



Rabbit Care Overview

Rabbits can live for 7-8 years if cared for properly. Proper care includes a diet rich in fiber, safe housing, reproductive sterilization, a mentally and physically enriching environment, and prompt medical care should the need arise.

Diet: Unlimited grass hay (not alfalfa)
No more than $\frac{1}{4}$ cup rabbit pellets per 4 pounds of body weight per day
Fresh vegetables up to 1 cup per 4 pounds of body weight per day
Unlimited fresh, clean water
Small amount of fruit as an occasional treat

Housing: Rabbits can be housed indoors or outdoors. Indoor (House) rabbits are less likely to be victims of predators. House rabbits should still have a cage where they stay when not supervised. Rabbits like to chew anything! Make sure your house is rabbit proof so electrical cords and furniture are not chewed. If kept outdoors, make sure the cage protects the rabbit from predators and provides shelter from the sun, wind and rain. Having a wooden or cardboard "hide box" also gives them protection. Adequate ventilation is important to reduce respiratory illness. Indoor cage pans or litter boxes should be cleaned frequently to reduce ammonia buildup.

Reproductive Health:
All female rabbits (does) should be spayed unless they are specifically used for breeding. Does can be spayed as young as 3 months of age. Unspayed does have a very high incidence of uterine cancer that can be completely prevented by spaying when they are young. Male rabbits (bucks) should be neutered to reduce spraying and territorial aggression. Even though rabbits are solitary creatures, neutered bucks and spayed does can live together quite happily.

Mental and Physical Exercise:
Rabbits love to be busy. Toys such as empty tuna cans, jar rings or lids, balls that can't be chewed as well as willow or apple branches give them something to do.

Illness: Signs to watch for: runny eyes or nose, matting of fur inside the front legs (from wiping their nose), crusts inside ears, not eating or decreased appetite, diarrhea or smaller fecal pellets than usual, or a change in personality. Any of these signs warrant a veterinary checkup.

Myxomatosis

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April 2010: The Brush Bunny population this year is exploding. In Oregon, these wild rabbits are the carrier of the virus that causes myxomatosis. There have already been cases of myxomatosis this spring, in rabbits housed outdoors. We expect this to be a particularly bad year for the transmission of this disease. We recommend that all rabbits be kept indoors with screened windows and doors to prevent access to mosquitoes. This disease has a 100% mortality rate.

Myxomatosis is a viral disease of rabbits that is spread by the bite of a mosquito or rarely a flea. This disease is endemic to the west coast of the U.S. meaning it is ALWAYS a threat to domestic rabbits and has been for many years. Most cases of myxomatosis occur during the months of July through September when the mosquito population is at it's highest. The virus lives in the wild (not domestic) rabbit population where it does not cause serious disease. A mosquito bites a wild rabbit carrying the virus then bites a domestic rabbit spreading the disease. Myxomatosis is fatal to domestic rabbits. It can also be spread from a sick domestic rabbit to another domestic rabbit via a bite from a mosquito or from direct contact of body secretions. This also means that humans can spread it between rabbits on our hands and our clothes. It CANNOT be spread from rabbit to human even through a mosquito bite.

Signs of myxomatosis in the domestic rabbit appear 5-14 days after being bitten by a mosquito carrying the virus. Signs include swelling around the eyes, lips, ears and genitals, high fever, lethargy and poor appetite. There is no cure and treatment is rarely successful. Prevention is to keep rabbits within screened areas to prevent mosquito entry.

CARE OF COMPANION RABBITS

Domestic rabbits belong to the scientific order LAGOMORPHA, not rodentia, which is where mice, hamsters, gerbils and squirrels belong. Two of the characteristics which help differentiate rabbits from rodents are (1) the extra set of tiny "peg teeth" which are behind the front incisors, and (2) the rabbit's inability to use the forepaws for manipulating objects.

Rabbits are vegetarians with complex dietary needs and are crepuscular (most active at dawn and dusk). Our domestic rabbits weigh between 1 1/4 pounds for the smallest dwarf breed up to more than 20 pounds for a giant breed.

