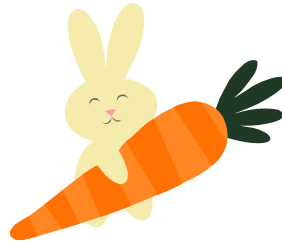




**Pet Kare Clinic**  
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“Happy Pets, Happy People”

## Rabbits



Rabbits make a good alternative to a dog or cat. Normally they are not aggressive, do not have to be walked and usually can be trained to use a litterbox. Their average lifespan is 5-10 years and they can breed at 4-6 months. Early spaying or neutering (at four to six months) is recommended to decrease medical and behavioral problems. In rabbits, pregnancy lasts about 30 days and the litter is four to twelve bunnies, with an average of seven.

The animal's large ears help give it excellent hearing and a way to regulate body temperature: the skin over the ears is thin, with large blood vessels just below the surface so that blood flowing through the ears is affected by the ambient temperature very quickly. The rabbit raises its ears to lose heat and clamps them to its body to limit heat loss. The large arteries and veins of the ears are often the site of drawing blood for diagnostic testing. The alimentary canal has adapted for digesting the large amount of fiber the rabbit ingests in the wild and there are two pairs of upper incisor teeth. Rabbit teeth, like those of rodents, grow throughout life and may need periodic trimming by a veterinarian. This can generally be avoided if rabbits are given blocks of wood to chew. Overgrown incisors may cause excessive drooling or the rabbit might stop eating but regular mouth checks should reveal the problem before symptoms occur.

### Normal biological information

Adult weight	1-8 kg (varies with breed and sex)
Litter size	4-12 (average 7)
Gestation	30-33 days
Weaning age	7-8 weeks
Life-span	5-10 yrs
Sexual maturity	16-24 weeks
Rectal temperature	37.0°-39.4° C (98.5-103° F)
Heart rate	220 per minute
Respiratory rate	35-60 per minute

### SELECTION

When selecting a rabbit (either at a pet shop or from a breeder) it should, ideally, be a young one. Its eyes and nose should be clear of any discharge that might indicate a respiratory infection and it should be inquisitive. He/she should not be thin and emaciated. Check for fleas and ear mites (mites cause a waxy black exudates in the ears). If possible, examine the rabbit's mouth for broken or overgrown incisors (front teeth), discolored gums (they should be light pink) and any obvious sores. Check for wetness around the anus (which could indicate diarrhea) and ask if the rabbit has been spayed or neutered; most have not been at the time of purchase. These operations should ideally be performed by four to six months of age. Finally inquire if the seller is offering any guarantee of the rabbit's health.

The rabbit should be examined within 48 hours of purchase by a veterinarian with skill in treating these animals. He/she should discuss housing, proper diet and appropriate toys for the rabbit. A fecal sample should be examined for parasites and this should be repeated annually, with a physical examination. At this initial examination the veterinarian will also be able to advise owners of potential problems.

## HANDLING

Proper handling is important: the rabbit has a very light skeleton in relation to the rest of its body, therefore its bones break easily. Despite this lightweight frame the powerful back legs allow it to kick with great force. If a rabbit kicks while being held incorrectly it might break its back and become paralyzed, requiring euthanasia. When carrying a rabbit always support its rear end. If it struggles put it on the ground immediately, give it time to quiet down and pick it up a few minutes later. Never pick a rabbit up by the ears. Ask a veterinarian to show you the correct way to carry and restrain a rabbit.



## FEEDING

Adult rabbits should be given high-quality rabbit chow, pellets and good-quality hay, grass or clover. Up to a year old, pellets and hay should be available *ad libitum* and over a year only hay, which provides fiber, should be *ad lib*. Pellets or chows can be offered a approximately  $\frac{1}{4}$  cup per 5-10 pounds of body weight per day. Overfeeding pellets to adult rabbits is a common cause of disease. While they can eat any type of hay, alfalfa is too rich to be their sole hay. Fruits and vegetables should constitute 20% of the diet, with vegetables making up most of this 20%. Fresh produce is best and make sure it is thoroughly washed prior to feeding. As with many pets, variety is the key, so offer small amounts of several items. Avoid lettuce and celery as they are of little nutritional value but otherwise anything green and leafy is loaded with vitamins and is a good supplement. Carrot tops, cilantro, and parsley are favored by most rabbits.

