

Welfare aspects of the slaughter of fur producing
animals in Ireland

A report from the working-group
**to the Scientific Advisory Committee on
Animal Health and Welfare**

Background and scope.

Fur farming in Ireland is a relatively small industry with just five registered mink farms and one fox farm which is run in conjunction with a mink farm. Fur animals are bred, reared and killed on the farm premises. In 2006 approximately 170,000 mink and 300 foxes were killed in Ireland (Department of Agriculture, Fisheries & Food (2007) Review of Operational Procedures for Killing of Fur Animals). Concerns have been raised about the welfare aspects of practices used in the killing of fur producing animals and compliance with national legislative requirements. The working-group of the Scientific Advisory Committee on Animal Health and Welfare has been asked to review the current practices relating to the slaughter of animals on fur-farms in Ireland, to examine the welfare implications of these practices and to make recommendations accordingly. The group has avoided consideration of the ethical aspects of fur farming and has focused exclusively on the scientific assessment of the welfare of fur animals at the time of slaughter with the aim of producing scientifically based recommendations on how practices can be improved to enhance their welfare at this time.

Contextual factors impinging on welfare of fur animals at the time of slaughter

Generally, in comparison with other farm animals, species farmed for their fur have been subjected to relatively little active selection except with respect to fur characteristics (EU Scientific Committee on Animal Health and Animal Welfare's Report on The Welfare of Animals Kept for Fur Production, 2001) hence they remain relatively undomesticated and more prone to fear and stress when handled by humans. Handling may result in vocalisation by both handled and non-handled animals and stress associated with handling is likely to result in the release of fear pheromones with attendant welfare implications for all animals in the area. Delayed time to loss of consciousness will have the same effect, thus the method of choice should require minimal handling and should induce rapid loss of consciousness.

Mink are semi-aquatic carnivores and are well adapted to aquatic hunting (Dunstone, 1993), with specific adaptations for swimming and diving, including the ability to detect and respond to the effects of hypoxia (Raj and Mason, 1999). Stephenson, Butler, Dunstone, and Woakes (1988) reported a pronounced bradycardia in mink during dives, which they concluded was the result of a physiological adaptation to conserve oxygen. They also reported a fear-induced bradycardia in mink but failed to determine whether this was the same mechanism of

bradycardia, which was operative during diving. These findings may have implications for the use of gases for killing of mink.

Another consideration specific to the slaughter of fur animals is that their pelts must remain intact to retain their value, thus any method of killing must avoid damage to the pelt.

Legislation.

The killing of fur animals takes place on fur farms and is subject to the provisions of the European Communities (Welfare of Farmed Animals) Regulations, 2008 (S.I. 14 of 2008) which gives effect to a series of European Directives concerning the protection of animals including Council Directive 93/119/EC on the protection of animals at time of slaughter or killing.

3.1 **Permitted methods comprise:**

- 3.1.1 The use of mechanically operated instruments which penetrate the brain (projectile must enter the cerebral cortex and this method must be followed by immediate exsanguination)
- 3.1.2 Injection of an overdose of a drug with anaesthetic properties (only anaesthetics, doses and applications of which cause immediate loss of consciousness followed by death may be used)
- 3.1.3 Electrocution with cardiac arrest
- 3.1.4 Exposure to carbon monoxide
- 3.1.5 Exposure to chloroform (applicable to chinchillas only)
- 3.1.6 Exposure to carbon dioxide (applicable to mustelids and chinchillas only)

Welfare implications of permitted methods of killing fur animals

4.1 Methods currently in use:

Two methods are currently in use in Ireland for killing mink – both involve the use of gaseous mixtures – either *carbon dioxide* or *carbon monoxide*. Both entail moving progressively along a shed, removing selected animals from their cages by grasping them at the base of the tail and placing them, using a single movement, through a spring-loaded trapdoor, into a mobile chamber which has been pre-filled with the gaseous mixture. Between 50 and 70 mink may be placed in the box at any one time (DAFF 2007). This approach, which minimises human-animal interactions, has welfare advantages given the lack of domestication of mink, however research

suggests that the efficacy and humaneness of both gaseous mixtures is questionable. In particular the introduction of a large number of animals into the chamber at one time gives cause for concern - unless loss of consciousness and indeed death is extremely rapid there is the potential for suffocation and also for stress due to confinement with so many other animals.

