

# CARE OF RABBITS

## Introduction

The domestic rabbit, *Oryctolagus cuniculus*, is a descendant of wild rabbits living in western Europe and northern Africa. In their natural environment, rabbits are gregarious and reproductively successful. They are completely herbivorous (eat only plants) and most actively forage in the twilight or nighttime hours. Rabbits use their claws to dig and burrow into the ground for shelter and protection. They rarely stand their ground when threatened but instead use their considerable speed and maneuverability to escape harm. Domestic rabbits or wild rabbits kept in captivity, however, can display an amazing degree of aggression when upset or threatened.

Rabbits make excellent pets. They are relatively easy to care for and can be litterbox-trained. Their fastidious nature, unaggressive behavior and quiet manner make them increasingly popular house pets.

Rabbits live an average of 5-10 years (potential life span, 15 years). Males reach breeding age at 6-10 months of age, and females at 5-9 months of age. Pregnancy lasts 29-35 days (average of 31-32 days) and litters average 4-10 bunnies. (See Important Physiologic Values on the last page).



## Diet

The diet recommended for the noncommercial, non-breeding pet rabbit is free

choice grass hay and large amounts of fresh leafy greens with added vegetables and fruits. Hay is the most important part of the diet as it provides a naturally high indigestible fiber source and encourages proper tooth wear. Good quality grass hay is also rich in other needed nutrients such as protein, vitamins, minerals, and carbohydrates. Grass hays available in the United States include timothy, oat, barley, and brome grass or mixed grasses. Alfalfa hay can be used if grass hay is not available, but it is higher in protein, calories, and calcium, which may be undesirable in some patients. It is more difficult to return overweight animals to their proper weight and to control some cases of chronic soft stools if patients are fed large amounts of alfalfa hay. In addition, it is not helpful to mix grass and alfalfa hay, as the more palatable alfalfa hay will be eaten exclusively and the grass hay left behind. Pet rabbits have been placed on an all hay diet for up to 4 months to treat digestive tract disorders without ill effect.

The three main drawbacks to hay are:

- Some rabbit owners are allergic to hay dust and cannot be exposed to it.
- Hay can contain the eggs of *Baylisascaris procyonis* (the raccoon roundworm) if it was taken from the top of the pile in an open hayloft or left outside on the ground uncovered.
- It may be difficult to obtain quality grass hay year round.

A less desirable but usable alternative to loose hay is pressed hay cubes, which can be purchased in many pet and feed stores.

The second most important part of the diet of the pet rabbit is clean, fresh leafy greens, including kale, collards, beet tops, carrot tops, parsley, dandelion greens, chicory, mustard greens, romaine lettuce, raspberry leaves, basil, mint, endive, raddichio, wheat grass, and Swiss chard to name a few. A minimum of three different greens should be fed daily, but the more variety the better. If the rabbit has never had

greens, establish it on hay first; then introduce a variety of greens over a few weeks at a minimum amount of 1 cup of tightly packed greens per 1 kg body weight per day. Once rabbits are well established on this diet, the total volume of greens is unrestricted. Rarely, an owner will observe a soft stool in relation to a particular green food (parsley is a common culprit); that food may be removed from the diet. Rabbits that ingest large amounts of greens will greatly decrease the amount of water they drink. Other fresh foods fed in smaller amounts include carrots, pea pods, green pepper, broccoli, brussels sprouts, melons, berries, apples, pears, peaches, papaya, pineapple, and mango. Avoid feeding legumes or grains (including bread, cookies, oats, and corn), which are high in starch, and grapes and bananas, which often are “addictive.” Fresh food provides not only important fiber, fluid, and other nutrients, but also likely provides stimulation in terms of different tastes and textures of foods. Rabbits fed a diet comprised primarily of grass hay and fresh foods are less likely to chew their own or other rabbits’ fur and are less likely to spend time chewing on cage bars, dry wall, furniture, and newspaper.

Owners like to feed “treat” foods, and they can be encouraged to find special fresh foods, particularly fruits, that can be used in this manner. In addition, fresh nontoxic tree branches, blocks of untreated soft wood, and unfinished grass or wicker baskets can all serve as excellent “dietary toys” as well as exercise for the teeth.

