



Organisation Mondiale de la Santé Animale

World Organisation for Animal Health

Organización Mundial de Sanidad Animal

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REPORT OF THE SIXTH MEETING OF THE OIE WORKING GROUP ON ANIMAL WELFARE

Paris, 5-7 September 2007

The OIE Working Group on Animal Welfare held its sixth meeting at the OIE Headquarters in Paris on 5-7 September 2007.

The members of the Working Group and other participants are listed in [Appendix A](#). The Agenda adopted is given in [Appendix B](#). Dr D. Bayvel chaired the meeting. Apologies were received from Drs Aidaros and Masiga, who were not able to attend the meeting in person.

On behalf of Dr B. Vallat, Director General of the OIE, Dr A. Thiermann welcomed the members of the Working Group and thanked them for agreeing to continue their work on this important mandate of the OIE.

Dr Thiermann advised that henceforth the industry will have full representation as a Working Group Member on a rotational basis. In 2007 the IDF member will undertake this role and the representatives of the other two industry organisations (the International Meat Secretariat [IMS] and the International Federation of Agricultural Producers [IFAP]) would participate as observers and would attend the second day of the meeting. He also informed members that Dr. Ed Pajor, of Purdue University, USA would present his project to develop an Animal Welfare Educational and Research Database for the OIE. Dr Thiermann informed members that Dr. Marie-Aude Montély, currently working as a intern with the International Trade Department would attend the meeting.

1. PAWWG 5th Meeting Report

Members noted the report. Dr Wilkins mentioned that he had not been able to progress the proposed paper on “Ethical Considerations” and sought advice as to the priority to be placed on this issue. Dr Bayvel summarised the discussion on this point. The conclusion was that Dr Wilkins would prepare a one page paper on an ethical policy for the OIE and send it to Professor Fraser for comment before submitting it for discussion at next PAWWG meeting.

2. OIE General Session 2007

2.1. Resolution on Animal Welfare

Dr Bayvel provided feedback to the Working Group (WG) on his presentation to the International Committee at the 75th General Session in May (GS 75), and confirmed that a copy of his Powerpoint Presentation, the WG annual report and the draft Resolution had been circulated for information to WG members.

2.2. Resolution on Universal Declaration on Animal Welfare (UDAW)

The Resolution was adopted with minor amendment by the International Committee at the GS 75.

Dr Wilkins stated that this OIE decision had provided a major impetus towards obtaining governmental support for the UDAW and for the holding of a Ministerial meeting in 2009. He had sent a letter to all CVOs after the GS and thanked them for their support for the Resolution.

2.3. Agreements between the OIE and other international organisations

The texts of two Agreements (with WSPA and with the International Council for Laboratory Animal Science; ICLAS) were briefly reviewed. Members agreed that these are positive developments.

Professor Fraser noted that although ICLAS was a leading international laboratory animal science organisation, with 40 member countries, it did not provide total international coverage.

Dr Bayvel noted that OIE has also developed a working relationship with the International Association of Colleges of Laboratory Animal Medicine (IACLAM) which is another important international stakeholder in the field of laboratory animal medicine and welfare. Both ICLAS and IACLAM members would contribute to the *ad hoc* Group on Laboratory Animal Welfare.

2.4. Updating of terrestrial animal welfare standards

Dr Thiermann reported to the WG that revisions of four animal welfare standards for terrestrial animals were adopted by the International Committee at GS 75 without further amendment.

WG Members reviewed the texts adopted at the GS 75 and comments received from OIE Members subsequently.

The draft chapters with modifications recommended by the Working Group are at Appendices C-G.

Participants then discussed how best to provide WG comments on OIE Member comments received after the General Session. There is a limited period (between mid-August and early September) in which the OIE compiles the comments of OIE Members for submission to the Terrestrial Animal Health Standards Commission (the TAHSC). These compiled documents could be provided to WG members but feedback would need to be received in time to provide it to the TAHSC.

Dr Kahn noted that the report of the TAHSC's September meeting, including text amendments made in response to OIE Members' comments, are publicly released on the OIE Internet site in October each year. The report of the March meeting is similarly posted on the Internet site in April each year. Dr Thiermann agreed to provide a reminder to WG members twice a year (October and April) when the TAHSC report is placed on the OIE Internet site. This would give WG members an opportunity to provide input to the TAHSC in time for its September/March meetings as appropriate.

2.5. Definition of animal welfare for the Terrestrial Code and interpretation of French terminology ("bientraitance" and "bien-être")

Members discussed the documents relevant to this issue, including advice provided to the OIE by the Veterinary Academy of France and the National Institute for Agricultural Research of France (INRA) (English translations provided by the OIE). Dr Wilkins provided a letter to WSPA from the French CVO and Dr Gavinelli outlined similar considerations that have been addressed by the European Commission (EC). Dr Bayvel pointed out that although the documentation related to French terms, the International Committee had requested that the WG should deal with the terminology in all three official languages.

The WG acknowledge that the English word "welfare" can be interpreted in at least two ways, including reference to the state of the individual (including its health and conditions of life; or reference to human actions (eg 'social welfare programs')). To avoid confusion, and following the established approach to animal welfare science, OIE documents will use the term "animal welfare" in the first sense, corresponding to 'bien-être' and equivalent words. The second sense will be covered by other terms such as "humane treatment", "animal protection" and "animal husbandry".

The WG decided to include in the Code a definition of animal welfare as this would help to clarify the scope of the OIE guidelines and help to avoid confusion over translation of the term into French. The following definition was proposed as meeting this objective:

Animal welfare: means the state of an animal as regards its attempts to cope with its environment and includes both the extent of failure to cope and the ease or difficulty in coping.

(D.M. BROOM. The effects of land transport on animal welfare. *Rev. sci. tech. Off. int. epiz.*, August 2005, **24**(2), 683-691.)

2.6. Massey Collaborating Centre

Dr Bayvel outlined the background to the proposal to recognize Massey University as an OIE Collaborating Centre (CC) on Animal Welfare Science and Bioethical Analysis and the decision at GS 75 to accept Massey as a Regional CC. Professor Fraser suggested that the OIE obtain CVs of scientists associated with CCs to help OIE Members to better understand the role and contribution of these institutes. Dr Gavinelli offered to obtain a copy of the EFSA list of Centres of Excellence for information of WG members.

2.7. Other issues raised

Dr Bayvel noted that the IMS has hosted a reception during the General Session and showed a video outlining the commitment of the international meat industry to animal welfare. Initial discussions were also held regarding the Cairo conference and Dr Ed Pajor's project (Animal Welfare: Educational Resources Database), the results of which could be presented at the Cairo conference.

3. Second Global Conference on Animal Welfare (Cairo 2008)

Dr Kahn outlined recent progress in planning the 2nd OIE Global Conference on Animal Welfare. She drew WG members' attention to the conference announcement on the OIE internet site and provided some information on the first teleconference of the Scientific Committee. Dr Bayvel introduced the decision paper on the 'stakeholder display' that is proposed to replace the traditional Poster session and noted that the OIE had accepted this approach. Members of the PAWWG supported this proposal.

PAWWG members discussed the question of participation and associated issues, such as maximum numbers, registration fees and balance of participation.. Members of the WG generally agreed that interest in the Conference could be very strong.

The primary objective of the conference is to help the implementation of OIE standards globally and it is essential to assure proper representation of the public and private sector. Involvement of veterinary educators and researchers is also important. Based on a maximum number of 500 participants (the limit for the venue), it is recommended that at least two places be reserved for each OIE Member, so as to ensure that Members, especially developing country Members, have the opportunity to participate. Beyond this, it is important that producers, processing industries, animal welfare NGOs, veterinary educators and researchers have an opportunity to attend the conference. Dr Gavinelli raised the possibility of producing a DVD of the meeting and making this available to the general public.

Dr Kahn indicated that the OIE is continuing to work on logistics issues and that the comments of the WG would be drawn to the attention of the committee responsible for planning and logistics.

3.1. Committee Structure and membership

Dr Kahn informed members of the participants in the Scientific Committee and provided a short background on those participants that are not already known to members of the WG. The first meeting of the Scientific Committee took place by teleconference on 7 August and the second is planned to take place in the second week of October.

3.2. Draft programme and speakers

Dr Kahn presented the current draft program and identified some issues that remain to be clarified. Members of the WG offered several comments on the proposed scientific content of the Conference. Professor Fraser recommended to group all the presentations that deal with education. Dr Wilkins proposed that some speakers make presentations to the work groups rather than the meeting in plenary. He also proposed to include more practical presentations, e.g. on how to train slaughterhouse staff and drivers. Dr Wilkins also mentioned that WSPA could be willing to present a paper on its experience in promoting its 'Concepts in Animal Welfare' project in Veterinary schools around the world, this presentation could be made in the working group session. Dr Wilkins suggested that a presentation be made on the work of the ad hoc Group on control of stray dog populations.

It was generally agreed that there was little time available for formal presentations on research topics, given the Conference priority on the implementation of the OIE standards and on veterinary training.

Dr Rahman supported the proposal for formal presentations on killing for disease control, particularly to include a developing country perspective.

Dr Gavinelli recommended that a presentation from the Kenyan Veterinary Services be invited as he is aware that Kenya is working very actively in implementing the OIE animal welfare standards.

Professor Fraser suggested an additional topic in regard to training, i.e. training of slaughterhouse auditors. He also suggested that the break-out sessions take place earlier in the program, to enable the speakers to focus their presentations on addressing the needs identified by the participants. He also encouraged the OIE to ensure that speakers are drawn equally from developed and developing countries.

Dr Bayvel encouraged all WG members to submit their suggestions for topics and speakers, taking into account today's discussion. The deadline for the OIE to receive contributions is the end of September.

3.3. Proposal to hold a scientific seminar alongside the 2nd OIE Global Conference

Dr Wilkins introduced a joint proposal of WSPA and the International Society for Applied Ethology (ISAE) offering an educational seminar on the topic "Getting started in Animal Welfare Science and Applied Ethology". This could be offered as an option to Conference participants perhaps on the Sunday before the Conference or on the following Thursday, with the objective of updating Conference participants on scientific research in the field of applied ethology. Dr Wilkins undertook to further discuss this proposal with colleagues at WSPA and ISAE before sending a revised proposal to the Director General.

3.4. Implementation of OIE standards

Dr Bayvel introduced the paper prepared by Dr Wilkins and Dr Gavinelli, recalling the original intention of WG members to support implementation of the OIE standards, including through the involvement of OIE Regional Commissions. Much good work has been done, including the decision to hold a 2nd OIE Global Conference, which was an important part of this initiative.

Dr Gavinelli emphasised the importance of active involvement of the OIE Regional Commissions, giving the example of actions in Latin America, where an important regional conference on animal welfare took place in 2006 and the OIE Regional Representation has been very active. The OIE standards have been very useful in establishing a benchmark for bilateral trade negotiations.

Dr Bayvel indicated that Dr Gavinelli has been invited to attend the next meeting of the Regional Commission for Asia, the Middle East and Oceania, to take place on 26-29 November 2007 and that he would also be contributing to the meeting.

The WG requested that the OIE Central Bureau investigate mechanisms to provide feedback on work underway in all OIE regions to implement the animal welfare standards. It is evident that some countries are making significant progress in implementing the standards but there is no obvious mechanism to record this progress. Collecting this information would enable the OIE to focus on helping the countries/regions in greatest need of assistance. Dr Thiermann suggested that the Director General should remind OIE Regional Offices of the need to include animal welfare in their annual reports of activities in the regions. These summaries could be provided to WG members. Further proposals in the tabled paper for the WG to conduct an analysis and/or follow up of individual countries level of implementation of the animal welfare standards were not accepted on the basis that the OIE prefers to adopt a consistent approach to all Code standards, including animal health, welfare and food safety.

4. Work of the Aquatic Animal Health Standards Commissions

4.1. Member comments on aquatic animal welfare appendices

Prof. T. Håstein briefed the WG on the Member comments and presented a new version of the documents “Introduction to OIE guidelines for the welfare of aquatic animals,” “Guidelines for the transport of fish by boat”, “Guidelines for the land transport of fish”, “Guidelines on slaughter of farmed fish for human consumption” and “Guidelines for the humane killing of fish for disease control purposes”, which address Members’ comments.

Members reviewed and discussed this work. It was agreed that, for the moment, the guidelines should only relate to the welfare of farmed fish. This decision was made on the basis that there is well established scientific evidence that finfish can feel pain. Human intervention in aquaculture is extensive and the welfare of farmed fish can be significantly affected by human actions. Work on other aquatic species should be deferred for the moment, notwithstanding that, as mentioned by Prof. Håstein, there is established scientific evidence that crustaceans can feel pain.

The following review articles on pain and sentience in fish were brought to the attention of the members and will, likewise, be brought to the attention of the Aquatic Animal Health Standards Commission.

CHANDROO K.P., DUNCAN I.J.H. & MOCCIA R.D. 2004. Can fish suffer? Perspective on Sentience, pain, fear and stress. *Applied Animal Behaviour Science*. 86, 225–250.

CHANDROO K.P., YUE S. & MOCCIA R.D. 2004. An evaluation of current perspective on consciousness and pain in fishes. *Fish and Fisheries*. 5(4), 281–295.

BRAITHWAITE V.A. & HANTINGFORD F.A. 2004. Fish and welfare: Do fish have the capacity for pain perception and suffering? *Animal Welfare*. 13 (Supplement), 87–92.

The contrary view of Rose was noted but not considered to represent current international scientific consensus.

4.2. Future development of a text on aquatic animal welfare

The WG supported the work done by Prof. T. Håstein and, after revising the new version, recommended to adopt the modified proposals. These revised texts should be submitted to the Aquatic Animal Health Standards Commission meeting in October 2007. [Appendix H](#)

5. Report of the *ad hoc* Group on Dog Population Control

The following documents were considered:

- a) **First draft guidelines prepared by the *ad hoc* Group (with OIE Members' comments)**
- b) **Paper prepared by Dr Wandeler (estimating numbers in dog populations)**
- c) **Paper prepared by Drs Wilkins and Ms Hiby (control measures)**
- d) **Revised table on methods for euthanasia compiled by the International Trade Department**

Members reviewed the revised draft guidelines on Dog Population Control in detail, taking into account comments received from OIE Members (Australia, the European Community, New Zealand, the USA and Japan) and additional papers submitted by Dr Wilkins and Dr Wandeler, as well as the very helpful work of Dr Marie-Aude Montély, stagiare with the International Trade Department. Dr Montély briefly outlined the work that she had done in reviewing the literature and contacting experts to obtain scientific background for the methods listed in the table. The WG discussed in detail the listing of euthanasia methods in the draft table. It was agreed that the table presents methods known to be used but does not imply OIE acceptance of the methods. Some WG members expressed concerns about the humaneness of certain methods, notably electrocution. Dr Montély reminded WG members that the reference to electrocution in the table specified that dogs should be anaesthetized before electrocution. It was agreed that Drs Wilkins and Gavinelli would draft text outlining concerns associated with certain methods listed in the table.

Comments of OIE Members were reviewed and the draft guidelines amended, with all changes shown with strikethrough/double underline in the usual way. The revised guidelines are at [Appendix I](#).

In response to Japan's request that the OIE "clarify whether the draft guidelines on dog population control were developed under the 'SPS mandate' or the 'animal welfare' mandate of the OIE", members of the Working Group were of the opinion that the work of the OIE is conducted in accordance with the global mandate granted by the Member Countries and Territories. In addressing the control of stray dog populations, the OIE's objective is to provide useful guidance to members on animal welfare and the protection of animal and human health. Countries introduce programmes for the control of stray dog populations with the objective of protecting animal health (through better definition of dog owners' responsibilities) and human health (through prevention of zoonotic diseases that threaten people coming into contact with stray dog populations). The guidelines also aims to provide advice on measures so that countries can use a scientific base to adopt measures that are both effective and humane. Thus, the guidelines address all aspects of the OIE mandate.

Animal welfare and the control of animal diseases, including zoonotic diseases such as rabies, are included in the 4th OIE strategic Plan voted unanimously by the OIE Members.

6. Current issues

6.1. 2006/ 2007 PAWWG Work Plan Review

Dr Bayvel briefly reviewed the Work Program and WG members agreed that good progress has been made on all the main topics.

6.2. 2007-2008 PAWWG Work Plan Preparation

It was agreed that Dr Bayvel would prepare a first draft of the 2008 Work Plan by November 2007 for comment by Working Group members and Central Bureau staff. The practice of using two monthly teleconferences to monitor Work Plan implementation will continue, involving Drs Kahn, Bayvel, Thiermann and Stuardo. WG members will continue to receive copies of the record of each teleconference and are encouraged to provide comment, where appropriate.

6.3. PAWWG TOR, Strategy Development and Performance Review

The WG discussed performance of the WG to date. Some concerns were raised about the effective use of WG members' time. For example, at this meeting, the WG reviewed some texts in great detail – is this effective use of time? Dr Kahn indicated that OIE Members are keen to see how their comments have been addressed and that it is an important function of the WG to address this expectation. Professor Fraser suggested that the OIE filter the comments for significance (e.g. tag them with colours to show the significance of the comment) before sending texts to WG members for review. Dr Bayvel recommended that the OIE explore the possibility of establishing a shared website to facilitate document review. Dr Thiermann had indicated that this was being used successfully in other areas of OIE activity.

It was agreed that Drs Stuardo and Kahn would look at the possibility of establishing a shared website.

6.4. Livestock Production Systems and Animal Welfare

Professor Fraser provided background on this issue and on the Discussion Paper entitled “Terrestrial animal welfare – housing/production systems”. He noted that this will be a challenging area and emphasised that future guidelines on animal welfare livestock systems should be science-based.

Dr Olsen (IFAP) indicated that the future guidelines should be elaborated with an animal-based perspective, rather than with the idea of developing prescriptive guidelines ([Appendix J](#)).

The WG recommended that the Director General create an *ad hoc* Group to develop a framework for the OIE's future development of animal production/management guidelines, with a report by mid February 2008. The WG also confirmed that the terms of reference of this *ad hoc* Group should be the four first dot points in the discussion paper.

a) *ad hoc* Group (composition, dates, TOR)

Dr Kahn noted that the criteria for the future composition of this *ad hoc* Group, should consider the issue of broad representation of all five OIE regions.

Professor Fraser asked that the criteria to select the *ad hoc* Group Members, should include their scientific experience and, in particular, their experience in adopting an ‘animal measures based’ approach to welfare.

b) IDF Guide to Good Animal Welfare Practice in Milk Production

Dr Kulkas, representing the industry as full member of the WG, reported on the development of animal welfare guidelines in dairy production. Dr Kulkas noted that OIE has commented on a first draft document and that the IDF agreed in principle to the OIE comments. The IDF is revising these guidelines and intends to put more emphasis on the OIE animal welfare guidelines.

Dr Kulkas indicate that this draft will be discussed at the next world IDF meeting in Ireland. Dr Stuardo suggested that the IDF take into account the proposed work of the *ad hoc* Group on production/housing.

It was agreed that the IDF Guide principal author Dr Verkerk would liaise with Professor Fraser.

The participation of the FAO in the elaboration of the IDF Guide was noted. Professor Fraser explained that FAO primarily elaborates educational material. Dr Thiermann supported this idea, indicating that the OIE is the only international standard-setting organization which develops standards that are presented and adopted by their members following the established procedures. The WG agreed that the OIE should continue supporting this development, bearing in mind the future work of the OIE in developing standards for animal production systems.

6.5. Wildlife Welfare

a) Discussion paper on wildlife issues

Dr Wilkins presented the paper prepared by him, Dr Rahman and Dr Masiga. The WG noted the problems facing wildlife in Africa and India. However, the development of standards in this large, diverse and complex area would be a major task. For 2007-2008, other issues have higher priority. Wildlife issues should be revisited at future WG meetings.

b) Background paper on harvesting of Wildlife

Dr Wilkins presented a background paper on harvesting seals and whales.

Dr Gavinelli updated the meeting on an EFSA scientific opinion that is being developed on the harvest of seals. Experts from Europe and Canada are involved in this work.

There was discussion on how the OIE might address the important interface of conservation and animal welfare. It was agreed that while no specific action by the OIE is recommended at this time, the WG should continue to follow international developments on this important issue.

6.6. Laboratory Animal Welfare

Dr Kahn and Bayvel provided an update on the interaction with ICLAS and other international laboratory animal science standards organisations since the last WG meeting

Dr Bayvel summarised the sequence of events and dialogue with ICLAS and the Central Bureau. The WG expressed its satisfaction with progress on this issue and supported the membership of the new *ad hoc* Group as being sufficiently broad and representative.

It was confirmed that an *ad hoc* Group will meet from 5 to 7 of December.

It was agreed that the *ad hoc* Group report would be circulated to the WG members for comments during January/February 2008

The WG agreed to forward the discussion paper to the TAHSC for information and to adopt the final points (under Recommendations) of this paper as the TOR for the *ad hoc* Group (Appendix K).

6.7. EC contribution to the OIE World Animal Health and Welfare Fund, for training in animal welfare

Dr Gavinelli updated the WG on the EC's future contribution to the OIE's World Animal Health and Welfare Fund. Dr Gavinelli noted certain administrative difficulties in achieving this contribution. Experience in the resolution of these problems could be useful to other institutions making similar approaches.

6.8. Poultry slaughter, killing and transport - status report

Dr Stuardo informed WG members that, at its March 2007 meeting, the TAHSC recommended to develop standards that more specifically address the transport of poultry. The International Trade Department also noted a possible need for the standards on slaughter and killing for disease control to address other poultry species, notably waterfowl. After discussion, Dr Wilkins agreed to review the current guidelines to identify the gaps and deficiencies in relation to poultry transport and slaughter/killing.

6.9. Animal Welfare Education

a) Project on Educational Resources Data Base (Dr. Ed Pajor)

Dr Pajor presented the project that he is undertaking on the development of a database of Animal Welfare Educational and Research Resources.

The WG supported the project and agreed to assist the Central Bureau in this endeavour. The most urgent task is to develop criteria on which to base the organisations and individual experts that will be invited to provide information to the Database.

The International Trade Department proposed the following criteria as a starting point:

For the selection of Organisations

In the Public Sector

Veterinary Authorities (including laboratories)

Veterinary statutory bodies

OIE Reference Laboratories

OIE Collaborating Centres

Veterinary and Agricultural Training Institutes

In the Private Sector

International Organisation that have an Agreement with the OIE (industry organisations and NGOs)

International and Regional Professional organisations (Veterinary and other scientific)

National organisations (industry organisations and NGOs) – with support of the OIE Delegate

Individual experts

At least three publications in peer reviewed scientific journals

Dr Gavinelli noted that the European Food Safety Agency (EFSA) recently finished a report on a database that identifies experts, mainly in animal welfare risk assessment. The WG supported Dr Gavinelli's suggestion to share this valuable information with the OIE and Dr Pajor.

A proposal from Dr Bayvel that Dr Pajor's project be referred to in a future OIE Bulletin Animal Welfare Update was supported.

b) Animal welfare in the Veterinary Curriculum

Dr Wilkins reported to the WG that the "Concepts in Animal Welfare" programme developed by WSPA and Bristol University Veterinary School was being revised. This programme had been designed as a teaching support resource in the veterinary curriculum. The initiative had been supported by the OIE.

This revised version was nearly complete and will include three new modules – Food and animal Welfare; Welfare of Fish; Environmental Enrichment.

Dr. Wilkins stated that WSPA would request further OIE support and publicity for the revised programme, perhaps also via an article in the OIE Bulletin. He agreed to send the new version of "Concept in Animal Welfare" programme to all members of the WG.

6.10. Collaborating Centre criteria

Professor Fraser asked that any future applications for Collaborating Centres (CC) on Animal Welfare be sent to WG members in advance. He noted that the expertise of the experts working at the CC is important.

The criteria developed by Professor Fraser and Dr Bayvel were agreed by the WG.

Dr Bayvel asked WG Members to be proactive in identifying potential OIE Animal Welfare CCs and it was agreed that this topic will be discussed further at the 2008 meeting.

6.11. Relationships with other organisations/associations

The WG noted the involvement of Drs Rahman, Wilkins and Bayvel (by DVD) in the November CVA conference and identified ISAE and VICH as two organisations, where strengthening of links would be beneficial.

6.12. Publications

Dr Bayvel indicated that the WG should continue to promote the special edition on animal welfare of the Scientific and Technical Review Series (24,2). He also commented that there is a possibility of preparing a thematic publication in the OIE Technical Series, dedicated to pain assessment and management in animals and that SATRS 27,2 will be devoted to veterinary education.

Dr Bayvel encouraged the WG member to propose authors for these publications and confirmed that he and Dr Kahn would be discussing further with the OIE Publication Department.

7. Other business

7.1. FAWC Consultation

Dr Bayvel confirmed that OIE had been invited to participate in a FAWC 2 year project on "Animal Welfare Policy Instruments." It was agreed that a Working Group Sub Committee of Dr Bayvel, Professor Fraser and Dr Gavinelli will address the issue in conjunction with the Central Bureau.

Dr Bayvel confirmed that OIE had been invited to a second FAWC 2-3 year consultation project on "Animal Welfare and Economics." In this case it was agreed that this would be addressed, in conjunction with the Central Bureau, by a Working Group Sub Committee comprising Dr Bayvel and Dr Wilkins.

7.2. EFSA and Animal Welfare and Risk Assessment

EFSA is currently adapting established OIE and Codex methodology to use for Animal Welfare Risk Assessment purposes. It was confirmed that Dr Kahn had represented the OIE at a meeting on this topic and that the Working Group would be kept informed regarding relevant developments.

7.3. Cairo Conference

Professor Fraser put to consideration of the WG two motions concerning the Cairo Conference:

- i) The WG recommend that the OIE Central Bureau cooperate with the International Society for Applied Ethnology and WSPA to offer an optional, one –day educational event associated with the conference in Cairo, to inform participants about the scientific basis of animal welfare guidelines.
- ii) The WG recommends that the Cairo conference be organized so as to engage participants as actively as possible and avoid overloading participants with an excessive number of didactic presentations.

The Working Group unanimously supported the following two motions proposed by Professor Fraser.

8. Meeting with the Director General

Dr Vallat participated in the WG meeting on the morning of Friday 7 September. After thanking the WG members for their ongoing support for the OIE in this important area of work, Dr Vallat commented on the importance that the International Committee places on the animal welfare guidelines. Dr Vallat agreed that the priorities for future development of animal welfare standards are in regard to the control of dog populations and standards for laboratory animal welfare. He noted that wildlife issues will continue to be significant and that the WG should follow developments on this closely.

Professor Fraser summarized the WG discussion on the development of guidelines for livestock production systems. He noted the proposal to establish an *ad hoc* Group and that its main work would be to make recommendations on the OIE approach to standard-setting in this area. This will be a difficult task requiring individuals with the capacity to develop ‘animal focused’ science-based standards. Dr. Vallat agreed that the OIE would establish an appropriate *ad hoc* Group for this work.

Dr Wilkins referred to the WG discussion on the implementation of OIE animal welfare standards. It was agreed that all efforts should be made to utilise the OIEs Regional structure – representatives, commissions regional meetings – to advocate implementation of the standards and to provide technical support where needed.

Prof. T. Håstein gave a short background on the development of the five draft standards for the welfare of aquatic animals and also mentioned that a summary of the guidelines had been presented at the OIE conference in Bergen in 2006. He indicated that the revised guidelines would be submitted to the AAHSC and that, if accepted, they would need to be recirculated to OIE Member for comments. Prof. Håstein expressed the hope for that some of the guidelines might be approved at the General Session in 2008.

Dr Bayvel referred to the Working Group’s reliance on its own resources, the established ad hoc Groups and interns. Additional resources similar to Dr. Ed Pajor are seen to offer valuable additional resources as are Collaborating Centres (e.g. Teramo and Massey)

Dr Bayvel noted that the WG had identified the need for the OIE to communicate to delegates on the OIE’s commencement of work on laboratory animal welfare standards. Dr Vallat agreed and indicated that the OIE would write to all member countries emphasizing the importance of this work and seeking their commitment to this important aspect of animal welfare.

Dr Bayvel confirmed that the WG was giving priority to contributing to the work of the Scientific Committee for the second global conference and suggesting speakers. It is very important, as in 2004, to have an appropriate representation of OIE member countries, especially developing and in-transition countries.

9. Next Meeting

Working Group members proposed that the 2008 meeting take place in either the last week of June, the first week of July or the last week of August. A decision should be taken once the timing of the TA HSC meetings in 2008 were decided.

.../Appendices

6th MEETING OF THE OIE WORKING GROUP ON ANIMAL WELFARE**Paris, 5-7 September 2007****List of participants****MEMBERS OF THE OIE WORKING GROUP**

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6th MEETING OF THE OIE WORKING GROUP ON ANIMAL WELFARE

Paris, 5-7 September 2007

Agenda

1. **PAWWG 5th Meeting Report**
2. **OIE General Session 2007 outcomes**
 - Resolution on Animal Welfare
 - Resolution on Universal Declaration on Animal Welfare
 - MOUs
 - WSPA
 - ICLAS
 - Updated four appendices on Animal Welfare in the *Terrestrial Animal Health Code*
 - Definition of animal welfare and French translation – “bientraitance”
 - Massey Collaborating Centre
 - other issues raised
3. **Second Global Conference on Animal Welfare (Cairo 2008)**
 - Committee structure and membership
 - Draft programme and speakers
 - Proposal to hold a scientific seminar alongside the 2nd OIE Global Conference
 - Implementation of OIE standards
4. **Work of the Aquatic Animal Health Standards Commission**
 - Member comments on animal welfare appendices
 - Future development of a text on aquatic animal welfare
5. **Report of the *ad hoc* Group on Dog Population Control**
 - First draft document
 - Work completed subsequently
6. **Current issues**
 - 2006/ 2007 PAWWG Work Plan Review
 - 2007-2008 PAWWG Work Plan Preparation
 - PAWWG TOR, Strategy Development and Performance Review
 - Livestock Production Systems and Animal Welfare
 - *ad hoc* Group (composition, dates, TOR)
 - IDF Guide to Good Animal Welfare Practice in Milk Production

Appendix B (contd)

- Wildlife Welfare
 - Discussion paper on wildlife issues
 - Discussion paper on harvesting seals
 - Laboratory Animal Welfare
 - ICLAS/FELASA June 2007
 - Issues and Options Paper
 - *ad hoc* Group (composition, dates, TOR)
 - EU contribution to the OIE's World Animal Health and Welfare Fund for the purpose of Animal Welfare training
 - Poultry slaughter, killing and transport - status report
 - Animal Welfare Education
 - Project on Educational Resources Data Base (Dr Ed Pajor)
 - Animal welfare in Veterinary Curriculum
 - Collaborating Centre criteria
 - Relationships with other organisations/associations
 - Publications (OIE Technical Series Publication)
- 7. Other business**
- FAWC Consultation
 - EFSA and Animal Welfare and Risk Assessment
 - Cairo Conference
- 8. Meeting of the Director General**
- 9. Next Meeting**
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CHAPTER 1.1.1.

GENERAL DEFINITIONS***Veterinary Authority***

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

APPENDIX 3.7.2.

**GUIDELINES FOR THE
TRANSPORT OF ANIMALS BY SEA**

Preamble: These guidelines apply to the following live domesticated animals: cattle, buffalo, deer, camelids, sheep, goats, pigs and equines. They may also be applicable to other domesticated animals.

Article 3.7.2.1.

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

Article 3.7.2.2

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.

