

## SMALL MAMMAL HEALTH SERIES

By Susan Brown, DVM

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### Gerbil Care



The Mongolian gerbil (*Meriones unguiculatus*) is a small rodent native to the desert regions of Mongolia and northeastern China, an area that experiences wide variations in environmental conditions. Gerbils are burrowing, social animals that can be active in both the daytime and nighttime depending on the environmental conditions. Gerbils live in an extensive system of tunnels including storage and nesting chambers with many entrances. The original natural color is called agouti, which is a mixed brown, with dark pigmented skin, light brown to white on the chest and abdomen, and darker coat on the back. There are currently many other color varieties that exist including black, white, shades of orange, gold, cream and color points like Siamese and Burmese.

Gerbils are curious, friendly and nearly odorless, which makes them a very popular pet. They have adapted well to captivity and tend to be relatively free of naturally occurring infectious diseases. Gerbils rarely bite, are easy to keep clean and care for, and are relatively easy to handle. **They are highly social and it is recommended to have a minimum of two gerbils living together for their mental and physical health and wellbeing.** Gerbils can be territorial to unfamiliar gerbils so it is best to start off with two or more gerbils from the same litter or two or more that are already living together.

#### Social Structure and Communication

In the wild, gerbils live in extended family structures composed of a single monogamous breeding pair and their offspring of various ages. As long as the offspring remain in the nest they do not breed, but once they leave the nest they find a mate of their own. The extended family helps rear each crop of new babies. Within the family unit, disputes are uncommon. Gerbils spend a lot of time sniffing each other and working out their hierarchy. A subordinate animal may climb onto the dominant animal and lick his face, or roll onto his back if threatened. Dominance may be demonstrated by a sideways stance, chasing or pushing.

The breeding male of these family units is territorial and he will fight intruders and mark the boundaries of his home area with the scent gland, which is a tan, hairless strip of skin in the middle of the underside of the abdomen. Signs of aggression include sniffing of the face and/or flanks followed by head lowering and partially closed eyes, sideways postures, boxing. If no one backs down, then they move on to locking together with their legs and rolling and biting each other in the neck or flank followed by periods of chasing and jumping.

Gerbils spent most of their time digging extensive underground burrows, which consist of tunnels with many entrances and breeding, nesting and food storage chambers. Living underground helps gerbils to adapt the temperature extremes of the harsh climate in which they live. They retreat to the underground when it is too hot or too cold outside.

Gerbils communicate by marking various objects with their abdominal scent glands (both males and females), secretions from the Harderian gland, foot thumping, and ultrasonic and audible vocalizations and by grooming each other.

The Harderian gland is located near the corner of a gerbil's eye and it produces fluid that is rich in lipids (fats) and reddish brown pigments (porphyrins) that drain out through the tear duct. The gerbil moves these secretions onto the fur through grooming. The secretions contain pheromones that are attractive to other gerbils and thus are used in communication. The secretions are also used in temperature regulation (see below under Housing and House Furniture). Foot thumping is most likely an alarm response although interestingly when it occurs in groups of animals it does not always result in the group making changes in their behavior! Gerbil pups make ultrasonic distress sounds under various environmental conditions and adult male gerbils make ultrasonic sounds during mating. Audible vocalizations are occasionally heard from gerbils, particularly if they are fighting, but do not seem to be a common means of communication.

Mutual grooming between gerbils is another important method of communication. One gerbil may lie on the ground while the other grooms him over his entire body. This appears to be greatly enjoyed by both parties!

As mentioned, *gerbils are highly social and it is unhealthy to keep one gerbil in solitude for its life*. Research suggests that gerbils raised alone have more aggressive behaviors than those raised in groups. When considering getting gerbils, always start with at least two. Gerbils of the same sex can live together well if they come from the same family unit or have already been living together. Introducing a new gerbil into an already established group has to be done gradually. Putting the cages side by side with the ability to see and smell but not touch each other is helpful. Switching the gerbils into each other's cages frequently (every one to two days) to get the gerbils used to each other's scent is also part of the process before actually trying them together for short periods under supervision until they show signs that they can coexist. (NOTE: It is best when bringing a new gerbil into the house to isolate him from direct contact with your established gerbils for 7 to 10 days to first make sure it is healthy before allowing direct contact with other gerbils.)

