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

I. **Background**: The Eighth edition of the NRC *Guide for the Care and Use of Laboratory Animals* 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 shoebox caging toward environmental isolation cageracks in order to offer a higher degree of biosecurity for our rats. Transitioning in different facility areas from the use of shoe box cages to environmental isolation caging for rats has gone smoothly and has resulted in no identifiable health or behavioral problems for rats of any age or social grouping.

Occasionally an IACUC protocol has specified housing litters of preweanling rats with their dams. Available Thoren rat cages for our units have a maximum floorspace of 115 sq. in. The current *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 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 house in a single cage.

- If all pups in the litter will remain until weaned, large litters will be culled to a litter size of 10.

- If pups are to be used in experiments prior to weaning, then it may not be necessary to cull larger litters depending on the rate at which pups will be used

There is a solid history of good health and well-being of female rats and litters housed in these cages at Brown facilities, and the floorspace area is little short o the new Guide recommendation.

References

Chahoud I, Paumgartten 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.