

# Increased Cage Height Does Not Impact the Well-Being of Rabbits



Kay Stewart, RVT, RLATG, CMAR, Danielle Guilfoyle, Whitney Preisser, and Mark Suckow, DVM, DACLAM Freimann Life Science Center-University of Notre Dame

## Abstract

In the eighth edition of *the Guide for the Care and Use of Laboratory Animals (the Guide)*, the recommended rabbit cage height was changed from fourteen inches to sixteen inches. In contrast, the majority of our rabbit cages, purchased in 1985 after the USDA prescribed rabbit cage size requirements, provide fifteen inches of interior cage height. A review of the literature failed to identify published data that support an advantage to rabbits having 16 inches of cage height versus 14 or 15 inches. The study described here evaluated the benefit of this minimal change in cage height for rabbits by comparing the effect of the cage height on the health, growth, and overall well-being of the rabbits. Groups of ten New Zealand white rabbits were housed in cages that provided either 15 inches or 18 inches of interior cage height. The rabbits were observed for 25 one-hour periods over seven weeks and various behavioral parameters scored. In addition, rabbits were weighed weekly and general clinical health assessed. After four weeks, the groups were switched to the alternate housing. No significant differences were observed in body weight gain or behavioral parameters between groups housed in cages of different heights, nor were significant differences observed in groups of rabbits when moved from one cage type to the other. In addition, all rabbits remained clinically healthy through the course of the study. These results demonstrate that minimal changes in interior cage height neither benefit nor harm rabbits.

## Objective

Just as the 8<sup>th</sup> edition of *the Guide* was being released, a rabbit project that required the long term housing of over 100 rabbits was scheduled to begin. Our cage inventory include cages of both 15" and 18" of interior height. To allow for an IACUC exception to *the Guide* recommendation of 16" of cage height, we sought to determine if there was any benefit to the increased cage height.

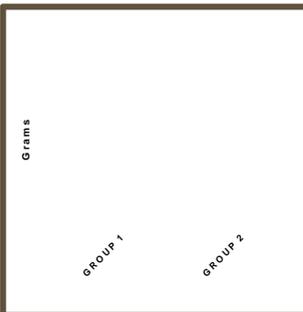
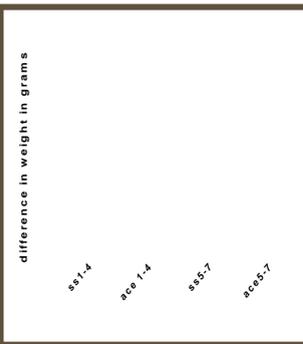
## Procedure

Ten rabbits were housed in cages offering 15 inches of interior height (Suburban Surgical, Inc.), and 10 rabbits were housed in cages offering 18 inches of interior height (Allentown, Inc.). Both groups were evaluated for a period of 7 weeks. All animals were adults, weighing 2 – 4.5 Kg. All were provided with floor space as recommended in the Guide. Rabbits were evaluated four times weekly for tips of the ears touching the cage ceiling, appetite, and general demeanor. Rabbits were also evaluated weekly for body weight, trauma to the ears, and overall clinical health. Midway through, the rabbits were placed in the opposite caging, thus serving as their own control. The rabbits were in two groups; group 1 was rabbits ND21-ND30 and group 2 was rabbits ND31-ND40. Group 1 spent the first 4 weeks in the Suburban Surgical, Inc. caging and the final 3 weeks in the Allentown, Inc. caging. Conversely, group 2 spent the first 4 weeks in the Allentown, Inc. caging and the last 3 weeks in the Suburban Surgical, Inc. caging. The observations were done by four trained individuals. The following observations were recorded as follows:

- ❖ Ears touching: Yes or No
  - ❖ Appetite: Fraction of portion consumed (full,  $\frac{3}{4}$ ,  $\frac{1}{2}$ ,  $\frac{1}{4}$ , or none)
  - ❖ General demeanor: Normal, Cautious, Lethargic, Aggressive
  - ❖ Body Weight: record in grams
  - ❖ Trauma to ears: None, Mild (tips abraded), Moderate (ongoing abrasion, infection), Severe (loss of tips, ongoing open lesions with or without infection and necrosis)
  - ❖ Overall clinical health: normal; or describe abnormalities
- Behavioral observations were recorded in the following categories:
- ❖ Sleeping
  - ❖ Inactive but alert
  - ❖ Walking around cage (chinning, calmly moving)
  - ❖ Eating and/or drinking
  - ❖ Stereotypies
  - ❖ Play/active (gnawing on objects, grooming, etc.)

## Results

Statistical analysis using the paired t-test on the percentage of weight gain of the rabbits showed no significant differences based on the cage type. The weight gain was compared at weeks 1-4, 5-7, and 1-7. When switched from one cage type to the other, 6 of the rabbits had some notable behavioral differences; increase in activity for example. However, the differences were not significant according to statistical analysis utilizing the Wilcoxon matched pairs rank test ( $P < 0.05$ ). Throughout all of the observations, there were no occasions reported on ears touching the top of the cage, no trauma to the ears, and the rabbits' appetite, general demeanor, and clinical health were all normal. The weight gain remained consistent throughout the 7 weeks



## Discussion

Rabbits exhibiting normal behaviors in both types of caging with no evident differences. In top photographs the rabbits are relaxed and alert, while in the bottom photos the rabbits are grooming. The results demonstrate that there are no differences in behavior or health between rabbits housed in cages with 15" or interior height and those housed in cages with 18" of interior height.



**Acknowledgements:** We want to acknowledge Emily Spulak and Tierney Roche for their assistance in the observations.