volume I only) that provides practical guidance on the conduct of import risk analysis for international trade in animals and animal products.

4. Advise if it is necessary to revise Volume 2 (Quantitative risk assessment) in light of the modifications proposed to Volume 1.

Note: the revised text should provide practical guidance to Veterinary Services needing to conduct risk analyses on proposed imports of animals and animal products consistent with the standards and recommendations of the OIE, particularly those found in the OIE *Terrestrial Animal Health Code* and *Aquatic Animal Health Code*. It should give practical examples of relevance to OIE Members that lack resources and expertise in the area of import risk analysis. The future use and availability of the OIE *Handbook on Import Risk Analysis for Animals and Animal Products* as a tool for training aid in the context of capacity building should also be addressed in developing the revised edition.

_____

[1] Relevant international organisations include the Codex Alimentarius Commission and the European Food Safety Authority.

Organisation Mondiale de la Santé Animale
World Organisation for Animal Health
Organización Mundial de Sanidad Animal

Original: English
August 2009

REPORT OF THE MEETING OF THE OIE *AD HOC* GROUP ON SALMONELLOSIS

Paris, 4–6 August 2009

The OIE *ad hoc* Group on Salmonellosis (hereinafter referred to as the *ad hoc* Group) met at the OIE Headquarters from 4 to 6 August 2009.

The members of the *ad hoc* Group and other participants are listed at Annex I, and the adopted Agenda is given at Annex II.

The Director General of the OIE welcomed members and thanked them for their participation and support, which has already resulted in the adoption of a new chapter on the prevention, detection and control of *Salmonella* in poultry in the OIE *Terrestrial Animal Health Code* (the *Terrestrial Code*) in May 2009. Dr Bernard Vallat commented that this *ad hoc* Group is addressing an important and complex area with both animal health and public health implications and there is a need for careful harmonisation with Codex standards. Dr Vallat clarified the outcomes of discussions during the 2009 General Session regarding the difference between standards and guidelines, noting that all texts in the OIE *Codes* have the legal force of standards under the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) whilst those published elsewhere (e.g. on the OIE Internet site) are considered to be guidelines.

In the unavoidable absence of Dr Ignacio Sánchez Esteban, Dr Elyakum Berman took over as acting Chair of the meeting and welcomed members of the *ad hoc* Group.

1. Update on Codex activities

Dr Gillian Mylrea, Chargée de Mission, updated the *ad hoc* Group on the collaboration between the OIE and the Codex Alimentarius Commission (CAC) on the development of standards for the control of *Salmonella* in chicken meat. In 2007, the CAC agreed that the development of guidelines for the control of *Salmonella* and *Campylobacter* in poultry was a priority. Later that year, at its 39th session, the Codex Committee on Food Hygiene (CCFH) agreed an approach to the development of draft Guidelines for the control of *Campylobacter* and *Salmonella* spp. in chicken meat. The draft Guidelines incorporated a 'production-to-consumption' approach and identified all steps in the food chain where control measures can potentially be applied. They included references to relevant OIE standards as the primary source of information regarding the primary production phase and noted that the Guidelines should be considered supplementary to relevant OIE standards as regards recommended control measures during primary production.

The 40th session of the Codex Committee on Food Hygiene asked the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) to provide the necessary scientific advice to ensure that the Guidelines were supported by the most robust scientific data. In response, the FAO and WHO convened an expert meeting on 4–-8 May 2009, in Rome, Italy. An OIE representative and two members of this *ad hoc* Group (Dr Berman and Dr Jaap Wagenaar) attended this meeting. The objective of this meeting was to make an independent assessment of the measures internationally available for the control of *Campylobacter* and *Salmonella* spp. in chicken meat, based on scientific information on the control of these micro-organisms at different steps of the broiler production chain.

The next meeting of the Codex Working Group on the development of the Draft Guidelines for the control of *Campylobacter* and *Salmonella* spp. in chicken meat will be held in Brazil in September 2009. An OIE representative will attend this meeting to ensure that the participants are informed of OIE work in this area and to support the harmonization of standards as appropriate.

2. Chapter 6.5. on Prevention, Detection and Control of *Salmonella* in Poultry

The *ad hoc* Group reviewed comments provided by the European Community and South Africa and amended the text accordingly.

The *ad hoc* Group also reviewed the text placed 'under study' in point 2 of Article X.X.5. in relation to *Salmonella* Typhimurium. This text had been placed 'under study' at the 2009 General Session following a comment from the Delegate from Canada, who requested clarification regarding the vertical transmission of *S.* Typhimurium.

The *ad hoc* Group recommended that 'under study' be removed and the original text maintained because it is commonly accepted that *S.* Typhimurium can be vertically transmitted from breeding flocks to progeny, even though this may not be via the mechanism of true ovarian transmission. In support of this fact, the European Community and the USA have specifically included *Salmonella* Enteritidis and *S.* Typhimurium in their *Salmonella* control programmes in breeder flocks. In addition, there are several references supporting this position. The study by K.A. Liljebjelke *et al.* (Foodborne Pathogens and Diseases 2005 Spring; 2(1):90-102. K.A. Liljebjelke C.L. Hofacre, T. Liu, D.G. White, S. Ayers, S. Young & J.J. Maurer) suggested that there is transmission of *S.* Typhimurium from breeder flocks to their progeny. An EFSA study (Scientific Opinion of the Panel on Biological Hazards on a request from the European Commission on Quantitative estimation of the impact of setting a new target for the reduction of *Salmonella* in breeding hens of *Gallus gallus*. *The EFSA Journal* (2009) 1036, 1-68) concluded that *S.* Enteritidis and *S.* Typhimurium have the greatest potential for vertical and pseudo-vertical transmission from breeder flocks to their progeny. C. Poppe (*Salmonella* Infections in the Domestic Fowl, pp 107-132, in *Salmonella in Domestic Animals* (2000) edited by C. Wray and A. Wray, 2000 ISBN 0851992617) stated that 'Other serovars that may cause a transovarian infection include *S.* typhimurium, *S.* enteritidis, *S.* Heidelberg and *S.* menston'; and H.M. Hafez and S. Jodas (*Salmonella* Infections in turkeys, pp 133-156, in *Salmonella in Domestic Animals* (2000) edited by C. Wray and A. Wray, 2000 ISBN 0851992617) stated that 'Vertical transmission is the most important route of infection in turkeys for *S.* gallinarum, *S.* pullorum, *S.* arizonae, *S.* sentfenberg, *S.* typhimurium and *S.* Hadar.'

The *ad hoc* Group recommended that the OIE Headquarters update relevant chapter(s) in the OIE *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals* (the *Terrestrial Manual*), to include details on sampling and laboratory methodology for *Salmonella* prevention and control. Up to date, information on current methods is needed and this would most appropriately be presented in the *Terrestrial Manual*.

The *ad hoc* Group did some additional work to combine the existing Chapter 6.4. on *Salmonella* Enteritidis and *Salmonella* Typhimurium in poultry, which presents recommendations for veterinary certification of breeders, day-old birds and hatching eggs, with Chapter 6.5. All articles in Chapter 6.4. were amended to include all poultry types and to ensure consistency with other articles and moved to Chapter 6.5.

The amended Chapter 6.5. is provided in Annex III.

The amended Chapter 6.4. is provided in Annex IV.

3. Draft Chapter 6.3. on Hygiene and Biosecurity Procedures in Poultry Production

The *ad hoc* Group reviewed comments received from Australia, Canada, Chinese Taipei, the European Community, Guatemala, Japan, New Zealand, Thailand and the USA. The *ad hoc* Group appreciated the depth and quality of Members' comments.

The *ad hoc* Group reorganised the chapter and amended the title, by removing the word 'hygiene' which they considered was superfluous as hygiene is a necessary part of biosecurity, and added an introduction, purpose and scope.

Several Members commented on the inclusion of table eggs in the chapter. The *ad hoc* Group decided that the chapter should include reference to table egg laying chickens. However, the hygienic practices that relate to table eggs themselves are already covered by CAC standards and these references were therefore deleted.

Several Members proposed that the OIE make recommendations on the specific frequency or timing of certain practices. The *ad hoc* Group considered that rather than adopting a prescriptive approach, the frequency and timing of hygiene and biosecurity practices should be determined by the Veterinary Services in each country as appropriate to their local conditions and industry practices.

The *ad hoc* Group noted that many Member comments related to Articles 6.3.6. and 6.3.7. The *ad hoc* Group reviewed these comments and proposed to delete details on the use of disinfectants that are contained in these articles. The reasons for this decision were as follows: i) the commercial availability of products is constantly changing as new products are being developed and therefore to mention specific products would make the document incomplete and outdated over time; ii) some products that were used historically are now considered to be dangerous (e.g. formaldehyde, a carcinogen) and potential problems with other products are currently being investigated; iii) preferences in the choice of disinfectants varies between countries and if this chapter was too prescriptive it may be inappropriate for some OIE Members.

Therefore, the *ad hoc* Group recommended deleting Articles 6.3.6. and 6.3.7. and to maintain only general principles for disinfection and sanitisation in the chapter. The *ad hoc* Group recommended that consideration be given to include detailed information on the disinfection and sanitisation of hatching eggs in the *Terrestrial Manual*.

The *ad hoc* Group responded to the request of the OIE Terrestrial Animal Health Standards Commission and developed a new article on the control of infectious disease agents in live bird markets.

The *ad hoc* Group recognised that live bird markets are complex because of the diverse geographical distribution and activities carried out in these markets, which have been recognised as presenting particular risks to public and animal health under certain conditions. Live bird markets are characterised by the continuous movement of birds into and out of the markets. They are part of a complex marketing system that provides valuable fresh protein to populations in particular socioeconomic circumstances. Typically, the poultry found in live bird markets come from three principal sources, (i) backyard flocks (ii) commercial flocks and (iii) spent layers and overgrown broilers. At times layers, cockerels and ornamental birds are also sold in these markets. These markets are often a source of infectious disease agents that continuously circulate in the market and can be disseminated to poultry establishments by contaminated containers and equipment, personnel and birds. Furthermore, the handling of live birds can be a source of infection for humans due to the potential high prevalence of zoonoses in the birds, the lack of personal protection of the operators and customers, the close contact between people and birds, and the lack of biosecurity measures.

The text proposed by the *ad hoc* Group provided general recommendations to minimise the dissemination of infectious disease agents in live bird markets. However, the extent to which these measures should or could be imposed in different settings would depend on the disease status of poultry and other birds in the market, the pathways for introduction and dissemination of infectious disease agents and the feasibility and cost effectiveness of control measures.

Due to the large number of amendments and movement of text within the chapter, the amended Chapter 6.3. is provided as clean text in Annex V.

Specific recommendations for the prevention, detection and control of *Salmonella* and biosecurity measures in backyard flocks (non-commercial and commercial) have not been included in these two chapters because there is a paucity of scientific data on *Salmonella* and other infectious disease agents of poultry in this sector. The *ad hoc* Group recommended that further research be undertaken before such measures can be included in these chapters.

4. Other items

The *ad hoc* Group reviewed Chapter 10.10. of the *Terrestrial* Code on fowl typhoid and pullorum disease, and recommended that this chapter be revised because these are significant diseases of poultry and the current chapter does not adequately reflect current knowledge on these diseases.

The *ad hoc* Group also noted that many of the other avian diseases chapters in the *Terrestrial Code* do not adequately reflect current scientific knowledge and recommended that they be scheduled for review in the future.

———————

…/Annexes

Annex I

MEETING OF THE OIE *AD HOC* GROUP ON SALMONELLOSIS

Paris, 4–6 August 2009

_____

List of participants

MEMBERS OF THE *AD HOC* GROUP

Dr Ignacio Sánchez Esteban (Chair - Absent)
Trasga
Maldonado, 58
28006 Madrid
SPAIN
Tel.: (34) 91 3225518
Fax: (34) 91 3225371
E-mail: isanchez@tragsa.es

Dr William Amanfu
Regional Manager
FAO - ECTAD Unit – Regional Animal Health Centre
AU-IBAR Offices
P.O. Box 30470 – 00100
Nairobi
KENYA
Tel.: (254 20) 3674000
Fax: (254 20) 3674346
E-mail: william.amanfu@fao.org

Prof Angelo Berchieri
Universidade Estadual Paulista Júlio de Mesquita
Faculdade de Ciências Agrárias e Veterinárias de Jaboticabal
Via de Acesso Paulo Donato Castellane, s/n
14884-900 - Jaboticabal, SP
BRAZIL
Tel.: (55 16) 3209 2662
E-mail: angelo.berchieri@gmail.com

Dr Elyakum Berman (Acting Chair)
Ministry of Agriculture and Rural Development
Poultry Department
Israel Veterinary Services
P.O. Box 12
Bet Dagan 50250
ISRAEL
Tel.: (972) 3 9681774
Fax: (972) 3 9688915
E-mail: elyakum@epb.org.il

Dr Daranai Viboolpong
Deputy General Manager
Betagro Science Center
136 Moo 9, Klong 1, Klong Luang
Pathumthani 12120
THAILAND
Tel.: (662) 564 7932-40
Fax: (662) 564 7941
E-mail: daranai@betagro.com

Prof Jaap A. Wagenaar
Dept Infectious Diseases and Immunology,
Faculty of Veterinary Medicine,
Utrecht University,
PO Box 80.165,
3508 TD Utrecht
THE NETHERLANDS
Tel.: (31) 30 2534376
Fax: (31) 30 2533199
E-mail: j.wagenaar@uu.nl

OTHER PARTICIPANTS

Dr Jeronimas Maskeliunas
Food Standards Officer
Joint FAO/WHO Food Standards Programme
Nutrition and Consumer Protection Division
Viale delle terme di Caracalla
00153 Rome
ITALY
Tel.: + 39 06 57053967
Fax: +39 06 57054593
E-mail:
Jeronimas.Maskeliunas@fao.org

Annex XLII (contd)

Annex I (contd)

OIE HEADQUARTERS

Dr Bernard Vallat
Director General
OIE
12, rue de Prony
75017 Paris
FRANCE
Tel.: 33-(0)1 44 15 18 88
Fax: 33-(0)1 42 67 09 87
E-mail: oie@oie.int

Dr Sarah Kahn
Head
International Trade Department
OIE
E-mail: s.kahn@oie.int

Dr Gillian Mylrea
Chargée de mission
International Trade Department
OIE
E-mail: g.mylrea@oie.int

Dr Wim Pelgrim
Chargé de mission
OIE
E-mail: w.pelgrim@oie.int

MEETING OF THE OIE *AD HOC* GROUP ON SALMONELLOSIS

Paris, 4–6 August 2009

———————

Adopted Agenda

Welcome from the Director General

Adoption of the Agenda

1. Update on Codex activities

2. Chapter 6.5. Prevention, Detection and Control of *Salmonella* in Poultry

2.1. Consider Member comments and amend text as appropriate

3. Draft Chapter 6.3. Hygiene and Biosecurity Procedures in Poultry Production

3.1. Review this chapter's content and format in light of OIE Member comments.

3.2. In particular, review Articles 6.3.6. (Sanitation of hatching eggs and hatchery equipment) and 6.3.7. (Fumigation procedures at the hatchery).

