



## EUTHANASIA OF RODENT FETUSES AND NEONATES

### Overview/Purpose

The Report of the AVMA Panel on Euthanasia provides limited recommendations for the euthanasia of prenatal or neonatal animals. It is unnecessary to remove fetuses for euthanasia after the dam is euthanized because hypoxia does not induce a fetal response (1). The items below are to ensure the **appropriate euthanasia of rodent fetuses or neonates when they are removed from the uterus for use in an approved Animal Use Protocol**. In all cases, the person performing the euthanasia must be trained in the appropriate procedures.

### Definitions

1. **Fetus** - an unborn offspring of a mammal
2. **Neonate** – a newly born mammal
  - a. **Altricial** - born in an undeveloped state and requiring care and feeding by the parents. e.g. mice, rats, and hamster pups.
  - b. **Precocial** - born in an advanced state and able to feed itself almost immediately. e.g. guinea pig pups.
3. **Gestation** – period of development in animals, from the time of fertilization of the oocyte to birth

### Requirements

1. **Fetuses:** At approximately 60 percent of the gestation period, the neural tube has developed into a functional brain and the likelihood that a fetus may perceive pain should be considered (2, 3). Reflexive behavior in response to painful stimuli has been observed in fetuses and correlates with adult behaviors (<http://oacu.od.nih.gov/GdeMammNeuro.pdf>).
  - a. **Mouse, Rat and Hamster Fetuses up to 15 days and Guinea Pig Fetuses up to 35 days of gestation** - Neural development at this stage is minimal and pain perception is considered unlikely (4,5). Euthanasia of the mother or removal of the fetus should ensure rapid death of the fetus due to loss of blood supply (6).
  - b. **Mouse, Rat and Hamster Fetuses 15 days of gestation to birth and Guinea Pig Fetuses 35 days of gestation to birth** - The neural development at this stage supports the likelihood that pain may be perceived (3, 4, 5). Chemical anesthetics, decapitation with surgical scissors or cervical dislocation are acceptable physical methods of euthanasia. Fetuses and altricial neonates <5 days of age may be quickly killed by rapidly freezing in liquid N<sub>2</sub> (1).
2. **Neonates** - Maturation of nociceptors and the development of excitatory and inhibitory receptor systems occur during the period just prior to birth and into the second week of postnatal life (8-11). Resistance to hypoxia at this age results in a prolonged time to unconsciousness when CO<sub>2</sub> is used as a euthanasia agent.
  - a. **Mouse, Rat and Hamster Neonates up to 10 days of age** - Acceptable methods for euthanasia include: injection of chemical anesthetics (e.g., pentobarbital), decapitation, or cervical dislocation. Additionally, these animals are sensitive to inhalant anesthetics although

prolonged exposure may be necessary. Immersion in liquid nitrogen may be used only if preceded by anesthesia. Similarly, anesthesia should precede immersion or perfusion with chemical fixatives. Anesthesia may be induced by inhalant or injectable anesthetics. Death of fetuses (if removed from the uterus) and neonates must be confirmed after euthanasia and prior to disposal as for adult rodents.

- b. **Guinea Pig Neonates** - Follow guidelines for adults.
- c. **Mouse, Rat and Hamster Neonates over 10 days of age** - Follow guidelines for adults.

### Applicable Regulations

1. Animal Welfare Act (AWA, Public Law 89-544, 7 U.S.C.)
2. Animal Welfare Act Regulations (AWAR, 9 CFR, Chapter 1, Subchapter A)
3. Health Research Extension Act of 1985 and Public Health Service (PHS) Policy on Humane Care and Use of Laboratory Animals
4. National Research Council *Guide for the Care and Use of Laboratory Animals*, Eighth Edition. National Academy of Sciences, 2011
5. AVMA Guidelines for the Euthanasia of Animals, 2013

### Additional Information/Guidance

1. AVMA Guidelines on Euthanasia, 2013
2. Guidelines for the Euthanasia of Rodent Fetuses and Neonates, ARAC Guideline approved 04/10/13 [http://oacu.od.nih.gov/ARAC/documents/Rodent\\_Euthanasia\\_Pup.pdf](http://oacu.od.nih.gov/ARAC/documents/Rodent_Euthanasia_Pup.pdf)
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## History of Revisions

**046-00** - new policy approved 05/17/13

**046-01** - Policy revisions reflect formatting in the new template, approved 06/17/16