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# Your Rabbit's Environment

## Cage

House rabbits should never be kept completely confined to a cage. Exercise is vital for the rabbit's physical and mental health. Confinement can cause: obesity, inflammation of the feet, poor bone density and muscle tone, gastrointestinal and urinary dysfunction, and behavioural problems.

The cage should have the following qualities:

- Large enough for rabbit to stand on hind legs, have a resting area, and space for litter box
- Easy to clean and indestructible (metal is best choice)
- Kept in a well ventilated, cool area, without dampness (may need a dehumidifier close by)
- 15.5-21 C (60-70 F) – any warmer may result in nasal discharge, then heat stroke



Rabbits can be caged outdoors if they are provided with a shelter to protect them from rain, heat and cold, and

predators such as dogs, coyotes and raccoons, and is kept clean so it won't attract parasitic insects. In the winter, use straw bedding in the sheltered area for insulation and make sure that the water bowl is changed daily.

## Exercise Area

It is vital to the health of your pet to provide an exercise area indoor and/or outdoor where your rabbit can roam for a few hours every day. Fencing must be at least 3-4 feet high.

The pen can also be used outside as a moveable enclosure to allow your pet access to grassy areas. Never leave a rabbit outside in a pen unsupervised in the event predators harm your pet.

If you are going to allow your pet free access to your house you need to bunny-proof it. Block all escape routes, cover or block access to electrical cords, cover furniture to protect it from the rabbit's teeth and claws and remove access to toxic plants and materials.

## Litter Box

Rabbits can be litter box trained relatively easily. When beginning training, confine your pet in a small area, either in a cage or a blocked off section of the room, and place a litter box in the corner; try to pick the corner your pet has already used for their toilet. Make sure the sides of the box are low enough so your pet can get in and out easily. It is helpful to put some droppings in the litter box. Some people have also found it helpful to put some hay in the box to encourage defecation there as rabbits usually pass stool while they are eating. They will not eat soiled hay, so you need not worry about sanitation. In exercise areas, provide one more litter box than the number of rabbits you have and put newspaper or plastic under the litter box to protect your floors from accidents. Never punish your pet while in the litter box.

Pelleted litter makes the best bedding - it is non-toxic and digestible if eaten, draws moisture away from the surface which keeps it drier, controls odor well and can be composted. Do not use clay or clumping kitty litter because if eaten, it will cause intestinal impaction.

## Hidden Areas

The ancestors of our pet rabbits would have spent a good portion of their day in protected underground burrows. Our pet rabbits retain the same need to have a protected area in which they feel safe and secure. Some rabbits are content to sit in a box full of hay, others like a completely enclosed box in which to hide. Commercially available Oxbow structures can be used as edible toys as well.

You may use material that is washable or disposable and absorbent such as fake fleece or absorbent baby blankets. Do not use carpet squares because they are not absorbent or easily washable, they are abrasive to the feet, and can be eaten, which may cause obstruction.

## Toys

Rabbits get a fair amount of mental exercise from their diet of grass hay and green foods, but additional toys are appreciated. Rabbits like to chew, so give them branches from untreated trees (dry the wood for at least a month to prevent any adverse reactions to the sap), wooden chew toys designed for birds, or unfinished unpainted wicker or straw baskets. They like things that make noise such as keys on an unbreakable key holder, empty plastic or metal cans, hard plastic baby toys and jar lids. They like things that both move and can be chewed such as paper towel rolls, cardboard cartons and shredded paper. To make a toy more interesting, you can hide in it healthy treats, or stuff hay in hiding areas, paper rolls and old tissue boxes. Giving the rabbit a sense that he or she is foraging for food is an excellent mental activity. They also like air-filled balls they can nose around.



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# Nutrition

Obesity is a problem with rabbits that eat a diet too high in calories and that don't get enough exercise. A healthy rabbit should be slim and sleek. You should be able to feel the ribs just under the skin without a thick layer of fat. The hindquarters should not have any folds of skin covering or interfering with the digestive tract or urinary openings. The dewlaps in females should not be so large as to interfere with grooming or eating.

There are two basic types of hay available: grass and legume.

**Grass hays** are made from timothy, meadow, oat, rye, barley or Bermuda grasses. Try to feed mixed grass hay or provide two or more individual types. If you have a choice, choose sun-dried hay which has retained more of its nutrients than commercially dried hay. Do not feed straw. Straw is devoid of most nutrients and although it is not harmful in small amounts, it will lead to serious nutritional deficiencies if it is a major part of the rabbit diet.