3.3. Develop text for the prevention and control of *Salmonella* in eggs and live birds in markets.

4. Any other business

Annex III

CHAPTER 6.5.

PREVENTION, DETECTION AND CONTROL OF *SALMONELLA* IN POULTRY

Article 6.5.1.

Introduction

This chapter provides recommendations on the prevention, detection and control of *Salmonella* in *poultry*.

Salmonellosis is one of the most common foodborne bacterial *diseases* in the world. The great majority of *Salmonella infections* in humans are foodborne with *Salmonella* Enteritidis and *Salmonella* Typhimurium accounting for a major part of the problem. *Salmonella* serotypes and prevalence may vary considerably between localities, districts, regions and countries and therefore, *surveillance* and identification of the prevalent *Salmonella* serotypes in humans and *poultry* should be carried out in order to develop a control programme for the area.

In most food animal species, *Salmonella* can establish a clinically inapparent *infection* of variable duration, which is significant as a potential *zoonosis*. Such animals may be important in relation to the spread of *infection* between *flocks* and as causes of human foodborne *infection*. In the latter case, this can occur when *meat* and eggs, or their products, enter the food chain thus producing contaminated food.

Article 6.5.2.

Purpose and scope

This chapter deals with methods for on farm prevention, detection and control of *Salmonella* in *poultry*, and complements the Codex Alimentarius Code of Hygiene Practice for Meat (CAC/RCP 58-2005) and Code of Hygienic Practice for Eggs and Egg Products (CAC/RCP 15-1976 Revision 2007). A pathogen reduction strategy at the farm level is seen as the first step in a continuum that will assist in reducing the presence of foodborne pathogens in eggs and *meat*.

Hygiene and biosecurity procedures to be implemented in *poultry flocks* and hatcheries are described in Chapter 6.3. on Hygiene and Biosecurity Procedures in Poultry Production.

The recommendations presented in this chapter are relevant to the control of all *Salmonella* with special attention to *S*. Enteritidis and *S*. Typhimurium, as these are common *Salmonella* serotypes in many countries. It should be noted that the epidemiology of animal and human salmonellosis in a particular locality, district, region or country is important for effective control of *Salmonella*.

Article 6.5.3.

Definitions (for this Chapter only)

Breeders

means *poultry* destined for the production of fertile eggs for incubation for the purpose of producing ~~day-old chicks~~ *day-old birds*.

Annex XLII (contd)

Annex III (contd)

Competitive exclusion

means the administration of defined or undefined bacterial flora to *poultry* to prevent gut colonisation by enteropathogens, including *Salmonella*.

Culling

means the depopulation of a *flock* before the end of its normal production period.

Layers

means *poultry* during the period of laying eggs for human consumption.

Article 6.5.4.

Surveillance of poultry flocks for Salmonella

Where justified by *risk assessment*, *surveillance* should be carried out to identify infected *flocks* in order to take measures that will reduce the prevalence in *poultry* and the risk of transmission of *Salmonella* to humans. Sampling methods, frequency and type of samples required should be determined by the *Veterinary Services* based on a *risk assessment*. Microbiological testing is preferred to serological testing because of its higher sensitivity in broilers ~~*flocks*~~ and higher specificity in breeders ~~*flocks*~~ and layer *flocks*. In the framework of regulatory programmes for the control of *Salmonella* in *poultry* and salmonellosis in humans, confirmatory testing may be required to ensure that decisions are soundly based.

1. Sampling

   a) Available methods for sampling

      Drag swabs: sampling is done by dragging swabs throughout the *poultry* building.

      Boot swabs: sampling is done by walking throughout the *poultry* building with absorbent material placed over the footwear of the sampler.

      Dust samples: sampling is done by collecting dust from exhaust fans, screens and other equipment in the *poultry* building.

      Faecal samples: multiple fresh faecal/caecal samples collected from different areas in the *poultry* building.

      Meconium, chick box papers, dead in shell and culled chicks at the hatchery.

      Hatchery samples: throughout the hatchery, including the inner liner of the incubators.

      Additional sampling of equipment and surfaces may be performed to increase sensitivity.

   b) Sample size

      Refer to the *Terrestrial Manual* (under development).

   c) Laboratory methods

      Refer to the *Terrestrial Manual* (under development).

2. Time and frequency of testing

Time and frequency of sampling for each *poultry* type are listed below:

a) Breeders and hatcheries

i) Breeder flocks before lay

- Before the end of the first week of life when the status of the breeding farm and the hatchery is not known or does not comply with this chapter.
- Within the four weeks before being moved to another house, or before going into production if the animals will remain in the same house for the production period.
- One or more times during the growing period if there is a culling policy in place. The frequency would be determined on commercial considerations.

ii) Breeder flocks in lay

- At least at monthly intervals during the laying period.
- Additional testing should be determined by the *Veterinary Services*.

iii) Hatcheries

- Testing hatcheries may complement on farm testing.
- The minimal frequency should be determined by the *Veterinary Services*.

b) Poultry for the production of eggs for human consumption

i) Flocks grown to be layers

- Before the end of the first week of life when the status of the breeding farm and the hatchery is not known or does not comply with this chapter.
- Within the four weeks before being moved to another house, or before going into production if the animals will remain in the same house for the production period.
- One or more times during the growing period if there is a culling policy in place. The frequency would be determined on commercial considerations.

ii) Layer flocks

- At expected peak of lay for each production cycle (the period of time in the laying cycle when the production of the *flock* is highest).
- One or more times if there is a culling policy in place or if eggs are diverted to processing for the inactivation of the pathogen. The minimal frequency should be determined by the *Veterinary Services*.

Annex XLII (contd)

Annex III (contd)

c) Poultry for the production of meat

i) *Flocks* should be sampled at least once.

ii) Where sampling occurs on farms and where there is a long period (2 weeks or more) between thinning and final depopulation further testing should be considered.

iii) Where sampling occurs on farms, *flocks* should be sampled as late as possible before the first birds are transported to the *slaughterhouse*. Where this is done to allow for the implementation of control measures during processing, this must be done at a time that ensures the results are available before *slaughter*.

Whether sampling occurs on the farm or at the processing plant, there should be an integrated system in place which allows for investigation of the source of positive *flocks*.

d) Empty building testing

Bacteriological monitoring of the efficacy of *disinfection* procedures is recommended when *Salmonella* have been detected in the previous *flock*.

As appropriate, sampling of equipment and surfaces as well as boot swabs or drag swabs of the empty building after depopulation, cleaning and *disinfection*.

3. Results from *surveillance* may lead to the implementation of additional prevention and control measures to reduce the risk of transmission of *Salmonella* to humans:

a) In breeders, control measures may be implemented to reduce the transmission of *Salmonella* to the next generation, especially for trans-ovarian transmitted serotypes such as *S*. Enteriditis.

b) In layer *flocks* control measures will reduce and may eliminate contamination of eggs with *Salmonella*.

c) In *poultry* for *meat* production, control measures may be implemented at *slaughter* or further down the food chain.

Article 6.5.5.

Prevention and control measures

Salmonella prevention and control may be achieved by adopting Good Agricultural Practices and Hazard Analysis Critical Control Point (HACCP), and general measures detailed in Chapter 6.4. on Hygiene and Biosecurity Procedures in Poultry Production, in combination with the following additional measures, where appropriate. No single measure used alone will achieve effective *Salmonella* control.

Additional prevention and control measures include: vaccination, competitive exclusion, *flock* culling, organic acids and product diversion to processing.

Antimicrobials should not be used to control *infection* with *Salmonella* in *poultry* because the effectiveness of the treatment is limited, may mask the *infection* at sampling, has the potential to produce residues in *meat* and eggs and can contribute to the development of antimicrobial resistance. Antimicrobials may also reduce normal flora in the gut and increase the likelihood of colonisation with *Salmonella*. In special circumstances antimicrobials may be used to salvage animals with high genetic value.

Annex XLII (contd)

Annex III (contd)

1. ~~Day-old chicks~~ *Day-old birds* used to stock a *poultry* house should be obtained from breeding *flocks* and hatcheries that are free from at least *S*. Enteritidis and *S*. Typhimurium and have been monitored according to this chapter.

2. Layer and breeder *flocks* should be stocked from *flocks* that are free from at least *S*. Enteritidis and *S*. Typhimurium ~~(under study)~~ and have been monitored according to this chapter.

3. Feed contamination with *Salmonella* is known to be a source of *infection* for *poultry*. Therefore, it is recommended to monitor the *Salmonella* status of *poultry* feed, and if found positive to take corrective measures. The use of heat treated feeds or feeds subjected to other bacteriostatic or bactericidal treatment ~~(e.g. organic acids)~~ is recommended (e.g. organic acids). Feed should be stored in clean closed containers to prevent access by wild birds and rodents. Spilled feed should be cleaned up immediately to remove attractants for wild birds and rodents.

4. Competitive exclusion may be used in ~~day-old chicks~~ *day-old birds* to reduce colonisation by *Salmonella*.

   When used, competitive exclusion should be administered according to the instructions provided by the manufacturer and in accordance with the standards and recommendations of the *Veterinary Services*.

5. Vaccines are used against *Salmonella infections* caused by different serotypes in various *poultry* species, including single or combined vaccines. Vaccines produced according to the *Terrestrial Manual* should be used.

   If live vaccines are used it is important that field and vaccine strains be easily differentiated in the laboratory. If serology is used as the *surveillance* method, it may not be possible to distinguish between vaccination and *infection* with a field strain.

   Vaccination can be used as part of an overall *Salmonella* control programme. It is recommended that vaccination not be used as the sole control measure.

   When the status of the breeding farm and the hatchery from which the *flock* originates is not known or does not comply with this chapter, vaccination of *flocks*, starting with ~~day-old chicks~~ *day-old birds*, against the *Salmonella* serotypes known to be significant should be considered.

   Vaccination against the *Salmonella* serotypes known to be significant should be considered when moving ~~day-old chicks~~ *day-old birds* to a previously contaminated shed so as to minimise the risk of the birds contracting *Salmonella infection*.

   When used, vaccines should be administered according to the instructions provided by the manufacturer and in accordance with the standards and recommendations of the *Veterinary Services*.

   Vaccination against *S*. Enteritidis can cause a positive reaction in *Salmonella* Gallinarum serological tests and needs to be considered when implementing measures for these pathogens.

6. Depending on animal health, *risk assessment*, and public health policies, culling is an option to manage infected breeder and layer *flocks*. Infected *flocks* should be destroyed or slaughtered and processed to minimise human exposure to *Salmonella*.

   If *poultry* are not culled, eggs for human consumption should be diverted for processing for inactivation of *Salmonella*.

Annex XLII (contd)

Annex III (contd)

7. *S*. Enteritidis is characterised by its ovarian transmission pattern. Countries should set targets for eradicating (or significantly reducing) *S*. Enteritidis from egg-producing flocks through a guided policy for eradication from the top of the production pyramid, i.e. from grandparent *flocks* through breeder *flocks* to layer *flocks*.

8. As far as the veterinary involvement is concerned, the responsible *veterinarian* should monitor the results of *surveillance* testing for *Salmonella*. This information should be available to the *veterinarian* before marketing if a veterinary certificate for *flock Salmonella* status is required. When required by the *Competent Authority*, the *veterinarian* or other ~~authorised~~ person responsible for notification should notify the *Competent Authority* if the presence of *Salmonella* of the relevant serotype is confirmed.

Article 6.5.6.

Prevention of *Salmonella* spread from infected flocks

If a *flock* is found infected with specific *Salmonella* serotypes of concern, the following actions should be taken in addition to general measures detailed in Chapter 6.4. on Hygiene and Biosecurity Procedures in Poultry Production:

1. According to the epidemiological situation, investigations should be carried out to determine the origin of the *infection*.

2. Movement of *poultry flocks* at the end of the production cycle should only be allowed for *slaughter* or destruction. Special precautions should be taken in the transport, *slaughter* and processing of the birds, e.g. they could be sent to a separate *slaughterhouse* or processed at the end of a shift before cleaning and *disinfection* of the equipment.

3. Litter should not be reused. *Poultry* litter/faeces and other potentially contaminated farm waste should be disposed of in a safe manner to prevent the direct or indirect exposure of humans, livestock and wildlife to *Salmonella*. Particular care needs to be taken in regard to *poultry* litter/faeces used to fertilise plants intended for human consumption. If litter is not removed then it should be treated in a manner to inactivate infectious agents, to prevent the spread from one *flock* to the next.

4. Particular care should be taken in cleaning and *disinfection* of the *poultry* house and equipment.

5. Before restocking the facility, a bacteriological examination should be carried out as detailed in this chapter and the *Terrestrial Manual*.

Article 6.5.7.

Recommendations for importation of live poultry (other than day-old birds)

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

1. the *poultry* originated from an *establishment* which participates in a *Salmonella surveillance* programme in accordance with the recommendations in Article 6.5.4.;

2. the *poultry* originated from an *establishment* in which no evidence of *S.* Enteritidis and *S.* Typhimurium has been detected and have had no contact with birds or other material from *establishments* which do not comply with this chapter;

3. the *poultry* originated from an *establishment* which complies with the recommendations of Chapter 6.4.

Article 6.5.8.

Recommendations for importation of day-old birds

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

1. the *day-old birds* showed no clinical signs of salmonellosis on the day of shipment;

2. the *day-old birds* originated from a breeder *establishment* and hatchery which participates in a *Salmonella surveillance* programme in accordance with the recommendations in Article 6.5.4.;

3. the *day-old birds* originated from a breeder *establishment* and hatchery in which no evidence of *S.* Enteritidis and *S.* Typhimurium has been detected and have had no contact during setting, incubation or hatching with *hatching eggs* or other material from *poultry* which do not comply with this chapter;

4. the *day-old birds* originated from a breeder *establishment* and hatchery which complies with the recommendations of Chapter 6.4.;

5. the *day-old birds* were shipped in new and clean *containers.*

Article 6.5.9.