## **Housing and House Furniture**

Gerbils need to dig and chew. If they are denied these activities, particularly as youngsters they can develop behavioral and other health problems. A lack of abundant opportunities to dig and chew can lead to the development of stereotypical behaviors such as incessant digging in corners and bar-mouthing (incessant chewing or mouthing of bars of cage), which can sometimes be irreversible. With

these things in mind it is important to have a cage with a solid floor and 4 or more inches of a solid wall so that 2 to 3 inches of bedding can be placed in the cage.

Aquariums are the most popular choices for gerbil enclosures as long as they have a mesh or wire top that can be locked in place to keep out cats or other curious animals and provide some ventilation. In addition, there are "aquarium toppers" which are wire enclosures that can clip onto an aquarium and include shelves and ladders, which increases the vertical space and ventilation for the cage. Other choices are plastic cages with a deep floor and wire on upper area such as might be made for hamsters. However, realize that if the gerbils are not given enough chewing materials they might quickly chew through a plastic cage and escape! Do not use completely enclosed plastic habitats that have little ventilation. It is unhealthy for your pet, they are easily chewed through and they may be difficult to clean.

Whatever cage you choose, the larger the better. For instance a 10-gallon aquarium COULD house up to two gerbils at a minimum but a 20-gallon (long not high 20 gallon) would be better and could house up to four gerbils for a bigger, happier group!

Bedding for the cage should be at least 2 to 3 inches deep and should not be scented. Some good choices include shredded or "fluffy" beddings like aspen or Carefresh™. You can also use shredded paper, especially if it has been through a paper shredder, which makes it easier to tunnel in! Avoid the use of scented cedar or pine bedding, which could cause respiratory problems or liver damage. I do not recommend the use of pelleted bedding as it is harder for the gerbils to burrow because the beddings do not hold their "shape" in the tunnels.

A sand bath will be appreciated by your pet because it not only cleans oils, dirt and saliva off the fur but is also a way for the gerbil to communicate by scent with other gerbils in the cage and it helps regulate body temperature. Either provide an area of the cage that always has some sand in it (a small pottery dish for instance) or put the dish with sand in it in the cage at least once a week.

The best sand to use is children's play sand from a home and garden store. It will have been cleaned to be safe for children and is fine but not so fine it causes dust clouds. Since you have to buy it in a larger bag than you will ever use, think about using some of the excess several inches deep in a long deep plastic storage box that can be a "play area" outside the cage for the gerbils to roll and dig in. Digging in sand is a great enrichment and also keeps their nails short. Alternatively you can use chinchilla dust, the disadvantage being it is so fine it can create clouds of dust in the cage and if the ventilation is not good it can cause irritation to the gerbil's respiratory system. The first time you introduce your gerbil to the sand they usually already know what to do with it and will shortly begin rolling, both cleaning the fur and scenting the area.

A nest or hide box is important and it is good to provide at least one per each gerbil in the cage, and if you have room provide one more than the number of gerbils in the cage. You can buy or make a nest box out of wood, coconut shell or paper (an old tissue box for instance), or buy hide areas made out of woven grass. Another option is a small clay pot turned upside down with a piece broken off the rim (large enough for the gerbil to get in), or a large hole drilled in the side and the sharp edges filed until they are smooth. Expect the nest box to be chewed, it is part of the fun and a great enrichment for the gerbil! Give the gerbils strips of unscented tissue or toilet paper to make a nice bed in the box.

Chewing items are important. Gerbil teeth grow throughout their life so if there is not enough opportunity to chew, it can lead to dental disease. Chew items can be as simple as untreated scraps of wood or fancy chew toys from a pet store. You can take an untreated piece of 2x4 or 4x4 for instance and drill some random holes in it to get the chewing party started and this will entertain them for days. Never use wood that has been glued, such as particle board or plywood. The glue can be toxic to your pet. Empty toilet paper and paper towel rolls make excellent tunnels as well as chew toys. You can also use plain envelopes with no metallic print and fold them into "tents" and put them in the cage. Try using wood from nontoxic trees. Check for [safe wood](#) for gerbils.

