

# Hamster enrichment and social housing

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## Introduction

Providing our animals with the best welfare possible is one of our main goals as Animal Technicians.

As we want to deliver the most appropriate care for our hamsters, we have undertaken some research projects of our own to ensure the most suitable environment so they can thrive, while providing better welfare and more accurate results.

During multiple carcinogenicity studies we worked on aspects that we thought needed the most improvement: social housing and enrichment.

## Current hamster environment

Syrian hamsters are the most common strain of hamsters used in medical research. They are typically used in carcinogenesis studies due to their susceptibility to a variety of carcinogens and the development of tumours. They are also used in metabolic disorder and diabetes studies.

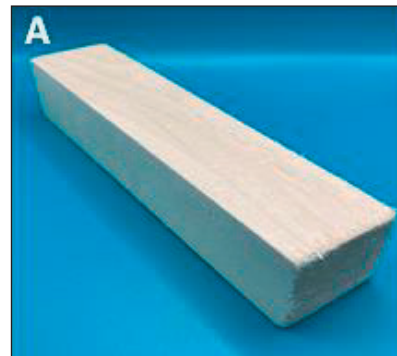
Hamsters are well known for their defensive behaviour and aggression. This aggression is notable enough that some universities are trying to genetically modify them to be more friendly.

Some labs may start group housing their animals but usually find that territorial behaviour starts to show around the age of sexual maturity, especially in females. There are limited choices for enrichment for hamsters in controlled environments. There are few non-dietary options that do not splinter or cause compaction. Most enrichment options are designed for rats or mice.

## Enrichment

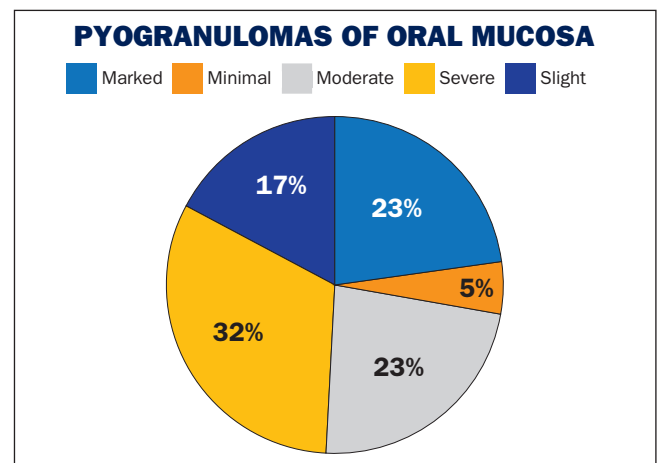
Originally the hamsters were provided with the same medium-sized wooden chew blocks that the rats are

typically housed with (Figure 1). Due to splintering in the pouches, the chew blocks were swapped for aspen balls.



**Figure 1.** Chew block.

The aspen balls were a relative success at first but once the study finished unusual findings were noted at pathology. It was discovered that the hamsters were trying to fit the aspen balls in their mouth which resulted in stretched muscles in the cheek pouches and an increased amount of mouth/oral cavity lesions and 56 instances of noncancerous pyogranulomas (Figure 2).



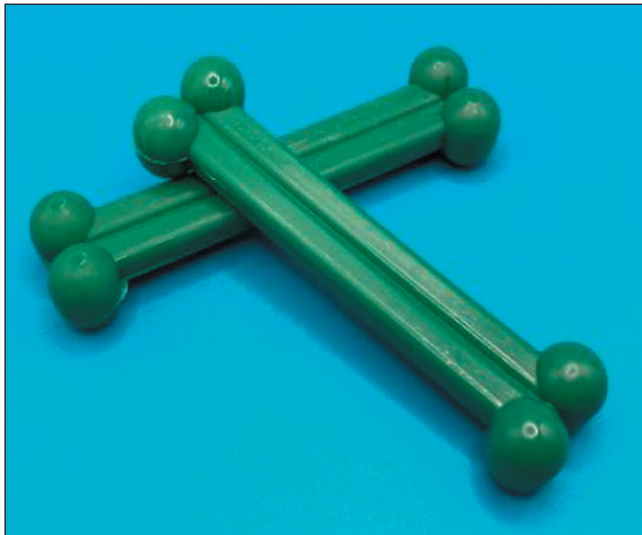
**Figure 2.** Pyogranulomas of oral mucosa with chew blocks/ chew balls available.



