

IACUC Guideline 05: Environmental Enrichment

Purpose: The purpose of this guideline is to ensure that all animals housed at University of Wyoming facilities are provided with species-appropriate enrichment and opportunities to express species-specific behaviors. These practices are designed to meet or exceed regulatory requirements, with the overarching goal of enhancing animal well-being.

Background

The University of Wyoming's environmental enrichment (EE) guide is designed to provide appropriate housing, care, activities, and social interactions for research animals to promote their well-being without compromising personnel safety, animal health, or research goals. The IACUC considers this an essential component of routine animal care and to improve research outcomes, as stress can significantly affect results, leading to inconsistencies and the need for repeated experiments. Therefore, EE should be provided to all laboratory animals as the default, with exemptions allowed only through scientific justification (see below).

The Guide for the Care and Use of Laboratory Animals recommends the use of environmental enrichment to enhance the physical and psychological well-being of laboratory animals and to promote species-typical behavior. Public Health Service (PHS) Policy (II; IV, A,1) mandates that institutions comply with both the Animal Welfare Act Regulations (AWAR) and the Guide. Exemptions from EE and social housing in research and teaching protocols, as well as written operating procedures, require proper justification and approval by the IACUC protocols and written operating procedures require justification and approval by the IACUC.

Definitions

Social housing: Social housing is an important component of the environmental enrichment program for social species. However, not all animals of a social species are socially compatible, and this may result in chronic stress, injury or other adverse effects. Species compatible housing can more readily be established if animals to be grouped are raised together from a young age, of the same sex, and remain in a stable group. However, the husbandry practices of vendors are unknown, and animals are likely not maintained or shipped in compatible housing groups. Thus, UWY considers social housing to include compatible housing with conspecifics. However, in cases of social incompatibility described below, it is also considered to include singly housing animals in primary containment as long as there are conspecifics in the same secondary containment with which the animals can have visual, auditory, olfactory or tactile contact.

Environmental Enrichment. The Guide for the Care and Use of Laboratory Animals recommends the use of environmental enrichment to enhance the physical and psychological well-being and to promote species-typical behavior in ALL laboratory animals, typically through the use of species-specific manipulanda or other enrichment opportunity unless justified based on experimental requirements and approved by the IACUC or due to veterinary-related concerns about animal well-being.

Recommendations for appropriate enrichment are listed below for each species. The option lists are not all-inclusive. Research in animal enrichment is on-going and novel options other than, or in addition to, those listed in this policy may also be appropriate.

General Guide

All animals should be provided with at least one form of species-appropriate enrichment. This enrichment may take the form of social housing, visual barriers, manipulanda, foraging opportunities, or other biologically appropriate forms. Additional enrichment may be required based on species-specific needs.

Specie Specific

Rodents:

- Required – direct social housing and nesting material
- Examples of nesting material include Nestlets, brown shredded paper, paper towels, etc.
- Additional enrichment includes but is not limited to cage furniture, human contact, shelters, tubes, rings, lofts/platforms (may increase aggression in male mice), gnawing devices (polyurethane chewing blocks/bones, aspen blocks), running wheels, and radio/music (set to a low decibel level i.e. normal conversation can be conducted without raising your voice).

Rabbits:

- Social housing can be challenging for rabbits; therefore, animals kept in isolation require additional EE.
- Enrichment includes but is not limited to human contact, hay and other food treats, occupational devices (balls, rattles, other), gnawing materials (nylon chewing blocks/bones, aspen blocks), exercise opportunities outside primary cage (e.g. playpen access), and radio/music (set to a low decibel level i.e. normal conversation can be conducted without raising your voice).

Livestock species, deer, and horses:

- Required – The minimum standard is social housing.
- Additional enrichment includes but is not limited to pasture or large outdoor pens, human contact, food treats, occupational devices (scratching brushes, licks, pellet feeders, manipulanda), and radio/music (set to a low decibel level i.e. normal conversation can be conducted without raising your voice).

Pigs:

- Required – The minimum standard is social housing.
- Additional enrichment includes but is not limited to human contact, food treats, occupational devices (ropes, tassels, brushes, manipulanda, foraging devices), rooting materials (straw, hay, shavings or compost), mirror for individually housed animals, and radio/music (set to a low decibel level i.e. normal conversation can be conducted without raising your voice).

Frogs, mudpuppies, and fish:

- Required – direct social housing and shelter, hide, lily pad or plant (live or artificial).

- Additional enrichment includes but is not limited to aquarium substrate (sand, silt, marbles, gravel), Live feed (rotifers, paramecium, brine shrimp).

Wildlife:

- Required - Social housing (pair or group) if appropriate and additional enrichment option
- Additional enrichment options include but is not limited to: naturalistic housing (pasture, pond, etc.), barriers, hides, shelters, platforms, or retreat areas, substrate (sand, soil, boulders, marbles, gravel, hay, straw, shavings, etc.), occupational devices (brushes, manipulanda, foraging devices, licks), novel food and foraging opportunities (treats, browse, high fiber diets, and exercise opportunities inside or outside of normal housing).

Whenever possible, the housing, social accommodation and environmental enrichment for wildlife species or non-traditional experimental subjects should attempt to replicate the natural habitat and social groupings for that species. The enrichment options for similar domestic species listed above may be applicable for a wildlife equivalent.

Exemptions

Research requiring exceptions to this policy for enrichment must be justified in the Animal Use Protocol (AUP) and approved by the IACUC. Investigators with exemptions from the enrichment program must work with the respective animal facility manager to ensure that the cages are appropriately labeled.

The list below are cases that researchers DO NOT require an exemption:

Situation	Rationale for Single housing
Separation due to fighting	Prevent recurrence of fighting
Stud males	Prevent fighting
Single animal left after others used for studies; experimental attrition	Avoid stress associated with re-introduction into new group
Pregnant female	Allow acclimation and nest-building prior to delivery
Female with offspring	Allow undisturbed care of offspring for the first 5 days following birth
Immediate post-operative period	Allow undisturbed recovery for up to 7 days after surgery

Resources

1. Guide for the Care and use of Laboratory Animals (eighth edition) - pp36-28
<https://grants.nih.gov/grants/olaw/guide-for-the-care-and-use-of-laboratory-animals.pdf>.
2. Policy on Humane Care and Use of Laboratory Animals (Policy)- II;IV, A,1
<https://grants.nih.gov/grants/olaw/references/phspolicylabanimals.pdf>.
3. Animal Welfare Act Regulations (AWAR) - §3.8 and §3.81
https://www.uwyo.edu/research/_files/research_compliance/animal_care/_docs/ac-bluebook-awa-

508-comp-version.pdf

4. National Institutes of Health (NIH) Office of Animal Care and Use (OACU). (2023). Guidelines for General Species Environmental Enrichment

https://oacu.oir.nih.gov/system/files/media/file/2023-06/d4_general_species_environmental_enrichment.pdf

5. National Institutes of Health (NIH) Office of Animal Care and Use (OACU). (2023). Appendix 1: Environmental Enrichment for Rodents.

http://oacu.oir.nih.gov/system/files/media/file/2023-07/d4a_enviromental_enrichment_of_rodents.pdf

6. National Institutes of Health (NIH) Office of Animal Care and Use (OACU). (2024). Appendix 3: Environmental Enrichment for Aquatic Species

https://oacu.oir.nih.gov/system/files/media/file/2024-01/d4c_environmental_enrichment_of_aquatic_species.pdf

History of Revisions

Guideline 05 – new guideline approved – IACUC meeting 09/17/2020