

TTUHSC LARC POLICY 010

MOUSE BREEDING AND COLONY MANAGEMENT

Purpose: Ensure that TTUHSC rodent colonies adhere to current animal welfare regulations, IACUC, and LARC policy on the housing density of mice.

Responsibilities:

Principle Investigator:

1. Obtaining an approved IACUC protocol for breeding.
2. Maintaining accurate colony records including number of mice weaned and transferred into experimental protocols and/or used as replacement breeders.
3. Daily checking of cages for pregnancies and new births. Cages with visibly pregnant animals should be marked with a PINK "**Pregnant Dam**" card. Cages with new litters should be marked with PINK "**New Litter**" card (back of Pregnant Dam card).
4. All litters must be weaned by 21 days unless 28 days is approved on the IACUC protocol or a Veterinary consult has occurred.
5. When notified of an **OVERCROWDED** cage the PI has 48 hours (2 business days) to wean the cage. After 48 hours the LARC staff will wean the cage and the PI will be charged.
6. Failure to properly maintain a breeding colony is considered non-compliance by the IACUC and can result in suspension or loss of the approved IACUC protocol.

LARC Staff:

1. The LARC staff will perform daily health checks and mark cages with new litters appropriately.
2. LARC staff will place PURPLE "**Overcrowded**" cards when necessary and notify the PI or colony manager.
3. LARC staff will change Overcrowded cages 48 hours after notification (PI will be charged).
4. LARC staff will immediately change any cages that contain two litters of disparate size/age (PI will be notified and charged).
5. The LARC will be more than happy to help or facilitate the necessary actions but should not be relied upon to manage breeding colonies unless there is a prior agreement.

Attending Veterinarian:

1. The Attending Veterinarian (AV) will monitor the health of all animals and examine any cases flagged for problems.
2. The AV will discuss any health issues with the PI and make recommendations as needed.
3. The AV will intervene in any case where animal welfare issues may, or have, arisen.
4. In the case of repeated overcrowding within a colony the AV will inform the IACUC of ongoing non-compliance.

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I. Housing Density

An average adult mouse weighs 25-30 grams, the standard cages used by LARC can hold up to 5 compatible adult mice per current regulations. The number of mice permitted in breeding cage may depend on the breeding scheme. These considerations are covered below.

II. Breeding Schemes Permitted:

- Pair Breeding (one male, one female).
- Trio Breeding (one male, two females).
- Harem Breeding is not allowed without justification and IACUC approval.

III. Pair Breeding

When breeding in pairs, the breeding cages may be set up on a continuous basis, leaving the male with the female after pups are born. Entire litter may remain with parents until weaning at 21 days of age or birth of next litter whichever is sooner. If one is attempting to take advantage of the post-partum estrus, weaning schedules must be strictly managed in order to prevent having two litters of disparate sizes in the same cage. **Having multiple litters of differing ages in the same cage is prohibited, those cages will be separated immediately by LARC staff (and fee levied).**

IV. Trio Breeding

Breeding trios (one male, two females) must be closely managed to ensure that multiple litters do not occur. Only one nursing litter may be present in a cage at a time with a dam and one other mouse. If multiple nursing litters are present the litters will be split by age>sex into separate cages. If two females are visibly pregnant, one female must be separated to a different cage.

Upon the birth of a litter, one other adult must be removed (either the male or the second female). The second female must be removed prior to giving birth. Litters should be weaned at 21 days unless there is an IACUC or AV exception.

VI. Weaning:

The PI/PI's staff is responsible for cage card documentation, separating, and weaning mice. Litters must be weaned according the procedures defined in the investigator's approved IACUC protocol. Male and female pups must be separated at weaning unless they are being set up as new breeding cages.

Cages **MUST** be adequately labeled by the investigator with the date of birth of each litter. If weaning does not occur on schedule, the cage will be labelled with a PURPLE "**overcrowded**" card for 48 hours (2 business days) after which weaning will be performed by the LARC at the investigator's expense.

Exceptions:

Occasionally with genetically modified strains, litters may be small or slow to thrive. If a litter does not seem to be large or mature enough the PI should discuss the case with the AV. The

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AV can approve exceptions to 21 day weaning schedule for a given strain or litter. An appropriate weight for weaning pups is 8-10 g. For strains that consistently require delayed weaning, the IACUC protocol can be amended provided data for the justification exists in the colony records. Once approved by the IACUC, this extended weaning time is acceptable, however no more than one litter is ever allowed in a cage at a time.

VII. Overcrowded Cages

History: In some mouse breeding colonies, overcrowding of cages is common. It occurs most frequently when trio or harem mating systems are used and each of the females has a litter. The problem becomes severe when the litters are not weaned according to the procedures define in the approved protocol (21-28 days of age).

A. Definitions of Overcrowding

- 2 litters in the same cage. These will be weaned **immediately** to prevent trampling of neonates.
- 1 litter and dam with an additional pregnant dam(s) in the same cage.
- Multiple visibly pregnant females in the same cage.
- More than 5 mice older than 21 days in the same cage (the day of birth is considered day 1).

B. Fees

If the investigative staff fails to correct the overcrowding, LARC will split the cages in question to comply with OLAW, Guide, and AAALAC housing guidelines. The investigator will be notified of this action and **will be charged a minimum of \$75 according to the rate schedule:**

\$25 for a new cage for the parents

\$25 for *each* cage of offspring (typically one cage of males, one cage of females)

C. Sanctions

The LARC is required to report patterns of overcrowded and non-compliance to the IACUC. In such cases, the investigator will be subject to further remedial actions as deemed necessary by the IACUC up to and including revocation of breeding protocol(s).

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Selected References:

- PHS Policy on Humane Care and Use of Laboratory Animals
<http://grants.nih.gov/grants/olaw/references/phspol.htm>
- *The Guide for the Care and Use of Laboratory Animals*, 8th Edition
http://www.nap.edu/catalog.php?record_id=12910
- USDA Policy #3: Veterinary Care
http://www.aphis.usda.gov/animal_welfare/policy.php?policy=3
- <http://www.iacuc.ucsf.edu/Policies/awSPMouseHousingDensity.asp>
- Heiderstadt KM, Blizard DA, "Increased juvenile and adult body weights in BALB/cByJ mice reared in a communal nest." *J Am Assoc Lab Anim Sci.* 2011 Jul;50(4):484-7.
<http://www.bu.edu/orccommittees/iacuc/policies-and-guidelines/rodent-breeding-colony-management-mice/>