

Novel approaches to social housing and enrichment to improve welfare for rabbits, rats, guinea pigs and mice



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Introduction

Over the past year, our team has been working on ways to provide additional social and environmental enrichment, and we have introduced pool parties to our rabbits, guinea pigs and rats. During this time, we also started housing our mice in larger, rat polycarbonates cages, giving them double the space that they were used to. We also added more enrichment for the rabbits and guinea pigs, such as loose hay stuffed in toys and frozen fruit treats. Overall, we saw many positive changes in the animals, their environments and the way they interacted with staff.

Methods

The Greenfield Labcorp Animal Care team set out to make improvements to our species-specific environments (Figures 1 and 2). **Rats:** This was achieved by adding “open field arena time” to the animals’ weekly schedule. The pool time consisted of 5-10 minutes of the rats playing in the pools with novel toys and experiencing human interaction. Animals were given access to gel cups.

**Rabbits:** This was achieved by introducing an open field arena. Sessions were 10-15 min, 1 to 2 times weekly. Later this was changed to a pen (8’x8’), allowing more space and water access. We gave them access to additional perches within the pen as well as chewable cardboard. We gave them novel enrichment such as toys stuffed with treats. The Greenfield site is also social-housing neutered males and females in the training colony. This has been very successful.

**Mice:** This was achieved by placing the mice in larger rat polycarbonate cages, (females cohoused and males cohoused), thus doubling their living space. To avoid aggressive behaviors, the Greenfield team added multiple novel types of interactive enrichment, including Innovive® spinning wheels, paper huts and dual-level platforms. We gave them access to multiple food and water sources and housed them 3-6 mice per cage. This allowed for a social and dominance hierarchy to form, while still accommodating individual space requirements that served as a means of escape.

**Guinea pigs:** This was achieved by modifying an older version of rabbit Allentown® caging with a tunnel connecting the two sides. We repurposed a polycarbonate panel from a canine cage to provide solid-bottom flooring, thus avoiding foot/paw issues. We removed the divider allowing access to both sides of the cage, which doubled their living space. We found that diamond soft bedding was the most adequate bedding. We also introduced open field arena lasting 10-20 minutes, 1-2 times weekly with human interaction and treats in the small pool.



Figure 1. From top left to right: Guinea pigs in open field area time; mouse in chewable biohut; rabbits commingled; rat open arena area.



Figure 2. From top left to right: Guinea pig flooring; rabbit pen (open field arena); rat double polycarb with perch, spinning biohut and chewable tube; rat polycarb with feeder, I chews, chewable biohut and spinning biohut; guinea pig housing with new floor and access door.

Results

Figure 1 shows a snapshot, over a 21-day period, of our average rabbit body weight. Day 0 represents weights following a simple surgery (spay and neuter) but before being commingled (animals are then comingled on day 7). On day 7, as suspected, the average body weight decreased during acclimation. Through day 14 and day 21, this graph shows that the average body weight increased back to day 0 body weights, confirming success in the rabbit’s food intake and ability to maintain weight while being cohoused (males and females).

Figure 2 shows a tally of desirable (normal) rabbit behaviors over the first 14 days of commingling spayed and neutered males and females, including grooming, interaction with toys and enrichment and other normal rabbit behaviors.