Fresh water should be available 24 hours a day. If water is offered in a bowl the container should not be able to spill in the cage. Chew toys, suitable for dogs, such as commercially available dog-chew or well-boiled meat bones, can be given and some owners offer wood to chew, which helps control growth of the incisors.

Rabbits should not require extra vitamins if their food is optimum. To help control hairballs, veterinarians may prescribe a cat laxative which can be given daily or every few days. Others find that pineapple juice is a useful measure to control hair balls in long haired rabbits.

## Coprophagy

Rabbits engage in coprophagy, which means they eat their own feces. This occurs at night and these fecal pellets are different from the ones normally excreted and seen by the owners. These pellets serve as a vital source of nutrients, especially vitamins and allow the rabbit to make best use of his/her fibrous diet. Most owners never observe this behavior but if you do, remember it is normal and necessary for the health of the rabbit. Also note that a rabbit which cannot easily bend round (for instance because of a back injury) will have difficulty with coprophagy and consequent gastrointestinal compromise.

## HOUSING

Some rabbits are housed outside in a hutch, with access to a grass run. Most people like to keep rabbits inside and they can make good household pets. They should never be allowed to run loose in the house as they love to chew and can be very destructive to furniture and even electrical cord. A rabbit can be let out of its cage when you are in the room and you can supervise ad play with him/her. Most owners use a portable dog or cat carrier as a cage to transport their rabbit and use a towel as bedding. Wire rabbit cages are also suitable but to

decrease foot trauma (which results in the condition sore hocks), at least half the wire floor should be covered with toweling, plastic glass, or wood. A concealed hiding area in the cage allows the rabbit to feel secure. Make sure the rabbit does not chew its towel bedding as it could be swallowed and contribute to an intestinal blockage.

The cage should also contain a litterbox – rabbits, like cats, easily learn to use one – and ceramic or steel food and water bowls (bowls are preferred for water, over droppers, which must be inspected daily for clogging of the nipple).

As rabbits are very sensitive to heat stroke it is critical to keep their environment at or below 26°C (80°F) and their hutch well ventilated.



***Traditional rabbit hutch***  
*(also suitable for guinea pigs)*

## **BREEDING**

Like dogs and cats, female rabbits should be spayed early in life (by four-six months old). Whereas unsprayed dogs and cats often develop malignant breast cancer and unsprayed female ferrets die of anemia, unsprayed rabbits quite often develop malignant cancer of the uterus (uterine adenocarcinoma). This is relatively common in older rabbits and should be suspected whenever an unsprayed female becomes sick. Diagnosis is difficult and often possible only during exploratory surgery.

The cost of the procedure is higher when the rabbit is sick (rabbits with uterine cancer normally need hospitalization, fluid therapy and force feeding), so early spaying to prevent the problem is recommended.

## **COMMON PROBLEMS**

These may be specific for a certain disease but most commonly they are vague and non-specific. A rabbit with anorexia (lack of appetite) and lethargy may have hairballs, uterine cancer, even kidney or liver failure. Any deviation from normal should be a cause of concern and requires immediate evaluation by a veterinarian.

Like dogs and cats, rabbits can contract various intestinal parasites, as well as external ones such as fleas, mange and ear mites. Any internal parasites should be detected at the yearly fecal exam and are easily treated. Which medication the veterinarian prescribes depends upon the examination findings.

### **Antibiotic Toxicity**

Antibiotics given by mouth often cause gut problems in rabbits. Some reports warn against using any oral antibiotics in rabbits, whereas others mention specific problems with oral drugs such as penicillin or lincomycin. Antibiotic toxicity is one reason to make sure only medications recommended by a veterinarian

