

IACUC Approved Animal Euthanasia Methods for the University of Arizona

All methods used must be in compliance with the *AVMA Guidelines on Euthanasia*, 2007 ed. (http://www.avma.org/issues/animal_welfare/euthanasia.pdf).

Amphibians and Fish

Method	Dosage	Comments
Benzocaine hydrochloride	400 mg/liter bath	
Pentobarbital sodium	60-100 mg/kg IV, IP, IPP	
Tricaine methane sulfonate (MS222)	3gm/liter bath buffered with 2.1gm/liter sodium bicarbonate	

Birds

Method	Dosage	Comments
Carbon dioxide asphyxiation	≥70%	Cannot use dry ice, only compressed gas.
Cervical dislocation under anesthesia		Requires scientific justification. If needed without anesthesia, must have prior approval of the IACUC.
Decapitation under anesthesia		Requires scientific justification. If needed without anesthesia, must have prior approval of the IACUC. Must use plastic cones for restraint. Must ensure sharpness of blades before each use. Annual certification of guillotines required.
Isoflurane	Saturated cotton ball in closed container or face mask.	Must be used with proper ventilation (e.g., under a fume hood). Bird must only be exposed to vapors, not the liquid.
Pentobarbital sodium	0.2-1.0 ml/kg ICe	

Cats and Dogs

Method	Dosage	Comments
Euthanasia solutions (e.g., Beuthanasia®, Euthasol®, Fatal-Plus®, Sleepaway®, Socumb®, Somlethol®)	1 ml/4.5 kg IV	Needs to be rapidly administered.
Pentobarbital sodium	Cats: 200 mg/kg IV; Dogs: 150 mg/kg IV	Needs to be rapidly administered.
Potassium chloride under anesthesia	1-2 mmol/kg IV or IC	Must be administered in conjunction with prior general anesthesia. Must be administered rapidly.

Horses

Method	Dosage	Comments
Euthanasia solutions (e.g., Beuthanasia®, Euthasol®, Fatal-Plus®, Sleepaway®, Socumb®, Somlethol®)	10-15 ml/45 kg IV	Needs to be rapidly administered.
Penetrating captive bolt		
Pentobarbital sodium	86 mg/kg IV	Needs to be rapidly administered.

Nonhuman Primates

Method	Dosage	Comments
Pentobarbital sodium	100 mg/kg IV	Needs to be rapidly administered.

Rabbits

Method	Dosage	Comments
Carbon dioxide asphyxiation	≥70%	Cannot use dry ice, only compressed gas.
Isoflurane		Must be used with proper ventilation (e.g., under a fume hood). Rabbit must only be exposed to vapors, not the liquid.
Pentobarbital sodium	150 mg/kg IV	Needs to be rapidly administered.

Reptiles

Method	Dosage	Comments
Carbon dioxide asphyxiation	≥70%	Cannot use dry ice, only compressed gas.
Isoflurane		Must be used with proper ventilation (e.g., under a fume hood). Reptiles must only be exposed to vapors, not the liquid.
Pentobarbital sodium	60-100 mg/kg IV, IP	Death may take up to 30 minutes.

Rodents (Mice, Rats, Gerbils, Hamsters, and Guinea Pigs)

Method	Dosage	Comments
Carbon dioxide asphyxiation	≥70%	Cannot use dry ice, only compressed gas.
Cervical dislocation under		Requires scientific justification.

anesthesia		If needed without anesthesia, must have prior approval of the IACUC. When used in rats, must be <200 g.
Decapitation under anesthesia		Requires scientific justification. If needed without anesthesia, must have prior approval of the IACUC. Must use plastic cones for restraint. Must ensure sharpness of blades before each use. Annual certification of guillotines required.
Isoflurane		Must be used with proper ventilation (e.g., under a fume hood). Rodent must only be exposed to vapors, not the liquid.
Pentobarbital sodium	150-200 mg/kg IP or IV	IC injections may be given if animal is unconscious or anesthetized.

Ruminants

Method	Dosage	Comments
Electrical stunning followed by exsanguination		Can only be used for animals intended for human consumption.
Nonpenetrating captive bolt followed by exsanguination		Can only be used for animals intended for human consumption.
Penetrating captive bolt		Cannot be used for animals intended for human consumption.
Pentobarbital sodium	86 mg/kg IV	Needs to be rapidly administered. Cannot be administered to animals intended for human or animal consumption.
Potassium chloride under anesthesia	1-2 mmol/kg IV or IC	Must be administered in conjunction with prior general anesthesia. Must be administered rapidly.

Swine

Method	Dosage	Comments
Carbon dioxide asphyxiation	≥70%	Piglets only. Cannot use dry ice, only compressed gas.
Electrical stunning followed by exsanguination		Can only be used for animals intended for human consumption.
Nonpenetrating captive bolt		Can only be used for animals

followed by exsanguination		intended for human consumption.
Penetrating captive bolt		Cannot be used for animals intended for human consumption.
Pentobarbital sodium	86 mg/kg IV	Needs to be rapidly administered. Cannot be administered to animals intended for human or animal consumption.
Potassium chloride under anesthesia	1-2 mmol/kg IV or IC	Must be administered in conjunction with prior general anesthesia. Must be administered rapidly.

Wildlife, Free-Ranging

Method	Dosage	Comments
Gunshot		Firearm and ammunition must be appropriate to the species. Personnel should be skilled and experienced.
Isoflurane		Animals must only be exposed to vapors, not the liquid.
Kill Traps		Cannot be used unless other methods listed are impossible and must be justified in the protocol. Trap must be certified by the International Organization for Standardization (ISO). Traps must be checked at least once daily.
Pentobarbital sodium	Match with closest species above (e.g., ruminant, rodent, etc.)	Needs to be rapidly administered. Cannot be administered to animals intended for human or animal consumption.
Potassium chloride under anesthesia	1-2 mmol/kg IV or IC	Must be administered in conjunction with prior general anesthesia. Must be administered rapidly.

Abbreviations

IC	intracardiac
ICe	intracoelomic
IP	intraperitoneally
IPP	intrapleuroperitoneally
IV	intravenously