The least important part of the diet of the noncommercial, non-reproductive pet rabbit is commercial pellets. The free choice feeding of a variety of commercial pellets has contributed to innumerable cases of dental disease, obesity, enteritis (inflamed stomach), ileus, and gastric stasis. After removing or severely restricting commercial pellets in the diet of the pet rabbit and supplementing it with hay and greens, the frequency with which these conditions are seen has been reduced dramatically. Commercial

pellets are based on alfalfa meal, grains, and other supplements and are designed for the rapid growth of the commercial or laboratory rabbit that is usually not intended to live out its full life span. To the credit of some feed companies there are commercial pellets now being produced that are more suitable for the pet rabbit. They have a high fiber content (18% minimum), a moderate to low protein level (14%-16%), and low calcium and fat. These “pet rabbit” pellets can be used in situations where a weight gain is desired, where fresh hay cannot be fed, or where owner compliance feeding the “natural” diet is poor. Unless a weight gain is desired, the amount of any pellets used in the pet rabbit diet should be restricted.

Fresh water is offered free choice and should not be contaminated with supplements, which may reduce water consumption. As mentioned, rabbits on a diet high in fresh foods drink considerable less water than a rabbit on a pelleted or all hay diet. Rabbits should be encouraged to exercise daily; ideally, they should not be kept in cages but rather in large pens. Daily exercise has multiple health benefits including improvement of digestive tract motility.

The solution to many rabbit health problems is feeding an appropriate diet for this species. The biggest obstacle to a healthy diet has been owner resistance to abandoning what has historically been touted as the “proper” rabbit diet (i.e., pellets). In addition, some rabbit owners like to feed their rabbits an assortment of treat foods that are usually high in fat or starch, which only complicates matters further. Once a lethargic, overweight rabbit that produced soft stools has been on a healthy diet for a few weeks, we often hear comments like, “I didn’t know he had that much energy! He isn’t a ‘couch rabbit’ anymore.”

### **Eating of Night Feces**

Rabbits engage in relatively uncommon but normal behavior when they deliberately eat

small, soft, moist (often mucus-covered), light green fecal pellets directly from the anus. These special “night stools” are especially rich in protein, vitamins and minerals. Rabbits must obtain these nutrients in this fashion. This behavior is most often carried out in the early morning hours and is rarely observed by rabbit owners. Sometimes, however, they choose not to eat the night pellets, and you may notice these slightly different droppings in the morning.

### **Handling and Restraint**

Improper handling may cause serious, life-threatening injuries. Fractures and dislocations of the back, most often resulting in paralysis of both rear legs, are the most common injuries. These injuries also occur when rabbits are suddenly frightened and attempt to escape from a small enclosure.

A rabbit’s spine is relatively lightweight and fragile. When a rabbit becomes frightened, it violently struggles by powerfully kicking its back legs. The lightning-fast movements of the rear legs cause over-extension of the lumbosacral (lower back) region of the spine, which frequently results in fractures or dislocations. One should never try to overpower a struggling rabbit. If a rabbit violently resists physical restraint, it should be immediately released and approached later when it has calmed down.

A soft-spoken, relaxed approach with rabbits works well. Covering the eyes and lightly stroking a rabbit will usually result in a hypnotic-like trance that often renders them less prone to panic and injury.

Rabbits should *never* be picked up by their ears. If you are concerned about being scratched by the claws, place a towel over the rabbit’s back and wrap it around the body to restrain all 4 feet before picking up the rabbit. An alternative method of picking up a rabbit involves sliding one hand under its breast bone and grasping both front legs between the fingers of this hand. The other hand is then gently worked under the rear quarters to fully support

them as the rabbit is lifted upwards, in the same manner as cats are held.

### **Housing Considerations**

Rabbits can be housed indoors or outdoors. Indoor rabbits should be confined to a suitable enclosure when their activity cannot be adequately supervised. A roomy wire cage with at least one-half of the floor’s surface area covered with Plexiglass or washable towels is recommended. The Plexiglass or towels provide relief from constant and continual contact with the wire floor, helping to prevent hutch sores on the feet (see section on Hutch Sores – Sore Hocks). A water bottle or ceramic crock, food dish and a litterbox should be provided for the rabbit inside the enclosure.