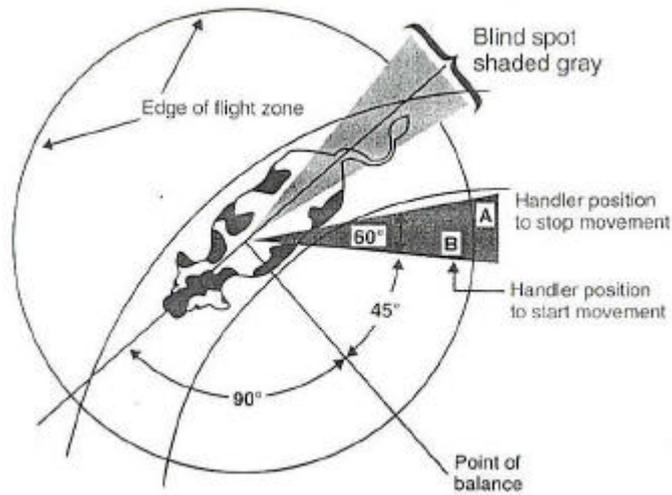
Most domestic livestock are kept in herds and follow a leader by instinct.

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

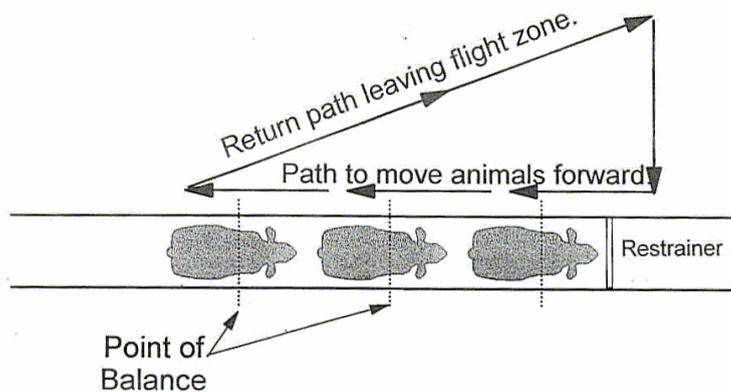
The desire of some animals to control their personal space should be taken into account in designing *loading* and *unloading* facilities, transport *vessels* and *containers*.

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

An example of a flight zone (cattle)



Animal handler movement pattern to move cattle forward



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

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

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

2. Distractions and their removal

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

- a) reflections on shiny metal or wet floors - move a lamp or change lighting;
- b) dark entrances - illuminate with indirect lighting which does not shine directly into the eyes of approaching animals;
- c) animals seeing moving people or equipment up ahead - install solid sides on chutes and races or install shields;
- d) dead ends-avoid if possible by curving the passage, or make an illusory passage;
- e) chains or other loose objects hanging in chutes or on fences - remove them;
- f) uneven floors or a sudden drop in floor levels – avoid uneven floor surfaces or install a solid false floor to provide an illusion of a solid and continuous walking surface;
- g) sounds of air hissing from pneumatic equipment - install silencers or use hydraulic equipment or vent high pressure to the external environment using flexible hosing;
- h) clanging and banging of metal objects - install rubber stops on gates and other devices to reduce metal to metal contact;
- i) air currents from fans or air curtains blowing into the face of animals - redirect or reposition equipment.

Article 3.7.2.3.

Responsibilities

Once the decision to transport the animals by sea has been made, the welfare of the animals during their *journey* is the paramount consideration and is the joint responsibility of all people involved. The individual responsibilities of persons involved will be described in more detail in this Article. These guidelines may also be applied to the transport of animals by water within a country.

The management of animals at post-discharge facilities is outside the scope of this Appendix.

1. General considerations

- a) Exporters, importers, owners of animals, business or buying/selling agents, shipping companies, masters of *vessels* and managers of facilities are jointly responsible for the general health of the animals and their fitness for the *journey*, and for their overall welfare during the *journey*, regardless of whether duties are subcontracted to other parties during transport.
- b) Exporters, shipping companies, business or buying/selling agents, and masters of *vessels* are jointly responsible for planning the *journey* to ensure the care of the animals, including:
 - i) choosing appropriate *vessels* and ensuring that *animal handlers* are available to care for the animals;

Annex D (contd)

- ii) developing and keeping up to date contingency plans to address emergencies (including adverse weather conditions) and minimise stress during transport;
 - iii) correct *loading* of the ship, provision of appropriate food, water, ventilation and protection from adverse weather, regular inspections during the *journey* and for appropriate responses to problems arising;
 - iv) disposal of carcasses according to international law.
- c) To carry out the above mentioned responsibilities, the parties involved should be competent regarding transport regulations, equipment usage, and the humane handling and care of animals.

2. Specific considerations

- a) The responsibilities of the exporters include:
 - i) the organisation, carrying out and completion of the *journey*, regardless of whether duties are subcontracted to other parties during transport;
 - ii) ensuring that equipment and medication are provided as appropriate for the species and the *journey*;
 - iii) securing the presence of the appropriate number of *animal handlers* competent for the species being transported;
 - iv) ensuring compliance of the animals with any required veterinary certification, and their fitness to travel;
 - v) in case of animals for export, ensuring compliance with any requirements of the *importing* and *exporting countries*.
- b) The responsibilities of the importers include:
(under study)
- c) The responsibilities of the owners of the animals include the selection of animals that are fit to travel based on veterinary recommendations.
- d) The responsibilities of the business or buying/selling agent include:
 - i) selection of animals that are fit to travel based on veterinary recommendations;
 - ii) availability of suitable facilities for the assembly, *loading*, transport, *unloading* and holding of animals at the start and at the end of the *journey*, and for emergencies.
- e) The responsibilities of shipping companies include:
(under study)
- f) The responsibilities of masters of *vessels* include the provision of suitable premises for animals on the *vessel*.
- g) The responsibilities of managers of facilities during *loading* include:
 - i) providing suitable premises for *loading* the animals;

Annex D (contd)

- ii) providing an appropriate number of *animal handlers* to load the animals with minimum stress and the avoidance of injury;
 - iii) minimising the opportunities for *disease* transmission while the animals are in the facilities;
 - iv) providing appropriate facilities for emergencies;
 - v) providing facilities, *veterinarians* or *animal handlers* capable of *killing* animals humanely when required.
- h) The responsibilities of managers of facilities during *unloading* include:
- i) providing suitable facilities for *unloading* the animals onto transport *vehicles* for immediate movement or securely holding the animals in *lairage*, with shelter, water and feed, when required, for transit;
 - ii) providing *animal handlers* to unload the animals with minimum stress and injury;
 - iii) minimising the opportunities for *disease* transmission while the animals are in the facilities;
 - iv) providing appropriate facilities for emergencies;
 - v) providing facilities, and *veterinarians* or *animal handlers* capable of *killing* animals humanely when required.
- i) The responsibilities of the *animal handlers* include humane handling and care of the animals, especially during *loading* and *unloading*.
- j) The responsibilities of the *Competent Authority* of the *exporting country* include:
- i) establishing minimum standards for animal welfare, including requirements for inspection of animals before and during their travel, and for certification and record keeping;
 - ii) approving facilities, *containers*, *vehicles/vessels* for the holding and transport of animals;
 - iii) setting competence standards for *animal handlers* and managers of facilities;
 - v) implementation of the standards, including through accreditation of / interaction with other organisations and *Competent Authorities*;
 - vi) monitor and evaluate health and welfare performance, including the use of any veterinary medications.
- k) The responsibilities of the *Competent Authority* of the *importing country* include:
- i) establishing minimum standards for animal welfare, including requirements for inspection of animals after their travel, and for certification and record keeping;
 - ii) approve facilities, *containers*, *vehicles/vessels* for the holding and transport of animals;
 - iii) setting competence standards for *animal handlers* and managers of facilities;
 - iv) implementation of the standards, including through accreditation of / interaction with other organisations and *Competent Authorities*;

Annex D (contd)

- v) ensuring that the *exporting country* is aware of the required standards for the *vessel* transporting the animals;
 - vi) monitor and evaluate health and welfare performance, including the use of any veterinary medications.
 - vii) give animal consignments priority to allow import procedures to be completed without unnecessary delay.
- m) The responsibilities of *veterinarians* or in the absence of a *veterinarian*, the *animal handlers* travelling on the *vessel* with the animals include:
- i) humane handling and treatment of animals during the *journey*, including in emergencies, such as humane killing of the animals;
 - ii) possess ability to report and act independently;
 - iii) meet daily with the master of the *vessel* to obtain up-to-date information on animal health and welfare status.
- n) The receiving *Competent Authority* should report back to the sending *Competent Authority* on *significant* animal welfare problems which occurred during the *journey*.

Article 3.7.2.4.

Competence

1. All people responsible for animals during *journeys*, should be competent to carry out the relevant responsibilities listed in Article 3.7.2.3. Competence in areas other than animal welfare would need to be addressed separately. Competence may be gained through formal training and/or practical experience.
2. The assessment of competence of *animal handlers* should at a minimum address knowledge, and ability to apply that knowledge, in the following areas:
 - a) planning a *journey*, including appropriate *space allowance*, feed, water and ventilation requirements;
 - b) responsibilities for the welfare of animals during the *journey*, including *loading* and *unloading*;
 - c) sources of advice and assistance;
 - d) animal behaviour, general signs of *disease*, and indicators of poor animal welfare such as stress, pain and fatigue, and their alleviation;
 - e) assessment of fitness to travel; if fitness to travel is in doubt, the animal should be examined by a *veterinarian*;
 - f) relevant authorities and applicable transport regulations, and associated documentation requirements;
 - g) general *disease* prevention procedures, including cleaning and *disinfection*;
 - h) appropriate methods of animal handling during transport and associated activities such as assembling, *loading*, and *unloading*;

- i) methods of inspecting animals, managing situations frequently encountered during transport such as adverse weather conditions, and dealing with emergencies, including euthanasia;
 - 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.
5. Assessment of competence for exporters should at a minimum address knowledge, and ability to apply that knowledge, in the following areas:
- a) planning a *journey*, including appropriate *space allowances*, and feed, water and ventilation requirements;
 - b) relevant authorities and applicable transport regulations, and associated documentation requirements;
 - c) appropriate methods of animal handling during transport and associated activities such as cleaning and *disinfection*, assembling, *loading*, and *unloading*;
 - d) species-specific aspects of animal handling and care, including appropriate equipment and medication;
 - e) sources of advice and assistance;
 - f) appropriate record keeping; and
 - g) managing situations frequently encountered during transport, such as adverse weather conditions, and dealing with emergencies.

Article 3.7.2.5.

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) type of transport *vessel* required;
 - iii) route, taking into account distance, expected weather and sea conditions;
 - iv) nature and duration of *journey*;
 - v) daily care and management of the animals, including the appropriate number of *animal handlers*, to help ensure the health and welfare of all the animals;
 - vi) avoiding the mixing of animals from different sources in a single pen group;

Annex D (contd)

- vii) provision of appropriate equipment and medication for the numbers and species carried; and
- viii) emergency response procedures.

2. Preparation of animals for the journey

- a) When animals are to be provided with a novel diet or unfamiliar methods of supplying of feed or water, they should be preconditioned.
- b) There should be planning for water and feed availability during the *journey*. Feed should be of appropriate quality and composition for the species, age, condition of the animals, etc.
- c) Extreme weather conditions are hazards for animals undergoing transport and require appropriate *vessel* design to minimise risks. Special precautions should be taken for animals that have not been acclimatised or which are unsuited to either hot or cold conditions. In some extreme conditions of heat or cold, animals should not be transported at all.
- d) Animals more accustomed to contact with humans and with being handled are likely to be less fearful of being loaded and transported. Animals should be handled and loaded in a manner that reduces their fearfulness and improves their approachability.
- e) Behaviour-modifying (such as tranquillisers) or other medication should not be used routinely during transport. Such medicines should only be administered when a problem exists in an individual animal, and should be administered by a *veterinarian* or other person who has been instructed in their use by a *veterinarian*. Treated animals should be placed in a dedicated area.

3. Control of disease

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

- a) When possible and agreed by the *Veterinary Authority* of the *importing country*, animals should be vaccinated against *diseases* to which they are likely to be exposed at their destination.
- b) Medications used prophylactically or therapeutically should only be administered by a *veterinarian* or other person who has been instructed in their use by a *veterinarian*.
- c) Mixing of animals from different sources in a single consignment should be minimized.

4. Vessel and container design and maintenance

- a) *Vessels* used for the sea transport of animals should be designed, constructed and fitted as appropriate to the species, size and weight of the animals to be transported. Special attention should be paid to the avoidance of injury to animals through the use of secure smooth fittings free from sharp protrusions and the provision of non-slip flooring. The avoidance of injury to *animal handlers* while carrying out their responsibilities should be emphasised.
- b) *Vessels* should be properly illuminated to allow animals to be observed and inspected.
- c) *Vessels* should be designed to permit thorough cleaning and *disinfection*, and the management of faeces and urine.
- d) *Vessels* and their fittings should be maintained in good mechanical and structural condition.

- e) *Vessels* should have adequate ventilation to meet variations in climate and the thermo-regulatory needs of the animal species being transported. The ventilation system should be effective when the *vessel* is stationary. An emergency power supply should be available to maintain ventilation in the case of primary machinery breakdown.
 - f) The feeding and watering system should be designed to permit adequate access to feed and water appropriate to the species, size and weight of the animals, and to minimise soiling of pens.
 - g) *Vessels* should be designed so that the faeces or urine from animals on upper levels do not soil animals on lower levels, or their feed or water.
 - h) *Loading* and stowage of feed and bedding should be carried out in such a way to ensure protection from fire hazards, the elements and sea water.
 - i) Where appropriate, suitable bedding, such as straw or sawdust, should be added to *vessel* floors to assist absorption of urine and faeces, provide better footing for animals and protect animals (especially young animals) from hard or rough flooring surfaces and adverse weather conditions.
 - j) The above principles apply also to *containers* used for the transport of animals.
5. Special provisions for transport in road vehicles on roll-on/roll-off vessels or for containers
- a) Road *vehicles* and *containers* should be equipped with a sufficient number of adequately designed, positioned and maintained securing points enabling them to be securely fastened to the *vessel*.
 - b) Road *vehicles* and *containers* should be secured to the ship before the start of the sea *journey* to prevent them being displaced by the motion of the *vessel*.
 - c) *Vessels* should have adequate ventilation to meet variations in climate and the thermo-regulatory needs of the animal species being transported, especially where the animals are transported in a secondary *vehicle/container* on enclosed decks.
 - d) Due to the risk of limited airflow on certain decks of a *vessel*, a road *vehicle* or *container* may require a forced ventilation system of greater capacity than that provided by natural ventilation.
6. Nature and duration of the journey
- The maximum duration of a *journey* should be determined taking into account factors that determine the overall welfare of animals, such as:
- a) the ability of the animals to cope with the stress of transport (such as very young, old, lactating or pregnant animals);
 - b) the previous transport experience of the animals;
 - c) the likely onset of fatigue;
 - d) the need for special attention;
 - e) the need for feed and water;
 - f) the increased susceptibility to injury and *disease*;
 - g) *space allowance* and *vessel* design;

Annex D (contd)

- h) weather conditions;
- i) vessel type used, method of propulsion and risks associated with particular sea conditions.

7. Space allowance

- a) The number of animals which should be transported on a *vessel* and their allocation to different pens on the *vessel* should be determined before *loading*.
- b) The amount of space required, including headroom, depends on the species of animal and should allow the necessary thermoregulation. Each animal should be able to assume its natural position for transport (including during *loading* and *unloading*) without coming into contact with the roof or upper deck of the *vessel*. When animals lie down, there should be enough space for every animal to adopt a normal lying posture.
- c) Calculations for the *space allowance* for each animal should be carried out in reference to a relevant national or international document. The size of pens will affect the number of animals in each.
- d) The same principles apply when animals are transported in *containers*.

8. Ability to observe animals during the journey

Animals should be positioned to enable each animal to be observed regularly and clearly by *animal handler* or other responsible person, during the *journey* to ensure their safety and good welfare.

9. Emergency response procedures

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

Article 3.7.2.6.

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 an emergency management plan;
 - b) time, date and place of *loading*;
 - c) the *journey* log – a daily record of inspection and important events which includes records of morbidity and mortality and actions taken, climatic conditions, food and water consumed, medication provided, mechanical defects;
 - d) expected time, date and place of arrival and *unloading*;
 - e) veterinary certification, when required;

Annex D (contd)

- f) *animal identification* to allow *animal traceability* of animals to the premises of departure, and, where possible, to the premises of origin;
 - g) details of any animals considered at particular risk of suffering poor welfare during transport (point 3e) of Article 3.7.2.7.);
 - h) number of *animal handlers* on board, and their competencies; and
 - i) *stocking density* estimate for each load in the consignment.
3. When veterinary certification is required to accompany consignments of animals, it should address:
- a) when required, details of *disinfection* carried out;
 - b) fitness of the animals to travel;
 - c) *animal identification* (description, number, etc.); and
 - d) health status including any tests, treatments and vaccinations carried out.

Article 3.7.2.7.

Pre-journey period

1. General considerations

- a) Before each *journey*, *vessels* should be thoroughly cleaned and, if necessary, treated for animal and public health purposes, using chemicals approved by the *Competent Authority*. When cleaning is necessary during a *journey*, this should be carried out with the minimum of stress and risk to the animals.
- b) In some circumstances, animals may require *pre-journey* assembly. In these circumstances, the following points should be considered:
 - i) *Pre-journey* rest is necessary if the welfare of animals has become poor during the collection period because of the physical environment or the social behaviour of the animals.
 - ii) For animals such as pigs which are susceptible to motion sickness, and in order to reduce urine and faeces production during the *journey*, ~~a species specific short period of feed deprivation prior to loading is desirable.~~
 - iii) When animals are to be provided with a novel diet or unfamiliar methods of supplying feed or water, they should be preconditioned.
- c) Where an *animal handler* believes that there is a significant *risk* of *disease* among the animals to be loaded or significant doubt as to their fitness to travel, the animals should be examined by a *veterinarian*.
- d) *Pre-journey* assembly / holding areas should be designed to:
 - i) securely contain the animals;
 - ii) maintain an environment safe from hazards, including predators and *disease*,

Annex D (contd)

- iii) protect animals from exposure to adverse weather conditions;
- iv) allow for maintenance of social groups; and
- v) allow for rest, watering and feeding.

2. Selection of compatible groups

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

- a) animals of different species should not be mixed unless they are judged to be compatible;
- b) animals of the same species can be mixed unless there is a significant likelihood of aggression; aggressive individuals should be segregated (recommendations for specific species are described in detail in Article 3.7.2.12.). 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 may need to be separated from older or larger animals, with the exception of nursing mothers with young at foot;
- d) animals with horns or antlers should not be mixed with animals lacking horns or antlers, unless judged to be compatible; and
- e) animals reared together should be maintained as a group; animals with a strong social bond, such as a dam and offspring, should be transported together.

3. Fitness to travel

- a) Animals should be inspected by a *veterinarian* or an *animal handler* to assess fitness to travel. If its fitness to travel is in doubt, it is the responsibility of a *veterinarian* to determine its ability to travel. Animals found unfit to travel should not be loaded onto a *vessel*.
- b) Humane and effective arrangements should be made by the owner or agent for the handling and care of any animal rejected as unfit to travel.
- c) Animals that are unfit to travel include, but may not be limited to:
 - i) those that are sick, injured, weak, disabled or fatigued;
 - ii) those that are unable to stand unaided or bear weight on each leg;
 - iii) those that are blind in both eyes;
 - iv) those that cannot be moved without causing them additional suffering;
 - v) newborn with an unhealed navel;
 - vi) females travelling without young which have given birth within the previous 48 hours;
 - vii) pregnant animals which would be in the final 10% of their gestation period at the planned time of *unloading*.
 - viii) animals with unhealed wounds from recent surgical procedures such as dehorning.

- d) Risks during transport can be reduced by selecting animals best suited to the conditions of travel and those that are acclimatised to expected weather conditions.
- e) Animals at particular risk of suffering poor welfare during transport and which require special conditions (such as in the design of facilities and *vehicles*, and the length of the *journey*) and additional attention during transport, may include::
 - i) very large or obese individuals;
 - ii) very young or old animals;
 - iii) excitable or aggressive animals;
 - iv) animals subject to motion sickness;
 - v) animals which have had little contact with humans;
 - vi) females in the last third of pregnancy or in heavy lactation.
- f) Hair or wool length should be considered in relation to the weather conditions expected during transport.

Article 3.7.2.8.

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 by the *Competent Authority* and conducted by *animal handler(s)*. *Animal handlers* should ensure that animals are loaded quietly and without unnecessary noise, harassment or force, and that untrained assistants or spectators do not impede the process.

2. Facilities

- a) The facilities for *loading*, including the collecting area at the wharf, races and loading ramps should be designed and constructed to take into account ~~of~~ the needs and abilities of the animals with regard to dimensions, slopes, surfaces, absence of sharp projections, flooring, sides, etc.
- b) Ventilation during *loading* and the *journey* should provide for fresh air, and the removal of excessive heat, humidity and noxious fumes (such as ammonia and carbon monoxide). Under warm and hot conditions, ventilation should allow for the adequate convective cooling of each animal. In some instances, adequate ventilation can be achieved by increasing the *space allowance* for animals.
- c) *Loading* facilities should be properly illuminated to allow the animals to be easily inspected by *animal handlers*, and to allow the ease of movement of 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 some animals. Artificial lighting may be required.

Annex D (contd)3. Goads and other aids

When moving animals, their species specific behaviour should be used (see Article 3.7.2.12.). 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 3.7.2.9.

Travel1. General considerations

- a) *Animal handler(s)* should check the consignment immediately before departure to ensure that the animals have been loaded according to the load plan. Each consignment should be checked following any incident or situation likely to affect their welfare and in any case within 12 hours of departure.

- b) If necessary and where possible adjustments should be made to the *stocking density* as appropriate during the *journey*.
- c) Each pen of animals should be observed on a daily basis for normal behaviour, health and welfare, and the correct operation of ventilation, watering and feeding systems. There should also be a night patrol. Any necessary corrective action should be undertaken promptly.
- d) Adequate access to suitable feed and water should be ensured for all animals in each pen.
- e) Where cleaning or *disinfestation* is necessary during travel, it should be carried out with the minimum of stress to the animals.

2. Sick or injured animals

- a) Sick or injured animals should be segregated.
- b) Sick or injured animals should be appropriately treated or humanely killed, in accordance with a predetermined emergency response plan (Article 3.7.2.5.). Veterinary advice should be sought if necessary. All drugs and products should be used according to recommendations from a *veterinarian* and in accordance with the manufacturer's instructions.
- c) A record of treatments carried out and their outcomes should be kept.
- d) When humane killing is necessary, the *animal handler* must ensure that it is carried out humanely. Recommendations for specific species are described in Appendix 3.7.6. on killing of animals for *disease* control purposes. Veterinary advice regarding the appropriateness of a particular method of euthanasia should be sought as necessary.

Article 3.7.2.10.

Unloading and post-journey handling

1. General considerations

- a) The required facilities and the principles of animal handling detailed in Article 3.7.2.8. apply equally to *unloading*, but consideration should be given to the likelihood that the animals will be fatigued.
- b) *Unloading* should be carefully planned as it has the potential to be the cause of poor welfare in transported animals.
- c) A livestock *vessel* should have priority attention when arriving in port and have priority access to a berth with suitable *unloading* facilities. As soon as possible after the *vessel's* arrival at the port and acceptance of the consignment by the *Competent Authority*, animals should be unloaded into appropriate facilities.
- d) The accompanying veterinary certificate and other documents should meet the requirements of the *importing country*. Veterinary inspections should be completed as quickly as possible.
- e) *Unloading* should be supervised by the *Competent Authority* and conducted by *animal handler(s)*. The *animal handlers* should ensure that animals are unloaded as soon as possible after arrival but sufficient time should be allowed for *unloading* to proceed quietly and without unnecessary noise, harassment or force, and that untrained assistants or spectators do not impede the process.

Annex D (contd)2. Facilities

- a) The facilities for *unloading* including the collecting area at the wharf, races and unloading ramps should be designed and constructed to take into account of the needs and abilities of the animals with regard to dimensions, slopes, surfaces, absence of sharp projections, flooring, sides, etc.
- b) All *unloading* facilities should have sufficient lighting to allow the animals to be easily inspected by the *animal handlers*, and to allow the ease of movement of animals at all times.
- c) There should be facilities to provide animals with appropriate care and comfort, adequate space, access to quality feed and clean drinking water, and shelter from extreme weather conditions.

3. Sick or injured animals

- a) An animal that has become sick, injured or disabled during a *journey* should be appropriately treated or humanely killed (see Appendix 3.7.6.). When necessary, veterinary advice should be sought in the care and treatment of these animals.
- b) In some cases, where animals are non-ambulatory due to fatigue, injury or sickness, it may be in the best welfare interests of the animal to be treated or humanely killed aboard the *vessel*.
- c) If *unloading* is in the best welfare interests of animals that are fatigued, injured or sick, there should be appropriate facilities and equipment for the humane *unloading* of such animals. These animals should be unloaded in a manner that causes the least amount of suffering. After *unloading*, separate pens and other appropriate facilities and treatments should be provided for sick or injured animals.

4. Cleaning and disinfection

- a) *Vessels* and *containers* used to carry the animals should be cleaned before re-use through the physical removal of manure and bedding, by scraping, washing and flushing *vessels* and *containers* with water until visibly clean. This should be followed by *disinfection* when there are concerns about *disease* transmission.
- b) Manure, litter and bedding should be disposed of in such a way as to prevent the transmission of *disease* and in compliance with all relevant health and environmental legislation.

Article 3.7.2.11.

Actions in the event of a refusal to allow the importation of a shipment

1. The welfare of the animals should be the first consideration in the event of a refusal to import.
2. When animals have been refused import, the *Competent Authority* of the *importing country* should make available suitable isolation facilities to allow the *unloading* of animals from a *vessel* and their secure holding, without posing a risk to the health of the national herd, pending resolution of the situation. In this situation, the priorities should be:
 - a) The *Competent Authority* of the *importing country* should provide urgently in writing the reasons for the refusal.
 - b) In the event of a refusal for animal health reasons, the *Competent Authority* of the *importing country* should provide urgent access to an OIE-appointed *veterinarian(s)* to assess the 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.

- c) The *Competent Authority* of the *importing country* should provide access to allow continued assessment of the ongoing health and welfare situation.
 - d) If the matter cannot be promptly resolved, the *Competent Authority* of the *exporting and importing countries* should call on the OIE to mediate.
3. In the event that the animals are required to remain on the *vessel*, the priorities should be:
- a) The *Competent Authority* of the *importing country* should allow provisioning of the *vessel* with water and feed as necessary.
 - b) The *Competent Authority* of the *importing country* should provide urgently in writing the reasons for the refusal.
 - c) In the event of a refusal for animal health reasons, the *Competent Authority* of the *importing country* should provide urgent access to an OIE-appointed *veterinarian(s)* to assess the 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.
 - d) The *Competent Authority* of the *importing country* should provide access to allow continued assessment of the ongoing health and other aspects of the welfare of the animals, and the necessary actions to deal with any issues which arise.
 - e) If the matter cannot be urgently resolved, the *Competent Authorities* of the *exporting and importing countries* should call on the OIE to mediate.
4. The OIE should utilise its dispute settlement mechanism to identify a mutually agreed solution which will address the animal health and welfare issues in a timely manner.

Article 3.7.2.12.

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. Housing strange goats together could result in fatalities, either through physical violence, or subordinate goats being refused access to food and water.

Annex D (contd)

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

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

Sheep are sociable animals with good eyesight and tend to "flock together", especially when they are agitated. They should be handled calmly and their tendency to follow each other should be exploited when they are being moved. Sheep may become agitated if they are singled out for attention and will strive to rejoin the group. Activities which frighten, injure or cause agitation to sheep should be avoided. They can negotiate steep ramps.

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APPENDIX 3.7.3.

**GUIDELINES FOR THE TRANSPORT
OF ANIMALS BY LAND**

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

Article 3.7.3.1.

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

Article 3.7.3.2.

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.

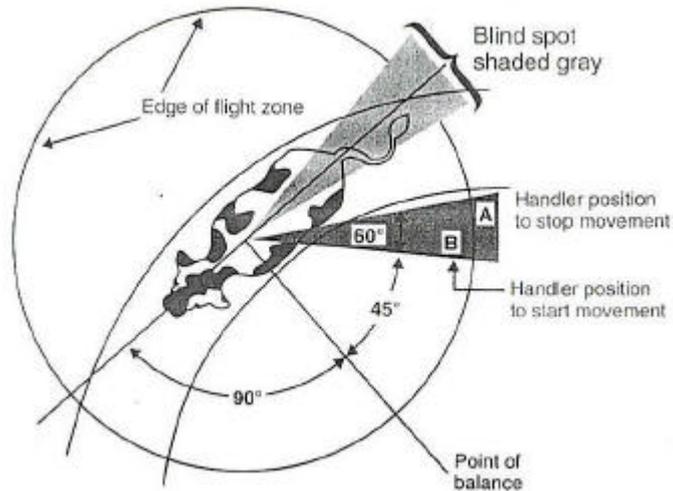
Most domestic livestock are kept in herds and follow a leader by instinct.

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

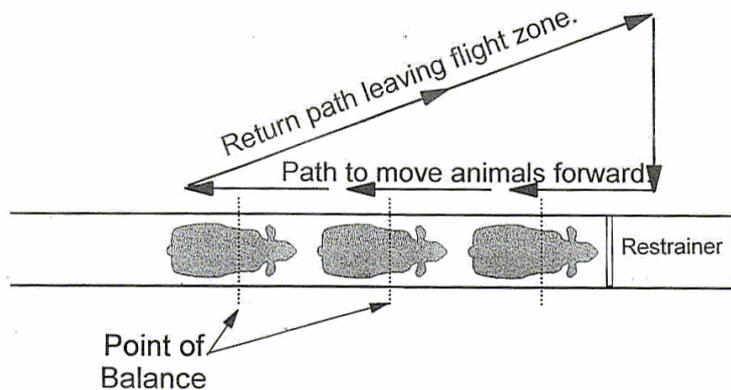
The desire of some animals to control their personal space should be taken into account in designing *loading* and *unloading* facilities, transport *vehicles* and *containers*.

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

An example of a flight zone (cattle)



Animal handler movement pattern to move cattle forward



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

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

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

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

2. Distractions and their removal

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

- a) reflections on shiny metal or wet floors - move a lamp or change lighting;
- b) dark entrances - illuminate with indirect lighting which does not shine directly into the eyes of approaching animals;
- c) animals seeing moving people or equipment up ahead - install solid sides on chutes and races or install shields;
- d) dead ends-avoid if possible by curving the passage, or make an illusory passage;
- e) chains or other loose objects hanging in chutes or on fences - remove them;
- f) uneven floors or a sudden drop in floor levels – avoid uneven floor surfaces or install a solid false floor to provide an illusion of a solid and continuous walking surface;
- g) sounds of air hissing from pneumatic equipment - install silencers or use hydraulic equipment or vent high pressure to the external environment using flexible hosing;
- h) clanging and banging of metal objects - install rubber stops on gates and other devices to reduce metal to metal contact;
- i) air currents from fans or air curtains blowing into the face of animals - redirect or reposition equipment.

Article 3.7.3.3.

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*.