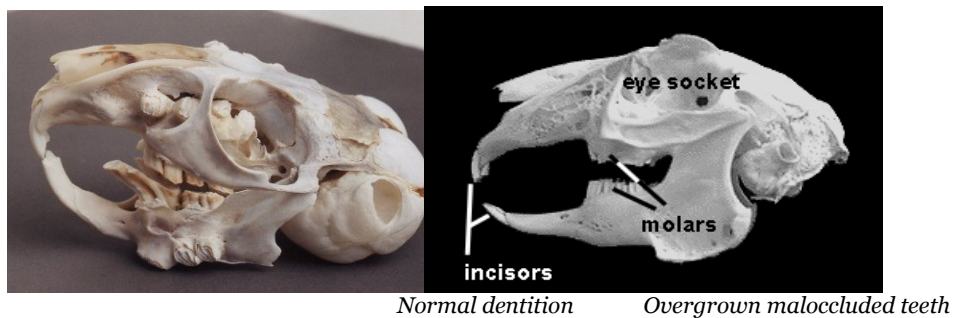
are used. If a rabbit develops diarrhea while on any medication it should be stopped and veterinary help sought at once!

### **Cystic calculi (bladder stones)**

Rabbits, like many other species, can develop bladder stones. Signs include urinating frequently, straining to urinate and blood in the urine. Often the stones can be palpated (felt) by a veterinarian on examination of the abdomen and radiographs (x-rays) can confirm the diagnosis. Surgical removal of the stones cures the problem. Rabbits that have been eating a diet high in pellets or high in alfalfa hay (which may contribute to stone formation) can be weaned onto a diet lower in pellets and higher in grass hay which may prevent stone recurrence.

### **Dental disease**

The rabbit's teeth grow throughout life and so incisor (front) teeth that do not wear each other down will grow until the upper ones bury themselves in the lower jaw gums and the lower ones poke way out of the mouth. A rabbit like this cannot eat or groom. If the molars or cheek teeth do not meet properly they wear unevenly, causing sharp spikes to form. These erode at the gums causing painful ulcers, again stopping the animal from feeding or grooming. The importance of continual food intake in rabbits is central to health, while grooming is essential to prevent problems like fly strike. Thus well-functioning teeth are absolutely essential to a rabbit's well-being.



***Rabbit Skulls***

One of the main reasons that teeth grow abnormally is that the bones of the jaw do not form properly due to genetic abnormalities.

Assessment of the quality of a rabbit's teeth can be made by looking at the enamel surface. This should be smooth and shiny and not chipped or with an irregular surface.

Overgrown incisors should be shortened but this needs to be done regularly since the teeth keep growing. Veterinarians formerly clipped rabbits' teeth with nail clippers but occasionally this damaged the teeth or gums. These days most veterinarians use dental burrs to file down the incisors; this procedure is most safely performed with the rabbit anesthetized. Treating poorly-aligned molar teeth is more difficult but filing rather than clipping is considered optimal today. One answer is to remove upper and lower incisors, a relatively simple operation. Although this sounds drastic it is without doubt the best long-term solution to the problem.

### **Diarrhea/muroid enteropathy**

Diarrhea is common in rabbits. While it can be due to coccidian (a one-cell protozoan) or incorrect use of oral antibiotics, often the cause cannot be determined. Rabbits eating a diet that is too high in carbohydrates (pellets or alfalfa hay) are more prone to develop intestinal problems than those eating a high fiber (grass hay) diet.

Mucoid enteropathy is a diarrhea disease of young rabbits than can be fatal. The diarrhea has a mucoid or gelatinous consistency. Treatment for diarrheal conditions of rabbits is controversial and varies among veterinarians. As a rule, fiber in the diet is increased (often nothing but hay is offered for several weeks). Fluid and vitamin therapy are used as needed.

### **Fly strike**

During the summer months pet rabbits may be affected by maggot infestation. Different terms are used for this but 'fly strike' is a common one. Another is to say that the rabbit is fly blown. The technical term a veterinarian might use is myiasis. Healthy rabbits are generally not affected by fly strike. There are three main problems that lead to the condition. First, a wound to which the flies are attracted and on which they lay their eggs is an obvious site where maggots can cause damage. More commonly, a rabbit that cannot, or does not, turn around to groom itself these fly larvae will hatch, survive and spread and may cause a tremendous amount of damage as they eat through the tissues. Thirdly, damp bedding is an ideal environment for egg-laying, maggot growth and development.