Recommendations for importation of hatching eggs

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

1. the *hatching eggs* originated from a breeder *establishment* which participates in a *Salmonella surveillance* programme in accordance with the recommendations in Article 6.5.4.;

2 the *hatching eggs* originated from a breeder *establishment* in which no evidence of *S.* Enteritidis and *S.* Typhimurium has been detected and have had no contact with *poultry* or other material from *establishments* which do not comply with this chapter;

3. the *hatching eggs* originated from a breeder *establishment* which complies with the recommendations of Chapter 6.4.;

4. the *hatching eggs* were shipped in new and clean *containers.*

- text deleted

CHAPTER 6.6.

SALMONELLA ENTERITIDIS AND SALMONELLA TYPHIMURIUM IN POULTRY

Article 6.6.1.

Veterinary Authorities of *importing countries* should require:

for breeding birds

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

1. come from an *establishment* which has been regularly monitored for the presence of Salmonella in conformity with the provisions of Chapter 6.4. (see Article 6.4.9.);

2. come from a *flock* of birds within the *establishment* in which no evidence of *Salmonella enteritidis* and *Salmonella typhimurium* has been detected and have had no contact with birds or other material from poultry flocks which do not comply with this standard;

3. come from an *establishment* which complies with the hygiene and disease security procedures referred to in Chapter 6.4.

Article 6.6.2.

Veterinary Authorities of *importing countries* should require:

for *day-old birds*

the presentation of an *international veterinary certificate* attesting that the *day-old birds*:

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

2. come from an *establishment* and a hatchery which are regularly monitored for the presence of Salmonella in conformity with the provisions of Chapter 6.4. (see Article 6.4.9.);

3. come from a *flock* of birds within the *establishment* in which no evidence of *Salmonella enteritidis* or *Salmonella typhimurium* has been detected and have had no contact during setting, incubation or hatching with *hatching eggs* or other material from poultry flocks which do not comply with this standard;

4. come from an *establishment* and a hatchery which comply with the hygiene and disease security procedures referred to in Chapter 6.4.;

5. were shipped in clean and unused packages.

Annex XLII (contd)

~~Annex IV (contd)~~

~~Article 6.4.3.~~

~~*Veterinary Authorities* of *importing countries* should require:~~

~~for *batching eggs*:~~

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

~~come from an *establishment* which is regularly monitored for the presence of Salmonella in conformity with the provisions of Chapter 6.4. (see Article 6.4.9.);~~

1. ~~come from a *flock* of birds within the *establishment* in which no evidence of *Salmonella enteritidis* or *Salmonella typhimurium* has been detected and have had no contact with *batching eggs* or material from poultry *flocks* which do not comply with this standard;~~

2. ~~come from an *establishment* which complies with the hygiene and disease security procedures referred to in Chapter 6.4.;~~

3. ~~were shipped in clean and unused packages.~~

- text deleted

Annex V

CHAPTER 6.4.

BIOSECURITY PROCEDURES IN POULTRY PRODUCTION

Article 6.4.1.

Introduction

This chapter provides recommended biosecurity procedures in *poultry* production.

Infectious disease agents of *poultry* are a threat to *poultry* health and, at times, human health and have significant social and economic implications. In *poultry* production, especially under intensive conditions, prevention is the most viable and economically feasible approach to the control of infectious disease agents.

Biosecurity procedures should be implemented with the objective of preventing the introduction and dissemination of infectious disease agents in the *poultry* production chain. The adoption of Good Agricultural Practices and the Hazard Analysis Critical Control Point (HACCP) system will help to achieve these objectives.

Article 6.4.2.

Purpose and scope

This chapter deals with biosecurity procedures in *poultry* production. It should be read in conjunction with the Codex Alimentarius Code of Hygiene Practice for Meat (CAC/RCP 58-2005) and Code of Hygienic Practice for Eggs and Egg Products (CAC/RCP 15-1976 Revision 2007).

This chapter provides general recommendations for infectious disease agents of *poultry*. Recommendations on specific *diseases* may be found in relevant *disease* chapters in the *Terrestrial Code*.

This chapter identifies several relevant biosecurity measures. The choice of measures to be implemented will vary according to national conditions, including *poultry* disease status, the risk of introduction and dissemination of infectious disease agents and the cost effectiveness of control measures.

Article 6.4.3.

Definitions (for this Chapter only)

Breeders

means *poultry* destined for the production of fertile eggs for incubation for the purpose of producing *day-old birds*.

Culling

means the depopulation of a *flock* before the end of its normal production period.

Live bird markets

means markets where live birds from various sources are sold for *slaughter* or further rearing.

Annex XLII (contd)

Annex V (contd)

Article 6.4.4.

Recommendations on the location and construction of poultry establishments

1. All establishments (poultry farms and hatcheries)

   a) A suitably isolated geographical location is recommended, taking into account the direction of the prevailing winds, location of other *poultry establishments* and the distance from roads used to transport *poultry*.

   b) *Poultry establishments* should be located and constructed to provide adequate drainage away from the site.

   c) *Poultry* houses and hatcheries should be designed and constructed (preferably of smooth impervious materials) so that cleaning and *disinfection* can be carried out effectively. Ideally, the area immediately surrounding the *poultry* houses should be paved with concrete or other impervious material to facilitate cleaning and *disinfection*.

   d) The *establishment* should be surrounded by a security fence to prevent the entry of unwanted animals and people.

   e) A sign indicating restricted entry should be posted at the entrance to the farm.

2. Additional measures for poultry farms

   a) *Establishments* should be designed for use with single species and single purpose. Whenever possible, the 'all-in all-out' single age group principle should be used. If this is not feasible and several *flocks* are maintained on one *establishment*, each *flock* should be managed as a separate *epidemiological unit*.

   b) *Poultry* houses, and buildings used to store feed or eggs, should be constructed and maintained to prevent the entry of wild birds, rodents and insects.

   c) Where feasible the floors of *poultry* houses should be constructed using concrete or other impervious materials and designed so that cleaning and *disinfection* can be carried out effectively.

   d) Where feasible, feed should be delivered into the farm from outside the security fence.

3. Additional measures for hatcheries

   a) The design of the hatchery should take account of work flow and air circulation needs, with 'one way flow' ' movement of eggs and *day-old birds* and one way air flow in the same direction.

   b) The hatchery buildings should include physical separation of areas used for the following:

      i) personnel changing, showering and sanitary facilities;

      ii) receipt, storage and transfer of eggs;

      iii) incubation;

      iv) hatching;

      v) sorting, sexing and placing of *day-old birds* in boxes;

vi) storage of egg boxes and chick boxes, egg flats, box pads, chemicals and other items;

vii) washing equipment;

viii) waste disposal;

ix) dining facilities for personnel;

x) office space.

Article 6.4.5.

Recommendations applicable to the operation of poultry establishments

1. All establishments (poultry farms and hatcheries)

a) There should be good communication between all those involved in the *poultry* production chain from breeding to production and consumption to ensure that steps are taken to minimise dissemination of infectious disease agents. Personnel should have access to basic training in biosecurity relevant to *poultry* production and food safety.

b) Traceability at all levels of the *poultry* production chain should be possible.

c) Records of production should be maintained. On farm, this includes treatment, vaccination, *flock* history, mortality and *disease surveillance* data. This should be maintained on an individual *flock* basis. In hatcheries, relevant records include fertility, hatchability, vaccination and treatment. Records should be readily available for inspection.

d) A *veterinarian* should be responsible for monitoring *poultry* health on the *establishment*.

e) Access to the *establishment* should be controlled to ensure only authorised persons and *vehicles* enter the site.

f) *Establishments* should be free from unwanted vegetation and debris.

g) Procedures for the prevention of entry of wild birds, and the control of vermin such as rodents and arthropods should be implemented on a routine basis.

h) All personnel and visitors entering an *establishment* should follow a biosecurity procedure. The preferred procedure is for visitors and personnel to shower and change into clean clothes and footwear provided by the *establishment*. Where this is not practical, clean outer garments (coveralls or overalls, hats and footwear) should be provided.

Before entering and after leaving a *poultry* house, personnel and visitors should wash their hands with soap and water and use a properly maintained disinfectant footbath. The disinfectant solution in the footbath should be changed on a regular basis to ensure its efficacy, according to the manufacturer's instructions.

i) Personnel and visitors should not have had recent contact with other *poultry*, *poultry* waste, or *poultry* processing plant(s). This time period should be based on the level of risk of transmission of infectious disease agents. This will depend on the *poultry* production purpose, biosecurity procedures and disease status (e.g. the time between visiting a breeder *flock* and then a broiler *flock* would be less than the time between visiting a broiler *flock* and then a breeder *flock*).

Annex XLII (contd)

Annex V (contd)

j) Delivery *vehicles* should be cleaned, and disinfected before loading each consignment of *hatching eggs*, *day-old birds* or *poultry*.

2. Additional measures for all poultry farms

a) Animals, other than *poultry* of the appropriate (resident) species and age, should not be permitted access to *poultry* houses. No animals should have access to other buildings (e.g. those used to store feed or eggs).

b) The water supply to *poultry* houses should be potable according to the World Health Organization or to the relevant national standard, and microbiological quality should be monitored if there is any reason to suspect contamination. The water delivery system should be disinfected between *flocks* when the *poultry* house is empty.

c) Birds used to stock a *poultry* house should preferably be obtained from breeder *flocks* and hatcheries that are free from vertically transmitted infectious disease agents.

d) Heat treated feeds with the addition of bacteriostatic or bactericidal treatments is recommended (e.g. organic acids). Where heat treatment is not possible, the use of bacteriostatic or bactericidal treatments is recommended.

Feed should be stored in a manner to prevent access by wild birds and rodents. Spilled feed should be cleaned up immediately to remove attractants for wild birds and rodents.

e) The litter in the *poultry* house should be kept dry and in good condition.

f) Dead birds should be removed from *poultry* houses as quickly as possible or at least daily. These should be disposed of in a safe and effective manner.

g) Personnel involved in the catching of birds should be adequately trained in bird handling and basic biosecurity procedures.

h) *Poultry* should be transported in well ventilated *containers* and should not be over crowded. Exposure to extreme temperatures should be avoided.

i) *Containers* should be cleaned and disinfected between each use.

j) When a *poultry* house is depopulated, it is recommended that all faeces and litter be removed from the house and disposed of in a manner approved by the *Veterinary Services*.

If litter is not removed and replaced between *flocks* then the litter should be treated in a manner to inactivate infectious disease agents, to prevent the dissemination of infectious disease agents from one *flock* to the next.

After removal of faeces and litter, cleaning and *disinfection* of the building and equipment should be done in accordance with Chapter 4.13.

All litter removed from a *poultry* house should be disposed of in a safe manner to prevent the dissemination of infectious agents.

k) For *poultry flocks* that are allowed to range outdoors, attractants to wild birds should be minimised e.g. feeders should be kept inside the *poultry* house. *Poultry* should not be allowed access to sources of contamination (e.g. household waste, other farm animals, stagnant water and litter storage areas). The nesting area should be inside the *poultry* house.

l) To avoid the development of antimicrobial resistance, antimicrobials should be used according to relevant directions of the *Veterinary Services* and manufacturer's instructions and in accordance with *Terrestrial Code* Chapters 6.8., 6.9., 6.10. and 6.11.

3. Additional measures for breeder farms

a) Nest box litter and liners should be kept clean.

b) *Hatching eggs* should be collected at frequent intervals, at least daily, and placed in a new or clean and disinfected *container*.

c) Grossly dirty, broken, cracked, or leaker eggs should be collected separately and should not be used as *hatching eggs*.

d) *Hatching eggs* should be cleaned and sanitised as soon as possible after collection using an approved sanitising agent, in accordance with the manufacturer's instructions.

e) *Hatching eggs* or their *containers* should be marked to assist *traceability* and veterinary investigations.

f) The sanitised *hatching eggs* should be stored in a dedicated room as soon as possible after collection. Storage conditions should minimise the potential for microbial contamination and growth and ensure maximum hatchability. The room should be well ventilated, kept clean, and regularly disinfected using disinfectants approved for this purpose.

4. Additional measures for hatcheries

a) Dead in shell embryos should be removed from hatcheries as soon as they are found and disposed of in a safe and effective manner.

b) All hatchery waste, garbage and discarded equipment should be contained or at least covered while on site and removed from the hatchery and its environs as soon as possible.

c) After use, hatchery equipment, tables and surfaces should be promptly and thoroughly cleaned and disinfected with an approved disinfectant.

d) Egg handlers, chick sexers and chick handlers should wash their hands with soap and water before commencing work and between working with batches of *hatching eggs* or *day-old birds* from different breeder *flocks*.

e) *Hatching eggs* and *day-old birds* from different breeder *flocks* should be kept separate during incubation, hatching, sorting and transportation.

f) *Day-old* birds should be delivered to the farm in new *containers* or in clean, disinfected *containers*.

Article 6.4.6.

Prevention of further dissemination of infectious disease agents of poultry

When a *flock* is determined to be infected, in addition to the general biosecurity measures described previously, management procedures should be adjusted to effectively isolate the infected *flock* from other *flocks* on the *establishment* and other epidemiologically related *establishments*. The following measures are recommended:

Annex XLII (contd)

Annex V (contd)

1. Personnel should be trained in the management of infected *flocks* to prevent the dissemination of infectious disease agents to other *flocks* and *establishments*, and to humans (relevant measures include: handling of an infected *flock* separately, last in sequence and the use of dedicated personnel and clothing and equipment).

2. Epidemiological investigations should be carried out to determine the origin and route of transmission of the infectious disease agent.

3. *Poultry* litter/faeces and other potentially contaminated farm waste should be disposed of in a safe manner to prevent dissemination of infectious disease agents.

4. Depending on the epidemiology of the *disease*, the results of a *risk assessment*, and public and animal health policies, culling may be used to manage infected *flocks*. When infected *flocks* are destroyed or slaughtered they should be processed in a manner to minimise exposure of humans and other *flocks* to the infectious disease agent, and in accordance with recommendations of the *Veterinary Services* and relevant chapters in the *Terrestrial Code*. Based on *risk assessment*, non-infected, high risk *flocks* may be culled. Movement of culled *poultry* should only be allowed for *slaughter* or destruction.

   Before restocking, the *poultry* house or *establishment* should be cleaned, disinfected and tested to verify that the cleaning has been effective. Special attention should be paid to feed equipment and water systems.

   Microbiological monitoring of the efficacy of *disinfection* procedures is recommended when pathogenic agents have been detected in the previous *flock*.

5. Depending on the epidemiology of the *disease*, *risk assessment*, vaccine availability and public and animal health policies, vaccination is an option to minimise the dissemination of the infectious disease agent. When used, *poultry* should be vaccinated in accordance with the directions of the *Veterinary Services* and the manufacturer's instructions. Recommendations in the *Terrestrial Manual* should be followed as appropriate.

