

SMALL MAMMAL HEALTH SERIES

By Susan Brown, DVM

Guinea Pigs

The guinea pig or cavy is a docile rodent native to the Andes Mountain area of South America. They were first domesticated by the Andean Indians of Peru who used them as a food source and as a sacrificial offering to Incan gods. During the 16th century, Dutch explorers introduced guinea pigs to Europe where they were selectively bred by fanciers. The guinea pig entered the research laboratory in the 18th century and have since made significant contributions to the scientific community. To this day, the guinea pig remains a favorite pet among children due to their docile behavior, ease of handling, and clean, quiet nature.



photo courtesy of Christy Cameron

Through selective breeding efforts, guinea pigs are found in an array of colors and coat types from which to choose. Four primary varieties are commonly encountered in the pet industry. The Shorthair or English is characterized by having a uniformly short hair coat. The Abyssinian has whorls or rosettes in their short, rough, wiry coat. The Silky is a large variety distinguished by its medium length silky hair. The Peruvian is recognized by its very long silky hair. All types are commonly kept as pets.

Diet

Like many animals, guinea pigs determine early in life what foods they prefer, based on their eating experiences. This is why it is a good idea to gradually expose young guinea pigs to a variety of foods once they are weaned so later they will have a broader range of food choices. However, by the time many guinea pigs are purchased from some sources, they have been fed nothing but pellets and may be hesitant to try new foods. Grass hay, as you will see, is very important and can be introduced right away. You may need to try several different varieties before you find the right one, but don't give up, this is an important part of their diet. Once your little buddy is eating grass hay, then start trying some of the fresh foods suggested below at the rate of one new food every 3 to 4 days.

Food is not just something we put in our bodies for nutrients, but it is also an environmental enrichment. The sight, smell, taste, and texture of food is mentally stimulating to all animals. Even the sound of the food preparation provides a joyful anticipation. Many a guinea pig care provider knows the sound of a guinea pig squealing with delight whenever the refrigerator door opens! Providing more than just a bowl of pellets every day is another step towards making your pet more content at home with you. Try putting the hay or fresh food in places such as hidden in little crumpled bits of paper, empty toilet paper or sections of paper towel rolls or non-toxic baskets just for fun! Try putting the pellets in a small hollow plastic ball with small holes drilled in the side that are slightly larger than a pellet; as he/she rolls it around with his/her nose, he will get to eat in the process!

Guinea pigs are herbivores and in their natural biology grasses are the most prominent part of their diet. Grasses can be abrasive to teeth, which is why the guinea pig evolved with teeth that grow throughout life. The molars are particularly adapted to grinding up tough fibrous materials. Grasses

also provide a variety of nutrients as well as indigestible fiber, which keeps the intestinal tract moving along at a normal speed, and digestible fiber that is used by the bacteria in the large cecum to produce such things as vitamin B and amino acids, which are used by the guinea pig.

The most important part of a guinea pig's diet is good quality grass hay, which should be available all the time. You can use any grass hay, including timothy, orchard grass brome and others. Avoid the use of alfalfa, which is not a grass but rather a legume (like peas and beans) and is generally too high in calories (which can lead to a tubby little pig) and some nutrients such as calcium and protein for the average pet guinea pig's dietary needs. Alfalfa hay, can however, be very helpful in situations where your guinea pig needs to gain weight, perhaps during or after an illness, or if she is pregnant and nursing. There are many good grass hay sources available now on the Internet so it should not be a problem to provide this for your little friend. The hay can be provided in a hay feeder or put in the corner of the cage. Even better, put it in an "edible" basket or cardboard box for more fun!

Guinea pigs do not produce their own vitamin C. They share this quality with us humans and primates. We all need an outside source of vitamin C in order to avoid developing a serious medical condition called scurvy. Fortunately it is pretty easy to provide your guinea pig with approximately 10 mg of vitamin C by giving some fresh vegetables daily, particularly dark leafy greens such as kale, collard greens, mustard greens or dandelion greens. One-quarter cup (packed) of any of these greens coarsely torn or shredded will provide more than enough vitamin C daily. Other fruits or vegetables that you might want to try include sweet peppers, apples, pears, berries, broccoli, cucumbers, parsley and basil. The total amount of fresh foods given in a day should be around ¼ to ½ cup (torn or shredded and packed in the measuring container). When testing out new fresh foods, add one every 3 to 4 days to allow the intestinal tract to adjust and give a fair trial to see if the guinea pig will eat it.

