

TREATMENT APPROACHES AIMED AT KEEPING CHIPMUNKS IN TUNE

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Livia Benato details the biology of an increasingly popular pet animal, and explains how husbandry and environment make a difference to their health

CHIPMUNKS are rodents belonging to the family **Sciuridae**. The most common species found in captivity are the Siberian (*Eutamias sibiricus*) and eastern (*Tamias striatus*) chipmunks.

The Siberian chipmunk is native to Siberia, Mongolia, Korea and the northern regions of China and Japan. The eastern chipmunk is common in the east coast and mid-western states of North America, from Hudson Bay to Mississippi and from Minnesota to the Atlantic coast.

Coat colours and dentition are the main distinguishing features between these species. While both have five black stripes on their back, the eastern chipmunk also has a white stripe between two black stripes on each flank. The Siberian chipmunk also has two upper premolars in each dental arcade, while the eastern chipmunk has one ([Table 1](#)).

The body length (head to tail tip) of an adult chipmunk is approximately 20cm to 25cm, with the tail comprising 10cm of the overall length. Bodyweight is between 70g and 120g.

Similar to hamsters, chipmunks transport food and nest material in cheek pouches. When the cheek pouches are fully expanded, they extend to the shoulders and reach a volume close to the size of their head.

In a similar fashion to other rodents, only the incisors grow continuously and have a characteristic yellow colour. It seems that chipmunks can see very well and appear to have full-colour vision.

Neonatal chipmunks can usually be sexed from seven days of age, with the anogenital distance being longer in males than females. Female chipmunks have four pairs of nipples and a duplex uterus. Males possess an os penis and a scrotum.

Chipmunks are diurnal ground squirrels. In the wild, they climb trees and jump between branches, but they generally live on the ground. They burrow and create nests in the soil in areas protected by tree roots, stones or bushes. In captivity, they will mimic these habitat-seeking behaviours.

Winter torpor

During the winter, generally from October to March, chipmunks enter a torpid state, spending most of the time hidden in their nests. They do not hibernate, as they do not store fat tissue, but store food in their burrows. During winter, they sleep for five to eight days, waking for short periods to eat and defecate before repeating this cycle. Due to this behaviour, it is not abnormal to see them during the day (searching for food) before disappearing again for a few days. In winter, it is still important to provide food, although the quantities offered can be smaller.

Housing

Chipmunks can be housed in indoor or outdoor enclosures. If housed indoors, a wire mesh cage should be provided with a minimum size of (L) 80cm x (H) 50cm x (W) 80cm for one pet, and double this size for a pair. As they are ground squirrels, the horizontal space requirements are more important than providing height; bird cages do not make suitable enclosures for chipmunks. The mesh should be small to prevent escapes and limb injuries, and the floor should be of hard plastic that is strong enough to resist gnawing. The cage should be positioned in a room at a constant temperature and well away from radios and televisions, as chipmunks are very sensitive to background noise. Space requirements are critical for chipmunks, as overcrowding can lead to stress.

Outdoor aviaries, with large floor spaces, are typically used to house a larger number of chipmunks. The aviary walls should be constructed from small wire mesh and the floor should be concrete or provided with an underground wire mesh to prevent escapes while burrowing.

Both indoor and outdoor enclosures should be furnished with branches for the chipmunks to climb, a wheel, a nesting space for each animal and water bottles and food bowls. A deep layer of straw and newspapers can be used as a substrate and nestbuilding material. Chipmunks are very clean, as they tend to create latrines; they store their waste in one corner, thus simplifying daily cage cleaning.

Diet

Chipmunks are omnivorous. They need a balanced diet that is low in fat to avoid obesity. They should be fed both fresh and dried fruits, seeds, veg etables and a source of protein. Ideal fruits include apples, pears, peaches, mandarins and oranges, nuts, walnuts, chestnuts and pine nuts.

Chipmunks are not dietary specialists and will eat a range of vegetables. However, they prefer carrots, dandelions, tomatoes and lettuce. Good protein sources are mealworms, light dog biscuits, cooked chicken and yoghurt. Two 10g meals of fruits, seeds and vegetables per animal (plus the protein source) are adequate for chipmunks' maintenance requirements.

If the diet is balanced, vitamin supplementation is not necessary. Peanuts and sunflower seeds, stored under appropriate conditions, should be given only as treats.

Reproduction

Chipmunks are easily stressed, and this can have a major impact on reproduction. Eastern chipmunks reach sexual maturity when they are 11 months old.

Chipmunks are seasonally polyoestrus, with reproduction occurring between February and September or October. This time is generally divided into two phases, from February to April and from June to August. The female oestrous cycle is 10 to 12 days and the oestrous duration is two to three days. During the breeding season, the male's testicles descend into the scrotum, while the female's vulva becomes congested and oedematous. During this time, they are very active and incessantly call to each other. If the female doesn't get pregnant after two weeks, the cycle will be repeated.

Pregnancy lasts 30 to 32 days, with one to three pregnancies per breeding season. The litter size is between two and nine kits, and they are born precocial. Weaning lasts approximately eight weeks.

It is important not to disturb a lactating mother. The male should be removed from the cage before parturition occurs to avoid aggression against the newborn chipmunks.

Behavioural problems

Even in captivity, chipmunks maintain their wild character and it is very difficult – although not impossible – to tame them.

For this reason, they are easily distressed and develop behavioural problems.

The first signs are hyperactivity and stereotypical behaviours, such as continuous circling or horizontal movements. The main causes of behavioural problems are small and/or overcrowded cages, lack of adequate nesting sites, continuous handling, proximity to predators (including domestic pets), and televisions, radios and stereos placed near their cage. Treatment is based on investigating then removing the inciting causes.