Carbon dioxide:

In a report on the use of gaseous mixtures in mobile chambers, for killing mink, Enggaard-Hansen *et al* (1991) recorded a lag time to loss of consciousness of 19 seconds and a time to death of 153 seconds when 100% carbon dioxide was used. The EU Working Party Report on Recommendations for Euthanasia of Experimental Animals (1997) concluded that carbon dioxide euthanasia was unacceptable for use in carnivores, due to its aversiveness. The American Veterinary Medical Association Guidelines on Euthanasia (2007) state that carbon dioxide euthanasia is acceptable in some species but advise that this method may take longer than other means, that high concentrations of carbon dioxide may be distressful to some animals and that burrowing and diving animals may have a very high carbon dioxide tolerance. Cooper, Mason and Raj (1998) reported that mink were aversive to high concentrations of carbon dioxide and recommended that other, more acceptable, methods be used for killing them. The EU Scientific Committee on Animal Health and Animal Welfare's Report on The Welfare of Animals Kept for Fur Production, 2001 concluded that the use of carbon dioxide for killing impairs mink welfare. Furthermore, the legislation specifies that chambers should be filled with the highest possible concentration of carbon dioxide from a pure source and the report of the International Consensus Meeting on Carbon Dioxide Euthanasia of Laboratory Animals (2006) concluded that placing animals into a chamber with levels of greater than 50% carbon dioxide would cause at least 10-15 seconds of pain in the mucosa of the upper airways which was considered a serious welfare problem.

There is strong evidence, therefore, that carbon dioxide is an unsuitable method for killing mink and that its use results in significant welfare compromise.

Carbon monoxide:

Lambooy *et al* (1985) observed that carbon monoxide, in a chamber as described above at 4.2, caused rapid death of mink without excitation, loss of consciousness occurring in 21 +/- 7 seconds. However, Enggaard-Hansen *et al* (1991) reported a lag time to loss of consciousness of 64 seconds and a time to death of 215 seconds. Both were reporting on the use of carbon monoxide from a source of 100% carbon monoxide rather than from exhaust gases. A review of current practices in Irish fur-farming industry (DAFF 2007) supported Lambooy's findings, concluding that time to unconsciousness and death when carbon monoxide from a 100% source was used was rapid – usually less than 30 seconds but that carbon monoxide derived from a combustion engine was less efficient. The EU Working Party Report on Recommendations for Euthanasia of Experimental Animals (1997) indicates that carbon monoxide euthanasia is acceptable for small animals but does not recommend its use for aesthetic reasons as convulsions and vocalizations have been reported with its use in dogs and because it presents a hazard to operators. The American Veterinary Medical Association Guidelines on Euthanasia (2007) conclude that carbon monoxide euthanasia is acceptable for fur animals and for dogs and cats provided compressed 100% carbon monoxide from cylinders is used. However, it is recommended that only one animal be introduced into the chamber at a time and that death be confirmed in each individual animal.

The DAFF review of Operational Procedures for Killing of Fur Animals, 2007 confirmed that animals are introduced one at a time into the chamber and indicated that unconsciousness and probably death were likely to have occurred prior to the introduction of subsequent animals. Raj and Mason (1999) expressed concerns about the potential welfare implications of hypoxia when carbon monoxide or other hypoxic methods are used for killing mink. Using passive avoidance testing they found that, although mink were not aversive to argon, they reduced the amount of time they spent in a reward chamber, which was filled with argon. They concluded that this was due to an ability to detect hypoxia - possibly a physiological adaptation related to their methods of hunting and diving. However, Gorman *et al* (2003) in a review of the clinical toxicology of carbon monoxide have questioned the hypoxic theory of carbon monoxide toxicity and have postulated cellular theories of toxicity including direct effects on brain neurotransmitter systems.

Clearly, more research is needed to establish whether or not mink are aversive to carbon monoxide at the levels used for killing and also to confirm the lag time to loss of consciousness and death as the Enggaard-Hansen (1991) paper, which is widely quoted, appears to be at

variance with other findings and recommendations. On the balance of available evidence 100% carbon monoxide from a bottled source appears to be a humane method for euthanasia of mink.