Annex E (contd)

2. Business agents or buying/selling agents are responsible for:
 - a) selection of animals that are fit to travel;
 - b) availability of suitable facilities at the start and at the end of the *journey* for the assembly; *loading*, transport, *unloading* and holding of animals, including for any stops at *resting points* during the *journey* and for emergencies.
3. Animal handlers are responsible for the humane handling and care of the animals, especially during *loading* and *unloading*, and for maintaining a journey log. To carry out their responsibilities, they should have the authority to take prompt action. In the absence of a separate *animal handler*, the driver is the *animal handler*.
4. Transport companies, *vehicle* owners and drivers are responsible for planning the *journey* to ensure the care of the animals; in particular they are responsible for:
 - a) 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 3.7.3.7.;
 - 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, 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 3.7.3.4.

Competence

1. All people responsible for animals during *journeys*, should be competent according to their responsibilities listed in Article 3.7.3.3. 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;

Annex E (contd)

- 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.

Article 3.7.3.5.

Planning the journey1. General considerations

- a) Adequate planning is a key factor affecting the welfare of animals during a *journey*.
- b) Before the *journey* starts, plans should be made in relation to:
 - i) preparation of animals for the *journey*;
 - ii) choice of road, ~~or~~ rail; roll-on roll-off *vessels* or *containers*;
 - iii) nature and duration of the *journey*;
 - iv) *vehicle/ container* design and maintenance, including roll-on roll-off *vessels*;
 - v) required documentation;
 - vi) *space allowance*;
 - vii) rest, water and feed;
 - viii) observation of animals en route;
 - ix) control of *disease*;
 - 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 is possible.

2. Preparation of animals for the journey

- a) When animals are to be provided with a novel diet or method of water provision during transport, an adequate period of adaptation should be planned. For all animals it is extra important that the rest stops during long journeys are long enough to fulfil the needs of the animals of 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 taking into account 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.

Annex E (contd)

- b) *Vehicles* and *containers* should be designed with the structures necessary to provide protection from adverse weather conditions and to minimise the opportunity for animals to escape.
 - c) In order to minimise the likelihood of the spread of infectious *disease* during transport, *vehicles* and *containers* should be designed to permit thorough cleaning and *disinfection*, and the containment of faeces and urine during a *journey*.
 - d) *Vehicles* and *containers* should be maintained in good mechanical and structural condition.
 - e) *Vehicles* and *containers* should have adequate ventilation to meet variations in climate and the thermo-regulatory needs of the animal species being transported; the ventilation system (natural or mechanical) should be effective when the *vehicle* is stationary, and the airflow should be adjustable.
 - f) *Vehicles* should be designed so that the faeces or urine from animals on upper levels do not soil animals on lower levels, nor their feed and water.
 - g) When *vehicles* are carried on board ferries, facilities for adequately securing them should be available.
 - h) If feeding or watering while the *vehicle* is moving is required, adequate facilities on the *vehicle* should be available.
 - i) When appropriate, suitable bedding should be added to *vehicle* floors to assist absorption of urine and faeces, to minimise slipping by animals, and protect animals (especially young animals) from hard flooring surfaces and adverse weather conditions.
5. Special provisions for transport in vehicles (road and rail) on roll-on/roll-off vessels or for containers
- a) *Vehicles* and *containers* should be equipped with a sufficient number of adequately designed, positioned and maintained securing points enabling them to be securely fastened to the *vessel*.
 - b) *Vehicles* and *containers* should be secured to the *vessel* before the start of the sea *journey* to prevent them being displaced by the motion of the *vessel*.
 - c) Roll-on/roll-off *vessels* should have adequate ventilation to meet variations in climate and the thermo-regulatory needs of the animal species being transported, especially where the animals are transported in a secondary *vehicle/ container* on enclosed decks.
6. Space allowance
- a) The number of animals which should be transported on a *vehicle* or in a *container* and their allocation to compartments should be determined before *loading*.
 - b) The space required on a *vehicle* or in a *container* depends upon whether or not the animals need to lie down (for example, pigs, camels and poultry), or to stand (horses). Animals which will need to lie down often stand when first loaded or when the *vehicle* is driven with too much lateral movement or sudden braking.
 - c) When animals lie down, they should all be able to adopt a normal lying posture which allows necessary thermoregulation.
 - d) When animals are standing, they should have sufficient space to adopt a balanced position as appropriate to the climate and species transported.

- e) The amount of headroom necessary depends on the species of animal. Each animal should be able to assume its natural position for transport (including during *loading* and *unloading*) without coming into contact with the roof or upper deck of the *vehicle*, and there should be sufficient headroom to allow adequate airflow over the animals.
- f) Calculations for the *space allowance* for each animal should be carried out using the figures given in 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;

Annex E (contd)

- c) when possible, animals should be vaccinated against *diseases* to which they are likely to be exposed at their destination;
- d) medications used prophylactically or therapeutically should be approved by the *Veterinary Authority* of the *importing country* and should only be administered by a *veterinarian* or other person who has been instructed in their use by a *veterinarian*.

10. Emergency response procedures

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

11. Other considerations

- a) Extreme weather conditions are hazardous for animals undergoing transport and require appropriate *vehicle* design to minimise risks. Special precautions should be taken for animals that have not been acclimatised or which are unsuited to either hot or cold conditions. In some extreme conditions of heat or cold, animals should not be transported at all.
- b) In some circumstances, transportation during the night may reduce thermal stress or the adverse effects of other external stimuli.

Article 3.7.3.6.

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 an 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 3.7.3.7.);
 - 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 *animal handler* or the driver of any factors affecting the fitness of animals to travel for a particular *journey*.

Article 3.7.3.7.

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 3.7.3.12.
- 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 risk 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*.

Annex E (contd)2. Selection of compatible groups

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

- a) Animals reared together should be maintained as a group; animals with a strong social bond, such as a dam and offspring, should be transported together.
- b) Animals of the same species can be mixed unless there is a significant likelihood of aggression; aggressive individuals should be segregated (recommendations for specific species are described in detail in Article 3.7.3.12.). 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.
- d) Animals with horns or antlers should not be mixed with animals lacking horns or antlers unless judged to be compatible.
- e) Animals of different species should not be mixed unless they are judged to be compatible.

3. Fitness to travel

- a) Each animal should be inspected by a *veterinarian* or an *animal handler* to assess fitness to travel. If its fitness to travel is in doubt, the animal should be examined by a *veterinarian*. Animals found unfit to travel should not be loaded onto a *vehicle*, except for transport to receive veterinary treatment.
- b) Humane and effective arrangements should be made by the owner 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) animal subject to motion sickness;
 - vi) females in late pregnancy or heavy lactation, dam and offspring;
 - vii) animals with a history of exposure to stressors or pathogenic agents prior to transport;
 - viii) animals with unhealed wounds from recent surgical procedures such as dehorning.

4. Specific species requirements

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

Recommendations for specific species are described in detail in Article 3.7.3.12.

Article 3.7.3.8.

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.

Annex E (contd)

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

3. Goads and other aids

When moving animals, their species specific behaviour should be used (see Article 3.7.3.12.). 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 3.7.3.9.

Travel1. General considerations

- a) Drivers and *animal handlers* should check the load immediately before departure to ensure that the animals have been properly loaded. Each load should be checked again early in the trip and adjustments made as appropriate. Periodic checks should be made throughout the trip, especially at rest or refuelling stops or during meal breaks when the *vehicle* is stationary.
- b) Drivers should utilise smooth, defensive driving techniques, without sudden turns or stops, to minimise uncontrolled movements of the animals.

2. Methods of restraining or containing animals

- a) Methods of restraining animals should be appropriate to the species and age of animals involved and the training of the individual animal.
- b) Recommendations for specific species are described in detail in Article 3.7.3.12.

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 *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.

Annex E (contd)

- 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 Appendix 3.7.6. on killing of animals for *disease* control purposes.
5. Water and feed requirements
- a) If *journey* duration is such that feeding or watering is required or if the species requires feed or water throughout, access to suitable feed and water for all the animals (appropriate for their species and age) carried in the *vehicle* should be provided. There should be adequate space for all animals to move to the feed and water sources and due account taken of likely competition for feed.
- b) Recommendations for specific species are described in detail in Article 3.7.3.12.
6. Rest periods and conditions including hygiene
- a) Animals that are being transported should be rested at appropriate intervals during the *journey* and offered feed and water, either on the *vehicle* or, if necessary, unloaded into suitable facilities.
- b) Suitable facilities should be used en route, when resting requires the *unloading* of the animals. These facilities should meet the needs of the particular animal species and should allow access of all animals to feed and water.
7. In-transit observations
- a) Animals being transported by road should be observed soon after a *journey* is commenced and whenever the driver has a rest stop. 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 3.7.3.10.

Unloading and post-journey handling

1. General considerations
- a) The required facilities and the principles of animal handling detailed in Article 3.7.3.8. 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 Appendix 3.7.5. on slaughter of animals for human consumption.

2. Sick and or injured animals

- a) An animal that has become sick, injured or disabled during a *journey* should be appropriately treated or humanely killed (see Appendix 3.7.6. on killing of animals for disease control purposes). 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.

Annex E (contd)

- 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 3.7.3.11.

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.
 - 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 ~~re~~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 dispute settlement mechanism to identify a mutually agreed solution which will address animal health and any other welfare issues in a timely manner.

Article 3.7.3.12.

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 strange surroundings. They benefit from well lit loading bays. Since they negotiate ramps with difficulty, these should be as level as possible and provided with secure footholds. Ideally, a hydraulic lift should be used for greater heights. Pigs also negotiate steps with difficulty. A good ‘rule-of-thumb’ is that no step should be higher than the pig’s front knee. Serious aggression may result if unfamiliar animals are mixed. Pigs are highly susceptible to heat stress.

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

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APPENDIX 3.7.5.

GUIDELINES FOR THE SLAUGHTER OF ANIMALS

Article 3.7.5.1.

General principles1. Object

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

These guidelines apply to the *slaughter* in *slaughterhouses* of the following domestic animals: cattle, buffalo, bison, sheep, goats, camelids, deer, horses, pigs, 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 guidelines 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 guidelines outlined in the present Appendix and their application within the national context.

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

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

3. Animal behaviour

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

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

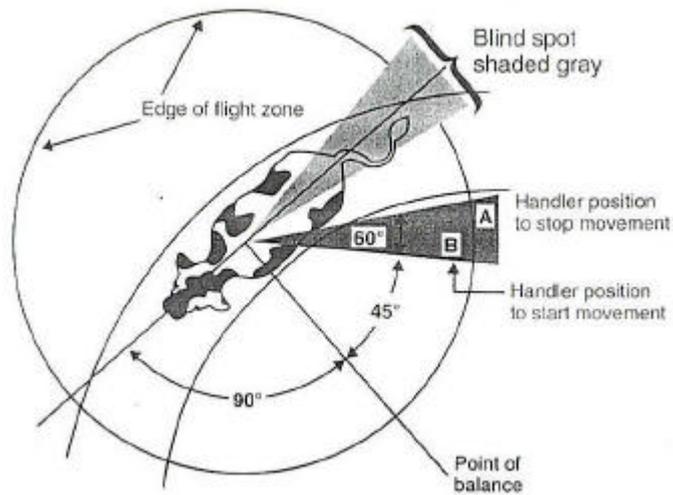
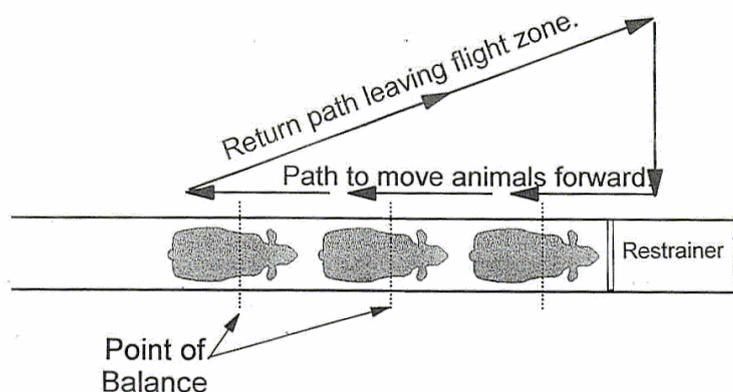
Most domestic livestock are kept in herds and follow a leader by instinct.

Animals which are likely to 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 F (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.

An example of a flight zone (cattle)**Animal handler movement pattern to move cattle forward**

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

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

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

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

4. Distractions and their removal

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

- a) reflections on shiny metal or wet floors - move a lamp or change lighting;
- b) dark entrances to chutes, races, stun boxes or conveyor restrainers - illuminate with indirect lighting which does not shine directly into the eyes of approaching animals;
- c) animals seeing moving people or equipment up ahead - install solid sides on chutes and races or install shields;
- d) dead ends-avoid if possible by curving the passage, or make an illusory passage;
- e) 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;
- g) sounds of air hissing from pneumatic equipment - install silencers or use hydraulic equipment or vent high pressure to the external environment using flexible hosing;
- h) clanging and banging of metal objects - install rubber stops on gates and other devices to reduce metal to metal contact;
- i) air currents from fans or air curtains blowing into the face of animals - redirect or reposition equipment.

Article 3.7.5.2.

Moving and handling animals

1. General considerations

Animals should be transported to *slaughter* in a way that minimises adverse animal health and welfare outcomes, and the transport should be conducted in accordance with the OIE guidelines for the transportation of animals (Appendices 3.7.2 and 3.7.3).

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

Annex F (contd)

- 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, at the site where they are found in accordance with the OIE guidelines for the killing of animals for *disease* control purposes (Appendix 3.7.6.).
- c) Animals should not be forced to move at a speed greater than their normal walking pace, in order to minimise injury through falling or slipping. Performance standards should be established where numerical scoring of the prevalence of animals slipping or falling is used to evaluate whether animal moving practices and/or facilities should be improved. In properly designed and constructed facilities with competent *animal handlers*, it should be possible to move 99% of animals without their falling.
- d) Animals for *slaughter* should not be forced to walk over the top of other animals.
- e) Animals should be handled in such a way as to avoid harm, distress or injury. Under no circumstances should *animal handlers* resort to violent acts to move animals, such as crushing or breaking tails of animals, grasping their eyes or pulling them by the ears. *Animal handlers* should never apply an injurious object or irritant substance to animals and especially not to sensitive areas such as eyes, mouth, ears, anogenital region or belly. The throwing or dropping of animals, or their lifting or dragging by body parts such as their tail, head, horns, ears, limbs, wool, hair or feathers, should not be permitted. The manual lifting of small animals is permissible.
- f) When using goads and other aids, the following principles should apply:
 - i) Animals that have little or no room to move should not be subjected to physical force or goads and other aids which compel movement. Electric goads and prods should only be used in extreme cases and not on a routine basis to move animals. The use and the power output should be restricted to that necessary to assist movement of an animal and only when an animal has a clear path ahead to move. Goads and other aids should not be used repeatedly if the animal fails to respond or move. In such cases it should be investigated whether some physical or other impediment is preventing the animal from moving.
 - ii) The use of such devices should be limited to battery-powered goads on the hindquarters of pigs and large ruminants, and never on sensitive areas such as the eyes, mouth, ears, anogenital region or belly. Such instruments should not be used on horses, sheep and goats of any age, or on calves or piglets.
 - iii) Useful and permitted goads include panels, flags, plastic paddles, flappers (a length of cane with a short strap of leather or canvas attached), plastic bags and 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 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 and to measure the percentage of animals moved with an electric instrument and the percentage of animals slipping or falling at a point in the *slaughterhouse*. Any risk of compromising animal welfare, for example slippery floor, should be investigated immediately and the defect rectified to eliminate the problem.

2. Provisions relevant to animals delivered in containers

- a) *Containers* in which animals are transported should be handled with care, and should not be thrown, dropped or knocked over. Where possible, they should be horizontal while being loaded and unloaded mechanically, and stacked to ensure ventilation. In any case they should be moved and stored in an upright position as indicated by specific marks.
- b) Animals delivered in *containers* with perforated or flexible bottoms should be unloaded with particular care in order to avoid injury. Where appropriate, animals should be unloaded from the *containers* individually.
- c) Animals which have been transported in *containers* should be slaughtered as soon as possible; mammals and ratites which are not taken directly upon arrival to the place of *slaughter* should have drinking water available to them from appropriate facilities at all times. Delivery of poultry for *slaughter* should be scheduled such that they are not deprived of water at the premises for longer than 12 hours. Animals which have not been slaughtered within 12 hours of their arrival should be fed, and should subsequently be given moderate amounts of food at appropriate intervals.

3. Provisions relevant to restraining and containing animals

- a) Provisions relevant to restraining animals for *stunning* or *slaughter* without *stunning*, to help maintain animal welfare, include:
 - i) provision of a non-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. Such methods include the following:
 - i) suspending or hoisting animals (other than poultry) by the feet or legs;
 - ii) indiscriminate and inappropriate use of *stunning* equipment;
 - iii) mechanical clamping of the legs or feet of the animals (other than shackles used in poultry and ostriches) as the sole method of *restraint*;

Annex F (contd)

- iv) breaking legs, cutting leg tendons or blinding animals in order to immobilise them;
- v) severing the spinal cord, for example using a puntilla or dagger, to immobilise animals using electric currents to immobilise animals, except for proper *stunning*.

Article 3.7.5.3.

Lairage design and construction**1. General considerations**

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

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

The following guidelines may help to achieve this.

2. Design of lairages

- a) The *lairage* should be designed to allow a one-way flow of animals from *unloading* to the point of *slaughter*, with a minimum number of abrupt corners to negotiate.
- b) In red meat *slaughterhouses*, pens, passageways and races should be arranged in such a way as to permit inspection of animals at any time, and to permit the removal of sick or injured animals when considered to be appropriate, for which separate appropriate accommodation should be provided.
- c) Each animal should have room to stand up and lie down and, when confined in a pen, to turn around, except where the animal is reasonably restrained for safety reasons (e.g. fractious bulls). Fractious animals should be slaughtered as soon as possible after arrival at the *slaughterhouse* to avoid welfare problems. The *lairage* should have sufficient accommodation for the number of animals intended to be held. Drinking water should always be available to the animals, and the method of delivery should be appropriate to the type of animal held. Troughs should be designed and installed in such a way as to minimise the risk of fouling by faeces, without introducing risk of bruising and injury in animals, and should not hinder the movement of animals.
- d) Holding pens should be designed to allow as many animals as possible to stand or lie down against a wall. Where feed troughs are provided, they should be sufficient in number and feeding space to allow adequate access of all animals to feed. The feed trough should not hinder the movement of animals.
- e) Where tethers, ties or individual stalls are used, these should be designed so as not to cause injury or distress to the animals and should also allow the animals to stand, lie down and access any food or water that may need to be provided.
- f) Passageways and races should be either straight or consistently curved, as appropriate to the animal species. Passageways and races should have solid sides, but when there is a double race, the shared partition should allow adjacent animals to see each other. For pigs and sheep, passageways should be wide enough to enable two or more animals to walk side by side for as long as possible. At the point where passageways are reduced in width, this should be done by a means which prevents excessive bunching of the animals.

- g) *Animal handlers* should be positioned alongside races and passageways on the inside radius of any curve, to take advantage of the natural tendency of animals to circle an intruder. Where one-way gates are used, they should be of a design which avoids bruising. Races should be horizontal but where there is a slope, they should be constructed to allow the free movement of animals without injury.
- h) There should be a waiting pen, with a level floor and solid sides, between the holding pens and the race leading to the point of *stunning* or *slaughter*, to ensure a steady supply of animals for *stunning* or *slaughter* and to avoid having *animal handlers* trying to rush animals from the holding pens. The waiting pen should preferably be circular, but in any case, so designed that animals cannot be trapped or trampled.
- i) Ramps or lifts should be used for *loading* and *unloading* of animals where there is a difference in height or a gap between the floor of the *vehicle* and the *unloading* area. Unloading ramps should be designed and constructed so as to permit animals to be unloaded from *vehicles* on the level or at the minimum gradient achievable. Lateral side protection should be available to prevent animals escaping or falling. They should be well drained, with secure footholds and adjustable to facilitate easy movement of animals without causing distress or injury.

3. Construction of lairages

- a) *Lairages* should be constructed and maintained so as to provide protection from unfavourable climatic conditions, using strong and resistant materials such as concrete and metal which has been treated to prevent corrosion. Surfaces should be easy to clean. There should be no sharp edges or protuberances which may injure the animals.
- b) Floors should be well drained and not slippery; they should not cause injury to the 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 a noise to the areas where animals are held and slaughtered.
- f) Where animals are kept in outdoor *lairages* without natural shelter or shade, they should be protected from the effects of adverse weather conditions.

Article 3.7.5.4.

Care of animals in lairages

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

Annex F (contd)

1. As far as possible, established groups of animals should be kept together. Each animal should have enough space to stand up, lie down and turn around. Animals hostile to each other should be separated.
2. Where tethers, ties or individual stalls are used, they should allow animals to stand up and lie down without causing injury or distress.
3. Where bedding is provided, it should be maintained in a condition that minimises risks to the health and safety of the animals, and sufficient bedding should be used so that animals do not become soiled with manure.
4. Animals should be kept securely in the *lairage*, and care should be taken to prevent them from escaping and from predators.
5. Suitable drinking water should be available to the animals on their arrival and at all times to animals in *lairages* unless they are to be slaughtered without delay.
6. If animals are not to be slaughtered as soon as possible, suitable feed should be available to the animals on arrival and at intervals appropriate to the species. Unweaned animals should be slaughtered as soon as possible.
7. In order to prevent heat stress, animals subjected to high temperatures, particularly pigs and poultry, should be cooled by the use of water sprays, fans or other suitable means. However, the potential for water sprays to reduce the ability of animals to thermoregulate (especially poultry) should be considered in any decision to use water sprays. The risk of animals being exposed to very cold temperatures or sudden extreme temperature changes should also be considered.
8. The *lairage* area should be well lit in order to enable the animals to see clearly without being dazzled. During the night, the lights should be dimmed. Lighting should also be adequate to permit inspection of all animals. Subdued lighting, and for example blue light, may be useful in poultry *lairages* in helping to calm birds.
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 euthanasia,~~ 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.

Recommendations for specific species are described in detail in Articles 3.7.5.5. to 3.7.5.9.

Article 3.7.5.5.

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.

1. Foetuses should not be removed from the uterus sooner than five minutes after the maternal neck or chest cut, to ensure absence of consciousness. A foetal heartbeat will usually still be present and foetal movements may occur at this stage, but these are only a cause for concern if the exposed foetus successfully breathes air.
2. If a live mature foetus is removed from the uterus, it should be prevented from inflating its lungs and breathing air (e.g. by clamping the trachea).
3. When uterine, placental or foetal tissues, including foetal blood, are not to be collected as part of the post-slaughter processing of pregnant animals, all foetuses should be left inside the unopened uterus until they are dead. When uterine, placental or foetal tissues are to be collected, where practical, foetuses should not be removed from the uterus until at least 15-20 minutes after the maternal neck or chest cut.
4. If there is any doubt about consciousness, the foetus should be killed with a captive bolt of appropriate size or a blow to the head with a suitable blunt instrument.

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

Annex F (contd)

Article 3.7.5.6.

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

	Presentation of animals	Specific procedure	Specific purpose	AW concerns/implications	Key AW 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
Restraining methods	Head restraint, upright	Halter/ head collar/bridle	Captive bolt Free bullet	Suitable for halter-trained animals; stress in untrained animals	Competent animal handlers	Cattle, buffalo, horses, camelids
	Head restraint, upright	Neck yoke	Captive bolt Electrical-head-only Free bullet Slaughter without stunning	Stress of loading and neck capture; stress of prolonged restraint, horn configuration; unsuitable for fast line speeds, animals struggling and falling due to slippery floor, excessive pressure	Equipment; competent animal handlers, prompt stunning or slaughter	Cattle
	Leg restraint	Single leg tied in flexion (animal standing on 3 legs)	Captive bolt Free bullet	Ineffective control of animal movement, misdirected shots	Competent animal handlers	Breeding pigs (boars and sows)

Annex F (contd)

Article 3.7.5.6.

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

	Presentation of animals	Specific procedure	Specific purpose	AW concerns/implications	Key AW requirements	Applicable species
Restraining methods (contd)	Upright restraint	Beak holding	Captive bolt Electrical-head-only	Stress of capture	Sufficient competent-animal handlers	Ostriches
		Head restraint in electrical stunning box	Electrical-head-only	Stress of capture and positioning	Competent animal handlers	Ostriches
	Holding body upright- manual	Manual restraint	Captive bolt Electrical-head-only Slaughter without stunning	Stress of capture and restraint; accuracy of stunning/slaughter	Competent animal handlers	Sheep, goats, calves, raites, small camelids, poultry
	Holding body upright mechanical	Mechanical clamp / crush / squeeze/ V-restrainer (static)	Captive bolt Electrical methods Slaughter without stunning	Loading of animal and overriding; excessive pressure	Proper design and operation of equipment	Cattle, buffalo, sheep, goats, deer, pigs, ostriches
	Lateral restraint – manual or mechanical	Restrainer/cradle/crush	Slaughter without stunning	Stress of restraint	Competent animal handlers	Sheep, goats, calves, camelids, cattle
	Upright restraint mechanical	Mechanical straddle (static)	Slaughter without stunning Electrical methods Captive bolt	Loading of animal and overriding	Competent animal handlers	Cattle, sheep, goats, pigs
	Upright restraint – manual or mechanical	Wing shackling	Electrical	Excessive tension applied prior to stunning	Competent animal handlers	Ostriches

Annex F (contd)

Article 3.7.5.6.

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

	Presentation of animals	Specific procedure	Specific purpose	AW concerns/implications	Key AW requirements	Applicable species
Restraining and /or conveying methods	Mechanical – upright	V-restrainer	Electrical methods Captive bolt Slaughter without stunning	Loading of animal and overriding; excessive pressure, size mismatch between restrainer and animal	Proper design and operation of equipment	Cattle, calves, sheep, goats, pigs
	Mechanical- upright	Mechanical straddle – band restrainer (moving)	Electrical methods Captive bolt Slaughter without stunning	Loading of animal and overriding, size mismatch between restrainer and animal	Competent animal handlers, proper design and layout of restraint	Cattle, calves, sheep, goats, pigs
	Mechanical – upright	Flat bed/deck Tipped out of <i>containers</i> on to conveyors	Presentation of birds for shackling prior to electrical stunning Gas stunning	Stress and injury due to tipping in dump-module systems Height of tipping conscious poultry Broken bones and dislocations	Proper design and operation of equipment	Poultry
	Suspension and/or inversion	Poultry shackle	Electrical stunning Slaughter without stunning	Inversion stress; pain from compression on leg bones	Competent animal handlers; proper design and operation of equipment	Poultry
	Suspension and/or inversion	Cone	Electrical – head-only Captive bolt Slaughter without stunning	Inversion stress	Competent animal handlers; proper design and operation of equipment	Poultry
	Upright restraint	Mechanical leg clamping	Electrical – head-only	Stress of resisting restraint in ostriches	Competent animal handlers; proper equipment design and operation	Ostriches

Article 3.7.5.6.

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

	Presentation of animals	Specific procedure	Specific purpose	AW concerns/implications	Key AW requirements	Applicable species
Restrain by inversion	Rotating box	Fixed dide(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 <u>Not recommended</u>	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 <u>Not recommended</u>	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

Annex F (contd)

Article 3.7.5.7.

Stunning methods1. General considerations

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

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

- a) the animal is adequately restrained;
- b) animals in *restraint* are stunned as soon as possible;
- c) the equipment used for *stunning* is maintained and operated properly in accordance with the manufacturer's recommendations, in particular with regard to the species and size of the animal;
- d) the instrument is applied correctly;
- e) stunned animals are bled out (slaughtered) as soon as possible;
- f) animals should not be stunned when slaughter is likely to be delayed; and
- g) backup *stunning* devices are available for immediate use if the primary method of *stunning* fails.

In addition, such persons should be able to recognise when an animal is not correctly stunned and should take appropriate action.

2. Mechanical stunning

A mechanical device should be applied usually to the front of the head and perpendicular to the bone surface. The following diagrams illustrate the proper application of the device for certain species.

Cattle

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

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.

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

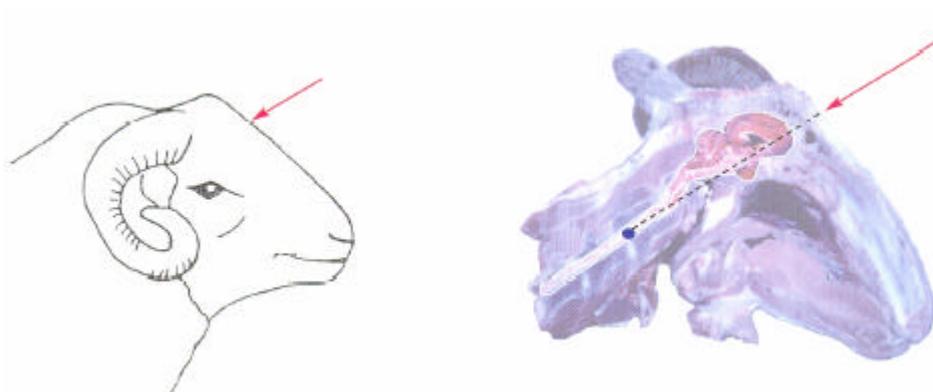


Figure source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire AL4 8AN, United Kingdom (www.hsa.org.uk).

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

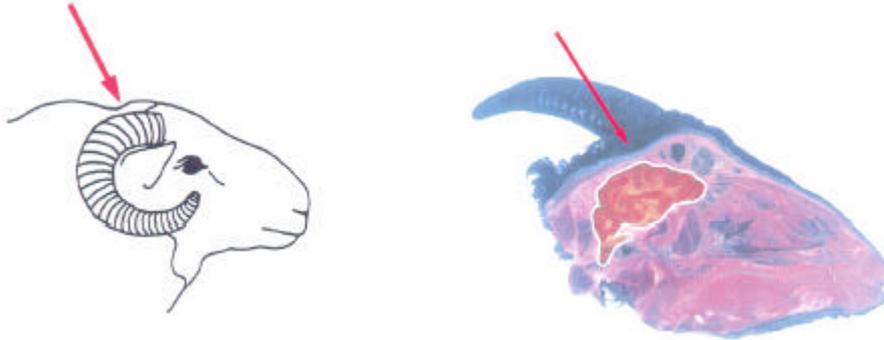
Annex F (contd)**Goats**

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.

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.

3. Electrical stunning

a) General considerations

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

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

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

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

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

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

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

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

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

In all cases, the correct current level shall be attained within one second of the initiation of stun and maintained at least for three seconds and in accordance with the manufacturer's instructions.

b) Electrical stunning of birds using a waterbath

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

Annex F (contd)

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

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

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

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

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

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

Birds should receive the current for at least 4 seconds.

Species	Current (milliamperes per bird)
Broilers	100
Layers (spent hens)	100
Turkeys	150
Ducks and Geese	130

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

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

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.

4. Gas stunning (under study)

a) Stunning of pigs by exposure to carbon dioxide (CO₂)

The concentration of CO₂ for *stunning* should be preferably 90% by volume but in any case no less than 80% by volume. After entering the *stunning* chamber, the animals should be conveyed to the point of maximum concentration of the gas as rapidly as possible and be kept until they are dead or brought into a state of insensibility which lasts until *death* occurs due to bleeding. Ideally, pigs should be exposed to this concentration of CO₂ 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 CO₂ 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 CO₂ 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 CO₂ concentration and the time of exposure, and to give a clearly visible and audible warning if the concentration of CO₂ falls below the required level.

