

Care of Rabbits

The Missouri House Rabbit Society would like to thank Dr. Susan A. Brown for her permission to post her excellent articles.

Rabbits make intelligent, friendly and quiet house pets. The average life span for a bunny is 7 to 10 years with records of up to 15 years of age reported. The following information is provided to help you enjoy a happy, healthy relationship with your little friend. In addition to this handout there are a number of excellent books on the topic of rabbit health care that you may wish to consult.

DIET

Normal Rabbit Weight

Unfortunately, what we thought was a normal rabbit weight in the past has often been an overweight rabbit. 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. If you are in doubt about your rabbit's proper weight, please consult your veterinarian.

CECOTROPES

Rabbits are herbivores with a marvelous gastrointestinal (GI) tract that allows them to extract nutrients from a variety of sources. Rabbits were designed to live on a diet composed of large quantities of grasses and leaves. They might also browse on flowers and fruits as they could find them at different times of the year. Rabbits are very 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 special type of dropping that is eaten by the rabbit directly from the anus and then digested. These droppings are not made up of wasted 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 (the "building blocks" of proteins), fatty acids and a variety of vitamins. In order for the rabbit to get these nutrients, the cecotropes and thus the organisms must be eaten and digested thereby extracting the nutrients. In this way, rabbits can extract the maximum nutrients from low energy food materials. They literally produce some of their own food! Rabbits will eat their cecotropes directly from the anus and you not see these special droppings in the cage. If a rabbit has a medical problem that prevents him/her 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. Please consult your veterinarian if you see a large number of cecotropes in the cage because your rabbit may be 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.

For more information on the workings of the GI tract of the rabbit read the handout: Hairballs in Rabbits: Fact or Fiction.
Cecotropes are a vital part of your rabbits diet.

GRASS HAY

Grass hay is one of the most important parts of your pet's diet. Hay should be provided at all times in your pet's cage. Hay is appropriate for all ages of rabbits starting at weaning. Hay provides a number of important things for your rabbit's health.

- Rich in nutrients such as vitamins, mineral and protein
- Provides "food" for the micro-organisms that make up the cecotropes.
- Provides indigestible fiber that promote proper wear of the teeth (all rabbit teeth grow continuously throughout its 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 which is satisfying and may also prevent inappropriate chewing.

Remember that rabbits are designed to live primarily on a diet of grasses and leaves, therefore grass hay can provide a good portion of that diet. There are two basic types of hay available: grass and legume.

LEGUME HAY

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 itself with calories, thus we do not recommend mixing grass and legume hay. If you live in an area where only legume hay is available it is preferable to use it rather than no hay at all. However, you may wish to limit the amount of hay if your pet experiences excessive weight gain or GI problems.

GRASS HAY

Grass hays are made from timothy, meadow, oat, rye, barley or Bermuda grasses. Grass hay availability varies greatly in different areas of the country and the world. You may only be able to obtain one variety where you live. However, if at all possible, try to feed mixed grass hay or provide two or more individual types. Grass hays are rich in nutrients but provide the lower energy diet appropriate for a house rabbit. These are the healthiest hays to feed. 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.

Sources of hay include veterinary clinics, horse barns, feed stores and rabbit clubs. 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. Do not close the bag of hay but rather leave it open. Hay can be given to your pet in a variety of ways including in a hay rack on attached to the side of the cage, in a box or basket within the cage or exercise area, or even placed in the litter box. Rabbits often pass stools when they are eating and placing some hay in the litter box can help with bathroom training. They will not eat soiled hay, so you need not worry about sanitation. Always keep hay in the cage or exercise area and replenish as needed. Providing grass hay in the diet is a major key in preventing many diseases in the pet rabbit.

GREEN FOODS

Green foods are equally as important as hay in the rabbit's diet. Remember we said that rabbits are designed to eat grasses and leaves, so green foods represent the "leaf" part of the diet. Green foods provide all the same benefits that we listed for hay. They also contain a wider variety of micronutrients and importantly provide water in the diet. Even though you may be providing a water container in the cage, rabbits do not always drink as much as they should. Feeding green foods forces the rabbit to take in liquid and thus helps promote healthy GI function as well as kidney and bladder function. You will notice that if you feed your pet a lot of green foods, he/she will drink very little water which is normal.

