

WEEK THREE

PELLETS

The recommendations for feeding pellets to rabbits have changed dramatically over the past 5-10 years. Pelleted rabbit feed used to be recommended as a complete diet for rabbits with little other supplementation necessary. However, pelleted diets were originally formulated for the rapid growth of the meat, fur production, or laboratory rabbit. Most of these rabbits were not meant to live out their full life span. The breeding rabbit, with an average life span of 5 to 10 years, needs a balanced, low-energy, consistent diet with plenty of fiber primarily in the form of hay. Pelleted diets are typically made up of chopped, compressed hay, various grains, molasses, and other added nutrients. Grains can be quite high in calories (starches and fats) and lower in fiber than hay, and disrupt the microbial balance when eaten in significant quantities. The hay in pellets is chopped, compressed, and heated, and thereby loses a lot of its fiber quality. A high-quality pellet should be chosen that contains over 20% fiber and less than 16% protein. Avoid pellet mixes that contain too much seeds or grains such as corn .

Feeding a high quality diet comprised of hay, fresh vegetables, and limited quantities of pellets is key to optimal rabbit health and good preventative medicine. Many common diseases of rabbits are related to improper nutrition and can be prevented by learning about their nutritional requirements, consistency in the diet, and maintenance on a well-balanced high-fiber ration.

Nutrient Requirement of Rabbits

Carbohydrates

Carbohydrates provide energy for the rabbit.

Types

- Simple sugars (a.k.a. monosaccharides):
glucose, fructose (fruit sugar), corn syrup, high fructose corn syrup, dextrose
- Complex sugars (a.k.a. polysaccharides):
starch

Source

- Grains - Concentrated Starch
- Pellets - Concentrated Starch
- Fruit - Fructose

Needs

Carbohydrates are the primary energy source in the rabbit's diet. Therefore, the rabbit's need for carbohydrate is dictated by their energy level. Rabbits with higher energy demands, such as nursing mothers, growing bunnies, rabbits with some types of cancer, and those on certain drugs, may require more carbohydrates in the diet. Spaying and neutering decreases the need for energy and intake should be modified accordingly.

Dangers

Too much starch or sugar can contribute to obesity because the rabbit will convert the excess energy to fat. Enterotoxemia can be caused by too much carbohydrate in the diet. This is because the excess carbohydrate travels to the cecum where the extra energy can cause the wrong populations of bacteria to grow and produce toxins.

Fiber

Function

- Drives digesting food through the digestive tract (breaks digested food/feces into smaller masses)
- Is the best source of energy for bacteria living in the cecum (eg. fiber is converted into volatile fatty acids)
- Protects against diet induced enterotoxemia (maintains the cecal bacteria balance)
- Protects against GI stasis and helps prevent blockages due to hair
- Adds water and bacterial bulk to the feces (makes defecation easier)
- Helps retain water in the digestive tract.

Protein

Function

Protein is essential to make a bunny.

- Proteins help make bone and muscle and fur, they also are responsible for turning food into energy.
- Proteins are important for the proper functioning of the cecal bacteria

Fats

Function

- Provide energy
- Facilitate absorption of fat soluble vitamins

Source

- Grains
- Nuts
- Pellets
- Oils (flax seed oils and vegetable oils)

Needs

- Rabbits require approximately 1-1.5% of the total caloric intake to be fats.
- There is also a requirement for essential fatty acids, linoleic and linolenic acids.
- Eicosanoid hormones are essential for blood pressure control, blood clotting, muscle contractions and memory. Precursors for these hormones (omega 3 and omega 6 fatty acids) are essential and must be supplied by the diet.

Vitamins

Function

- Are important to help release energy from food and energy stores
- Act as hormones to regulate metabolism
- Act as antioxidants to prevent cellular damage

Source

- The water soluble vitamins and vitamin K are synthesized by the cecal bacteria and obtained by coprophagy.
- Carotenes (plant pigments) are converted to Vitamin A in animal tissues.
- Pre-vitamin D is found in sun-dried hay and can be synthesized by the skin after exposure to UV light.
- Vitamin E is found in vegetable oils and cereal grains.

Needs

- Rabbits do have an absolute requirement for all the vitamins except C.
- However, the vitamin K and the B-vitamins are provided by the cecal bacteria and therefore may not need further supplementation until the cecum is disturbed or the cecal pellets are not consumed.
- Rabbits receiving pellets as part of the diet should be receiving sufficient amounts of vitamins D, A, and E. For rabbits receiving no pellets, it is possible that D and E would become deficient after a long time (many years). Carrots, of course, are rich in vitamin A.
- Extreme excesses of Vitamin C can cause kidney damage.
- Excess vitamin D can cause calcium deposits in tissues (joint, kidneys, etc.).
- Excess vitamin A causes neurological and skin damage.

Minerals

Function

- Are important for bone structure (calcium, phosphorus, magnesium).
- Bind oxygen and carry it through the blood stream (iron).
- Act as antioxidants to prevent cellular damage (selenium).
- Help to release energy from foods and stores (iodine, cobalt, chromium).
- Participate in blood pressure control (sodium, potassium)

Source

- Many plants concentrate minerals therefore there is not a big risk that rabbits fed a varied diet including lots of vegetables would develop deficiencies.
- Pellets are a good source for minerals.

Excess minerals can be toxic, however, this should not be a concern with most minerals. The one exception is calcium. Rabbits metabolize calcium very differently from other animals. Rabbits absorb calcium from the intestine very efficiently (60-80% of ingested calcium is absorbed into the blood stream), and the major way for them to get rid of this calcium is through the urine.