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

b) Inert gas mixtures for stunning pigs

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

Such gas mixtures include:

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

Annex F (contd)

c) Gas stunning of poultry

The main objective of gas *stunning* is to avoid the pain and suffering associated with shackling conscious poultry under water bath *stunning* and *killing* systems. Therefore, gas *stunning* should be limited to birds contained in crates or on conveyors only. The gas mixture should be non-aversive to poultry.

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

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

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

i) Gas mixtures used for *stunning* poultry include:

- a minimum of 2 minutes exposure to 40% carbon dioxide, 30% oxygen and 30% nitrogen, followed by a minimum of one minute exposure to 80% carbon dioxide in air; or
- a minimum of 2 minutes exposure to any mixture of argon, nitrogen or other inert gases with atmospheric air and carbon dioxide, provided that the carbon dioxide concentration does not exceed 30% by volume and the residual oxygen concentration does not exceed 2% by volume; or
- a minimum of 2 minutes exposure to argon, nitrogen, other inert gases or any mixture of these gases in atmospheric air with a maximum of 2% residual oxygen by volume; or
- a minimum of 2 minutes exposure to a minimum of 55% carbon dioxide in air.

ii) Requirements for effective use are as follows:

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

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)

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

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

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.

Annex F (contd)

Article 3.7.5.8.

Summary analysis of stunning methods and the associated animal welfare issues

Method	Specific method	AW concerns/implications	Key AW requirements applicable	Species	Comment
Mechanical	Free bullet	Inaccurate targeting and inappropriate ballistics	Operator competence, achieving outright kill with first shot	Cattle, calves, buffalo, deer, horses, pigs (boars and sows)	Personnel safety
	Captive bolt - penetrating	Inaccurate targeting, velocity and diameter of bolt	Competent operation and maintenance of equipment; restraint; accuracy	Cattle, calves, buffalo, sheep, goats, deer, horses, pigs, camelids, ratites	(Unsuitable for specimen collection from TSE suspects). A back-up gun should be available in the event of an ineffective shot
	Captive bolt - non-penetrating	Inaccurate targeting, velocity of bolt, potentially higher failure rate than penetrating captive bolt	Competent operation and maintenance of equipment; restraint; accuracy	Cattle, calves, sheep, goats, deer, pigs, camelids, ratites	Presently available devices are not recommended for young bulls and animals with thick skull. 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	

Article 3.7.5.8.

Summary analysis of stunning methods and the associated animal welfare issues

Method	Specific method	AW concerns/implications	Key AW requirements applicable	Species	Comment
Gaseous	CO ₂ air/O ₂ mixture; CO ₂ inert gas mixture	Aversiveness of high CO ₂ concentrations, respiratory distress; inadequate exposure	Concentration; duration of exposure; design, maintenance and operation of equipment; stocking density management	Pigs, poultry	
	Inert gases	Recovery of consciousness	Concentration; duration of exposure; design, maintenance and operation of equipment; stocking density management	Pigs, poultry	
Bleeding out by severance of blood vessels in the neck without stunning	Full frontal cutting across the throat	Failure to cut both common carotid arteries; occlusion of cut arteries; <u>pain during and after the cut.</u>	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. An incision which does 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 60 seconds for mammals) The practice to remove hypothetical blood clots just after the bleeding should be discouraged since this may increase animal suffering.

Annex F (contd)

Article 3.7.5.9.

Summary analysis of slaughter methods and the associated animal welfare issues

Slaughter methods	Specific method	AW concerns / implications	Key requirements	Species	Comments
Bleeding with prior stunning	Full frontal cutting across the throat	Failure to cut both common carotid arteries; occlusion of cut arteries; pain during and after the cut.	A very sharp blade or knife, of sufficient length so that the point of the knife remains outside the incision during the cut; the point of the knife should not be used to make the incision. An incision which does not close over the knife during the throat cut.	Cattle, buffalo, horses, camelids, sheep, goats,	
	Neck stab followed by forward cut	Ineffective stunning; failure to cut both common carotid arteries; impaired blood flow; delay in cutting after reversible stunning	Prompt and accurate cutting	Camelids, sheep, goats, poultry, ratites	
	Neck stab alone	Ineffective stunning; failure to cut both common carotid arteries; impaired blood flow; delay in cutting after reversible stunning	Prompt and accurate cutting	Camelids, sheep, goats, poultry, ratites	
	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	

Article 3.7.5.9.

Summary analysis of slaughter methods and the associated animal welfare issues (contd)

Slaughter methods	Specific method	AW concerns / implications	Key requirements	Species	Comments
Bleeding with prior stunning (contd)	Automated mechanical cutting	Ineffective stunning; failure to cut and misplaced cuts. Recovery of consciousness following reversible stunning systems	Design, maintenance and operation of equipment; accuracy of cut; manual back-up	Poultry only	
	Manual neck cut on one side	Ineffective stunning; recovery of consciousness following reversible stunning systems	Prior non-reversible stunning	Poultry only	N.B. slow induction of unconsciousness under slaughter without stunning
	Oral cut	Ineffective stunning; recovery of consciousness following reversible stunning systems	Prior non-reversible stunning	Poultry only	N.B. slow induction of unconsciousness in non-stun systems
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	

Annex F (contd)

Article 3.7.5.10.

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

APPENDIX 3.7.6.

GUIDELINES FOR THE KILLING OF ANIMALS FOR DISEASE CONTROL PURPOSES

Article 3.7.6.1.

General principles

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

1. All personnel involved in the humane *killing* of animals should have the relevant skills and competencies. Competence may be gained through formal training and/or practical experience.
2. As necessary, operational procedures should be adapted to the specific circumstances operating on the premises and should address, apart from animal welfare, aesthetics of the method of euthanasia, cost of the method, operator safety, biosecurity and environmental aspects, aesthetics of the method of euthanasia and cost of the method.
3. Following the decision to kill the animals, *killing* should be carried out as quickly as possible and normal husbandry should be maintained until the animals are killed.
4. The handling and movement of animals should be minimised and when done, it should be done in accordance with the guidelines described below.
5. Animal *restraint* should be sufficient to facilitate effective *killing*, and in accordance with animal welfare and operator safety requirements; when *restraint* is required, *killing* should follow with minimal delay.
6. When animals are killed for *disease* control purposes, methods used should result in immediate death or immediate loss of consciousness lasting until death; when loss of consciousness is not immediate, induction of unconsciousness should be non-aversive and should not cause anxiety, pain, distress or suffering in the animals.
7. For animal welfare considerations, young animals should be killed before older animals; for biosecurity considerations, infected animals should be killed first, followed by in-contact animals, and then the remaining animals.
8. There should be continuous monitoring of the procedures by the *Competent Authorities* to ensure they are consistently effective with regard to animal welfare, operator safety and biosecurity.
9. When the operational procedures are concluded, there should be a written report describing the practices adopted and their effect on animal welfare, operator safety and biosecurity.
10. These general principles should also apply when animals need to be killed for other purposes such as after natural disasters or for culling animal populations.

Article 3.7.6.2.

Organisational structure

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

Annex G (contd)

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 guidelines.

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

In considering the animal welfare issues associated with the *killing* of animals, the key personnel, their responsibilities and competencies required are described in Article 3.7.6.3.

Article 3.7.6.3.

Responsibilities and competencies of the specialist team1. Team leader

a) Responsibilities:

- i) plan overall operations on ~~an~~ affected premises;
- ii) determine and address requirements for animal welfare, operator safety and biosecurity;
- iii) organise, brief and manage team of people to facilitate humane *killing* of the relevant animals on the premises in accordance with national regulations and these guidelines;
- iv) determine logistics required;
- v) monitor operations to ensure animal welfare, operator safety and biosecurity requirements are met;
- vi) report upwards on progress and problems;
- vii) provide a written report at the conclusion of the *killing*, describing the practices adopted and their effect on the animal welfare, operator safety and biosecurity outcomes.

b) Competencies

- i) appreciation of normal animal husbandry practices;
- ii) appreciation of animal welfare and the underpinning behavioural, anatomical and physiological processes involved in the *killing* process;
- iii) skills to manage all activities on premises and deliver outcomes on time;
- iv) awareness of psychological effects on farmers, team members and general public;
- v) effective communication skills;
- vi) appreciation of the environmental impacts caused by their operation.

2. Veterinarian

a) Responsibilities

- i) determine and supervise the implementation of the most appropriate *killing* method to ensure that animals are killed without avoidable pain and distress;
- ii) determine and implement the additional requirements for animal welfare, including the order of *killing*;
- iii) ensure that confirmation of animals deaths is carried out by competent persons at appropriate times after the *killing* procedure;
- iv) minimise the *risk* of *disease* spread within and from the premises through the supervision of biosecurity procedures;
- v) continuously monitor animal welfare and biosecurity procedures;
- vi) in cooperation with the leader, prepare a written report at the conclusion of the *killing*, describing the practices adopted and their effect on animal welfare.

b) Competencies

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

3. Animal handlers

a) Responsibilities

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

Annex G (contd)

b) Competencies

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

6. Farmer/owner/manager

a) Responsibilities

i) assist when requested.

b) Competencies

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

Article 3.7.6.4.

Considerations in planning the humane killing of animals

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

1. minimising handling and movement of animals;
2. *killing* the animals on the affected premises; however, there may be circumstances where the animals may need to be moved to another location for *killing*; when the *killing* is conducted at an *abattoir*, the guidelines in Appendix 3.7.5. on *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.

Article 3.7.6.5.

Table summarising killing methods described in Articles 3.7.6.6.-3.7.6.17.

Species	Age range	Procedure	Restraint necessary	Animal welfare concerns with inappropriate application	Article reference
Cattle	all	free bullet	no	non-lethal wounding	3.7.6.6.
	all except neonates	captive bolt - penetrating, followed by pithing or bleeding	yes	ineffective stunning	3.7.6.7.
	adults only	captive bolt - non-penetrating, followed by bleeding	yes	ineffective stunning, regaining of consciousness before killing	3.7.6.8.
	calves only	electrical, two stage application	yes	pain associated with cardiac arrest after ineffective stunning	3.7.6.10.
	calves only	electrical, single application (method 1)	yes	ineffective stunning	3.7.6.11.
	all	injection with barbiturates and other drugs	yes	non-lethal dose, pain associated with injection site	3.7.6.15.
Sheep and goats	all	free bullet	no	non-lethal wounding	3.7.6.6.
	all except neonates	captive bolt - penetrating, followed by pithing or bleeding	yes	ineffective stunning, regaining of consciousness before death	3.7.6.7.
	all except neonates	captive bolt - non-penetrating, followed by bleeding	yes	ineffective stunning, regaining of consciousness before death	3.7.6.8.
	neonates	captive bolt - non-penetrating	yes	non-lethal wounding	3.7.6.8.
	all	electrical, two stage application	yes	pain associated with cardiac arrest after ineffective stunning	3.7.6.10.
	all	electrical, single application (Method 1)	yes	ineffective stunning	3.7.6.11.
	neonates only	CO ₂ / air mixture	yes	slow induction of unconsciousness, aversiveness of induction	3.7.6.12.
	neonates only	nitrogen and/or inert gas mixed with CO ₂	yes	slow induction of unconsciousness, aversiveness of induction	3.7.6.13.
	neonates only	nitrogen and/or inert gases	yes	slow induction of unconsciousness	3.7.6.14.

Annex G (contd)

Table summarising killing methods described in Articles 3.7.6.6-3.7.6.17. (Contd)

Species	Age range	Procedure	Restraint Necessary	Animal welfare concerns with inappropriate application	Article reference
Sheep and goats (contd)	all	injection of barbiturates and other drugs	yes	non-lethal dose, pain associated with injection site	3.7.6.15.
Pigs	all, except neonates	free bullet	no	Non-lethal wounding	3.7.6.6.
	all except neonates	captive bolt - penetrating, followed by pithing or bleeding	yes	ineffective stunning, regaining of consciousness before death	3.7.6.7.
	neonates only	captive bolt - non-penetrating	yes	Non-lethal wounding	3.7.6.8.
	all §	electrical, two stage application	yes	pain associated with cardiac arrest after ineffective stunning	3.7.6.10.
	all	electrical, single application (Method 1)	yes	ineffective stunning	3.7.6.11.
	neonates only	CO ₂ / air mixture	yes	slow induction of unconsciousness, aversiveness of induction	3.7.6.12.
	neonates only	nitrogen and/or inert gas mixed with CO ₂	yes	slow induction of unconsciousness, aversiveness of induction	3.7.6.13.
	neonates only	nitrogen and/or inert gases	yes	slow induction of unconsciousness,	3.7.6.14.
	all	injection with barbiturates and other drugs	yes	non-lethal dose, pain associated with injection site	3.7.6.15.
Poultry	adults only	captive bolt - non-penetrating	yes	ineffective stunning	3.7.6.8.
	day-olds and eggs only	Maceration	no	non-lethal wounding, non- immediacy;	3.7.6.9.
	adults only	electrical single application (Method 2)	yes	ineffective stunning	3.7.6.11.
	adults only	electrical single application, followed by killing (Method 3)	yes	ineffective stunning; regaining of consciousness before death	3.7.6.11.

Table summarising killing methods described in Articles 3.7.6.6-3.7.6.17. (Contd)

Species	Age range	Procedure	Restraint Necessary	Animal welfare concerns with inappropriate application	Article reference
Poultry (contd)	all	CO ₂ / air mixture Method 1 Method 2	yes no	slow induction of unconsciousness, aversiveness of induction	3.7.6.12.
	all	nitrogen and/or inert gas mixed with CO ₂	yes	slow induction of unconsciousness, aversiveness of induction	3.7.6.13.
	all	nitrogen and/or inert gases	yes	slow induction of unconsciousness	3.7.6.14.
	all	injection of barbiturates and other drugs	yes	Non-lethal dose, pain associated with injection site	3.7.6.15.
	adults only	addition of anaesthetics to feed or water, followed by an appropriate killing method	no	ineffective or slow induction of unconsciousness	3.7.6.16.

- The methods are described in the order of mechanical, electrical and gaseous, not in an order of desirability from an animal welfare viewpoint.
- § The only preclusion against the use of this method for neonates is the design of the stunning tongs that may not facilitate their application across such a small-sized head/body.

Article 3.7.6.6.

Free bullet

1. Introduction

- a) A free bullet is a projectile fired from a shotgun, rifle, handgun or purpose-made humane killer.
- b) The most commonly used firearms for close range use are:
 - i) humane killers (specially manufactured/adapted single-shot weapons);
 - ii) shotguns (12, 16, 20, 28 bore and .410);
 - iii) rifles (.22 rimfire);
 - iv) handguns (various calibres from .32 to .45).
- c) The most commonly used firearms for long range use are rifles (.22, .243, .270 and .308).
- d) A free bullet used from long range should be aimed to penetrate the skull or soft tissue at the top of the neck of the animal (high neck shot), to cause irreversible concussion and death and should only be used by properly trained and competent marksmen.

2. Requirements for effective use

- a) The marksman should take account of human safety in the area in which he/she is operating. Appropriate vision and hearing protective devices should be worn by all personnel involved.

Annex G (contd)

- 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 animal.
- c) The correct cartridge, calibre and type of bullet for the different species age and size should be used. Ideally the ammunition should expand upon impact and dissipate its energy within the cranium.
- d) Shot animals should be checked to ensure the absence of brain stem reflexes.

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



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

Figure 2 The optimum position for hornless sheep and goats is on the midline, with the shot aiming at the angle of the jaw.

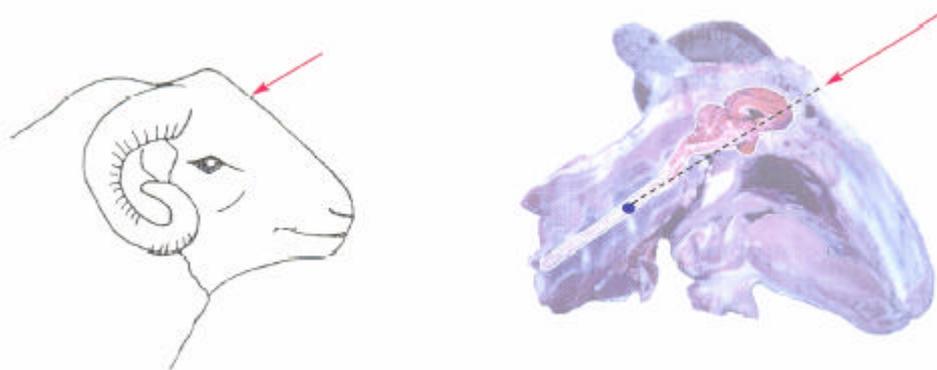


Figure Source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire, AL4 8AN, United Kingdom (www.hsa.org.uk).

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

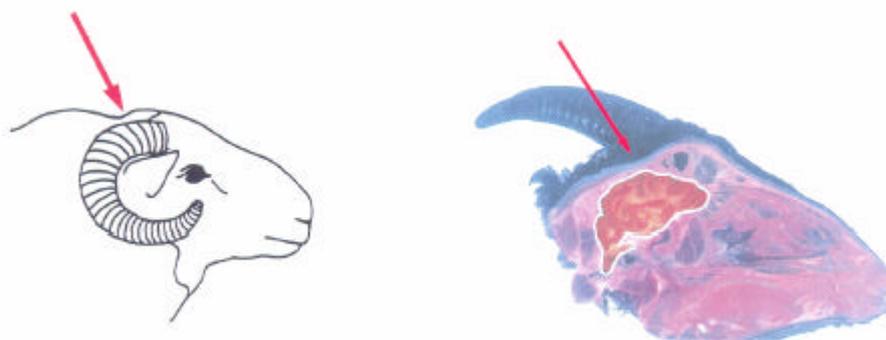


Figure Source: Humane Slaughter Association (2005) Guidance Notes No. 3: Humane Killing of Livestock Using Firearms. Published by the Humane Slaughter Association, The Old School, Brewhouse Hill, Wheathampstead, Hertfordshire, AL4 8AN, United Kingdom (www.hsa.org.uk).

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).

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.

Annex G (contd)

- 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. Conclusions

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

Article 3.7.6.7.

Penetrating captive bolt1. Introduction

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

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

2. Requirements for effective use

- a) For cartridge powered and compressed air guns, the bolt velocity and the length of the bolt should be appropriate to the species and type of animal, in accordance with the 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 cattle, sheep, goats and pigs (except neonates), when followed by pithing or bleeding.

Article 3.7.6.8.

Captive bolt – non-penetrating

1. Introduction

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

The gun should be placed on the front of the skull to deliver a percussive blow which produces unconsciousness in cattle (adults only), sheep, goats and pigs, and death in poultry and neonate sheep, goats and pigs up to a maximum live weight of 10 kg. Bleeding should be performed as soon as possible after the blow to ensure the death of the animal.

2. Requirements for effective use

- a) For cartridge powered and compressed air guns, the bolt velocity should be appropriate to the species and type of animal, in accordance with the recommendations of the manufacturer.
- b) Captive bolt guns should be frequently cleaned and maintained in good working condition.
- c) More than one gun may be necessary to avoid overheating and a back-up gun should be available in the event of an ineffective shot.
- d) Animals should be restrained; at a minimum mammals should be penned for cartridge powered guns and in a race for compressed air guns; birds should be restrained in cones, shackles, crushes or by hand.
- e) The operator should ensure that the head of the animal is accessible.
- f) The operator should fire the captive bolt at right angles to the skull in the optimal position (figures 1-4).

Annex G (contd)

- g) To ensure death in non-neonate mammals, bleeding should be performed as soon as possible after *stunning*.
- h) Animals should be monitored continuously after *stunning* until death to ensure the absence of brain stem reflexes.

3. Advantages

- a) The method induces an immediate onset of unconsciousness, and death in birds and neonate mammals.
- b) Mobility of equipment reduces the need to move animals.

4. Disadvantages

- a) As consciousness can be regained quickly in non-neonate mammals, they should be bled as soon as possible after *stunning*.
- b) Laying hens in cages have to be removed from their cages and most birds have to be restrained.
- c) Poor gun maintenance and misfiring, and inaccurate gun positioning and orientation may result in poor animal welfare.
- d) Post stun convulsions may make bleeding difficult and hazardous.
- e) Difficult to apply in agitated animals; such animals may be sedated in advance of the *killing* procedure.
- f) Repeated use of a cartridge powered gun may result in over-heating.
- g) Bleeding may present a biosecurity risk.

5. Conclusions

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

Article 3.7.6.9.

Maceration1. Introduction

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

2. Requirements

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

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

3. Advantages

- a) Procedure results in immediate death.
b) Large numbers can be killed quickly.

4. Disadvantages

- a) Specialised equipment is required.
b) Macerated tissues may present a biosecurity or human health risks.
c) The cleaning of the equipment can be a source of contamination.

5. Conclusion

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

Article 3.7.6.10.

Electrical – two-stage application

1. Introduction

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

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



Figure 5. Scissor-type stunning tongs.

2. Requirements for effective use

- a) The stunner control device should generate a low frequency (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 > 6 weeks	220	1.3
Pigs < 6 weeks	125	0.5

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

Annex G (contd)

- 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~~10 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 3.7.6.11.

Electrical – single application1. 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 10 seconds.
 - v) Electrodes should be cleaned regularly between animals and after use, to enable optimum electrical contact to be maintained.
 - vi) Water or saline may be necessary to improve electrical contact with sheep.
 - vii) An effective stun and kill should be verified by the absence of brain stem reflexes.
- b) Advantages
- i) Method 1 stuns and kills simultaneously.
 - ii) It minimises post-stun convulsions and therefore is particularly effective with pigs.
 - iii) A single team member only is required for the application.
 - iv) Non-invasive technique minimises biosecurity risk.
- c) Disadvantages
- i) Method 1 requires individual mechanical animal *restraint*.
 - ii) The electrodes must be applied and maintained in the correct positions to produce an effective stun and kill.
 - iii) Method 1 requires a reliable supply of electricity.
- d) Conclusion

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

2. Method 2

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

- a) Requirements for effective use
- i) A mobile waterbath stunner and a short loop of processing line are required.
 - ii) A low frequency (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.

Annex G (contd)

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

- Quail - 100 mA/bird
- Chickens – 160 mA/bird
- Ducks & Geese – 200 mA/bird
- Turkeys – 250 mA/bird.

A higher current is required for wet birds.

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

b) Advantages

- i) Method 2 stuns and kills simultaneously.
- ii) It is capable of processing large numbers of birds reliably and effectively.
- iii) This non-invasive technique minimises biosecurity risk.

c) Disadvantages

- i) Method 2 requires a reliable supply of electricity.
- ii) Handling, inversion and shackling of birds are required.

d) Conclusion

Method 2 is suitable for large numbers of poultry.

3. Method 3

Method 3 comprises the single application of sufficient electrical current to the head of poultry in a position that spans the brain, causing unconsciousness; this is followed by a *killing* method (Article 3.7.6.17.).

a) Requirements for effective use

- i) The stunner control device should generate sufficient current (more than 600 mA/ duck, more than 300 mA/bird) to stun.
- ii) Appropriate protective clothing (including rubber gloves and boots) should be worn.
- iii) Birds should be restrained, at a minimum manually, close to an electrical supply.
- iv) A *stunning* current should be applied in a position that spans the brain for a minimum of ~~3~~7 seconds; immediately following this application, the birds should be killed (Article 3.7.6.17.).
- v) Electrodes should be cleaned regularly and after use, to enable optimum electrical contact to be maintained.
- vi) Birds should be monitored continuously after *stunning* until death to ensure the absence of brain stem reflexes.

b) Advantages

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

- c) Disadvantages
 - i) Method 3 requires a reliable supply of electricity and is not suitable for large-scale operations.
 - ii) The electrodes must be applied and maintained in the correct position to produce an effective stun.
 - iii) Birds must be individually restrained.
 - iv) It must be followed by a *killing* method.
- d) Conclusion

Method 3 is suitable for small numbers of poultry.

Article 3.7.6.12.
(under study)

CO₂ / air mixture

1. Introduction

Controlled atmosphere *killing* is performed by exposing animals to a predetermined gas mixture, either by placing them in a gas-filled *container* or apparatus (Method 1) or by the gas being introduced into a poultry house (Method 2). Method 2 ~~should be used whenever possible, as it~~ eliminates welfare issues resulting from the need to manually remove live birds.

Inhalation of carbon dioxide (CO₂) induces respiratory and metabolic acidosis and hence reduces the pH of cerebrospinal fluid (CSF) and neurones thereby causing unconsciousness and, after prolonged exposure, death.

2. Method 1

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

- a) Requirements for effective use in a *container* or apparatus
 - i) *Containers* or apparatus should allow the required gas concentration to be maintained and accurately measured.
 - ii) When animals are exposed to the gas individually or in small groups in a *container* or apparatus, the equipment used should be designed, constructed, and maintained in such a way as to avoid injury to the animals and allow them to be observed.
 - ii) 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.

Annex G (contd)

b) Advantages

- i) CO₂ 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 CO₂ 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.

3. Method 2

The gas is introduced into a poultry house.

a) Requirements for effective use in a poultry house

- i) Prior to introduction of the CO₂ the poultry house should be appropriately sealed to allow control over the gas concentration.
- ii) The house should be gradually filled with CO₂ so that all birds are exposed to a concentration of >40% until they are dead; a vaporiser may be required to prevent freezing.
- iii) Devices should be used to accurately measure the gas concentration at the maximum height accommodation of birds.

b) Advantages

- i) Applying gas to birds *in situ* eliminates the need to manually remove live birds.
- ii) CO₂ is readily available.
- iii) Gradual raising of CO₂ 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 CO₂ in some poultry houses.
- ii) It is difficult to verify death while the birds are in the poultry house.

d) Conclusion

Method 2 is suitable for use in poultry in closed-environment sheds.

Article 3.7.6.13.

Nitrogen and/or inert gas mixed with CO₂1. Introduction

CO₂ may be mixed in various proportions with nitrogen or an inert gas (e.g. argon), and the inhalation of such mixtures leads to hypercapnic-hypoxia and death when the oxygen concentration by volume is =2%. This method involves the introduction of animals into a *container* or apparatus containing the gases. Such mixtures do not induce immediate loss of consciousness, therefore the aversiveness of various gas mixtures containing high concentrations of CO₂ and the respiratory distress occurring during the induction phase, are important animal welfare considerations.

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

2. Requirements for effective use

- a) *Containers* or apparatus should allow the required gas concentrations to be maintained, and the O₂ and CO₂ concentrations accurately measured during the *killing* procedure.
- b) When animals are exposed to the gases individually or in small groups in a *container* or apparatus, the equipment used should be designed, constructed, and maintained in such a way as to avoid injury to the animals and allow them to be observed.
- c) Animals should be introduced into the *container* or apparatus after it has been filled with the required gas concentrations (with =2% O₂), and held in this atmosphere until death is confirmed.
- d) Team members should ensure that there is sufficient time allowed for each batch of animals to die before subsequent ones are introduced into the *container* or apparatus.
- e) *Containers* or apparatus should not be overcrowded and measures are needed to avoid animals suffocating by climbing on top of each other.

3. Advantages

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

4. Disadvantages

- a) A properly designed *container* or apparatus is needed.
- b) It is difficult to verify death while the animals are in the *container* or apparatus.
- c) There is no immediate loss of consciousness.
- d) Exposure times required to kill are considerable.

5. Conclusion

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

Annex G (contd)

Article 3.7.6.14.

Nitrogen and/or inert gasses1. 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 O₂ 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 $\pm 2\%$ O₂), and held in this atmosphere until death is confirmed.
- d) Team members should ensure that there is sufficient time allowed for each batch of animals to die before subsequent ones are introduced into the *container* or apparatus.
- e) *Containers* or apparatus should not be overcrowded and measures are needed to avoid animals suffocating by climbing on top of each other.

3. Advantages

Animals are unable to detect nitrogen or inert gases, and the induction of hypoxia by this method is not aversive to animals.

4. Disadvantages

- a) A properly designed *container* or apparatus is needed.
- b) It is difficult to verify death while the animals are in the *container* or apparatus.
- c) There is no immediate loss of consciousness.
- d) Exposure times required to kill are considerable.

5. Conclusion

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

Article 3.7.6.15.

Lethal injection1. Introduction

A lethal injection using high doses of anaesthetic and sedative drugs causes CNS depression, unconsciousness and death. In practice, barbiturates in combination with other drugs are commonly used.

2. Requirements for effective use

- a) Doses and routes of administration that cause rapid loss of consciousness followed by death should be used.
- b) Prior sedation may be necessary for some animals.
- c) Intravenous administration is preferred, but intraperitoneal or intramuscular administration may be appropriate, especially if the agent is non-irritating.
- d) Animals should be restrained to allow effective administration.
- e) Animals should be monitored to ensure the absence of brain stem reflexes.

3. Advantages

- a) The method can be used in all species.
- b) Death can be induced smoothly.

4. Disadvantages

- a) *Restraint* and/or sedation may be necessary prior to injection.
- b) Some combinations of drug type and route of administration may be painful, and should only be used in unconscious animals.
- c) Legal requirements and skill/training required may restrict use to *veterinarians*.
- d) Contaminated carcasses may present a risk to other wild or domestic animals.

5. Conclusion

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

Article 3.7.6.16.

Addition of anaesthetics to feed or water

1. Introduction

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

2. Requirements for effective use

- a) Sufficient quantities of anaesthetic need to be ingested rapidly for effective response.
- b) Intake of sufficient quantities is facilitated if the birds are fasted or water is withheld.
- c) Must be followed by *killing* (see Article 3.7.6.17.) if birds are anaesthetised only.

Annex G (contd)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.

Article 3.7.6.17.

Cervical dislocation and decapitation1. 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.

However, conscious birds of less than 3 kilograms in case of small numbers of birds where other methods are not available or impracticable, 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. Its use should be avoided in any case for birds over 3 kg of live weight.
 - iii) Requires trained personnel to perform humanely.
2. Decapitation
- a) Introduction
Decapitation results in death by cerebral ischaemia using a guillotine or knife.
 - b) Requirements for effective use
The required equipment should be kept in good working order.
 - c) Advantages
The technique is effective and does not require monitoring.
 - d) Disadvantages
The working area is contaminated with body fluids, which increases biosecurity risks.

Article 3.7.6.18.

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.
 - 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.

Annex G (contd)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.

Bleeding out should be completed and any incision made should ensure the complete severance off both carotid arteries, or the vessels from which they arise (e.g. chest stick).

b) Requirements for effective use

- i) A sharp knife is required.
- ii) An access to the neck or chest of the animal is required.
- iii) Animals should be monitored continuously until death to ensure the absence of brain stem reflexes.

c) Advantages

The technique is effective in producing death after an effective *stunning* method which does not permit pithing.

d) Disadvantages

- a) A delayed and/or ineffective bleeding due to convulsions may occur.
- b) The working area is contaminated with body fluids, which increases biosecurity risks.

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CHAPTER 1.1.1.