Killing of foxes:

In Ireland, foxes raised for fur are killed exclusively by electrocution, in accordance with national legislation, namely the European Communities (Welfare of Farmed Animals) Regulations, 2008. A one-step method is used which employs an electrical apparatus connected to a standard battery. Foxes are caught and removed from their cages using a neck tongs. They are restrained with the device whilst two electrodes are applied, one to the mouth and the other into the rectum. A current of greater than 0.3 amps is applied across the electrodes for more than 3 seconds to achieve electrocution (DAFF, 2007). The EU Working Party Report on Recommendations for Euthanasia of Experimental Animals (1997) indicates that killing by electrocution is acceptable only if electrodes are applied simultaneously to the animal's head and back so that the current is directed through the brain to produce unconsciousness before cardiac fibrillation. Head to tail stunning is not acceptable, as it does not cause immediate unconsciousness. Likewise the American Veterinary Medical Association Guidelines on Euthanasia (2007) conclude that techniques which apply electrical current from head to tail are unacceptable and recommends that electrocution is not used as a method of euthanasia as its disadvantages far outweigh any advantages, in particular because of the difficulty in ensuring loss of consciousness prior to cardiac fibrillation. However, the DAFF review of Operational Procedures for Killing of Fur Animals, 2007 reported that unconsciousness was instantaneous using this method with death determined to be immediate thereafter.

The rapidity of this method is an obvious advantage, especially as the prolonged restraint associated with alternative methods is not required, thereby reducing stress to the animal. However, the potential for cardiac fibrillation is a significant disadvantage and alternative methods should be considered.

Permitted methods not currently used:

5.1 Injection of an overdose of a drug with anaesthetic properties:

Barbiturate overdose is recognised as an acceptable procedure for killing almost all animals. The American Veterinary Medical Association Guidelines on Euthanasia (2007) conclude that intraperitoneal injection of barbiturate is acceptable for killing fur animals provided death is confirmed. The EU Working Party Report on Recommendations for Euthanasia

of Experimental Animals (1997) also concludes that overdose of barbiturate is an acceptable method of killing carnivores but recommends that intravenous injection is used wherever possible, as it is rapid and effective. Intravenous injection of mink is unlikely to be practical and although intraperitoneal injection with return of animals to their home cage, could be used it would not fulfil the legal requirement for the use of 'doses and applications, which cause immediate loss of consciousness'. Furthermore there is a legal requirement for such an injection to be administered by a veterinary surgeon, which is likely to be impractical when used for killing mink. Intravenous injection of barbiturate has been used for killing foxes raised for fur in the UK and, as small numbers are involved, may be a practical and humane method in the Irish situation.

5.2 The use of Mechanically operated instruments that penetrate the brain:

Although these methods have not been used to any great extent for killing fur animals in Ireland or elsewhere they appear to be both practical and humane.

Note:

The EU Scientific Committee on Animal Health and Animal Welfare's Report on The Welfare of Animals Kept for Fur Production (2001) refers to the use of 'snap traps' which crush the base of the skull and neck and are potentially quick and effective for killing mink without pelt damage but this particular method is not currently permitted under the legislation.

Recommendations

6.1 **Procedures:**

- Every effort should be made to minimise any pain, suffering or distress experienced by animals at the time of killing. Noise should be kept to a minimum and animals should be handled as gently as possible. All equipment and dead animals should be removed quickly and expeditiously from the caging area.

6.2 **Methods:**

- The use of carbon dioxide for killing mink is not acceptable and should not be permitted, although it is permitted under EU and National legislation.
- The use of carbon monoxide, from exhaust gasses, for killing mink is not acceptable and should not be permitted, although it is permitted under EU and National legislation.
- On the evidence available, carbon monoxide from a bottled source appears to be the method of choice for killing mink and we recommend that this method be employed.

- Animals should be introduced individually into the killing chamber allowing sufficient time for unconsciousness / death to be achieved prior to introduction of the next animal.
- Carbon monoxide levels should be maintained at levels in excess of 10,000 p.p.m. At all times.
- Regular monitoring and recording must guarantee that CO gas levels are maintained at 10,000 PPM, during the slaughter process.
- Calibration of the equipment should be carried out according to the manufacturer's instructions, and these details should be recorded in written Standard Operating Procedures (SOPs).
- Although electrocution with cardiac arrest is permitted under EU and National legislation, and field evidence indicates that it is an acceptable method, international recommendations suggest that intravenous injection of barbiturate is the method of choice for killing foxes. This should be performed by a veterinary surgeon.
- There should be a requirement for each animal to be checked by a trained person to confirm that death has occurred.

6.3 **Training:**

- A requirement for formal training of all those involved in on-farm killing of fur animals should be introduced. Such training should be documented and subject to inspection by the competent authority.
- There should be a requirement for written SOP's for all equipment used in killing of fur animals and such equipment, and its operation should be subject to inspection by the competent authority.
- There should be a requirement for a written SOP, giving details of the monitoring and recording frequency of CO gas levels.

6.4 **Inspection:**

- On-farm killing of fur animals should be subject to unannounced inspection by the competent authority.
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