

**CONSULTATION ON OPTIONS FOR THE TRANSPOSITION OF
EUROPEAN DIRECTIVE 2010/63/EU
ON THE PROTECTION OF ANIMALS USED FOR SCIENTIFIC PURPOSES**

APPENDIX I

**COMPARISON OF ANNEX IV AND SCHEDULE 1
OF THE ANIMALS (SCIENTIFIC PROCEDURES) ACT 1986**

COMPARISON OF ANNEX IV (AIV) AND SCHEDULE 1 (S1)

Confirmatory methods:

The methods by which the killing of animals must be completed specified in S1 are replicated in AIV.

Methods of killing animals

Fish

Method	S1	AIV	Differences	Comments
Anaesthetic Overdose	Y	Y	AIV mandates prior sedation where appropriate	Option for sedation increases flexibility.
Concussion/ percussive blow to the head	Y	Y	Destruction of brain before return of consciousness mandated by S1 but not AIV	Unlikely to be an issue so long as emphasis on requirement for completing killing by a method causing destruction of the brain specified in guidance
Electrical Stunning (specialised equipment)	N	Y		Currently used slaughter method for fish for human consumption. Likely to be impractical (lack of equipment) & safety issues with use unless moved to slaughter facility.

Amphibians

Method	S1	AIV	Differences	Comments
Anaesthetic Overdose	Y	Y	AIV mandates prior sedation where appropriate	Option for sedation increases flexibility.
Concussion/ percussive blow to the head	Y	Y	Weight limit of 1kg and requirement for destruction of brain before return to consciousness in S1. No such restrictions in AIV	Unlikely to be an issue so long as emphasis in guidance on requirement for completing killing by a method causing destruction of the brain
Electrical Stunning (specialised equipment)	N	Y		Practically, unlikely that specialist equipment will be available

Reptiles

Method	S1	AIV	Differences	Comments
Anaesthetic Overdose	Y	Y	AIV mandates prior sedation where appropriate	Option for sedation increases flexibility.
Captive Bolt	N	Y	Proposed for large reptiles only.	“Large” not defined. Accepted by other regulators (e.g. CCAC). Likely to be humane, based on other species, but no papers to support this
Concussion/ percussive blow to the head	Y	Y	Weight limit of 1kg and requirement for destruction of brain before return to consciousness in S1. No such restrictions in AIV	Possible implications for welfare if performed in large reptiles if skull very thick? Emphasis needed in guidance on requirement for completing killing by a method causing destruction of the brain. Practically probably not an issue in UK
Shooting with free bullet	N	Y	Proposed in field conditions only	Unlikely to ever be an issue in UK

COMPARISON OF ANNEX IV (AIV) AND SCHEDULE 1 (S1)

Birds

Method	S1	AIV	Differences	Comments
Anaesthetic Overdose	Y	Y	AIV mandates prior sedation where appropriate	Option for sedation increases flexibility.
Carbon dioxide	Y	Y	Weight limit of 1.5kg and requirement for rising concentration in S1. No such restrictions in AIV	Method is unsuitable for use in diving birds – guidance would be required to this effect.
Cervical Dislocation	Y	Y	Weight limit of 3kg in S1. AIV only up to 1kg, with sedation over 250g.	Sedation may increase handling stress. Poultry users may be affected by reduction in weight limit. Standard method of killing “in the field” without sedation for many types of bird. Should sedation should be optional so that it is used where this is in the welfare interests of the animal?
Concussion/ percussive blow to the head	Y	Y	Weight of 250g in S1. No weight limit proposed in AIV.	Could cause welfare issues if applied to large birds
Decapitation	N	Y	Proposed for birds up to 250g.	Method applied correctly is likely to be humane in adults, neonates and foetuses. Where the latter, these are assumed to have no consciousness until shortly before hatching.
Electrical Stunning (specialised equipment)	N	Y		Used as stun for slaughter commercially. As with fish and amphibia, unlikely that many will have access to the correct equipment unless animals are transported to specialist slaughter facility
Inert Gases (Ar, N2)	N	Y		Inert gas mixtures well researched in poultry. Appropriateness of method can not be extrapolated between species because of species differences. Delivery method, rate and percentages important

Rodents

Method	S1	AIV	Differences	Comments
Anaesthetic Overdose	Y	Y	AIV mandates prior sedation where appropriate	Option for sedation increases flexibility.
Carbon dioxide (rising concentration/gradual fill)	Y	Y	Weight limit of 1.5kg in S1. No weight limit imposed but use not permitted in foetal or neonatal animals in AIV.	Use acceptable with these safeguards, but “neonatal” will require definition in guidance (evidence that >7 days old should be minimum is available) ¹ . Absence of weight limit in AIV allows extension of method into guinea pigs. Method of application required for humane killing for guinea pigs may not be the same as for rats and mice
Cervical Dislocation	Y	Y	Weight limit of 500g in S1. AIV up to 1kg with sedation over 150g.	Evidence that CD is rapid and humane method ^{2 3} (performed correctly) and therefore requirement for sedation may be harmful by inducing additional handling stress. Should use of sedation be optional so that it is used where this is in the welfare interests of the animal?
Concussion/ percussive blow to the head	Y	Y	None	
Decapitation	N	Y	Proposed if other methods are not possible.	Clear guidance on what “not possible” means would be needed. Sufficient evidence probably available that method is humane in adults and foetuses, but little evidentiary support for use in neonates, where resistance to anoxia could be a factor. Probably OK
Inert Gases (Ar, N2)	N	Y	Proposed without limitation.	Concerns have been expressed that there is currently insufficient evidence of humaneness for this method ⁴ . Should it require specific justification?