Guinea pig pellets can be given to your pet in limited quantities. Please use guinea pig pellets, which have additional vitamin C, and not rabbit pellets. Read the label and use a brand that is grass-hay based and not alfalfa based, if at all possible. Also look at the date that the food was produced and try to buy food that is no more than 3 months (90 days) past that date. If the food is too old, the vitamin C levels will have decreased dramatically. Watch your little friend's weight carefully and adjust the pellet amounts downward if he or she is gaining too much weight. Generally, an adult guinea pig with a medium level of exercise would get no more than ¼ cup of pellets a day along with unlimited grass hay and a small amount of fresh foods.

Foods to completely avoid are the high starch foods such as peas, beans, corn, nuts, cakes, cookies, cereal, grains, breads, and so on. These foods can create a serious imbalance in the normal bacteria in the intestinal tract and lead to potentially fatal disease. Although very small amounts of these foods can be tolerated, guinea pigs can get "addicted" to them to the point they don't want to eat healthier foods. Therefore, it is best to just avoid them all together.

And let us not forget water, which is vital to good health. Fresh, clean water should always be available either in a sipper bottle or a heavy crock that prevents spillage. Guinea pigs like to play with their water bottles, so make sure you check the bedding under the bottle for moisture and change it frequently. Do not add any medications or vitamins to the water as it will change the taste and your guinea pig may not drink as much. Not drinking enough water can lead to chronic dehydration and potentially diseases such as kidney disease and kidney or bladder stones.

Diseases

Bacterial Enteritis

A number of bacteria are capable of causing infections of the gastrointestinal tract in guinea pigs. Some of these bacteria are introduced through contaminated greens or vegetables or in contaminated water. One of the most common bacteria that causes intestinal disease in guinea pigs is *Salmonella* spp. Other bacterial species that may cause diarrhea and enteritis are *Yersinia pseudotuberculosis*, *E. coli*, *Arizona* spp., and *Clostridium* spp. In addition to diarrhea, other common symptoms associated

with intestinal disease are lethargy and weight loss. In other case, sudden death may occur before expression of these signs.

A veterinarian may elect to use aggressive antibiotic therapy and supportive care to treat this condition. A bacterial culture of the patient's stool with antibiotic sensitivity will greatly assist the veterinarian in choosing an appropriate antibiotic to use.

Bacterial Pododermatitis (Footpad Infection)

Severe infections of the footpads are very common among guinea pigs housed in cages with wire flooring. Fecal soiling of the wire potentiates the problem. The guinea pig's front feet are most vulnerable to this condition.

Symptoms of this condition include swelling of the affected feet, lameness, and reluctance to move. Improved sanitation and cage floor alterations are the initial steps in correcting the problem. In addition, the feet themselves should be treated by a veterinarian. Topical dressing with an antibiotic and periodic bandaging is often required. Depending on the severity of the damage, injectable antibiotics may also be necessary. Therapy may have to be carried out for a lengthy period of time to get full recovery. Unfortunately, a consequence of this condition is arthritis.

Barbering (Hair Chewing)

Hair loss is a common problem in guinea pigs. 'Barbering' is just one of the many causes of it. This vice (bad habit) occurs when guinea pigs chew on the hair coats of other guinea pigs that are lower than them in the social 'pecking order'. The dominant 'pig' and main culprit is identified by its normal, full hair coat while others have areas of alopecia (hair loss). There is no treatment for this condition except separating the guinea pigs if it becomes a serious problem.

