PURPOSE: To provide guidance on the management of in-house rodent (mouse and rat) breeding colonies consistent with current veterinary standards, industry guidelines, and institutional practices.

I. RESPONSIBILITIES

A. Research personnel are responsible for

1. establishing and maintaining breeding cages consistent with the breeding scheme and colony requirements outlined in the IACUC approved protocol,

2. pairing and separating male and female breeders,

3. identifying and recording date of birth and litter size at the cage level,

4. maintaining cage population density consistent with recommendations of the Guide for the Care and Use of Laboratory Animals (the Guide) and institutional practices,

5. ensuring that no more than one litter of pups is present in the cage at any time,

6. weaning animals at the appropriate age into a clean (sanitized) cage with an adequate supply of potable water, appropriate animal diet, and a DLAR (CAMS) generated cage card,

7. and maintaining appropriate breeding colony records.

B. DLAR personnel are responsible for

1. providing clean cages and other supplies (e.g., water bottles, enrichment items) necessary for research personnel to wean and separate animals,

2. and providing DLAR (CAMS) generated cage cards requested by research personnel to generate new cages.

II. GENERAL INFORMATION

A. Genetically modified animals (GMAs) are created by mutagenesis, transgenesis, and/or targeted technologies that include “transgenic”, “knock-out”, “knock-in”, and “knock-down” animals. GMAs may be “inducible” with the specific genetic alteration turned on or off by the administration and/or withdrawal of a specific substance.

B. The establishment, production, and maintenance of in-house rodent breeding colonies must be outlined in an IACUC approved protocol, conducted in accordance with applicable
DLAR and IACUC policies and procedures, and be accommodated within the Principal Investigator’s (PI’s) animal space allocated by the DLAR.

C. Common rodent stocks, strains, and GMA lines readily available from approved commercial sources should not be maintained as in-house breeding colonies.

D. The size of the breeding colony should be kept to the minimum number of animals necessary to

1. establish and maintain the colony to meet breeding colony objectives outlined in the IACUC approved protocol, including the production of replacement breeders,

2. and produce experimental cohorts necessary to meet research objectives and needs outlined in IACUC approved protocols.

E. The cage population density must comply with applicable regulations, standards, and guidelines, including those in the current version of the Guide and any applicable institutional policies.

F. Anticipated clinical concerns associated with the genotype and/or phenotype of a specific GMA line should be discussed with the DLAR veterinary staff and appropriately outlined in the IACUC approved protocol. Clinical concerns include any lethal phenotypes, abnormalities in growth, development, appearance, behavior, or any other clinical observation or noticeable difference from conventional or common rodent stocks and strains.

G. Anticipated animal husbandry needs that differ from standard DLAR practices and procedures should be discussed with the DLAR facility supervisor and appropriately outlined in the IACUC approved protocol.

H. The DLAR strongly recommends establishing a resource or method to safeguard and recover every in-house GMA breeding colony to protect against colony loss from genetic drift, disease outbreak, or an unanticipated adverse or catastrophic event. Methods to safeguard and recover GMA colonies include the cryopreservation of embryos, ovaries, sperm, or the establishment of repository back up colonies. The DLAR can assist in coordinating these efforts with commercial vendors, but all costs and related expenses are the responsibility of the PI.

III. BREEDING SCHEMES

A. Pair mating consists of housing one male and one female in the same cage for breeding purposes. Breeding pairs may be set up on a permanent or temporary basis.

B. Harem mating consists of group housing one male with two or more females for breeding purposes. Trio breeding (one male paired with two females) is a form of harem breeding.
1. Pregnant females should be separated and housed individually once pregnancy is suspected or confirmed.

2. Pregnant females must be separated and housed individually prior to parturition (giving birth) to avoid cage overcrowding and ensure that only one litter of pups is present in the cage, unless otherwise justified in an IACUC approved protocol.

C. Multiple litters housed in the same cage constitute noncompliance regardless of the breeding scheme utilized.

IV. WEANING

A. The day of parturition is considered day 0.

B. Mice and rats cannot be weaned prior to 19 days of age unless otherwise justified in an IACUC approved protocol.

C. Mice and rats weaned prior to 21 days of age should be provided with additional supportive care, including soft diet (e.g., Nutra-Gel Diet™) on the cage floor, to improve their survival.

D. Mice and rats should be weaned between 21 – 24 days of age under most circumstances; however, mice and rats born from continuous pair matings when the male and female remain housed together should be weaned between 19-20 days of age to minimize the chance of a second litter being born prior to weaning the older litter.

E. Mice and rats must be weaned no later than 28 days of age unless otherwise justified in an IACUC approved protocol or directed by a DLAR veterinarian on an individual cage basis as a veterinary exemption for animal health or welfare concerns.

F. Animals must be weaned to provide the minimum space requirements outlined in DLAR POL #112 (Minimum Space Requirements of Primary Enclosures).

1. Female mice can typically be housed up to 5 adult females per cage.

2. Male mice can typically be housed up to 4 or 5 adult males per cage, depending on the type of caging available in the DLAR facility. Contact the DLAR facility supervisor to confirm the maximum cage population density supported by the specific caging type.

3. Failure to provide the minimum space requirements constitutes noncompliance.

V. MISCELLANEOUS INFORMATION

A. Research personnel must document the date of birth and number of pups born at the cage level. Typically this is done by documenting births on a laboratory generated breeding record/card placed within the cage card holder. If research personnel fail to document the date
of birth and litter size at the cage level, DLAR personnel will estimate the date of birth to determine the required weaning date.

B. DLAR personnel will not routinely open the cage during the first 3-5 days after parturition to minimize the chance of rejection or cannibalism of the litter by the dam, unless

1. the cage is excessively soiled and is perceived to pose a health or welfare concern to the dam or litter,

2. an insufficient quantity of food or water is present and previous arrangements have not been made for research personnel to provide food and water,

3. or for any other animal health or welfare concern.

C. The number of animals generated by in-house breeding is captured and tracked to the IACUC approved protocol allocation according to the following:

1. CAMS generated cage card barcodes capture and track animal census, including offspring born in-house.

2. Pre-weaning animals used on research study activities are counted against the total number of animals allocated by the IACUC approved protocol.

3. Pre-weaning animals that die or are euthanized without any experimental manipulation are not counted against the total number of animals allocated by the IACUC approved protocol.

4. All weaned animals, regardless of use, are counted against the total number of animals allocated by the IACUC approved protocol.

5. The PI can access CAMS to monitor the current percentage of animal use for each of his/her IACUC approved protocols.

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1 The words “must” and “should” are utilized throughout this document in accordance with the current edition of the Guide for the Care and Use of Laboratory Animals (the Guide). According to the Guide “must indicates actions that the Committee for the Update of the Guide considers imperative and mandatory duty or requirement for providing humane animal care and use. Should indicates a strong recommendation for achieving a goal; however, the Committee recognizes that individual circumstances might justify an alternative strategy.”