Article 6.4.7.

Recommendations to prevent the dissemination of infectious disease agents from live bird markets

1. Personnel should be educated on the significance of infectious disease agents and the need to apply biosecurity practices to prevent dissemination of these agents. Education should be targeted to personnel at all levels of operations in these markets (e.g. drivers, owners, handlers, processors). Programmes should be implemented to raise awareness of consumers of the risks associated with activities of live bird markets.

2. Personnel should wash their hands with soap and water before and after handling birds.

3. All *containers* and *vehicles* should be cleaned and disinfected every time they leave the market.

4. Live birds that leave the market should be housed separately from other birds for a period of time to minimise the potential dissemination of infectious disease agents of *poultry*.

5. Periodically the market should be emptied, cleaned and disinfected. This is of particular importance when an infectious disease agent of *poultry* deemed significant by the *Veterinary Services* has been identified in the market or the region.

6. Where feasible, *surveillance* should be carried out in these markets to detect infectious disease agents of *poultry*, especially those agents of zoonotic significance. The *surveillance* programme should be determined by the *Veterinary Services*, and in accordance with recommendations in relevant *disease* specific chapters of the *Terrestrial Code*.

7. Attempts should be made to ensure the possibility of tracing all birds entering and leaving the markets.

Annex XLIII

Dossier in Support of Control of Hazards of Animal and Public Health Importance in Heat Treated Pet Food for the OIE Terrestrial Animal Health Code

July 17, 2009

Expert Reviewers

W.D. Hueston
Director, University of Minnesota Center for Animal Health and Food Safety

Stuart MacDiarmid
Principal International Adviser Risk Analysis, International Coordination, MAF and Adjunct Professor in Veterinary Biosecurity (Massey University)

David E. Swayne
Center Director, Southeast Poultry Research Laboratory
Agricultural Research Service, USDA

Y.M Saif
Head, Food Animal Health Research Program
The Ohio State University

Contributing Authors

James Barritt, Mars Pet Care US
Allen Bingham, Kelly Foods
Pablo Carrion, Nestle Purina Pet Care Global
Nancy K. Cook, Pet Food Institute
David Corley, Nestle Purina Pet Care Global
Christopher Cowell, Nestle Purina Pet Care, North America
Richard Driggs, Nestle Purina Pet Care, North America
Fausto Fiorini, Nestle Purina Pet Care, Central and South America
Larry Hawley, Del Monte Foods
Claude Huard, Hill's Pet Nutrition
Philip Jackson, Nestle Purina Pet Care, Asia, Oceania, and Africa
Diane Loiselle, Hill's Pet Nutrition
Clotilde Marchand, Nestle Purina Pet Care, Europe
Robert Strathman, Hill's Pet Nutrition
John Reynolds, P&G Pet Care
Angele Thompson, Thompson Pet Tech
Jean Vignal, Nestle Purina Pet Care, Global

1. Executive Summary

This dossier provides supporting information for the proposed *Terrestrial Animal Health Code* chapter, *The Control of Hazards of Animal and Public Health Importance in Pet Food.* Recommendations for controlling hazards through adherence to appropriate practices during the production (procurement, handling, storage, processing and distribution) of *pet food* are provided. *Pet food* is an important component of the animal feed and human food supply-chain that has a direct impact on animal health and welfare and also on food safety and public health. Processed pet food must meet the sanitary and phytosanitary (SPS) requirements of the importing country as well as the country of manufacture.

Pet food is defined in the chapter as: "any commercial feed, including snacks and treats, prepared and distributed for consumption by dogs or cats." The World Customs Organization recognizes dog and cat food with a specific code in its Harmonized Commodity Description and Coding System classification of commodities for global trade.

Pet food manufacturers are responsible for making safe and nutritious pet foods that meet regulatory requirements in the country of manufacture and marketing. This dossier describes methods of processing used in pet food manufacturing that create three moisture levels of pet food: wet, soft-moist, and dry. It should be noted that pet foods are produced using processes originally developed and proven for production of human foods. As new human food processes are developed, they are quickly adapted for use in making pet food and the processes are often identical, although the ingredients may not be.

The processes used in the production of pet food ensure that they are free from biological pathogens, specifically those sometimes found in animal-derived ingredients. Commercially-produced pet food utilises animal origin ingredients from a variety of species. Commonly used animal sources include cattle, swine, sheep, and many species of poultry. In some locations, deer, rabbit, kangaroo and other mammals may be used. Aquatic animals such as fresh-water fish and marine origin materials, such as crustaceans and marine fish are also commonly used in pet food manufacturing. These ingredients are major sources of high quality protein and fat and are important components of the economic value of the livestock, poultry and aquatic animals from which they are produced.

Independent of the animal species of origin, common industry-wide manufacturing cooking processes have been established over many decades of safe production around the world. These methods ensure that the finished products will not contain the animal pathogens of interest.

Concerns about pathogens such as *Salmonella, Clostridium perfringens,* avian *Birnavirus* (infectious bursal disease or IBDv), avian influenza (AI), and Newcastle disease (ND) have disrupted global trade of pet food in recent years due to a lack of understanding of the processes involved in pet food manufacturing. Thermal processing reduces the numbers of pathogenic organisms resulting in safe pet food. However, because bovine spongiform encephalopathy (BSE) is caused by an unconventional pathogen that is not completely inactivated by normal cooking processes, control of BSE risks must rely on proper ingredient sourcing.

2.0 Introduction

Today, the range of pet food products is nearly as diverse as those produced for human consumption. A wide variety of processed pet foods is manufactured to meet the needs of the pet and the multiple and changing desires of the consumer. This market demand for choices requires the utilisation of several sources of animal-based ingredients to meet the nutrition, taste, and texture requirements for modern pet food.

Pet food is often overlooked as a component of the animal feed and human food supply-chain that has a direct impact on animal health and welfare and also on food safety and public health. The importance stems not only from the potential to affect pets and their owners, but also from the potential to affect food producing animals through the use of pet food as a protein source in compounded feeds. Because of the ongoing perceived risk of BSE, ruminant protein-based pet food should not be fed to ruminant animals.

This dossier pertains **only** to commercially produced pet foods, including pet treats and pet chews, using animal-derived ingredients and that are manufactured by heat treatment in cooking processes (thermal processing). These products may be produced by baking, rotary moulding, extrusion, extrusion-expansion, slow cooking or other processes which cook the product. This dossier does not pertain to pet foods with only vegetable-based ingredients.

The major groups of commercially processed pet food are: wet, soft-moist, and dry (often called "kibble" or "crunchy"). While ingredients may be similar across these groups, the exact formulas and processes are considered intellectual property of the manufacturer. Specific values are trade secrets, but examples of general process conditions can be discussed. As an example, some dry foods that look like pellets were not made via the pelleting process, but by some other process with the same moisture group endpoint.

To ensure that dogs and cats consume and enjoy their meals, coatings are often added as flavours or palatants to dry and soft-moist pet foods. The coatings that are relevant to this dossier are those that include processed animal digests or flavouring innards (acidified ingredients); and those that include dried milk and cheese products and dried eggs (all non-acidified ingredients) as part of the formula.

2.1 Global Value of Pet Food

The first documented commercial pet food was created in the United Kingdom in the 1860s as biscuits for a ship's dog and was later commercialised for sale to English huntsmen. The industry rapidly developed in the 1920s with the advent of commercial canning technology for human food, which was used also to provide food for dogs in military units. When extrusion-expansion technology was developed in the 1940s and 1950s for cereal products, it was quickly recognised that the process made convenient and safe products for use in feeding the growing number of dogs and cats living with people in their homes. As other types of processing have been developed, they too, have found their way into use for manufacturing and packaging pet food. In fact, the convenience of feeding prepared pet food along with improved access to veterinary care has helped increase the number of household pets worldwide.

As global prosperity has increased, the knowledge of the benefits of good nutrition for both humans and their pets has increased as well. This has generated the need for expanded trade in food items known to benefit health and that provide variety and convenience. Growing trade in meat, milk, eggs, all types of fruit and vegetables and a wealth of complex processed foods for people and pets has been seen in most areas of the world.

International trade in commercially produced pet food is growing. This growth has resulted in value to the pet food industry of almost US$49 billion in 2008. Of the ten top companies producing pet food in the world, four are based in North America, two in the European Union, two in Japan and two in Brazil. Consistent with principles of the World Trade Organization, efficiencies in international trade in pet food benefit consumers, farmers and manufacturers in all areas of the world (Appendix A). The World Custom Organisation's International Convention on the Harmonized Commodity Description and Coding System, Chapter 23 Residues from Food Industries, Animal Feed of the Harmonized System (HS) lists "dog or cat food, put up for retail sale" as 2309.10., while "other preparations of a kind used in animal feeding" are coded 2309.90.

The importation and exportation of pet food are critical business functions necessary to meet the global consumer demand for high quality pet foods. Wet and dry foods are the most widely traded, while growth in soft-moist products is mostly attributable to the growth in the market for pet treats. Growth in these markets is increasing because of the rising acceptance of pets in the household.

Appendix B shows the domestic pet food consumption figures for each country and the world total retail sales in US dollars for the top 100 markets. Appendices A and B illustrate the expanding economic importance of global trade in pet food.

3.0 How pet food is made

3.1 Introduction

This document discusses the manufacturing of pet food from its ingredients to the finished product. Pet food is judged for acceptability every day by its ultimate consumer, the pet dog or cat. It is the manufacturer's responsibility to deliver safe, palatable and nutritious food to the pet every day.

The making of commercial pet foods is a blend of science, cultural preference, and culinary art. Pet food is a complex product, as it must meet the needs of the pet, often as a complete and balanced diet, as well as meeting the desires of the consumer who purchases it. The processes used to make pet food are often the same technologies used to make foods for human consumption. However, pet food is different from human food in that the design must often meet all the nutritional requirements of the dog or cat as its sole source of nutrition. This is a goal that is seldom a concern for human food other than infant formulas. Snacks and treats are usually not formulated to provide all of the nutritional requirements of the pet.

Pet food must deliver the nutrient requirements for its intended use. In addition to energy and water, pets need between 42 and 48 essential nutrients which must be supplied in the diet. Those nutrients must be incorporated in the food via the ingredients of the pet food. Ongoing research on dog and cat nutritional requirements continually provides new and important information.

Dogs are omnivores which are able to eat a wide range of both plant and animal foods. Dogs are considered to be opportunistic carnivores because when given the opportunity they will readily eat animal-based foods. However, they are very flexible and adaptable in their diet, which has served them well over millennia of intimate cohabitation with humans.

Cats are obligate carnivores with specific metabolic requirements for some nutrients of animal origin. For example, they do not produce enough of nutrients such as taurine or arachidonic acid in their bodies, so these nutrients must come from their daily diets. Cats can digest and use plant-sourced ingredients as sources of nutrients. They can also use carbohydrates to spare the use of protein for energy production but cats are not as flexible as dogs in their diets and have only cohabited with humans for centuries rather than millennia.

Pet food, including its ingredients, manufacturing and labelling, is highly regulated in many countries of the world. Countries wishing to trade pet food internationally should use existing international regulatory agreements, including the relevant chapters in the Terrestrial Animal Health Code.

3.2 Starting Point

There are several steps in the development of a pet food. The first step is to consider the nutrient requirements of the targeted species including the intended life stage of growth, breeding, adult maintenance, and aging. Will this product be a complete food, an incomplete food, a veterinary therapeutic diet or a treat/snack? Once these determinations have been made, the recipe or formula of the food are designed to meet the intended use of the product. The nutrients that must be provided in complete and balanced diets include: water, proteins and amino acids, fatty acids, vitamins, minerals, fibre and other carbohydrates. Depending on their intended purpose, treats and therapeutic diets may not contain all required nutrients. Finally, a determination must be made as to what moisture group the finished product will be assigned.

3.3 Moisture Groups

The moisture content of the pet food was chosen as the means to group the wide variety of pet foods discussed in the *Terrestrial Animal Health Code* chapter because this method aligns with the manufacturing processes which deliver shelf-stable products with specific moisture endpoints. Each of these specific endpoints are designed to produces safe, nutritious products. Further, labelling and nutritional requirements for pet foods are also based on the moisture content of the food as illustrated in pet food regulations found in many countries[1].

For this dossier and in general use, Group A (wet pet food) is defined as having a moisture content greater than 65% as fed. Group B (soft-moist pet food) is also known as "semi-moist" or "intermediate moisture" food; and is defined as having a moisture content from 20% to 65%, while most of these products range in the area of 25%-32% moisture as fed. Finally, Group C (dry pet food, "kibble" or "crunchy") has less than 20% moisture as fed (Table 1) [1]. As shown in Table 1, each of these moisture groups also has sub-groups which are well accepted around the world. Nonetheless, all thermally processed pet foods fall into one of these categories.

Table 1. Pet Food Groups by Moisture

Group	% Moisture in finished product	Product subgroup
A- Wet	>65	1) Low-acid pet food in hermetically sealed containers 2) Refrigerated pet food in non-hermetically sealed containers
B- Soft-moist	20-65	1) Extruded-expanded pet food 2) Extruded-non-expanded pet food 3) Non-extruded pet food
C-Dry	< 20	1) Extruded-expanded pet food 2) Extruded non-expanded pet food 3) Non-extruded pet food

3.4 The Matrix

In the context of pet food, the "matrix" means the complex combination of ingredients which deliver the nutrients and the processing method which results in the moisture group to which the product as been assigned. The nutrients are embedded in the ingredients within the matrix. The ingredients and the processing method combine to make the matrix, which then becomes the finished food.

Large-scale production of pet food requires the use of ingredients that are widely availability and affordable. There is a vast array of possible ingredients, but each one will have a specific role within the matrix. There are many parameters to be considered when choosing ingredients such as: availability (including seasonality), consistency, process applicability, species of animal source, form (wet, dry, fresh, frozen, etc.), storage limitations, and cost. The ingredient must deliver the desired functionality, palatability, nutrient levels, nutrient availability and overall digestibility when added and combined into the matrix.

3.5 Ingredients

Ingredients for pet foods are often sourced from animals and plants intended for human consumption. In many countries, pet food ingredients are co-products from the production of human food. The types of ingredients available for use in pet foods, particularly, animal-based ingredients, are determined by the food culture of the region.

Ingredients used to make pet food have to be safe for their intended use and are subject to regulations in most countries. Countries may define or issue standards for certain ingredients regarding acceptable levels of residues, mycotoxins, etc., just like for human foods.