Under no circumstances should rabbits be allowed total freedom within the home. Rabbits love to chew and can be very destructive to household furnishings. Further, they can be seriously injured by biting into telephone and electrical cords.

Like cats, rabbits can be easily trained to use a litterbox in the home. If the rabbit has already selected an area for elimination, the litterbox should be placed in this location. It helps to place some of the rabbit’s fecal pellets in the litterbox to encourage its use.

Rabbits housed outdoors should be confined in roomy wire cages with Plexiglass covering about one-half of the floor’s surface area. The wire mesh should be just large enough to allow fecal pellets to drop through. A water bottle or ceramic crock and a heavy food dish should be provided.

Adequate shade and a “hiding spot” should be provided as well. Rabbits are typically anxious, wary animals and are easily frightened. This is especially true of newly acquired pet rabbits and rabbits kept for reasons other than as pets. A concealed area into which these rabbits can retreat when they feel threatened is necessary to prevent injury that would result from excessive and futile efforts to escape from the

cage. Hiding provides a safe alternative to useless and often injurious escape efforts.

Shade must be provided to prevent heat stress or heat stroke. All rabbits, even those housed indoors, are especially sensitive to high environmental temperatures. Adequate shelter must also be provided against wind, rain, snow, ice, and especially predators. Rabbits kept outdoors do not have as long a lifespan as those kept indoors.

## **Surgical Considerations**

### **Spay/Neuter**

Pet rabbits not intended for breeding should be neutered at any time after 5 months of age. Male rabbits (especially of the dwarf varieties) have a tendency to become aggressive upon reaching sexual maturity. Neutering (castration) is the best way to reduce the severity of the problems (biting, urine spraying) seen in sexually mature male rabbits.

Female rabbits should be spayed (ovariohysterectomized) to prevent unwanted pregnancy and uterine cancer. Uterine tumors are the most common type in females and often associated with serious blood loss. Spaying female rabbits may also help to prevent or reduce territorial aggression among females.

## **Infections Requiring Veterinary Attention**

### **Bacterial Disease**

*Pasteurellosis*: The bacterium, *Pasteurella multocida*, is the major infectious agent of rabbits. It is most often transmitted among chronically infected does and their litters or between breeding males and females. Bacteria most often reside in the nose, lungs and eye membranes, but can spread to other areas of the body.

Pasteurellosis of rabbits may take many different forms. Respiratory disease, including

pneumonia and infection of the nasal passages and sinuses, is very common. Infections of the eye membranes, middle ear, jawbone and uterus are most often the result of the *Pasteurella* organism. Abscesses are also common and occur when the *Pasteurella* organism settles in a specific location.

*Pasteurella* infections may become incurable if untreated or improperly treated. Aggressive antibiotic therapy with the appropriate drugs, however, especially if undertaken early in the course of the disease, is often rewarding.

Ideally, prospective owners should obtain their pet rabbit from a *Pasteurella*-free rabbitry, but this is not always possible. Regardless of origin, all newly acquired pet rabbits should be thoroughly examined by a veterinarian as soon as possible after purchase.

*Abscesses*: As mentioned in the previous section on Pasteurellosis, rabbits are very prone to abscess formation. The bacteria most often involved in these abscesses include *Pasteurella multocida* and *Staphylococcus aureus*. Abscesses represent focal areas of infection and may be in single or multiple locations. The most important consideration regarding this condition is the way in which abscesses must be treated. Because rabbit pus is roughly the consistency of toothpaste, lancing and draining abscesses are difficult and attempts to do so may be futile. Abscesses should be treated as if they were tumors and be surgically removed. In addition, an appropriate antibiotic should be given.

*Respiratory Disease*: Most respiratory diseases of rabbits are caused by the bacterium, *Pasteurella multocida*, though other bacteria are often involved. In rare instances, the protozoan (one-celled) organisms that cause coccidiosis colonize the nasal passages and cause respiratory disease. Respiratory signs often include sneezing, nasal congestion and discharge, eye discharge, listlessness, inappetence and pneumonia.

