



CM SOP #407 – Rodent Environmental Enrichment

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I. Purpose & Scope

The purpose of this Standard Operating Procedure (SOP) is to establish institutional standards for environmental enrichment and social housing for rodents housed within Comparative Medicine (CM) facilities at Florida Atlantic University (FAU).

Environmental enrichment and social housing are implemented to promote psychological well-being, support species-typical behaviors, and maintain animal welfare while remaining compatible with scientific objectives. These practices are implemented in accordance with institutional policies and applicable regulatory guidance.

Environmental enrichment and social housing are provided as the default housing condition for rodents unless a scientifically justified exception has been reviewed and approved by the Institutional Animal Care and Use Committee (IACUC).

This SOP applies to all mice and rats housed in CM-managed vivaria and applies to Comparative Medicine staff, veterinary personnel, and research personnel working with rodents within these facilities.

II. Roles & Responsibilities

Comparative Medicine Staff

- Providing environmental enrichment to rodents in accordance with this SOP.
- Maintaining social housing whenever compatible with animal welfare and research protocols.
- Monitoring animals during daily observations for signs of aggression, injury, or distress related to social housing or enrichment items.
- Ensuring enrichment items are present in cages unless an IACUC-approved exemption exists.
- Inspecting enrichment items during daily health observations and routine husbandry activities.
- Removing excessively soiled, damaged, or unsafe enrichment devices.
- Transferring appropriate nesting material during cage changes when compatible with research needs.
- Reporting animal injuries, abnormal behaviors, or enrichment-related concerns to veterinary staff.
- Documenting enrichment tasks on husbandry logs when required.

Research Staff, Students, Visitors

- Understanding that environmental enrichment and social housing are the institutional default housing condition for rodents.
- Identifying any scientific justification for enrichment or social housing exemptions within the IACUC protocol.



- Clearly labeling cages or animals when enrichment or social housing exemptions have been approved.
- Ensuring enrichment restrictions are implemented only as approved by the IACUC.
- Communicating study-specific enrichment requirements to CM and veterinary staff.
- Monitoring animals for enrichment-related behavioral changes that may impact study outcomes.

CM Assistant and Associate Directors

- Ensuring this SOP is implemented across CM facilities.
- Ensuring enrichment materials are available and appropriate for the species housed.
- Providing training to CM personnel regarding enrichment practices.
- Ensuring enrichment practices remain consistent with current animal welfare standards and regulatory guidance.
- Reviewing enrichment practices periodically to maintain compliance with institutional policies and accreditation expectations.

CM Director and AV

- Providing veterinary oversight of the environmental enrichment program.
- Approving enrichment materials used in rodent housing.
- Ensuring enrichment strategies support animal health and welfare while remaining compatible with research needs.
- Determining when animals must be separated for health, behavioral, or veterinary reasons.
- Reviewing enrichment- or social housing-related exemptions submitted to the IACUC.
- Modifying enrichment or social housing practices when required for veterinary care, animal welfare, or regulatory compliance.

III. General Notes & Definitions

- **Environmental Enrichment (EE)**
 - EE refers to modifications to the housing environment that allow animals to express species-typical behaviors and improve psychological well-being.
- **Default Enrichment**
 - Rodents housed in CM facilities will receive environmental enrichment unless a specific exemption has been approved by the IACUC.
- **IACUC Exemption**
 - In some studies, enrichment items may interfere with research objectives. Investigators may request exemptions through the IACUC protocol review process. Approved exemptions must be clearly documented and communicated to CM staff.
- **Performance Standards**
 - EE programs follow performance standards, meaning enrichment strategies may vary as long as animal welfare goals are achieved.
- **Social Housing**
 - Social housing is the default standard housing arrangement for rodents when compatible with study design and animal welfare. Social housing requirements are addressed separately in IACUC policies.



- **Compatible Social Housing**
Animals are considered compatible for group housing when they:
 - Do not display aggression toward cage mates
 - Maintain normal behavior and body condition
 - Do not exhibit persistent injury related to group housing
- **Separation**
Separation refers to removal of an animal from a social group when necessary for:
 - Veterinary treatment
 - Aggression or fighting
 - Study design requirements
 - Animal welfare concerns
 - AttritionSeparated animals should receive additional enrichment when compatible with the research protocol.
- **Acceptable Enrichment Characteristics**
Enrichment devices must:
 - Be non-toxic
 - Be free of sharp edges
 - Withstand sanitization processes
 - Not interfere with access to food or water
 - Not significantly reduce usable cage space
 - Be compatible with cage washing procedures
- Reusable enrichment items must tolerate cage washer temperatures and sanitation processes used within CM facilities.
- For animals that have undergone surgery, are pregnant, or are otherwise medically compromised, enrichment devices may be modified or temporarily removed based on veterinary guidance.

IV. Materials & Equipment

Disposable Enrichment Items

- Paper nesting material (e.g., Nestlets)
- Paper huts or cardboard tubes
- Cotton or paper nesting material
- Wood gnawing sticks
- Wooden chew blocks
- Paper twists
- Paper cups or dishes used for dietary supplementation

Reusable Enrichment Items

- Polycarbonate huts or shelters
- Plastic igloos
- Polycarbonate tunnels
- Plastic running wheels (rats when appropriate)
- PVC tunnels
- Polyurethane or nylon chew devices
- Polycarbonate rest stops

Feed-Based Enrichment (when approved)

- Fresh produce
- Seeds or grain-based enrichment items



Note: Food enrichment items must be approved by veterinary staff and investigators prior to use.