The smallest breed rabbit has been recorded as living as long as 10 years; the larger breeds have been documented to live as long as 18 years!

The average lifespan of an INDOOR-housed, SPAYED/NEUTERED, well cared for rabbit is approximately 10 years, but many oldsters are on record as living as long as 13-16 years of age!

Learning how to take the best possible care of your companion rabbit will help him/her live out his/her full lifespan...and it will give you a chance to share a long friendship.

NUTRITION

Until recent years, dietary information for pet rabbits has been based on research done in the fields of breeding, laboratory or production rabbits.

However, with the growing popularity of house rabbits, increased documentation from rabbit shelters nationwide and intensified study by veterinarians who specialize in treating pet rabbits, a much greater understanding of the true nutritional needs of spayed/ neutered companion house rabbits has been established and it greatly differs from the old protocol!

Although a good quality commercial rabbit pellet can be part of your house rabbits' diet, they are NOT an absolute necessity IF the other components of the diet are complete. Commercial pellets were originally manufactured to bring production rabbits to mature weight quickly for the meat, fur or laboratory industries. Consequently, although commercial pellets ensure proper dietary needs are met for GROWING bunnies, they also provide mature house rabbits (8 months or older) with TOO MANY CALORIES if intake is not carefully controlled. Feeding your rabbit a CONTROLLED amount of quality pellets daily will prevent obesity and its associated problems. Give all food in a clean dish; don't just add to yesterday's leftovers. There will be no waste if you are feeding your bunny the recommended amount. If you choose to use commercial pellets, it is best to buy rabbit pellets FROM A FEEDSTORE. Grocery stores and pet store pellets are seldom fresh and often much more expensive. Look for a FIBER content of at least 18% and a protein content of 12-14%. Rabbits do NOT need high protein levels but they DO need high fiber levels. Do NOT buy any "gourmet" rabbit pellets or treats that contain dried fruits, vegetables, seeds, nuts, or "puffs". Regardless of what the pet stores tell you, these are NOT good for your rabbit, as they are high in

carbohydrates, fats and sugars! Forget the "yogurt drops" as well! Not only does the possibly beneficial acidophilus bacteria get killed in the manufacturing, but sucrose and lactose are dangerous additions to your rabbits' delicately balanced gastro-intestinal tract.

If you plan on switching commercial pellet brands, gradually introduce the new brand by mixing it with the old brand over a period of 5-7 days. If you have been feeding the gourmet" foods, the switch-over may take longer. Be sure that your bunny is at least eating hay during this change, but DO insist on changing to a regular pellet diet. Store pellets in an airtight container in a cold, dry place. Buy only what you will use in a month to six weeks.

If using commercial pellets, the recommended amount is no more than $\frac{1}{4}$ cup per 4 pounds of body weight. Most rabbits do well with the following amounts:

1-1/2 to 4 pounds body weight: 1/16 to 1/8 cup daily

5 to 7 pounds body weight: 1/8 to 1/4 cup daily

8-12 pounds body weight: 1/4 to 1/2 cup daily

over 12 pounds: 1/2 to 1 cup daily

Adjust these amounts within the range of body weight, according to your rabbits' ideal weight (see your veterinarian to help determine that) and his/her activity level and age.

Young rabbits, under 4-8 months of age, depending on breed, can have free access to pellets until maturity. At that point, decrease amounts to the recommended amount.

HAY

ALL rabbits, regardless of whether they receive commercial pellets or not, MUST have UNLIMITED access to fresh, dry hay. Hay is extremely important to maintain gut motility, which keeps your rabbit healthy. It should be green, but dry, and have no mold or white looking powder in it. If you DO provide commercial alfalfa based pellets, AVOID alfalfa hay. Offer instead Timothy, Oat or Grass hays. Alfalfa hay contains high levels of protein carbohydrates and calcium, all of which are already supplied in good quality pellets. If you were to offer BOTH pellets and alfalfa hay, you would be overdoing these nutrients. High calcium levels have been associated with kidney and bladder stones, along with mineralization of the large blood vessels and soft tissue. Rabbit urine already contains a high amount of calcium. Alfalfa hay is also higher in calories.