Respiratory disease of rabbits must be aggressively treated with an appropriate antibiotic (determined by a bacterial culture and antibiotic sensitivity test) and for an appropriate length of time to prevent relapses. A total cure for *Pasteurella*-related disease may be very difficult.

Eye infections are relatively common extensions of sinus infections in rabbits and should be treated aggressively with systemic (body-wide) and topical antibiotics. This is important because the eyes are connected to the brain by important nerves. If an eye infection goes unchecked, encephalitis (infection of the brain) is a common and dangerous consequence.

Common signs of eye infections include accumulation of debris at the corner of the eye, and soiling of the hair below the lower eyelid. Obstruction of the nasolacrimal duct, which normally drains tears from the eye into the nasal cavity, causes tears to spill onto the hair below the lower eyelid.

Long-term use of topical antibacterial ophthalmic ointment may correct nasolacrimal duct obstruction; flushing is required in some cases.

### **Internal Bacterial Infections**

Internal bacterial infections from a host of bacterial organisms are common among rabbits. Affected rabbits show a wide variety of signs because multiple organs (liver, kidney, intestinal tract, brain, etc) are usually involved.

Laboratory workups (blood, urine, bacterial cultures) are vital to properly diagnose and monitor the progress of these cases. Laboratory tests also help predict the outcome.

Rabbits suffering from these serious multiple organ bacterial infections (septicemias) must be aggressively treated with appropriate antibiotics and proper supportive care (nutrition, fluids, etc). Recovery usually requires several weeks or more of treatment. If infection results in formation of internal abscesses, a cure may be virtually impossible.

*Venereal Spirochetosis (Rabbit Syphilis):* Rabbit syphilis is a relatively rare sexually transmitted (venereal) disease of pet rabbits. This disease is caused by a slender, spiral bacterium (spirochete) transmitted by direct contact between infected and uninfected rabbits. Transmission is more likely to occur in rabbitries than in a household. In fact, exchange of bucks (breeding males) among rabbit breeders helps spread the disease.

Infected rabbits develop multiple raised, crusted and sometimes bleeding ulcers on the external genitalia, around the anus, and on the face (particularly the nose). Affected rabbits remain alert and the condition usually disappears after several weeks. Treatment is recommended and involves antibiotic injections.

### **Fungal Disease**

*Ringworm:* Ringworm is a relatively uncommon fungal disease in rabbits. It is caused by an agent similar to the one that causes athlete's foot in people. It is transmitted easily by direct contact with fungal spores on haircoats, bedding and soil. It most commonly affects juvenile rabbits and susceptible adults, usually causing multiple hairless areas with slightly reddened skin. These hairless areas are often covered with a slight or heavy crust. The patches usually occur on the head, ears and forelimbs.

Spot application of topical preparations can be used to treat a few individual areas, but oral medication is required if ringworm affects much of the body.

Ringworm can be transmitted to susceptible people (including children). Caution should, therefore, be exercised in handling rabbits with ringworm.

### **Viral Disease**

Viral diseases affecting pet rabbits are rarely identified. Fortunately, such devastating

viral diseases as myxomatosis are very uncommon in pet rabbits in the US. Rabies is virtually unknown in pet rabbits.

### **Parasites Commonly Seen in Pet Rabbits**

*Ear Mite Infestation:* Ear mite infestations cause accumulation of a light brown crusty material that nearly fills the external ear canal. The underlying tissues are usually very raw and irritated. In especially severe cases, these sores may spread to adjacent areas of the head. The infestation may be treated with ear-drops, though injectable medication has recently proven highly successful in treating this condition.

*Cheyletiella Mange (“Walking Dandruff”):* Most rabbit owners overlook the early signs of mange, a parasitic infestation of the skin by the *Cheyletiella* mange mite. As this condition worsens, however, the accumulation of dried scale and scurf (“dandruff”) within the fur and limited hair loss (often in clumps) become obvious. Affected rabbits may or may not exhibit increased scratching.

This parasitic problem is easy to diagnose and treat. An injectable drug works very well in conjunction with a medicated shampoo to eliminate the offending mites and clear up the skin disease.

