

Nitrate Testing Fact Sheet

Nitrate is potentially poisonous to livestock when consumed in large quantities and accumulates in forages under stress conditions including: drought, hot weather, cool weather, frost, herbicide applications, or disease. Once stressors are removed, live plants can return to normal nitrate levels after several days.

High nitrate levels are most commonly found in grass forages like corn silage, small grains, sudangrass, orchardgrass, and fescue but can also be found in most forage under extreme conditions. In addition to forages, Nitrates can occur in very high levels in common weeds including pigweed, lambsquarter, ragweed, Johnson grass, and many others. Corn stubble is particularly dangerous for grazing because Nitrates are concentrated in the lower portions of the stalk.

Guidelines for use of feeds with known nitrate content	
NO ₃ -N ppm (100% dry basis)	Comments
<1000	Safe. A 1000 pound cow consuming 20 pounds of dry matter would consume about 9 grams of NO ₃ -N or less than 1 gram per 100 pounds of body weight.
1000 to 2000	Generally safe when fed balanced rations. Best to limit it to half of the total dry ration for pregnant animals and also be sure water is low in nitrate.
2000 to 4000	Limit amount to less than half of total dry ration. Be sure ration is well fortified with energy, minerals, vitamin A.
Over 4000	Potentially toxic - do not feed.

Source: University of Wisconsin www.uwex.edu/ces/forage/pubs/nitrate.htm

Sampling Recommendations		
Standing Forage	Silage	Pasture
<ul style="list-style-type: none"> Variability of Nitrate levels within a field can be very high Cut at least 15 whole plants taken at random Cut plants at the same height as the chopper Chop plant to at least 1 inch lengths and mix well Remove about 0.5lbs for testing 	<ul style="list-style-type: none"> Collect several samples from the silo face or during unloading Mix well and remove about 0.5 lbs for testing 	<ul style="list-style-type: none"> Pasture is extremely difficult to sample because animals will selectively consume plants If high nitrates are expected cautious management is recommended

* For fresh forages it is recommended to deliver samples directly to the lab or freeze samples for 24 hours prior to shipping and ship in an insulated container. Fresh forage in a sealed bag will begin to ferment which reduces the Nitrate level of the sample.

Sources

- Allison, C D., 2010 Nitrate Poisoning of Livestock. New Mexico State University Cooperative Extension Service Guide B-807
- Crowley, J W. 1985 Effects of Nitrate on Livestock. American Society of Agricultural Engineers. Paper Number 80-20026.
- Faulkner and Hutjens Nitrates in Livestock Feed University of Illinois, Urbana-Champaign
- Vough, et al. Nitrate Poisoning of Livestock: Causes and Prevention. South Dakota State University Cooperative Extension Service. ExEx4015 Dairy Science.
- Undersander, et al Nitrate Poisoning in Cattle, Sheep, and Goats, University of Wisconsin Extension Service. www.uwex.edu/ces/forage/pubs/nitrate.htm