



### Hot and Dry Weather can Trigger Nitrate Accumulation in Some Forage Crops

Nitrate is one of the major nitrogen (N) forms utilized by plants. Excessive nitrate accumulation can occur when the uptake of nitrate exceeds its utilization in plants for protein synthesis due to factors such as over N fertilization and stressful weather conditions. It can be toxic to livestock when too much nitrate is accumulated in the forage crops. Sorghum and millet have been noted as having a high potential for accumulating nitrate. Producers should watch their forage nitrate closely to avoid cattle fatality and to better manage their hay crop since we have seen many high nitrate forage samples this year. Normally, drought stress, cloudy weather and other climatic conditions will enhance nitrate accumulation in the plant. In addition, forage planted in failed wheat fields with high soil residual nitrogen unused by wheat can result in high forage nitrate problem too.

#### Generalized interpretation for forage nitrate test (dry matter basis).

Nitrate (ppm)	Interpretation
0-3,000	Generally safe for all cattle
3,000-5,000	Generally safe for non-pregnant beef cattle. Low risk of reduced breeding performance and early term abortions. Total ration for dairy cattle should be less than 2500 ppm.
5,000-10,000	Some risk for all cattle. May cause mid to late term abortions and weak newborn calves. May decrease growth and milk production.
>10,000	Potentially toxic for all cattle. Can cause abortions, acute toxicity symptoms, and death.

As indicated by the table above, it is considered potentially toxic for all cattle when nitrate (not expressed in nitrate-nitrogen) in the forage is greater than 10,000 ppm. Producers should avoid grazing or feeding with high nitrate hays. More detailed interpretation can be found from OSU Extension Fact PSS-2903 **Nitrate Toxicity in Livestock**. The most reliable way to find out nitrate in the hay is to collect a representative sample and have it tested by a laboratory. OSU Extension Fact PSS-2589 **Collecting Forage Samples for Analysis** highlights the proper techniques to collect forage samples. Samples can be submitted for nitrate and other forage quality analyses to the Soil, Water and Forage Analytical Laboratory in Stillwater through your local county extension office. We normally have the results ready within 24 hours from the time when sample is received by the lab. However, many samples we receive at the lab were not sampled properly. More attention should be paid on sampling standing forage, such as a haygrazer by following the right procedures:

1. Clip at least 20 representative plants at grazing or harvesting height from the suspected area. Cut the whole plants (include leaves and heads) into 2-3" long pieces, combine and mix well in a bucket.
2. Fill the cut sample into a forage bag. Use quartering to reduce the amount if there is too much sample to send to a lab.
3. Put the forage bag into a plastic bag will give you more accurate moisture content, but never put plastic bags inside our forage bags.



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