*Flea Infestation:* Fleas can infest pet rabbits whether or not the rabbits share the household with other pets, such as dogs and cats. Fleas suck blood and can cause anemia if present in large enough numbers and if they are not eliminated from the environment. Topical flea products (powders or sprays) formulated for use on cats are generally well tolerated by rabbits. They should be used in the same manner as for cats. The manufacturers of these products have taken into consideration that cats (and rabbits) habitually lick to clean themselves and, in doing so, may swallow small amounts of the product. Poisoning, therefore, is unlikely as long as a product formulated for cats is used properly. Flea collars should *not* be used on rabbits.

Frontline spray has been associated with several rabbit deaths (this was most likely associated to a toxicity from the alcohol base in which the Frontline spray is delivered), therefore, Advantage is the preferred spot-on product.

*Coccidiosis:* Coccidiosis, caused by a protozoan (one-celled organism) parasite, is a disease of the liver and/or intestinal tract. Rabbits become infected by eating food or consuming water contaminated with feces from an infected rabbit. Signs depend on whether the disease is localized within the liver (inappetence, diarrhea, death) or the intestinal tract (weight loss, soft to watery feces, mucus and/or blood in feces, soiled anal area, dehydration, increased thirst, possibly death). The relative severity of both types of infection depends upon the number of coccidia eaten, the age of the rabbit, the strength of its immune system, and other illness in the rabbit. Occasionally, the coccidia colonize the nasal passages, resulting in respiratory disease (nasal coccidiosis).

Coccidiosis may be treated with sulfa drugs. Emphasis must be placed on prevention (good husbandry and sanitation) of this disease in all rabbitries, since it can be difficult to eliminate in these situations.

*Pinworm Infection:* Pinworm infections are rarely detected unless routine fecal examinations are conducted. These worms reside within the large bowel and rarely cause difficulties in rabbits. Pinworm eradication is somewhat difficult because a number of treatments and followup fecal examinations are necessary. This parasite is not transmissible to people.

*Maggot Infestation (Myiasis):* Maggots often infest rabbits housed outdoors in nonscreened enclosures. Maggot infestation typically occurs in rabbits with back injuries or debilitating illness, or old rabbits with hindquarters soiled with urine or feces.

Flies lay eggs on the soiled hair, and the hatched maggots begin feeding on the underlying skin and flesh.

In addition to removing the infesting maggots, the veterinarian must try to determine the underlying cause of the infestation. This condition is best prevented, if at all possible.

### **Non-Infectious Conditions Requiring Veterinary Attention**

#### **Hairballs**

Like cats, rabbits (especially Angora rabbits) frequently develop hairballs within their stomach. But unlike cats, rabbits cannot vomit. As a result, hair that is swallowed from frequent grooming passes into the stomach and remains there. Over time, the hair develops into a solid mass. As the hairball increases in size, it begins to occupy more and more of the stomach, leaving less room for food. Initial signs of a hairball problem include reluctance to eat pellets and more interest in eating greens and treat items. Later signs include inappetence, smaller fecal pellets or none passed at all, weakness, weight loss and, eventually, death from starvation.

Surgery is sometimes necessary to remove the hairball from the stomach. Some cases can be successfully managed more conservatively with fluids, increasing the hay portion of the diet and G.I. motility enhancing drug. For this reason, conservative treatment is usually attempted before resorting to surgical intervention. Recurrences are common.

Prevention involves vigorous daily brushing of the rabbit, Laxatone, (Evsco Pharmaceuticals, Buena, NJ 08310) and a diet high in natural roughage (i.e. grass hay & dark leafy green vegetables) and exercise.

#### **Hutch Sores (“Sore Hocks”)**

Hutch sores are chronically ulcerated and infected wounds on the weight-bearing surfaces of the rear (and sometimes the front) paws. They are caused by a number of predisposing factors: reduced thickness of fur on the bottoms of the feet; continued thumping of the rear feet when frightened; excessive body weight; repeated or

continual urine-soiling of feet; lack of movement from living in a small enclosure; and abrasions from irregular cage flooring. Hutch sores can occur in rabbits housed on solid floors, but are more common in rabbits kept in enclosures with wire floors. Pet rabbits that are housed indoors or outdoors should be confined in roomy wire cages with Plexiglass covering about one-half of the floor’s surface area.