AQUATIC ANIMAL WELFARE DEFINITIONS

For the purposes of the *Aquatic Code*, the following definitions apply:

- **Anaesthesia** means a state whereby an *aquatic animal* is insensitive to sensory inputs achieved through means of exposure to anaesthetic agents. Stages range from sedation to complete loss of response to stimuli.
- **Aquatic animal carcass** means the body/trunk of an *aquatic animal* subsequent to killing or death.
- **Aquatic animal offal/waste** means the whole or parts of an *aquatic animal* and *aquatic animal products* not approved for human consumption including sludge and sieve material collected during slaughtering.
- **Aquatic animals for killing** means *aquatic animals* that are killed on site or transported to a suitable location for killing, for disease control purposes.
- **Boat** means a *vessel* constructed or adapted for the transport or temporary holding on water of live *aquatic animals* and their products, and includes well-boats, barges, and boats with tanks on deck.
- **Brailing device** means equipment used to haul fish into a transport vessel.
- **Crustaceans** means crabs, crayfish, lobsters, prawns and shrimps.
- **Death** means irreversible loss of brain activity in fish as evidenced through absolute and sustained loss of responsiveness to all stimuli, and through irreversible loss of responsiveness to all stimuli in crustaceans.
- **Exsanguination** means the action or process of draining or otherwise losing blood.
- **Fish** means live freshwater, estuarine or seawater fishes belonging to the classes *Agnatha* and *Osteichthyes* and cartilaginous fish of the class *Chondrichthyes*.
- **Fish Health Specialist** means a person registered or licensed by the *Competent Authority* of a country on the basis of an educational degree in fish health and related issues.
- **Harvest** means the removal of *aquatic animals* from their environment for human consumption.
- **Humane killing** means either immediate death, or death preceded either by immediate unconsciousness or by unconsciousness induced without adverse behavioural responses.
- **Killing** means any procedure which causes the *death* of an *aquatic animal*.
- **Mass destruction** means an emergency killing and disposal of a population of *aquatic animals* for disease control purposes.

Appendix H (contd)

- **Pithing** means to sever or destroy the spinal cord of an aquatic animal, usually by inserting a needle or knife into the vertebral channel.
 - **Slaughtering** means the killing and/or processing of *aquatic animals* with or without anaesthesia for human or animal consumption.
 - **Stocking density** means, in the case of *aquatic animals*, the biomass of *aquatic animals* per unit area or per unit volume of water in a controlled environment, e.g. tank, pen or vehicle.
 - **Stress** means quantifiable and measurable factors influencing the physiological processes of an *aquatic animal*.
 - **Stunning** means any mechanical, electrical, chemical or other procedure which causes the complete loss of responsiveness to external stimuli in an aquatic animal until death ensues.
 - **Transport equipment** means the compartment in which live *aquatic animals* and transporting water are kept during transport (buckets, cylinders, tanks, wells, etc.), and associated equipment such as water circulation devices, pumps, water treatment equipment, water filtration devices and systems for loading and unloading live fish, valves, tubes and pipelines.
 - **Transport unit**: means the combination of the transport equipment and the *vehicle/ vessel*.
 - **Travel means** the movement of a *vehicle/ vessel* or container carrying live *aquatic animals* from one location to another.
 - **Vehicle/vessel** means any train, truck, automobile, airplane, helicopter or *boat* that is used for the transport of live *aquatic animals*.
 - **Vestibulo-ocular reflex (VOR)** means eye rolling.
 - **Visual evoked response (VER)** means a test that evaluates the conduction of electrical impulses from the optic nerve to the occipital cortex of the brain.
 - **Water quality parameters** means the physical, chemical and biological characteristics of water.
-

APPENDIX X.X.1.

INTRODUCTION TO OIE GUIDELINES FOR THE WELFARE OF LIVE AQUATIC ANIMALS

Article X.X.1.1.

Guiding principles for aquatic animal welfare

1. That there is a relationship between *aquatic animal health* and *aquatic animal welfare*, and that sound *aquatic animal welfare* requires *aquatic animal health* issues to be solved in accordance with the principles referred to in the OIE *Aquatic Animal Health Code*.
2. That valuable indices of aquatic animal welfare may be derived from a homeostasis approach to welfare research, guided by the more objective principles of the internationally recognised 'five freedoms' (freedom to express normal patterns of behaviour, freedom from pain, injury and disease; freedom from fear and distress; freedom from physical and thermal discomfort; freedom from hunger, thirst and malnutrition) provide valuable guidance in *aquatic animal welfare*.
3. That the internationally recognised 'three Rs' (reduction in numbers of *aquatic animals*, refinement of experimental methods and replacement of *aquatic animals* with non-animal techniques) provide valuable guidance for the use of *aquatic animals* in science.
4. That the scientific assessment of *aquatic animal welfare* involves diverse elements which need to be considered together, and that selecting and weighing these elements may involve value-based assumptions which should be minimized where possible, or if considered essential, are made as explicit as possible.
5. That the use of *aquatic animals* in *aquaculture*, harvest or capture fisheries, research and for recreation (e.g. ornamentals in aquaria), makes a major contribution to the social and well-being of people.
6. That the use of *aquatic animals* carries with it an ethical duty to ensure the welfare of such animals to the greatest extent practical.
7. That the improvements in *aquatic animal welfare* may lead to improvements in individual *aquatic animal* productivity.
8. That equivalent outcome (performance criteria), rather than identical systems (design criteria), be the basis for comparison of *aquatic animal welfare* standards and guidelines.

Article X.X.1.2.

Scientific basis for guidelines

1. Welfare is a broad term which includes the many elements that contribute to an *animal's* quality of life, including those referred to in the "five freedoms" listed in Article X.X.1.1. paragraph 2.
2. The scientific assessment of *aquatic animal welfare* has progressed in recent years and forms the basis for these guidelines. Many areas of *aquatic animal welfare* may require further research to understand in full the ability of *aquatic animals* to feel pain and be sentient.

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3. Measures of *aquatic animal* welfare may involve assessing health and injuries; growth, behaviour, and other performance factors; capture, feeding, handling, management, transport, slaughter and other conditions not normally encountered in nature. Environmental and other stressors may also affect *aquatic animal* production and performance negatively, many of which can be measured and observed in wild, captured and farmed *aquatic animals*.

 4. Such measures can lead to criteria and indicators that help to evaluate how different methods of managing *aquatic animals* influence their welfare.
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GUIDELINES FOR THE TRANSPORT OF LIVE FARMED FISH BY BOAT

Article 1

Where the conditions of transport adversely affect the welfare of *fish* over time, the length of time *fish* spend on a transport by boat should be as short as possible.

Article 2

Responsibilities

The welfare of farmed *fish* during their transport is the joint responsibility of all personnel involved. These guidelines apply to the transport of *fish* by *boat* within a country and between countries. The roles of each of the various personnel are defined below:

1. Owners and managers of farmed *fish* are accountable for the general health of the *fish* and their fitness at the start of the transport and for ensuring the overall welfare of *fish* during the transport regardless whether these duties are subcontracted to other parties.
2. All parties handling *fish* prior to loading as well as during loading and unloading have a personal responsibility for the welfare of the *fish* being shipped. Those parties supervising such activities should have an appropriate knowledge and understanding to ensure the welfare of the *fish* is maintained during the process. The responsibilities include:
 - a) adequate water supply and quality for live-holding within the physiological requirements of the species;
 - b) adequate containment to sustain life for the duration of the transportation.
3. Transport companies, *boat* owners and captains, in cooperation with the *Competent Authorities*, are responsible for planning the transport to ensure that the transport can be carried out according to *fish* welfare standards; these include:
 - a) responsibility for choosing an appropriate and functioning *boat* and ensuring that competent staff are available for loading and unloading;
 - b) responsibility for having contingency plans to address emergencies and minimise stress during transport;
 - c) responsibility for correct loading of the *boat* with the *fish*, their holding containers, etc. that permit access for regular examinations of the *fish* during the transport and for appropriate responses if welfare problems arise.
4. The person (captain) directly supervising the transport should have adequate knowledge and experience of *fish* welfare requirements and the operation of the transport equipment. The person should also maintain sufficient records to satisfy regulatory requirements.

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5. Owners/managers of facilities at the start and at the end of the journey are responsible for:
 - a) the general health of the *fish* and their fitness at the start of the journey and to ensure the overall welfare of the *fish* during the transport regardless whether these duties are subcontracted to other parties;
 - b) ensuring competent personnel supervise operations at their facilities to *fish* are loaded and unloaded in a manner that causes minimum stress and injury;
 - c) having a contingency plan available to enable killing of the *fish* humanely if required;
 - d) providing facilities and agents for washing and disinfecting *transport equipment* after unloading.

6. The responsibilities of the *Competent Authorities* for the exporting and importing jurisdiction include:
 - a) establishing minimum standards for *fish* welfare, including requirements for the examination by appropriate aquatic animal health personnel of *fish* before, during and after their travel, and appropriate certification and record keeping;
 - b) setting criteria for *vessels* for the transport of *fish*;
 - c) ensuring appropriate awareness and training;
 - d) setting criteria as appropriate for those people in control of relevant parts of transportation;
 - e) implementation of the standards, including through accreditation of / interaction with other organisations;
 - f) providing information on designated restriction zones and fish health, as need to prevent the transport of fish from spreading disease;
 - g) monitoring and evaluating health and welfare performance.

7. Those parties supervising or involved in making judgments with respect to *aquatic animal* welfare should have specialized training as part of their qualifications in the areas of which they are involved.

Article 3

Competence

1. All persons handling live *fish*, or who are otherwise responsible for live *fish* during transportation, should be competent according to their responsibilities listed in Articles 1 and 4. Competence may be gained through formal training and/or practical experience. Competence in areas other than *fish* welfare would need to be addressed separately.

2. Any necessary training should address species-specific knowledge and practical experience on:
 - a) *fish* behaviour, physiology, general signs of disease and indicators of poor *fish* welfare;
 - b) transport regulations;

- c) operation and maintenance of equipment relevant to *fish* health and welfare;
- d) water quality;
- e) methods of live *fish* handling during transport and associated activities such as loading and unloading;
- f) methods of inspecting the *fish*, managing situations frequently encountered during transport such as adverse weather conditions, and dealing with emergencies;
- g) species-specific aspects of fish handling and care, whenever necessary;
- h) appropriate record keeping.

Article 4

Planning the transport1. General considerations

- a) Adequate planning is a key factor affecting the welfare of live *fish* during transportation. Before the transport starts, plans should be made in relation to:
 - i) type of *boat/transport equipment* required;
 - ii) route, taking into account distance, expected weather and sea conditions;
 - iii) nature and duration of the transport;
 - iv) care of the *fish* during the transport;
 - v) emergency response procedures related to *fish* welfare.
- b) Extreme weather conditions are hazards for live *fish* undergoing transport and require appropriate *boat* design to minimise risks. In extreme conditions that threaten *fish* welfare or biosecurity, live *fish* should not be transported.
- c) As live *fish* transport is often a significant factor in the spread of infectious diseases, transport planning should take the following into account:
 - i) anti-microbials should not be used prophylactically; if used therapeutically, treatment should only be carried out upon instruction by a veterinarian or duly qualified and/or licenced fish health specialist as appropriate under the legislation of a country; if *fish* intended for transport have been treated, they should not be transported until they have recovered;
 - ii) before transport is carried out, the necessary biosecurity level should be assessed (e.g. washing and disinfection practices, safe places for changing water, treatment of transport water).

Appendix H (contd)2. Contingency plans

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

3. Boat design and maintenance

- a) *Boats* used for transport of live *fish* should be designed, constructed and fitted as appropriate to the species, size and weight of the *fish* to be transported. Special attention should be paid to the avoidance of injury to the *fish* through the use of containers that minimise the risk of injury to the *fish*.
- b) In order to minimise the likelihood of the spread of pathogenic agents during a transport, *boats* should be designed to allow the biosecure handling of dead *fish*, and thorough cleaning and disinfection prior to and after the transport.
- c) *Boats* should be maintained in good mechanical and structural condition.
- d) *Boats* should have adequate circulation of water and equipment for oxygenation to meet variations in the conditions during the journey.
- e) The *fish* should be accessible to inspection *en route* to ensure that *fish* welfare standards considerations are assessed and appropriately addressed.
- f) Containers carried on *boats* should be adequately secured.
- g) The maximum number of live *fish* to be transported in a container should be determined in conjunction with any applicable stocking density recommendations and/or the *Competent Authority*, and before the *boat* is loaded; the biomass should be measured during the loading process.
- h) Documentation that focuses on live *fish* welfare and thus carried with the *boat* should include:
 - i) maintenance programme for water quality including schematics for the containers and pipe systems supplying the *transport unit*;
 - ii) transport logbook of stocks received, contact information, mortalities and disposal/storage logs;
 - iii) check-list for cleaning and disinfection schedules and responsible personnel prior to transport commencement.
- i) The *transport unit* should be of a type that meets the criteria set by the *Competent Authority*.

4. Water and equipment on boat and/or container

- a) Equipment to maintain adequate water circulation, water quality (e.g. oxygen, pH, temperature), and to monitor water quality should be available as appropriate to the length of the transport.

- b) Adequate water circulation and extra oxygenation which can be adjusted to meet variations in temperature and oxygen demand during the transport to fulfil the needs of the *fish* species being transported should be available as appropriate to the length of the transport.
- c) The water used should not come from locations under restriction by the *Competent Authority*. The water should contain sufficient oxygen to ensure the well-being of the *fish*.

5. Documentation

- a) *Fish* should not be loaded until the required documentation is complete.
- b) The documentation accompanying the consignment (the transport log) should include:
 - i) transport plan including a contingency plan for *fish* welfare emergencies and actions to be taken during the transport;
 - ii) date, time, and place of loading;
 - iii) *fish* species transported;
 - iv) information on biomass load, route, water quality and exchanges, and morbidity/mortality;
 - v) expected time, date and place of arrival and unloading and receiver contact information;
 - vi) information to allow traceback to the premises of origin;
 - vii) *stocking density* estimate for containers/compartments in the consignment.
- c) The transport log should be made available to the dispatcher and the receiver of the consignment as well as to the *Competent Authority* upon request. Transport logs from previous journeys should be kept after completion of the transport for a period of time as specified by the *Competent Authority* after completion.
- d) When health certification is required to accompany consignments of live *fish*, it should include:
 - i) appropriate information on the origin of the *fish*;
 - ii) information on the health status of the *fish* including test, treatment and vaccination status.

6. Preparation of fish for the transport.

- a) *Fish* intended for transport should be starved prior to transport.
- b) *Fish* found unfit for transport by inspection by the *farm staff*, captain, or fish health specialist/veterinarian should not be loaded onto a *boat*.
- c) A group of live *fish* that is unfit to be transported includes:
 - i) a group demonstrating significant physical injuries or abnormal behaviour, such as rapid ventilation, discolouration or unusual swimming;

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- ii) a group with recent exposure to stressors or pathogenic agents.

7. Species-specific recommendations

Transport procedures should be able to take account of variations in the behaviour and needs of the *fish* species. Handling procedures that are successful with one species are often ineffective or dangerous with another.

Some species may need to be physiologically prepared prior to entering a new environment; this may include food deprivation or osmo-regulatory manipulation.

8. Nature and duration of the journey

The pre-transport preparation, the duration and route of a transport should be determined by:

- a) the purpose of the transport e.g. biosecurity issues, transport of *fish*, *fish* for stocking farms or resource enhancement, *fish* for slaughter/killing for disease control purposes;
- b) the ability of the *fish* to cope with the stress of *transport*;
- c) the previous handling and transport experience of the *fish*;
- d) factors such as *stocking density*, species and life-stage being transported, metabolic rate of the *fish*;
- e) the quality of water and the availability of water exchange facilities;
- f) other extrinsic factors such as environmental conditions (e.g. air and water temperature), *boat* and equipment design, route and weather conditions as well as *boat* transport quality.

Article 5

Loading the fish

1. The issues which should be addressed to avoid unnecessary stress and injury to the *fish* include:
 - a) crowding;
 - b) improperly constructed or operated nets;
 - c) improperly constructed or operated pumps, pipes and fittings;
 - d) water quality and air temperature.
2. The density of *fish* in a container or compartment should not exceed the maximum load (kg/m² and/or kg/m³) for a given species and a given situation. During loading, techniques should be used to measure and record the biomass.
3. Loading should be carried out by or supervised by operators with knowledge and experience of the behavioural and other characteristics of the *fish* species being loaded to ensure that the welfare of the *fish* is maintained.

Article 6

Transport1. General considerations

- a) The captain should ensure that the load is checked immediately before departure to ensure that the *fish* have been properly loaded. Each load should be checked again early in the transport as appropriate to the length of the transport.
- b) Where possible, periodic inspections should take place during the transport to verify that acceptable welfare is being maintained. *Fish* found moribund or dead should be removed from contact with other *fish* and stored under biosecure conditions as appropriate to the length of the transport.
- c) The person in charge should ensure that water quality is monitored and the necessary adjustments made to avoid extreme conditions regarding water temperature, oxygen levels, CO₂ levels, pH changes and ammonia nitrogen.
- d) The person in charge should try to minimise the effect of adverse environmental conditions which may affect the welfare of the *fish*.

2. Emergency procedures

- a) In the event of a *fish* health emergency on board, the captain or his/her designate should contact the relevant *Competent Authority* to determine the correct procedure to follow.
- b) If the killing of *fish* is necessary during the transport, the person in charge should ensure that the killing is carried out in accordance with the *Guidelines for the Humane Killing of Fish for Disease Control Purposes* (in preparation), and in compliance with relevant aquatic animal health and environmental legislation. If *fish* health or welfare is irrevocably compromised in an emergency during boat transport, such killing should be done as feasibly as possible with the available personnel (see *Guidelines for the Humane Killing of Fish for Disease Control Purposes* [in preparation]).
- c) Person in charge at the place of unloading should be notified of increased mortality during the journey to enable appropriate arrangements to be made in accordance with the contingency plan.

Article 7

Unloading the fish

1. The principles of good *fish* handling during loading apply equally during unloading.
2. Some species of *fish* should be acclimatised if there is a likelihood of the *fish* being unloaded into water of a significantly different temperature or other water qualities.
3. *Fish* should be unloaded from the *boat* into appropriate holding containers as soon as possible after arrival at the destination, sufficient time to ensure that the unloading proceeds does not cause harm to the *fish*.

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4. Unloading should be supervised by *person in charge* with knowledge and experience of the behavioural and physical characteristics of the species being unloaded, and of the equipment being used.
5. Moribund or injured *fish* or *fish* otherwise disabled during a transport should be sorted out and disposed in accordance with the *Guidelines for the Humane Killing of Fish for Disease Control Purposes* (in preparation).

Article 8

Post-transport activities1. General considerations

- a) As the health of the *fish* may be compromised as a result of transport and/or change of environment, the person in charge receiving the *fish* should closely observe them during the post-transport period, and keep appropriate records.
- b) *Fish* showing abnormal clinical signs to the person in charge should be humanely killed in accordance with the *Guidelines for the Humane Killing of Fish for Disease Control Purposes* (in preparation) or isolated and examined by a veterinarian or other suitable qualified person as permitted under the laws or jurisdiction, who may recommend treatment.
- c) Significant problems arising during a transport should be evaluated and corrective actions taken if necessary in order to prevent recurrence of such problems.

2. Cleaning and disinfection

If the next transport involves a new pickup or delivery point, or a different type of load, all transport equipment to transport *fish* should be cleaned and disinfected before re-use, in accordance with Chapter 1.1.5. of the OIE *Manual of Diagnostic Tests for Aquatic Animals*.

Article 9

Actions in the event of an inability to unload a consignment

1. In the event of a temporary or permanent inability to unload a consignment, the welfare of the *fish* should be given due consideration as attempts are undertaken to rectify such inability. *Fish* whose health or welfare may be irrevocably adversely impacted through delay in unloading should be humanely killed in an efficient manner as may be feasible and content with the *Guidelines for the Humane Killing of Fish for Disease Control Purposes* (in preparation). Contact with the *Competent Authorities* is also vital in order to solve such a problem.
2. In the case of an international transport, the OIE dispute settlement mechanism may be a useful guide to identify a mutually agreed solution which will address animal health and any other welfare issues in a timely manner.

GUIDELINES FOR THE LAND TRANSPORT OF LIVE FARMED FISH

Article 1

Where the conditions of transport adversely affect the welfare of *fish* over time, the length of time *fish* spend on a transport by land should be as short as possible.

Article 2

Responsibilities

The welfare of *fish* during their transport is the joint responsibility of all people involved. These guidelines apply to the land transport of *fish* within a country and between countries. The roles of each of those responsible are defined below:

1. Owners and managers of farmed *fish* are accountable for the general health of the *fish* and their fitness at the start of the transport and for ensuring the overall welfare of *fish* during the transport regardless whether these duties are subcontracted to other parties.
2. All parties handling farmed *fish* prior to loading as well as during loading and unloading have a responsibility for the welfare of the *fish* being transported. Those parties supervising such activities should have an appropriate knowledge and understanding to ensure the welfare of the *fish* is maintained during the process.
3. Transport companies, *vehicle* owners and drivers, in cooperation with the *Competent Authorities*, are responsible for planning the transport to ensure that the transport can be carried out properly according to *aquatic animal* welfare standards; these include:
 - a) responsibility for choosing an appropriate and functioning *vehicle* and ensuring that competent staff are available for loading and unloading;
 - b) responsibility for developing and keeping up to date contingency plans to address emergencies and minimise stress during transport;
 - c) responsibility for correct loading of the *vehicle* with the *fish*, for regular inspections of the *fish* during the transport and for appropriate responses to problems arising during transport.
4. The driver should be properly trained in transport regulations, and the correct *vehicle* and equipment usage to ensure that appropriate welfare oversight is applied. The driver is responsible for all documentation relevant to the transport.
5. Managers of facilities at the start and at the end of the transport are responsible for:
 - a) providing suitable equipment for loading and unloading of *fish*;
 - b) providing farm staff to load and unload the *fish* in a manner that causes minimum stress and injury;

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- c) minimising the opportunities for disease transmission while the *fish* are in the facilities;
 - d) providing facilities and agents for washing and disinfecting *vehicles* after unloading;
 - e) providing facilities and veterinarians, fish health specialist or farm staff be enable killing of *fish* humanely if required.
6. The responsibilities of the *Competent Authorities* include:
- a) establishing minimum standards for *fish* welfare, including requirements for the inspection by appropriate aquatic animal health personnel of *fish* before, during and after their transport, and appropriate certification and record keeping requirements;
 - b) approving *vehicles* for the transport of *fish*;
 - c) setting licensing standards for drivers, farm staff and managers; taking into consideration training and experience;
 - d) implementation of the standards, including through accreditation of / interaction with other organisations;
 - e) providing information on designated restriction zones and fish health, as need to prevent the transport of *fish* from spreading disease;
 - f) monitoring and evaluating health and welfare performance.
7. Private veterinarians and fish health specialists involved in handling *fish* in association with their transport should have specialist training as part of their qualifications.

Article 3

Competence

1. All persons handling *fish*, or who are otherwise responsible for *fish* during transport, should be competent according to their responsibilities listed in Articles 1 and 4. Competence may be gained through formal training and/or practical experience. Competence in areas other than *fish* welfare would need to be addressed separately.
2. Any necessary training should address:
 - a) *fish* behaviour, physiology, general signs of disease and indicators of poor *fish* welfare;
 - b) transport regulations;
 - c) operation and maintenance of equipment relevant to *fish* health and welfare;
 - d) water quality;
 - e) methods of *fish* handling during transport and associated activities such as loading and unloading;

- f) methods of inspecting animals, managing situations frequently encountered during transport and dealing with emergencies;
- g) species-specific aspects of fish handling and care, whenever necessary;
- h) appropriate record keeping.

Article 4

Planning the transport1. General considerations

- a) Adequate planning is a key factor affecting the welfare of *fish* during a transport.
- b) Before initiation of transport, plans should be made in relation to:
 - i) type of *vehicle* required;
 - ii) route, taking into account distance, type and quality of road, topography, traffic conditions and availability of water exchange stations for *fish*;
 - iii) nature and duration of transport;
 - iv) care of the *fish* during the transport;
 - v) emergency response procedures.
- c) Extreme weather conditions are hazards for *fish* undergoing transport and require appropriate *vehicle* design to minimise risks. In some extreme conditions of heat or cold, *fish* should not be transported at all.
- d) As *fish* transport is often a significant factor in the spread of infectious diseases, transport planning should take the following into account:
 - i) anti-microbials should not be used prophylactically; if used therapeutically, treatment should only be carried out upon instruction by a veterinarian or duly qualified and/or licenced fish health specialist as appropriate under the legislation of a country; if *fish* intended for transport have been treated, they should not be transported until they have recovered;
 - ii) before transport, the necessary biosecurity level should be assessed (e.g. washing and disinfection practices, safe places for changing water and treatment of transport water).

2. Contingency plans

There should be a contingency plan that identifies the important adverse events that may be encountered during the transport, 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.

Appendix H (contd)3. Vehicle and container design and maintenance

- a) *Vehicles* used for the transport of *fish* should be designed, constructed and fitted as appropriate to the species, size and weight of the *fish* to be transported; special attention should be paid to the avoidance of mechanical injury to *fish*.
- b) In order to minimise the likelihood of the spread of pathogenic agents during a transport, *vehicles* and containers should be designed to allow the secure handling of dead *fish*, and thorough cleaning and disinfection prior to and after the transport.
- c) *Vehicles* should be maintained in good mechanical and structural condition.
- d) The *fish* should be inspected *en route* to ensure that *fish* welfare considerations are assessed and appropriately addressed.
- e) Containers carried on *vehicles* should be adequately secured.
- f) The maximum number of *fish* to be transported in a container should be determined in conjunction with any applicable stocking density recommendations and/or the *Competent Authority*, and before the *vehicle* is loaded; the biomass should be able to be measured during the loading process.
- g) Documentation carried with the *vehicle* should include:
 - i) maintenance programme;
 - ii) transport logbook of stocks received, contact information, mortalities and disposal/storage logs;
 - iii) check-list for completed cleaning and disinfection prior to transport commencement;
 - iv) licence from the *Competent Authority*;
 - v) drawings (plan) of the container and pipe system of the *transport unit*.
- h) The *transport unit* should be of a type approved by the *Competent Authority* which should give consideration to the above factors.

4. Water and equipment on vehicle and container

- a) Equipment to keep water circulation, water quality (e.g. oxygen, pH, temperature), and monitoring of water quality should be available.
- b) Adequate water circulation and extra oxygenation which can be adjusted to meet variations in temperature during the transport to fulfil the needs of the *fish* species being transported should be available.
- c) Water filling and exchange should only take place at the place of loading or at a source that is approved by the *Competent Authority*. The transport water should be added to the container prior to loading the *fish* and the water should contain optimal levels of oxygen depending upon the *fish* species to be transported.

5. Documentation

- a) *Fish* should not be transported until the required documentation is complete.
- b) The documentation accompanying the consignment (the transport log) should include:
 - i) transport plan including a contingency plan for emergencies and actions to be taken during the transport;
 - ii) date, time, and place of *loading*;
 - iii) *fish* species transported;
 - iv) information on biomass load, route, water quality and exchanges, and morbidity/mortality prior to the transport;
 - v) expected time, date and place of arrival and *unloading*;
 - vi) veterinary certification, when required;
 - vii) information to allow traceback to the premises of origin;
 - viii) *stocking density* estimate for containers/compartments in the consignment.
- c) The transport log should be kept after completion of the transport for a period of time as specified by the *Competent Authority*. Transport logs from previous transports should be kept for a considerable time after completion.
- d) When health certification is required to accompany consignments of *fish*, it should include:
 - i) appropriate information on the origin of the *fish*;
 - ii) health status including test, treatment and vaccination status.

6. Preparation of *fish* for the transport

- a) *Fish* intended for transport should be starved prior to transport.
- b) *Fish* found unfit for transport after examination by farm staff, an aquatic animal technician, driver or fish health specialist/veterinarian should not be loaded onto a *vehicle*.
- c) A group of *fish* that is unfit to be transported includes:
 - i) a group undergoing a disease event which would be exacerbated by handling or transport;
 - ii) a group demonstrating significant physical injuries or abnormal behaviour such as rapid ventilation, discolouration or unusual swimming.

Appendix H (contd)7. Species-specific recommendations

Transport procedures should be able to take account of variations in the behaviour and needs of the *fish* species. Handling procedures that are successful with one species are often ineffective or dangerous with another.

Some species may need to be physiologically prepared prior to entering a new environment; this may include food deprivation or osmo-regulatory capacity.

8. Nature and duration of the transport

The pre-transport preparation as well as the duration and route of a transport should be determined by:

- a) the purpose of the transport e.g. biosecurity issues;
- b) the ability of the *fish* to cope with the stress of *transport*;
- c) the previous handling and transport experience of the *fish*;
- d) factors such as *stocking density*, species and life-stage being transported as well as metabolic rate of the *fish*;
- e) the quality of water and the availability of water exchange facilities;
- f) other extrinsic factors such as environmental conditions (e.g. air and water temperature), vehicle and equipment design, road and weather conditions as well as driver skill.

Article 5

Loading the fish

1. The issues which should be addressed to avoid unnecessary stress and injury to the *fish* during loading include:
 - a) air temperature;
 - b) crowding;
 - c) improperly constructed or operated nets;
 - d) improperly constructed or operated pumps, pipes and fittings;
 - e) water quality.
2. The stocking density of *fish* in a container or compartment should not exceed the maximum load (kg/m² and/or kg/m³) for a given species and a given situation. During loading, techniques should be used to measure and record the biomass.
3. Loading should be carried out by *aquatic animal technicians* with knowledge and experience of the behavioural and physical characteristics of the *fish* species being loaded.

Article 6

Transport1. General considerations

- a) The driver should check the load immediately before departure to ensure that the *fish* have been properly loaded. Each load should be checked again early in the transport.
- b) Where possible, periodic inspections should take place during the transport to maintain acceptable welfare conditions. *Fish* found moribund or dead should be removed from contact with other *fish* and kept under biosecure conditions.
- c) The driver should monitor water quality and make the necessary adjustments to avoid extreme conditions regarding water temperature, oxygen levels, CO₂ levels, pH changes and ammonia nitrogen.
- d) The driver should utilise smooth, defensive driving techniques, without sudden turns or stops to minimise uncontrolled movements of the *fish*.

2. Emergency procedures

- a) In the event of a *fish* health emergency on board, the driver should contact the relevant *Competent Authority* to determine the correct procedure to follow.
- b) If the killing of *fish* is necessary during the transport, it should be ensured that the killing is carried out in accordance with the *Guidelines for the Humane Killing of Fish for Disease Control Purposes* (in preparation) and their disposal in compliance with relevant animal health and environmental legislation.
- c) Farm staff at the place of unloading should be notified of increased mortality during the transport to enable appropriate arrangements to be made in accordance with the contingency plan.

Article 7

Unloading the fish

1. The principles of good *fish* handling during loading apply equally during unloading.
2. Some species of *fish* should be acclimatised if there is a likelihood of the *fish* being unloaded into water of a significantly different temperature. Account should also be taken to ensure that the air temperature at the time of unloading is acceptable to the species of *fish* transported.
3. *Fish* should be unloaded from the *vehicle* into appropriate compartments as soon as possible after arrival at the destination, but sufficient time should be allowed for unloading to ensure that the unloading proceeds smoothly and does not cause harm to the *fish*.
4. Unloading should be supervised by a farm staff member with knowledge and experience of the behavioural and physical characteristics of the species being unloaded, and of the equipment being used.

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5. Moribund or injured *fish* or *fish* otherwise disabled during a transport should be separated and disposed in accordance with the *Guidelines for the Humane Killing of Fish for Disease Control Purposes* (in preparation).

Article 8

Post-transport activities1. General considerations

- a) As the health of the *fish* may be compromised as a result of transport and/or change of environment, the farm staff receiving the *fish* should closely observe them during the post-transport period, and keep appropriate records.
- b) *Fish* showing abnormal clinical signs should be humanely killed or isolated and examined by a veterinarian or other suitable qualified person as permitted under the laws of the jurisdiction who may recommend treatment.
- c) Significant problems arising during a transport should be evaluated and corrective actions taken if necessary.