If your rabbit has never eaten green foods before, we recommend starting him/her on hay first. This will help to make the appropriate changes in the GI tract, including improving movement and production of cecotropes. In this way you can avoid the problem of "soft stools" that is occasionally noted when a rabbit that has never eaten hay or greens is given greens. This is not a dangerous disease; it is only the rabbit's intestinal tract making changes from its sluggish state to a more active state. However, these soft stools can be messy, so making the change to hay first for a couple of weeks will avoid this problem. Greens are appropriate for any age of rabbit. If a weaned rabbit is eating hay, he can eat greens right away.

When selecting and using green foods follow these guidelines:

- Buy (or grow) organic if possible
- Wash any green foods first
- 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 minimum of 1 packed cup of green foods per 2 pounds of body weight at least once a day-feed more if your pet is eating hay as well, there is no real upper limit.

There are two situations that can occur that will alter the manner with which you feed greens. The first situation is 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 not sure which 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. This is not a dangerous situation, but it can be messy and there is no need to feed a food that is causing a problem. There are many green foods from which to choose.

The second situation concerns rabbits that have lost too much weight that need to gain weight after a serious illness. It is extremely rare to see a rabbit lose too much weight on a diet of hay and green foods, unless the rabbit is not eating the hay and is only eating greens. Hay is a more concentrated food than greens. In any event, if you are trying to put weight back on a rabbit, you can limit the greens to one cup/2 lbs. body weight maximum to encourage an increase in hay consumption.

There are a huge variety of green foods that you can offer your pet. You might even consider growing some yourself! This would include grass that you grow in your yard but it can only be used if there have been no pesticides or other chemicals used on it. You might consider growing a patch of grass just for your bunnies. And don't throw away those dandelions when you pull them up, if they have not been treated with any chemicals they are an excellent source of nutrition. In general, the darker green a food is the higher in nutritional value. This is why, for instance, we do not recommend iceberg lettuce. It is not dangerous, but is low in nutritional content. You can use packages of mixed salad greens if they contain dark colored greens and are not comprised primarily of iceberg lettuce or romaine lettuce. Please, no salad dressing!

Broccoli (leaves & tops)
Brussels sprouts Bok Choy
Cabbage (red, green, Chinese)
Celery (leaves are good)
Chickory
Dandelion greens (and flower)
Borage Basil
Swiss chard (any color)
Endive
Escarole
Parsley (Italian or flat leaf best)
Mustard greens
Kale
Romaine lettuce
Leaf lettuce
Baby greens
Water cress
Raddichio
Carrot/Beet tops

FRUITS AND OTHER VEGETABLES (Treat Foods)

Depending on the time of the 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, we recommend feeding these special items in limited quantities. Another reason for limiting the amount is because some rabbits like these foods so well, that they will eat them to the exclusion of all others thereby creating a potential for health problems. Foods from this list can be fed daily and you may even wish to use them as part of a reward or training system. These treat foods are far healthier (and less expensive) than the commercial treat foods sold for rabbits. Commercial treat foods should be totally avoided because they are loaded with starch and fat and if fed in quantity can cause serious health problems. Stick to "natural and healthy treats for your pet.

Kiwi Fruit

Strawberries

Blueberries

Raspberries

Blackberries

Apple

Pear

Peach

Papaya

Pineapple

Cactus Fruit

Melons

Bean or alfalfa sprouts

Green or red bell peppers

Mango

Pea pods (flat, NO peas)

Cherries

Cranberries

Edible flowers from the garden (organically grown and NOT from a florist) such as roses, nasturtiums, day lilies, pansies and snap dragons.

Dried fruit can be used as well, but since it is so concentrated, use only half the amount as fresh. We do not recommend feeding bananas and grapes as rabbits sometimes become "addicted" to these foods. If you do choose to feed them, watch your pet carefully to ensure he/she is also eating sufficient quantities of green foods and hay.

FORBIDDEN FOODS

A diet of grass hay and green foods with small amounts of 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. 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 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.

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

Examples of high fat and/or starch foods to AVOID include:

- Beans (of any kind)
- Peas
- Corn
- Breads
- Cereals
- Nuts
- Seeds
- Oats
- Wheat
- Chocolate
- Refined sugar
- Any other grains

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. Do not use medications or vitamins in the water, because your pet may not drink the water if the taste or color is altered. Please remember if your pet is eating a large quantity of greens that the water consumption may be minimal.

