

SOP #: 113.02Title: SOP - Management of Mouse Breeding Colonies

Approvals:

Attending Veterinarian

Date:

IACUC Chair

Date:

---

**1. Purpose**

1.1 The purpose of this policy is to outline recommendations of the management of mouse breeding colonies in compliance with new rodent housing requirements set forth in the Guide for the Care and Use of Laboratory Animals, Eighth edition (Guide, NRC, 2011).

**2. Responsibility**

2.1 The procedure outlined in this policy is limited to use by authorized employees at FIU

**3. Definitions**

3.1 AAALAC – Association for Assessment and Accreditation of Laboratory Animal Care

3.2 FIU – Florida International University

3.3 Guide - Guide for the Care and Use of Laboratory Animals, Eighth edition (NRC, 2011).

3.4 OLAW - Office of Laboratory Animal Welfare

**4. Guidelines**

4.1 FIU's Assurance of Compliance with Public Health Service Policy and AAALAC accreditation standards require strict compliance with federal animal welfare regulations and the Guide.

4.2 Previous editions of the Guide have always specified the minimal amount of cage floor space required for each species based on size and/or weight. However, the eighth edition of the Guide (Chapter 3) now has specific floor space recommendations for breeding mice. According to the Guide, mice less than 10 grams (e.g., pre-weanlings) require 6 square inches each and dams with litters require 51 square inches.

- 4.3 Standard mouse cage at FIU has 75 square inches of floor space; strict adherence to this guidance would require separation of all females with litters into single cages and would preclude trio-breeding schemes housing two adult female mice with their litters.
- 4.4 Moreover, the Guide identifies examples of performance indices (page 55) to assess the adequacy of housing which include the animal(s) health, reproduction, growth, behavior, activity, and use of the space. Both the OLAW and the AAALAC have stated that mouse cages of the size commonly used in the United States may be appropriate for trio breeding groups. A mouse litter size can vary greatly depending on the age of the female or whether you are dealing with an inbred or outbred strain. The Guide requires that sufficient space be available for mothers and litters to allow pups to develop to weaning without detrimental effects for the mother or litter.
- 4.5 The IACUC acknowledges that this level of adherence to the Guide may not be in the best interests of researchers developing specialized genetically-modified animals and housing them in the OE Facilities. The AHC4-V facility is compliant to the Guide requirements due to special cages that are used for breeding. The aim of this policy, therefore, is to meet the intent of the Guide using performance based standards of animal care and use while keeping in mind the special needs of investigators maintaining transgenic mouse breeding colonies.
- 4.6 Breeding and Weaning Issues
- 4.6.1 A standard-sized filter-top mouse cage (75 square inch floor space) can house up to 5 adult mice.
- 4.6.2 Accepted breeding schemes at FIU include monogamous (one male, one female), and trio (one male, two females) mating.
- 4.6.2.1 Mouse trio breeding groups have been used successfully at the NIH and other institutions for several decades, especially for strains that are difficult to propagate. The use of continuous trio breeding groups can result in a higher breeding efficiency by permitting breeding at the first post-partum estrus and facilitating pup survival through cross fostering.
- 4.6.2.2 The Jackson Laboratory recommends mouse trio breeding groups, stating that "Most strains produce more progeny per cage if mated as trios because all adult cage mates generally help care for the young."
- 4.7 Policy Statements
- 4.7.1 Investigators who decide that trio breeding groups would be a beneficial breeding strategy for their research must accept responsibility for any overcrowding in their colony and follow the following guidelines:

- 4.7.2 Trio breeding groups are best suited for the propagation of inbred, transgenic, or other strains of mice which generate small numbers of pups or are difficult to breed. Outbred crosses, hybrid crosses, intra-specific crosses or any other crosses that produce larger litters are best propagated by monogamous breeding strategy.
- 4.7.2.1 For a "trio" mating scheme with one male and two females per cage, adult animals may remain in the home cage as long as the average litter size of the mouse line is 6 pups or fewer. Maximum allowed number for pups is 12 per cage.
- 4.7.2.2 Exceptions for lines with average litter size of more than six pups must be specifically justified with a reasoning based on the specific mouse line and health or wellbeing of the animals along with data showing that trio mating with large litter sizes is necessary.
- 4.7.2.3 When multiple litters of mice are present in one cage, the age difference between litters must be less than 6 days. If a subsequent litter is born at an interval greater than 6 days, the mother and litter (of the oldest pups) must be moved to a separate cage.
- 4.7.3 Investigators using trio breeding groups must be aware that they have increased responsibilities to ensure "the adequacy of cage space" for all animals. These increased responsibilities include the prompt weaning of mature pups at twenty-one (21) days and the prompt separation of animals if the cage density becomes greater than that established by this policy.
- 4.7.4 The Principal Investigators are responsible for adhering to this policy and must ensure that all research personnel responsible for colony maintenance are appropriately trained and experienced. Research personnel must provide sufficient monitoring of the animals to prevent overcrowding and deal with associated issues such as cannibalism, fighting, excessively soiled caging, etc.
- 4.7.5 If significant overcrowding is noted by OLAR staff or if a litter is more than 21 days old, an "overcrowding" card will be placed on the cage. Animals must be separated within 48 hours of the posting; failure to comply may result in additional charges to the researcher.
- 4.7.6 This policy would not apply to trio breeding performed in Lab Products breeding cages (double cages).

## 5. References

5.1 The Guide for the Care and Use of Laboratory Animals, 8th Ed. 2011 NRC, page 57

5.2 AAALAC interpretation of new Guide policies (<http://aaalac.org/about/guidelines.cfm>)

6. Revisions

6.1 Revision 02: 2016 IACUC Review. Addition of paragraph 4.7.6 – Lab products breeding cages.

---