

LARC Mouse Housing Density and Breeding Schemes Policy

Purpose: Address the health and well-being of mice by ensuring safe population densities. Animal overcrowding can contribute to significant animal welfare issues and therefore may violate Federal and University policies on the humane care of animals if not expediently addressed. The **PI has the ultimate responsibility** to ensure the colony is managed appropriately. This means the PI or the PI's staff has day to day responsibility to check breeding pairs for new births, to wean when appropriate, and to maintain colony records.

I. Housing Density

Assuming an average adult mouse weighs 25-30 grams, the standard cages used by LARC can hold up to 5 compatible adult mice. Mice that are observed fighting must be separated. The number of mice permitted in breeding cages depends on the breeding scheme and a number of variables specific to the strain of animals being bred. These considerations are covered below.

II. Breeding:

Breeding mice can be done in:

- pairs (one male, one female)
- trios (one male, two females)
- harem (one male, up to 4 females)

III. Pair Breeding

A. 21 Day Wean

For pairs, the breeding cages may be set up on a continuous basis, leaving the male with the female after pups are born. Multiple litters of differing ages are NOT allowed, thus weaning schedules must be strictly managed to avoid overcrowding cages with animals that are nearly adult-sized along with newborn pups.

B. 28 Day Wean

28 day weans are used when weaning needs to be delayed beyond 21 days due to the small size of offspring and their inability to thrive. As multiple litters of differing ages are NOT allowed, the male must be pulled as soon as the female is noticed to be pear-shaped and pregnant to prevent the female from getting pregnant during post-partum estrus. If the male is not pulled and she gets pregnant during post-partum estrus, the 1st litter will be weaned at 21 days to prevent overcrowding and trampling of the new litter. Note that trio breeding cannot be used with 28 day weaning.

IV. Trio Breeding

Breeding trios (one male, two females) should be closely managed to ensure that multiple litters do not occur. The litters should be weaned at 21 days. If weaning does not occur on schedule, weaning will be performed by the LARC at the investigator's expense (See the LARC Policy on Overcrowded Cages for specific fees.) Note that trio breeding **CANNOT** be used with 28 day weaning.

V. Harem Breeding

Harem breeding is when one male is housed with multiple females. Visibly pregnant females **MUST** be moved to their own cage to prevent housing multiple pre-weanling litters with more

than 2 adults (i.e., only 1 litter per cage is allowed). Males that have been housed with breeding females must NOT be re-housed with other males to prevent fighting and death. Breeder males must be housed alone when not housed with females.

VI. Weaning:

The PI/PI's staff is responsible for cage card documentation, separating, and weaning mice. Litters must be weaned according to 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 labeled with a Concern card for 2 business days; after 2 business days, weaning will be performed by the LARC at the investigator's expense (See the LARC Policy on Overcrowded Cages for specific fees.)

Exceptions:

In the event that a litter cannot be weaned according to the approved schedule in the protocol, the investigator should notify the LARC by appropriately labeling the cage with a yellow card. If the expected weaning date is reached and the litter is still not ready to be weaned, notify LARC veterinary staff. An appropriate weight for weaning pups is 8-10 g. For strains that consistently require delayed weaning, exceptions to the 21 day weaning age may be made. Exceptions must be requested in the IACUC protocol. The request should include justification (scientific, via a performance standard or a growth curve) for extended weaning and should include appropriate documentation or scientific justification that the strain does not reach the same weight as the background strain at 21 days. Once approved by the IACUC, this extended weaning time is acceptable, however no more than one litter is ever allowed at a time.

VII. Overcrowded Cages

The LARC checks for overcrowding and pregnancy when performing daily health checks and when changing cages. Any cages that might be considered overcrowded are marked with a Concern card.

When overcrowding is noted, the PI/PI's staff is given 2 business days to correct the problem, (note that two litters will be separated immediately, as it is an animal welfare emergency). If overcrowding is not addressed within the allotted time, LARC staff separates the mice and charges the PI according to the LARC Policy on Overcrowded Cages.

VIII. Fees

If weaning has not occurred on the schedule defined in the approved IACUC protocol, weaning will be performed by the LARC at the investigator's expense. The investigator will be notified of this action and **a minimum of \$75** will be charged to the PI. (See the LARC Policy on Overcrowded Cages for specific fees.)

IX. 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.

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/orcccommittees/iacuc/policies-and-guidelines/rodent-breeding-colony-management-mice/>
- Hickman DL, MP Swan. “Effects of Age of Pups and Removal of Existing Litter on Pup Survival during Cross-Fostering between Multiparous Outbred Mice.” *J Am Assoc Lab Anim Sci.* 2011 Sept;50(5):641-646.