**Grass hay** should be provided at all times in your pet's cage, for all ages of rabbits, starting at weaning.

- It is rich in nutrients such as vitamins, minerals, and proteins
- Provides “food” for the micro-organisms that make up the cecotropes
- Provides indigestible fiber that promotes healthy motility (movement of contents) of the intestinal tract
- Provides healthy chewing activity to promote proper wear of the teeth (all rabbit teeth grow continuously throughout life)
- Chewing also provides healthy mental activity, which decreases chewing of inappropriate objects such as furniture and wallpaper
- Provides a full feeling in the stomach that is satisfying and may also prevent inappropriate chewing



**Legume hays** are made from alfalfa, clover, peas, beans or peanuts. These hays are loaded with nutrients but have more calories, calcium and protein than a house rabbit needs. Feeding only legume hays may lead to GI disorders and obesity and for this reason we do not recommend feeding these hays. If you mix legume hay with grass hay, the rabbit may only pick out the calorie-rich legume hay and thus overload himself with calories, so we do not recommend mixing grass and legume hay. There are now several online sources of grass hay so even if you live in an area where you cannot get grass hay you should be able to order it online. A small amount of alfalfa hay used as a treat is fine but not used as the routine hay source for the house rabbit.

Sources for hay include veterinary clinics, horse barns, feed stores, pet stores, rabbit clubs and a growing number of online stores. When you buy hay you need to consider the following:

- Buy hay that smells fresh, never buy damp or old hay
- Buy from a reputable source that replenishes the hay frequently
- If you buy from a feed store or horse barn, buy hay that has not been on the top of the pile to prevent contamination with animal or bird droppings.

Hay can be stored at home in a dry place that has good air circulation. Hay can be given to your pet in a variety of ways including in a hay rack or box within the cage or exercise area, or even placed in the litter box. Always keep hay in the cage or exercise area and replenish as needed. You can also stuff hay into toilet paper rolls and other hiding areas as a fun way to increase mental exercise associated with foraging for food. Providing a regular source of grass hay is a major key in preventing many diseases in a pet rabbit.

### **Green Foods**

Green foods are the next most important food in the rabbit's diet. Green foods contain a wide variety of micronutrients and provide water in the diet in addition to a water container in the cage. You will notice that if you feed your pet a lot of green foods, he will drink very little water, which is normal.

It is NEVER appropriate to feed your rabbit a diet comprised primarily of green foods. The green foods available in grocery stores do not have enough concentrated calories to sustain a rabbit's normal body weight when this is the primary source of food. Even in the wild a rabbit would eat dried grasses and tree and bush leaves to obtain more calories.

If your rabbit has never eaten green foods before, it is important to start them on hay first. This will help to make the appropriate changes in the flora of the GI tract, including improving movement and production of cecotropes. In this way you can avoid the problem of soft stools that is occasionally seen when you give greens to a rabbit who has never eaten hay or greens – this is the rabbit's intestinal tract making changes from its sluggish state to a more active state. Though not a problem, these soft stools can be messy, so making the change to hay first for a month at minimum will avoid this problem. Greens are appropriate for any age of rabbit if the rabbit is already eating hay on a daily basis as mentioned above.

When selecting and using green foods follow these guidelines:

- Buy (or grow) organic if possible
- Wash any green foods first
- Make sure your rabbit is eating hay well first for at least one month
- Introduce greens a little at a time over several days and watch the stools for any change
- Feed a variety of green foods daily – a minimum would be three varieties – variety provides a wider range of micronutrients as well as mental stimulation for your pet
- Feed a maximum of about 1 packed cup of green foods per 2 pounds of body weight at least once a day or this amount divided twice a day.

Occasionally you may have a situation where a select green food causes a soft stool. You will know if this is the case within 12 hours of feeding the offending food. If you are feeding a variety of greens and are not sure which one is causing the problem, then feed only one green food every 48 hours until the offending food is identified and then simply remove it from the diet.

In general, the darker green a food is, the higher the nutritional value.

Here are some of the green foods you might consider: Baby greens, Bok Choy, Borage Basil, Broccoli (leaves and top), Brussels sprouts, Cabbage (red, green, Chinese), Carrot/beet tops, Celery (leaves are good), Chickory, Collard greens, Dandelion greens (and flower), Kale, Leaf lettuce, Mustard greens, Parsley (Italian or flat leaf best), Romaine lettuce, Swiss chard (any color), Water cress

### **Fruits and other Vegetables (Treat Foods)**

Depending on the time of year, rabbits in the wild would have access to additional foods such as fruits, vegetables and flowers. Since these items do not make up the majority of the diet, feed these treats in limited quantities. Foods from this list can be fed daily and you may even wish to use them as part of a reward or training system.