The key factors is preventing fly strike are to ensure that bedding is dry, that the rabbit does not have any wounds or ulcerated ears of skin and that there are no problems to prevent him grooming. These include dental disease and back immobility.

An animal which has sharp hooks on its molar or cheek teeth will not want to groom since these hooks cause pain when the rabbit extends its tongue to groom in the normal manner. Similarly, overgrown incisor teeth (at the front of the mouth) will impede grooming.

Rabbits with back problems may not be able to turn round to groom properly. Any rabbit with diarrhea will be especially prone to fly strike and will have many other problems associated with the diarrhea. Such a condition is an emergency for the rabbit far more than for a dog or cat (unless a puppy or kitten when, again, it is a major problem).

To treat fly strike the animal will need to be sedated or anesthetized so that all the maggots can be removed and whole area well disinfected with an antiseptic solution. The rabbit will need antibiotics since there is a major probability of secondary bacterial involvement. If the condition is severe intravenous fluids and steroids may be needed. In such a case the rabbit will be hospitalized and kept warm and comfortable, probably with a heat pad or an overhead infrared light. Such intensive care may cure the rabbit of the maggot infestation but in severe cases extensive surgery may be needed to remove all the dead maggot-ridden tissue. This can be a long, risky and often expensive treatment and it will still be necessary to overcome the original problems which led to the fly strike.

Owners should try to prevent fly strike by taking the rabbit to the veterinarian maybe twice yearly for a routine health check (to ensure that dental disease or back problems are not imminent) and by providing dry, well-aired housing.

### **Hairballs**

Hairballs (trichobezoars) are relatively common in rabbits. Like cats and ferrets, rabbits are very clean animals and love to groom themselves. Occasionally, a lot of hair can be swallowed during grooming and forms a ball in the stomach. Rabbits cannot vomit and, if the hair does not pass through the intestines they develop and obstruction. Hairballs are so common that they should always be suspected in a lethargic rabbit which is not eating. Diagnosis can be made on radiographs (x-rays) of the stomach: if the owner is sure the rabbit has not eaten within 24 hours and the radiographs show matter in the stomach, it is often a hairball. Sometimes, the diagnosis is made only during exploratory surgery.

Surgery should be a last resort, however, as the mortality rate from hairball surgery can be very high (about 50%). For very early mild cases, injections of drugs that alter intestinal motility may allow the

obstruction to pass. The veterinarian may also use fluid therapy and force feeding to help encourage the hairball to pass through the intestinal tract. Otherwise, surgery is needed and the earlier the surgery the better.

### **Nail overgrowth**

Rabbits have sharp nails and owners are easily scratched when handling their pets. The back feet, which are the most powerful, are usually the culprits. Scratches to owners most commonly occur when placing the rabbit back into its cage or down onto the floor. Supporting the rear end of the rabbit during the entire lifting, carrying, and replacing regimen will usually eliminate the problem (see above). Periodic nail trimming is important. Ask a veterinarian to show you the proper technique.

### **Snuffles**

This is the lay term given to respiratory infection mainly with the Pasteurella bacterium. Most commonly, clinical signs are related to the eyes (discharge, redness, squinting) or nose (sneezing, discharge). Often the eyes and nose are affected at the same time and Pasteurella can infect other areas of the body. Ear infections (resulting in a head tilt), abscesses (seen as lumps on the body) and uterine infections (often diagnosed only during exploratory surgery) also occur. Sudden death from septicemia (infection in the blood) is rare but can occur.

Most cases of snuffles are mild. Treatment involves antibiotics but due to potential problems with many oral antibiotics, injections are often preferred. Eye drops and nose drops, prescribed by a veterinarian, may be needed in selected cases.

Snuffles caused by Pasteurella is relatively easy to treat but hard, if not impossible, to cure. Like the kennel cough bacterium in dogs, most rabbits have Pasteurella, but only some show signs. Most rabbits are chronically infected, just as some children always seem to have a cold. The disease is easily transmitted by close contact between rabbits; new rabbits should be isolated (for about one month) before introducing them to existing pets. Stress situations, such as caused by a new cage mate, different diet or overcrowding, can cause relapse. Litter should be changed regularly to prevent ammonia accumulation from the urine which can irritate the eyes and nasal tissue.