

# IACUC Policy on the Housing of Aquatic Species

## Purpose

Animal Resource Facilities (ARF) provides housing and husbandry for animals used in research and teaching at the University. Some species, such as aquatic animals, may need to be housed outside of the ARF facility to best accommodate the needs of the research and to provide optimal care for the animals. Maintaining fish outside of ARF requires Institutional Animal Care and Use Committee (IACUC) approval PRIOR to housing fish in this manner. The purpose of this policy is to provide guidance on what criteria is required to house fish at the University. This policy is based on the recommendations and requirements of the 2011 Guide for the Care and Use of Laboratory Animals.

## USC Aquatic Animal Housing Guidelines

1. Water Quality
  - a. Water quality parameters and life support systems for aquatic animals will vary with the species, life stage, total biomass supported and the animals' intended use.
  - b. Characteristics that may affect the appropriateness of water quality include temperature, pH, alkalinity, nitrogen waste products, phosphorus, chlorine/bromine, oxidation-reduction potential, conductivity/salinity, hardness, dissolved oxygen, total gas pressure, ion and metal content, and the established microbial ecology of the tank.
  - c. Appropriate water quality characteristics should be recorded daily. Records should be available at the housing site for IACUC inspection at all times.
2. Life Support System
  - a. Life support system refers to the physical structure used to contain the water and the animals as well as the ancillary equipment used to move and/or treat the water.
  - b. The type of life support system should be appropriate for the intended use. Its selection and/or design should be based on the natural habitat of the species, age/size of the species, number of animals maintained, availability and characteristics of the water required and the type of research.
3. Temperature, Humidity, and Ventilation
  - a. Most aquatic animals are poikilothermic and depend on the temperature of their environment to sustain physiologic processes.
  - b. Temperature should be controlled at the appropriate level and monitored regularly. If the temperature falls outside the appropriate range, a system should be in place such that the person responsible for the animals and/or ARF is notified immediately.
  - c. The volume of water contained in a room can affect room temperature, temperature stability, and relative humidity. Air handling systems must be adequate to compensate for these thermal and moisture loads.
4. Illumination
  - a. Aquatic species are often sensitive to changes in photoperiod, light intensity, and wavelength.
  - b. Lighting should be appropriate to support normal physiological function.
5. Noise and Vibration
  - a. Aquatic species may be sensitive to noise and vibration which is transmitted through the water
  - b. Effects of noise and vibration may be present but subclinical.
  - c. If noise and vibration are evident the system must be placed on isolation pads (or otherwise modified) or moved to another location.
6. Housing must:
  - a. Allow for the normal physiological and behavioral needs of the animals, including excretory function, control and maintenance of body temperature, normal movement and postural adjustments, and, where applicable,

reproduction. In some poikilothermic reptiles and amphibians, microenvironmental temperature gradients may be needed for certain physiologic functions such as feeding and digestion.

- b. Allow conspecific social interactions (i.e., schooling in fish species).
  - c. Provide a balanced, stable environment that supports the animals' needs.
  - d. Provide the appropriate water quality and characteristics, and permit monitoring, filling, refilling and changing of water.
  - e. Allow access to adequate food and allow removal of food waste.
  - f. Restrict escape or accidental entrapment of animals or their appendages.
  - g. Be free of sharp edges and/or projections that could cause injury.
  - h. Allow for observation of the animals with minimal disturbance.
  - i. Be constructed of nontoxic materials that do not leach toxicants or chemicals into the aquatic environment.
  - j. No present electrical hazards.
7. Space
- a. Space recommendations and housing density vary extensively with the species, age, and size of the animals, the life support system and the type of research.
  - b. The needs of each situation must be evaluated by the IACUC in consultation with the Principle Investigator to determine appropriate housing space. Advice from outside experts may be indicated.
8. Husbandry
- a. Food should be stored in a type-appropriate manner to preserve nutritional content, minimize contamination and prevent entry of pests.
  - b. The animal room should be regularly cleaned and disinfected.
  - c. Animals must receive daily care from qualified personnel who have sufficient understanding of the housing system to identify malfunctions and, if they are unable to address a system failure of such magnitude that it requires resolution before the next workday, access to staff who can respond to the problem.

