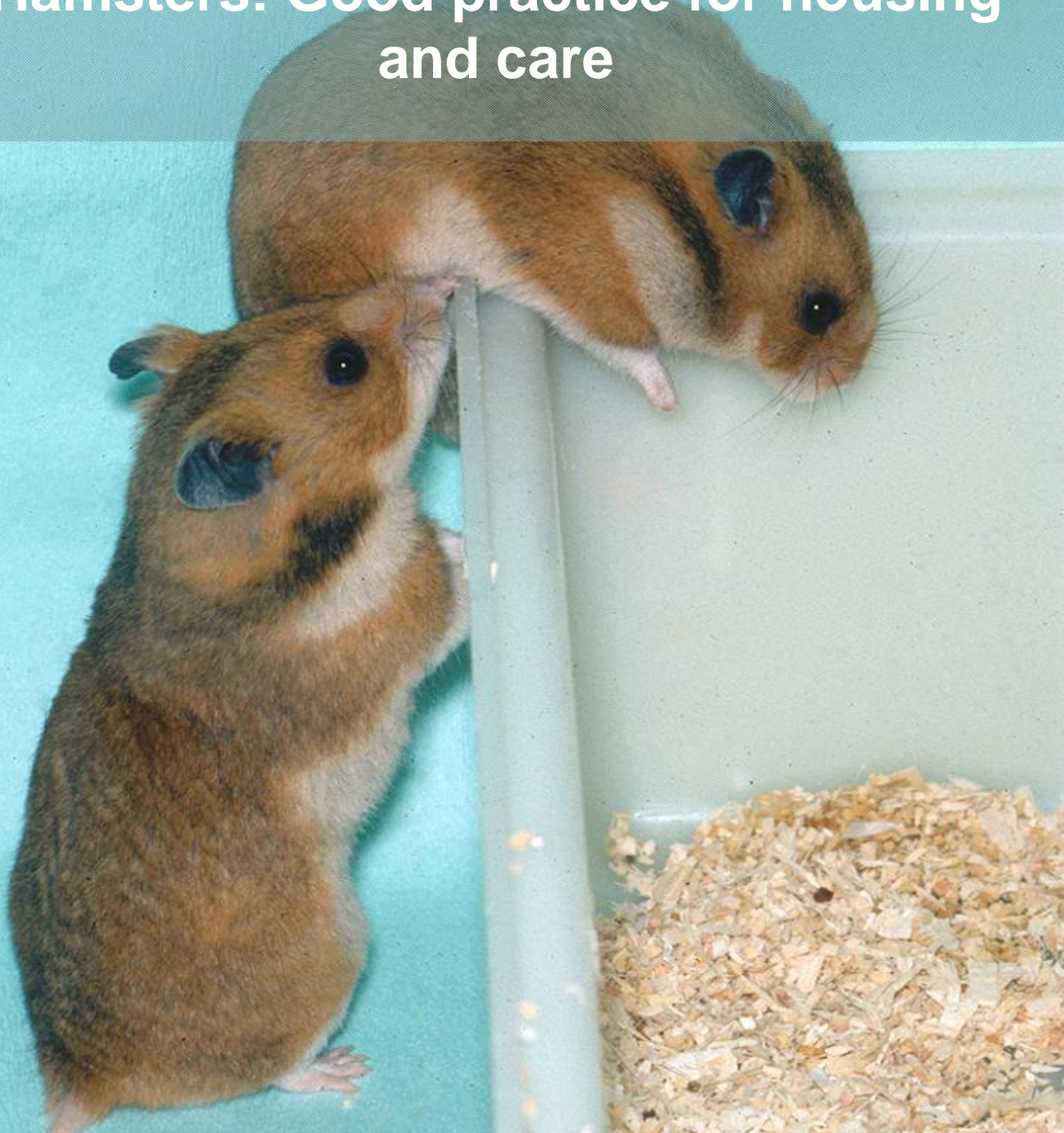




Supplementary resources for members of local ethical review processes

Hamsters: Good practice for housing and care





Before using these guidance notes, please read the introductory sheet that accompanies this series:
Supplementary resources for lay members: an introduction

Natural history

Several species of hamster are used in the laboratory, including the Chinese hamster (*Cricetus griseus*) and the Golden or Syrian hamster (*Mesocricetus auratus*). This document is about the Syrian hamster. These animals originate from the hot, dry climate of the Middle East. They are nocturnal and build nests in self-dug burrows where they sleep whilst escaping the extremes of temperature during the day.