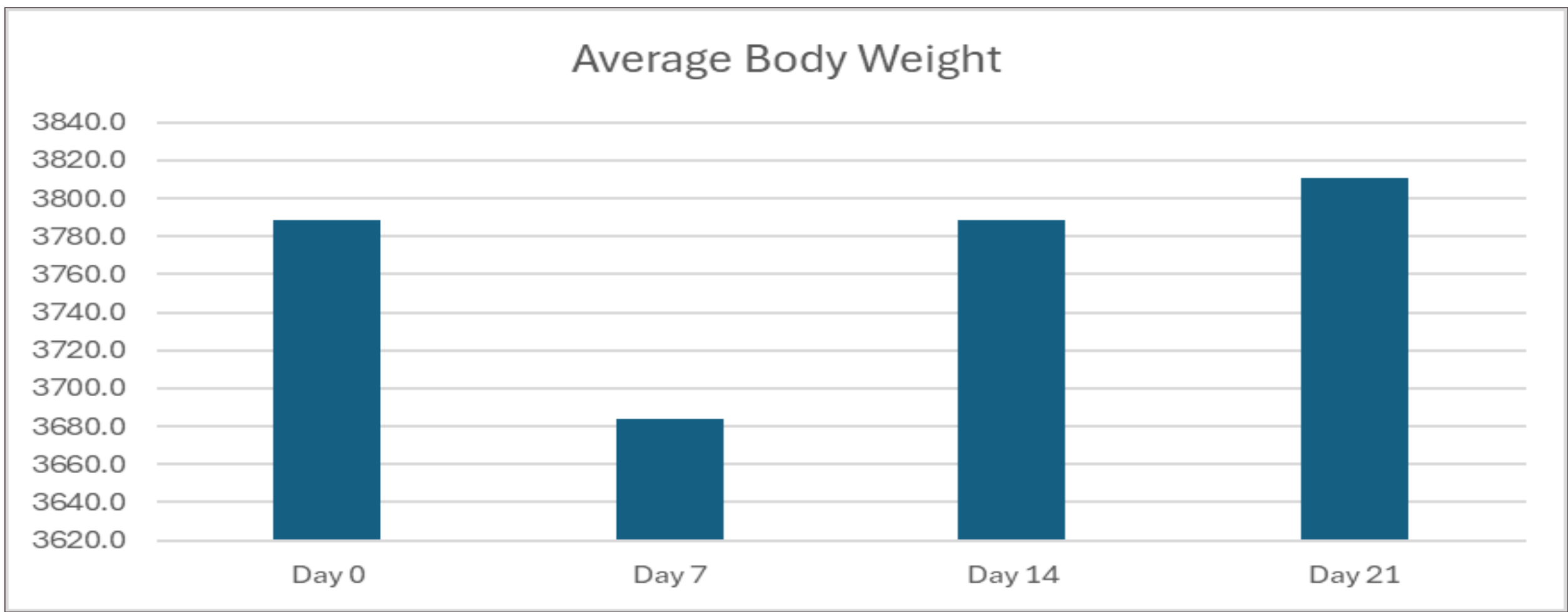


Figure 1. Average rabbit body weight.

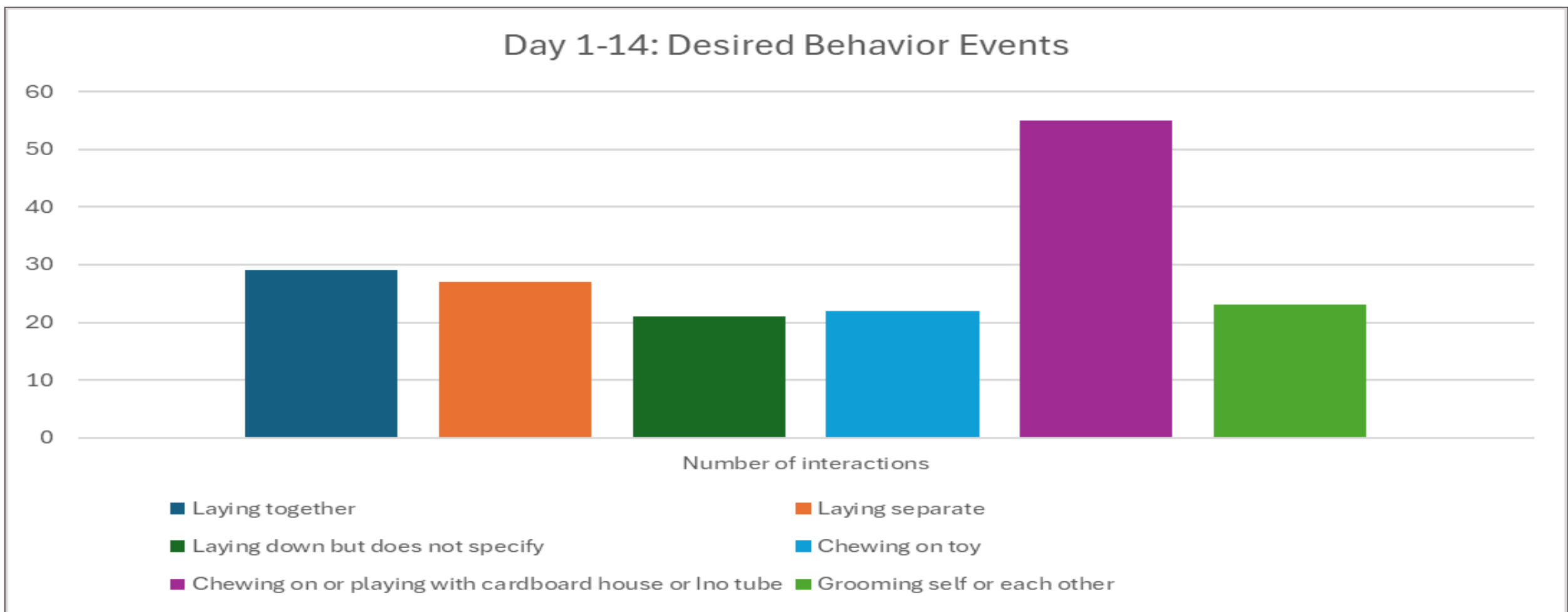


Figure 2. Rabbit behavior events.

Conclusions

Combining different types of environmental and social enrichment in novel ways involves many people of different backgrounds willing to share out-of-the-box thinking. This approach garnered several unique wins for our animal welfare and enrichment program that will stay with us for years to come. With the keen behavioral knowledge and real-time observations from Technical Training Staff and Animal Care, we were able to conclude some of the following observations:

Mice

- Reduction in barbering
- Less aggression toward cage mates
- Fewer flooding events
- Reduced aggression toward handlers
- More active
- Fewer stereotypies (e.g., cage flipping)

Rabbits

- Acclimated quickly during commingling (male and female)
- Less skittish
- Reduced urinary marking of cage mates
- Increased frequency and likelihood of human interaction

Rats

- Reduced aggression toward handlers
- Less vocalization
- Less skittish
- More likely to interact with handlers

Guinea pigs

- Cleaner with reduction in odor
- Less skittish
- Easier cage conversions
- Easier to handle and care for
- Fewer flooding events
- Increased environmental enrichment usage