If NO pellets are being given to your rabbit, alfalfa hay CAN be safely offered to help supply necessary nutrients. Whichever hay is offered should be provided in unlimited amounts. Most rabbits begin eating hay as soon as it is offered, even if they've never had it before. If your rabbit doesn't seem interested, keep offering it or try switching kinds of hay. We carry a product line from Oxbow Hay Company that includes a Timothy based pellet, Bunny Basics-T and Western Timothy Hay. These products are highly recommended over other brands of pellets and types of hay.

FRESH FOOD

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Fresh foods also constitute a very important part of your house rabbit's diet. If your rabbit has never had fresh foods, start out gradually. It is a good idea to introduce HAY into the diet and make sure your rabbit is eating hay before introducing fresh foods.

Once you establish fresh foods in the diet, you should be consistent in providing it daily. A rabbit's gastrointestinal tract is VERY sensitive to change. Introduce one new food at a time and monitor your rabbit's droppings for 24 hours before introducing another new food. Any diarrhea or soft stool within a few hours after a new food is eaten may indicate the bunny is not yet ready for that particular food. His/her gastrointestinal tract will become accustomed to fresh foods given daily as long as hay is also provided.

Even young rabbits can enjoy small amounts of fresh foods: just be cautious introducing them and monitor your rabbit's droppings and attitude carefully. Young bunnies 8-12 weeks old can be given about 1 TABLESPOON of fresh veggies every day, gradually increasing fresh foods until they reach maturity. Hay should ALWAYS be available to them. The following are some of the fresh foods that are safe to offer your rabbit. Make sure your rabbit's food is of "people quality". Don't feed your rabbit anything you would not eat yourself - nothing limp, dirty, spoiled, or throw away parts, i.e. no potato peels! Five to eight DIFFERENT fresh foods alternated daily is a well rounded fresh food diet.

FRESH VEGETABLES (1 CUP PER 4 POUNDS OF BODY WEIGHT)

Asparagus	Kale(*)(!)
Alfalfa Sprouts	Kohlrabi
Basil	Mint
Beet Greens(*)(!)	Mustard Greens (*)
Bok Choy	Okra
Broccoli (all parts)(*)	Parsley (*)
Brussels sprouts	Pumpkin (*)
Cabbage (!)	Raddichio
Carrots and Greens (*)	Radish Greens
Celery and Greens (*)	Romaine (*)
Chard (*)(!)	Snow Peas (*)
Citrus Leaves and Branches (**)	Squash (*)
Clover and Sprouts (**)	Spinach (!)
Collard Greens (*)	Sweet Potato (*)
Cucumbers	Tomato
Dandelion (all parts) (*)	Turnips and Greens (*)
Dill	Watercress (*)
Endive (*)	Wheat Grass
Escarole	Yams (#)
Green Peppers	
Hibiscus Flowers (**)	

FRESH FRUITS (1 TABLESPOON PER 4 POUNDS OF BODY WEIGHT)

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* = Contains Vitamin A: Provide one daily

+ = Contains beneficial enzymes to help dissolve mucous surrounding foreign matter in GI tract.

= High in fat or sugars: Limit amounts

! = Contains either oxalates or goitrogens and may be toxic in cumulative quantities over a period of time- avoid oxalates if your rabbit has a urinary sludge problem

** =Native or introduced plants ("weeds" - learn to identify these plants)

ABSOLUTELY AVOID cookies, crackers, grains, cereals (especially breakfast cereals!), bread, pastas, yogurt drops, tortilla chips, popcorn, and other human treat foods. These carbohydrates have been linked to gastrointestinal distress - bunnies do NOT digest carbohydrates well! Also AVOID all raw beans, which cause red blood cell damage and interfere with the metabolism of nutrients.

AVOID nuts (high fat content), white potatoes (carbohydrates), and all iceberg lettuces (high in nitrates).

