

STANDARD OPERATING PROCEDURES
DIVISION OF COMPARATIVE MEDICINE
UNIVERSITY OF SOUTH FLORIDA

SOP#: 403.5

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TITLE:	Environmental Enrichment and Social Housing
SCOPE:	Personnel with Regular Animal Contact
RESPONSIBILITY:	Facility Manager, Technical Staff, Veterinary Staff
PURPOSE:	To Outline Circumstances, Forms, and Procedures of Providing Enrichment

I. PURPOSE

1. To ensure the highest quality of health among animals used for research and teaching purposes, and to ensure the consistency and integrity of research data.
2. **Group housing and interactions contribute to the well-being of social species.** Current regulations require facilities to develop a plan to address the social needs of the animals in their care (9 CFR, Subchapter A).
3. The purpose of this SOP is to describe the procedures for enriching the primary enclosure of rodents, and to ensure socially compatible species, strains, and/or lines are group housed whenever possible.

II. RESPONSIBILITY

1. The Veterinarians oversee all aspects of animal health, and are assisted by all program staff.
2. The Facility Managers **ensures clear and accurate communication** with the Principal Investigator and research staff, and uniform implementation of all procedures.
3. The animal care staff is responsible for the careful implementation of this procedure, for daily observations of animals under their care, and for prompt reporting of observations regarding the performance of this procedure.
4. Any environmental changes made must be communicated to and approved by the researcher prior to implementation.
5. Every effort should be made to provide singly-housed animals with visual, tactile, auditory, and/or olfactory contact with conspecifics.
6. When USDA-covered, socially compatible species are singly housed, an enrichment plan should be developed and reviewed by a member of the veterinary staff and included as part of the clinical record of the animal and/or study.

III. GENERAL PROCEDURES

1. Rodents
 - a. When in agreement with the objectives of the protocol, (A) the structural and social environments of rodents will be enhanced to encourage species-typical behavior, improve animal well-being, and prevent maladaptive behaviors, and (B) socially compatible species, strains, and/or lines will be group housed whenever possible.
 - b. **New research faculty and staff are advised during animal facility orientations that all rodent housing receives environmental enrichment, unless an exemption has been approved in writing by the IACUC, which includes group housing as the default standard housing for socially compatible species.**
 - c. **Aspects of protocols that may require an exemption** from this procedure at the discretion of the Principal Investigator and approved by the IACUC include, but are not limited to, studies involving nutrition, exercise, behavior, protruding catheters or cannulae or those involving certain strains. Proposed study-related exemptions to species-specific environmental enrichment must be described and justified in item 13.4.1 of the IACUC protocol and be for the shortest period of time necessary.
 - d. Single housing of animals for non-study-related reasons is acceptable if justified. Examples include: social incompatibility (e.g., female hamsters, adult male C57BL/6, male rabbits), as a result of attrition due to study endpoints, and/or if there are veterinary concerns regarding an animal's health or well-being. Such exemptions to social housing need not be described in item 13.4.1 as it reflects good animal care, but should be documented at the time of ungrouping on the cage card.
 - e. Mice that have been separated due to fighting are incompatible and should remain in single housing by removing only the mouse that seems to be the "aggressor", and leaving the compatible group intact.
 - f. All animals exempt from social housing should be provided extra enrichment. Where reasonable and appropriate (i.e., when not study related), and under the direction of a veterinarian, every effort should be made to reintroduce singly-housed animals to a social setting with a different group/pair. After three unsuccessful attempts at reintroduction, the animal can be considered incompatible. All attempts and outcomes should be documented. Exemptions to this policy may be made at the discretion of the veterinarian for well-established aggressors.
 - g. **To ensure that enrichment devices or materials do not** introduce a variable that may confound interpretation of protocol data, the use of **enrichment devices or materials will be uniform**, including use of a **uniform color** of device, and comprehensive in manner, and will **involve all animals of a study and/or colony**, unless instructed otherwise by the IACUC approved protocol and/or Principal Investigator and as documented on the contact sheet of the rodent housing room log book.
 - h. **Enrichment devices that are used** in the primary enclosures of **mice** include the Mouse Igloo from Bio-Serv, the Mouse Hut from Bio-Serv, and the Mouse House from Techniplast.