2. Cleaning and disinfection

If the next transport will involve a new pickup or delivery point (or different type of load), *vehicles*, containers and other equipment used to transport *fish* should be cleaned and disinfected before re-use, in accordance with Chapter 1.1.5. of the *Manual of Diagnostic Tests for Aquatic Animals*.

Article 9

Actions in the event of an inability to unload a consignment

1. In the event of a temporary or permanent inability to unload a consignment, the welfare of the *fish* should be given due consideration as attempts are undertaken to rectify such inability. *Fish* whose health or welfare may be irrevocably adversely impacted through delay in unloading should be humanely killed in as efficient a manner as may be feasible, consistent with other Guidelines that may be established to that effect.
2. In the case of an international transport, the OIE dispute settlement mechanism should be followed to identify a mutually agreed solution which will address animal health and any other welfare issues in a timely manner.

GUIDELINES FOR THE SLAUGHTER OF FARMED FISH FOR HUMAN CONSUMPTION

Preamble: These guidelines apply to farmed species of *fish* to be slaughtered for human consumption and emergency slaughter of *fish* that is safe for human consumption.

Article 1

1. General principles for slaughter

These guidelines address the need to ensure the welfare of farmed *fish* intended for human consumption during pre-*slaughter* and *slaughter* processes, until they are dead.

These guidelines apply to those *fish* species intended for human consumption which are commonly slaughtered in *fish* slaughterhouses.

2. Personnel

Persons engaged in the moving, handling, *stunning* and *slaughter* of *fish* play an important role in their welfare. Personnel handling *fish* for *slaughter* should be experienced and competent in the transport and handling of *fish*, and understand their behaviour patterns as well as the underlying principles necessary to carry out their tasks. They should also be familiar with relevant guidelines and the applicable legislation.

The management personnel of the *fish* slaughterhouse together with the *Competent Authority* should ensure that persons engaged in *slaughter*-related handling of live *fish* intended for human consumption carry out their tasks in accordance with the principles of *aquatic animal* welfare.

Article 2

Transport of fish for slaughter

Live *fish* for slaughter for human consumption should be transported to *fish* slaughterhouses in accordance with the OIE *Guidelines on the transport of live fish* (in preparation). *Fish* intended for transport should be starved prior to transport.

Article 3

Design of facilities for holding fish prior to slaughter

1. The holding facilities should be designed and constructed to hold an appropriate number of *fish* for processing in a given timeframe without compromising the welfare of the *fish*.
2. To permit operations to be conducted as smoothly and efficiently as possible, with minimal injury and stress to the *fish*, the facilities should be of a size that allows if possible the *fish* to move freely in the required direction, using their behavioural characteristics. Pumping and other physical handling of the *fish* should be as gently as possible to avoid damage to the *fish*.
3. The following guidelines may help to achieve this:

Appendix H (contd)

- a) Nets and tanks used for the pre-*slaughter* movement or containment of live *fish* intended for human consumption should be of appropriate mesh size and type to minimize injury.
- b) Water quality should be appropriate regarding the stocking density and species-specific needs of the *fish*.
- c) Sensory stimulation

Excessive visual and auditory stimulation of live *fish* intended for human consumption should be minimized while such *fish* are in pre-*slaughter* containment situation.

- d) Systems for moving fish, including pumps and pipes
 - i) For optimum welfare, *fish* should be pumped in a continuous flow from source to destination. When moved or relocated by hydraulic or other pumping conditions, live *fish* intended for *slaughter* for human consumption should be pumped and moved in a continuous flow from the pumping point of origin to their destination. Areas of turbulence and variability of water pressure should be avoided.
 - ii) There should be a contingency plan in place in case pumping ceases, to avoid exposing *fish* to low oxygen or other factors which could compromise their welfare. Pumping lines should be constructed to allow smooth, unobstructed flow of *fish* and water. Pipes should be of appropriate diameter and flow of sufficient strength to prevent *fish* being trapped.
 - iii) Live *fish* intended for *slaughter* for human consumption when moved through pre-*slaughter* pumping lines should be provided smooth, transitional surfaces at points of exit from the lines. Areas of turbulence and variability of water pressure should be avoided.
 - iv) Brailing devices (used to haul live *fish* intended for *slaughter* for human consumption into boats), if used, should contain an adequate volume of water in proportion to the number of *fish*, to minimize physical injuries.

Article 4

Unloading and moving fish in slaughterhouses

1. Farmed *fish* intended for human consumption should be transported within a slaughterhouse setting under conditions that minimize adverse *fish* health conditions.
2. The following principles should apply to the unloading and moving of *fish* in the slaughterhouse:
 - a) Management procedures should be in place to ensure that suitable environmental conditions are appropriate for the welfare of the *fish* species maintained within the holding and moving systems at a slaughterhouse for farmed *fish* intended for human consumption.
 - b) Environmental conditions associated with the maintenance of adequate *fish* health should be assessed on arrival prior to unloading at a slaughterhouse, and corrective action taken as appropriate.

- c) Where possible on arrival at a slaughterhouse, any injured or moribund *fish* should be separated and killed humanely.
- d) Sedation, where approved for farmed *fish* for human consumption, may be used to minimise stress associated with the movement or crowding of such *fish*.
- e) The crowding period(s) of such *fish* prior to *slaughter* should be as short and infrequent as possible.
- f) The physical or mechanical handling of farmed *fish* intended for human consumption should be minimised in a slaughterhouse environment.
- g) Where feasible, and when applicable, farmed *fish* being slaughtered for human consumption should be allowed to swim directly into a percussive stunning device (without handling) in a slaughterhouse environment to avoid handling stress.

Article 5

Mechanical stunning and killing methods1. General considerations

For details on *stunning* methods, see the OIE *Guidelines for the Humane Killing of Fish for Disease Control Purposes* (in preparation).

The *Competent Authority* should regularly ensure the appropriateness and effectiveness of the *stunning* equipment and process, and that the operators of such equipment are competent to humanely kill live *fish* intended for human consumption.

If farmed *fish* intended for human consumption are removed from the water, *stunning* should take place as soon as possible (preferably within 30 seconds, but the time should be minimized as much as possible).

The equipment used for *stunning* should be maintained, adjusted and operated in accordance with the recommendations of the manufacturer. It should be tested on a regular basis to ensure that performance is adequate.

Bleeding should only be performed on live *fish* intended for human consumption which are effectively stunned or anaesthetised.

Stunning should not take place if *slaughter* is likely to be delayed.

When killing novel *fish* species, it is important to obtain species-specific information on the exact location of the brain and *medulla oblongata* in order to target the *stunning* correctly to the head.

Signs of correct *stunning* include:

- a) immediate loss of respiratory movement (loss in opercular activity);
- b) loss of *visual evoked response* (VER);
- c) immediate loss of vestibulo-ocular reflex (VOR, eye rolling);

Appendix H (contd)

d) loss of lip or tail reflex and muscular movements.

2. Mechanical stunning

Percussive *stunning* is achieved by a blow of sufficient strength to the head applied above or immediately adjacent to the brain in order to damage the brain (Fig. 1).

Spiking, coring or Iki-jime are irreversible killing methods for *fish* based on physical damage to the brain by inserting a spike into the brain either manually or using specially developed equipment to destroy sensory and motor functions in large *fish*. The so-called captive needle stun is a modification of spiking (Fig. 2).

Mechanical *stunning* is an irreversible method in more than 99% of the cases if correctly applied. If stunned *fish* show recovery of reflexes or motor function, the *fish* should be re-stunned.

Figure 1. Stunning zone and point of impact in Atlantic salmon

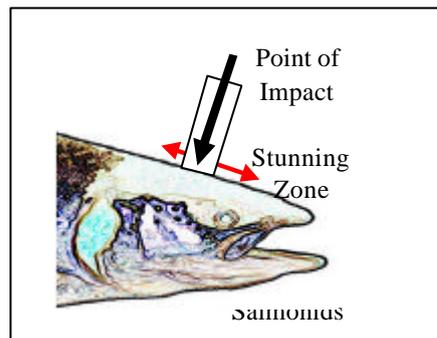
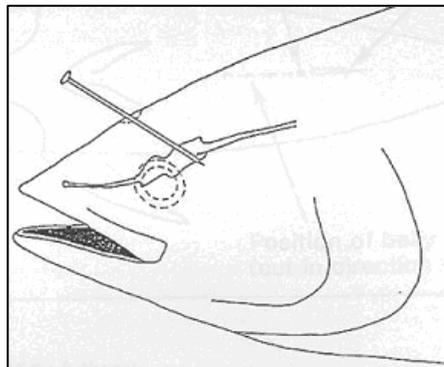


Figure 2. Spiking of tuna



3. Electrical stunning

Electrical *stunning* involves the application of an electrical current of sufficient strength, frequency and duration to cause immediate unconsciousness and insensibility.

An electrical *stunning* device should be used in accordance with the following principles:

- a) The operators should be competent in applying the method properly.
- b) Appropriate protective clothing (including rubber gloves and boots) should be worn.
- c) The water in the stun must be of suitable conductivity and the voltage used in the stun must be of suitable potential to induce immediate immobilization.
- d) The electrical *stunning* device should be constructed and used for the specific *fish* species and their environment.
- e) It should be ensured that heads of farmed *fish* intended for human consumption are confined beneath the surface of the water, and that there is a uniform distribution of electrical current in the stun tank or chamber.
- f) The equipment used for *stunning* should be maintained and operated in accordance with the manufacturer's recommendations, and it should be tested on a regular basis to ensure that the power output is adequate.
- g) An effective stun should be verified by the absence of consciousness. For signs of correct *stunning*, see description under mechanical *stunning* above. Eels are reported to be somewhat resistant to electrical *stunning*.

Article 6

Summary of some stunning methods for fish and their respective welfare issues

Stunning method	Fish welfare concerns / implications	Applicable species
Percussive stunning	Hand operated equipment may be hampered by uncontrolled movement of the fish. Unconsciousness may not be achieved due to a too weak blow to the head. Injuries may occur.	Salmonids Halibut
Spiking (Iki-Jime)	Inaccurate application may cause injuries. May be hampered by uncontrolled movement of the fish. Difficult to apply.	Salmonids Tuna
Electrical stunning	Difficult to control and apply correctly in the field. Optimal control parameters unknown. May be hazardous to operating personnel.	Salmonids, Eels
Free bullet	Shooting distance; calibre. Noise of guns may cause stress reaction. May be hazardous for operating personnel.	Tuna

Note: A key *fish* welfare requirement is the competence of the personnel carrying out the *stunning* methods.

Article 7

Unacceptable methods, procedures or practices on fish welfare grounds

The following methods are not considered acceptable for anaesthetising *fish* on welfare grounds because they do not produce immediate consciousness:

1. inadequate positioned or insufficient depth of mechanical stunning;
2. insufficient current or voltage in electrical stunning;
3. carbon dioxide (CO₂) in holding water;
4. chilling with CO₂ in holding water;
5. salt or ammonia baths;
6. asphyxiation by removal from water;
7. exsanguination.

Based on currently available scientific validated information and knowledge, it is considered that the production of a rapid consciousness can be corroborated by the observation of a certain number of signs such as opercular movements, visual evoked response (VER), vestibule-ocular reflex [VOR], lip and tail reflex and aversive behaviour.

GUIDELINES FOR THE HUMANE KILLING OF FARMED FISH FOR DISEASE CONTROL PURPOSES

Article 1

General principles of humane killing of fish for disease control purposes

1. 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; *fish* welfare considerations should be addressed within these disease control contingency plans.
2. Disease control strategies must balance the risk of spreading communicable *aquatic animal* pathogens or disease against potential compromises to general or specific principles of *aquatic animal* welfare.
3. The following principles apply after a decision to kill the *fish* has been made.
 - a) All personnel involved in the *humane killing* of *fish* should have necessary competencies for such work. Competence may be gained through formal training and/or practical experience under supervision.
 - b) As necessary, operational procedures should be adapted to the specific circumstances operating on the premises and should address *fish* welfare and biosecurity.
 - c) Following the decision to kill the *fish*, killing should be carried out as quickly as possible by appropriately qualified personnel (see Article 3) with all due consideration made to increased biosecurity protocols, until the killing is implemented.
 - d) The handling and movement of *fish* should be minimised and when done, it should be done in accordance with the Articles described below. Movement of fish should be according to biosecurity principles.
 - e) When *fish* are killed for disease control purposes, the methods used should result in immediate death or loss of consciousness lasting until death.
 - f) There should be continuous monitoring of the procedures to ensure they are consistently effective with regard to *fish* welfare and biosecurity.
 - g) Standard procedures should be written and maintained by individual facilities to describe the welfare and biosecurity practises to be adopted in the event of disease outbreaks.
 - h) To the extent possible to minimise public inconvenience, humane killing of *fish* for disease control purposes should be conducted in as unobtrusive manner as feasible.

Appendix H (contd)

Article 2

Organisational structure

The operational activities associated with the humane killing of *fish* for disease control purposes should be under supervision of a *Competent Authority* official who has the authority to appoint appropriate operational personnel for each farm, and ensure that they adhere to the relevant *fish* welfare and biosecurity standards.

The *Competent Authority* official should be responsible overall for operational activities on affected premises associated with the humane killing of *fish* for disease control purposes and should be supported if needed by coordinators for planning (including communications), operations and logistics to facilitate efficient operations.

The *Competent Authority* official should provide overall guidance to personnel and logistic support for operations on all affected premises to ensure consistency in adherence to the OIE aquatic animal welfare and biosecurity guidelines.

In considering the associated *fish* welfare issues, responsibility and competencies required by key personnel to be involved in such work are described in Article 3.

Article 3

Responsibilities and competencies of the operational team1. Team leader

a) Responsibilities

- i) Plan overall operations on an affected premises;
- ii) determine and address requirements for *fish* welfare, operator safety and biosecurity;
- iii) organise, brief and manage team of people to facilitate *humane killing* of the relevant *fish* on the premises in accordance with national regulations and these guidelines;
- iv) determine logistics required;
- v) monitor operations to ensure that *fish* welfare, operator safety and biosecurity requirements are met;
- vi) report upwards on progress and problems;
- vii) provide a written report summarizing the killing, practices utilized in the operation and their effect on aquatic animal welfare and subsequent biosecurity outcomes. The report should be archived for a period of time defined by the *Competent Authority* official and be accessible to them or their designate, as required.

- b) Competencies
 - i) Appreciation of *fish* welfare and the underpinning behavioural, anatomical and physiological processes involved in the killing process;
 - ii) skills to manage all activities on premises and deliver outcome on time;
 - iii) awareness of psychological effects on farmer, team members and general public;
 - iv) effective communication skills.
- 2. Veterinarian/fish health specialists
 - a) Responsibilities
 - i) Determine and implement the most appropriate killing method(s) to ensure that the *fish* are killed without avoidable pain and distress which balance applicable *fish* welfare and disease outbreak considerations;
 - ii) determine and implement the order of killing for various populations of *fish* that may be affected in a disease situation, if applicable;
 - iii) verify the death of all applicable populations of *fish* at an appropriate time after the operations;
 - iv) minimise the risk of disease spread within and from the premises through the supervision of biosecurity procedures;
 - v) continuously monitor *fish* welfare and biosecurity procedures;
 - vi) in cooperation with the team leader, provide a written report summarizing the killing, practices utilized in the operation and subsequent outcomes.
 - b) Competencies
 - i) Ability to assess *fish* welfare, especially relating to the effectiveness of the killing techniques selected and utilized in the *fish* killing operations, to detect and correct any deficiencies;
 - ii) ability to assess biosecurity risks.
- 3. Farm staff
 - a) Responsibilities
 - i) Assist as required;
 - ii) review on-site facilities in terms of their appropriateness for mass destruction;
 - iii) design and construct temporary *fish* handling facilities, when required.

Appendix H (contd)

- b) Competencies
 - i) Specific knowledge of *fish*, and their behaviour and environment;
 - ii) experience in *fish* handling procedures.
4. Personnel responsible for killing
- a) Responsibilities

Ensure humane killing of *fish* through effective killing techniques.
 - b) Competencies
 - i) When required by regulations, licensed to use necessary equipment;
 - ii) competent to use and maintain relevant equipment and methods for the *fish* species involved;
 - iii) competent to assess effectiveness of killing techniques selected and utilized in *fish* killing operations.
5. Carcass disposal personnel
- a) Responsibilities

Ensure appropriate and efficient carcass disposal to ensure killing operations are not hindered, paying due consideration to all relevant biosecurity protocols and local waste management regulations as applicable.
 - b) Competencies

Competent to use and maintain available equipment and apply techniques for the *fish* species involved.
 - c) If *fish* are intended to enter the human or animal food chain, the final disposal of the animal carcasses should be directed under veterinary/fish health specialist oversight, and should be consistent with the label directions for any killing agents used.

Article 4

Operational guidelines1. Planning humane killing of fish

A plan for the *humane killing* of *fish* on affected premises due to disease control issues should be developed by operator and approved by the *Competent Authority*, taking into consideration welfare and pertinent biosecurity requirements such as:

- a) minimizing handling and movement of *fish*;

- b) killing the *fish* on the affected premises; however, where this is not feasible, the *fish* may be moved to another location for killing;
- c) the species, number, age and size of *fish* to be killed;
- d) methods of killing the *fish*, and the costs thereof;
- e) the availability of chemicals/equipment needed for the killing of the *fish*;
- f) the facilities available on the aquaculture premises for sampling of dead *fish* following the killing;
- g) biosecurity issues;
- h) any legal issues that may be involved, including the use of controlled drugs or chemicals or other compounds which may adversely impact on the environment,
- i) the presence of other nearby aquaculture premises;
- j) implementation time.

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

2. Killing of fish

Single fish pose operational challenges for rapid, effective and humane killing than do large numbers of *fish*. For this reason, certain methods recommended for single *fish* are not practical for mass destruction and are, therefore not recommended (Article 4).

a) Single individuals

Any moribund, injured or other *fish* with an apparently poor prognosis should be killed humanely as soon as practicable.

Such *fish* should be caught by a net and killed instantly by a blow to the head or by administration of an overdose of a suitable anaesthetic. Only anaesthetics registered for use in *fish* should be used. No *fish* should die by asphyxiation. Agents used to anaesthetize *fish* before slaughtering for food purposes should be administered so that unacceptable residues are avoided.

b) Mass killing

Mass killing of *fish* for disposal or for human consumption (slaughter/processing) due to disease control or other purposes should be conducted under the supervision of the *Competent Authority*. The method of choice will depend on whether the killing takes place in a closed-, semi-closed- or open system and the end point for the killed product (disposal or human consumption).

The efficacy of killing single or large numbers of *fish* should be established through observation of parameters associated with death or irreversible processes leading to death.

Appendix H (contd)

Signs of effective *stunning* and *killing* include:

- i) sustained absence of respiratory movement (loss in opercular activity);
- ii) sustained absence of *visual evoked response* (VER);
- iii) sustained absence of vestibulo-ocular reflex (VOR, eye rolling);
- iv) sustained absence of lip or tail reflex and muscular movements.

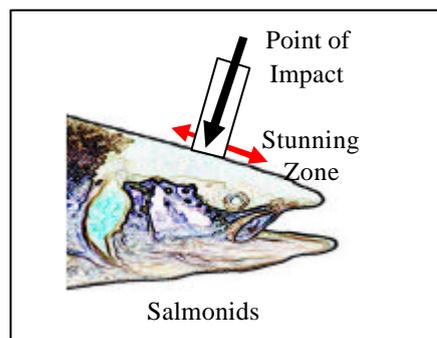
Article 5

Mechanical stunning and killing methods for fish1. Percussive stunning

a) Introduction

Killing by a blow to the head may be an appropriate *humane killing* method for larger *fish*, when the number of *fish* is limited (Figure 1). Operating personnel using this method for *killing* should be competent and fit for the purpose to ensure the method is performed properly. Ideally, this method should be followed by decapitation, pithing or exsanguination. Percussive *stunning* is an irreversible method in more than 99% of the cases if correctly applied. The *fish* should be out of water for less than 30 seconds before blow is applied, but the time frame should be as minimized as much as possible.

Figure 1. Stunning zone and point of impact in Atlantic salmon



b) Requirements for effective use

- i) Operating personnel using manual or automated percussive *stunning* should be skilled in order to ensure the *humane killing* of *fish*.
- ii) *Fish* should be quickly removed from the water, restrained and given a quick blow to the head, delivered either by a club or by mechanical *stunning* device.

- iii) The blow should be of sufficient force and delivered above or adjacent to the brain in order to render immediate unconsciousness.
- iv) The *fish* should be inspected to check the effectiveness of *stunning*, and restunned if necessary.

c) Advantages

When percussive *stunning* is applied correctly, loss of consciousness is immediate.

d) Disadvantages

When the method is used improperly, immediate unconsciousness is not achieved and injuries as well as poor welfare to the *fish* may occur. Manual percussive *stunning* is only practicable for the killing of a limited number of *fish*. Defined criteria for all types of *fish* are lacking.

e) Conclusion

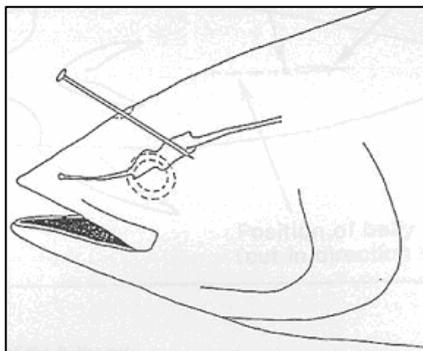
Percussive *stunning* is suitable for killing *fish* species such as salmonids and halibut and should ideally be followed by decapitation, pithing or exsanguination to ensure death.

2. Spiking, coring and Iki-jime

a) Introduction

Spiking, coring or Iki-jime are irreversible killing methods for *fish* based on physical damage to the brain by inserting a spike into the brain either manually or using specially developed equipment to destroy sensory and motor functions in large *fish*. The so-called captive needle stun is a modification of spiking (Figure 2).

Figure 2. **Spiking of tuna**



Appendix H (contd)

The spike should be aimed on the skull in a position to penetrate the brain of the *fish* and the impact of the spike should produce immediate unconsciousness. Physical damage to the brain caused by penetration of the spike may result in death; however, bleeding should be performed as soon as possible after spiking to ensure the death of the *fish*. The elapsed time between capture and spiking should be between 5–10 seconds and a minute.

b) Requirements for effective use

- i) Operating personnel using manual or automated spiking equipment should be skilled in order to ensure the *humane killing* of *fish*.
- ii) Only specifically designed devices should be used.
- iii) *Fish* should be quickly removed from the water, restrained and the spike immediately inserted into the brain either manually or by an automated device.
- iv) The spike should be inserted in such a way that the brain is destroyed.

c) Advantages

Immediate onset of unconsciousness with a simultaneous loss of movements and *visual evoked response* (VER), should result when the spike is accurately applied.

d) Disadvantages

- i) Difficult to apply in agitated *fish*.
- ii) Inaccurate positioning and orientation of the spike may result in injury rather than human killing to the *fish*.
- iii) Not applicable under field conditions unless the *fish* farm is equipped with sanitary slaughter equipment for the purpose.
- iv) *Fish* need to be removed from the water. In the case of large *fish* such as tuna, the elapse of time before *stunning* can be carried out should not be more than the recommendation given above.

e) Conclusion

The method is suitable for killing larger *fish* (including tuna) when used in *fish* slaughterhouses or in farms equipped with sanitary slaughter equipment.

2. Free bullet

a) Introduction

Shooting by using a free bullet may be used for killing large *fish* (such as tuna). The *fish* may either be crowded in the net and shot in the head, or caught and held in a fixed position in the surface of the net (gaffing) prior to being shot in the head. The gun should be aimed on the skull in a position to penetrate the brain of the *fish* and the impact of the bullet should produce immediate unconsciousness and physical damage to the brain, resulting in death. Commonly used firearms for shooting large *fish* include a 12-bore shotgun and a Magnum handgun (0.357). The time between crowding and shooting should be kept to a minimum.

b) Requirements for effective use

The *fish* should be positioned correctly without gaffing and the shooting range should be as short as practicable. The shot should be carefully aimed at the brain.

c) Advantages

Shooting may be an effective and humane method for killing large *fish* as minimal handling and restraint are required.

d) Disadvantages

- i) Gaffing causes tissue damage, bleeding and noxious reactions in the *fish*.
- ii) Gun noise may cause stress reactions.
- iii) May be hazardous to operating personnel.
- iv) Contamination of the working area due to release of body fluids may present a biosecurity risk and cause stress to other *fish*.

e) Conclusions

The method is suitable for killing large *fish* under field conditions where adequate biosecurity measures are in place to ensure containment of any pathogens released during the killing process.

Article 6

Electrical stunning/killing1. Introduction

Electrical *stunning* involves the application of an electrical current of sufficient strength, frequency and duration to cause immediately unconsciousness. Provided sufficient current is applied, *fish* will not recover consciousness.

2. Requirements for effective use

- a) Operating personnel of electrical *stunning* equipment should be competent in applying the method properly.
- b) The electrical *stunning* device should be constructed and used for the specific *fish* species and their environment.
- c) The equipment used for *stunning* should be maintained and operated in accordance with the manufacturer's recommendations, and it should be tested on a regular basis to ensure that the power output is adequate.

Appendix H (contd)

- d) It should be ensured that heads of the *fish* are confined beneath the surface of the water, and that the electrodes extend to the full length of the tank, chamber or bath to ensure a uniform distribution of electrical current in the stun tank or chamber.
- e) Uniform distribution of an appropriate electrical current in the water bath in which the *fish* are contained to ensure an immediate (< 1 sec.) stun or stun/kill lasting until death if the *fish* are to be exsanguinated is required.
- f) The time between crowding and *stunning* should be kept to a minimum.

Since *fish* for disposal do not need to be bled, the duration of the current in the bath should be of sufficient length to ensure that the *fish* are dead. An effective stun and kill should be verified. Signs of correct *stunning* include:

- g) sustained immediate loss of respiratory movement (loss in opercular activity);
- h) sustained loss of *visual evoked response* (VER);
- i) sustained immediate loss of vestibulo-ocular reflex (VOR, eye rolling);
- j) sustained loss of lip or tail reflex and muscular movements.

3. Advantages

- a) Electrical *stunning* is humane as the method may stun and kill immediately, and the *fish* do not have to be removed from the water.
- b) A large number of *fish* may be stunned/killed simultaneously with minimum handling and restraint.
- c) Non-invasive technique minimises biosecurity risk.

4. Disadvantages

- a) Requires industrial *fish* slaughterhouse premises or similar and is not applicable for mass killing of *fish* under large water body field conditions.
- b) The electrocution equipment should be applied and maintained correctly to produce an effective stun and kill.
- c) Requires a reliable supply of electricity.
- d) May be hazardous to operating personnel.
- e) Electrical stunning has limited applicability to saltwater fish.

5. Conclusions

The method is suitable for killing *fish* under controlled conditions.

Article 7

Chemical killing methods1. Use of chemicals added to the water

Chemicals used for killing *fish* should kill the *fish* effectively, not merely have an anaesthetic effect. When using such chemicals, the operating personnel should ensure that the solution has the correct concentration, and that sea water is used for marine *fish* species and freshwater for freshwater species.

Fish should be kept in the chemical solution until they are dead. *Fish* that are merely anaesthetised should be killed by another method such as bleeding, decapitation or appropriate killing method. The suitable chemicals listed below may or may not be approved in all countries and *fish* exposed to such chemicals may not enter the human or animal food chain.

Suitable chemicals include:

- a) Benzocaine hydrochloride can produce a deep anaesthesia and final death when added in an overdose to water. Since the solubility of benzocaine in water is low, it has to be administered from a stock solution of either ethanol (10%) or propyleneglycol (5%). A final solution of 100 mg/liter is sufficient to kill *fish*.
- b) Iso-eugenol (2-methoxy-4-(1-propenyl) phenol (Aqui S) is effective for killing *fish*. The effective dose for killing is 25 ml/1000 litre of water.
- c) Metacaine (tricaine metanesulfonat) (MS 222) has a similar effect as benzocaine. The solubility in water is high. A final solution of 100 mg/liter is sufficient to kill *fish*, but a concentration of = 250mg/liter for 10 minutes following cessation of opercular movements is recommended.
- d) Metomidate hydrochloride is effective in anaesthetising *fish*. Induction of anaesthesia is rapid (1–2 minutes) and without stress reactions such as elevated heart rate. In salmonids, the recommended dose is 2–6 mg/liter of water. Metomidate may give inadequate anaesthesia of larvae of some *fish* species such as goldfish and red drum.

2. Requirements for effective use

- a) Sufficient quantities of the chemical need to be added to the water.
- b) Should be followed by killing if *fish* are merely anaesthetised.

3. Advantages

- a) Large numbers of *fish* may be killed in one batch.
- b) Handling is not required until *fish* are anaesthetised or euthanized.
- c) Use of chemicals is a non-invasive technique and thus minimises biosecurity risks.

Appendix H (contd)4. Disadvantages

- a) May need to be followed by killing if *fish* are anaesthetised only.
- b) Care is essential in the preparation and provision of treated water, and in the disposal of water and/or *fish carcasses* that have been treated with anaesthetic agents, or which may be contaminated with antimicrobial compounds or other drug residues.

5. Conclusion

Chemical methods are suitable for killing large numbers of *fish* in closed compartments.

Article 8

Unsuitable methods, procedures or practises on fish welfare grounds

The following methods are not acceptable for killing *fish* on welfare grounds:

1. The use of CO₂ alone or in combination with chilled water/crushed ice is unsuitable for the mass killing of *fish*, due to its potential noxious effects.
2. Salt or ammonia baths used on eels are not acceptable due to their noxious effects.
3. Suffocation by removing non-anaesthetised fish from water to die is not unsuitable as sensation is not lost during the slow induction.
4. Exsanguination is not acceptable for killing conscious *fish*.

Article 9

Other killing methods1. Decapitation

a) Introduction

Decapitation, using a sharp device such as a "guillotine" or knife, may be used for killing *fish* but only following anaesthesia.

b) Requirements for effective use

The required equipment should be kept in good working order.

c) Advantages

The technique is effective for the killing of *fish* such as eels when applied properly but may also be applied to larval fish/juveniles following rapid removal from water.

d) Disadvantages

Contamination of the working area due to bleeding and body fluids may present a biosecurity risk.

e) Conclusion

The method is acceptable for killing *fish* such as eels but may also be applied to larval fish/juveniles following rapid removal from water.

2. Maceration

a) Introduction

Maceration by a mechanical device with rotating blades or projections causes immediate fragmentation and death in newly hatched *fish* and embryonated eggs, as well as fertilised/unfertilised eggs of *fish*. It is a suitable method for the processing of such material. The procedure results in immediate death and a large number of eggs/newly hatched fry can be killed quickly and humanely. For biosecurity reasons, macerated material from infected *fish* should preferably be treated by one of the processing methods given in *OIE Guidelines for handling and disposal of carcasses and waste of aquatic animals* (under preparation).

Maceration requires specialised equipment which should be kept in good working order. The rate of introducing material into the device should be such that the cutting blades continue to rotate at their fully functional rate and that they do not fall below the critical speed defined by the manufacturer.

b) Conclusion

The method is suitable for killing large numbers of eggs/newly hatched fry of *fish*.