DIETARY SUPPLEMENTS

You do NOT need to add any vitamins or salt licks to the diet of your indoor housed bunny. Quality pellets include all of the nutrients they need, including salt. Adding things to bunny's water simply makes it a haven for bacterial growth.

There are conflicting reports about the possible value of adding papaya enzyme tablets to the diet. Most rabbits consider them a treat, and as long as no sugars or preservatives are added, they may help break down mucous bindings of hair in the GI tract.

Fresh mango, papaya, kiwi, or pineapple in the diet are probably the best choices for impaction prevention, however.

EATING OF NIGHT FECES

Cecal pellets, "night feces", are a NECESSARY part of your rabbit's diet. You may see your rabbit eating these special droppings occasionally, and not necessarily at night.

Cecal droppings are clustered, softer, shinier, and more odorous than regular droppings, and may resemble a mulberry in shape. They are covered with a light mucous film, which helps keep them intact as they travel through the GI tract to the small intestine. Produced in the cecum as part of the digestive process, the essential nutrients are absorbed in the small intestine. The droppings contain high concentrations of manufactured B Vitamins and proteins. Re-ingesting these cecal droppings is VITAL to your rabbit's health.

HANDLING

There are several ways to pick up your rabbit, depending on size, temperament, and trust. NEVER, pick up your rabbit by the ears! Hold your rabbit securely under the chest with one hand, using the other hand to support the hindquarters. A rabbit's spine and other bones are VERY FRAGILE - a sudden kick can SEVERELY injure both you and your rabbit!

You can brace the rabbit's back against your chest, supporting the chest and hindquarters, but leaving the legs free. SOME rabbits tolerate being held on their back "baby style". This can be an easy way

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to groom, trim nails, check teeth, etc., but ALWAYS remember that a bunny "hypnotized" in this way may suddenly snap out of his/her lull! If your rabbit struggles while you are attempting to hold or pick him/her up, and you feel you are losing control, IMMEDIATELY kneel to the floor and release the bunny right away!

HOUSING

The ideal housing arrangements for your rabbit is a properly sized cage INSIDE your home. Rabbits thrive on social interaction, and being close to family activities allows them to develop their full personality potential and become a cherished part of the family. Although you can prepare your home so that your rabbit can be free-running, it is a good idea to have a cage, as rabbits like a space that belongs solely to them. If the bunny can come and go as he/she pleases from an easily accessible cage doorway, they will see the cage as a safe haven, rather than a place of isolation.

Completely wire cages are preferred. These have 1/2 by 1 inch wire on the bottom and 1 by 2 inch wire for the sides and top. A slide in metal tray below the wire bottom makes cage cleaning easy. Purchase the biggest cage you can afford. Even the smallest rabbit should have a minimum 24 by 24 inch cage. NEVER use an aquarium or any other solid-walled enclosure for your inside rabbit. The lack of air circulation is directly correlated with respiratory disease.

You should provide a box inside the cage as a "house". A clean cardboard box, with tape and staples removed, can be used. Rabbits enjoy redecorating them with their teeth and it can easily be replaced when soiled or destroyed. A plastic pet carrier (Kennel-Cab or Pet Taxi) can also be used. As an alternative to caging your litter trained companion rabbit, build a holding pen. Build with welded wire, sides and roof, place the door at rabbit level but don't add a floor. Put in a safe haven house and a litter box and make the pen as big as your space allows.

If your rabbit is allowed to run in the yard, make sure that it is fenced in and that the fence is blocked along the bottom or at least 6 inches into the ground and is bent inward into the ground. Rabbits like to dig and may end up outside the yard. Make sure the grass and other plants to which your rabbit is exposed to is pesticide-free, fertilizer-free and non-toxic. NEVER leave your rabbit loose outside at night. As a last resort, house your rabbit outside. This takes extra precautions to keep your rabbit safe. The cage should be sturdy enough to keep predators from getting to your rabbit. Adequate shade, heat, wind, rain, snow and ice protection needs to be provided. A safe haven house is especially important. Rabbits housed outdoors are more at risk for a fatal mosquito carried disease called myxomatosis. It is best to house rabbits in a totally screened area from July through September when myxomatosis transmission is highest .