For treat foods, follow the same guidelines listed above for selecting and using green foods with the exception of the amount. You can feed your pet a total of 1 tablespoon per 2 pounds of body weight per day of any combination of the foods below:

Apple, Bean or alfalfa sprouts, Blackberries, Blueberries, Cactus fruit, Carrots, Cherries, Cranberries, Edible flowers from the garden (organically grown and NOT from a florist) such as roses, nasturtiums, day lilies, pansies and snap dragons, Green or red bell peppers, Kiwi Fruit, Mango, Melons, Papaya, Pea pods (flat, NO peas), Peach, Pear, Pineapple, Raspberries, Squash

Dried fruit can be used as well, but since it is so concentrated, use only one third the amount as fresh. Instead of one tablespoon use one teaspoon. We do not recommend feeding bananas and grapes as rabbits sometimes become “addicted” to these foods. If you chose to feed them, watch your pet carefully to ensure that he is also eating sufficient quantities of green foods and hay.

## **Forbidden Foods**

A diet of grass hay and green foods with small amounts of fruits and vegetables contains all the nutrition necessary for the pet rabbit. Unfortunately there are many commercial treat foods sold for rabbits that contain high levels of starch and fat. In addition, some people still feel that it is necessary to feed rabbits high starch foods such as cereals, cakes and cookies. Although a pet rabbit can eat very small amounts of starchy or fatty foods without ill effect, the problem is that people often feed excess amounts because the rabbits eat these foods so greedily. Our recommendation is to completely avoid high starch and/or fat foods for your pet. In this way you will avoid any potential problems these foods can cause, including obesity and serious GI disease. It is always easier to prevent than to treat a disease. Examples of high fat and/or starch foods to AVOID include: beans (of any kind), breads, cereals, chocolate, corn, nuts, oats, peas, refined sugar, seeds, wheat

## **Commercial Rabbit Pellets**

Rabbit pellets should generally only comprise a small portion of a pet rabbit's diet. When fed to the exclusion of anything else in the diet we see these problems in the pet rabbit:

- High calorie content can lead to obesity.
- Low indigestible fiber content can lead to a sluggish GI tract and eventually more serious GI disease, including complete GI shutdown.
- Doesn't promote normal tooth wear due to the concentrated nature of the food.
- Lack of sufficient chewing activity may lead to behavioral problems, such as inappropriate chewing
- Concentrated, dry pellets may not promote normal water intake, resulting in urinary tract disease. A rabbit's natural diet would not be consistently low in moisture.
- The recommendation for feeding pellets would be that they comprise ideally 10% of the healthy rabbit's diet and maximally no more than 20%.

Pellets are useful for female rabbits that are used for breeding during the pregnancy and nursing period. They have a high requirement for calories during these times and it may be necessary to increase pellets during this time period or even to feed them free choice.

When selecting a pellet look for the following:

- 18% or higher in fiber
- 2.5% or lower in fat
- 16% or less in protein
- 1% or less in calcium
- Do not buy pellet mixes that also contain seeds, dried fruits or nuts.
- Buy pellets based on grass hays NOT alfalfa hay unless otherwise advised by your veterinarian

The amount to feed a healthy rabbit would be approximately  $\frac{1}{4}$  cup of pellets per 4 lbs of body weight daily. This can be divided and fed twice a day or all fed once a day. Pellets can even be fed one by one and used in a training program.