If you decide to use a wheel in the cage, it is best to suspend it from the side or top of the cage, and use a solid wheel not a wire one. Wire wheels have been known to cause injuries such as broken legs and injured tails. Some gerbils will use a wheel for hours and others will ignore it completely.

Consider making your dry bathtub a play area for your gerbils so they can explore a new environment. Small empty boxes, cardboard tubes, shredded paper and food treats hidden about can all make for hours of fun. This is the best place to feed fresh foods such as bits of wheat grass, lettuce or fruit, so they don't get stored in the gerbil's permanent bedding.

Temperatures in the gerbil's native environment may fluctuate between 120 and -40°F and the environment is dry. However in our households it is most comfortable to keep them between 65 and 75°F with a low humidity of about 30 to 50%. High temperatures along with high humidity will not be well tolerated, especially if ventilation in the cage is limited. The light cycle for your gerbil should be roughly 12 hours dark and 12 hours light. Depending on the temperature in their cage and the amount of light they are receiving, gerbils may be more active during the day (when it is cooler in the room and more light), the night (when it is hotter in the room or more dark) or at equally active early morning and early evening.

Gerbils also can regulate their body temperature through saliva, Harderian gland secretions and by sand bathing. When gerbils are hot they groom their fur by spreading saliva, which evaporates and thus cools them. They also use the sand bath to remove oils and pigments from the Harderian gland allowing better air circulation in the coat. When gerbils are cold they spread Harderian gland secretions through grooming to coat the fur in fats (protects from moisture and cold) and to darken the fur with the pigments (causes more heat to be absorbed from the sun).

Gerbils, unlike other pet rodents, are very sensitive to low frequency sounds, which is where human speech falls. This means it is best to place the cage in an area where they are out of the direct pathway of the human inhabitants of the house. In addition, do not put the cage near a TV or stereo, which can be very disturbing to your pet.

Gerbils produce very little urine, so it is not necessary to clean their cage daily if it is of adequate size with several inches of bedding. Certainly no more than weekly is necessary if they have a thick layer of bedding. Remember that they work hard at making their cage just the way they like it and when you clean it, it causes quite a disturbance. Gerbils are scent oriented so put a small amount of the old bedding in with the new bedding so they feel like they are still "at home"! Clean cage furniture and the cage itself with a mild disinfectant without a strong odor. If you use something with a strong odor, rinse it off completely after disinfecting and allow the cage or item to dry and the odor to dissipate before putting the gerbils back.

## **Diet**

Gerbils are omnivores and in the wild they eat primarily leaves, grasses, seeds, nuts and occasional insects. They hoard food as part of their natural behavior. There are a variety of food mixes on the market and they vary greatly in their nutritional content. Some of the mixes are healthy if the gerbil eats all the items in the mix but gerbils often tend to pick out the fattiest foods first. They are particularly fond of sunflower seeds, so if the diet you are feeding is heavy on the sunflower seeds, remove most of them and hand feed 4 or 5 to each gerbil daily (which is great for taming them) rather than letting them get too many or hoard them. Sunflower seeds are good sources of nutrition but when fed to excess they can lead to obesity. Try a variety of mixes made for gerbils and supplement with lab blocks made for laboratory animals. You can leave one or two of these blocks in the cage but they should not be the total diet as they are too monotonous for the gerbil to eat and many are too high in protein as well.

Leave a small amount of grass hay in the cage (timothy or meadow grass) to munch on and stash as well. For treats you can occasionally offer unsweetened cereal such as Cheerios or puffed rice or Kashi, roasted unsalted nuts (just a small piece please) and dried, unsweetened fruit. You can also give the occasional small bit of green food such as wheat grass or lettuce, fruit or sprouted seeds, but

it is best to give these items outside of the cage so they don't get stashed in the bedding where they can decompose and cause illness.

It is not necessary to put the dry food in a bowl. Just sprinkle it on the bedding and the gerbils will have fun foraging for it, snacking on it and then hiding any extra for later! Any food bowls put in the cage will be buried in short order.