RABBITS DO NOT TOLERATE HEAT WELL! Temperatures of 80 degrees or higher can be FATAL! A plastic soda bottle (1-2 liter size) filled with water and frozen solid is a nice addition for your bunny to lie against during heat waves.

Care of Orphaned Bunnies

Trying to raise orphaned wild rabbit species (cottontails, hares, etc.) is rarely a rewarding venture. Bunnies are often orphaned when people unknowingly disrupt a nest. Lactating does (females) nurse their young for only 3-5 minutes in the early morning hours of each day, giving the uninformed observer the impression that the new mother is neglecting her litter or that she has abandoned it altogether. This is how people mistakenly make orphans out of bunnies that are, in fact, being well and properly cared for by their mothers. Causes for abandonment of the nest include agalactia (doe with no milk), mastitis (doe with infection of the mammary glands), hypothermia (chilling) of the young, and physical disturbance of the nest itself. Whenever possible, orphaned bunnies should be placed with a doe nursing her own litter. Success is most likely if the orphans are less than 2 weeks of age and within 2 days of the age of the litter belonging to the foster doe. Orphaned bunnies under 3 weeks of age can be fed warmed formula: $\frac{1}{4}$ cup raw goat milk, 1.5 tablespoons heavy cream, pinch of Splenda or second best is Esbilac or Nurturall Kitten Milk Replacer. Substitute milk formula should be given slowly 2-3 times daily. Up to 5 cc (1 teaspoon) can be given the first few days. The volume is increased slowly to 15 cc (1 tablespoon) the second week, and to 25 cc (nearly 1 ounce) by the third week depending on the size of the breed. The anal area should be gently swabbed with a warm water-soaked cottonball to stimulate defecation and urination. Aspiration pneumonia, hypothermia and diarrhea are frequent consequences of hand-feeding orphaned bunnies.

Sterilization

Pet rabbits not intended for breeding should be sterilized at any time after 3 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 female rabbits and often are associated with serious blood loss. Spaying female rabbits may also help to prevent or reduce territorial aggression among females.

Bacterial Diseases

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. The 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. The rabbit's body responds to this invasion with an influx of tremendous numbers of white blood cells to fight the infection. Pus results from the accumulation of dead and dying white blood cells and tissue cells in the area of the infection.

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. Many antibiotics have great difficulty penetrating the relatively inaccessible sites of most infections and the thick pus seen in rabbit abscesses. Pasteurellosis can be a persistent problem in rabbits and can be very difficult to eradicate. This disease creates its most

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serious problems under conditions of malnutrition, overcrowding, poor sanitation, temperature extremes, inadequate air circulation and other stressful situations. All newly acquired pet rabbits should be thoroughly examined by a veterinarian as soon as possible after purchase. A blood test is now available whether a rabbit has been exposed to the pasteurilla organism.

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 Diseases

Viral diseases affecting pet rabbits are rarely identified. There is a viral disease called *Myxomatosis* that only occurs in Northern California, Oregon, England and Australia. The myxomatosis virus is carried in the wild brush bunnies in our area. It does not cause illness in the wild rabbit. A mosquito bites the wild rabbit then bites a domestic rabbit and spreads the virus. The virus in the domestic rabbit causes high fever, lethargy, poor appetite, swelling of the ears, lips, nose and genitals and is always fatal. There is a vaccine available in England and Australia but is not available here in the US.

The best prevention is to keep your rabbits inside especially during mosquito season and at dusk and dawn. Rabies is virtually unknown in pet rabbits.

Parasitic Diseases

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 a spot-on product called Revolution 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. Revolution 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 such as Advantage and Revolution can be used on rabbits. **DO NOT USE FRONTLINE SPRAY, Frontline Plus or Frontline Topspot ON RABBITS**, it has shown to cause seizures in susceptible rabbits. Pyrethrin shampoos can also be used although they do not leave residual flea protection.

