

ALBERTA SHEEP

Feeding High Nitrate Crops to Sheep

Nitrates Levels during Severe Growing Conditions

Crops that have been fertilized or manured for grain production and then subjected to severe growing conditions (drought, frost, hail) are likely to have high nitrate levels. Salvaging these crops for feed is a high risk.

The cost of the test is inexpensive compared to losing an animal. If the crop is burning up, take the crop off (leave a 10 foot strip for crop insurance), keep the crop separate and test it. Once the test results are known, the crop can be managed for feed purposes.

How to Sample

Take a composite sample of the crop you are going to feed: If you plan to graze the field, collect several (12-24) plants from throughout the field and place them in a plastic bag (i.e. a large freezer Ziploc bag). If you plan to bale or silage, collect a sample either before you cut* or of the processed feed and place it in a plastic bag. Send your sample to one of the labs listed.

*Once the plant is cut or swathed, nitrate levels will not change with time as the nitrate conversion to protein has stopped. If a nitrate problem is suspected, as in the case of drought, frost or hail, the crop should be tested prior to cutting. Crops that are subjected to severe growing conditions can have an increased risk of high nitrate levels.

If the crop can recover and start to re-grow, nitrate will be converted to protein again, resulting in a decline in plant nitrate levels. Therefore, it is often practical to test prior to cutting and consider if the crop has re-growth potential. If so, cutting can be delayed.

Symptoms of Nitrate Poisoning

In ruminants, such as sheep, nitrate is converted to nitrite in the rumen, and then to ammonia, which is passed out of the animal. When sheep consume a high nitrate feed, some of the nitrate cannot be immediately converted to nitrite and finally ammonia. Nitrate poisoning occurs when the nitrate and nitrite accumulates in the rumen and is absorbed into the bloodstream. Nitrite (the toxic form) binds to the red blood cells and impairs the blood's ability to carry oxygen, and the animal begins to suffer from oxygen starvation.

Symptoms of nitrate poisoning include:

- rapid pulse rate
- increased respiration rate
- laboured breathing
- muscle tremors and weakness
- blue-grey mucous membranes
- death



Maximum Safe Levels for Sheep			
	Nitrate(NO3)	Potassium Nitrate (KNO3)	Nitrogen
Pregnant ewes	0.49%	0.80%	0.11%
Non-pregnant sheep	0.74%	1.20%	0.17%

Feed Management

Forages with high nitrate levels can often be used in feeding programs but often have feeding restrictions. (Producers should also be aware that nitrates from certain water sources can lead to nitrate poisoning. In particular, water runoff from feedlot grounds can be high in nitrites, and nitrate and nitrite can be found in well water. These potential sources should be taken into account when calculating total nitrate intake.) In most cases high nitrate forages need to be fed in conjunction with other forage sources or with grain. It is important to balance rations to ensure not only safe nitrate levels but also to ensure a proper nutrient balance for the class of livestock being fed.

For harvested forages testing higher than 2.0% NO₃ (nitrate), 3.25% KNO₃ (potassium nitrate), or 0.45% N (nitrogen) it is difficult to ration properly and the forage should not be used.

Feed Testing Labs

Please contact the labs before sending sample to inquire about if the lab is currently feed testing, pricing and turn around time.

Parkland Labs in Red Deer (403) 342-0404 (testing done in Red Deer)

Midwest Labs in Calgary (403) 250-3317 (testing done in Omaha)

ALS Laboratory Group in Calgary, Edmonton, Fort McMurray, Grande Prairie and Lethbridge 1-800-667-7645 (testing done in Saskatoon)

Central Testing, drop off at 20/20 Seed Labs in Nisku 1-877-955-7861 (testing done in Winnipeg)

Information taken from “Nitrate Levels in Drought Affected Areas” by Karla Barmentloo

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