



BROWN

Institutional Animal Care and Use Committee (IACUC)

Performance Standard

Policy on Cage Floorspace Recommendations for a Female Rat with a Litter

Date of IACUC Review and Approval: July 3, 2013

Last Updated: May 4, 2018

- I. Background:** The Eighth edition of the NRC *Guide for the Care and Use of Laboratory Animals (The Guide)* lists, for the first time, minimum floorspace area recommendations for housing a female rat with a litter.

Housing of rats at Brown has been moving steadily away from the use of static microisolator caging toward individually ventilated cages (IVCs) in order to improve the cage environment and facility biosecurity. The use of IVCs has not resulted in any identifiable health or behavioral problems for rats of any age or social grouping.

Occasionally an IACUC protocol requires the housing of pre-weanling with their dams to meet experimental requirements. Available Thoren rat IVCs have a maximum floor space of 115 sq. in. The *Guide* recommends 124 sq. in. for a female rat with a litter. The Thoren cage offers approximately 93 percent of the space recommended for this purpose in the Guide.

II. Performance Standard:

The performance standard is that a rat mother plus litter will have sufficient space for the health and well-being of the animals and such that overcrowding does not occur.

The mean or median litter size for Sprague-Dawley, Long-Evans, and Wistar rats is 10-11 pups, but litter sizes can range up to 17-18 pups (Chahoud and Paumgartten, 2009; Prager et al., 2010; Rodel and Meyer, 2011). There is evidence that medium-sized litters are optimal for behavioral, immune, and stress developmental biomarkers (Prager et al., 2010; Rodel and Meyer, 2011; Rodel et al., 2010).

To meet our performance standard, we take into account the age and intended use of the pups as well as the size of the cage.

- Multiple litters of rats will not be housed in a single cage

- If large litters of rats produce adverse clinical signs or evidence of distress, litters may be culled to prevent overcrowding

There is a solid history of good health and well-being of female rats and litters housed in Thoren IVCs at Brown even with the floor space being less than what is recommended in *The Guide*.

References

- Chahoud I, Paumgarten FJ. 2009. Influence of litter size on the postnatal growth of rat pups: is there a rationale for litter-size standardization in toxicity studies? *Environmental research* 109(8):1021-7.
- Prager G, Stefanski V, Hudson R, Rodel HG. 2010. Family matters: maternal and litter-size effects on immune parameters in young laboratory rats. *Brain, behavior, and immunity* 24(8):1371-8.
- Rodel HG, Meyer S. 2011. Early development influences ontogeny of personality types in young laboratory rats. *Developmental psychobiology* 53(6):601-13.
- Rodel HG, Meyer S, Prager G, Stefanski V, Hudson R. 2010. Litter size is negatively correlated with corticosterone levels in weanling and juvenile laboratory rats. *Physiology & behavior* 99(5):644-50.
- The Guide for the Care and Use of Laboratory Animals, Institute of Laboratory Animal Resources is available from National Academy Press and posted on the web at: http://www.nap.edu/catalog.php?record_id=12910