



## GUIDELINES FOR BREEDING AND AVOIDING OVERCROWDING OF MOUSE AND RAT CAGES

The 8th Edition of *The Guide for Care and Use of Laboratory Animals* is used as the primary reference for cage density determination to ensure an appropriate housing environment for mice and rats that enables breeding colonies to thrive. The RFUMS default caging density uses numbers based on average body weights of individual animals at different ages as the basis for assessing cage overcrowding. This method is conservative, avoids unnecessary handling of neonatal animals, and enables a rapid way of monitoring overcrowding. The PI and their research staff should monitor breeding colony animals at sufficient frequency to allow for timely weaning and adherence to the guidelines.

### MICE:

Housing Style	Weight (gms)	Required floor area per animal (sq. inches)	IVC cages (82.7 sq. in.) Max #/cage	Conventional cages (74.25 sq. in.) Max #/cage
Group	< 10	6	13	12
Group	11-15	8	10	9
Group	16-25	12	6	6
Group	>25	15	5	5
Female + litter		51	2 adults plus 8 pups	

### RATS:

Housing Style	Weight (gms)	Required floor area per animal (sq. inches)	Height (in.)	Max #/cage (134 sq. in.)
Group	< 100	17	7	8
Group	100-200	23	7	6
Group	200-300	29	7	4
Group	300-400	40	7	3
Group	400-500	60	7	2
Group	>500	≥ 70	7	1
Female + litter		124	7	Female + pups

### 1. General Considerations

- Overcrowding in mice housing is defined as more than 5 adults (over 21 days of age is considered adult) per IVC cage.



- Overcrowding in rat housing is defined as more than 6 adults (up to 200 g each) per standard rat cage (134 sq. in. floor space).
- Based on the above space requirements, no more than 2 adults may be in a cage when a litter is born (unless an exception has been approved in advance by the BRF veterinarians or the IACUC for animal welfare concerns).
- Mouse and rat pups must be weaned by 21 to 25 days of age. An extension can be approved by the BRF veterinarians or the IACUC for, for example, sensitive delicate strains or for animal welfare concerns.
- Any cage with more than one litter is considered overcrowded, unless an exception in that instance has been approved.

## 2. Breeding Schemes

### MICE:

Pair Breeding: 1 adult male and 1 adult female.

*This maximizes productivity of females by utilizing post-partum estrus and allows for ready identification of the dam for the litter.*

Harem Breeding: 1 adult male and up to 4 adult females.

- There may be no litters born into cages with harem breeding.
- **Pregnant females must be removed and placed into another cage before parturition.**
- Provides an option for projects that require intensive breeding
- Maximizes the progeny of an individual male; does not utilize post-partum estrus.

### RATS:

Pair Breeding: 1 adult male and 1 adult female.

*This maximizes productivity of females by utilizing post-partum estrus and allows for ready identification of the dam for the litter.*

Breeding Trio: 1 adult male and 2 adult females.

*This maximizes productivity of females by utilizing post-partum estrus.*

## 3. Overcrowding of Cages:

- If overcrowded cages are observed, they will be marked with an "Overcrowded Cage" card that is dated, and the BRF main office notified. The PI or designate will receive notification by email or voice to rectify the overcrowding *within 48 hrs*.
- After the overcrowding has been corrected by the PI or his/her designate, the overcrowded cage card must be signed, dated, and returned to the BRF office. Removal of an overcrowded cage card without correcting the overcrowding is not permitted and will be reported to the IACUC.
- If overcrowding is not corrected by the PI or designate within 48 hours of the



cage being marked as 'overcrowded', BRF staff will separate the mice or rats, adjust the census, duplicate the cage card, and identify the new cage with a card indicating the date that the overcrowding was corrected. *There will be a charge for this service.* While every effort will be made by the BRF staff to duplicate and identify separated animals correctly, their primary mission is to ensure compliance with the guidelines on overcrowding.

- If a PI has more than 3 overcrowded cage incidents in a 30-day period, the BRF manager will report this to the IACUC for corrective action. Continuing or repeated non-compliance may result in the IACUC restricting or removing the PI's ability to maintain a breeding colony in the BRF.

#### **4. Exemptions/Exceptions:**

- Delayed weaning of pups (up to 28 days of age) may be approved by the BRF veterinarians or the IACUC for issues, such as failure to thrive, small birthweight, or slow maturation that may arise with particular strains.
- Exceptions to the "one litter per cage rule" may be granted in 'poor breeder' situations where very small litters are routinely produced by certain strains.
- All exceptions to the standard guidelines must be clearly marked by special (clear blue) cage card covers; the cage cards must show when the delayed weaning date was approved.