UNIVERSITY STANDARD

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL
STANDARD ON RAT CAGE DENSITY

Introduction

PURPOSE
To ensure sufficient space for rats with litters that will allow pups to develop to weaning without detrimental effects, and to house adult rats in space that is sufficient for their needs. This Standard is a blend of the requirements in the 8th edition of the Guide for the Care and Use of Laboratory Animals and the long standing, performance based UNC policy.

Multiple factors contribute to successful breeding and welfare of rats. In addition, different rat strains can have a variety of requirements for successful breeding and physiological differences, making it difficult to make a “one size fits all” rule for regulation of rat breeding. The purpose of this standard is to allocate sufficient space for rats with litters that will allow for optimal breeding and welfare, and to indicate appropriate space for adult rats.

SCOPE OF APPLICABILITY
All Principal Investigators, laboratory members, and DCM personnel involved in the breeding and maintenance of rat colonies.

The UNC-CH IACUC expects that anyone involved in animal work at the University will comply with this Standard. Requests for exceptions to this Standard must be reviewed and approved by the IACUC.

Standard

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) and are permitted to contain the following maximum numbers of animals:
3. Wean pups at approximately 21-23 days old. The IACUC will consider exceptions when scientifically justified.

4. DCM 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 24 days.

5. DCM 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 15 days.

6. 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 Rats in Groups</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></td>
<td>124 (recommended space for the housing group)</td>
</tr>
</tbody>
</table>
Other Essential Information

- DCM will mark cages not meeting above requirements with a green “Action Required” card which will list the day indicating when corrections must be made. Corrections must be made by the end of the day listed on the card (two calendar days). Example- DCM flags a cage with an “Action Required” card on Wednesday, corrections must be completed by end of the day Friday (two calendar days). On Saturday DCM staff will separate according to the policy. For a cage marked on a Friday, DCM will separate the following Monday.

- Cages that exceed the densities listed in this policy are considered out of compliance the day after the date on the “Action Required” card has expired. (Therefore, DCM will correct the issue at this time so that the density is in compliance.) After the expiration date, DCM is authorized to correct the overcrowded cage, separate animals, and assess a separation charge without notifying the investigator. DCM will correct by removing a male or separating litters. If there is no space in which to separate, DCM will euthanize animals to correct the cage density.

- 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 female): This scheme is allowed but requires frequent monitoring. Prior to parturition, one of the females must be removed. If continuous breeding is used, older litters must be weaned prior to parturition or as soon as the new litter is noted.

- 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.

- Research staff should avoid placing animals prone to fighting in the same cage (i.e. males-other than those weaned together, older animals, different strains). Incompatible housing resulting in fighting/injury is an animal welfare concern that must be remedied as soon as it is identified.

- Nesting material must be added to all breeder cages at the time of set-up. Approved types of nesting material for rats can be referenced on the IACUC standard: Environmental Enrichment Program for Animals

- DCM 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.

EXCEPTIONS
Requests for exceptions to this Standard must be reviewed and approved by the IACUC and/or DCM Management.

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Definitions

**IACUC:** Institutional Animal Care and Use Committee  
**DCM:** Division of Comparative Medicine  
**Green “ACTION REQUIRED” Card:** Green card placed by DCM technicians on rodent cages that are out of compliance for cage density, indicating a specific date that the issue must be remedied by. Pictured below.

**Cage Density:** The maximum number of rodents allowed in a given cage space based on the animal’s weight and cage type.

**Weaning:** The transfer of pups out of the mother’s cage

**University Standard:** The minimum acceptable limits or rules used to achieve Policy implementation, enforceable by the IACUC.
Related Requirements

EXTERNAL REGULATIONS AND CONSEQUENCES

UNIVERSITY POLICIES, STANDARDS, AND PROCEDURES

For more detailed guidance, please refer to the University Policy on the Care and Use of Vertebrate Animals for Research, Training and Teaching Purposes.

Contact Information

<table>
<thead>
<tr>
<th>Subject</th>
<th>Contact</th>
<th>Telephone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol or Standard Questions</td>
<td>Office of Animal Care and Use</td>
<td>919-966-5569</td>
<td><a href="mailto:iacuc@med.unc.edu">iacuc@med.unc.edu</a></td>
</tr>
<tr>
<td>Rodent Housing Questions</td>
<td>Division of Comparative Medicine (DCM)</td>
<td>919-962-5335</td>
<td></td>
</tr>
</tbody>
</table>

Important Dates

- Effective Date and title of Approver: 09/22/00; UNC IACUC
- Revision and Review Dates, Change notes, title of Reviewer or Approver: Revised 03/18/04; 05/16/06; 04/17/09; 10/08/10; 12/07/12; 04/29/13; 04/08/16; Placed on University Standard template, Reviewed by veterinarians, clarification on when rats are separated after “Action Required” card is placed on the cage; UNC IACUC

Approved by: UNC IACUC

Dr. Roland Tisch
UNC IACUC Chair