Rabbit Dietary Disorders

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In order to fully understand the significance of dietary problems in the rabbit, it is important to review normal digestive mechanisms. Rabbits are monogastric (simple stomach), hind-gut fermenting vegetarians with a very complex digestive physiology. The rabbit eliminates insoluble fiber rapidly from the gut and in effect, uses fiber as a motion-stimulating agent and not a direct nutrient. This allows the rabbit to eat a large amount of roughage and not get weighed down with the storage of bulk fiber. With the rapid elimination of the insoluble portion of the diet, the rabbit can more efficiently process the soluble, energy concentrated portion. This rapid elimination of fiber is the key to a healthy digestive system in the pet rabbit.

The rabbit has a very large stomach with a relatively narrow diameter small intestine. The stomach functions largely as a food reservoir and is usually never empty. The stomach is anatomically arranged to prevent vomiting. The stomach empties into the small intestine which leads to the cecum . The cecum is where fermentation takes place and is the largest organ of the gut. The colon is the last part before the rectum.

Food enters the stomach where the acidic pH exerts an antimicrobial effect on ingested microorganisms. Normal motion is stimulated by fiber. The food enters the small intestine where fiber is very rapidly transported through the intestines and the smaller, more soluble particles concentrate in the colon. This portion of the food is then moved backwards into the cecum for fermentation. The bacterial population of the cecum very effectively concentrates amino acids, fatty acids, and vitamins from this soluble suspension. Cyclic contractions of the cecum produces and excretes a smaller, wetter pellet or cecotrope while the rapidly excreted, fibrous portion of the diet makes up the more abundant hard and dry fecal pellets. This daily production of cecotropes ("night stool") provides the rabbit with essential protein and vitamins, particularly B and K. The cecotropes are consumed directly from the rectum and are recycled by the gastrointestinal tract.

Dietary Recommendations

Pet rabbits should be offered a diet high in fiber, and low in simple carbohydrates. A good quality grass hay (timothy or bermuda grass) should be offered free-choice, and the pelleted portion of the diet should be fed in controlled amounts e.g., 1/4 cup per 5 lbs. of body weight/day. Pellets high in fiber (> 18%) should be chosen whenever possible. Pellets are usually alfalfa-based but there are timothy-based pellets on the market (Oxbow Pet Products) which may be appropriate for certain individuals. Alfalfa hay is very palatable to bunnies but because of it's high calcium concentration, it might not be appropriate for individuals with excessive crystals in the urine or bladder stones.

Fresh greens are enjoyed by most rabbits and can be offered daily by the handful once introduced gradually over a two-week period. Choose greens high in fiber like broccoli rabe, watercress, parsley, carrot-tops, mustard, dandelion, and turnip greens. Fruit should be the only "treat" given and can be pieces of apple, melon, pear, and peach. Cereals, grains, seeds, and nuts are not part of the rabbit's natural diet and should not be fed. Avoid those pelleted diets that have the colored "treats" or grains mixed in. Bunnies are really adept at picking out the junk food and leaving behind the more nutritious pellets.

Diet-related Disorders

Disruptions to the rabbit's digestive system are common and usually caused by feeding a diet too low in fiber, and too high in protein and carbohydrates. This occurs commonly in pet rabbits who receive too much in the way of table foods and store bought "treats". Breads, cereals, grains, and nuts are often fed by the most caring of owners who do not understand the digestive processes of the rabbit. Low fiber diets can result in a slowing down of the cecum and colon, abnormal fermentation, prolonged exposure to microorganisms, pH changes, and ultimately, changes in the normal bacterial population (the "good bugs"). The ensuing environment may favor the overgrowth of pathogens (the "bad bugs"), particularly *Clostridium* and *E. coli*, and result in diarrhea and production of bacterial toxins.

"Gastric Stasis" and Hairballs

The contents of the rabbit's stomach is often mixed with hair but is rarely 100% hair like a furball in a cat or ferret. Most cases of "hairballs" in rabbits actually represents a sluggish emptying of stomach contents caused by the slowing effects of low fiber diets. This effect is compounded by sedentary lifestyle, obesity, stress, and the rabbit's inability to vomit. Gastric stasis ("slow or inactive stomach"), is probably the most common cause of anorexia or inappetance in the otherwise "healthy" bunny.

Clinical signs of gastric stasis include inappetance or anorexia and normal or reduced water intake. Stools may be very small and dry or loose. Fecal output begins to slow and eventually stops. Affected rabbits are usually bright and alert but do not eat their normal rations or won't eat anything at all.

Diagnosis is based on clinical signs and dietary history, veterinary palpation of the gut, and XRAY images. The stomach may be large and firm and there may be gas. XRAY's are recommended to evaluate the amount of food, gas, and fluid in the gut. Old rabbits should have a basic blood panel performed (CBC and biochemistry).

Treatment consists of fluids and dietary management. Rabbits with gastric stasis can have fluid imbalances that result in a loss of water from the stomach. The mass of food in the stomach needs to be moist to pass through into the intestines. Fluids can be given both through the mouth and by veterinary-guided injections. In stable patients, subcutaneous fluids (under the skin) are administered. Intravenous fluid administration is reserved for weak and dehydrated rabbits. Hand-fed fluids can consist of watered down juices (apple or pineapple) or vegetable baby food, or a commercial human product like Ensure® (Mead Johnson). These products are given several times a day to the rabbit using a syringe (without the needle) placed into the sides of the mouth. Sometimes motility drugs (like Reglan® or Propulsid®) are recommended by your veterinarian. These can be used in protracted cases as long as the rabbit does not have a blockage in the stomach or intestines. In cases where there is a lot of gas in the gut, pediatric anti-gas preparations can be used (Phazyme®). Antibiotics may not be neccesary unless the rabbit has diarrhea, or prolonged illness. Improvement is usually seen in 2-4 days and consists of an increase in appetite and fecal output. The decision to hospitalize these patients depends on the rabbit's condition, duration of clinical signs, and stress level of both owner and pet. Because of their highly stressable nature, rabbits should not be hospitalized near dogs or in brightly lit areas.

Diarrhea or Soft Stools

The most common cause of soft stools is an inappropriate diet that is too low in fiber or too high in carbohydrates. It is important to differentiate these soft stools from the cecotropes or night stools that the rabbit is supposed to eat directly from the rectum every day. These soft, sticky, malodorous stools are normal but should be eaten by the bunny and not found left on the cage floor or stuck to the rectum. Obese rabbits may be too big to reach back and groom or eat the cecotropes. These sticky stools adhere to the fur near the rectum and can grow into large "fecal balls" if left unattended.

Really runny and wet stools or mucous-filled stools is abnormal and should be considered a bunny emergency. Bacterial disturbances in the gut may be the cause, (see above under "diet-related disorders") or in the juvenile rabbits, coccidia parasites are often present. These rabbits need immediate veterinary care.