Hair loss or hair thinning can occur for a number of other reasons as well. It is a common phenomenon among sows who are repeatedly bred or weakened, newly weaned juvenile guinea pigs. Certain fungal diseases and external parasite infestations also present with hair loss problems. These specific problems will be addressed in later sections.



photo courtesy of Christy Cameron

External Parasites (Lice and Mites)

Lice and mites are the most common external parasites of guinea pigs. Lice are tiny, wingless, flattened insects that live within the hair coats of infested animals. Both adults and eggs are found attached to hair shafts of affected pets. Mites are microscopic, spider-like organisms that infest the top layers of the skin in affected animals. Guinea pig lice and mites are not known to parasitize man.

Mite infestations are usually more severe than lice. A specific mite, *Trixacarus caviae*, causes serious infestations in pet guinea pigs. This sarcoptic mite lives in the outer layers of skin causing an intense itching and scratching with considerable hair loss. In some cases, they present without itching and

scratching but with only hair loss and crusting of the skin. In other cases, the infestation and irritation is so severe that the pet causes significant self-inflicted wounds and exhibits wild running and circling behavior.

A veterinarian can diagnose this mite infestation by performing skin scrapings of affected areas and viewing them under the microscope. Successful treatment consists of one to four injections of a specific antiparasitic drug at approximately two week intervals. In the meantime, if wood shavings are used as bedding or litter, it should be replaced with paper toweling to make your pet more comfortable.

Transmission of *Trixacarus caviae* mites can occur only through direct contact between infested and noninfested guinea pigs. Therefore, pet guinea pigs are not likely to harbor this parasite unless they are recent additions or had previous exposure to mite-infested guinea pigs. For your pet's sake, be sure that any guinea pig (s)he comes in contact with is healthy and free of this and other parasites.

Lice infestations often go unnoticed. However, heavy infestations are usually accompanied with excessive itching, scratching, and some hair loss. Scabbing on or around the ears may also be evident. Guinea pigs have two types of biting lice that may parasitize them. Both irritate and abrade the skin's surface and feed off the bodily fluids that exude through the superficial wounds they create.

A veterinarian can confirm the diagnosis of lice infestation by examination of the hair coat as well as microscopic examination of hairs from affected animals. Treatment is usually in the form of an insecticidal shampoo which is prescribed by the veterinarian.

As with mites, lice transmission occurs through direct contact with infested guinea pigs. Therefore, pet guinea pigs are not likely to have this parasite unless they had previous exposure to lice-infested guinea pigs. For your pet's sake, be sure that any guinea pig (s)he comes in contact with is healthy and free of this and other parasites.

Heat Stress (Stroke)

Guinea pigs are very susceptible to heat stroke, particularly those that are overweight and/or heavily furred. Environmental temperatures above 85 degrees, high humidity (above 70%), inadequate shade and ventilation, overcrowding, and other stresses are additional predisposing problems.

Signs of heat stroke include panting, slobbering, weakness, reluctance to move, convulsions, and ultimately, death. This is a treatable condition if recognized early. Heat stressed guinea pigs should be misted with cool water, bathed in cool water, or have rubbing alcohol applied to its footpads. Once this first aid measure is accomplished, veterinary assistance should be sought.

Prevention of heat stroke involves providing adequate shade and proper ventilation. In addition, a cool misting of water and/or a fan operating over a container of ice can be directed toward the pet's cage. If indoors, air conditioning during the heat of the summer provides the best relief.

Pneumonia

Pneumonia is one of the most common bacterial diseases of the pet guinea pig. Respiratory infections are caused by a number of viral and bacterial agents including *Streptococcal pneumoniae*, *Bordetella bronchiseptica*, and a gram-positive diplococcus. Many of the disease causing organisms inhabit the respiratory tracts of clinically normal guinea pigs. Conditions of stress, inadequate diet, and improper husbandry will often predispose a pet to an opportunistic infection with one or more of these agents. Symptoms of pneumonia may include dyspnea (difficulty breathing), discharge from the nose and eyes, lethargy, and inappetence. In some cases, sudden death will occur without any of these signs.

Occasionally, middle or inner ear infections accompany respiratory disease in guinea pigs. Additional symptoms in these cases include incoordination, torticollis (twisting of the neck), circling to one side, and rolling.