In addition to meeting regulatory standards, each manufacturer will have further specifications that the ingredient must meet. These specifications may include nutrient levels, attributes such as colour or texture, particle size, measures of oxidative stability, mould or bacteria numbers. A certificate of analysis (COA) on the ingredient demonstrates that the ingredient meets the required specifications. Manufacturers typically perform audits on their suppliers for compliance with contractual agreements and specifications. Ingredients will be visually inspected and may be tested when they arrive at the manufacturer. Tests performed on the ingredient may include proximate nutrient analyses (crude protein, crude fat, crude fibre, and ash), moisture content, mycotoxins or peroxide values, as appropriate.

3.6 Processing

Once the ingredients have been determined, the other contributor to the matrix is the processing method that is used to manufacture the finished product. Specific processing methods are considered to be trade secrets with no one company's methods being exactly like another. The type of processing method influences the decisions about the ingredients. The most common methods are: baking, retort cooking; extrusion, both with and without expansion, freezing, slow cooking, *sous vide* (cooking but then storing under refrigeration) and whatever other imaginative process that can be applied making a new food product.

The first pet foods were baked biscuits much like those consumed by sailors on the high seas. They tended to be made mostly from wheat flour with some animal fat and salt added. Eventually, biscuits evolved into both complete feeds providing all required nutrients and treats and snacks, which might not have all the essential nutrients.

Later, technology was developed for canned foods and the availability of wet or high moisture products to the consumer became widespread. That retorting (cooking with heat and pressure) technology has been expanded to work for pouches, trays, and tubs (Group A1). Retorted products have many forms: ground (minced), pâtés, loaves, chunks, fillets, flakes, slices and all of those forms can be combined with sauces, gravies, gels or aspic. Retorted foods typically have greater proportions of fresh or frozen animal-based ingredients than dry or rendered ingredients.

These same animal-based ingredients can also be formed into chubs and chill-packs, (Group A2) which can be frozen or refrigerated. An even newer development is the use of *sous vide* as a processing method. These products also use a high percentage of fresh or frozen animal-based ingredients which are then cooked. A finished *sous vide* product must be refrigerated throughout the retail distribution chain.

The methods for processing soft-moist food include: extrusion, with or without expansion (Groups B1 and B2); co-extrusion, using more than one extruder (Groups B1 and B2); slow cooking or baking (Group B3). The processing methods for dry food include: extrusion-expansion (Group C1) co-extrusion, extrusion-without expansion (Group C2), pelleting (rarely) (Group C2); slow cooking (Group C3), baking, followed by drying or by simple drying alone (Group C3).

Many ingredients are common to both soft-moist and dry pet food. Dry, rendered animal-based ingredients may be used in dry or soft-moist products. Plant-based ingredient supplying protein and carbohydrates are also common to both groups. Many soft-moist and dry products also may contain fresh/frozen animal-based ingredients, but they must be handled differently from dry ingredients. Soft-moist products, because of their higher moisture content, also have ingredients such as acidifiers, humectants and preservatives, which contribute to a reduced water activity and result in a stable finished product. The details of the processing methods for soft-moist and dry are presented in detail in the appendices to this document.

Dry and soft-moist products often have coatings added after the initial cooking and drying process to act as flavouring agents or palatants. Coatings can consist of: fats or oils, both animal and plant based; liquids, including digests of animal-based materials; and/or dry powders, which are often dried digests or other ingredients such as milk or cheese powders. These palatants increase the attractiveness of the product to pets through the addition of aroma and flavour. These coatings will be discussed in greater detail in an appendix.

Animal proteins and fats from all species can be used in all groups of products. All products that are complete feeds usually contain vitamin/trace mineral premixes that have been matched to the processing method to account for potential processing losses.

3.7 Co-Manufacturing and Co-Packing

The making of food, be it for pets or humans, is complex. Some companies have the resources and choose to invest in the capital assets of processing equipment. Other companies choose to focus their resources on marketing of the product while having recipes to which they own the rights manufactured into products by another company. This is called co-manufacturing. Co-manufacturers produce finished products to the product owner's specification. Additionally, some companies may not have all of the needed packaging equipment and will use the services of a co-packer (also known as a toll packer), who places the product into its final container. These co-manufacturing systems are not unique to pet food and are widely used in the production of human foods. Such products are often known as store-brand or private label products. Even large well-recognised human food brands routinely use co-manufacturers to deliver their products globally.

4.0 Pasteurisation and Pathogen Control

Once the ingredients come into a manufacturing facility, they are mixed according to the recipe and subjected to the chosen method of processing to result in the finished product within the chosen moisture group. Some of the keys to product safety inside the manufacturing facility across all types of processing are: plant design, thermal process controls, ingredient consistency, ingredient storage, plant sanitation, operator training, prevention of post-process cross contamination and packaging integrity.

Thermal processing is the most common general type of process applied to pet foods. While heat changes protein structures and develops desirable flavour notes, it also is responsible for the destruction of various animal pathogens which might be present in the raw ingredients, thus producing safe food for pets. Each of the moisture groups A, B and C are subjected to processing that reduces the risk from possible animal pathogens in the raw materials (Table 2).

It is the responsibility of the pet food industry to produce safe products. While each company has confidential processes, some general conditions can be met industry-wide. Each of the identified groups is processed in ways that ensure their safety. Group A products with their anaerobic environments are processed sufficiently to control *Clostridium*. Group B and C products are processed sufficiently to control *Salmonella*, which means that other pathogenic bacteria such as Enterobacteriacea are also controlled, along with viruses such as classical swine fever, infectious bursal disease, Newcastle disease and avian influenza viruses, amongst others.

Note that *E. coli*, *Salmonella*, and *Listeria* are all destroyed if a temperature of 70º C is achieved for one second during processing [2, 3]. The inactivation of avian influenza (AI) (high and low pathogenic) and Newcastle disease virus (NDV) has been documented in several studies as virtually instantaneous (less than 1 second) at 70°C and 74°C, respectively. [4, 5, 6, 7]. The *Terrestrial Animal Health Code* (Article 15.3.15.) specifies a core temperature of 70°C for inactivation of classical swine fever virus[8]. The inactivation conditions for *Salmonella* exceed those for inactivation for avian influenza[9]. Reduction of infectious bursal disease virus (IBDv) is achieved at temperatures above 71º C [10, 11]. It is important to note that all of these inactivation temperatures are minimum internal product temperatures achieved throughout the matrix.

Table 2 lists the minimum treatment or temperature applied in the processing of ingredients of animal origin used in pet foods to ensure the inactivation of biological hazards discussed in this dossier. It should be noted that there is already international agreement on the acceptability of the treatment shown for Wet (Low-Acid Canned Foods) [12]. Other moisture groups are currently under review by the pet food industry.

Table 2. Minimum Treatment/Temperature for Processing of Ingredients of Animal Origin in Pet Food

Group	Product subgroup	Minimum treatment/temperature
A Wet	1) Low-acid pet food in hermetically sealed containers 2) Refrigerated pet food in non-hermetically sealed containers	1) F_0= 3 F_c= 3 2) BD*
B- Soft-moist	1) Extruded-expanded pet food 2) Extruded-non-expanded pet food 3) Non-extruded pet food	1) TBD* 2) TBD* 3) TBD*
C- Dry	1) Extruded-expanded pet food 2) Extruded non-expanded pet food 3) Non-extruded pet food	1) TBD* 2) TBD* 3) TBD*

*** TBD- To Be Determined- Under Study**

4.1 Group A: Wet Pet Food

This group is defined as having a moisture content of greater than 65% and is comprised of two sub-groups.

Group A1 is called "low acid hermetically sealed pet food," because the finished product has a finished equilibrium pH greater than 4.6, so the term "low-acid canned foods" or LACF is often used to describe this category [13, 14]. Although the term "canned" is used, the pet food industry uses the same technology for other types of containers including those made of plastic (trays), laminated materials (pouches) and others that are cooked in retorts.

The process involves a filling step, a hermetic sealing step, and then a heat and pressure retort treatment step that is designed for the size of the container and the ingredients used in the product. The process is designed to deliver commercial sterility. That means that the wet product is free from viable microorganisms of significance to public health and spoilage.

Achieving commercial sterility requires both thermal processing and hermetic sealing of the package. The thermal process follows a process schedule calculated to meet the regulatory requirements for commercial sterility. The critical factors include the formulation of the product or its matrix and the type and size of the container. Once those factors are determined, the thermal process is calculated for the microorganisms of interest.

A hermetically sealed container is defined as an air-tight container that is designed to protect the contents against the entry of microorganisms and thereby to maintain the commercial sterility of its contents during and after processing. To achieve commercial sterility, three conditions must be met:

1. The use of proper filling and sealing procedures that result in hermetically sealed containers capable of preventing the re-entry of microorganisms into the product after achieving commercial sterility.

2. The application of the scheduled thermal process to ensure the commercial sterility of the product and the container.

3. The use of proper post-process handling procedures to protect the integrity of the sealed and processed containers.

The pet food industry uses the same conventional canning technology that is used for human foods and, in most countries, is under regulatory control in order to achieve $F_0>3$ or $F_C>3$. The accumulated lethality given to a thermally processed food is referred to as its F-value. F-values are expressed in minutes at a specific temperature required to destroy a certain number of viable cells. F-values are cited with a reference temperature (Tref) and slopes called its z-value (z); and are written in the form Fz/Tref. F_0 is frequently cited in retorting processes (such as cans, pouches and trays). It specifically refers to the accumulated lethality when the reference temperature is 121.1°C and z-value is 10°C. When the target organism is *Clostridium botulinum* and a 12-log cycle reduction (reduction in the number of target organisms by 10) is desired, the F-value is normally expressed: $F_0 = F_{10/121.1°C} = 3.0$ minutes[14]. In pet food processing, thermal processes frequently exceed $F_0 = F_{10/121.1°C} = 3.0$ minutes, and are often found in the F_0 range of 5-8 as an additional margin of safety[15]. Details are given in Appendix F.

Group A2 is wet pet food that is cooked to pasteurisation temperatures, packaged and chilled for storage and transport. Much of this product is very similar in appearance to sausages containing spices, vegetables or other ingredients and intended for human consumption.

4.2 Group B: Soft-moist Pet Food

Group B products are defined as having a moisture content of greater than 20% and less than 65%. Most are in the range of 25% to 32% moisture on an as fed basis. These are sometimes known as intermediate moisture foods or semi-moist foods.

Microbial stability in Group B products is achieved not only by thermal processing and high moisture content but also by controlling water activity. Group B products often are made by employing what is known in both human and pet food manufacture as 'hurdle' technology to achieve microbial stability. This technology consists of developing obstacles or hurdles that are known to impede microbial growth based on the vulnerabilities of the microorganisms. The hurdles may include acidification, water activity reduction and chemical preservation.

Additional ingredients may be added to the mix to make safe, shelf stable, and higher moisture products. These ingredients might include acidifiers, humectants and preservatives such as inorganic and organic acids (phosphoric acid, sorbic acid, propionic acid, etc.), salts, sugar sources (dextrose, corn syrup, molasses, etc.), and polyalcohols. These additional ingredients result in an adjusted final product water activity (Aw) of 0.60 to 0.80, which means that the water present in the product is not available for the growth of microorganisms[16]. Combinations of these hurdles allow for the production of safe, palatable products without excessive levels of preservatives.

Soft-moist foods in Group B can be manufactured by methods similar or identical to those dry products in Group C. Examples are; extrusion with expansion (Group B1) extrusion without expansion (Group B2), and slow cooking, baking (Group B3). Much of the discussion on thermal processing in Section 3.2 is valid for Group B and C products as well. As in Group C, forming extrusion is often used in manufacturing these Group B products, which may or may not be expanded and are usually cooled, rather than dried, after extrusion. The product mixtures are extruded, subjecting them to similar thermal and mechanical energy as in Group C, resulting in the same inactivation of pathogens. The products are usually acidified with ingredients such as phosphoric acid or organic acids. The acids lower the pH of the matrices so that the growth conditions inhibit microbial growth. The water activity is controlled by the addition of humectants such as salts, sugars, etc. The lower water activities do not allow the pathogens access to the water they need to grow. Finally, anti-mycotic agents may also be included as a barrier to microbial growth.

4.3 Group C: Dry Pet Food

Group C products are defined as having a moisture content of no greater than 20% and are usually referred to as dry pet foods, often called "kibble" or "crunchy." Pet foods of this type are similar to human foods such as, but not limited to, breakfast foods, crackers and cookies. These products may be produced in a number of ways, including but not limited to, extrusion-expansion (Group C1), extrusion-without expansion (Group C2), and baking, pelleting, slow cooking (Group3). The cooking process may vary but always results in a shelf-stable product. The process cannot be identified from the shape of the product. A product that looks like a pellet may not have been made by the process of pelleting, but by one of the other methods.

All of the process methods used to make Group C dry pet food achieve pasteurisation and microbial control. As the processes were developed over time, the finished products also showed improved microbial stability. Pelleting was one of the first methods adopted for making animal and pet foods of uniform size and shape. Pelleting used as a thermal process kills all coliforms at temperatures from 80°C to 90°C and total bacteria are significantly reduced [17].

However, researchers found that extrusion was more uniformly bactericidal than pelleting and began to develop processes to use that technology in food processing. Extrusion cooking is universally recognised as a high temperature, short time process. During extrusion, the preconditioned (hydrated and heated) slurry is subjected to a succession of variable treatments. These variables include moisture and temperature profiles, extruder configuration, and extruder speed. The critical process parameters for cooking are summarised into four areas: specific mechanical energy, specific thermal energy, retention time, and moisture levels. The temperature rise in the extruder barrel is primarily from mechanical energy dissipated through the rotating screw. It may be assisted by the direct injection of steam or from external thermal energy sources.

The key steps in this process relevant to pathogen inactivation are preconditioning and extrusion. The drying phase may also contribute to pathogen control. Each step has a time and temperature profile unique to the product and the manner in which it is produced. When taken together, they provide assurance that the sanitary objective has been achieved. This process will vary by company and by the type of product being made. Each of these processes is proprietary in nature and thus is a trade secret of the individual company.

The reduction of moisture by processing results in reduced water activity (Aw). When water activity is reduced to 0.60 to 0.80 (a dimensionless quantity that represents the energy status of the water), the water present in the product is not available for the growth of microorganisms. Water activity is one of the crucial factors in producing shelf-stable products[19].

5.0 Conclusion

The *Terrestrial Animal Health Code* chapter aims at ensuring the control of animal and public health hazards through adherence to international practices during the production (procurement, handling, storage, processing and distribution) of pet food. The chapter applies to the production of all products of animal origin destined for pet food including pet chews.