Water should be available at all times. Even though gerbils do not drink a lot of water in the wild because they manufacture most of their needs through the foods they eat, they still need a constant water source. Gerbils like to chew on plastic so make sure the water bottle you use has a metal collar or is hung so your gerbil cannot reach the plastic parts. You can hang the bottle from the middle of the cage, which makes it difficult for the gerbil to access the plastic.

## **Sexing Gerbils**

It is possible to sex gerbils as early as 4 weeks of age. Turn the gerbil gently over on his back or put him on a glass table or in a clear plastic box so you can see the area under the tail. There will be two openings, the anus and the urogenital opening (where the bladder and reproductive system empties). In the female these two openings are right next to each other. In the male the openings are separated by about a small finger width of space. In addition, in the male the scent gland on the abdomen is prominent and in a sexually mature animal the scrotal sacs (where the testicles reside) should be visible and dark in color.

## **Handling**

Gerbils would rather run away than bite a person and are not difficult to tame and handle. Start by offering treats through the cage or in a tank offered from the top of the cage. As your pet starts looking forward to seeing your hand with treats, try introducing your hand with the treat farther into the cage until eventually (over several short sessions) you can rest your hand in the bottom of the cage and let your gerbil investigate. Keep repeating the hand feeding and letting your pet investigate until he is comfortable with the presence of your hand. Be patient, slow and pay attention to your pet's body language. If you are causing him to flee and hide, then remove your hand carefully and back up your plan a bit and try again with another treat and slower movements. While you are training, talk softly to him to get him used to the sound of your voice. Gerbils can hear our voices very well.

**NEVER pick him up by the tail!** The skin of the tail can come off which can result in the eventual loss of the tail. This is a protective mechanism that helps a gerbil if he is caught in the grasp of a predator, but it is not something we want to cause to happen. If your pet is used to you, then cup your hands on the floor of the cage and let him walk onto them and then gently enclose him to move him. You can use a treat in your hands to enhance cooperation. You can also use a cup that is large enough for him to sit in comfortably and so that you can cover the top with your hand to prevent escape. Put this cup on its side and gently herd your gerbil into the cup by using your other hand or moving the cup towards a corner, then cover the cup with your other hand and transport. You can do the same with a small box with a lid or a paper tube that you cover both ends. If you need to have a closer look at your gerbil you can gently scruff him along the loose skin at the back of the neck and gently grasp the lower body or BASE of the tail, not the tail itself. Keep such examinations short and afterwards offer a treat before returning him to his cage.

Basic training can be taken farther. Gerbils can be trained using marker-based training (one form is clicker training) to run agility courses or do fun tricks! Look around for more information on [this kind of training](#).

## **Reproduction**

It is not within the scope of this article to cover breeding in gerbils. I encourage you to think carefully before you consider breeding your pet gerbils. This comes with great responsibility, including finding the space in your home for the offspring and finding them homes. Once a breeding pair starts to reproduce, it will be difficult to stop the process since this is how gerbils form their groups in the wild. Separating a breeding pair is detrimental to both parties as they may become depressed or anxious if they can see or smell the mate but not have access. Neutering the male may be the only option, which can be done safely by a veterinarian with exotic mammal experience. It is better to start with a group of gerbils of the same sex if you are not set up or prepared for the responsibilities of breeding gerbils.

## **Diseases**

Gerbils are relatively healthy little creatures as a rule. Here are just a few of the more common disorders that might be seen. It is a good idea to find a veterinarian who has experience in treating rodents BEFORE you have a problem so you are not searching madly when there is an emergency. You can go to the [Association of Exotic Mammal Veterinarians](#) to find veterinarians that are experienced in exotic pet care. The list and descriptions below is not all inclusive and is designed to just introduce you to some disorders that gerbils may experience.

### *Nasal Dermatitis (Bald Nose)*

Gerbils can develop hair loss on the nose and muzzle. The most common cause is inappropriate housing including rough bedding or aromatic bedding (like cedar), no access to a sand bath to clean the fur, not enough bedding (causing the animal to rub up against the hard cage surface when digging, wire cages with no bedding (gerbil sticks nose out of cage to chew on bars) and sharp edges in chewing areas of the cage. These worn areas can become infected with bacteria and develop crusts and open lesions as well. The treatment is improving the cage environment, most particularly using soft, deep bedding for plenty of burrowing activities and frequent access to sand bathing.