Veterinary consultation should be sought when a guinea pig exhibits any of the above symptoms. A bacterial culture with antibiotic sensitivity of the throat or nasal discharge will assist in the selection of an appropriate antibiotic. Aggressive antibiotic therapy in addition to supportive care of the patient

may be necessary to get the condition under control. Unfortunately, even though elimination of the symptoms may be possible with appropriate therapy, erradication of the causative bacteria is not.

Scurvy (Vitamin C Deficiency)

Guinea pigs cannot manufacture Vitamin C and must receive an adequate supply from outside food sources. Lack of sufficient Vitamin C in the diet results in scurvy. The symptoms of scurvy include poor appetite, swollen, painful joints and ribs, reluctance to move, poor bone and teeth development, and spontaneous bleeding especially from the gums, into joints, and in muscle. If left untreated, this disease can be fatal especially to rapidly growing young and pregnant females. In addition, subclinical deficiencies often predispose animals to other diseases.

The mandatory level of vitamin C is supplemented in commercial guinea pig pelleted rations. However, with improper storage and handling these pellets lose their potency rapidly. In fact, even when properly stored in a cool, dry environment, fresh pellets lose up to half of their potency in only six weeks or so due to degradation of the vitamin. For this reason, further supplementation is recommended.

These animals should be examined at the first sign of this condition for early diagnosis and treatment. Early supplementation of vitamin C (either in food, water, or by injection) is required to reverse the symptoms.

Slobbers / Dental Malocclusion

Slobbers is the condition where the fur under the jaw and down the neck remains wet from the constant drooling of saliva. The primary cause for this condition is overgrowth of the guinea pig's premolars and/or molars. Most often this occurs in older (2-3 years of age) guinea pigs and usually involves the premolars (the most forward positioned cheek teeth). The overgrowth is due to improper alignment of the teeth when chewing, and excess selenium in the diet has also been incriminated. The overgrown tooth causes injury to the guinea pig's tongue resulting in an inability to chew and swallow food, drooling down the chin and neck, and weight loss (often severe).

A veterinarian must be consulted as soon as this condition is suspected. The diagnosis is confirmed by visual examination of the mouth. Correction of the problem involves trimming or filing of the overgrown teeth (usually requiring general anesthesia). Dental work in the mouth of a guinea pig is difficult due to the extremely small mouth opening. A correction of the diet may also be in order if an elevated selenium level is suspected. In addition, force feedings and antibiotics may be necessary to aid in the recovery.

There is no permanent solution or correction to this problem. Periodic trimming or filing of the teeth is usually necessary. Guinea pigs with this problem should not be bred since dental malocclusion is often hereditary.

Handling

The Guinea pig's natural curiosity and friendly disposition makes it fairly easy to handle. Most Guinea pigs will approach a hand introduced into their cage and can be easily scooped into the palm of the hand. Usually, cupping one hand under the rump while the other hand cradles the midsection is a good way to pick up guinea pigs safely. Two hands are recommended so that nothing is left dangling (they're larger than most of the other "pocket pets"), and because there is less risk of dropping them. Guinea pigs are quite nose-heavy, and will do a potentially injurious nosedive if dropped. Guinea pigs not accustomed to being handled may jump and run, but rarely turn aggressive. Once picked up, the Guinea pig can be restrained by one hand with the over-the-back grip. This is done by scruffing the loose skin over their neck between your thumb and index finger while the base of the tail is held between your fourth and fifth fingers. The Guinea pig may struggle when held on its back or manipulated, so be careful not to let it escape.

Housing

Housing accommodations provided for pet guinea pigs are limited only by one's imagination, ingenuity, and budget. There is no single correct way to house your guinea pig as long as the well-being of your pet is considered. Adequate housing is a major factor in the maintenance of healthy pets.

Guinea pigs can be housed within enclosures made of wire, stainless steel, durable plastic, or glass. The latter three materials are preferred since they resist corrosion. Wood should not be used due to difficulty in cleaning and susceptibility to destructive gnawing. Many plastics are also easily destroyed by gnawing. Ideally, the enclosure should have one side open for adequate ventilation, so be careful when using aquariums. The design and construction of the enclosure



photo courtesy of Christy Cameron

must be escape-proof. In addition, the cage must be free of sharp edges and other potential hazards. The size of the enclosure should allow for normal guinea pig activity. Approximately 100 square inches of floor area per adult guinea pig is recommended. Breeding animals should be provided 180 square inches each. The enclosure can remain opened on the top if the sides are at least 10 inches high (as long as other family pets such as dogs or cats are not a threat).