This document describes major processes used in the manufacture of pet food. There are as many ways to make safe food for pets as there are for foods for human consumption. This document describes the pet food groups referred to in the chapter. This dossier provides information showing that these groups can be produced in ways that reduce the pathogen risk. This reduction of risk allows for the safe global trade in pet foods. Other processes may be used to produce an equivalent endpoint to those described here. That is, they must produce safe, healthful foods for dogs and cats.

For more detail on each of these processes, please refer to the appendices D and E.

Annex XLIII (contd)

6.0 References

1. Association of American Feed Control Officials Incorporated Oxford, Indiana, USA. Official Publication 2009; 132-134

2. Hoffmans CM, Fung DYC. Effective method for dry inoculation of bacterial cultures. J Rapid Methods and Automation in Microbiology 1993;**1**:287-294.

3. Mossel DAS, Corry JEL, Struijk CB and Baird RM. Essentials of the microbiology of foods: A textbook for advanced studies. J. Wiley & Sons 1995.

4. Thomas C,Swayne DE. Thermal inactivation of H5N1 high pathogenicity avian influenza virus in naturally infected chicken meat. Journal of Food Protection 2007;**70**:674-80.

5. Thomas C, King DJ, Swayne DE. Thermal inactivation of avian influenza and Newcastle disease viruses in chicken meat. Journal of Food Protection 2008;**71**:1214-22.

6. Swayne DE,.Beck JR. Heat inactivation of avian influenza and Newcastle disease viruses in egg products. Avian Pathol 2004;**33**:512-8.

7. Swayne DE. Microassay for Measuring Thermal Inactivation of H5N1 High Pathogenicity Avian Influenza Virus in Naturally-Infected Chicken Meat. International Journal of Food Microbiology 2006;**108**:268-71.

8. *Terrestrial Animal Health Code* World Organisation for Animal Health 17th edition 2008;Vol 2:Article 15.3.25.

9. Swayne D., Thomas C. Trade and food safety aspects for avian influenza viruses 2008; 493-506

10. Alexander DJ, Chettle NJ. Heat inactivation of serotype 1 infectious bursal disease virus. Avian Pathol 1998;**27**:97-9.

11. Mandeville WF, Cook FK, Jackwood DJ. Heat lability of five strains of infectious bursal disease virus. Poult Sci 2000;**79**:838-42.

12. Recommended international code of hygienic practices for acidified and acidified low acid canned foods Codex Alimentarius Commission/RCP 23/1979 Rev 2 (1993)

13. United States Code of Federal Regulations 21, Part 113. Thermally processed low acid foods packaged in hermetically sealed containers.

14. GMA Science and Education Foundation Canned Foods: Principles of Thermal Process Control, Acidification, and Container Closure Evaluation. Washington D.C., Seventh Edition

15. Thermal Food Processing: New Technologies and Quality Issues, CRC Press edited by Da-Wen Sun, Boca Raton, FL 2006;78-79

16. Rokey G, Personal communication Wenger Manufacturing Inc., Sabetha, Kansas, USA

17. Crane FM, Hansen M, Yoder R, Lepley K, Cox P. Proceedings 'Effect of Processing on Nutritional Values in Feeds' National Academy of Sciences. Effect of Processing Feeds on Molds, Salmonella and Other Harmful Substances in Feeds. 1973; 87-88.

18. Rokey G, Sanitation by Extrusion, Wenger Manufacturing Inc., Sabetha, Kansas, USA

19. Frazier WC. Food Microbiology McGraw-Hill. 2nd Edition, 1967.

APPENDIX A

TOP TEN GLOBAL PET FOOD COMPANIES BY SALES IN 2007

COMPANY	WORLD HEADQUARTERS	2007 RETAIL SALES US $ BILLIONS	YEAR TO YEAR GROWTH % 2006-07
Mars, Inc	McLean, VA, US	$11.8	9.8%
Nestle' SA	Vevey, Switzerland Nestle Purina PetCare, St. Louis MO, US	$10.9	5%
Colgate-Palmolive Co.	New York, NY, US Hill's Pet Nutrition Topeka, KS, US	$3.0	8.3%
Proctor & Gamble Co.	Cincinnati, OH, US P&G Pet Care, Dayton, OH, US	$2.99	3.4%
Del Monte Foods Co.	San Francisco, CA, US	$1.7	1.5%
Agrolimen SA	Sant Cugat del Valles. Spain	$.61	4.3%
Uni-Charm Corp.	Tokyo, Japan	$.31	4.1%
Nutriara Alimentos Ltda.	Arapangas, Parana State, Brazil	$.27	39.1%
Total Alimentos SA	Tres Caracoes, Brazil	$.23	19%
Nisshin Seifun Group	Tokyo, Japan	$.20	1.9%

Annex XLIII (contd)

APPENDIX B

DOG AND CAT FOOD RETAIL VALUE FOR WORLD + TOP 100 MARKETS

Dog and Cat Food Retail Value (RSP, including treats and mixers)

World Summary + Top 100 Markets - Values at Current Prices (US$ in Millions)
Fixed 2008 Exchange Rates

Country/Market	2003	2004	2005	2006	2007	2008
World	37,461.2	39,392.8	41,317.3	43,719.5	46,117.1	48,839.0
USA	13,060.3	13,713.3	14,346.3	15,134.0	15,818.8	16,501.2
Japan	3,393.4	3,403.8	3,405.5	3,457.9	3,521.7	3,596.2
Brazil	1,634.8	2,031.6	2,314.7	2,643.0	3,029.1	3,514.9
United Kingdom	2,860.6	2,942.9	3,049.7	3,168.7	3,311.8	3,441.8
France	2,524.9	2,592.1	2,672.9	2,744.8	2,819.9	2,894.4
Germany	2,469.2	2,388.3	2,422.3	2,462.7	2,470.4	2,479.5
Italy	1,587.4	1,659.8	1,737.9	1,810.3	1,885.6	1,977.6
Russia	401.1	532.9	722.7	912.2	1,134.7	1,406.5
Mexico	760.4	834.2	908.0	1,090.5	1,203.3	1,317.9
Canada	1,027.5	1,071.0	1,114.0	1,157.9	1,208.3	1,259.6
Australia	928.3	961.7	996.0	1,046.2	1,095.2	1,145.1
Netherlands	720.1	742.7	766.0	791.4	810.0	837.5
Spain	604.6	644.2	682.7	719.3	762.8	814.3
Belgium	437.0	445.4	455.9	466.6	476.8	485.8
Sweden	403.4	412.1	424.8	434.6	446.3	456.3
Argentina	155.6	193.7	239.0	289.9	352.7	432.5
Poland	280.0	306.3	323.3	353.0	379.6	407.4
Switzerland	356.3	349.1	344.9	346.1	349.8	353.6
South Africa	233.8	249.0	264.0	276.9	293.5	310.3
Finland	254.8	263.5	275.2	286.7	296.1	309.8
Venezuela	102.1	158.6	146.2	164.8	204.6	305.4
Chile	181.1	201.1	235.6	253.9	276.6	301.3
Norway	257.2	265.1	272.1	278.2	284.9	294.5
Austria	294.8	295.3	292.2	287.5	284.9	282.8
China	172.9	192.0	213.0	231.8	247.3	265.3
Czech Republic	169.2	181.7	197.4	217.0	237.6	254.3
Hungary	136.2	157.3	175.0	195.7	216.7	235.4

Dog and Cat Food Retail Value (RSP, including treats and mixers)

World + Top 100 Markets - Values at Current Prices (US$ in Millions)
Fixed 2008 Exchange Rates

Country/Market	2003	2004	2005	2006	2007	2008
New Zealand	171.6	181.7	192.6	203.0	213.0	222.8
Thailand	109.8	126.6	145.4	168.4	193.5	221.4
Portugal	170.9	173.8	184.5	198.2	209.8	217.0
South Korea	185.3	208.1	172.9	182.1	196.5	213.1
Ireland	173.3	180.4	186.4	193.9	202.9	212.2
Taiwan	155.2	162.7	168.4	174.1	184.0	195.7
Ukraine	78.1	91.2	106.0	125.8	151.0	185.2
Romania	65.1	78.6	105.9	126.9	149.7	182.4
Colombia	135.7	141.1	147.7	157.5	164.0	178.4
Denmark	139.0	140.7	142.5	147.1	152.8	159.2
Turkey	55.2	71.8	89.7	98.1	108.8	121.6
Greece	97.1	100.5	100.4	101.6	103.2	103.8
Israel	61.3	64.0	67.1	71.7	77.4	82.5
Malaysia	46.3	48.5	50.9	53.5	56.8	60.4
Hong Kong, China	47.5	48.1	49.1	50.6	52.4	56.4
Singapore	29.9	31.8	33.6	35.6	36.9	38.2
Bulgaria	16.4	20.0	22.7	26.2	29.6	33.2
Slovakia	20.0	22.3	23.9	26.7	30.0	33.1
India	17.7	18.0	20.9	24.3	26.8	32.5
Morocco	19.2	20.6	22.3	24.2	26.3	28.4
Serbia and Montenegro*	14.4	13.4	14.9	16.8	19.3	22.1
Myanmar * modeled*	11.7	12.3	13.9	15.9	18.2	20.8
Peru *	6.6	12.0	12.8	14.5	15.3	20.8
Guatemala *	12.4	13.9	14.3	15.6	16.6	20.3
Philippines	13.3	14.1	15.4	16.9	18.5	19.6
Puerto Rico *	16.8	16.9	17.4	17.9	18.4	19.0
Dominican Republic *	10.5	11.8	12.1	13.2	14.1	17.1
Indonesia	8.8	10.0	11.4	13.1	14.8	16.7
Cuba *	9.2	10.2	10.6	11.5	12.3	14.7
Luxembourg *	13.4	12.4	12.7	12.9	13.3	13.9

Annex XLIII (contd)

Dog and Cat Food Retail Value (RSP, including treats and mixers)

World + Top 100 Markets - Values at Current Prices (US$ in Millions)
Fixed 2008 Exchange Rates

Country/Market	2003	2004	2005	2006	2007	2008
El Salvador *	7.9	8.8	9.1	9.9	10.6	12.8
Saudi Arabia	8.2	9.1	9.7	10.2	11.1	12.8
Slovenia *	10.9	10.6	11.1	11.5	12.0	12.7
Uruguay *	8.7	8.4	8.8	9.0	9.7	10.6
Iceland *	11.0	10.7	10.4	10.5	10.3	10.6
Costa Rica *	5.1	5.7	5.9	6.5	6.9	8.4
Lithuania *	7.2	6.7	6.7	6.7	7.2	8.1
Croatia *	6.1	5.8	5.7	5.7	6.2	6.9
Panama *	4.2	4.7	4.9	5.3	5.7	6.8
Latvia *	5.7	5.4	5.3	5.3	5.8	6.4
Jamaica *	4.0	4.4	4.6	5.0	5.4	6.4
Malta *	4.8	4.4	4.6	4.9	5.3	5.6
Ecuador *	1.7	3.2	3.4	3.8	4.1	5.5
Honduras *	3.2	3.6	3.7	4.1	4.4	5.3
Bolivia *	4.7	4.4	4.2	4.5	4.7	5.2
Haiti *	3.1	3.4	3.5	3.9	4.1	5.0
Belarus *	2.2	2.3	2.6	3.0	3.7	4.5
Paraguay *	4.0	3.8	3.6	3.8	4.0	4.5
Cyprus *	3.6	3.6	3.7	3.8	3.8	4.0
Vietnam	2.0	2.3	2.6	3.1	3.4	3.5
Bosnia-Herzegovina *	2.2	2.1	2.3	2.6	3.0	3.4
Estonia *	2.8	2.6	2.6	2.6	2.8	3.1
Georgia *	1.4	1.5	1.7	2.0	2.4	3.0
Trinidad and Tobago *	0.8	1.5	1.6	1.8	1.9	2.6
Guadeloupe *	2.2	2.0	2.1	2.1	2.2	2.3
Turkmenistan *	0.9	1.0	1.2	1.4	1.7	2.2
Nicaragua *	1.2	1.4	1.4	1.5	1.7	2.0
Kazakhstan *	0.8	0.9	1.0	1.2	1.5	1.9
Bahamas *	1.7	1.7	1.7	1.8	1.8	1.9
Egypt	1.3	1.4	1.5	1.6	1.6	1.8

Dog and Cat Food Retail Value (RSP, including treats and mixers)

World + Top 100 Markets - Values at Current Prices (US$ in Millions)
Fixed 2008 Exchange Rates

Country/Market	2003	2004	2005	2006	2007	2008
Macedonia *	1.1	1.0	1.2	1.3	1.5	1.7
Martinique *	1.5	1.4	1.5	1.5	1.5	1.6
Uzbekistan *	0.6	0.7	0.8	0.9	1.1	1.4
Andorra *	1.1	1.1	1.1	1.2	1.3	1.4
Barbados *	1.0	1.0	1.1	1.1	1.1	1.2
Bermuda *	1.0	1.1	1.1	1.2	1.2	1.2
Fiji *	0.9	0.8	0.8	0.9	1.0	1.1
Albania *	0.6	0.7	0.7	0.8	0.9	1.0
Netherlands Antilles *	0.9	0.9	0.9	1.0	1.0	1.0
Liechtenstein *	1.0	1.0	1.0	1.0	1.0	1.0
Pakistan *	0.5	0.5	0.5	0.6	0.7	0.9
Monaco *	0.9	0.8	0.9	0.9	0.9	0.9
Brunei *	0.7	0.7	0.7	0.7	0.7	0.8

* These are modeled estimates.

Sources:

1. Pet Food and Pet Care Products: Euromonitor from trade sources/national statistics

Note: Historic regional/global values are the aggregation of local currency country data at current prices converted into the common currency using fixed exchange rates.

Date Exported (GMT): 28/04/2009 9:05:06 PM

APPENDIX C

ANIMAL PATHOGENS INACTIVATED BY HEAT TREATMENT

Emerging and re-emerging animal diseases are a continual threat to the pet food production system and international trade. Although not comprehensive, the animal diseases listed below are the priority pathogens that have the potential to disrupt trade of pet food on a global basis. Following a critical review of the established minimum heat treatments described in this dossier, the Expert Review Panel concluded that the following diseases are sufficiently inactivated to not be of concern to animal health:

Animal Pathogens Inactivated by Heat Treatment

Name	Temp	Reference
Foot and mouth disease	**70°C, 30 min or equivalent**	**TAHC Article 8.5.32**
Avian influenza	**70°C, < 1 second**	**4, 5, 6,7**
Newcastle disease	**74°C, < 1 second**	**5, 6**
Infectious bursal disease	**75°C, 57 min**	**10**
Classical swine fever	**F_0>3 or 70°C**	**TAHC Article 15.3.25**

Note: Concerns about BSE have disrupted the global trade in pet food. Control of BSE is in the sourcing of the ingredients and not in the processing.

