

1977

# The Mongolian Gerbil

Lorene Stockberger  
*Iowa State University*

Follow this and additional works at: [https://lib.dr.iastate.edu/iowastate\\_veterinarian](https://lib.dr.iastate.edu/iowastate_veterinarian)



Part of the [Comparative and Laboratory Animal Medicine Commons](#), and the [Small or Companion Animal Medicine Commons](#)

---

## Recommended Citation

Stockberger, Lorene (1977) "The Mongolian Gerbil," *Iowa State University Veterinarian*: Vol. 39 : Iss. 2 , Article 8.  
Available at: [https://lib.dr.iastate.edu/iowastate\\_veterinarian/vol39/iss2/8](https://lib.dr.iastate.edu/iowastate_veterinarian/vol39/iss2/8)

This Article is brought to you for free and open access by the Journals at Iowa State University Digital Repository. It has been accepted for inclusion in Iowa State University Veterinarian by an authorized editor of Iowa State University Digital Repository. For more information, please contact [digirep@iastate.edu](mailto:digirep@iastate.edu).

# The Mongolian Gerbil

by  
Lorene Stockberger\*

The Mongolian dark-clawed jird, *Meriones unguiculatus* has become an increasingly popular pet and laboratory animal during the past ten years.

Referred to in popular literature as the Mongolian gerbil, *M. unguiculatus* is a small rodent of the Family *Cricetidae*, somewhat larger than a mouse and much smaller than a rat. It belongs to the Subfamily *Gerbillinae*, which includes twelve genera. To be taxonomically correct, the name "gerbil" should be reserved for those members of the genus *Gerbillus*, also in the Subfamily *Gerbillinae*. But because of the widespread (mis)usage of the common term "gerbil," *M. unguiculatus* will be referred to as the gerbil in the remainder of this article.

Gerbils are also called desert rats or sand rats. They are native to the desert areas of northeastern China and Eastern Mongolia. All of the gerbils in the United States were derived from stock bred in the laboratory since 1935, when Dr. C. Kasuga captured 20 pairs along the Amur River basin in Eastern Mongolia. In 1954, Dr. Victor Schwentker obtained 11 pairs from the colony started with Dr. Kasuga's captives and started the gerbil colony at Tumblebrook Farm.

As late as 1963, the gerbil was a prohibited species in California. It was feared by some that they might escape and due to their burrowing habits wreak havoc on irrigation systems and crops. This fear was not entirely unfounded, because a related species of *Gerbillinae* in the western provinces of South Africa had done just that.

But through litigation, the laws have been relaxed and the gerbil is now a legal laboratory animal, although officially

required to be kept under maximum security. Of course, with the increasing popularity of gerbils as pets, controls are unenforceable.

The gerbil has several characteristics which make it a satisfactory pet. They are almost without fear, and seldom (if ever) bite unless severely provoked. They have an appealing appearance, and are alert and active most of the time.

The most characteristic quality of the gerbil is its curiosity. They are intelligent and have been shown to acquire avoidance responses ten times more rapidly than rats. But as one frustrated researcher found, they will not run mazes. Even when starved to the point of losing weight, they curiously examine the walls of the maze rather than try for record times. If a gerbil should accidentally get out of its cage, its curiosity helps to locate it. It may first run to someplace inaccessible, but within a short time will become bored with that and reappear.

Besides its personality, the gerbil has a remarkable physiology that makes it ideal for a pet. Gerbils thrive on what would constitute neglect for any other species. And since many pets that are taken care of by children live in a state of constant semi-neglect, the gerbil may be a good species to suggest.

The easy care and wide range of bacterial and viral susceptibilities have made the gerbil popular as a laboratory animal, also. But one author noted that there was a problem with the lab personnel becoming more attached to the friendly gerbils than to mice or rats.