- i. **Enrichment devices that may be used** in the primary enclosures of **rats** include the Rodent Retreats from Bio-Serv, Rat Tunnels from Bio-Serv, and the Rodent Crawl Balls from Bio-Serv.
 - j. **Enrichment devices that may be used** in primary enclosures of **gerbils** include the Rodent Retreats from Bio-Serv, Rat/Mouse Tunnels from Bio-Serv and Rodent wood gnawing blocks from Bio-Serv. In addition, sand baths may be provided for gerbil enrichment.
 - k. **Enrichment devices that may be used** in primary enclosures of **guinea pigs** include the Rodent Retreats from Bio-Serv, Rat/Mouse Tunnels from Bio-Serv, Hide N' Seek Shelter from Bio-Serv, other similar perches/spaces for hiding, and Rodent wood gnawing blocks from Bio-Serv. In addition, play time in open spaces (e.g., 'kiddie pools' or fenced off areas on the floor) may be provided for guinea pig enrichment.
 - l. **Enrichment devices that may be used** in the primary enclosures of **spiny mice** include Mouse Igloos from Bio-Serv, Fat Rat huts from Bio-Serv, and Bio-huts from Bio-Serv. Spiny mice are very social and should be housed at least in pairs. Additionally, each cage should be provided a sanitizable bowl, Nyla bone, and at least one wood chew item.
 - m. **Enrichment materials** (e.g., nesting material) used uniformly in a majority of primary enclosures for a given protocol may vary among rodents held on behalf of that protocol as instructed by the Principal Investigator (e.g. mice undergoing imaging may not be given nesting material but are provided igloos or huts for enrichment), and as documented on the contact sheet of the rodent housing room log book.
 - n. Enrichment devices will be changed and **sanitized at least once every two weeks when cage change-outs occur.**
 - o. If a device's physical integrity is questioned, the use of that device will be discontinued immediately. **All devices are evaluated during change outs** to ensure that are free of sharp edges, defects, cracks, or other evidence of diminished integrity, and disposed of and replaced with a similar device if such evidence is found.
2. Rabbits
 - a. **Every single-housed rabbit not exempt due to IACUC approved animal study restrictions will be involved in the compatibility testing program** (SOP # 101: Compatibility Testing of Rabbits).
 - b. During compatibility testing additional enrichment items, including manipulada (such as rattles, shower curtain rings or bolts dangling from the top of cages, balls with hay for interactive enrichment, and stuffed animals) or novel treats may be provided to enhance interactions
 - c. All single-housed rabbits, whether due to IACUC-approved exemptions, social incompatibility, or for health/welfare reasons, will have an enrichment plan that is developed and reviewed by a member of the veterinary staff and included as part of the clinical record of the animal and/or study.
 - d. Forms of enrichment: manipulada, structures for hiding or perching, novel food treats, balls with hay, time spent in a 'play' area or complex environment, and/or increased interactions with caregivers.
 3. Ferrets
 - a. **Single housing of ferrets should be the exception** and must be justified and approved by the IACUC based on experimental requirements, or for veterinary-related concerns about animal well-being. Because of the close bonds that

ferrets form, whenever realistic and feasible, maintaining ferrets in trios, rather than pairs, should be considered. This can ameliorate some of the clinical and behavioral abnormalities that can be seen with the loss of a mate.

- b. All ferrets receive environmental enrichment, unless an exemption has been approved in writing by the IACUC.
 - c. All enrichment items should be able to be easily cleaned and sanitized.
 - d. All single-housed ferrets, whether due to IACUC-approved exemptions, social incompatibility, or for health/welfare reasons, will have an enrichment plan that is developed and reviewed by a member of the veterinary staff and included as part of the clinical record of the animal and/or study. Forms of enrichment: hammocks, tunnel systems (PVC, industrial tubing, or cylindrical boxes), manipulada, and/or caretaker interactions.
4. Livestock
- a. **Single housing of livestock should be the exception** and should be justified based on experimental requirements or veterinary-related concerns about animal well-being.
 - b. All livestock receive environmental enrichment, unless an exemption has been approved in writing by the IACUC.
 - c. All single-housed livestock, whether due to IACUC-approved exemptions, social incompatibility, or for health/welfare reasons, will have an enrichment plan that is developed and reviewed by a member of the veterinary staff and included as part of the clinical record of the animal and/or study.
 - d. Each animal will have a minimum of one enrichment device, either suspended inside the cage or on the floor inside the cage (e.g., flexi keys, rattle triangles, suspended plastic apples, Kong® toys on chain).
 - e. Animals that are singly-housed for prolonged period of time, should also have increased time interacting with human caregivers as part of their enrichment plan.

Approved:

Date: