



Title: Euthanasia for Aquatic Species

SOP #	AV 40-106
Version #	1
Implementation Date	10/21/16
Next Review Date	10/21/19

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Standard Operating Procedure

1. Purpose

To establish minimum standards for euthanasia for aquatic species such as fish and frogs.

2. Scope

All units providing care for aquatic species must meet or exceed these minimum requirements for euthanasia based on the *Guide for the Care and Use of Laboratory Animals*, and the *AVMA Guidelines for the Euthanasia of Animals*.

Exemptions to these policies must be approved by the Institutional Animal Care and Use Committee (IACUC) and/or the Attending Veterinarian.

3. Responsibilities

The Attending Veterinarian (AV) is responsible for the health and well-being of all laboratory animals used at an institution. The AV must assure that euthanasia is carried out by trained personnel using acceptable techniques in accordance with applicable regulations and policies.

Personnel who perform euthanasia must have documented training, experience and competency with the techniques to be used.

4. Procedure

Agents and methods of euthanasia are available in the *AVMA Guidelines for the Euthanasia of Animals: 2013 Edition* (<https://www.avma.org/KB/Policies/Documents/euthanasia.pdf>) or subsequent revisions of that document. Euthanasia is the procedure of killing an animal rapidly, painlessly, and without distress.

Euthanasia must be carried out by trained personnel using acceptable techniques in accordance with applicable regulations, protocols, and policies. The method used should not interfere with postmortem evaluations. Proper euthanasia involves skilled personnel to help ensure that the technique is performed humanely and effectively and to minimize risk of injury to people. Personnel who perform euthanasia must have training and experience with the techniques to be used. The equipment and materials required to perform euthanasia should be readily



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available, and the Attending Veterinarian or a qualified animal scientist should ensure that all personnel performing euthanasia have demonstrated proficiency in the use of the techniques selected.

Euthanasia techniques should result in rapid unconsciousness followed by cardiac or respiratory arrest and the ultimate loss of brain function. In addition, the technique used should minimize any stress and anxiety experienced by the animal before unconsciousness. For this reason, anesthetic agents are generally acceptable, and animals of most species can be quickly and humanely euthanized with the appropriate injection of an overdose of a barbiturate. Certain other methods may be used for euthanasia of anesthetized animals because the major criterion (insensibility) has been fulfilled.

Agents that result in tissue residues cannot be used for euthanasia of animals intended for human or animal food unless those agents are approved by the FDA. The carcasses of aquatics euthanized by barbiturates may contain potentially harmful residues and should be disposed of in a manner that prevents them from being consumed by human beings or animals and/or entering the food chain.

2013 AVMA Guidelines for the Euthanasia of Animals:

Finfish:

Acceptable Methods	Conditional Methods *require IACUC approval*
Immersion in buffered benzocaine or benzocaine hydrochloride, isoflurane, sevoflurane, quinaldine sulfate, buffered tricaine methanesulfonate, 2-phenoxyethanol, injected pentobarbital, rapid chilling (appropriate zebrafish/research setting)	Eugenol, isoeugenol, clove oil, CO2 saturated water (aquarium-fish facilities/fisheries), decapitation/cervical transection/manually applied blunt force trauma followed by pithing, rapid chilling followed by adjunctive method (aquarium-fish facilities), maceration (research setting)

Amphibians:

Because it is often difficult to confirm that an amphibian or reptile is dead, the application of two or more euthanasia procedures is usually recommended. Consulting multiple references on reptile euthanasia is advised as a means of identifying methods that are most appropriate for a given species and set of circumstances. (AVMA, 2013)



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Acceptable Methods	Acceptable with Conditions
As appropriate by species – Injected barbiturates, dissociative agents and anesthetics as specified, topical buffered tricaine methanesulfonate or benzocaine hydrochloride	As appropriate by species – Inhaled anesthetics as specified, CO2, penetrating captive bolt or firearm, manually applying blunt force trauma to the head, rapid freezing for animals < 4 g

Verification of Death:

No matter what method of euthanasia is performed, personnel must ensure that death has occurred. Assurance of death may include ascertaining the absence of heartbeat and respiration, lack of corneal or other reflexes, and lack of physical movement. Personnel must be trained on how to assure death in animals.

Methods used to verify death in mammalian species, such as auscultation, ECG, Doppler ultrasound, or pulse oximetry, can be used for amphibians, but it is important to remember that amphibian hearts can beat even after brain death. Death should always be confirmed by physical intervention. (AVMA, 2013)

5. References

1. Institute of Laboratory Animal Resources: Guide for the Care and use of Laboratory Animals, National Academy Press, Eighth Edition (http://www.nap.edu/catalog.php?record_id=12910).
2. Animal Welfare Act and Animal Welfare Regulations. United States Department of Agriculture, 2013 (https://www.aphis.usda.gov/animal_welfare/downloads/Animal%20Care%20Blue%20Book%20-%202013%20-%20FINAL.pdf).
3. National Institutes of Health: Public Health Service Policy on Humane Care and Use of Laboratory Animals (<http://grants.nih.gov/grants/olaw/references/phspol.htm>).
4. The Federation of Animal Science Societies: Guide for the Care and Use of Agricultural Animals in Research and Teaching, 3rd Edition, 2010 (http://www.fass.org/docs/agguide3rd/Ag_Guide_3rd_ed.pdf).
5. AVMA Guidelines for the Euthanasia of Animals: 2013 Edition (<https://www.avma.org/KB/Policies/Documents/euthanasia.pdf>).



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6. Definitions

1. AV – Attending Veterinarian – responsible for the health and well-being of all laboratory animals used at the institution
2. AVMA – American Veterinary Medical Association – a not-for-profit organization for advancing the science and practice of veterinary medicine to improve animal and human health
3. SOP – Standard Operating Procedure – established or prescribed methods to be followed routinely for the performance of designated operations or in designated situations
4. IACUC – Institutional Animal Care and Use Committee – responsible for assessment and oversight of the institution’s animal care program components and facilities
5. Chair – Chairperson of the IACUC
6. PI – Principal Investigator – a Central Oregon Community College employee having the background and training in scientific and administrative oversight necessary to conduct and manage the proposed study
7. AUP – Animal Care and Use Protocol – protocol created by the principal investigator of the proposed research, testing, or educational study
8. Protocol – Animal Care and Use Protocol – protocol created by the principal investigator of the proposed research, testing, or educational study
9. COCC – Central Oregon Community College
10. Guide – the *Guide for the Care and use of Laboratory Animals*
11. AWA – Animal Welfare Act – requires that minimum standards of care and treatment be provided for certain animals bred for commercial sale, used in research, transported commercially, or exhibited to the public
12. PHS – Public Health Service – establishes guidelines for the proper care of animals to be used in research

Revision	Author	Revisions Made	Effective Date	Approval
1	Cindy Elston	<ul style="list-style-type: none"> • New SOP 	10/21/16	Cindy Elston (AV)
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