**Figure 3.** Pathology slide of hamster oral cavity. 1 tooth enamel, 2 cheek pouches, 3 pyogranulomas.

Out of 755 animals, 46 hamsters had oral cavity and mouth lesions as their cause of demise (Figure 3). Comparing this data with the initial removal of study, we found that these lesions caused bodyweight loss as well as multiple masses.

Due to these issues we needed to find a non-splintering, sturdy and non-ingestible alternative. We decided that the nylon green bones were the most appropriate enrichment that fulfilled our requirements (Figure 4).



**Figure 4.** Nylon green bone.

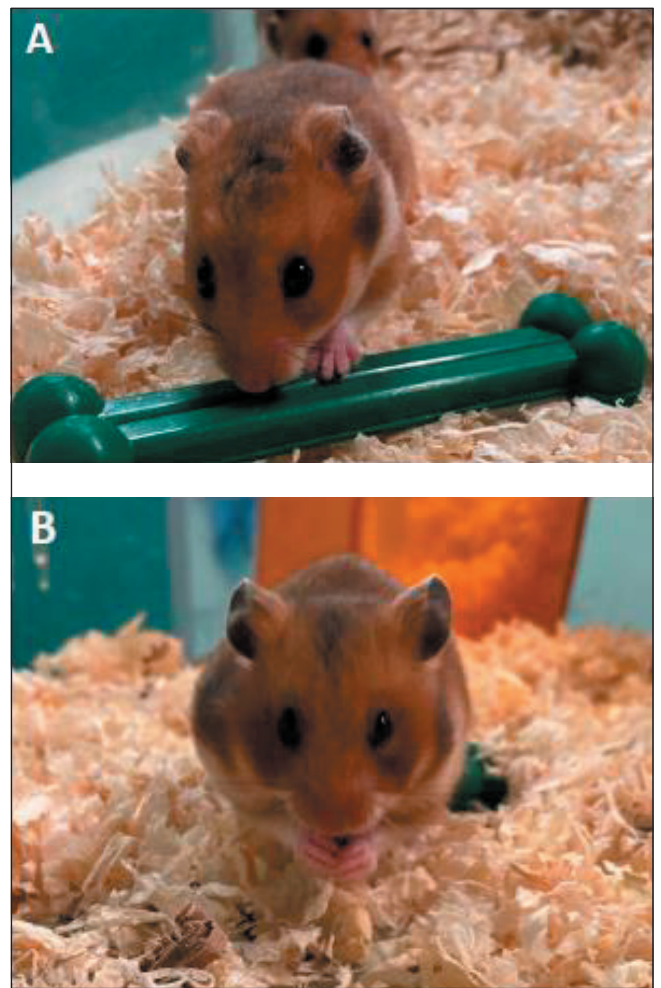
After monitoring the animals in the current study, we discovered that the hamsters interacted with the nylon bones positively with no signs of ingestion even after repetitive gnawing. After the end of the latest study, out of 836 animals, we had 0 pyogranulomas and only 2 animals that had oral cavity/mouth lesion recorded as their cause of demise.

## Social housing

At Labcorp Harrogate, we started group housing our hamsters in single-sex groups and up to 3 per cage. We house them in cages with a floor area of 2456.3 cm<sup>2</sup> and upon arrival they are 4 to 7 weeks old (Figure 6A).

