

Post Rock Extension District Column

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Be sure to TEST your forages for nitrates!

Producers are busy working out in the field on their forage sorghum or sudan, however, don't forget to check for nitrates! The potential for high nitrate concentrations occurs when crops such as corn, sorghum, cereal grains and some grasses are exposed to drought, hail, frost, cloudy weather, or soil fertility imbalance. Nitrates accumulate in the lower portion of the plant when stresses reduce the crop yield to less than that expected based on the supplied nitrogen fertility level. When fed to livestock, nitrates interfere with the ability of the blood to carry oxygen. Forages that contain high levels of nitrates can cause death, though not as quickly as prussic acid poisoning. In fact, some animals can adapt to increasing amounts of nitrate in feed. If cows are exposed to high levels of nitrate, there is a medication that can be given to them. All livestock are susceptible to nitrate toxicity, but cattle and horses are affected most often.

Nitrate poisoning causes the blood to turn chocolate brown in color and does not allow it to carry oxygen. Nitrates can affect the mineral balance in the body. Make sure that trace minerals are accounted for in cow diets when utilizing nitrate-containing feeds. The lower 1/3 of the stalk can have 8 times more nitrates than the middle 1/3 of the stalk. Ears, leaves and tops will usually be very low in nitrates.

Nearly all plants contain nitrate, but some species are more prone to accumulate nitrate than others. Crops such as forage and grain sorghum, sudangrass, hybrid sorghum-sudan, and pearl millet are notorious nitrate accumulators. Brassica species (e.g. radishes, turnips) take up nitrogen effectively and can accumulate dangerous concentrations of nitrates. Weed species such as kochia, lambsquarters, sunflower, pigweed, and Johnsongrass also are often high in nitrate. Under certain environmental and managerial conditions, corn and cereal grains like wheat and oats, and other plants can accumulate potentially toxic levels of nitrate. Under extreme stress, legumes such as alfalfa and soybeans also can accumulate nitrate.

Shaded plants lack sufficient photosynthetic energy to convert nitrate to amino acids. Extended periods of cloudy weather increase nitrate content and dangerously high levels can occur when wet, overcast days follow a severe drought.

Frequent intake of high-quality water is important for optimal rumen fermentation. Analyze the livestock water supply to determine whether it is contributing to the nitrate burden of cattle.

The following are guidelines to reduce nitrates in forages:

- *The best way to feed high nitrate feeds is to dilute the nitrates to a safe level. You can use grains, by-products, low-nitrate forages to balance the diets. Feeding 2 to 5 pounds of grain or by-product dilutes the amount of nitrate in the total ration and provides the energy necessary for bacteria to quickly convert nitrite to ammonia. Molasses also can provide needed energy for nitrite reduction but may be cost prohibitive.
- * Pay close attention to potentially troublesome plants, such as sorghum and sudangrass, which often have high nitrate levels.
- * Avoid excessive application of manure or nitrogen fertilizer.
- * Raise cutter bar 6 to 12 inches to exclude basal stalks. This also will minimize harvesting many weed species that have accumulated nitrate from shading.
- * Delay harvesting any stressed forages. A week of favorable weather generally is required for plants to reduce accumulated nitrate.
- * Never feed green chop that has been heated after cutting or held overnight.
- * Harvest plants containing high levels of nitrate as silage rather than hay. This could reduce nitrate levels by as much as 50% with the ensiling process.
- * Have representative samples of suspect forage analyzed before feeding.

K-State Research and Extension has an excellent publication, **“Nitrate Toxicity”** that is available ONLINE or at any Post Rock Extension District Office in Beloit, Lincoln, Mankato, Osborne or Smith Center. If you have questions on nitrate toxicity management, give me a call at any of our Post Rock Extension District Offices.