UNC-CH Policy on Rat Cage Density

Introduction:
Updates in the Guide for the Care and Use of Laboratory Animals (8th edition) have prompted re-evaluation of the UNC-CH rat cage density policy. The revised policy below is a blending of Guide requirements with the UNC performance based standards.

Rat Density in Breeding Cages
Rat strains have a variety of requirements for successful breeding. Many of these depend on acknowledgment of the natural behaviors of rats in the wild, seasonal differences in fecundity and innate physiological differences among “normal” strains of rats. As a result of this diversity, it is impossible to make a “one size fits all” rule for regulation of rat breeding. The purpose of this policy is provide Guide recommendations for housing rats in groups and to allocate sufficient space for mothers with litters that will allow for the pups to develop to weaning without detrimental effects.

Key Action Points for Breeding Rats
1. Birth of litter: Research staff record date of birth (on investigator breeding card)
2. UNC rat cages range from 140 to 143 square inches (individually ventilated cages, static micro-isolator, standard rat caging) are permitted to contain the following maximum numbers of animals:

<table>
<thead>
<tr>
<th>Animals</th>
<th>1 Adult</th>
<th>2 Adults</th>
<th>3 Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single litter</td>
<td>no limit on pups</td>
<td>Unlimited pups under 14 days</td>
<td>Trio mating – no pups (1 female must be removed before litter drops)</td>
</tr>
<tr>
<td>Multiple litters</td>
<td>not allowed</td>
<td>not allowed</td>
<td>not allowed</td>
</tr>
</tbody>
</table>

3. For trio cages – the second pregnant female must be removed before her litter drops.
4. Wean pups at approximately 21-23 days old.
5. DLAM will flag cages exceeding the allowed density at 21 days. Research personnel will have a 48-hour period after the cage is flagged to address the potential density issue. Cages exceeding allowed density will be considered non-compliant at 23 days.
6. DLAM will flag cages that have more than 14 pups and 2 adults at 12 days. Research personnel will have a 48-hour period after the cage is flagged to address the potential density issue. Cages exceeding allowed density of 14 pups and 2 adults will be considered non-compliant at 14 days.
7. After pups are weaned, cage density guidelines are based on body weight as shown in the table below.

Recommended Minimum Space for Rats Housed in Groups

<table>
<thead>
<tr>
<th>Animals</th>
<th>Weight, gram</th>
<th>Floor Area of cage/Animal, Inches²</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>&lt;100</td>
<td>17</td>
</tr>
<tr>
<td>6</td>
<td>Up to 200</td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>Up to 300</td>
<td>29</td>
</tr>
<tr>
<td>3</td>
<td>Up to 400</td>
<td>40</td>
</tr>
<tr>
<td>2</td>
<td>Up to 500</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>&gt;500</td>
<td>≥70</td>
</tr>
<tr>
<td>Female + litter</td>
<td>124 (recommended space for the housing group)</td>
<td></td>
</tr>
</tbody>
</table>

Approved 9/22/00; Revised 3/18/04; 5/16/06, 4/17/09, 10/8/2010, 12/07/12, 4/29/13
Other Essential Information

- Rat cages cannot be off the ventilated system for any appreciable amount of time. When removing a cage from the ventilated system, break the vacuum seal and prop open the top or transfer animals to a static cage.
- The IACUC recognizes two breeding schemes:
  - Monogamous pairing (one male and one female): This is the preferred breeding scheme.
  - Trio breeding (one male and two females): This scheme is allowed but requires frequent monitoring. Prior to parturition, one of the females must be removed.
- Multiple breeding age males are not allowed to occupy the same cage with a breeding age female unless an “Exception” has been submitted to, and approved in writing by, the IACUC.
- Under the current set of guidelines two females with two litters may not occupy the same cage. However, the IACUC recognizes that future genetically engineered rat strains may have greatly reduced reproductive capability and maternal behaviors. Scientifically based exceptions to this policy may be requested on an as needed basis.
- Most rat strains are ready to wean at 21 – 23 days of age. For weaker strains, the IACUC will consider exceptions when scientifically justified.
- If continuous breeding is used, older litters must be weaned prior to parturition or as soon as the new litter is noted.
- Options for reducing numbers: remove female, remove male, move mother/litter, cull pups.
- For cages not meeting the above cage densities, DLAM is authorized to correct the overcrowded cage, separate animals, and assess a separation charge without notifying the investigator. DLAM will correct by removing an adult or separating litters. If there is no space in which to separate, DLAM will contact the PI.
- DLAM supervisors will inform the IACUC of ongoing compliance problems with this policy.
- The investigator is responsible for contacting the IACUC if they cannot comply with the policy.
- The IACUC will consider requests for an “Exception” to this policy on a case-by-case basis if the investigator provides scientific justification. The exception will not be in effect until the PI has received written notification from the IACUC.
- Nesting material must be added to all breeder cages at the time of set-up.

*Disclaimer: if your experimental procedure requires a significant deviation to this Standard Operating Procedure (SOP), please amend your application(s) to include Addendum 8.0 Request for Exception to Policy and indicate the following: a description of the exception; the rationale (provide scientific justification and/or justification based on animal welfare); the potential adverse effects/clinical signs resulting from the exception; and specify which (and the total number of) animals in the approved protocol that will be affected. The IACUC will review your request at the next monthly meeting.*