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.

Hairballs

Like cats, rabbits (especially Angora rabbits) can develop hairballs within their stomachs. 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. If your rabbit is showing any of these signs, it needs to be examined immediately and started on appropriate medication to relieve the intestinal discomfort.

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Hairballs can be prevented in rabbits by feeding grass hay in the diet. Refer to the Diet section of this handout for more information.

Ileus

Ileus is a painful condition where the intestine is unable to move food through properly. The cause of ileus or GI stasis is a low fiber diet. The result is a very ill rabbit that may die without proper medical intervention. Prevention of stasis is feeding a good diet rich in fiber--- lots of grass hay.

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

Rabbits teeth grow continuously throughout their lives. 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 young rabbits with malocclusion probably have a genetic abnormality 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. Most cases of malocclusion in adult rabbits occur from a diet lacking enough grass hay. Rabbits need to grind hay to keep their molars or cheekteeth from overgrowing. Tooth root disease is a deterioration of the tooth roots that often leads to abscesses of the teeth. Malocclusion and tooth root disease can be a life threatening but preventable problem. The prevention is to feed grass hay as the major part of the rabbit's diet.

Initial signs of this disorder include failure to properly chew and swallow food, salivation and a wet dewlap. Inappetance and weight loss soon become noticeable. Death from starvation can occur if the problem goes untreated. Treatment involves the veterinarian initially trimming and filing the incisors and then scheduling extraction of the incisors within a month. Rabbits do very well without their incisors. Vegies and fruits should be fed coarsely chopped, pellets are easily eaten without incisors. Rabbits without incisors are also able to easily eat the grass hay they need to maintain a healthy gastrointestinal tract.

Molar or cheektooth malocclusion is more difficult to but is possible to manage.

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 85F, 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 rabbit 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 3 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.

Another possible cause of wryneck is a parasite called *Encephalocytozoon cuniculi* which is passed through the urine of infected rabbits. Many rabbits get exposed to this parasite from their mother in the nest box. There is a blood test for this parasite.

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. Electrocution, 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.

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 that have been 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
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

For More Information:

Rabbit shows and Breeding:

House Rabbits and Behavior:

Glen C. Carr, Executive Secretary
American Rabbit Breeders' Association
Box 426
Bloomington, IL 61701
www.arba.net

House Rabbit Society
P.O.Box 1201
Alameda, CA 94501
Publication: House Rabbit Journal
www.rabbit.org

Transmission of herpesvirus from a person to a rabbit (When you should not be kissing your rabbit!)

The July 1, 2009 edition of the Journal of the American Veterinary Medical Association (Muller et al) reports a case of encephalitis (brain inflammation) in a rabbit caused by a human herpesvirus. Herpesvirus type 1, also called herpes simplex viruses type 1 (HSV-1), is a common sexually transmitted disease (STD) in people. It can cause oral, genital and ocular (eye) lesions. Humans are the primary host of this virus but it has been found in other species. In rabbits it causes encephalitis and is almost always fatal.

In the report, the owner had a severe genital and oral herpes lesions 5 days before the rabbit became ill. While infected, the owner had intensive nose-to-nose and mouth-to-nose contact with the rabbit. The first symptoms in the rabbit were a decreased appetite and a watery ocular (eye) discharge. This progressed to neurological signs. Despite aggressive treatment, the rabbit deteriorated and was euthanized after a week of hospitalization. Subsequent testing revealed human herpesvirus type 1 in the rabbit's brain.

This case shows that human to animal transmission of disease can occur.

If you have an active herpesvirus infection:

- Limit close contact with rabbits (to be safe, limit contact with other pets as well). No kissing your rabbit!
- Wash your hands or use an alcohol hand sanitizer regularly, particularly after using the restroom or having contact with any infected sites/sores
- Make sure herpesvirus infection is considered if your rabbit develops eye or neurological disease.

The risk of rabbits transmitting human herpesvirus is unclear. Wear gloves and wash hands after contact and avoid contamination of clothing.