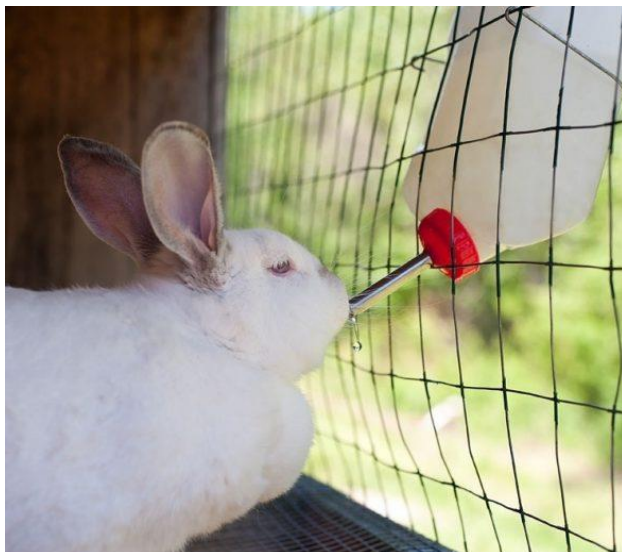
## Cecotropes

Rabbits are herbivores with a marvelous gastrointestinal (GI) tract that allows them to extract nutrients from a variety of sources. Rabbits are meant to live on a diet composed of large quantities of grasses and leaves. They also graze on flowers and fruits that can be found at different times of the year. Rabbits are successful at making the most out of the food they eat, food that many other animals could not even digest. One of the keys to their success is the production of cecotropes, which are a type of dropping that is eaten by the rabbit directly from the anus and then digested. These droppings are not made up of waste materials but rather are rich in organisms that have come from the area of the intestinal tract called the cecum. These organisms are packed with nutrients such as amino acids, fatty acids and a variety of vitamins. For the rabbit to get these nutrients, the cecotropes, including the organisms, must be eaten and digested. In this way, rabbits can extract the maximum nutrients from low-energy food materials. They literally produce some of their own food!

Healthy rabbits will eat their cecotropes directly from the anus and you will not see these droppings in the cage. If a rabbit has a medical problem that prevents him from reaching the anus, then you may see cecotropes on the cage floor. Cecotropes are elongated, greenish in color, coated in mucous and have a strong odor. Many cecotropes in the cage may indicate your rabbit is missing vital nutrition. If a rabbit is eating a diet that is too rich in nutrients, such as one that contains mostly commercial pellets, there may normally be a few cecotropes dropped in the cage.

## Water

Water should always be available and changed daily. A dirty water container can be a breeding ground for bacteria. Use either a water bottle or a heavy bowl that is weighted or secured to the side of the cage so that it does not tip over. Please remember that if your pet is eating a large quantity of greens that the water consumption may be minimal.



## Care and Handling

There are a number of ways to pick up your pet depending on their demeanor and size. The main thing to remember is to **always support the hindquarters to prevent serious spinal injuries**. Rabbit backbones can fracture if the hind legs are allowed to dangle and the animal then gives one strong kick. Never pick up a bunny by the ears because it's painful and totally unnecessary! **Grasp the loose skin over the shoulders or scoop up under the chest and then place your other hand under the back legs** to lift your bunny from the floor. Work near the floor when first learning to handle your pet so that if they jump out of your arms there isn't a chance for a fall. Rabbits can be wrapped in a "bunny burrito" for administering of medication – swaddled in a blanket with the head exposed.



## Socialization & Behaviour

Rabbits are very loving, social animals, which means they not only love to spend time with their humans or companion rabbits – they require it. Without interaction, rabbits can get bored and depressed. While toys can alleviate some of their boredom, they still need human attention and interaction. It's important to remember that rabbits are prey animals. In general, rabbits do not like to be picked up. The act of bending over them and grabbing them by their ribs to pick them up is very similar to being picked up by a hawk – scary! The best way to interact with your rabbit is on the floor. Sit in the room while bunny is out to play and they will soon come investigate you. Separate males and females into different pens or have your veterinarian desex them to avoid unwanted pregnancy. Males will be less likely to fight each other if introduced at a young age. Females and males can be prone to fighting amongst each other so make sure you help new rabbits get used to each other in a supervised environment or through a mesh fence before they co-habit.

Contact your vet if you notice a rapid change in your rabbit's behaviour such as: hiding, aggression when you try to touch or pick them up, excessive cage or object chewing, over grooming, changes in feeding or toileting, over drinking, repeated circling of enclosure.

# Medical

## **Spay/Castration**

Uterine adenocarcinoma is a malignant cancer that can affect female rabbits over two years of age. The best prevention for this disease is to remove the reproductive organs (ovaries and uterus) in a surgical procedure commonly called a spay. The procedure can be performed in females over four months of age. Spaying a rabbit also prevents pregnancy and can help control some aggressive behavior.

Male rabbits can also develop disease of the reproductive organs (the testicles) but with much less frequency than females. However, some male rabbits tend to become aggressive in their adolescence (8-18 months of age) and can also start spraying urine on vertical surfaces outside the toilet area to mark their territory. Surgical removal of the testicles, called castration, can control these behaviors if it is done before the behavior occurs or shortly thereafter. Male rabbits can be neutered anytime after four months of age.