### *Epilepsy*

The gerbil has a genetic tendency to develop epileptiform seizures. The occurrence rate for the general pet population is 20 to 40 percent. These seizures may be initiated by fright, handling, or exposure to a new environment. The attacks can be mild (slight shaking) to very severe (violent convulsive body jerking, erratic movements and collapse). The convulsions appear not to have any long-term effects. In some instances, however, death may result following severe seizures, but this is rare. Anticonvulsant therapy is not indicated, and can cause more serious side effects than the seizures themselves. Frequent handling during the first few weeks of life and providing a stable environment with a complete, balanced diet can help suppress the seizures in genetically predisposed gerbils.

### *Tail Sloughing*

Improper handling of gerbils can result in the loss of skin and fur from the tail. This occurs when the animal is grasped by the tip of the tail. The skinless tail dies off and sloughs, with the stump usually healing without complications. In some instances, the tail may need to be amputated.

### *Renal (Kidney) Disease*

Old gerbils, 2 1/2 to 4 years of age, often have weight loss, loss of muscle mass, poor appetite, and lethargy. In addition, an increase in water consumption may be observed. These are all signs consistent with renal disease in old gerbils. Treatment is only supportive in rodents, with emphasis on providing ample fresh, clean water and food at all times to prevent stress that may trigger full renal failure.

### *Neoplasia (Cancer)*

Gerbils have a relatively high incidence of cancer after they reach 2 years of age. The organ most affected is the ovary. Ovarian tumors are common in female gerbils with poor reproductive performance. They may have early cessation of reproduction, decreased litter size, or distended abdomens. All of these signs may also be present with cystic ovaries as well.

The skin is the second most affected site for tumors in the gerbil. Squamous cell carcinomas and melanomas are most frequently encountered. Melanomas tend to develop around the ear, foot, or base of the tail.

The ventral marking scent gland is the third most common site of cancer. This gland is located in the mid-abdominal area. It is a hairless, oval tan structure, which tends to be more prominent in males. The gland produces an orange-colored secretion that is used to mark territory. Tumors of this gland appear as 'abscesses' on the abdomen. Usually the tumor is not malignant, but may have a secondary bacterial infection.

Many other organs may be affected by cancer, but much less often. Where possible, surgical intervention as early as possible is the treatment of choice.

#### *Tyzzer's Disease*

The most commonly reported infectious disease of gerbils is Tyzzer's disease, caused by *Clostridium piliforme*, a spore-forming bacterium that infects living cells. It is transmitted through the feces of the affected animal. The disease causes a high death rate, especially in young male gerbils. Clinical signs are nonspecific, primarily consisting of ruffled fur, lethargy, hunched posture and poor appetite. The gerbil may also have diarrhea. The disease causes changes in the heart, liver, lymph nodes and digestive tract. Stains of tissue samples from dead rodents can confirm the diagnosis.

Treatment with some types of antibiotics may be helpful but prevention is the key to controlling this disease. High-level sanitation and minimal stress greatly reduces the occurrence of this disease in colony situations. Tyzzer's disease typically affects gerbils that are stressed by weaning, shipping, and adjusting to new environments. Strict sanitation prior to introduction of new animals is important in preventing outbreaks.

Viral diseases - The good news is there are no known viral diseases of gerbils!

#### **Quick Gerbil Facts**

(*Courtesy of Biology and Medicine of Rabbits and Rodents (5th Edition) by J. Harkness, P. V. Turner, S. Vande Woude, C.L. Wheler, Wiley-Blackwell, 2010.*)

- Scientific Name: *Meriones unguiculatus*
- Adult body weight male: 80-130 g (<3-4.5 oz)
- Adult body weight female: 55-85 g (2-3 oz)
- Body Temperature: 98.6-101.3 F
- Life span: 3-4 years
- Food consumption: 5-8 g/100g body weight/day (.17-.28oz / 3.5 oz)
- Sexual maturity male: 70-85 days
- Sexual maturity female: 65-85 days
- Gestation (pregnancy) period: 24-26 days up to 48 days long if they are nursing another litter at the time
- Litter size: 3-7; 5 average
- Weaning age: 20-26 days
- Litters per year: 7 average

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