APPENDIX D

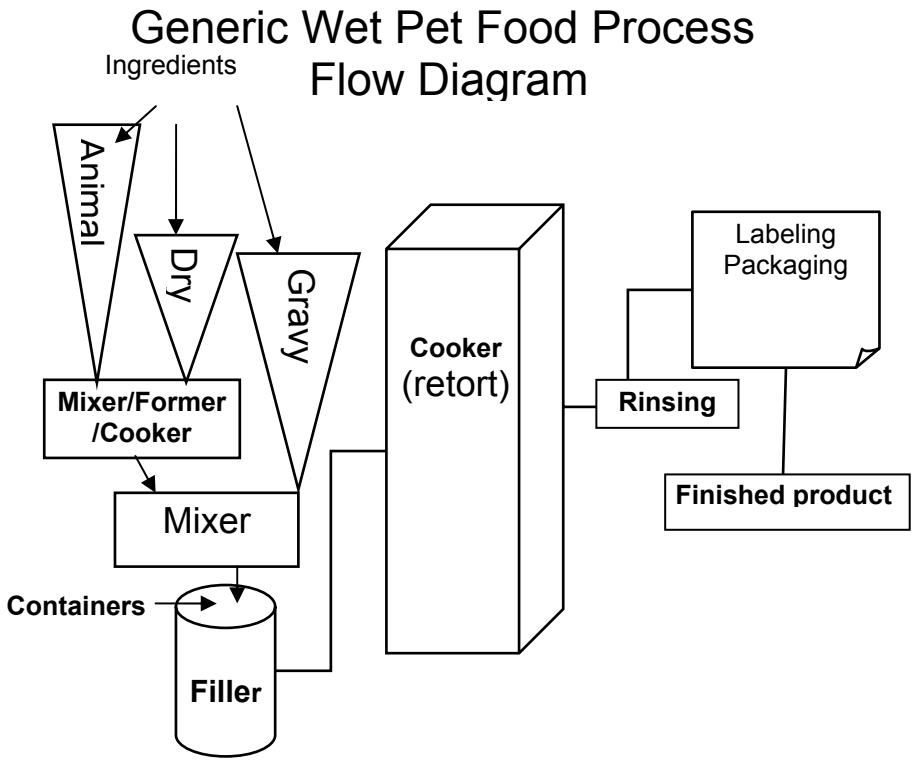
PROCESSING EXAMPLES

Appendix D-1 Wet pet food processing

Wet processing is based on cooking under pressure or retorting. The containers used may be cans, pouches, trays, tubs, chubs, etc. Some products may be cooked and then aseptically filled. Figure 1 is a flow diagram for a generic wet process. Wet and dry ingredients are combined in a mixer/former where the mixture might be cooked to set the proteins of a shaped piece. They then might be mixed with gravy. These products are typically hot filled into containers that are then subjected to retorting. The products may have many forms in the package such as being ground, chunked, filleted, sliced, cubed, or whatever form is popular with the pet or its owner. Some are packed in gravy, aspic or juices.

There are three key parts to wet processing for producing a safe product: integrity of the packaging, thermal treatment and prevention of post-processing contamination. All such operations are subject to the same regulations as foods for human consumption under low acid hermetically sealed food regulations. These regulations require: registration, submission of detailed process control reports, inspections and certification of operators.

Figure 1.



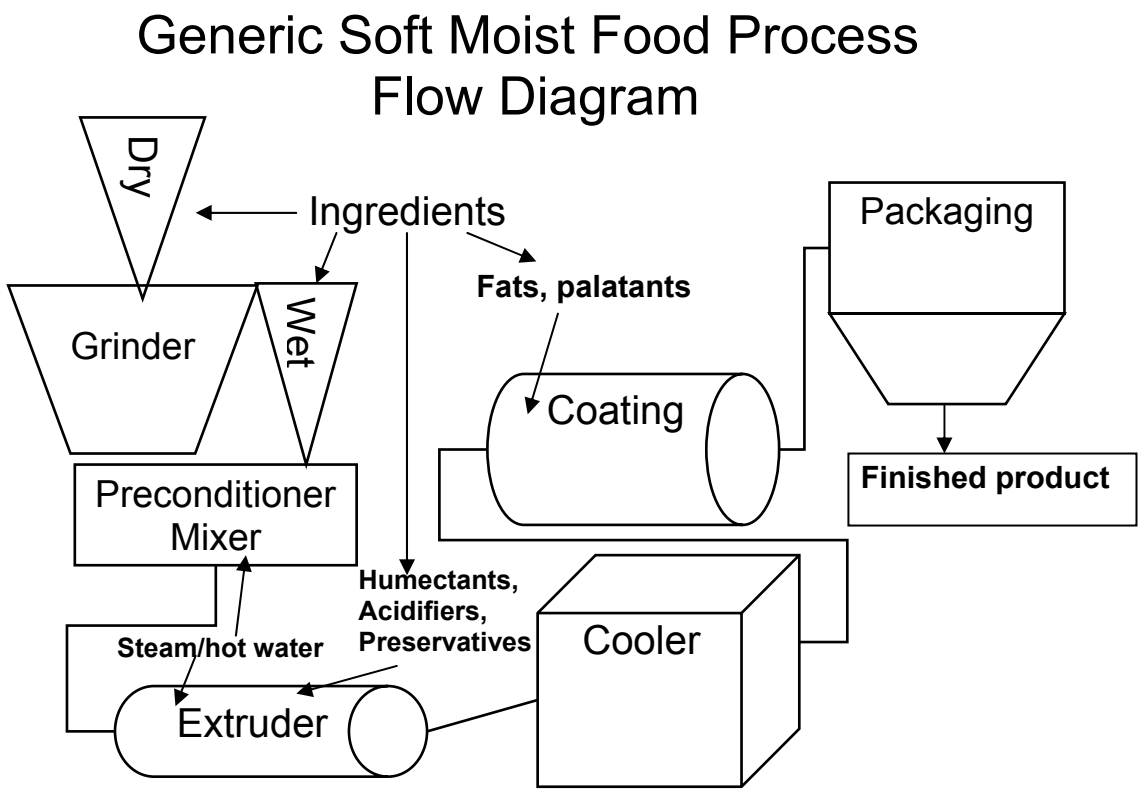
Annex XLIII (contd)

Appendix D-2 Soft-moist pet food processing

Extrusion

The processing of extruded soft-moist products is quite similar to dry processing. (See Figure 2) The dry ingredients enter the mixer and are hydrated with water and/or steam. As the mix flows into the extruder, slurries with finely ground animal-based ingredients and liquid ingredients, including acidifiers, preservatives, and other water binding ingredients, are often introduced into the matrix. Steam heats the matrix while the equipment pushes the material forward creating both thermal and mechanical energy. The matrix may be kept below 100°C, which results in a non-expanded product. Expansion occurs at temperatures above 100°C in the matrix at the exit of the extruder. The product exits the end of the extruder with about 25 to 35% moisture. These products are subjected to cooling rather than drying which allows for retention of some of the moisture and may have coatings added similarly to dry products.

Figure 2



Slow cooked soft-moist pet food processing

Slow cooking for soft-moist foods is similar to that of dry pet foods. For example, in one possible method, the ingredients of animal origin are cooked at a temperature of 100°C for approximately 40 minutes. The matrix is cooled and partially dried to a specific moisture level. Additional ingredients, such as humectants, may be added to the matrix to make safe, shelf stable soft-moist products with the proper water activity. This process provides the necessary thermal processing for the pathogens to be destroyed. The finished product is then packaged in the appropriate container.

Appendix D-3 Dry pet food processing

There are a number of methods available to produce dry pet foods, such as pelleting, extrusion (with or without expansion), baking, and slow cooking. In general, these processes combine a complex matrix of ingredients to provide a complete and balanced diet.

Pelleting is one process whereby materials are subjected to heat via steam conditioning and to pressure from the material being moved through a restricting die. This method has been used to produce animal feeds and pet foods since the 1930s. Currently this method is most often used for the production of animal feed, rather than pet food, though it may occur. The resulting product is a hard, dense, brittle and dry piece.

One of the most widely used methods of producing dry pet food is extrusion and expansion. This is the same technology used to cook and puff whole grains for human consumption, as well as to form fancier human expanded products including snacks and breakfast foods. Extrusion is a hydro-thermal process where the critical process parameters of retention time, moisture, thermal and mechanical energy inputs are varied to produce the desired product. The extrusion process can be divided into two basic categories, cooking extrusion and forming extrusion. Cooking extrusion elevates temperature under pressure to a level that results in an expanded product kibble with a final density less than that of the starting raw materials. The extruded kibble (Group B) is the most common form of dry pet food sold through international trade.

In addition to single flow extrusion, pet foods and treats can also be made using the technology of co-extrusion. Co-extrusion comprises the combination of one or more matrices into a finished product. The resulting combination may be different colour, different texture, or different consistency. However, the thermal process of extrusion technology is still at the heart of these more complex products. Co-extruded product may be shaped into small bites or into complex shapes like bacon, jerky, twists or other specialty products.

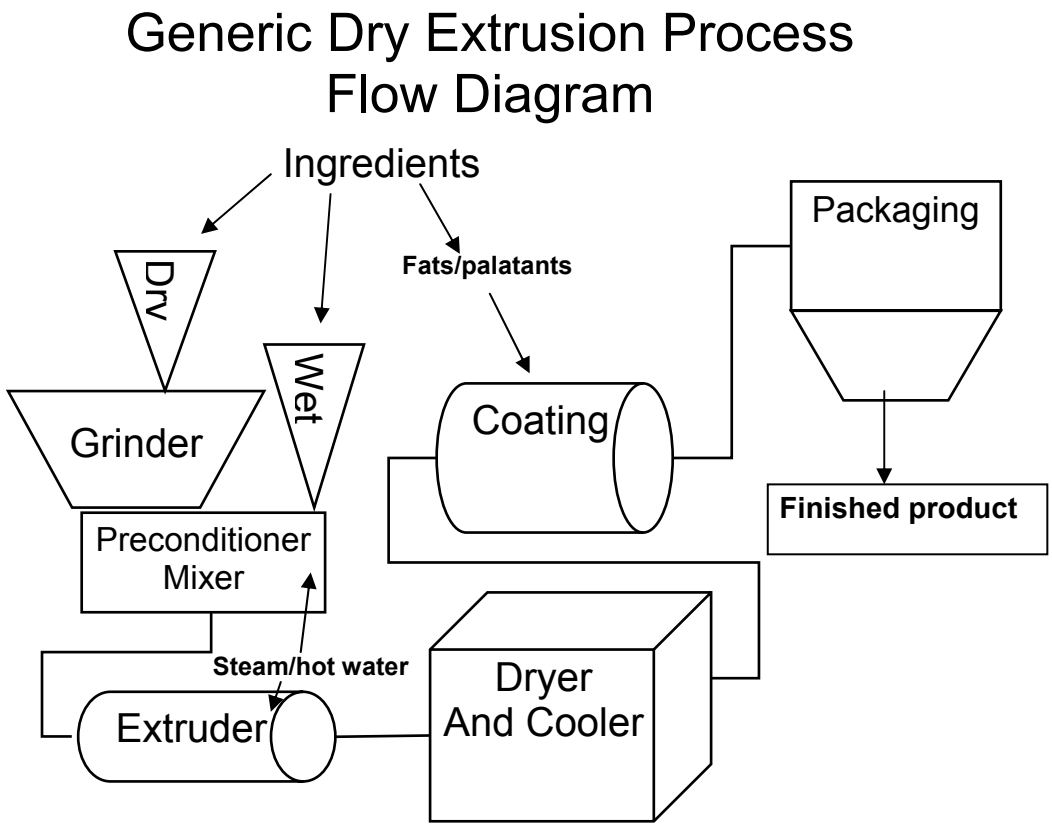
Forming extrusion is used to produce other dry pet food that is cooked but that may not be expanded. Pet food, including snacks and treats, may also be produced through rotary moulding and injection moulding. These products may be cooked before, during or after forming. The microbial controls provided by the temperatures and times referenced in pre-conditioning will also apply to formed products. Equivalent thermal kills that produce safe products can be achieved through the manipulation of time and temperature.

Extrusion processing involves hydrating dry ingredients and then subjecting them to heat via the extruder barrel and the addition of both thermal and mechanical energy. The pet foods may or may not be subjected to pressure. The ingredients are thoroughly cooked in each method, which provides the necessary processing for pathogens to be destroyed. The end result is a nutritious and safe product.

The design and running conditions of the equipment determine whether or not the product is expanded when exiting the extruder. See Figure 3. During the flow of ingredients in the mixer (or preconditioner), water is added (which may be hot) to help in the processing of the materials. The material then flows into the extruder. Sometimes other materials are added into the extruder such as fats or slurries of animal-based ingredients to form the final matrix. The barrel of the extruder is heated via a steam jacket and water (which may be hot) may also be added. After extrusion, forming and cutting, the product is dried and then subjected to coating. After coating, the product is then packaged into the appropriate, properly labelled container.

Annex XLIII (contd)

Figure 3



Slow cooked dry pet food processing

The ingredients of animal origin are mixed and pasteurized. They are then combined with other ingredients to create a diet that is nutritionally complete and balanced. For example, in one possible method, the ingredients of animal origin are cooked at a temperature of 100°C for approximately 40 minutes. The exact combinations of time and temperature will vary according to the trade secrets of a company. This process provides the necessary thermal processing for the pathogens to be destroyed. The food matrix is then formed into the desired shape and enters the final drying process. The finished product is then packaged in the appropriate container.