Hutch sores are treated with antibiotics (both topically and by injection) and periodic bandaging of the affected feet. Treatment is usually long-term and also requires identification and correction of the underlying causes. Hutch sores must be treated aggressively to prevent infection of deeper soft tissues and bone.

#### **Overgrown Incisor Teeth**

Malocclusion (improperly aligned teeth resulting in abnormal tooth growth and wear) in rabbits usually results in overgrown incisor (front) teeth. Occasionally, misdirected premolar and molar teeth are noted. Many rabbits with a malocclusion probably have a genetic deficiency that causes an abnormally short upper jaw. This structural defect prevents the continuously growing upper and lower incisors from meeting each other as the rabbit chews. Consequently, the overgrown incisors cause considerable trauma to the tongue and lining of the mouth. A rabbit’s “bite” must be absolutely perfect so that its continuously growing teeth wear down properly.

Infections of the jawbone in the area of the incisors can also result in misalignment of these teeth. Many cases of overgrown incisors results from previous injury to the area of the jaw responsible for growth of the incisors, with subsequent uneven tooth growth.

Initial signs of this disorder include failure to properly chew and swallow food, salivation and a wet dewlap. Inappetence and weight loss soon become noticeable. Death from starvation can occur if the problem goes untreated.

Treatment involves periodic clipping of the incisors and attention to any wounds within the mouth caused by the overgrown teeth. The clipping procedure should be carried out by an experienced veterinarian or veterinary technician and must be done periodically for the remainder of the rabbit's life. Rabbits with this condition should *never*, under any circumstances, be bred.

### **Overgrown Claws**

Overgrown claws are easily torn when caught in fabric or wire mesh. A panicked rabbit can also inflict painful scratches with them. Clipping claws requires experience and judicious restraint of the rabbit, and should be done as needed. Declawing of rabbits is *not* recommended.

### **Heat Stress (Heat Stroke)**

Rabbits are especially susceptible to heat stroke, particularly those that are overweight and/or heavily furred. Environmental temperatures above 85 F, high humidity (above 70%), inadequate shade and ventilation, crowding and other forms of stress are additional predisposing factors.

Signs of heat stroke include panting, salivation, ear reddening, weakness, refusal to move, delirium, convulsions and, eventually, death. Heat stroke can be successfully treated if recognized early. Heat-stressed rabbits should either be sprayed or bathed with cool water. Another very effective way to rapidly lower the body temperature involves applying cold running water to the ear flaps. Once these first-aid measures are undertaken, a veterinarian should be contacted immediately.

Prevention of heat stroke involves providing adequate shade from the sun (if the rabbit is housed outdoors) and ventilation (if the

rabbits is housed indoors or with many other rabbits). A continuous light mist or spray of water and/or a fan operating over a container of ice and directed at a rabbit within its enclosure can help lower the air temperature, whether the rabbit is housed indoors or outdoors.

### **Trauma to the Spine**

An interesting fact is that a rabbit's entire skeleton comprises only 8% of its total body weight. In comparison, a domestic cat's skeleton comprises 13% of its body weight. The rabbit's fragile lumbar spine (lower back) is surrounded by powerful muscles and is particularly susceptible to fracture. Back injuries most often occur when rabbits are dropped, or improperly picked up or restrained. Closely confined rabbits that become excited and thrash about excessively are very prone to back injuries.

Signs of back injury may include incoordination, urine-soiling and uncontrolled defecation. Paralysis of the rear quarters is the most serious consequence of this type of injury. Any rabbit exhibiting any of these signs should be examined by a veterinarian at once. A thorough physical examination and radiographs (x-rays) are usually necessary to make the diagnosis and predict the eventual medical outcome. Spinal injuries are considered very serious and, generally speaking, the outcome is often unfavorable.

To avoid injury, rabbits should be picked up and restrained very carefully. A panicked, struggling rabbit should never be forcefully restrained. Instead, such a rabbit should be immediately released and reapproached when it has calmed down.

