

VETS30030/VETS90122 Module 4: Small mammals as pets

‘Exotic Pet Practice’ refers to the veterinary care of a large range of domesticated and non-domesticated species that includes many small mammals, but also birds, reptiles, amphibians, fish and invertebrates. Although ‘exotic’ means an animal that is not native to the country where it is kept, and thus will vary according to location, the term is frequently used generically to encompass non- cat/dog pets, and includes both domesticated and wild species. This field of veterinary practice is popular and rapidly expanding, in response to the growing interest in keeping these species as companion animals or for interest. Owners acquire ‘exotic’ pets for a variety of reasons, including a desire for something unusual, novelty value, genuine zoological interest, inappropriate marketing, or a perception that these animals are easier to keep and less demanding than the more traditional cats and dogs. Unfortunately, these motivations are often misguided and there are numerous welfare and health issues associated with inappropriate husbandry and management.

Veterinarians have a key role to play in the exotic pet industry, and small mammal species are frequently encountered in general veterinary practice. Small mammals kept as pets include a variety of species of rodents, rabbits, ferrets, which are all domesticated, and a variety of largely undomesticated species such as African pygmy hedgehogs, small marsupials (e.g. sugar gliders), skunks, raccoons, often driven by the latest trend or media-driven lifestyle choice with little regard for animal welfare. This lecture will only cover the commonly kept **rodents, rabbits, and ferrets**.

Whilst in the past many small mammals were considered children’s pets, they are now commonly kept by adults as highly valued companion animals, and many species are not suitable for young children. All veterinarians should have an understanding of their anatomy, biology and husbandry and be able to offer basic veterinary care and advice. Most diseases are caused by inappropriate husbandry and diet. Rabbits, rodents and ferrets can be considered a normal part of companion animal practice - even though they are still routinely labelled ‘exotic/unusual’ pets this is misleading. These species are fully domesticated with large numbers of ‘fancy’ breeds and varieties derived from the wild-type animal. There is also a strong showing/breeding cohort of owners in many countries, where animals are bred in larger numbers mainly for showing or supplying the pet industry, and veterinary treatment will frequently be on a group rather than individual basis.

Many vets develop a special interest or acquire advanced skills or specialist qualifications in this field, and there are special interest groups (SIGs) such as the Unusual Pet and Avian Veterinarians (UPAV) SIG of the AVA, and equivalents globally. Dedicated text books, journals and formularies and a small but growing number of licensed veterinary drugs are available but there are still limited scientific studies and evidence -based literature, and most drug use is off-label. Some practices are tailored exclusively to exotic pets and wildlife. Veterinary knowledge and experience with rabbits, rodents and ferrets is also relevant to laboratory animal practice, and much basic knowledge has been derived from this field.

Some countries do not permit the keeping of certain species if they are non-native/pest species e.g. hamsters are not permitted as pets in Australia, but are common in Europe and North America, and rabbits are outlawed as pets in Queensland.

Small mammal behaviour: Rodents and rabbits are prey species, and are therefore stressed by the presence (sight/sound/smell) of predators and in unfamiliar surroundings, especially large open spaces and bright light, such as in a veterinary practice environment. Predators include cats, dogs and ferrets,

and unfamiliar humans. Rodents and rabbits are also highly social (with the exception of golden/Syrian hamsters) and so separation from a familiar, bonded companion is also highly stressful. Due to their prey status, rabbits and rodents tend to hide overt signs of disease until these are advanced – this is a normal response sometimes referred to as the ‘preservation reflex’, to avoid attracting the attention of a predator. Stress has many adverse effects, particularly on the motility of the gastrointestinal system and immune function. Minimisation of stress is therefore essential when dealing with these species. Surgical neutering is commonly performed in rabbits and rodents to prevent breeding, and the development of uterine adenocarcinoma in rabbits and cystic ovarian disease in guinea pigs.

RODENTS

The commonest pet rodents can be divided into two main groups, based on their taxonomy, with important differences in **dentition, diet and gastrointestinal function, and reproductive strategies (see Table 1)** that influence their predisposition to disease and their veterinary care.

1. **MOUSE, RAT, HAMSTER, GERBIL** are Myomorphs – the ‘mouse-like’ rodents:
2. **GUINEA PIG (CAVY), CHINCHILLA, DEGU** are Hystricomorphs – the ‘porcupine-like’ rodents:
(A third group sometimes kept as pets are the sciromorphs – the ‘squirrel-like’ rodents, such as chipmunks and prairie dogs)

All rodents have 2 upper and 2 lower chisel shaped incisor teeth, no canines (a large gap or diastema between incisors and cheek teeth with cheek folds or pouches (hamsters, chipmunks)), and cheek teeth (premolars/molars) for grinding food. The incisor enamel in some species is highly pigmented – orange/yellow in colour. Guinea pigs, chinchillas and degus are prone to dental disease which is usually dietary-induced due to lack of fibre (overgrowth and malocclusion). They have a simple stomach and large caecum – particularly the hystricomorphs (hind gut fermenters). All rodents are coprophagic- they eat their faeces; this is an important digestive strategy.

