

UMB Veterinary Resources Standard Operating Procedure (SOP)

Cage Population Densities for Rodents

Revised September 2021

Introduction

Regulatory guidelines for housing of laboratory mice and rats indicate a need to clearly define maximum cage population densities. Determination of maximum cage densities in this SOP are based on both the recommendations outlined in the “[Guide](#)” (8th Ed. 2011) and performance data/metrics for animal facilities at the University of Maryland Baltimore.

Population Density for Mice

- 1) Five adult female mice (≤ 25 g body weight) or male mice (≤ 25 g body weight) or one lactating female with nursing litter and a male mouse are allowed in the current mouse cages. Research personnel must weigh aging mice or large mouse breeds, e.g., CD-1, frequently to comply with the cage density policy.
- 2) Monogamous pair breeding is the only recommended breeding scheme for strains with no breeding difficulties. A monogamous breeding cage consists of one adult male and one adult female with or without nursing litter.
- 3) Harem breeding is recommended for strains with breeding difficulties or small litter sizes. Breeding records demonstrating poor breeding and small litter sizes must be submitted to a VR Veterinarian for review and consultation prior to IACUC approval.
 - a) A harem breeding cage consists of one adult male and two or a maximum of three adult females without litters.
 - b) The pregnant female must be separated as soon as the pregnancy is visible.
- 4) Birth date of new litter must be documented on the breeding card. Weaning must occur on day 21 unless the strain/line is specifically approved for delayed weaning by the IACUC. If weaning is to occur after 21 days, only one litter per cage may be maintained.
 - a) If pups are not weaned until 28 days, the larger pups (≥ 10 g body weight) that can reach food and water need to be weaned before day 28.

Population Density for Rats

Investigators and/or designated research staff are responsible for weighing group housed rats less than 500 grams at least once per month to ensure that animals meet housing density guidelines. Male/sire must be separated after litter is delivered. Only one female/dame with one litter is allowed in the current caging. Birth date of new litter must be documented on the breeding card. Pups must be weaned on day 21. Animals must be separated as needed to comply with the following guidelines.

Rat Cage Type	Floor Area (inches ²)	Maximum # of Rats	
Conventional rat cage	142	<100 grams	8
		Up to 200 grams	6
		Up to 300 grams	4
		Up to 400 grams	3
		Up to 500 grams	2
		>500 grams	1
		Female w/ litter	1

Reference: Table 3.2 Guide (2011), p.57-58

Rat Cage Type	Floor Area (inches ²)	Maximum # of Rats	
Lab Products single "One Cage" <i>*Female w/ litter not permitted in this size cage as minimal space required for a female w/litter is 124 in²</i>	92	<100 grams	5
		Up to 200 grams	3
		Up to 300 grams	3
		Up to 400 grams	2
		Up to 500 grams	1
		>500 grams	1
		Female w/ litter	0*
Lab Products double "One Cage"	214	<100 grams	12
		Up to 200 grams	9
		Up to 300 grams	7
		Up to 400 grams	5
		Up to 500 grams	3
		>500 grams	3
		Female w/ litter	1

Reference: Table 3.2 Guide (2011), p.57-58

Separation of Rodents in Overcrowded Cages

It is incumbent on Veterinary Resources (VR) staff and the Principal Investigator (PI) and their respective staff to follow housing density guidelines. Housing densities exceeding the above guidelines will be considered overcrowded. Cages that are identified by VR staff as overcrowded or exceeding housing densities will require separation within 24 hours of discovery. A [pink 'Overcrowded cage' cage card](#) is used for this purpose and defines the date separation needs to be accomplished. If the condition is not corrected in that time frame, VR staff will separate the animals and charge a technical service fee billable to the PI's account. If overcrowding occurs frequently, VR and the PI staff will need to meet to develop a plan to alleviate the overcrowding problem – this is also charged as a labor fee.

In the event that a PI wishes to deviate from these standards, a written justification must be provided for IACUC review and approval via one of the following mechanisms: as part of the original [Animal Use Protocol](#) application; as a [Protocol Amendment](#) (for change in cage density or weaning time point); or as a revised [Enrichment / Socialization Plan Addendum](#) (for single housing).

Singly Housed Rodents

Rodents are social animals. They should be group housed unless otherwise justified. If animals are singly housed, please be sure to place the ['Singly Housed Animal' cage card](#) in the card holder and check the appropriate box to justify single housing.

Cage Card Examples:

Overcrowded Cage

There are too many animals in this cage per VR policy
(<http://medschool.umaryland.edu/IACUC/guidelines.asp>).

Please separate by : _____

Singly Housed Animal

Date of Single Housing: _____ Protocol #: _____

Justification for Single Housing (check one):

- Single animal of this sex in a litter at weaning – no other age or genotype compatible animals available for co-housing
- Last animal in an experimental group
- IACUC approved scientific justification

- Medical/Behavioral (VR use only)

Brief description of reason: _____