### **Uterine Cancer**

The most common tumor of domestic rabbits involves the uterine lining. In breeding rabbits, the early signs of this tumor involve decreased fertility, smaller litter sizes, abortions and stillbirths. In pet rabbits, the most common

clinical sign of a uterine tumor is intermittent bleeding from the vulva. This vulvar bleeding is often mistaken for blood in the urine. The volume of hemorrhage can be substantial and alarming. If bleeding is intermittent, the results of a urinalysis may be normal between bleeding episodes.

Though this type of tumor can spread to the lungs, spaying of affected does is strongly advised. Because this type of tumor is so common, all pet female rabbits should be spayed after 5-6 months of age to avoid difficulties with the reproductive tract later in life.

### **Wryneck**

Wryneck, a serious problem in pet rabbits, is a mild to severe twisting of the head that causes incoordination and sometimes total incapacitation. Wryneck is most often the result of a bacterial infection of the inner ear and is not a true neck problem. It can be treated with antibiotics and anti-inflammatory drugs, but the outlook with these cases is always guarded.

Unfortunately, wryneck often results from abscessation of the inner ear (and sometimes the brain). Penetration of antibiotics into the diseased area is often restricted or impossible, resulting in mild improvement, temporary relief, or no improvement at all.

### **Temporary Selective Anorexia**

Some pet rabbits occasionally refuse to eat alfalfa pellets. Affected rabbits usually continue to eat other items in their diets. This condition occurs most often in response to stress, such as that associated with inadequate husbandry or sudden environmental changes. Affected rabbits may continue to refuse to eat pellets for weeks. Old or spoiled (rancid) pellets will also be steadfastly refused.

This condition is diagnosed indirectly. Physical examination of the rabbit reveals nothing abnormal and laboratory tests on blood samples are normal. Other causes of inappetence

must also be ruled out, such as hairball formation.

### **Poisonings and Other Hazards**

Pet rabbits are often allowed the “run of the house.” However, rabbits love to chew and often get into trouble by chewing on electrical cords, poisonous house plants, floor mats and rugs. Electrocutation, serious burns, poisoning and intestinal impaction are the most frequent consequences of such chewing.

Rabbits should be confined when their owners are away from the house and must be closely supervised when their owners are at home so that these accidents are avoided.

### **Use of Antibiotics in Rabbits**

Antibiotics should never be used in rabbits unless they are specifically prescribed by a veterinarian. The route of administration (oral versus injectable) of antibiotics is a much more important consideration with rabbits than with dogs and cats. Because rabbits are herbivorous (plant-eating) and depend upon bacteria within their bowel for proper digestion, antibiotics given by mouth can wipe out these beneficial bowel microorganisms. When these helpful and necessary bacteria are destroyed, undesirable bacteria can overgrow and produce poisons within the bowel that can kill the rabbit. When needed, injectable antibiotics are preferred because they are far less injurious to the bacteria within the intestinal tract.

Rabbits receiving antibiotics, especially oral antibiotics, should be given yogurt to help replenish those beneficial bacteria destroyed by the antibiotic. Yogurt (piña colada or orange-flavored is preferred) should be given during the course of antibiotic therapy and for at least 3 days after antibiotic use has been stopped. A suitable alternative is to add a powdered *Lactobacillus* or *Acidophilus* product, plus Tang (General Foods) to water. Rabbits seem to prefer the flavor of orange and will be unaware that

they are also drinking a large volume of favorable and desirable bacteria that may help their intestinal tract. Yogurt should be included in the usual diet in anticipation of future antibiotic use.

### **Sensitivity of the Rabbit's Intestinal Tract**

The bacterial populations in a rabbit's intestinal tract are considered the most delicately balanced of any in all herbivorous mammals. The growth and activity of normal (favorable) bacteria tend to keep potentially harmful bacteria in check. Overgrowth of harmful bacteria usually results in production of toxins that are rapidly absorbed into the rabbit's circulation, quickly causing illness and death.

