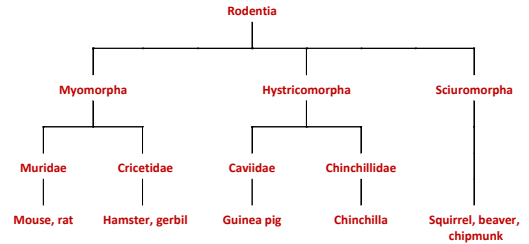


# Hamsters

1

## Classification of rodents



2

## Hamsters

- Myomorpha
- Common strains Golden or Syrian hamster (*Mesocricetus auratus*)
- Also used are the Chinese hamster (*Cricetulus griseus*)
- Open rooted teeth so care needs to be taken to avoid malocclusion
- Hamsters are known widely for their cheek pouches, in which they gather food, to store in deep burrows, particularly when photoperiod is decreasing.
- The pouches are unusual in having no lymph drainage and, therefore, do not reject tissues transplanted to them. This is useful in immunological and other research.



3

## Environmental conditions

Condition	Recommendation
Air	Need to maintain suitable air quality, and air flow rates may differ depending on housing situation. 15-20 is usually sufficient for a fully stocked room but where stocking density is low 8-10
Temperature	20 - 24°C
Humidity	45 - 65%
Lighting	350 - 400 lux at bench level but lower for albino animals.
Photoperiod	12 - 12 photoperiod
sound	Sensitive to ultrasound Over 20KHz problematic

4

## Behaviour

- These animals are solitary animals, and will attack each other. Females will attack males except for the brief period during oestrus, and often attack other females
- They are readily tamed and rarely bite unless startled or handled roughly
- Males are more docile than females
- Territory marking is done using a secretion from the flank gland

5

## Nutrition

- Hamsters can eat a variety of foodstuffs, including seeds and grains, leaves, fruits, occasionally insects and other sources of protein (omnivorous). Usually fed a standard rodent diet in the laboratory situation.
- The bacteria throughout the hamster's digestive system, starting with the oesophagus and ending in the colon, help break down the food and release the nutrients. A Hamster's stomach consists of two parts. A fore stomach and glandular stomach almost ruminant like.
- Coprophagy
  - soft faeces ingested during dark period
  - hard faeces deposited on the floor of the cage

6

LO: 3.1.1 7

### Hamster Anatomy



7

LO: 4.10 9

### Breeding

- Mating occurs over the dark period, fertility is lower during the winter.
- Oestrus can be detected by looking for post-ovulatory discharge. This is a thick creamy vaginal discharge.
- Pups are altricial –naked, blind and deaf when born
- Hamsters commonly abandon or kill their young. This can be caused by environmental disturbances, inadequate nest material or early handling of the mother and young
- Weaned at 15 – 16 days
- Economic breeding life is usually 6 litters

9

LO: 4.10 11

### Breeding systems

- Arranged – Males and females are usually kept separately, and put together for a short period after dark. If the females does not accept the male, he should be removed at once. Otherwise he will be removed at the end of the dark period, before the light part of the cycle starts
- Monogamous pair – as long as they are paired before puberty and keep permanently together
- Harems can be set up with several females and males together. Females are removed before parturition and returned after weaning. This system can lead to fighting
- Alternatively females can be rotated through the males cage on a weekly basis, 1 male can be used for up to 7 females

11

LO: 3.1.1 8

### Biological data

Data	Syrian Hamster
Adult weight (g)	M: 85 – 130 F: 95 - 150
Natural lifespan	1 - 3
Rectal temperature (°C)	37 - 38
Heart rate/min	250 - 500
Blood volume (ml/kg)	78
Respiratory rat/min	35 - 135



8

LO: 4.10 10

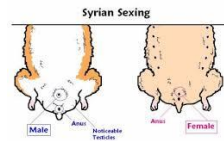
### Breeding data

Breeding terms	Syrian
Puberty	32 – 42 days
Age at first mating	M: 10 -14 weeks F: 6-10 weeks
Gestation period	15 -16 days
Average litter size	7 - 9
Birth weight	2 – 3g
Weaning age	20 - 25 days
Oestrus cycle	4 days
Post partum oestrus	Infertile

10

LO: 3.1.1 12

### Sexing Hamsters



12

LO: 3.1.5 &amp; 4.6

13

## Diet

- Nutrient requirements vary
  - strain
  - maintenance vs production
  - environment and microbiological status (different intestinal flora influence nutrient requirements)
- Usually fed on standard rodent diets consisting of 16% protein, 5-7% fat and 60-65% carbohydrates
- They eat 5-7g diet per day
- They have blunt noses, hamsters cannot feed from standard wire mesh suspended hoppers. They need hoppers with slots greater than 11 mm, so they can pull the food through onto the floor.

