

Proper Sampling for Nitrate in Feedstuffs

Nitrate Testing

Nitrate toxicosis is a concern for livestock and can occur when animals ingest forage or feed (or water) with a high nitrate content. The NDSU-VDL tests for nitrate in feed samples by a qualitative diphenylamine test and quantitative for nitrate levels by ion selective electrode. It is important that a proper and representative sample is sent into the diagnostic Lab for testing.

Plants

There are many plants that are known to accumulate nitrate. If using field crops for animal feed prior to maturity or turning animals out on crops, consider not only nitrates, but also recent uses of herbicides and pesticides and potential withdrawal periods for livestock feed.

Common Plants that Accumulate Nitrate

Crops			Weeds		
Barley	Radishes	Soybean	Canada Thistle	Lambsquarter	Russian Thistle
Corn	Rape	Sorghum	Dock	Nightshade	Smartweed
Flax	Rye	Sudangrass	Jimsonweed	Pigweed	Wild Sunflower
Millet	Turnips	Sugar Beets	Johnson Grass		
Oats	Wheat	Sweetclover	Kochia		

Sampling

It is crucial that sampling is done correctly for the results to be accurate and truly represent what the animal is consuming. A gallon sized bag (bread bag) of sample is requested with either fresh forage stalks or baled hay.

Dry forage/baled hay - Use a hay probe to take a core samples from 10 or more hay bales that represent the cutting batch and combine for a gallon sized sample.

Corn stalks/Pasture grasses– Cut the stalk/grass at expected harvest height and send entire grass/stalk that represents what animal would be fed. Collect a representative sample from 4 to 5 locations across the field and combine for a gallon sized sample. When appropriate, collect samples from suspect forage that appears 'droughtier' than other areas or take samples where higher growth of nitrate accumulator plants (i.e., pigweed, dock, Canada thistle, Lambsquarter), and send another sample from the remainder of the field. Do not send in roots.

Sample Handling and Shipping

If sample is moist place in plastic bags and store cool either on icepacks or in a freezer (bacterial activity in wet forage can reduce the nitrate level). Dry samples can be held at room temperature overnight. If sending immature, green plants – place plants in freezer overnight and ship on icepacks to prevent conversion nitrate to more deadly nitrite. Send samples as quickly as possible to the laboratory, overnight if possible. Avoid shipping samples at the end of the week to prevent a delay in testing. Nitrate levels can decrease gradually over time.

For More information on nitrate poisoning

Stoltenow, C. and Lardy, G., *Nitrate Poisoning of Livestock V839*, NDSU Extension Service, March 2015