In addition to orally administered antibiotics, other insults can disturb the balance of bacteria. Rapid change in the diet are most often implicated. For example, a rabbit's diet was suddenly changed from alfalfa pellets to oats because the pet owner had run out of rabbit pellets. The rabbit died within 24 hours of this diet change. Another case of sudden death involved a pet rabbit that ate a large quantity of oatmeal cereal and died the following day. A third rabbit was allowed to consume huge quantities of lawn grass. Its intestinal tract was not adequately prepared and the rabbit died the same day.

No other commonly kept house pet is as sensitive to dietary changes as the rabbit. Consequently, such changes should be made very gradually. Supplements to the regular diet should be added cautiously and should not constitute more than 20% of the total diet by volume.

### **The Appearance of Rabbit Urine**

Urine from normal rabbits usually contains large amounts of a light-colored sediment and may appear abnormal to the uninitiated. The color of normal rabbit urine varies from white, to yellowish-white, to light brown. Rabbits that drink large quantities of water tend to produce clearer urine containing less sediment.

Rabbits recently treated with antibiotics and those undergoing significant stress may temporarily produce urine that is orange or red-tinged. Such urine can be differentiated from that which accompanies urinary tract infections or uterine bleeding by use of a urinalysis, performed by a veterinarian.

### **Important Physiologic Values**

Normal Body Temperature: 101.5–103 F

Life Span: 5-10 years (rarely up to 15 years)

Breeding Age: Males, 6-10 months; females, 5-9 months

Pregnancy: 29-35 days

Litter Size: 4-10

Weaning Age: 4-6 weeks

### **Rabbit Fancier Associations**

Below is partial list of national rabbit specialty clubs and associations found in the *Encyclopedia of Associations*, which can be found in any local library. The mailing addresses and phone numbers of local organizations affiliated with these clubs and associations and those not listed here could be obtained by contacting individuals associated with the national clubs and associations.

Glen C. Carr, Exec Sec  
American Rabbit Breeders' Association  
Box 426  
1925 S. Main St  
Bloomington, IL 61701  
(309) 827-6623

Jean Brunette, Sec-Treas

Lop Rabbit Club of America  
R.R. 15, Box 561  
West Terre Haute, IN 47885  
(812) 533-3761

National House Rabbit Society  
www.rabbit.org  
Indiana Education representative  
Amy Young-Leith  
e-mail inhrrs@bluemarble.net  
(812) 331-3670

### Books to Read

*House Rabbit Handbook* by Marinell Harrimen

*Creating A Peaceable Kingdom* by Cynthia D.  
Miller

### REFERENCES:

1. Krull WH: Coprophagy in the wild rabbit (*Sylvilagus nutalli granger*) (Allen). *Vet Med* 35:481-483,1954.
2. Crossley DA: Denistry for small animals other than cast and dogs. Second Annual Midwest Exotic Pet Seminars Proceedings, Schaumburg, IL, March 1997.
3. Cheeke PR: *Rabbit Feeding and Nutrition*. Orlando, Academic Press, 1987, pp 20-21.
4. Smith HW: The development of flora of the alimentary tract in young animals. *J Pathol Bacteriol* 89:95-122,1965.
5. Brooks DL: Rabbit gastrointestinal disorders, in Kirk RW (ed): *Current Veterinary Therapy VIII*. Philadelphia. WB Saunders, 1983, pp 654-657.
6. Brooks DL: Nutrition and gastrointestinal

tract physiology, in Hillyer EV, Quesenberry KE (eds): *Ferrets, Rabbits, and Rodents: Clinical Medicine and Surgery*. Philadelphia, WB Saunders, 1977, p 148.

7. Harkness JE. Wagner JE: *The Biology and Medicine of Rabbits and Rodents*, ed 4. Media, PA. Williams & Wilkins, 1995.
8. Forsyth SJ. Parker DS: Nitrogen metabolism by the microbial flora of the rabbit caecum. *J Appl Bacteriol* 58:363-369, 1985.
9. Jenkins JR: *Gastrointestinal Disorders*, in Hillyer EV, Quesenberry KE (ed): *Ferrets, Rabbits, and Rodents: Clinical Medicine and Surgery*. Philadelphia, WB Saunders, 1977, pp 176-188.
10. S. Brown: Waltham Exotic Pet Conference Proceedings