Guidelines on Mouse and Rat Breeding and Housing Management

Last Updated 1 November 2017

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1. **Purpose**
   
   To address the health and well-being of mice and rats by ensuring safe breeding practices and population densities. Limiting breeding cage occupancy reduces the incidence of morbidity and mortality due to overcrowding.

   In all cases, cages should be regularly monitored to ensure the well-being of the neonates (e.g., size, age, and activity level of litter), as well as characteristics of the cage environment and colony breeding performance. Exceptions to this policy require prior IACUC approval.

2. **Procedures for the Breeding and Housing Management of Mice**

   a. **Breeding Density**

      i. When breeding, no more than 2 adults and 1 litter, regardless of the size of the litter, will be allowed in a 75 square inch ("standard" mouse) cage.

      ii. Mice can be bred under the following conditions:

         1. **Recommended Strategy**

            a. Monogamous pairs in a "standard" mouse cage.

         2. **Alternative Strategies**

            a. Breeding trios (one male, two females) or harem breeding (1 male, 3-4 females) in a "standard" mouse cage.

            b. These breeding strategies are only allowable provided that pregnant females are separated prior to parturition and only 1 litter of pups and 2 adults remain in the cage after pups are born.

            c. Breeding trios (one male, two females) in a 100 sq. in. cage ("standard" rat cage).

            d. If post-partum estrus is used in "standard" mouse cages, the first litter must be weaned by 21 days of age to prevent the presence of two litters in a cage, i.e. no extended weaning is allowed if post-partum estrus is used.

      iii. The IACUC acknowledges that some specialized genetically modified lines may require more than 2 adults and 1 litter in the breeding cage to facilitate adequate production. Breeding records demonstrating poor breeding must first be reviewed with a faculty veterinarian and scientific justification submitted and approved of by the IACUC. See Guidelines for Documenting Scientific Justification for Exceeding Cage Densities for details on required data.

3. **Management of Fighting Mice**

   a. Fighting among adult male mice is a well-documented behavior and can result in severe wounding and death. To minimize fighting, the following group-housing practices should be followed for mice bred in-house:

      i. Do not combine adult male mice (older than 5 weeks).

      ii. Weaned males should ideally be group-housed only with their littermates.

      1. Males grouped from different litters should be combined within seven days of weaning, and only with males that are seven days apart in age or less.

      2. When combining males from different litters, a clean cage should be used to prevent territorial behavior.

      iii. Some strains are more aggressive than others, and will fight regardless of the age at which they are combined. In these instances, all males should be housed individually or with females, if intending to breed.

   iv. If fight wounds are observed:

      1. Mice with mild to moderate wounds (those involving minimal damage to the epidermis) necessitates consultation with ULAM veterinary staff for determination of appropriate therapy.

      2. Mice with severe wounds (e.g., those involving the genitals or limbs that compromise normal function, significant damage to the epidermis, or significant morbidity) must be euthanized promptly following assessment by ULAM veterinary staff.

      3. Place the aggressor (typically the mouse without wounds) in a separate cage immediately, and never recombine with other males.

      4. If there are multiple aggressors (multiple mice without wounds, or all mice have wounds), separate all mice.

4. **Procedures for the Breeding and Housing Management of Rats**

   a. Rats can be bred in the following conditions:

      i. **Monogamous Pairs**

         1. This is recommended to prevent overcrowding.

      ii. **Breeding Trios (one male, two females)**
1. This is allowed only when animals weigh 400g or less.
2. Females must be removed prior to parturition to prevent overcrowding.

b. In addition, for any breeding scheme, all rat pups must be weaned by 21 days of age. Delayed weaning (weaning at >21 days) requires prior IACUC approval. Under certain circumstances, it may be necessary to provide additional floor space in order to ensure animal well-being.

5. **Related Documents**
   a. Guidelines for Documenting Scientific Justification for Exceeding Cage Densities