Cage flooring can be either wire or solid. Wire mesh flooring provides a cleaner environment and easier maintenance but may result in injuries to the feet and hocks. Housing on wire over long periods of time often results in foot pad and hock infections from abrasive rubbing on fecal soiled wire. To reduce the incidence of these problems provide a solid platform as a resting place in one area of the cage. Broken legs are common in guinea pigs that fall through the wire mesh and panic to escape. Although solid flooring requires more effort to keep sanitary, it is safer for the guinea pig. Solid floored cages also tend to be more aesthetically pleasing when appropriate bedding is used.

Bedding materials must be clean, non toxic, absorbent, relatively dust-free, and easy to replace. Acceptable beddings are wood shavings, shredded paper, processed ground corn cob, and commercial pellets. Make sure the ground corn cob is properly processed and stored to reduce fungal spore problems. Cedar shavings have been associated with causing respiratory difficulty and liver disease in some guinea pigs and thus should not be used. Saw dust should also be avoided since it tends to accumulate within the external genitalia of male guinea pigs causing an impaction.

The environment in the vicinity of the pet's cage is another important consideration. Because of their sensitive nature, guinea pigs are more comfortable and relaxed when housed in a quiet spot away from noise, excitement, and other such stresses. Also be sure to select a location away from direct sunlight and avoid cold damp areas. Guinea pigs thrive in a dry, cool environment with adequate ventilation. Drastic environmental changes should be prevented (especially high temperatures and humidity). Since they are nocturnal (active at night), guinea pigs require quiet periods of light in order to rest.

Since guinea pigs are social creatures, more than one animal may be safely housed together. In addition, males and females can remain in the same enclosure indefinitely. However, new males may occasionally fight if in the presence of a female. Older, dominant animals may also chew on the ears or hair of subordinate cagemates.

Reproduction

The single most important consideration regarding guinea pig breeding is that the female guinea pig (sow) should be bred between four and seven months of age if she is to be bred at all. If the first breeding is delayed much beyond this time, serious and often fatal problems with delivery may result. The reason for this is that the pelvis of the guinea pig fuses at this early age which narrows the birth canal and prevent the babies from passing easily. Males (boars) should be at least four months of age before breeding.

The sow's estrus cycle ('heat') lasts 14 to 19 days. The actual period in which the sow is receptive to the boar for breeding is approximately eight to fifteen hours during this cycle. Sows often return to 'heat' within a few hours after giving birth. This time is known as 'postpartum estrous' which means that she can be nursing one litter while being pregnant with another.

Pregnancy lasts between 63 and 70 days. The gestation is shorter with larger litters and longer with small litters. This duration of pregnancy is relatively long when compared to other rodents.

Pregnant sows exhibit a grossly enlarged abdomen during the later stages of pregnancy. Her body weight may actually double during pregnancy. The time of delivery is difficult to assess in guinea pigs due to the relatively long gestation period and lack of nest building by the sow. Within one week prior to delivery, a slight widening of the pelvic area can be noted. If this separation of the pelvis does not occur, then it can cause the delivery problems mentioned previously. Therefore, sows bred past seven months of age require caesarean section for delivery of the young.

An uncomplicated delivery usually takes about one-half hour with an average of five minutes between babies. Litter sizes range between one and six with an average of three to four. First time litters are usually very small. Unfortunately, abortions and stillbirths are not uncommon with guinea pigs.

The young are very well developed at birth. They weigh between 50 and 100 grams and have a full hair coat. Babies are even born with teeth and open eyes. Mothers are not very maternal in the raising of the offspring in that she does not build a nest and even remains in a sitting position while nursing. The young can actually eat solid food and drink from a bowl shortly after birth, but it is recommended to allow them to nurse for three weeks before weaning.

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