



The Veterinary Link

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Remember vitamin A in winter rations

Vitamin A is the vitamin most likely to be deficient in cattle diets and is the only vitamin with a well-defined requirement. It is important for vision, bone formation, growth, reproduction, and skin and other tissue health.

Carotene

Cattle convert carotene from plants into vitamin A in their intestinal tracts.

Carotene is a yellow pigment that occurs in all green plants and is plentiful in fresh, leafy forage but not present to any extent in the grains and oilseeds used in cattle feeds (yellow corn is the exception).

The liver can store enough vitamin A to protect cattle from long periods of dietary scarcity (two to four months), so animals on green pasture (grass or legume) often can store sufficient reserves to help meet their needs during the winter feeding period when rations may be deficient.

Large losses of carotene take place in the curing and storage of roughages. Hays that are cut in the bloom stage or earlier and cured without exposure to rain or excessive sun retain most of their original carotene content, while hay cut in the seed stage and exposed to rain or to extended periods of sunshine loses most of its carotene content. Hay rapidly cured with a drier has only a slight loss of carotene. The degree of greenness in roughage is a good, rough indicator of its carotene content.

Both carotene and vitamin A are destroyed by oxidation, which can occur during feed storage. The stability of vitamin A added to feed has been increased by modern milling practices, such as covering minute droplets of vitamin A with gelatin or

wax or by adding an antioxidant — such as ethoxyquin — to the feed.

Deficiency

Vitamin A deficiency is most likely to occur when cattle are eating a high-concentrate diet, grazing bleached pasture or hay grown during drought conditions, being fed a heavily processed diet (mixed with oxidizing materials, such as minerals), eating feeds that have been stored for long periods of time, or consuming a protein-deficient diet that is also low in vitamin A.

Deficiencies can be corrected by increasing carotene intake by adding fresh, leafy, high-quality forages to the diet, by supplying vitamin A supplements in the feed or by injecting vitamin A preparations.

The classic sign of vitamin A deficiency in cattle is night blindness (difficulty seeing in dim light), with total and permanent blindness possible in younger animals and in calves born to deficient dams. Cattle with vitamin A deficiency may also exhibit excessive tearing (watery eyes); rough, dry, faded and shaggy coats; overgrown hooves that are dry and brittle; and hooves with multiple, vertical cracks.

Vitamin A deficiency has been identified as a cause of infertility in both females (delayed or lack of ovulation, silent heat, and early fetal loss) and bulls (abnormal semen).

Vitamin A is important for the normal function of the tissues lining the respiratory, digestive and urinary tracts. Cattle with vitamin A deficiency have a higher incidence of pneumonia, diarrhea and urinary tract stones. It should be

noted, however, that greater than optimal levels of vitamin A will not help prevent pneumonia or other diseases.

Supplementation

Although clearly identifiable cases of vitamin A deficiency are not particularly common, we do see herds that do not reach their potential reproductive performance, growth rate and health because of limited vitamin A in the diet.

Because the vitamin A activity in typical beef cattle rations is unpredictable, the total requirement is usually added to the diet as a commercially synthesized, stabilized vitamin A product. Vitamin A palmitate and vitamin A acetate added to the feed or water provide inexpensive supplementary sources. Vitamin A also can be given as an injection, as it can be stored in the liver for a number of weeks.

Vitamin A requirements for cattle range from 2,000 to 8,000 international units (IU)/100 pounds (lb.) of body weight. Growing cattle, lactating cows and bulls require higher levels of vitamin A than mature cows. Vitamin A is very safe to use in cattle feed because toxicity is extremely rare.

As we move into the winter months when most cow herds will be receiving rations composed of dormant or stored forages, vitamin A supplementation is one of the first items to consider when planning a healthy diet.