VITAMINS/LACTOBACILLUS/ENZYMES

Vitamins are not necessary for the healthy rabbit. Rabbits will obtain all the vitamins they need from their cecotropes, grass hay and green foods. The misuse of vitamins can cause serious disease. If your pet becomes ill, particularly if he/she is unable to eat the cecotropes, then your veterinarian may prescribe vitamin therapy. Please do not use supplemental vitamins in a healthy pet. In addition, rabbits on a healthy diet do not need a salt or mineral block.

Lactobacillus or acidophilus are bacteria found in the GI tracts of a number of different species. In some older texts there was a recommendation to feed rabbits yogurt (which contains active cultures of these organisms) to improve the health of the GI tract. However, there is no benefit to feeding these bacteria to the rabbit because Lactobacillus does not hold an important place in the rabbit GI tract and adult rabbits may not be able

to adequately digest dairy products. Other products, called probiotics, that contain bacteria more specific to the rabbit GI tract, are available but their benefits are still controversial. A rabbit on a healthy diet of grass hay and green foods should be able to maintain a normal population of bacteria without additional supplementation. We do not recommend the routine use of probiotics in the healthy rabbit.

Some older texts recommend feeding digestive enzymes to rabbits to help dissolve hairballs. This is of no benefit to the rabbit because such products do not dissolve hair and the problem is not the hair ball anyway. (See handout Hairballs: Fact or Fiction for more information on this disease). Although these products will not harm the rabbit, they are of no use.

COMMERCIAL RABBIT PELLETS

It may seem odd that this topic is the last on our diet list. This is because we feel that commercial rabbit pellets DO NOT need to be part of a healthy house rabbit diet. As mentioned several times, rabbits gain all the nutrition they need from a grass hay and green foods diet along with their cecotropes. In addition, these foods promote a healthy GI tract and proper wear for the teeth.

Pellets were originally developed for the rabbit in the meat, fur and laboratory animal industry to provide a uniform and highly concentrated food that could easily be fed to large numbers of animals. The pellets are loaded with concentrated nutrition to promote rapid growth. Rabbits in these industries have a shortened life span, unlike the house rabbit. Commercial pellets work well in these industries, but can wreak havoc with the house rabbit.

The problems that a diet comprised primarily of commercial pellets can create in the house rabbit include:

- High calorie content can lead to obesity-easy to overfeed because the rabbit is always acting "hungry"
- High protein content can lead to eating less cecotropes which are dropped in the cage
- Low indigestible fiber contact 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 and "full feeling" in stomach due to concentrated nature of the food may lead to inappropriate or excessive chewing on furniture, plants, wallboard, etc... - could be related to "boredom"?
- Concentrated, dry nature of food may not promote normal water intake resulting in potential urinary tract disease.

There have been improvements in a few of the commercial pellet brands available to the public, including increased indigestible fiber levels and decreased calorie, protein and

calcium content. There have also been some unfortunate changes such as adding seeds and nuts or sugars to the diet, which are all detrimental to your pet. However, it still remains that pellets are not a necessary component of a healthy house rabbit diet and need not be fed. Remember that rabbits were designed to eat a diet comprised of a large volume of grasses and leaves, not a low volume, highly concentrated diet. Rabbits in the wild do not need to come to a feed station for a meal of pellets to survive and our pets do not this either.

So, are there any circumstances where we might consider feeding pellets to our pets?

The following is a list of situations where a good quality commercial pellet might be useful as part of a diet, but not the complete diet.

- * In households where hay cannot be used due to human allergies or unavailability
- * To implement a weight gain most often related to debilitating illness
- * When the owners are unable to feed a varied diet of good quality grass hay and a variety of green foods.

If we really want to provide the healthiest diet for our pets we should be striving to reproduce its natural diet, not taking the "easy" way out for our own convenience. Providing a healthy diet for a rabbit is neither difficult nor expensive and in addition will save you many dollars in veterinary bills. The number one cause of disease in the rabbit remains an inappropriate diet, and the number one prevention for these diseases is a diet of quality grass hay and a variety of green foods.

If you do need to feed pellets for any reason then buy those that are at least 18% or higher in fiber, 2.5% or lower in fat, 16% or less in protein, and 1.0% or less in calcium. Do not buy pellet mixes that also contain seeds, dried fruits or nuts. Please consult your veterinarian for the amount that you need to feed your pet if you fall into one of these categories. However, try to avoid feeding your rabbit a diet of exclusively commercial pellets.