Diseases

The initial approach to clinical examination of the chipmunk should be “hands off”, as restraint of this species can cause major distress.

• Initial observations

Observe the chipmunk inside its cage to evaluate demeanour, stereotypic behaviours and respiratory rate. To facilitate handling, a towel or a leather glove should be used. This will also avoid painful bites. Chipmunks should be restrained by placing one hand around the thorax, controlling the head, with the other hand supporting the hindlimbs. The rest of the physical examination is similar to other rodents, evaluating the animal from head to tail.

• Skin disease

Alopecia and erythema in chipmunks can be due to several causes such as stress, parasitic infestation (mainly due to fleas and mites), ringworm, an incorrect diet, suboptimal husbandry or a combination of these causes. These skin disease should not be confused with physiological alopecia due to two annual moults – one in spring and one in autumn.

• **Pododermatitis.** This can be caused by wire mesh on the floor of the cage or inadequate cleaning of the chipmunks’ bedding. Either situation will irritate the plantar surfaces when the chipmunk walks, leading to infection and secondary changes in ambulation. Wire mesh should be removed and replaced with soft bedding, such as kitchen paper, hay or newspaper.

• Wounds and abscesses.

These are often a consequence of fights between animals if the cage is too small or overcrowded, leading to the chipmunks being unable to establish territories within the cage. Treatment consists of lancing the abscess under general anaesthesia, antibiotics and reducing stress.

• Tail degloving and necrosis.

This can occur when chipmunks are restrained by it, rather than the chest. The former method of restraint is not recommended. If degloving occurs, it will be necessary to amputate the tail just above the de-gloved section. Tail necrosis due to *Candida albicans* has also been reported. The

treatment of choice is also surgical amputation.

- **Cheek pouch diseases.**

These are common in pet chipmunks. The main causes are abscesses, neoplasias, impaction due to incorrect nest material (such as cotton wool), prolapses and infection as a consequence of foreign bodies. Once the cause has been identified, it is possible to flush and clean the cheek pouch with disinfectant liquids, such as dilute povidoneiodine. Surgical removal of the cheek pouch can be considered as a treatment option if indicated.

- **Dental disease.** This is generally due to incisor overgrowth. The aetiology can be congenital, or acquired through trauma or infection. The treatment method is to regularly burr down the teeth. The use of clippers and scissors is contraindicated, because this can lead to teeth fractures. Removing the incisors surgically is an option, but this can be very difficult due to the long roots and the potential for mandibular fractures.

- **Influenza.** Chipmunks, like ferrets, seem to be very susceptible to infection with human strains of the influenza virus, leading to a viral pneumonia. Treatment consists of supportive care and antibiotic administration to protect against secondary bacterial infections. The transmission risk is minimised by humans symptomatic for influenza by avoiding contact with pet chipmunks.

- **Diarrhoea.** Clinical signs in chipmunks are loose faeces, a stained perianal area, lethargy, anorexia and a dull coat. The main causes are stress, diet change, mouldy food, poor hygiene and infection with *Coccidian* species. Treatment consists of supportive care and addressing the specific cause.

- **Pyometra and cystitis.** These are the most common diseases of the urogenital tract. Clinical signs include discharge from the vulva, increased toileting, a stained perianal area, polydipsia, lethargy and anorexia. Pyometra can be diagnosed by clinical signs, abdominal palpation and ultrasonography, and treated with ovariohysterectomy. Cystitis can be diagnosed by urinalysis via the use of a dipstick test, and treated with analgesics and antibiotics.

- **Heatstroke.** High temperatures, being kept in a car for extended periods in hot weather and an inadequate water supply can precipitate heat stroke in chipmunks. The clinical signs of heatstroke are tachypnoea, dehydration and unresponsiveness to the surrounding environment. Body temperatures can be reduced using a damp towel, a small amount of surgical spirit on the axillary and inguinal area, or surgical gloves filled with cold water and placed near the pet. Due to the small size of the animal, it is important to constantly check the body temperature to avoid hypothermia.

- **Obesity.** This is a growing concern in exotic pet medicine. It is often caused by overfeeding and the variety of specific feedstuffs on the market for exotic pets that contain a high content of oil-based seeds. In addition, inadequate space requirements can also precipitate obesity in

chipmunks. Obesity in chipmunks can cause hepatic, renal and cardiac disease, and may also lead to boredom and consequent behavioural abnormalities.

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Further reading

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During the winter, chipmunks enter a torpid state, spending most of the time hidden in their nest.



Above: the Siberian chipmunk, Eutamias sibiricus.



Below: the eastern chipmunk, Tamias striatus.



Both indoor and outdoor enclosures should be furnished with branches for the chipmunks to climb.

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Above: females have a shorter anogenital distance.



Right: males have a longer anogenital distance and the presence of testicles in the scrotal sacs.



A deep layer of straw and newspapers can be used as a substrate and as nest-building material.

	Eastern chipmunk	Siberian chipmunk
Origin	North America, from Hudson Bay to the Mississippi and from Minnesota to the Atlantic coast	Siberia, Mongolia, Korea and the northern area of China and Japan
Coat	Five black stripes on back from rump to shoulders, and one white stripe on each flank	Five black stripes on back from rump to neck
Dental formula	I 1/1, C 0/0, P 1/1, M 3/3	I 1/1, C 0/0, P 2/1, M 3/3

TABLE 1. Differences between chipmunk species