¹ Refs within ACLAM Task Force on Euthanasia paper (2005)

² Cartner, Barlow and Ness (2007) Comparative Medicine.

³ Iwarsson and Reh binder (1993) Scan J Lab An Sci

⁴ Newcastle consensus meeting on CO2 Euthanasia 2006

COMPARISON OF ANNEX IV (AIV) AND SCHEDULE 1 (S1)

Rabbits

Method	S1	AIV	Differences	Comments
Anaesthetic Overdose	Y	Y	AIV mandates prior sedation where appropriate	Option for sedation increases flexibility.
Captive Bolt	N	Y		Used in commercial killing in some countries and accepted by other regulators (e.g. ANZCCART). Likely to be humane, but unknown what public reaction to method would be
Carbon dioxide	Y	N		Appears may be more aversive in rabbits than in rodents due to delay in loss of consciousness, but unclear how conclusive actual evidence is. Removal probably not issue for experimental animals but might be for breeders for excess stock
Cervical Dislocation	Y	Y	S1 and AIV both allow use up to 1kg. Requirement for sedation for animals over 150g in AIV.	As with birds, basis for requirement for sedation at this weight unknown. Probably more justifiable for rabbits than rodents and birds. Should use of sedation should be optional so that it is used where this is in the welfare interests of the animal?
Concussion/ percussive blow to the head	Y	Y	S1 allows up to 1kg. AIV allows up to 5kg.	May require significant skill/ strength of operator
Decapitation	N	Y	Proposed if other methods are not possible.	Clear guidance on what “not possible” means would be needed. Sufficient evidence probably available that method is humane in adults and foetuses, but little evidentiary support for neonates, where resistance to anoxia could be a factor. Probably OK
Electrical Stunning (specialised equipment)	N	Y		Comments as for fish and birds. May be public perception issues

Dogs, cats, ferrets, foxes

Method	S1	AIV	Differences	Comments
Anaesthetic Overdose	Y	Y	AIV mandates prior sedation where appropriate	Option for sedation increases flexibility.
Concussion/ percussive blow to the head	N	Y	Proposed for neonates.	Likely to be humane, but public perception of use of this method in these species may be (very) poor. Need to define upper age limit of neonate for each of these species.
Electrical Stunning (specialised equipment)	N	Y		Public perception of electrical stunning of these species is likely to be poor
Shooting with free bullet	N	Y	Proposed only in field conditions where other methods not possible.	Poor perception by public likely, but the likelihood of use in UK would appear remote

Large Mammals

Method	S1	AIV	Differences	Comments
Anaesthetic Overdose	Y	Y	AIV mandates prior sedation where appropriate	Option for sedation increases flexibility.
Captive Bolt	Y	Y	S1 currently permits if registered vet or licensed slaughterman. No such restriction in AIV	Correct training required under other legislation, when animals are killed in a slaughterhouse. But possible issues when animals killed elsewhere if such training is not mandated under the legislation with suitability of training and/or public perception
Electrical Stunning (specialised equipment)	Y	Y		Standard slaughter stun technique for pigs and sheep – whether equipment is available will determine likelihood of use unless animals moved to slaughterhouse. See previous comments relating to the need for mandated training.
Inert Gases (Ar, N2)	N	Y		Proposed use in pigs mirrors slaughter practices and there is evidence method is appropriate. Practical difficulties mean unlikely to be used at many establishments
Shooting with free bullet	Y	Y	For field conditions only. S1 permits if registered vet, AIV states ‘experienced marksman’.	Would seem reasonable for animals such as deer. See previous comments relating to the need for mandated training

COMPARISON OF ANNEX IV (AIV) AND SCHEDULE 1 (S1)

Non-human primates

Method	S1	AIV	Differences	Comments
Anaesthetic Overdose	Y	Y	AIV mandates prior sedation where appropriate	Option for sedation increases flexibility.

Methods for foetal, larval and embryonic forms

Methods appropriate for foetal, embryonic and larval forms are not specified separately within AIV. This means that appropriate killing methods for these developmental stages may not be available in the methods of AIV, as methods for killing free-living forms are not always suitable for earlier developmental stages.

S1 method	Animals	Comments
Anaesthetic Overdose	All animals covered by AIV	Covered by AIV
Refrigeration, disruption of membranes or maceration in approved apparatus	Birds & reptiles	Not covered by AIV. Options from S1 would need to be retained
Carbon dioxide (near 100% concentration)	Reptiles	Not covered by AIV. Options from S1 would need to be retained
	Birds	Covered by AIV wording (as how fill is applied is not specified)
Cooling followed by immersion in cold tissue fixative	Mice, rats & rabbits	Not covered by AIV. Would need some form of authorisation after animals become protected. Method, so long as applied correctly (essential that proper cooling is performed initially), is probably humane and it is likely that users would want it retained or extended to other species.
Decapitation	Mammals & birds up to 50g	Covered by AIV