Policy on Euthanasia of Animals Used in Science

Experimental animals are euthanized when study endpoints have been met and disposition has been approved by the University Animal Care Committee (UACC) in the approved Animal Use Protocol (AUP).

Whenever an animal is euthanized, it must be done with the upmost respect and in a way that ensures death is as painless and free of distress as possible. The definition of euthanasia is *a gentle death*, and in the context of animals used in science, it refers to doing what is humanly possible to minimize pain and distress, given the circumstances under which euthanasia is performed. The most important criteria for acceptance of a method of euthanasia is that it has a rapid initial depressive action on the central nervous system to ensure immediate insensitivity to pain, and that steps are taken to minimise distress. In short, euthanasia should result in rapid loss of consciousness, followed by respiratory and cardiac arrest and ultimate loss of all brain function.

Personnel responsible for euthanizing animals must be trained so that they execute the appropriate and approved method of euthanasia both effectively and humanely and demonstrated competency; are able to recognize signs of pain and distress in relevant species; and recognize and confirm unconsciousness, and death.

The UACC is responsible for the approval of the method of euthanasia for any study involving the use of animals. All Animal Use Protocols involving euthanasia must include a description of the methods to be used. The UACC will consider the method of euthanasia on a case-by-case basis according to its appropriateness in a given situation, taking the scientific literature and scientific goals of the research into account, and in consultation with the attending veterinarian, researcher and animal care staff as appropriate.

The recognised methods of euthanasia are listed as either *acceptable* or *conditionally acceptable* based on the *CCAC Guidelines on: euthanasia of animals used in science* (2010). The use of conditionally acceptable methods may be acceptable by the UACC in certain circumstances where there is scientific justification. Conditionally acceptable methods are listed as such, because there is a greater potential for operator error or safety hazards, they might not consistently produce humane death, or they are not well documented in the scientific literature.

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Table 1: Acceptable Methods of Euthanasia:

Classification and Common Name	Acceptable Methods
Class *Amphibia* (Amphibians)	
Frog, Toad	• Immersion or injection of buffered tricaine methane sulfonate (TMS; also known as MS222, tricaine) • Immersion or injection of benzocaine • SC injection of barbiturates into lymph sac • Overdose of inhalant anesthetics (for species that do not breath hold), followed by another method to ensure death
Class *Reptilia* (Reptiles)	
Turtle, Snake, Lizard	• IV or IP injection of barbiturates • Penetrating captive bolt (for larger species)
Class *Osteichthyes* (Bony Fishes) **Class *Chondrichthyes* (Cartilaginous Fishes)**	
Fish	• See also CCAC guidelines on: the care and use of fish in research, teaching and testing • Immersion or injection of buffered tricaine methane sulfonate (TMS; also known as MS222, tricaine) • Benzocaine • Clove oil • Maceration (for fish less than 2cm in length)
Class *Aves* (Birds)	
Chicken, Pigeon, etc.	• IV or IP injection of barbiturates with local anesthetic • Overdose of inhalant anesthetics (for species that do not breath hold), followed by another method(s) to ensure death
Class *Mammalia* (Mammals)	
Order *Rodentia* Mouse, Rat, Hamster, Gerbil, Guinea Pig	• IP/IV injection of barbiturate or anesthetic overdose • Overdose of inhalant anesthetics (for species that do not breath hold), followed by a secondary method to ensure death
Order *Lagomorpha* Rabbit	• IV injection of barbiturates • Overdose of inhalant anesthetics, followed by another method(s) to ensure death
Order *Carnivora* Dog	• IV injection of barbiturates • Overdose of inhalant anesthetics, followed by another method(s) to ensure death
Order *Artiodactyla (Hoofed animals)* Swine	• IV injection of barbiturates • Overdose of inhalant anesthetics, followed by another method(s) to ensure death
Order *Primates (Non-human primates)* Monkeys	• IV injection of barbiturates • Overdose of inhalant anesthetics, followed by another method(s) to ensure death

Table 2: Conditionally Acceptable Methods of Euthanasia

Species	Conditionally Acceptable Methods of Euthanasia
Fish	• Concussion (emergency killing for other species)
Birds	• CO2 • Cervical dislocation without prior sedation • Decapitation without prior sedation • Thoracic compression (in suitably sized birds)
Rodents	• Cervical dislocation without prior sedation • Decapitation without prior sedation • CO2 asphyxiation
Rabbits	• Cervical dislocation without prior sedation

Reference:

CCAC Guidelines on: euthanasia of animals used in science.
http://www.ccac.ca/Documents/Standards/Guidelines/Euthanasia.pdf