## **Dental Disease**

Dental disease can be the result of a variety of factors including trauma to the face, genetics, nutritional disease, infectious disease and diet. Rabbit ancestors ate a diet that was tough and abrasive, therefore they developed teeth that grew throughout their lives. Any condition that causes a rabbit's teeth to be worn down improperly or causes mal alignment can result in serious dental disease. The best prevention for dental disease is a healthy diet including grass hay and green foods. Your rabbit should have a dental examination performed by a veterinarian at least once a year. You should never attempt to trim a rabbit's overgrown teeth without consulting your veterinarian. An improperly performed tooth trim can lead to serious dental disease.

## **Loss of Appetite**

Rabbits are little eating machines and if you notice that your pet has changed their eating habits, there is cause for concern. The most common reason a rabbit stops eating is in response to pain. If every day you give a small amount of a healthy treat that your rabbit loves, as outlined in the Diet Section, you will quickly know when your rabbit's appetite is changing. Loss of appetite but otherwise acting normal should be investigated within 48 hours. Some rabbits may go through a slow down and then pick up again in a day. The key here is that the rabbit is still active and alert and is still producing stools. Loss of appetite accompanied by obvious lethargy should be considered an emergency and should be investigated immediately. This can be a sign of an intestinal obstruction or toxin ingestion. Another important sign is that no stools are being produced.

## **Respiratory Signs**

Rabbits can exhibit sneezing, coughing and excess tearing. Not all these signs are related to respiratory disease. Common environmental causes include perfumes, sprays, cooking fumes, ammonia fumes from accumulated urine in toilet area, fabric softener on bedding, dust, poor air circulation, damp environment and hot environment. Dental disease can also cause signs that may mimic respiratory disease, such as excessive tearing that stains the eyes. Please consult your veterinarian if your pet is showing these signs.

## **“Hairballs”**

Hairballs are often cited as a reason for rabbits to stop eating. The problem is not hair in the stomach (which is always in a normal rabbit's stomach due to grooming) but abnormalities in GI tract motility. A rabbit on a healthy diet with lots of grass hay and other foods as described in the diet section will not have a problem with hairballs.

The only exception is that, rarely, longhaired breeds of rabbits such as Angoras and Jersey Woollys, can accumulate an abnormal amount of hair in their stomachs even if they are on a good diet. Brush these breeds regularly to prevent the ingestion of large amounts of long hair. Remember that these rabbits do not have the normal rabbit haircoat of the ancestral rabbit so we humans have artificially created this problem! Consult our handout on Rabbit Hairballs for more information.

## **Diarrhea**

True diarrhea, where all the stool being passed is purely liquid, is rare in the pet rabbit eating a healthy diet. More commonly we see a situation where the rabbit has both normal and soft pudding-like stools in the toilet area. This is not diarrhea, but a problem with GI motility usually caused by an inappropriate diet.

## **Urinary Disease**

The normal color of rabbit urine can range from yellow to dark orange-red. The color comes from plant pigments in the food or from normal pigments produced in the wall of the bladder. The urine can be clear or cloudy with a white precipitate. The white precipitate is excess calcium excreted through the urine. Rabbits can develop disease of the bladder or kidneys and may exhibit signs such as blood in the urine, straining to urinate, inappropriate or frequent urination, or the complete inability to urinate. The best prevention for urinary disease is an adequate water intake, which is accomplished through the feeding of green foods and providing fresh water daily.

## **Head Tilt**

Head tilt in rabbits is seen with some frequency and can be caused by a variety of diseases. The correct medical term is vestibular disease, which can include other signs besides a head tilt. Rabbits with vestibular disease can have a head position that ranges from a few degrees to 180 degrees off the normal position. They can fall over, circle, have difficulties standing and develop eye injuries because the prominent eye globe (especially of the “down” eye, the one facing the ground when the head is tilted) is prone to trauma. The cardinal signs of true vestibular disease in the rabbit are a persistent head tilt and a loss of balance.

# Emergencies

- True diarrhea, where all the stool being passed is purely liquid. This can quickly lead to severe dehydration
- Constipation, with no stool being passed in 24 hours. This may indicate an obstruction of the GI system.
- The complete inability to urinate
- Heavy breathing or panting
- Seizures or unconsciousness
- Anorexia (refusal to eat)

## Sources of Info

This article was adapted from "Rabbit Care" from [www.veterinarypartner.com](http://www.veterinarypartner.com)

This website is a reliable and informative source to learn from!