Burrows contain several chambers with separate areas for nesting, defaecation/urination and hoarding of food items. Grains, chickpeas, insects and green plant material have been discovered in burrows, indicating that hamsters have quite a varied diet.

In the wild, hamsters tend to be aggressive towards each other and lead solitary lives, marking their territories by means of scent glands on their flanks. Hamsters only make social contact with others of their species in order to mate. Nursing mothers live with their dependent young, but otherwise hamsters live alone in their burrows.

What hamsters need

Compared with some other laboratory species, there have been relatively few behavioural studies that have evaluated hamsters' preferences and needs in a laboratory environment. The following list of requirements is based on the results of such studies, supplemented by published observations of hamsters in their natural habitat.

More information on enrichment, welfare, and suitable physical environmental conditions can be found in the references listed at the end of this document.

- **Housing that minimises aggression**

Syrian hamsters are solitary and territorial and consequently both sexes can be aggressive towards each other, so they are commonly singly housed. However, behavioural studies have shown that male laboratory hamsters prefer the company of other hamsters, even though this can result in agonistic encounters and injuries. It is possible for groups of same sex animals to be kept together if groups are formed at weaning or before puberty, and the animals are monitored closely to ensure that they remain compatible.

If hamsters are group housed, it is absolutely vital to provide adequate space and a stimulating environment, particularly refuges to allow animals to escape from each other within the cage. Groups must remain stable.



- **Plenty of space and height**

Hamsters need enough space for enrichment to be provided, to permit a range of behaviours, including exercise, foraging and digging, and to allow individuals to distance themselves from each other if they need to when housed in groups. It is therefore important to use the largest cages possible and to allow each hamster plenty of space.

Rearing on the hind legs is a natural exploratory behaviour for hamsters, so they should be able to rear up in at least part of the cage. As a guide, this will require a height of around 18cm for adult animals.

- **Solid floor with appropriate depth of litter material**

Solid floors should be provided - in common with many other rodents, hamsters prefer solid floors with litter to bare or grid floors. The litter absorbs urine whilst providing a cushioning surface to walk on. It should be provided in a thick enough layer to allow hamsters to express natural digging and hoarding behaviours. Wood shavings make particularly good litter because hamsters can incorporate these into their nests.

Grid floors should not be used since this does not allow the provision of litter. In addition, young animals can repeatedly step through the mesh of grid floors which may cause injury. Wire floors have also been shown to increase aggression and depression.

- **Nesting materials**

Hamsters are highly motivated to build nests, even when kept in warm conditions, so they should always be provided with appropriate nesting materials. This should be provided in addition to any litter. This is particularly important if the litter is a granular-type material that cannot be incorporated into nests.

- **Opportunities to forage and hoard**

Foraging and hoarding are natural hamster behaviours. Opportunities to express these can be provided by scattering or burying food items in the litter rather than only providing feed in pellet form in a hopper, and by providing nesting material in which the hamster can hide food.

- **Something to gnaw**

The incisor teeth of hamsters grow continually and are ground down in the wild when hard or gritty food is eaten. Laboratory hamsters can be provided with cardboard tubes, wood blocks or hay to perform this function.

- **Environmental enrichment including a refuge or shelter**

The provision of shelters has been shown to reduce aggression in hamsters. Shelters also allow group housed animals to hide from each other to help minimise aggressive encounters. In the wild, hamsters spend most of the time underground. Consequently a shelter that simulates a dark burrow with a tunnel-like entrance would be the most desirable design.