### Implementation

1. Potential housing sites for aquatic species must be inspected and approved by the IACUC PRIOR to acquisition of animals. If the principle investigator obtains animals prior to IACUC approval, he/she may be required to transfer the animals to an appropriate location or euthanize them if appropriate housing is not available.
2. Exceptions to this policy are considered to be exceptions to the Guide and require a written scientific justification in the Animal Use Protocol. The exception request must provide adequate scientific justification for not following the Guide and will be reported, as required, to accreditation and regulatory agencies.

# IACUC Policy on Euthanasia by Cervical Dislocation or Decapitation

## Background

The IACUC is specifically charged with reviewing the methods of euthanasia for each research protocol to assure compliance with the recommendations contained in the AVMA Guidelines on Euthanasia. Since physical methods of euthanasia require the most skill to perform and are most likely to be affected by human error, the AVMA recommends that such methods are used only when alternative methods are not appropriate. The IACUC requires anesthesia prior to decapitation or cervical dislocation unless there is an approved justification in the IACUC protocol. Physical euthanasia without anesthesia will be considered by the IACUC on a case by case basis.

## Policy

The IACUC reviews all protocols using physical techniques to assure that personnel performing the procedures are appropriately trained. The primary responsibility for establishing and monitoring this training lies with the investigator. Before using physical methods, inexperienced persons should be trained by experienced persons by an IACUC-approved trainer and should practice on carcasses or anesthetized animals to be euthanized until they are proficient in performing the method properly and humanely:

- 1) The trainer will demonstrate the decapitation procedure to one or more researchers, the attending veterinarian or his designee.
- 2) The researcher(s) will (each) practice the procedure on anesthetized or dead rodents until proficient. The trainer will be present for each of these practice decapitations.
- 3) The researcher will then perform a live decapitation under the supervision of the trainer. This will be repeated (including additional anesthetized/dead decapitations, at the discretion of the trainer) until the researcher demonstrates proficiency.
- 4) Proficiency will be determined by the trainer, and will be based upon one or more demonstrations that the researcher conducts the decapitation quickly and smoothly, without any overt signs of distress in the animal.
- 5) If animals are required for training, the Principal Investigator will request those animals on the relevant protocol or consult with Animal Resource Facilities about using animals from the Institutional Training Protocol.
- 6) Upon completion of training/demonstration of proficiency, the trainer will document the proficiency and provide it in writing to the IACUC. A copy of the document will be kept in the IACUC office.
- 7) Researchers who are approved to perform live decapitations must be listed on the appropriate IACUC protocol.

## Acceptable Use

Use of cervical dislocation to euthanize mice and rats with body weights <200g by trained personnel is appropriate (upon IACUC approval) if the investigator has considered other methods, and has determined that cervical dislocation without the use of other agents is the most appropriate method based the specific aims of the study. The IACUC requires anesthesia prior to cervical dislocation unless there is an approved justification in the IACUC protocol.

Decapitation can be used to euthanize rodents and small rabbits in research settings. It provides a means to recover tissues and body fluids that are chemically uncontaminated when performed without anesthesia. It also provides a means of obtaining anatomically undamaged brain tissue for study. Handling and restraint required to perform this technique may be distressful to animals. Distress is largely minimized in animals that are handled regularly and are accustomed to being picked up by the investigators.

Decapitation may be aesthetically displeasing to personnel performing or observing the technique. Guillotines that are designed to accomplish decapitation in adult rodents and small rabbits in a uniformly instantaneous manner are commercially available.

Guillotines are not commercially available for neonatal rodents, but sharp scissors can be used for this purpose. The IACUC requires anesthesia prior to decapitation unless there is an approved scientific justification in the IACUC protocol, such as published reports or documentation of interference of the results by anesthetics.