We start our handling acclimatisation the day after arrival. This provides time for the hamsters to settle into their new home cage and familiarise themselves with their new cage mates.

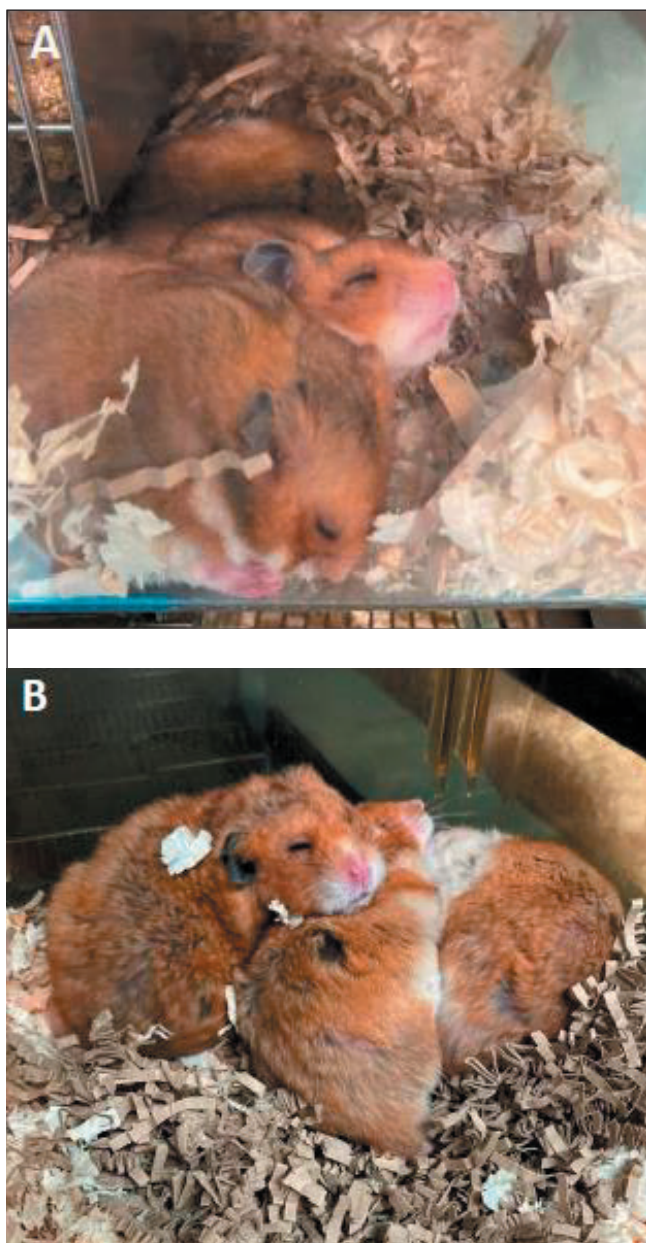
The daily handling consists of the animals being gently removed from the home cage and held in cupped hands until the animal is calm and is placed back into the home cage as recommended by NC3Rs. They are then positively rewarded with sunflower seeds (Figure 5B).



**Figure 5.** Nylon green bone in use (A). Hamster eating sunflower seeds (B).

This positive reinforcement is our key to ensuring happy friendly hamsters (Figure 6B).

Large enclosures, amber hides, large food hoppers with ad libitum access to diet, constant supply of water and daily dietary supplements reduce the need to fight for resources.



**Figure 6.** Hamsters 4 to 5 days after arrival (A) at the end of 2-year study (B).

## Conclusions

After our success with social housing as well as positive findings with the new enrichment type, we plan to further our research into providing hamsters with the best opportunity to thrive.

In the future we hope to find alternative caging, implement a dietary reward rotation after procedures and provide more interactive enrichment to ensure the hamsters can express their natural behaviour in a safe manner.

As the popularity of hamsters increases in laboratories, we want to provide them with the best care and welfare to ensure happy animals and more reliable data.