Article 10

List of killing methods for farmed *fish**

Species	Method	Animal welfare concerns / implications	Additional comments
Salmonids, cod (gadids) and flatfish	Anaesthetic overdose using benzocaine, metacaine, iso-eugenol	Considered to have a low impact on welfare but mode of operation of chemicals in all species is not known.	Applicable to all sizes of <i>fish</i>
	Percussive stunning	Should be properly applied to be humane and effective. Low impact on welfare.	Suitable for most <i>fish</i> species handled individually
	Electrical stunning	The equipment should be maintained and applied correctly to produce an effective stun and kill. Low impact on welfare. Suitable in salt water.	May be hazardous to personnel. Applicable to all sizes

Appendix H (contd)

Species	Method	Animal welfare concerns / implications	Additional comments
Tuna	Spiking, coring, Iki-Jime.	When applied properly, the <i>fish</i> are killed instantly.	Applicable to all sizes
	Free bullet.	When applied properly, the <i>fish</i> are killed instantly.	Applicable to all sizes. Operator safety needs to be addressed.
Cyprinids	Anaesthetic overdose using benzocaine, metacaine, iso-eugenol.	Considered a low impact on welfare but mode of operation of chemicals in all species not known.	Applicable to all sizes
Eels	Decapitation.	Negative impact on welfare. Acceptable if preceded by anaesthesia	
	Electrical stunning.	Eels are resistant to electrical stunning and require high currents for at least 5 minutes to achieve insensibility. Negative impact on welfare.	May be hazardous to personnel.
	Percussive stunning.	Low impact on welfare.	Suitable for <i>fish</i> handled individually.
Newly hatched fry/eggs of any <i>fish</i> species	Maceration.	Low impact on welfare.	

* The order of description of the methods is not in an order of acceptability from a *fish* welfare point of view.

N.B.: The table does not represent an exclusive list of acceptable methods.

Article 11

Handling of fish killed for disposal

OIE *Guidelines for the handling and disposal of carcasses and waste of aquatic animals* (in preparation).

DRAFT GUIDELINES ON DOG POPULATION CONTROL

Preamble: Stray and feral dogs pose serious human health, socio-economic, political and animal welfare problems in many countries ~~of the world. Many of these are developing countries and others fall in the least developed category.~~ Whilst acknowledging human health is a priority including the prevention of zoonotic diseases notably rabies, the OIE recognises the importance of controlling dog populations without causing unnecessary or avoidable animal suffering. Veterinary Services should play a lead role in preventing zoonotic diseases and ensuring animal welfare and should be involved in dog population control.

Guiding principles

The following guidelines are based on those laid down in Section 3.7 of the *OIE Terrestrial Animal Health Code*. Some additional principles are relevant to these guidelines:

1. The promotion of responsible dog ownership can significantly reduce the numbers of stray dogs and the incidence of zoonotic diseases.
2. Because dog ecology is linked with human activities, management of dog populations has to be accompanied by changes in human behaviour to be effective.

Article 1

Definitions

a) Stray Dog dog: Means any dog not under direct control or not prevented from roaming

Types of stray dog:

- a) free roaming owned dog not under direct control or restriction at a particular time;
- b) free roaming dog with no owner;
- c) feral dog: domestic dog that has reverted to the wild state and is no longer directly ~~dependant~~ dependent upon humans for successful reproduction.

b) Owned Dog dog: Means dog with a person that claims responsibility ~~is responsible~~ for this animal.

e) Person: This can include more than one individual, and could comprise family/household members or an organisation.

d) Responsible Ownership ownership: The situation whereby a person (as defined above) accepts and commits to perform various duties focused on the satisfaction of the psychological, environmental and physical needs of a dog ~~(or other pet)~~ and to the prevention of risks (aggression, disease transmission or ~~causing~~ injuries) that the ~~pet~~ dog may cause to the community, other animals or the environment.

e) Euthanasia: Means the act of inducing death in a humane manner.

f) Competent Authority: means the ~~Veterinary Services, or other Authority of a Member Country, having the responsibility and competence and for ensuring or supervising the implementation of animal health measures or other standards in the Terrestrial Code.~~

Appendix I (contd)

g) Dog Population Control Programme: ~~A programme with the objective of reducing the number of stray dogs.~~ Means a programme with the aim of reducing a dog population to a particular level and/or maintaining it at that level and/or managing it in order to meet a predetermined objective (see Article 2).

h) Carrying capacity: Is the upper limit of the dog population density that could be supported by the habitat based on the availability of resources (food, water, shelter); and human acceptance.

Article 2**Dog population control programme ~~optional~~ objectives**

The objectives of a programme to control the dog population may include the following:

1. improve health and welfare of owned and stray dog population;
2. reduce numbers of stray dogs;
3. ~~Create~~ assist in the creation and maintenance of a rabies immune dog population;
4. promote responsible ownership;
5. reduce the risk of zoonotic diseases other than rabies;
6. manage other risks to human health (e.g. parasites);
7. prevent harm to the environment;
8. prevent illegal trade and trafficking.

Article 3**Responsibilities and competencies**

1. Veterinary Authority Administration

The ~~Veterinary Authority Administration~~ is responsible for the implementation of animal health legislation ~~and for controlling outbreaks of notifiable animal diseases such as foot and mouth disease and avian influenza.~~ Control of endemic zoonotic diseases such as rabies and parasitic infections (e.g. *Echinococcus spp.*) would require technical advice from the ~~Veterinary Authority Administration~~, as animal health and some aspects of public health are within this Authority's competence but organising and/or supervising dog control schemes is frequently the responsibility of government agencies other than the ~~Veterinary Authority Administration~~.

~~In many countries the Veterinary Authority Administration is in the Ministry of Agriculture.~~

2. Other government agencies

The responsibilities of other government agencies will depend on the ~~disease~~ risk being managed and the objective/nature of the dog population control measures employed.

The Ministry or other Agency responsible for Public Health would normally play a leadership role and may have legislative authority in dealing with zoonotic diseases. Control of stray dogs ~~in regards~~ with regard to other human health risks (eg stray dogs on roads; dog attacks within communities) may fall within the responsibility of the Public Health Agency but is more likely to be the responsibility of police or other agencies for public safety/security operating at the State/Provincial or municipal level.

Environment Protection Agencies (normally within a National or State/Provincial Ministry for the Environment) may take responsibility for ~~the~~ controlling problems associated with stray dogs when they present a hazard to the environment (eg control of feral dogs in national parks; prevention of dog attacks on wildlife or transmission of diseases to wildlife) or where a lack of environmental controls is giving rise to stray dog populations that threaten human health or access to amenities. For example, Environmental Protection agencies may regulate and enforce measures to prevent dogs (and other wild animals) from accessing waste or human sewage.

3. Private sector veterinarians

The private sector veterinarian is responsible for providing advice to pet owners consulting the veterinarian for advice or treatment of a dog. The private sector veterinarian can play an important role in disease surveillance ~~as~~ because he/she might be the first to see a dog suffering from a notifiable disease such as rabies. It is necessary that the private sector veterinarian follow the procedure established by the *Veterinary Authority* for responding to and reporting a suspected rabies *case* or a dog that is suffering from any other notifiable disease. Private sector veterinarians also play an important role (often in liaison with the police) in dealing with cases of neglect that can lead to problems with stray and mismanaged dogs.

The private veterinarian has competence and will normally be involved in pet dog health programmes and population control measures, including health testing and vaccination, kennelling during the absence of the owner, sterilisation and euthanasia. Two-way communication between the private sector veterinarian and *Veterinary Authority*, often via the medium of a veterinary professional organisation, is very important and the *Veterinary Authority* is responsible to set up appropriate mechanisms for this action.

4. Non Governmental Organisations (NGOs)

Non Governmental Organisations (NGOs) are potentially important partnersu of the *Veterinary Services* in contributing to public awareness and understanding and helping to obtain resources to contribute in a practical way to the design and successful implementation of dog control programmes. NGOs can supply local knowledge on dog populations and features of ownership, as well as expertise in handling and kennelling dogs and the implementation of large scale vaccination and sterilisation programmes. NGOs can also contribute, together with veterinarians and the authorities in educating the public in responsible dog ownership. NGOs can help to obtain funding for control programmes, particularly in countries where governments may depend on support from NGOs for programmes carried out to assist poor communities.

5. Local Government Authorities

Local Government Authorities are responsible for many services and programmes that relate to health, safety and public good within their jurisdiction. In many countries the legislative framework gives authority to local government agencies in regard to aspects of public health, environmental health/hygiene and inspection/compliance activities.

Appendix I (contd)

In many countries local government agencies are responsible for the control of stray dogs (eg dog catching and shelters) and the alleviation of the problems stray dogs cause. This would normally be done with advice from a higher level (national or state/provincial) authority with specialised expertise in regard to public health and animal health. Collaboration with the private sector veterinarians (e.g. in programmes to sterilise and vaccinate stray dogs) is a common feature of dog control programmes. Regardless of the legislative basis, it is essential to have the co-operation of local government authorities in the control of stray dogs.

6. Dog owners

When a person takes on the ownership of dog there should be an immediate acceptance of responsibility for that dog, and for any offspring it may produce, for the duration of its life or until a subsequent owner is found. The owner must ensure the dog is protected, as far as possible, from infectious diseases (e.g. through vaccination and parasite control) and from unwanted reproduction (e.g. through surgical sterilisation). Owners should ensure that the dog's ownership is clearly identified (preferably with permanent identification such as a tattoo or microchip) and, where required by legislation, registered on a centralised database. All reasonable steps should be taken to ensure that the dog does not roam out of control in a manner that would pose a problem to the community and/or the environment.

Article 4**Considerations in planning a dog population control programme measures**

In the development of a dog population control programme it is recommended that the authorities establish an advisory group, which should include appropriate veterinarians, experts in dog ecology, dog ownership and zoonotic diseases, and representatives of relevant and stakeholders (local authorities, human health services/authorities, environmental control services/authorities and the public). The main purpose of this advisory group would be to analyse the problem, identify the causes and propose the most effective approaches to use in the short and long term.

Important considerations are as follows:

1. Identifying the sources of stray dogs
 - a) Owned animals that roam freely
 - b) Animals that have been abandoned by their owner, including animals resulting from:
 - i) uncontrolled breeding of owned dogs;
 - ii) unowned dogs that reproduce successfully.
2. Estimating the existing number, distribution and ecology (To be completed)

Practical tools that are available include ~~Using available practical tools such as~~ registers of dogs, population estimates, surveys of dogs, owners, dog shelters and associated veterinarians, etc. The important factors relevant to the dog carrying capacity of the environment include food, shelter, water and human behaviour.

A methodology, including generalised dog identification and centralised registration, ~~must~~ should be established ~~in order~~ to make an estimate of the total dog population.

An overview of appropriate methodologies may be found in Annex I.

The same methodology ~~must~~ should be used at appropriate intervals to assess population trends.
~~Find references if possible:~~

- ~~The Identify the important factors relevant to the dog carrying capacity of the environment. These generally include food, shelter, water, and human behaviour.~~
- ~~Add examples of good methodology if possible~~

3. Legislation

Legislation that would help authorities establish ~~to establishing~~ successful dog control programmes should include the following key elements:

- a) registration and identification of dogs and licensing of dog breeders-owners;
- b) rabies vaccination;
- c) veterinary procedures (e.g. surgical procedures);
- d) control of dog movement (restrictions within the country);
- e) control of dog movement (international movement);
- f) control of dangerous dogs;
- g) regulations on the breeding and sale of dogs ~~Commercial dog production~~;
- h) environmental controls (e.g. abattoirs, rubbish dumps, dead stock facilities);
- i) dog shelters;
- j) animal welfare, including humane capture and killing methods.

4. Resources available to authorities

- a) human resources;
- b) financial resources;
- c) technical tools;
- d) infrastructure;
- e) cooperative activities;
- f) public-private-NGO partnerships;
- g) central-state or province-local partnerships.

Article 5

Control measures

The following control measures should be implemented according to the situation in national context and local circumstances of Member Countries. They can Measures may be used in combination. ~~or singly.~~
Killing of dogs, used alone, is not an effective control measure. If used, it should be combined with other measures to achieve effective long term control. It is also important that authorities gain an understanding of people's attitudes towards dog ownership so that they can develop a cooperative approach to the control of dog populations.

1. Education and ~~promotion~~ legislation of for responsible ownership (To be completed)

~~The health and welfare of domestic dogs may be improved through the promotion of responsible human ownership. Minimizing stray dogs population, in combination with educating humans, particularly children about specific behaviours, can reduce dog bite injury and prevent some major zoonotic diseases.~~

Appendix I (contd)

~~Responsible dog ownership includes the control of reproduction of dogs under direct human supervision such that offspring of owned dogs are not abandoned.~~

The owned dog population is a primary source of stray dogs, through the abandonment of unwanted dogs and their offspring, and through allowing owned dogs to roam unrestricted, contributing to the stray population. Encouraging dog owners to be more responsible will reduce the number of dogs allowed to roam, improve the health and welfare of dogs, and minimise the risk that dogs pose to the community. The promotion of responsible dog ownership through legislation and education is a necessary part of a dog population management programme. Collaboration with responsible animal welfare NGOs and private veterinarians will assist *Veterinary Authorities* in establishing and maintaining programmes.

Education on responsible dog ownership (for the currently owned dog and any offspring it produces) should address the following elements:

- a) the importance of proper care to ensure the welfare of the dog and any offspring; this may include preparing the dog to cope with its environment through attention to socialisation and training;
- b) registration and identification of dogs (see Article 5.2.);
- c) prevention of zoonotic diseases, e.g. through regular vaccination in rabies endemic areas;
- d) preventing negative impacts of dogs on the community, via pollution (e.g. faeces and noise), risks to human health through biting or traffic accidents and risks to wildlife, livestock and other companion animal species;
- e) control of dog reproduction.

In order to achieve a shift towards responsible ownership, a combination of legislation, public awareness, education, and promotion of these elements will be required. It may also be necessary to improve access to resources supporting responsible ownership, such as veterinary care, identification and registration services and measures for control of zoonotic diseases.

2. Registration and identification of dogs (licensing)

A core component of dog population management by the Competent Authority is the registration and identification of owned dogs. This ~~and~~ may include granting licences to owners. Registration and identification may be emphasized as part of responsible dog ownership and are often linked to animal health programmes, for example, mandatory rabies vaccination.

Registration and identification of animals in a centralised database can be used to support the enforcement of legislation, the reuniting of lost animals with owners and may be used as a tool to encourage control of dog reproduction control of owned dogs through financial incentives reduced fee schedule to register neutered sterilise dogs.

3. Reproductive control

Controlling reproduction in dogs prevents the birth of unwanted ~~litters of~~ puppies and can help address the balance between demand for dogs and the size of the population. It is advisable to focus efforts to control reproduction on those individuals or groups in the dog population identified as the most productive and the most likely to be the sources of unwanted and stray dogs, as this will to ensure best use of resources. Methods of controlling reproduction will require direct veterinary input to individual animals, involvement of both private and public veterinary sectors may be required to meet demand. The control of reproduction is essentially the responsibility of owners and can be incorporated into education on responsible ownership (see section 5 a.). Methods for controlling reproduction in dogs include:

- a) surgical sterilisation;
- b) chemical sterilisation;
- c) chemical contraception;
- d) separation of female dogs during oestrus from ~~entire~~ unsterilised males.

Surgical sterilisation should be carried out in a humane manner and include appropriate use of pain relief.

Any chemicals or drugs used in controlling reproduction should be shown to have appropriate safety, quality and efficacy for the function required and used according to the ~~manufacturers~~ manufacturer's and ~~Competent Authorities~~ Authority's regulations. In the case of chemical ~~sterilants~~ sterilants and contraceptives, ~~this may require further~~ research and field trials may need to be completed before use.

4. Removal and handling

The *Competent Authority* should collect dogs that are not under direct supervision and verify their ownership. Capture, transport, and holding of the animals should be done humanely. The *Competent Authority* should develop and implement appropriate legislation and training to regulate these activities. Capture should be achieved with the minimum force required and equipment should be used that supports humane handling. Snares and uncovered wire loops should not be used for capture.

5. Management of dogs removed from communities

Competent authorities have the responsibility to develop minimum standards for the housing (physical facilities) and care of these dogs. There should be ~~a~~ provision for holding the dogs for a reasonable period of time to allow for reunion with the owner and, as appropriate, for rabies observation. ~~A period of 7–10 days is often used for this purpose.~~

a) Minimum standards for housing should include the following provisions:

- i) site selection: Access to drainage, water and electricity are essential and environmental factors such as noise and pollution should be taken into account;
- ii) kennel size, design and occupancy taking exercise into account;
- iii) disease control measures including isolation facilities.

b) Management should address:

- i) adequate fresh water and nutritious food;
- ii) regular hygiene and cleaning;
- iii) routine inspection of the dogs;
- iv) monitoring of health and provision of required veterinary treatments;
- v) policies and procedures for rehoming, sterilisation and euthanasia;

Appendix I (contd)vi record keeping and reporting to authorities.

Dogs that are removed from a community may be reunited with the owner or offered to new owners for adoption (rehoming). This provides an opportunity to promote responsible ownership and good animal health care (including rabies vaccination). ~~including animal health care through vaccination against common diseases of dogs, control of ecto- and endo-parasites, and vaccination against major zoonotic diseases such as rabies. Incentives for dog reproduction control may be provided through the provision of neutering services at a reduced rate or the release for adoption of only neutered animals. Sterilisation of dogs prior to adoption should be considered. The suitability of new owners to adopt dogs should be assessed and owners matched with available animals.~~ The effectiveness of ~~this strategy i.e. offering dogs to new owners~~ rehoming may be limited due to the suitability and number of dogs.

Dogs that are removed from a community may in some cases be provided health care (including rabies vaccination), sterilised, and released to their local community at or near the place of capture. ~~who agree to take responsibility for the health, welfare and management of the animal. The beneficial effect of this practice for dog welfare and population management is unknown. With regard to disease control, such as for rabies and possibly others, some beneficial effect may be realized. This may be short or long time. This method is more likely to be accepted in the situation where the presence of stray dogs is considered to be inevitable and is well tolerated by the local community.~~

This method is not applicable in all situations and may be illegal in countries where legislation prohibits the abandonment of dogs. Problems caused by dogs, such as noise, faecal pollution and traffic accidents, would not be alleviated as dogs are returned to the local community and their movements are not restricted. If the local community has owned dogs, consideration should be given to the potential encouragement of abandonment of unwanted. In the situation where many dogs are owned, a population control programme that focuses on neutering and responsible ownership may be more appropriate.

It is recommended that before adopting this approach, a cost-benefit analysis is conducted. Factors such as the monetary costs, impact on culture of ownership and public safety should be assessed as well as the benefits for disease control and animal welfare as well as any societal benefits.

c) If this method is adopted, the following factors should be addressed:

- i) raising awareness of the programme within the local community to ensure understanding and support;
- ii) use of humane methods for catching, transporting and holding dogs;
- iii) correct surgical technique, anaesthesia and analgesia, followed by post-operative care;
- iv) disease control may include blanket vaccination (e.g. rabies) and treatments and testing for diseases (e.g. Leishmaniasis) followed, as appropriate, by treatment or euthanasia of the dog;
- v) behavioural observation may be used to assess if dogs are suitable for release; if not suitable for release or re-homing euthanasia should be considered;
- vi) permanent marking (e.g. tattoo) to indicate that the animal has been sterilised; individual identification allows for tracking of vaccination status and treatment history; a visible identification (e.g. collar) may also be used to prevent unnecessary recapture; identification can also be taken to indicate a level of 'ownership' by the organisation/authority responsible for carrying out this intervention;

vii) the dog should be returned to a place that is as near as possible to the place of capture;

viii) the welfare of dogs after release should be monitored and action taken if required

Dogs that are removed from a community may, ~~in some cases,~~ be too numerous or may be unsuitable to place responsible ownership. ~~If elimination of the excess animals is the only option, killing should be under regulation by a~~ for any rehoming scheme. If euthanasia of these unwanted animals is the only option, the procedure should be conducted in accordance with the regulations of the *Competent Authority* and conducted humanely (see Article 4 k).

~~A number of selected animals, could be released if “environmentally compatible”, meaning that, once again, the feasibility of this strategy is very much related to the local people attitude/resources availability:~~

- ~~= Risk benefit evaluation of Catch Neuter Release & Monitoring (CNR&M) in terms of public safety and AW.~~
- ~~= Proper behavioural evaluation of dogs when removed for problems related to public nuisance~~
- ~~= Monitoring needed to evaluate individual health and welfare~~
- ~~= Sufficient level of public tolerance, food and assistance provided by responsible people/community~~
- ~~= Permanent identification (i.e. surgical sterilization, rabies vaccination, echinococcosis treatment, Leishmaniasis negative test). These actions clearly recon duct the animal to an “owner”, both intended as public (local municipality, regional government) or private~~
- ~~= Possibly clearly visible at distance (i.e. painted collars)~~

Advantages: ~~Possible strategy in an early stage, when scarce resources are in place, if adopted in very specific situation it may also promote the societal value of animals and the benefits of a positive human animal relationship (Rome’s cat colony, “community” dogs)~~

Disadvantages: ~~Ineffective over a long term since not promoting responsible ownership concept, possible AW concerns due to persistent intolerance by the community, possible risk to human safety and damage of the private property due to improper selection of animals.~~

~~Preferably to be used as a “spot” solution in specific situations and only in addition to other measures (humane education, door to door reuniting programs, adoption programs), possibly not to be used as the sole method of stray dog population control as a long term strategy.~~

6. Environmental controls

Steps should be taken to reduce the carrying capacity, such as excluding dogs from sources of food (e.g. rubbish dumps and abattoirs, and installing animal-proof rubbish containers).

This should be linked to a reduction in the animal population by other methods, to avoid animal welfare problems.

7. Control of dog movement – international (export/import)

Chapter 2.2.5 of the OIE *Terrestrial Animal Health Code* provides recommendations on the international movement of dogs between rabies free countries and countries considered to be infected with rabies.

Appendix I (contd)8. Control of dog movements – within country (e.g. leash laws, roaming restrictions)

Measures for the control of dog movement in a country are generally invoked for ~~two~~ the following reasons:

- a) for rabies control when the disease is present in a country;
- b) for public safety reasons;
- c) for the safety of “owned dogs” in an area or locality when a stray dog control programme is in place;
- d) to protect wildlife and livestock.

~~In both cases it is essential that dogs are registered and permanently identified to control or confine these dogs, reunite them if collected and to keep the relevant sanitary information recorded.~~

~~It is necessary to have empowering legislation to give the necessary power is necessary and a national or local infrastructure comprising of organization, administration, staff and resources is essential to encourage the finders of a stray dog to report to the Competent Authority.~~

~~The following 3 grades of movement control can be applied:~~

- ~~– Absolute control (confinement, leash and muzzle), feasible during a limited periods such as for an emergency~~
- ~~– Partial control (obedience f not on leash during daylight, confinement between the relevant information times of 5pm and 8 am)~~
- ~~– Control during specific times (rabies vaccination campaign, stray dog roundup)~~

9. Regulation of commercial ~~Animal~~ dog dealers

~~While the majority of animal breeders and dealers are committed to raising and selling physically and psychologically healthy pets, regulation is necessary to ensure that all of these operations provide adequate care.~~

~~The law should require the humane care and treatment of certain animals sold as pets in retail stores as well at the wholesale level, transported in commerce, and used in research or exhibits.~~

~~Individuals using or working with such animals should be licensed and they must comply with regulations and standards.~~

- Standards of Care and Recordkeeping

~~Businesses in the commercial pet trade must maintain minimum standards for veterinary care and animal management. The requirements should cover housing, handling, sanitation, food, water, and protection against extremes of weather and temperature.~~

~~To prevent lost or stolen animals from entering trade channels, breeders and dealers are required to keep records that identify the source and disposition of all regulated animals that come into their possession.~~

- Shipping and Handling

~~Specific regulations and standards are needed to regulate the transport of animals by commercial carriers. These rules help ensure that licensed dealers, contract carriers, and intermediate handlers treat regulated animals humanely. Transported animals must meet established minimum age and health certification requirements.~~

Regulation is needed to ensure that dog breeders and dealers are identified by the Competent Authority and are committed to raising and selling physically and psychologically healthy animals, as unhealthy animals may be more likely to be abandoned to become part of the stray population. Regulations should include specific requirements for accommodation, provision of suitable food, drink and bedding, adequate exercise, veterinary care and disease control. Breeders and dealers establishments should be inspected at regular intervals, including veterinary inspections. Advice on proper animal care should be given to all new owners of dogs.

9. Reduction in dog bite incidence

~~Propensity to bite is influenced by heredity, early experience, socialisation & training, health and human behaviour towards the dog. Breed or type specific bans are difficult and costly to enforce, provide a false sense of security to the community and, where enacted, no data currently supports them as effective in reducing incidence of dog bites; therefore, they are not recommended. Specific behaviours or incidences can be used as criteria to facilitate identification of a dog as 'dangerous' and appropriate measures taken to control the animal by the competent authority. For example, a dog that has been reported to have bitten someone or something (livestock or pets) may be required by law to be confined on the owner's property and kept on a lead (and if necessary muzzled) when in public. Note that confinement by tethering should be avoided as this can increase the likelihood of aggressive behaviour.~~

The most effective means of reducing prevalence of dog bites are education and placing responsibility on the owner, ~~not the animal~~. Dog owners should be educated ~~trained~~ in principles of responsible pet ownership as described in Article 5.a. Legal mechanisms that enable the competent authorities to impose penalties or otherwise deal with irresponsible owners are necessary. Mandatory registration and identification schemes will facilitate the effective application of such mechanisms. Young children are the group at highest ~~most at-risk group~~ for dog bites. Education programmes focussed on appropriate dog-directed behaviour have been demonstrated to be effective in reducing dog bite prevalence and these programmes should be encouraged.

10. Euthanasia

~~When euthanasia is practised, the procedures used should comply with general principles the presented laid down in the OIE Terrestrial Animal Health Code — 2006 (Article 3.7.6.1) should be followed, with the emphasis on using the most practical, rapid and humane methods and ensuring operator safety.~~

For practical reasons, different procedures may be used in rural and urban areas.

~~For reasons of convenience, different procedures could be used in rural and in urban areas. Dogs should only be euthanized after holding for a period of time to allow for the owner to locate his/her dog.~~

Table 1 shows a list of methods for the euthanasia of dogs.

~~They fall into two major categories based on whether it is necessary to handle or restrain the dog or not in order to euthanize it.~~

~~Where capture or restraint procedures give rise to a risk or potential risk of human exposure to rabies, procedures that do not require restraint of dogs are preferable.~~

~~The methods are not described in any particular order.~~

Appendix I (contd)

	Procedure	Capture	Restraint = Handling	Advantages/Dis advantages
Urban areas	Electrocution	Yes	No	Affordable equipment: 220 V mains current; gloves + boots. Instant death.
	Carbon monoxide (CO)	Yes	No	Needs appropriate premises; puts personnel at risk. Slow death.
	CO ₂	Yes	No	As CO ₂ is heavier than air, the dogs can lift their heads over the CO ₂ layer and death is slow.
	Barbiturates			Requires an appropriate dose and pre-anaesthetic.
	Intravenous	Yes	Yes	Administered under veterinary supervision and requires trained personnel. Slow death.
	Intracardial	Yes	Yes	
	Intraperitoneal	Yes	Yes	
T 61 = Tanax				Dangerous for personnel in the event of accidental injection. Slow death.
Intravenous	Yes	Yes		
Intracardial	Yes	Yes		
Intrapulmonary	Yes	Yes		
Rural areas	Free bullet used from long range	No	No	Fast death. Risk of accident (same as for hunting)

Table 1: List of methods for the euthanasia of dogs

Euthanasia method	Specific method	Animal welfare concerns/ implications	Key animal welfare requirements	Considerations relating to operator security	Advantages	Disadvantages
Chemical - via injection	Barbiturates	Correct restraint is needed. IP is slow and may be irritant. IC injection is a painful procedure.	Recommend to use IV injection. When using IP injection, the solution may be diluted or local anaesthetic agent used in conjunction. IC should only be performed on unconscious animal and by skilled operator.	Correct restraint is needed. Administered under veterinary supervision and requires trained personnel.	Speed of action generally depends on the dose, concentration, route and rate of injection. Barbiturates induce euthanasia smoothly, with minimal discomfort to the animal. Barbiturates are less expensive than many other euthanasia agents.	Mild aesthetic objection as terminal gasps may occur in unconscious animals. These drugs persist in the carcass and may cause sedation or death in animals that consume the cadaver.
	Embutramide +Mebezonium +Tetracaine	Muscle paralysis may occur before lost of consciousness if injection given rapidly	Use slow IV injection with sedation to permit slow rate of injection.	Correct restraint is needed. To be administered under veterinary supervision and by trained personnel.	Quite low cost.	Unavailable/unlicensed in some countries
	Anaesthetic agent overdose (thiopentone or propofenol)	Underdosing may lead to recovery	IV injection of a sufficient dose	Correct restraint is needed. To be administered under veterinary supervision and by trained personnel.	Generally quick action and minimal discomfort to animal.	Large volume required (cost implications)
	Potassium chloride (KCl)	K ⁺ is cardiotoxic and very painful if used without anaesthetic agent.	Only use on anaesthetised animals, IV injection	Requires trained personnel.	Readily available without veterinary control.	Prior need for anaesthetic (cost and availability implications)

Appendix I (contd)**Table 1: List of methods for the euthanasia of dogs (contd)**

Euthanasia method	Specific method	Animal welfare concerns/ implications	Key animal welfare requirements	Considerations relating to operator security	Advantages	Disadvantages
Mechanical	Free bullet	Can be inhumane if shot is inaccurate and dog is only wounded; dog may also escape.	Skilled operator essential.	Risk of injury of operator.	Not necessary to handle or capture dog.	Brain tissue may be unavailable for rabies diagnosis. Risk of injury to bystanders. Legal constraints on use of firearms..
	Penetrating captive bolt	Can be inhumane if shot is inaccurate and dog is only wounded.	Skilled operator essential.	Animal must be restrained. Skilled operator essential.	No risk to operator (c.f. free bullet)	Brain tissue may be unavailable for rabies diagnosis. Legal constraints on use of firearms. May raise aesthetic objections.
	Exsanguination	Onset of hypovolaemia may cause dog to become anxious.	Only use on unconscious animal	Danger to operator through use of sharp instrument.	Material requirements minimal.	Must be done on unconscious animal. Aesthetically objectionable

Table 1: List of methods for the euthanasia of dogs (cont d)

Euthanasia method	Specific method	Animal welfare concerns/ implications	Key animal welfare requirements	Considerations relating to operator security	Advantages	Disadvantages
Gaseous	Carbon monoxide (CO)	Gas is aversive. Inadequate concentration of CO is not lethal and can cause suffering. Signs of distress (convulsions, vocalization and agitation) may occur.	Compressed CO in cylinders must be used to achieve and maintain adequate concentration, which must be monitored. Note: fumes from gasoline engines are irritant and this source of CO is not recommended.	Very hazardous for operator - gas is odourless and causes both high and chronic toxicity.	Dog dies quite rapidly if concentration of 4 to 6% used. No odour (therefore no aversive effect). Gas is not flammable or explosive except at concentration greater than 10%.	
	Carbon dioxide (CO ₂)	Gas is highly aversive. Inadequate concentration of CO ₂ is not lethal and can cause suffering. CO ₂ is heavier than air, so when incomplete filling of the chamber occurs, dogs may raise their head and avoid exposure. Few studies on adequate concentration and animal welfare.	Compressed CO ₂ gas chamber is the only recommended method because the concentration can be monitored and regulated.	Minimal hazard to operator when properly designed equipment used.	Gas is not flammable or explosive and causes quite rapid anaesthesia when correct concentrations used. Low cost. Readily available as compressed gas	Anaesthesia can be quite rapid but death may take some time.
	Inert gas (nitrogen, N ₂ argon, Ar)	Loss of consciousness is preceded by hypoxemia and ventilatory stimulation, which may be distressing to the dog. Re-establishing a low concentration of O ₂ (i.e. greater than or equal to 6%) in the chamber before death will allow immediate recovery.	Concentration above 98% must be achieved rapidly and maintained. Properly designed equipment must be used.	Minimal hazard to operator when properly designed equipment used.	Gas is not flammable or explosive and is odourless. Readily available as compressed gas.	High cost. Little data on animal welfare implications in dogs.