RABBITS

Rabbits are not rodents, but ‘lagomorphs’ (along with hares). There are important differences in anatomy between rabbits and rodents, particularly in dentition, gastrointestinal tract and reproductive tract (see table 1). They have a simple stomach and large caecum (hind gut fermenters). Rabbits are coprophagic and produce two distinct types of faeces - soft caecotrophs eaten directly from anus, and firm faecal pellets which are not eaten. All rabbit teeth grow constantly and they are prone to dental (overgrowth and malocclusion) which can be genetic or dietary-induced (lack of fibre). Breeds with ‘lop’ ears are prone to aural disease. Rabbits are increasingly kept as house pets, and can be litter-trained.

FERRETS

Ferrets are a domesticated European polecat from the Mustelid family (similar to weasels, stoats, mink) Ferrets are carnivorous predators, reliant mainly on scent rather than sight for hunting, and are still used in many countries including the UK as working animals for hunting rabbits. Dentition is similar to cats and dogs with large canine teeth and a strong bite. They are intelligent active hunters and make amusing pets although can be aggressive if not handled from a young age. Chemical neutering with hormonal implants (deslorelin, a GnRH agonist) is recommended in pet ferrets as it prevents hyperoestrogenism in females, and adrenal gland disease in both sexes, both common disorders that lead to hair loss and severe immunosuppression. Adrenal gland disease is linked to surgical neutering.

Chemical neutering also decreases their characteristic strong smell but will not eliminate it completely. Ferrets are susceptible to many of the same infectious and non-infectious diseases as dogs and cats, including distemper and cardiomyopathy. They are also susceptible to influenza viruses and coronaviruses (including SARS-CoV2 that causes Covid19) from humans and are used as animal models for these diseases.

Table 1. Some key features of rodents and rabbits of relevance to husbandry and disease:

	MOUSE, RAT, HAMSTER, GERBIL	GUINEA PIG, CHINCHILLA, DEGU	RABBIT
DENTITION	Dental formula 1/1 0/0 0/0 3/3 Incisors grow constantly, cheek teeth do not. Mandible wider than maxilla	Dental formula 1/1 0/0 1/1 3/3 All teeth grow constantly. Mandible wider than maxilla. Prone to acquired dental disease	Dental formula 2/1 0/0, 3/2 3/3 All teeth grow constantly Maxilla wider than mandible. Prone to dental disease – congenital and acquired
DIET and GASTROINTESTINAL TRACT	Omnivores/herbivores - commercial pellets/ mixes, limit high-fat seeds Coprophagic	Herbivores, hind gut fermenter, large caecum. Grass, hay, leafy greens, limited amounts high fibre pellets Dental health, gut motility and health dependent on high fibre diet. Guinea pigs require dietary vitamin C. Coprophagic	Herbivores, hind gut fermenter, large caecum Grass, hay, leafy greens, limited amounts high fibre pellets. Dental health, gut motility and health dependent on high fibre diet. Coprophagic (two distinct types of faeces)
REPRODUCTION	Females have separate vaginal and urethral opening, no vulva. Vaginal plug after mating. Two uterine horns, one cervix Spontaneous ovulation Short gestation, altricial (undeveloped) young	Females have separate vaginal and urethral opening, no vulva. Vaginal plug after mating not visibly obvious Two uterine horns, one cervix Spontaneous ovulation (except degu, needs male presence) Long gestation, precocial (highly developed) young	Females have vulva Two uterine horns and two cervices Induced (reflex) ovulation Short gestation, altricial young

Table 2. Basic biological data for small mammal pets

Species	Life expectancy (yrs)	Maturity	Oestrus (days)	Gestation period (days)	Size of litter	Age at weaning	Adult weight	Body temp C
Mouse	1-2.5	3-4 weeks	Every 4-5	19-21	5-12	21 days	20-40g	37.5
Rat	3	6 weeks	Every 4-5	20-22	6-12	21 days	400-800g	38
Gerbil	1.5-2.5	10-12 weeks	Every 4-6	24-26	3-6	21-28 days	70-130g	38
Syrian hamster	1.5-2	6-10 weeks	Every 4	15-18	3-7	21-28 days	100-200g	38 Hibernates
Chinese/ Russian hamster	1.5-2	6-10 weeks	Every 4	19-22	3-5	21-28 days	20-40g	38
Guinea Pig	4-7	Male 8-10 weeks Female 4-5 weeks	Every 15-16	60-72 (av 65)	2-6	21 days	750-1000g	38-39
Chinchilla	10-15	8 months	Every 30-35 Nov-May	111	1-4	6-8 weeks	400-500g	38-39
Degu	7	3-6 months	Every 21, need male presence	87-93	4-6	4-6 weeks	170-300g	38
Rabbit	10-15	3 months	Induced (reflex) ovulator, seasonal, can develop pseudopregnancy	30-32	32	6 weeks	1-10 kg depending on breed	
Ferret	6-8	6-9 months	Induced (reflex) ovulator, seasonal, prolonged oestrus if unmated	42	2-10	8 weeks	0.5-1kg (f); 1-2 kg (m)	37.8- 40

