



Supplementary resources for members of local ethical review processes

Cage cleaning: Mice and rats





Introduction

Cage cleaning is obviously necessary for good animal health and hygiene. However, the process can cause distress to mice and rats, which can affect both the welfare of the animals and the quality of scientific data obtained from them.

There are two main causes of stress associated with cage cleaning.

- **It disrupts scent marking.** The sense of smell is very important to rodents. Smells provide information on food and predators and also on other animals of the same species, including important social information such as age, rank, sexual status and each individual's family group. When cages are cleaned, structures such as nests and latrine areas are destroyed, and the animals' scent marks are removed. This can be very stressful for the animals.
- **It involves handling the animals and moving their cages.** This has been found to cause stress responses to the extent that animal behaviour and physiology are significantly affected following cage cleaning. Because of this, it has been recommended that mice and rats should be allowed to recover for at least two hours after cage cleaning before any scientific data is collected [1].

The following comments and recommendations for minimising stress to rats and mice are based on the current laboratory animal science literature, but research on the topic is ongoing and it is good practice to review it regularly.

Minimising disruption to scent marking

- **When cleaning cages for mice, transfer some nesting material from the soiled cage into the clean cage.** Used nesting material contains hormones from glands in the body (such as the plantar glands in the foot pads) that inhibit aggression. Male mice, for example, were found to be less aggressive following cage cleaning when some nesting material was transferred from the soiled into the cleaned cage [2].
- **Do not transfer litter (such as sawdust) from the soiled cage.** Mice and rats urinate in the cage litter, and their urine contains hormones that can increase aggression - this is especially important in mice [2].
- **Take extra care with monitoring post-cleaning aggression in group housed male mice.** Cage cleaning can cause short term increases in aggression in any group but especially in male mice, so extra monitoring may be necessary in the immediate post-cleaning period [2,3].
- **Transferring material from the soiled cage does not seem to benefit rats.** Studies have shown that, when given a choice, rats do not appear to have a strong preference for their own scent marks over clean areas [4].

Reducing stress due to handling and being placed into the clean cage

- **Make sure that animals are handled competently and sympathetically.** Training in animal handling should help to ensure that all staff know how to catch and handle animals with care, minimising any distress to them. Recent research has shown that the traditional method of catching mice by the base of the tail induces aversion and anxiety. Handling can be refined by scooping them up in the open hand, or by using 'handling tunnels' [see reference 5].
- **Minimise noise throughout the process.** Noise can be minimised by using polycarbonate instead of metal cages and by calm, unhurried working when cleaning cages [1].
- **For non-breeding animals, clean cages as often as necessary to maintain a healthy environment and prevent levels of ammonia and micro-organisms from becoming harmful or unpleasant.** There is currently insufficient evidence to make any recommendations



on the best frequency of cage cleaning for rat or mouse welfare. For example, there are no clear effects of cleaning frequency on the welfare of non-breeding rats housed in stable groups [4]. Some changes in behaviour are observed after cage cleaning in non-breeding mice and rats, but these are short-lasting and the welfare implications are unclear - so this should not affect decisions on cleaning frequency [2,3]. The optimum frequency will depend on several factors including ventilation rates (which vary with caging type), the number of animals in each cage and the type of litter and nesting material provided.

Special considerations for breeding animals

- **Minimise the transfer of odours between cages containing different individuals when cleaning breeding rats.** This will reduce the risk of cannibalism and premature parturition [6].
- **Do not clean the cages of mice or rats during the last third of pregnancy or during the first two to three days following birth.** Animals are especially sensitive to disturbance at these times and cannibalism in breeding rats is especially likely if pups are under two days old at first cleaning [6].
- **Review your establishment's cage cleaning frequency for breeding mice.** Mouse pup mortality is greater when they are cleaned out every 7 days and less when cages are cleaned every 14 days [6,7]. If breeding mice are cleaned out weekly, consider whether this is necessary.

References

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