Appendix I (contd)

Table 1: List of methods for the euthanasia of dogs (cont d)

Euthanasia method	Specific method	Animal welfare concerns/ implications	Key animal welfare requirements	Considerations relating to operator security	Advantages	Disadvantages
Gaseous (cont.)	Anaesthetic gas overdose (halothane or enflurane)	Animal may struggle and become anxious during induction. Vapours may be irritating and can induce excitement.	Supplementation with air or O ₂ required to avoid hypoxemia during induction phase.	Some gases may be hazardous, especially for pregnant women. General recommendation: Avoid human exposure to greater than or equal to 2ppm to avoid narcosis.	Gas is not flammable or explosive. Valuable for use with small animals.	High cost. Anaesthetic and euthanasia properties of the gas used must be known. Isoflurane has a pungent odour. Methoxyflurane's action is slow and dog may become agitated.
Electrical	Electrocution	Cardiac fibrillation occurs before onset of unconsciousness, causing severe pain if dog is conscious. Pain can also be caused by violent extension of the limbs, head and neck. Method may not be effective if insufficient current applied.	Dogs must be unconscious before being electrocuted. This can be accomplished by electrical stunning (current through the brain to produce an instantaneous stun) or anaesthesia. Electrodes should span the brain in order that the current passed through the brain. Proper equipment and trained operator is essential.	May be hazardous for operator, who should use protective equipment (boots and gloves).	Low cost.	Inhumane if performed on conscious dog. May raise aesthetic objections.

KEY to abbreviations used in Table 1:

IV: intravenous

IP: Intraperitoneal

IC: Intracardiac

To be developed for each method

- 1- Introduction
- 2- Requirements for effective use
- 3- Advantages
- 4- Disadvantages
- 5- Conclusions

a) Summary assessment of Comments on methods for the euthanasia of dogs:i) Restraint

When a dog needs to be restrained for any procedure, including euthanasia, procedure, this should always be done with full regard for operator security and animal welfare. In order to use Some euthanasia methods must be used in association with sedation or anaesthesia in order to be considered humane way, may be required.

ii) Special equipment

When special equipment is needed to perform euthanasia (eg. gas chamber) the system should be properly designed for the purpose and regularly maintained in order to achieve operator security and animal welfare.

iii) The following methods, procedures and practices are unacceptable on animal welfare grounds:• Chemical methods:

- Embutramide + Mebezonium + Tetracaine without sedation or by other than IV injection
- Chloral hydrate
- Nitrous oxide : may be used with other inhalants to speed the onset of anaesthesia, but alone it does not induce anaesthesia in dogs
- Ether
- Chloroform
- Cyanide
- Strychnine
- Neuromuscular blocking agents (nicotine, magnesium sulphate, potassium chloride, all curariform agents): when used alone, respiratory arrest occurs before lost of consciousness, so the dog may perceive pain.
- Formalin
- Household products and solvents

• Mechanical methods:

- Air embolism on conscious animal

Appendix I (contd)

- Burning
- Exsanguination of conscious animal
- Decompression: expansion of gas trapped in body cavities may be very painful
- Drowning
- Hypothermia, rapid freezing
- Stunning: stunning is not a euthanasia method, it should always be followed by a method which ensures death.
- Kill-trapping
- Electrocution of conscious animal.

Because neonatal animals are resistant to hypoxia, methods that depend upon achieving a hypoxic state (e.g. CO₂, CO, N₂, Ar) should not be used. These methods should not be used in animals aged less than 4 months, except to produce loss of consciousness and should be followed by another method to cause death. Cervical dislocation and concussion may be used in neonatal dogs. Operators must be well trained in the use of physical techniques to ensure that they are correctly and humanely carried out. The dog must be exsanguinated immediately after concussion or cervical dislocation.

iv) Confirmation of death

For all methods of euthanasia used, death must be confirmed before animals are disposed of or left unattended. If an animal is not dead, another method of euthanasia must be performed.

v) Carcass disposal

Carcasses should be disposed of in a manner that complies with legislation. Attention must be paid to the risk of residues occurring in the carcase. Incineration is generally the safest way of carcase disposal.

Article 6

Monitoring and evaluation of dog population control programmes

Monitoring and evaluation allows for comparison of important indicators against the baselines measured during initial assessment (Article 4). The three main reasons for carrying out monitoring and evaluation are:

1. to help improve performance, by highlighting both problems and successful elements of interventions;
2. for accountability, to demonstrate that the programme is achieving its aims;
3. assuming methods are standardised, to compare the success of strategies used in different locations and situations.

Monitoring is a continuous process that aims to check the programme progress against targets and allows for regular adjustments. Evaluation is a periodic assessment, usually carried out at particular milestones to check the programme is having the desired and stated impact. These procedures involve the measurement of 'indicators' that are chosen because they reflect important components of the programme at different stages. Selection of suitable indicators requires clear planning of what the programme is aiming to achieve, the best selection of indicators will be one that reflects the interest of all relevant stakeholders. Standardised methodology will facilitate comparison of data from subsequent evaluations and performance between different projects. Indicators can be direct measurements of an area targeted to change (e.g. population of free roaming dogs on public property) or indirect measures that reflect change in a targeted area (e.g. number of reported dog bites as a reflection of rabies prevalence).

4. Elements that should generally be monitored and evaluated ~~most programmes will need to monitor and evaluate~~ include:
- a) Dog population size, separated by into sub-populations according to ownership and restriction of movement (i.e. roaming unrestricted or restricted by an owner):
 - b) Dog welfare, in the target population (e.g. body condition score, skin conditions and injuries or lameness) and as a result of the programme (if interventions involve direct handling of dogs, the welfare of the dogs as result of this handling should be monitored):
 - c) Prevalence of zoonotic diseases, such as rabies, ~~prevalence~~ in both the animal and human population can be measured:
 - d) Responsible animal ownership, including measures of attitudes and understanding of responsible ownership and evidence that this is translating into ~~actual~~ responsible behaviour.
5. There are many sources of information for measuring indicators ~~can be widespread~~, including:
- a) Feedback from the local community (e.g. through the use of structured questionnaires or 'open format' consultation processes)
 - 3) Records and opinions obtained from relevant professionals (e.g. veterinarians, medical doctors, law enforcement agencies, educators)
 - 4) Animal based measurements (e.g. direct observation surveys of population size and welfare status)

The output of activities against budget should be carefully recorded in order to evaluate ~~balance~~ the effort (or cost) against the outcomes and impact (or benefit) that are reflected in the results of monitoring and evaluation results.

Article 7

Research needs

To be completed

Article 8

International cooperation

To be completed

Annex I:

An overview of appropriate methodologies for estimating the size of dog populations.

Population estimates are necessary for making realistic plans for dog population management and zoonosis control, and for monitoring the success of such interventions. However, for designing effective management plans, data on population sizes alone are insufficient. Additional information is required, such as degrees of supervision of owned dogs, the origin of ownerless dogs, accessibility, etc.

The term “owned” may be restricted to a dog that is registered with licensing authorities, or it may be expanded to unregistered animals that are somewhat supervised and receive shelter and some form of care in individual households. Owned dogs may be well supervised and restrained at all times, or they may be left without control for various time periods and activities. Dogs without owners that claim responsibility may still be accepted or tolerated in the neighbourhood, and individuals may provide food and protection. Such animals are sometimes called “community owned dogs” or “neighbourhood dogs”. For an observer it is frequently impossible to decide if a free roaming dog belongs to someone or not.

The choice of methods for assessing the size of a dog population depends on the ratio of owned versus ownerless dogs, which may not always be easy to judge. For populations with a large proportion of owned dogs it may be sufficient to consult dog registration records or to conduct household surveys. These surveys should establish the number of owned dogs and the dog to human ratio in the area. In addition, questions on dog reproduction and demographics, care provided, zoonosis prevention, dog bite incidence, etc. may be asked. Sample questionnaires can be found in the “Guidelines for Dog Population Management” (WHO/WSPA 1990). Standard polling principles must be applied.

If the proportion of ownerless dogs is high or difficult to assess, then one must resort to more experimental approaches. Methods borrowed from wildlife biology can be applied. These methods are described in WHO/WSPA’s “Guidelines for Dog Population Management” (1990), and in more detail in numerous professional publications and handbooks, such as Bookhout (1994) and Sutherland (2006). Being generally diurnal and tolerant to human proximity, dogs lend themselves to direct observation and the application of mark-recapture techniques. Nevertheless, a number of caveats and limitations have to be taken into account. The methods are relatively labour intensive, they require some understanding of statistics and population biology, and most importantly, they are difficult to apply to very large areas. One must take into account that dog distribution is non-random, that their populations are not static, and that individual dogs are fairly mobile.

Counting of dogs visible in a defined area is the simplest approach to getting information on population size. One has to take into account that the visibility of dogs depends on the physical environment, but also on dog and human activity patterns. The visibility of animals changes with the time of the day and with seasons as a function of food availability, shelter (shade), disturbance, etc. Repeated standardized counting of dogs visible within defined geographical localities (e.g. wards) and specific times will provide indications of population trends. Direct counting is most reliable if it is applied to small and relatively confined dog populations, e.g. in villages, where it might be possible to recognize individual dogs based on their physical appearance.

Methods using mark-recapture procedures are often considered more reliable. However, they also produce trustworthy results only when a number of preconditions are met. Mortality, emigration and recruitment into the population must be minimal during the census period. One may be able to incorporate corrective factors into the calculations.

It is therefore important that the recommended census procedures are applied at times of low dispersal and that one selects study plots of shape and size that minimize the effect of dog movements in and out of the observation area. Census surveys should be completed within a few days to a maximum of two weeks in order to reduce demographic changes. In addition, all individuals in the population must have an equal chance of being counted. This is a highly improbable condition for dogs, whose visibility depends on ownership status and degrees of supervision. It is therefore recommended that the investigator determines what fraction of the total population he/she might cover with an observational method and how much this part overlaps with the owned dog segment that he/she assesses with household surveys.

There are essentially two ways to obtain a population estimate if it is possible, in a defined area and within a few days, to tag a large number of dogs with a visible mark, e.g. a distinctive collar or a paint smudge. The first method requires that the capture (marking) effort remains reasonably constant for the whole length of the study. By plotting the daily number of dogs marked against the accumulated total of marked dogs for each day one can extrapolate the value representing the total number of dogs in the area. More commonly used in wildlife studies are mark recapture methods (Peterson-Jackson, Lincoln indices). Dogs are marked (tagged) and released back into the population. The population is subsequently sampled by direct observation. The number of marked and unmarked dogs is recorded. One multiplies the number of dogs that were initially marked and released by the number of subsequently observed dogs divided by the number of dogs seen as marked during the re-observation to obtain a total population estimate. Examples for the two methods are given in WHO/WSPA's "Guidelines for Dog Population Management" (1990).

Since the dog populations of entire countries, states, provinces or even cities are much too large for complete assessment, it is necessary to apply the methods summarized above to sample areas. These should be selected (using common sense) so that results can be extrapolated to larger areas.

Bookhout TA (ed), 1994: *Research and Management Techniques for Wildlife and Habitats*, 5th ed. The Wildlife Society, Bethesda, Maryland, 740p.

Sutherland WJ (ed), 2006: *Ecological Census Techniques - A Handbook*, 2nd ed. Cambridge University Press, Cambridge, 448 p.

WHO/WSPA, 1990: *Guidelines for Dog Population Management*. WHO/ZOON/90.165. WHO, Geneva, 116 p.

DISCUSSION PAPER ON THE DEVELOPMENT OF ANIMAL WELFARE GUIDELINES FOR PRODUCTION SYSTEMS (TERRESTRIAL ANIMALS)

(Developed by the OIE Animal Welfare Working Group, 2006)

Background

The OIE International Committee in May 2005 endorsed the proposals of the Animal Welfare Working Group for priorities for 2005/2006. Among those priorities was the development of animal welfare guidelines for terrestrial animal production systems.

The development of global OIE animal welfare guidelines for production systems will be challenging for a number of reasons. Worldwide, animals are raised under extremely diverse conditions ranging from intensive systems with animals kept permanently indoors, to extensive systems with little or no housing. These different systems involve very different animal welfare challenges. There are also large differences from country to country in the level of priority accorded to the welfare of food animals.

Nonetheless, because of the close link between animal welfare and animal health, guidelines designed to improve animal welfare will often lead to better animal health, productivity and food safety. Especially in cases where these relationships can be clearly demonstrated, animal welfare guidelines may be broadly acceptable to member countries.

This discussion paper sets out some of the key issues that need to be considered in developing animal welfare guidelines for production systems, and suggests next steps in this area.

Animal-based and resource-based criteria

Animal welfare guidelines may include (1) animal-based criteria and (2) resource-based criteria of animal welfare. Resource-based criteria (also called design criteria or input criteria) indicate the resources that should be provided. These often specify space allowances and dimensions, ambient temperature range, humidity, condition of the litter, air quality, availability of feed and water, frequency of inspection, and biosecurity and sanitation measures. Animal-based criteria (also called performance criteria or output criteria) are described/specified in terms of the animals' state. They often include such elements as survival rate, incidence of disease and injury, body condition scoring, the ability of animals to behave in certain ways, and the reaction of animals to their handlers.

Resource-based criteria are widely used in animal welfare assurance programs because they are often easier to evaluate and score than animal-based criteria. However, they have important limitations:

- Resource-based criteria are generally derived from research carried out with specific species/breeds and production systems, and they may not be applicable to other breeds and other production systems. For example, a space allowance that minimizes crowding-related problems in light hybrid hens in battery cages may not apply to other breeds or to other housing systems.

Appendix J (contd)

- The welfare of animals is strongly influenced by the skill and attitude of animal handlers, and it is difficult to develop and implement resource-based criteria to describe these elements.
- Resource-based criteria are often created in response to well researched problems such as over-crowding and air quality, and they may not apply to new or emerging problems such as new diseases or genetic modifications of the animals.

Perhaps because of these limitations, research shows that animal production units that conform to the same resource-based criteria may still have widely varying animal welfare outcomes.

Animal-based criteria are not as widely used in existing animal welfare standards but they should, in principle, be applicable to any production system. In fact animal based criteria may provide a better measure of the animal welfare outcomes because they reflect the influence of variables (e.g. experience and attitude of handlers, presence of emerging diseases) that may be missed by resource-based criteria. However, many animal welfare concerns are difficult to address using animal-based criteria. Examples include the capacity of the ventilation system to prevent extreme temperatures, the use of pain mitigation for surgical procedures, and the implementation of appropriate biosecurity measures.

A reasonable approach, therefore, would be for the OIE to incorporate animal-based criteria in its guidelines where feasible and to supplement these with resource-based criteria where there is a good scientific basis for doing so. Thus, for example, animal welfare guidelines for chickens might specify certain levels of survival and freedom from disease and injury (animal based criteria) and would also recommend requirements for ambient temperature, humidity, air quality and litter quality (resource based criteria) for birds that are kept indoors.

Clarifying the objectives of animal welfare guidelines

Animal welfare guidelines are generally designed to achieve one or more of three objectives:

1. to protect the basic health and normal functioning of animals, for example by preventing and alleviating disease, injury, malnutrition and similar harm;
2. to protect the psychological well-being of animals, for example by preventing and alleviating pain, fear, distress and discomfort;
3. to provide living conditions that are considered to be 'natural' for the species, for example by providing a social and physical environment where animals can perform key elements of their natural behaviour.

The three objectives overlap. For example, preventing injury is important for psychological well-being, and preventing pain and fear can be important for normal functioning. However, the overlap is not perfect. For example, environments that limit the spread of disease do not necessarily allow natural behaviour and vice versa.

The three objectives are based on somewhat different bodies of scientific research. The research relevant to objective 1 includes studies of survival rate, incidence of disease and injury, body condition scoring, and productivity measures. The research relevant to objective 2 includes studies of pain, fear and distress in animals, studies of ways to alleviate such states, and studies that determine the animals' own preferences and aversions. Research relevant to objective 3 includes studies of the normal (and abnormal) behaviour of animals, how these are influenced by the social and physical environment, and the strength of the animals' motivation to carry out elements of their natural behaviour.

In the past, confusion has sometimes occurred because different standards, which are all claimed to address animal welfare, have involved very different requirements. Often such differences arise because the different standards address different objectives and rely on different bodies of research. In order to avoid confusion, it is important that recommendations be clear as to the welfare objectives they are intended to address.

Standards based on objective 1, because they reinforce basic health and functioning of animals, tend to be the most aligned with the traditional objectives of animal producers and veterinarians. The cost/benefit ratio is often favourable because implementation often leads to measurable improvements in productivity (e.g. improved survival or reduced mortality due to stress and disease). Hence, these standards are likely to be the most acceptable to animal producers and in cultures where concern for the welfare of animals is relatively low. However, in cultures where the public is actively interested in and concerned about animal welfare, standards based on objective 1 are likely to be viewed as minimum standards that promote productivity rather than animal welfare per se.

Standards based on objective 2 (alleviating pain and distress, etc.) vary in their ease of implementation and their economic implications. Some (such as handling animals in ways that do not cause distress) should be relatively easy to implement, involve little or no cost, and may produce measurable economic benefit. Others (such as requiring anaesthesia for minor surgery) may be difficult and costly to implement. The level of acceptance by producers will likely vary accordingly. In countries which accord a high priority to animals welfare, standards based on objective 2 tend to be strongly supported by the concerned public who generally see the alleviation of pain and distress as a key element of animal welfare.

Standards based on objective 3 (providing more 'natural' living conditions) can have widely varying implications. Some requirements, such as providing more natural social grouping of animals, can be achieved in confinement production systems with only small cost implications. Others may require substantial redesign of animal environments and incur higher land and labour costs. Such standards may, however, allow producers using alternative production systems to market products to consumers who support such standards.

In proposing OIE guidelines on animal production systems, one approach would be to focus principally on objective 1 because of the clear linkage with animal health and traditional veterinary interests, and to propose the adoption of guidelines based on objectives 2 and 3 where this is feasible and appropriate. If this approach is used, however, it should be made clear that the guidelines are intended as basic guidelines designed mainly to promote the health and functioning of animals. In cultures that place a high priority on animal welfare, the development and implementation of guidelines that more closely address animal welfare objectives 2 and 3 would be appropriate to meet societal expectations.

Clarifying the underlying science

In the past, the development of animal welfare guidelines for production systems has sometimes been hampered by a lack of clarity over the scientific literature. In some cases organizations have attempted to create guidelines without a clear review or understanding of the science. In other cases, scientific reviews are available but these lead to conflicting conclusions. Guidelines that lack a clear and transparent link to science are often criticized as reflecting the subjective views or self-interest of those (animal producers, regulators or animal welfare organizations) that produce them.

Appendix J (contd)

In general, then, a good first step in developing animal welfare guidelines for a given production system is to ensure that a competent review of the relevant science is in place and widely accepted. If there is no such review, or if there are significant conflicts among existing reviews, then a new review may need to be created before beginning to develop a guideline.

Recommended next steps

Given the number of strategic decisions involved in the development of guidelines for terrestrial animal production systems, the Working Group on Animal Welfare recommends that the OIE proceed as follows.

Appoint an *ad hoc* Group to consider the issues presented in this paper and prepare a Guidance Document on the development of animal welfare guidelines for terrestrial animal production systems. The *ad hoc* Group should, at a minimum, consider and report on the following:

- the various objectives of animal welfare guidelines, how these relate to animal health, and the role that the objectives should play in OIE guidelines;
- the advantages and disadvantages of animal-based versus design-based criteria, with examples and recommendations on how these different criteria should be addressed in developing OIE guidelines;
- the role of science in animal welfare guidelines, with recommendations on how the OIE should proceed to ensure that guidelines are clearly and transparently based on relevant science;
- a proposed strategy, including whether to approach the development of guidelines based on species (e.g. chickens) or production systems (e.g. caged layers);
- recommendations on the composition of expert groups including the appropriate scientific expertise, regulatory experience and regional and cultural representation;
- priorities for development of guidelines (species, production systems).

This Guidance Document should be submitted to the Animal Welfare Working Group and, if endorsed, submitted to the OIE Code Commission and possible distribution to the OIE Delegates.

With the Guidance Document in place and endorsed by the International Committee, the OIE could proceed by appointing one or more *ad hoc* Groups to work on particular animal species or production systems. Such groups may begin with the creation of a comprehensive review of the literature where this is needed.

DISCUSSION PAPER

ISSUES AND OPTIONS REGARDING A FUTURE INTERNATIONAL ROLE FOR THE OIE IN LABORATORY ANIMAL WELFARE

Purpose:

The purpose of this discussion paper is to assist the OIE in defining, and scoping, the unique international role it can play, in the future, in connection with laboratory animal welfare.

It is envisaged that the strategy underlying the OIE's involvement in laboratory animal welfare will include close liaison with the already established specialist international organisations. In this regard, a parallel already exists in relation to the working relationships between the OIE and IATA and AATA.

The unique benefit of OIE involvement would be the scientific and policy credibility provided by an internationally recognised inter-governmental body dedicated to animal health and welfare issues and representing 169 member countries.

OIE Update

The original version of this discussion paper was discussed at the fourth meeting of the OIE Permanent Working Group on Animal Welfare held in Teramo, Italy, in September, 2005.

It was agreed, at this meeting, to enter into dialogue with appropriate stakeholders to discuss what unique international role could be played by the OIE and what support there would be for the OIE assuming such a role.

It was initially proposed to hold such dialogue, in late 2005, but this did not prove possible. Arrangements were, however, made with the International Council of Laboratory Animal Science (ICLAS) to hold a half day OIE/ICLAS meeting in association with the 2006 meetings of the American Association of Laboratory Animal Science (AALAS) and ICLAS, in October 2006, in Salt Lake City. During 2006, a formal offer of support was also made to the OIE by the nascent International Association of Colleges of Laboratory Animal Medicine (IACLAM) by its inaugural President Dr Judy MacArthur Clark. IACLAM was subsequently invited to participate in the OIE/ ICLAS Meeting.

All participants at the Salt Lake City confirmed strong support for the OIE assuming an international laboratory animal welfare role.

Valuable additional discussions, with key international organisations involved in laboratory animal welfare, were also held in Lake Como in June 2007 and key matters arising from these discussions are included. These deliberations also provided important suggestions regarding ad hoc Group membership. A formal OIE/ ICLAS MoU was agreed at the May 2007 OIE General Session and it is anticipated that this will be formally signed in December 2007.

This version of the original paper, has been prepared for discussion at the September 2007 meeting of the OIE Permanent Animal Welfare Working Group. The final agreed version of the paper will be considered at the December 2007 meeting of the Laboratory Animal ad hoc Group.

Appendix J (contd)**Introduction:**

The use of animals in research, testing and teaching was discussed at the February, 2004 OIE Global Conference on Animal Welfare as a possible future element of the OIE's strategic initiative on animal welfare. This led to an offer of international stakeholder support from a consortium co-ordinated by Dr Marilyn Brown and an invitation to speak at both the AALAS annual conference and the ICLAS International Committee meeting in October 2004. Laboratory Animal Welfare, was one of four priority strategic items identified at the December, 2004 meeting of the Permanent Animal Welfare Working Group. At that time, the Director-General emphasized the importance of the OIE's international network of reference laboratories and diagnostic centres and the role that laboratory animals play both in these centres and in the regulatory testing of veterinary medicinal and biological products conducted by OIE member countries.

Support for OIE involvement in laboratory animal welfare was received at the May, 2005 OIE General Session and a written offer of support was subsequently received from the CVO of Finland. The opportunity was also taken to briefly discuss potential OIE involvement in this area, with staff from the Teramo OIE Collaborating Centre for Animal Welfare at meetings in London and Paris in March and May 2005 respectively.

Relevant review papers by Drs Clement Gauthier and Vera Baumanns were published in the August 2005, OIE Scientific and Technical Review Series issue "Animal Welfare: Global Issues Trends and Challenges". A number of key current international issues and trends were also addressed in the concluding paper of this publication. At the 2006 meeting of the OIE International Committee, delegates were updated on progress to date with this new area of strategic involvement.

This discussion paper is designed to provide some selected background information, identify some key issues and potential roles and make some recommendations for initial OIE involvement in this specialised and often controversial area of animal use.

Background:

The use of animals for scientific purposes is the subject of an extensive international literature, with a number of well-established international organisations playing key roles in promoting humane science and good laboratory animal practice, in encouraging ethical debate, in countering the misinformation promulgated by "antivivisection" groups and in fostering the ethical principles of the three Rs of Russell and Burch.

Key organisations include:

- International Council for Laboratory Animal Science (ICLAS)
- American Association for Laboratory Animal Science (AALAS)
- Institute for Laboratory Animal Research (ILAR)
- Canadian Council for Animal Care (CCAC)

- Universities Federation for Animal Welfare (UFAW)
- Australian and New Zealand council for the Care of Animals in Research and Teaching (ANZCCART)
- American College of Laboratory Animal Medicine (ACLAM)
- Japanese College of Laboratory Animal Medicine (JCLAM)
- European College of Laboratory Animal Medicine (ECLAM)
- Korean College of Laboratory Animal Medicine (KCLAM)
- International Association of Colleges of Laboratory Animal Medicine (IACLAM)
- European Centre for the Validation of Alternative Methods (ECVAM)
- US Interagency Coordinating Committee for the Validation of Alternative Methods (ICCVAM)
- Fund for the Replacement of Animals in Medical Experimentation (FRAME)
- Interniche
- Council of Europe ETS 123 Review
- European Food Safety Authority (EFSA) Working Group on Experimental Animal Welfare
- AALAC International
- Various Governmental Three Rs Organisations

The Three Rs of Russell and Burch have provided an important ethical underpinning for the use of animals in science and groups are established in Baltimore, Davis, Utrecht, Palmerston North and London to specifically promote the Three Rs and encourage relevant research.

The five World Congresses on Alternatives and Animal Use in the Life Sciences, held from 1993 to 2005, have made a major contribution to international dialogue on this subject. These congresses are excellent examples of a forum where a range of view -points can be heard, within a framework of problem solving and trust. Regular updates are provided at these conferences on the reduction, refinement and replacement of animal use in regulatory testing of veterinary biological products, in particular.

Appendix J (contd)

The issue of international harmonisation of the use of animals in regulatory testing is being addressed by the International Cooperation on Harmonisation of Technical Requirements for Registration of Veterinary Medicine Products (VICH) programme. The VICH is an international forum to provide guidance on technical requirements for the registration of new veterinary medicinal products in order to protect public health and animal health and welfare, as well as the environment. VICH is a programme of collaboration primarily between the regulatory authorities and the animal health industry of the EU, Japan and the USA. Australia, New Zealand and Canada participate as active observer members, while the OIE participates as an associate member in supporting and disseminating outcomes worldwide.

VICH was officially launched in 1996, under the auspices of the OIE, and the factors which influenced its establishment specifically included:

- The drive to reduce the number of animals used in regulatory testing by eliminating the need for duplication of tests in each VICH region
- The international drive to harmonize regulatory standards and minimize their impact on trade.

The objectives of VICH also specifically refer to establishing and monitoring harmonized regulatory requirements for veterinary medicinal products in the VICH regions, which meet high quality safety and efficacy standards and minimize the use of test animals and costs of product development.

Replacement of animal use in veterinary undergraduate teaching is another area where major advances have been made in recent years. Considerable expertise has been developed in, for example, the veterinary schools in Norway and New Zealand and there would be scope for the OIE to facilitate uptake and adoption of such teaching techniques.

ICLAS/OIE Salt Lake City Meeting, October 2006

This well-attended and successful, by invitation only, meeting had the objectives detailed in Appendix 1. Appendices 2 and 3 provide agenda and participant details.

Key issues identified in the formal presentations, and arising from subsequent discussion, included the following:

- The important role being played by the ICLAS Working Group on the Harmonisation of Guidelines and the commitment to an international harmonisation, rather than a standard setting approach.
- ICLAS resourcing issues and the need to consider a new international location for the secretariat, after 10 years of being hosted by the CCAC in Canada.
- An indication that the European Commission might consider a case for financial support for a possible EU member country location.
- The OIE's commitment to ensuring that animal welfare standards and guidelines have broad applicability internationally.
- The potential for the OIE to raise awareness internationally at both a government and stakeholder level.

Appendix J (contd)

- The strategic significance of the establishment of IACLAM and its particular interest in laboratory animal transport (including primates) and *in-vitro* and *in-silico* testing methods for both animal and human pharmaceuticals.
- The important international role played by AALAC International, with its commitment to performance standards and practical harmonisation.
- The important international role played by ILAR including the ILAR Journal, ILAR Care and Use Guidelines and other international reference documents.
- The role of the OECD model in facilitating the international regulatory acceptance of non-animal tests.
- The value of the ISO model in facilitating the international regulatory acceptance of human medical devices.
- The “European Partnership on Alternative Approaches to Animal Testing” as an example of an action programme including the EC and all stakeholders (Refer Appendix 4).

The need for greater research support (Refer Framework 7 programme in Europe and research coordination).

Strong support was given to the OIE’s proposed involvement in the international laboratory animal welfare area. In addition to the areas originally identified in 2005, the following were suggested as particular priorities:

- Revision, promulgation and, if necessary, updating of 1986 Committee of International Organisations of Medical Science (CIOMS) “International Guiding Principles for Biomedical Research involving Animals”.
- Provision of expert international advice in relation to transport of laboratory animals, including primates, to ensure that the role played by such animal use in animal disease diagnosis and animal disease research is fully recognised and that the assessment of zoonoses transmission is both science- and risk-based
- Ongoing provision of secretariat support for ICLAS, as the established international platform for the harmonisation of laboratory animal welfare standards
- Value of OIE participation in the 2007 meeting of the ICLAS Working Group on Harmonisation

To complement the proposal that the OIE formalises and strengthens its ties with ICLAS, it was suggested that a similar strong relationship be developed with IACLAM. Appendices 5 and 6 outline the established international role of ICLAS and the expertise underpinning the priorities of IACLAM.

Appendix J (contd)**Recommendations:**

In recognition of the complexity and specialised nature of this topic, it is recommended that the OIE adopt a very focused strategy and establish an ad hoc Group of experts to make recommendations regarding:

1. The need to establish Guiding Principles for Laboratory Welfare and the relevance of the 1986 CIOMS Principles.
2. The development of a strategy which would prioritise and address the following areas of potential involvement:
 - The availability of guidelines for the use of animals in regulatory testing of veterinary medicinal and biological products
 - Liaison with VICH and the International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH), to facilitate the regulatory acceptance and adoption of internationally validated non-animal test methods
 - Potential OIE role in provision of expert international advice on the transport of laboratory animals, including primates
 - Issues relating to the use of animals in research and diagnostic testing
 - Options for OIE involvement in the use of animals in research and diagnostic testing
 - The availability of guidelines for the use of animals in undergraduate teaching
 - Identification of key international stakeholders and availability of relevant resource material

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