The complexity of the hamsters' environment can be increased by the provision of small cardboard boxes and cardboard tubes. These will be climbed on, used as shelters and also shredded and incorporated into nests.

Some establishments provide running wheels for hamsters, which the animals normally use extensively. However, there is some controversy as to the benefits of running wheels. They may either be viewed as a way of providing exercise and interest, or alternatively as facilitating an obsessive behaviour that disrupts normal time budgets. If running wheels are provided, these should be solid so as to avoid injury.



- **Appropriate light regimes**

Hamsters are nocturnal, so it is good practice for lighting regimes to be set so that the animals' active period (in the dark) is during the human working day wherever possible. This makes it easier to monitor wellbeing and may reduce stress caused by husbandry and experimental procedures.

- **Acceptable levels of ultrasound**

There are many sources of ultrasound in the laboratory, such as running water, electronic equipment including PC monitors and the animals themselves. Ultrasound is part of the natural environment for hamsters and does not necessarily cause problems, but it is good practice to check each room with a bat detector to ensure that electrical equipment is not creating excessive levels of ultrasound, as this would cause distress.

- **Sympathetic cleaning protocols**

Hamsters scent mark their territories so, as with some other rodents, cage cleaning can be very disruptive and stressful. They produce little bodily waste which means that cleaning may not be needed as often as with some other laboratory rodents. Transferring some of the used nesting material (but not litter) from the soiled into the clean cage may reduce stress associated with cage cleaning.

Nursing mothers have been known to abandon or kill their young if their environment is disturbed and so cleaning should be restricted to every two weeks for breeding females, avoiding the first two to three days post-partum, to minimise the disturbance to the nesting environment.

Potential husbandry related welfare problems and how to resolve them

Abnormal or undesirable behaviours such as stereotypies (e.g. back-flipping or circling), anxiety or apathy can indicate that an animal's environment is inappropriate and that the animal is unable to cope. Abnormal behaviours are indicators of poor welfare and if observed there should be a full review of housing and care, addressing all of the issues in this resource.

Aggression in group housed animals should be addressed by ensuring that space allowances and stocking densities are adequate and go beyond legal minimum standards. Adding extra refuges and making sure that an appropriately complex environment is provided can also help to reduce aggression and fighting.



Hamster housing and care: ERP aide-memoire

- ❖ **Social housing that minimises aggression (housed in same sex groups, formed during weaning or before puberty; females individually housed when aggression levels require it)**
- ❖ **Plenty of space to provide a stimulating environment, and height for rearing**
- ❖ **Solid floors with litter deep enough for digging and hoarding behaviours**
- ❖ **Nesting material**
- ❖ **Opportunities to forage and hoard**
- ❖ **Something to gnaw**
- ❖ **Additional environmental enrichment (e.g. burrows, cardboard boxes) and refuges**
- ❖ **Sympathetic cleaning protocols with some used nesting material (not litter) transferred to the clean cage**

Notes



Recommended references

1. Whittaker D (2010) Hamsters. Ch. 24 in: *The UFAW Handbook on the Care and Management of Laboratory Animals*, 8th edn (R Hubrecht & J Kirkwood, eds), pp 348-358. Oxford: Wiley-Blackwell Ltd.
2. Kuhnen G (2002) Comfortable quarters for hamsters in research institutions. In: *Comfortable Quarters for Laboratory Animals*, 9th edn (V & A Reinhardt, eds), pp 33-37. Washington DC, Animal Welfare Institute, www.awionline.org
NOTE: the 10th edition of *Comfortable Quarters* is under production at the time of writing.
3. NC3Rs (2008) *Rodents*. www.nc3rs.org.uk/informationportal click on "Rodents".
4. Sørensen DB, Krohn T, Hansen HN, Ottesen JL & Hansen AK (2005) An ethological approach to housing requirements of golden hamsters, Mongolian gerbils and fat sand rats in the laboratory - a review. *Applied Animal Behaviour Science* **94**: 181-195.



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