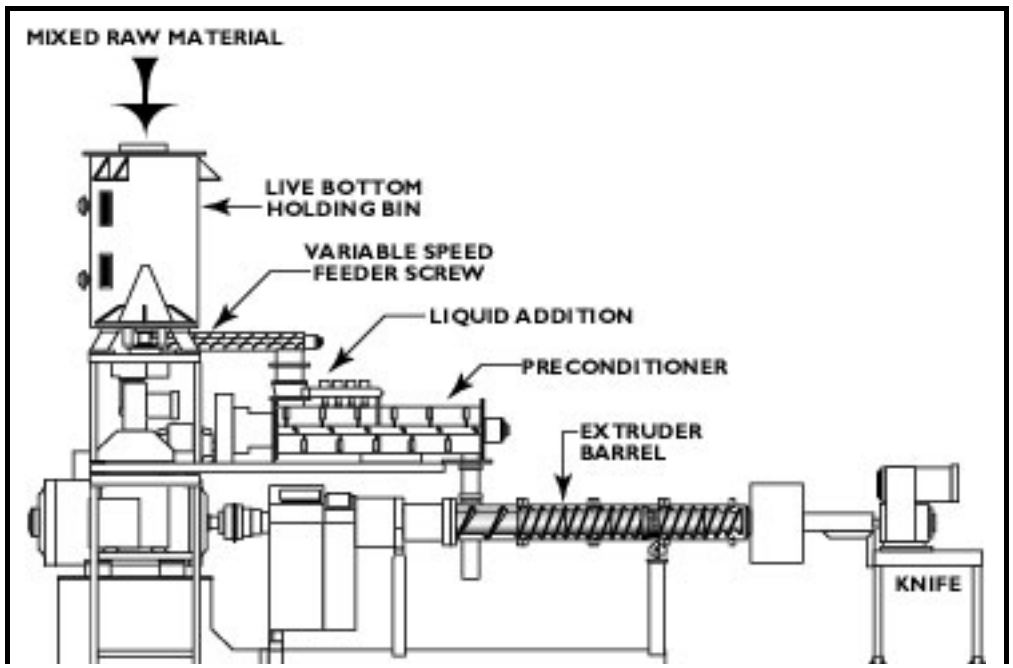
Appendix D-4 The Extrusion Process

The process flow diagram for an extrusion application is illustrated in Figure 4.

A wide variety of ingredients is used in order to produce an extruded kibble (piece) that is nutritionally complete and balanced for the feeding of dogs or cats. These ingredients are chosen for their nutritional, textural, and flavouring aspects. The dry ingredients are usually ground to a small particle size with attention being paid to maintaining the uniform integrity of the mixture.

An extrusion system includes a live bin/feeder for the dry ingredients, a preconditioner, an extrusion cooker, and finally, a die/knife assembly as shown in Figure 4. Each component is designed to accomplish a specific function in the process of cooking and forming pet food products. The operating conditions are influenced by the ingredients and are adjusted to vary the characteristics of the finished pet food.

- Figure 4: Extrusion System



Preconditioning: Time and Temperature

The preconditioner is the first step where the dry ingredients are subjected to heat, usually in the form of added steam and hot water. The step is used to hydrate and begin to heat the ingredients so that the resulting slurry can be introduced to the extruder. Although preconditioning is a part of a continuous batch process, the residence time in the preconditioner, may for example range from 120 to 180 seconds with possible temperatures ranging of 80°C to 100°C.

Extrusion Cooking: Time, Temperature, and Pressure

As the slurry exits the preconditioner, it enters the extruder barrel for extrusion cooking. During extrusion, the preconditioned slurry, now hot and wet, is subjected to a succession of variable treatments. These variables include moisture and temperature profiles, extruder configuration, and extruder speed. Inside the extruder barrel is the extruder screw which has various patterns of screw flights. The inside of the barrel wall is also patterned and the result is small channels through which the hot slurry is pressed creating high pressures adding mechanical energy to the matrix. The varying configuration of the screw and wall results in varying process parameters.

The critical process parameters for cooking are summarised into four areas: specific mechanical energy, specific thermal energy, retention time, and moisture levels. The temperature rise in the extruder barrel is primarily from mechanical energy dissipated through the rotating screw. It may be assisted by the direct injection of steam or from external thermal energy sources. Based on selected processing parameters and the amount of moisture in the ingredient mixture, the extrusion cooking process may for example reach a pressure up to 65 bar and a temperature up to 160°C. There are many possible combinations of moisture, temperature, time and pressure found in extrusion processing (Table 1).

- Table 1: Ranges of Possible Extrusion Process Parameters

Process	Moisture (%)	Time (seconds)	Temperature (ºC)	Pressure (bar)
Group B Dry extrusion	22-28	20-30	110-140	40-65
Group C Soft-Moist, single-screw extrusion	18-35	25-35	80-140	15-40
Group C Soft-Moist, twin-screw extrusion	18-45	25-35	60-160	15-40

Most extruder barrels are fitted with temperature and pressure gauges embedded just at the surface of the barrel where it meets the matrix, unlike in hermetically sealed containers where a thermocouple can be sent through the entire processing system. Because the matrix flows through very small channels and passes through the constricted area of the endplate die, it is impossible for "free" thermocouples to retain their integrity through the extruder barrel in non-experimental processing situations.

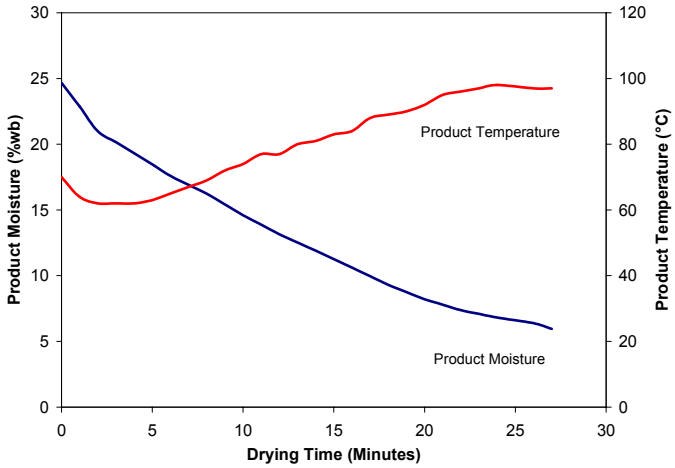
At the end of the extruder is a die plate to form the product and a knife assembly to cut the product to the desired length and shape. The amount of energy, both thermal and mechanical, added to the matrix determines the extent of expansion of the kibble. Some extruders are also equipped with additional pressure systems to control pressure just before the die plate.

Post Extrusion Drying: Time and Temperature

After extrusion, the injected steam and water that has been added to the product must be removed. Part of the moisture is flashed off, or removed from the kibble, if the product is expanded. Typical post-extrusion moistures of dry extruded products will range from 22 to 28%, and that moisture level may be reduced via a dryer to final moisture of 8 to 10% prior to packaging and storage. In contrast, soft-moist extruded products are cooled to maintain a moisture level around 25-30%. Drying curves are used to relate moisture level and temperature over time. The factors that will determine the rate of drying include the incoming product's moisture content, size, shape, and density. Temperature, time, bed depth, and air velocity are all controlled within the dryer to accomplish both complete and uniform drying.

An example of a drying curve for a dry extruded pet food dried at 120°C is shown in figure 5. Figure 5 demonstrates how moisture changes more rapidly during the first portion of the drying process and then more slowly as the drying progresses. The product temperature is about 70°C as it enters the dryer from the extruder as a result of evaporative cooling. The product temperature decreases during the first phase of drying to a minimum of about 60°C. After the surface moisture is removed, the product temperature begins to rise. This is a result of heat being added to the product more quickly than water can be evaporated due to restrictions to water movement within the product. The moisture content corresponding to the point at which the temperature begins to rise is called the critical moisture content, in this case about 18% moisture. Figure 5 illustrates one example of a drying curve for a particular matrix. The target final moisture content is 10%, the required drying time will be about 17 minutes and the final temperature will be approximately 90°C for this example matrix.

Figure 5: Typical drying curve for a dry extruded product.



Post Extrusion Coating

At the end of the dryer, products are cooled slightly and then conveyed to the coating system. At the coating system, usually fats or oils and then palatants are added to the product. The fats or oils may be heated or not. The coatings may be applied either as a liquid via a nozzle or as a dry powder via a powder delivery system. The dry powder addition systems are very similar to those used in chips or crisps for humans to add flavours. The product gets agitated so that the palatants completely enrobe the kibble. This enrobement helps to keep oxygen out of the kibble and reduces oxidative degradation.

Appendix D-5 Baked pet food processing

Baking is a millennium-old process of mixing materials and then subjecting them to dry heat for various times depending on the shape, size and consistency of the material. It is the oldest process of making pet foods, especially those containing animal-based materials. Baked dry pet products are formulated and processed nearly identically to baked human foods. It is no accident that the best known dog biscuit, Milk Bone®, was originally made by the National Biscuit Company, known today as Nabisco, the giant cookie and snack company. Baking cooks the material and reduces the moisture, both of which provide an environment that is not conducive to microbial growth, thus reducing risks to health. Baked pet food products usually include some kind of animal-based protein source, often rendered protein meals. Just as crackers or biscuits for human consumption sometimes include fats, some products for pets include tallow or other oils.

Once the dry ingredients are mixed and liquids added, the mixed dough is shaped either via a die mould or a forming extruder. The pieces are then transferred to a belt that takes the pieces into an oven. In the oven, the product is thoroughly cooked at a particular temperature for a particular time which depends on the thickness and shape of the piece. This supplies the necessary thermal processing for the pathogens to be destroyed. Moisture is also removed in the oven, resulting in a product with moisture below 20% and low water activity. Some baked items also receive a coating (either acidified or non-acidified) and then are returned to a second oven to dry the coating. The drying process can involve additional heat treatment of the product to impart a “baked” or “toasted” flavour and appearance to the product.

Annex XLIII (contd)

Appendix D-6 Coatings

Acidified Coatings

This set of ingredients is comprised of animal origin ingredients which are hydrolyzed by enzymes or added acids and may be used in a dry or liquid form. These are known as palatants, coatings, or flavoured innards. Digest production systems used by pet food manufacturers are proprietary in nature and frequently are produced by processing systems identical to those used in the human food industry for flavours. For pet food, these systems utilise internal organs such as liver of various animal species that undergo a low-pH hydrolysis and additional processing to produce the desired flavouring system in the coating. To improve the palatability of pet food, coatings may be applied to products in Groups B and C. These coatings are applied either before or after the drying stage of production.

The processing systems for these digests usually involve some thermal processing to aid the chemical/enzymatic processes. Under the new EU regulation 399/2008 amendment to the 1774/2002 Annex VIII, Chapter II (Requirements for pet food and dog chews) for flavouring innards, this group is exempt from the 90º C requirement imposed on animal by-products used in the manufacture of pet food These coatings are acidified to a range from pH 2.0 to 4.0, depending on the intended use of the finished pet food. The acidification also contributes to the microbial stability of the coating material.

Non-Acidified Coatings

This set of ingredients is comprised of animal origin ingredients which may be applied to the exterior of products in Groups B and C. Non-acidified coatings may be applied in dry or liquid form to improve the palatability of pet food. As in Acidified Coatings, the production of these ingredients is often proprietary. The primary non-acidified coating of animal origin is rendered fat, such as tallow or poultry fat. Other types of wet or dry coatings are produced from milk, cheese and eggs and are also widely used around the world.

APPENDIX E

CODEX ALIMENTARIUS COMMISSION: RECOMMENDED INTERNATIONAL CODE OF HYGIENIC PRACTICE FOR LOW AND ACIDIFIED LOW ACID CANNED FOODS LACF 1993

Table of Contents

To see the entire document (95 pages), please visit the following web link:
www.**code**xalimentarius.net/download/standards/24/CXP_023e.pdf

Annex XLIV

FUTURE WORK PROGRAMME FOR THE TERRESTRIAL ANIMAL HEALTH STANDARDS COMMISSION

Topic		
Action	**How to be managed**	**Status (September 2009)**
Restructuring of the *Terrestrial Code* Harmonisation of *Terrestrial* and *Aquatic Codes*		
1. Work with AAHSC towards harmonisation, as appropriate, of the Codes 2. Reorganization of semen & embryo chapters 3. Chapters / references of non listed disease	TAHSC, ITD & IETS experts	1. Ongoing 2. Modified CH proposed for MC 3. Deletion proposed for MC
Import risk analysis		
Revise handbook	TAHSC & AHG	On going
Anthrax		
Develop text on the inactivation of *B. anthracis*	TAHSC&SCAD& an expert	Modified CH proposed for MC
Scrapie		
Update CH	TAHSC&SCAD	Modified CH proposed for MC
Evaluation of VS and OIE PVS		
1. review of PVS 2. Address aquatic animal health services 3. inclusion of legislation aspect	1. AHG 2. AHG & ITD 3. TAHSC & ITD	1. Feedback session & AHG in Dec09 2. Ongoing 3. Modified CH proposed for MC
Surveillance articles on AI,ND,CSF		
Modify for consistency	SCAD	Start working
Equine diseases		
Official recognition	SCAD	wait until decision by Council/SCAD
Other *Terrestrial Code* texts in need of revision		
Update CH on Brucellosis	SCAD; APFSWG	AHG in Nov09 under SCAD
Update CH on Rabies	SCAD	AHG in Jan10 under SCAD
Update CH on Bee diseases	SCAD	AHG in Jan10 under SCAD and BSC
Update CH on PPR	SCAD	AHG in Dec09 under SCAD
Update CH on ND (inactivation)	TAHSC &SCAD	Table proposed for MC
Update CH on SVD	SCAD, ITD	Revised CH TAHSC in Feb10
Update CH on ASF(inactivation + SURV)	SCAD	
CH on Paratuberculosis	BSC (diagnostic test) & STD (guidance document)	On hold pending further development in diagnostics

Annex XLIV (contd)

Animal Production Food Safety		
Salmonellosis 1. Consolidate CH on salmonella control. 2. Update biosecurity procedures CH	APFSWG & AHG	Modified draft CH proposed for MC
Discussion paper on future priorities for standard setting	APFSWG & TCC	To be discussed in November
Cysticercosis	APFSWG	On hold
Campylobacterosis	APFSWG	Ongoing
Pet food CH	Expert group	Modified draft CH proposed for MC
Animal welfare		
New texts: 1. Dog populations 2. Lab animals 3. Livestock production systems Future work programme	AWWG & AHGs TAHSC supervision	1. Modified draft CH proposed for MC 2. Ongoing 3. Ongoing
Alternative approaches to providing OIE advice		
Develop alternative mechanism for providing guidance to Members on managing certain animal health and welfare issues outside the Code framework	TAHSC, AWWG, APFS WG & ITD	Ongoing
Commodity-based measures for trade		
1. Examine scientific evidence that beef (deboned matured pH tested) may safely traded regardless of disease status of exporting country/zone 2. OIE/DEFRA project	TAHSC, SCAD, AHG, ITD / S&T Dept	1.Disease specific items ongoing 2.AHG review in Oct09
Role of wildlife as disease reservoirs		
Definition of wildlife	TAHSC with WG on Wildlife & SCAD	On going
Compartmentalisation		
FMD	TAHSC	Draft CH proposed for MC
Aujeszky's disease	TAHSC	On hold
Communication		
Develop new CH	TAHSC & AHG	Ongoing

Note: MC; Member comments, CH: chapter, SURV: surveillance, ITC: International Trade Department, S&T Dept: Scientific & Technical Department, IC: International Committee