In the laboratory, the gerbil has been used to bio-assay steroid hormones via weight changes in its ventral sebaceous gland. It has also become somewhat of a paradox in serum cholesterol research because of the fact that it exhibits a natural lipemia without developing

\*Ms. Stockberger is a third year student in the College of Veterinary Medicine.

atherosclerosis. It may serve as a model for epilepsy. It shows a very high radiation tolerance. It is susceptible to many viral and bacterial diseases and is an especially good model for Leptospirosis. There is ongoing research using gerbils in tumor induction and graft-rejection studies. As more data is compiled, gerbils will no doubt become almost as common for laboratory use as rats and mice. From the gerbil's standpoint, this may or may not come as good news.

Gerbils are found in many pet stores, usually for under \$2 each. The average weight for adult males is 80-90 grams and 70-80 grams for adult females. In adults, the tail is 90% as long as the body, while at birth it is only 25% of the body length.

The color is typically agouti, although black mutations have appeared in laboratory colonies. The under-side is creamy to grey; the sides light brown, and the dorsum a darker brown. The tail is furred and may have a black tuft at the tip. There is a large sebaceous gland on the abdomen which is used for scent-marking territories. It is present in both sexes.

The gerbil is very adaptable and adjusts to a wide range of housing without stress. Cages at least 6 inches high are required because gerbils like to sit up to eat. They are very active, both day and night, and enjoy exercise wheels and crawling through tubes.

In the home, their curiosity lets them enjoy watching day to day family activity. A transparent plastic cage or a glass aquarium provides them with security and at the same time allows maximum interaction.

Since they are desert animals, humidity below 50% is best. Above this level, their fur may appear matted and damp, although no other physiological effects have been noted. They are tolerant of wide ranges of temperature. Temperatures from 20-25 degrees F. to 80-85 degrees F. have no effect, except that there is no reproduction at the lower temperatures.

Gerbils require some form of bedding, as they like to burrow. Ground corn cobs, wood shavings, sand, hay, and paper have all been used. The paper need not be shredded, as the gerbils will enjoy doing this themselves.

Because gerbils produce only 2-3 drops of highly concentrated urine per day, absorbency of the litter material is not a prime consideration. And because the cages remain

dry, they need to be cleaned only about once every two weeks.

Like most other rodents, gerbils depend on coprophagy for their B-vitamins. About 50% of the feces are normally eaten to satisfy this requirement. So gerbils may develop a vitamin deficiency if the cage is cleaned too often or if they are kept on wire floors unless their diet is supplemented with a B-complex preparation.

In the wild, gerbils require only metabolic water. Their adrenals are four times as large as the rat's, perhaps indicating increased aldosterone activity. And the fat deposits resulting from their unique fat metabolism have been hypothesized to relate to a water storage mechanism. In the laboratory, they may consume about 4 ml. of water per day.

The nutritional requirements of gerbils are not known. They reproduce and seem to thrive on commercial rat or mouse chow. The high fat varieties should be avoided because the gerbil's increased deposition of fat while on such a ration may cause him to become obese. Also, fat deposition around the ovaries of the female may lead to reproductive failure.

Because of their curiosity, gerbils will try to eat anything that is offered to them, from anchovies to zucchini. They are especially fond of sunflower seeds. Probably the best diet would be a commercial mouse or rat chow supplemented with mixed grains such as corn, oats, wheat, and barley; and also some sunflower seeds. Succulent foods such as lettuce or cabbage may be offered occasionally.

Gerbils are monogamous and mate for life. A mature gerbil that has lost its mate will not usually take another. However, one researcher claims that when he kept several pairs in one cage, occasional "cheating" was observed. Perhaps their association with man and successive generations of laboratory rearing are gradually influencing their behavioral patterns.

Gerbils are also somewhat selective in accepting a mate. In the wild, this is no problem, because there are a lot to choose from. But in the laboratory, gerbils may think matings based on selection and planning are merely arbitrary and refuse to participate. The most severe reaction of this kind is when the female kills the male. But she may allow him to live with her and just reject

copulation.

