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Title: Development of the "Rat Loft" for use in wire mesh and shoe box cages.

Animal care and Use Committees (ACUC's) are currently implementing caging recommendations and guidelines for experimental rodents where animal health and well-being are a main concern. At some institutions, animal care committees require that investigators provide scientific justification for the use of wire mesh caging. Changes in caging guidelines from wire mesh to shoe box cages can have a significant economic impact (1). Current guidelines at many institutions are greatly influenced by a statement taken from the Guide for the Care and Use of Laboratory animals (2), "Rodents are often housed on wire-bottom caging, which enhances sanitation of the cage by enabling urine and feces to pass through to a collection tray. However, there is some evidence that suggests solid-bottom caging, with bedding, is the preferred housing by rodents (Fullerton and Gilliatt 1967; Grover-Johnson and Spencer 1981; Ortman et al. 1983). Solid-bottom caging, with bedding is therefore recommended for rodents."

A review of these three references (3-5) by others (1) and the author indicates that these papers do not specifically address a particular caging preference. Concern has also been raised that rodents housed in wire-bottom caging are at greater risk of developing foot problems, although Peace et al. (6) reported that rats weighing less than 500g housed for a year in wire bottom cages showed no such issues. Turner et al. (7) report that two-thirds or more of the rodents used in pharmaceutical and contract research organizations are housed on wire bottom caging. We wondered if the concern for foot problems, when wire mesh caging is used, could be alleviated by a simple device that would reduce the time spent on the wire bottom floor. Thus, we have designed the "Rat Loft." The initial Rat Loft was made from a single piece of stainless steel sheet metal and was designed to hang from the back of the standard individual wire mesh or shoe box style caging. The device was constructed by making two bends in the sheet metal. The first bend was made in a U-shape to facilitate the hanging of the Rat Loft from the back of the cage. The second bend was made in a 90 degree angle to provide a 3.5 inch platform (about 3.5 inches above the wire mesh floor).

Our experience to date indicates that rats housed on both wire mesh and in shoe box cages made extensive use of the Rat Loft. After six months of use, one of our animal technicians reported that its use appeared to have had a calming effect on the rats, and rats from weanlings to adults seemed to spend at least half of their day on the loft. The Rat Loft also increases the available animal floor space and provides an unforeseen environmental enrichment tool. Finally, the Rat Lofts are very easy to clean, as they can be left in the individual cage when a suspended rack is washed.

Most importantly, the Rat Loft may provide a means of addressing the well-being of rats, in both wire mesh caging and in solid bottom bedded cages.

## References

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