V. Procedure

A. General Enrichment Practices

Environmental enrichment will be provided to rodents housed in CM vivaria unless a documented IACUC exemption exists.

1. Enrichment programs will:
 - a) Encourage species-typical behaviors such as nesting, gnawing, and exploration.
 - b) Minimize disruption to research protocols.
 - c) Maintain animal safety and cage sanitation standards.
2. Enrichment devices must not obstruct access to:
 - a) Food
 - b) Water
 - c) Ventilation
 - d) Animal observation
3. Enrichment items must not reduce the usable cage space below acceptable housing standards.
4. CM staff will evaluate enrichment items during routine husbandry and remove items that are excessively soiled or damaged.

B. Mouse Enrichment

Note: Nesting material supports thermoregulation and natural nest-building behavior and is considered core enrichment for mice.

Unless otherwise approved by the IACUC, each mouse cage will receive:

- Nesting material (e.g., Nestlet or equivalent)
- At least one additional enrichment item when compatible with cage density and research needs

Examples include:

- Paper huts
- Cardboard tubes
- Plastic shelters
- Chew blocks

During cage changes:

- A small portion of existing nesting material may be transferred to the clean cage to reduce stress and preserve familiar scent cues unless incompatible with research requirements.
- CM staff may reposition enrichment items during animal observation to ensure clear visualization of animals.
- Additional enrichment may be considered when abnormal behaviors such as barbering, excessive aggression, or stereotypic behaviors are observed.

B. Rat Enrichment

Unless otherwise approved by the IACUC, rat cages will receive enrichment such as:

- Paper twists or nesting material
- Shelters or tunnels
- Chew devices

Enrichment items may be rotated periodically to promote environmental novelty.

C. Food Enrichment (When Approved)



Food-based enrichment must be approved by veterinary staff and the investigator.

When produce is provided:

- Produce must be rinsed with potable water prior to use.
- Produce must be free of spoilage or contamination.
- Produce should be provided in small amounts to prevent cage contamination.
- Produce must be discarded if it becomes spoiled or excessively soiled.

D. Social Housing

Rodents must be housed in compatible pairs or groups whenever possible.

- Group housing should consider:
 - a) Species and strain characteristics
 - b) Age and sex
 - c) Behavioral compatibility
 - d) Research requirements
- Animals should be grouped early when possible to minimize aggression.

E. Single Housing

Single housing may occur when:

- Required by research protocols, such as studies involving:
 - a) Nutrition
 - b) Exercise
 - c) Behavior
 - d) Protruding catheters or cannulae
 - e) Others as described, scientifically justified, and approved by the IACUC
- Single housing of animals for non-study-related reasons is acceptable if justified. Such exemptions need not be described in the IACUC protocol, as it reflects good animal care, but should be documented at the time of ungrouping on the cage card. Examples include:
 - a) Social incompatibility (e.g., female hamsters, adult male C57BL/6, male rabbits)
 - b) As a result of attrition due to study endpoints
 - c) Veterinary concerns regarding an animal's health or well-being

Every effort should be made to provide singly-housed animals with visual, tactile, auditory, and/or olfactory contact with conspecifics. Animals housed singly should receive additional environmental enrichment when compatible with research objectives.

F. Enrichment Exemptions

If enrichment exemption has been approved by the IACUC:

- The exemption must be documented in the IACUC protocol.
- Cages or animals subject to exemption **must be clearly labeled**.
- CM staff will follow protocol-specific enrichment instructions.
- Exemption must be for the shortest period of time necessary

G. Monitoring

Animals housed in groups must be monitored for signs of incompatibility including:

- Fighting or aggression
- Bite wounds or injuries
- Barbering
- Persistent stress behaviors

If incompatibility is observed:

- Animals may be separated



- Veterinary staff should be notified
- Housing arrangements may be modified

Animals will be monitored during routine observations for:

- Aggression related to enrichment items
- Injury
- Excessive chewing or destruction of devices
- Obstruction of food or water access

If enrichment items appear to contribute to injury or fighting:

- The item may be removed.
- Veterinary staff should be notified.

VI. Health & Safety

- Enrichment devices must be inspected regularly to ensure they do not present hazards.
- If injuries occur related to enrichment devices:
 - The item must be removed immediately.
 - Veterinary staff must be notified.
- Personnel must follow facility PPE requirements when handling cages and enrichment items.

VII. References & Attachments

- *Guide for the Care and Use of Laboratory Animals*
- AAALAC International Position Statements and FAQ
- Office of Laboratory Animal Welfare Public Health Service Policy on Humane Care and Use of Laboratory Animals
- Approved Rodent Enrichment Device List

VIII. Revision History

Revision Date	Revision Number	Summary of Changes
08/31/2017	2	Added produce under rats
01/04/2020	3	Nesting material added as default EE for mice
01/06/2020	4	Clarification of processes re nesting material and produce
04/04/2021	5	Added storing and dating produce
04/04/2024	6	Minor revisions on what is given to mice vs rats
04/01/2026	7	Updated format, renamed to include 'Social Housing', added social & single housing sections, removed routine bleach washing of produce, clarified expectations for monitoring, sanitation, and cage change transfer, highlighted that provision of enrichment is the default standard

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