13

LO: 3.1.5 &amp; 4.6

14

## Water

- Hamsters need 10 ml water per 100 g body weight daily.
- Water bottles or automated systems can be used, but the sipper tubes must be stainless steel as they will chew the sipper.
- Fresh water must be provided daily and must be checked/treated to ensure no water-borne pathogens are introduced.
- For breeding animals, the sipper tubes should extend low into the cage so that neonates can reach them.
- Lactating females have a greater water requirement.



14

LO: 4.1 &amp; 4.2

15

## Housing for laboratory Hamsters

- Hamsters are solitary and prefer to be housed individually.
- They are adept at chewing so you will need to provide strong plastic solid based cages. They can be kept in normal rodent caging such as IVC's or conventional caging
- Little waste is produced, and cages can be cleaned out one to two times weekly.
- Must also provide for behavioural needs of animals
  - Opportunities for animals to perform natural behaviours
  - Failure to provide these opportunities can lead to abnormal behaviours, called stereotypies



15

LO: 5.2

16

## Stereotypic behaviour

- Persistent repetitive behaviour, with no obvious purpose
  - Pacing
  - Flipping
  - overgrooming/ barbering
- Need to provide enrichment to combat this behaviour
  - Wheels
  - Tunnels
  - Deep bedding



16

LO: 4.7 &amp; 7.1 &amp; 7.2

17

## Handling

- Hamsters may bite if startled and should be picked up gently but firmly, by cupping the animal in the hand.
- They are restrained by grasping a large pinch of scruff and turning over into the hand
- If insufficient scruff is grasped, the hamster will turn and bite



17

LO: 5.2

18

## Hamster diseases

- Hamsters are relatively free from clinical diseases.
- They may get non-specific enteritis, known as 'wet tail', which is sometimes associated with Salmonella or Campylobacter infection, both of which are potentially zoonotic.
- They can also carry LCM and Sendai viruses, and these should be included in the regular health-screening programme.



18

LO: 5.2

19

## Recognition of PSD and LH

### Hamster

- Weight loss
- Extended sleep period
- Hunched and immobile
- Increased aggression
- Depression
- Ocular discharge
- Diarrhoea



19

LO: 4.8

20

## Identification methods

- Appearance/coat colour
- Ear notching
- Microchips
- Ear tags
- Use least severity method

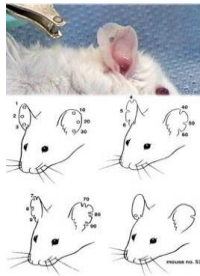


20

LO: 4.8

21

## Ear notching



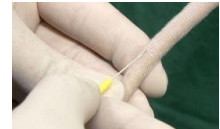
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LO: 7.4

22

## Minor procedures

- Oral dosing – Gavage or food/water or tablets/paste
- Subcutaneous – between shoulder blades
- Intraperitoneal – left/right lower quadrant of abdomen
- Intramuscular – hind limb
- I.V. dosing or blood sampling!
  - Saphenous vein
  - Jugular Vein



22

LO: 7.5

23

## Recommended sample volumes

		Routes and volumes (ml/kg)				
		Oral	S/C	I/P	I/M	I/V
Hamster	Ideal	10	5	5-10	0.1**	5
	Maximum	20	10*	20	0.2**	20 slow injection

\* Divided in 2-3 sites

\*\* Total ml/site (2 sites per day)

23

LO: 1.12

24

## Schedule 1 methods for category A

- Overdose of an anaesthetic
  - Use a route and agent appropriate for Hamsters
- Exposure to carbon dioxide
- Dislocation of the neck
  - Up to 500g
- Concussion of the brain
  - Up to 1kg

24

## Confirmation of death

- Schedule 1 requires death to be “confirmed” before disposal of the animal. This is not optional.
  - Permanent cessation of circulation
  - Destruction of the brain
  - Dislocation of the neck
  - Exsanguination
  - Onset of rigor mortis
  - Mechanical disruption
- The animal must be killed before one of these “completions” is applied
- A different method from the method of killing must be used

25



26