Gerbils become sexually mature at 10-12 weeks and mating them at 9-10 weeks so they mature together helps to eliminate rejection of each other.

The estrous cycle is probably about 4 days, with the heat period lasting less than 24 hours. Gestation is 24-25 days with a litter size of 1-12. Litters of 1 or 2 are usually ignored by the mother and die of starvation or neglect. The reason for this is unknown. Cannibalism is rare and any young that die before weaning are often buried under the bedding by the parents. The male also helps to care for the young.

There is a post-partum estrus, but implantation may be delayed if the female is nursing a large litter. The young should be weaned at 21 days to avoid competition between litters, since the mother may have another litter at day 24 if she was bred at the post-partum estrus.

The breeding life of the female may extend to 20 months. Gerbils may live up to 4 years, although most do not.

Disease problems of the gerbil are negligible. There have been a few reports of naturally occurring Tyzzer's Disease (*Bacillus piliformis*) in laboratory colonies. Parasites are not a problem because the secondary hosts remain in Mongolia. Sporadic pneumonia may occur, usually following stress, such as surgery. Diarrhea may occur in response to toxins from unwashed lettuce or spoiled food. The gerbil may be infected with *Salmonella*, but the disease is self-limiting and a carrier state does not result.

Dermatitis of the nose and jaw may be caused by gnawing on wire. It is aggravated by poor sanitation. Very old animals may develop a protrusion of the nictitating membrane and conjunctiva with exophthalmia. The cause of this is unknown.

Newborn gerbils may show abnormalities of pigment and hair growth that resolves with age. However, most of the affected animals do not survive to weaning. Some gerbils, especially young ones, will exhibit spontaneous hypnotic or cataleptic seizures when handled or otherwise stressed. The legs are stiffly extended and the body trembles. The seizures last for up to a minute, after which normal activity resumes. No cause has been

found and no lesions are associated with this. The frequency of seizures lessens with age because of evidence of a variable genetic threshold, individuals that exhibit frequent seizures should be culled from breeding programs. The seizures may be controlled with diphenylhydantoin, but this is probably not necessary.

Older gerbils may develop neoplasms, but the data is not sufficient to make any generalized conclusions about type or distribution. The female gerbil is quite prone to development of ovarian cysts.

Overgrown incisors are rare, but a single case has been reported.

Blood samples may be obtained by orbital bleeding or lancing a vein. A large number of "abnormal" erythrocytes that resemble reticulocytes prompted one investigator to report that 94% of gerbils had *Hemabartonellosis*. But more plausible explanations are continuous erythropoiesis caused by lipid-induced hemolysis or perhaps genetically controlled continuous hyperactive erythropoiesis.

No normal values for uninalysis have been published, probably because of the scant quantities produced.

In conclusion, the gerbil's friendly, curious nature, minimal care requirements and few natural disease problems make it a good pet and laboratory animal.

## BIBLIOGRAPHY

- David, Tony D. *Aeromedical Review: Selected Topics in Laboratory Animal Medicine*. Volume XXIII. 7-74. "The Mongolian Gerbil."
- Marston, J. H. Chapter 21, "The Mongolian Gerbil" in: *The UFAW Handbook on the Care and Management of Laboratory Animals*, 4th Ed. London, 1972.
- Rich, Sigmund T. "The Mongolian Gerbil (*M. inguiculatus*) in Research."
- Schushman, Stephen M. "Individual Care and Treatment of Mice, Rats, Guinea Pigs, Hamsters, and Gerbils" in: *Current Veterinary Therapy V*. W. B. Saunders Co. 1974.
- Schwentker, Victor. "Care and Maintenance of the Mongolian Gerbil—a basic manual for laboratory animal technicians." Tumblebrook Farm, Inc. Brant Lake, New York.
- White, D. J. and Waldron, M. M. "Naturally-occurring Tyzzer's Disease in the Gerbil." *Veterinary Record*, August 2, 1969. pp. 111-114.