



ON FEED

A newsletter of Dakotaland Feeds

July 21, 2017

Nitrates and Drought

Dean Martin used to sing a song called, "Ain't that a kick in the head." It feels somewhat appropriate for the way Mother Nature has been treating us lately.

With drought conditions continuing to worsen, our hopes of getting decent feed of any quality rounded up are also dwindling. Along with poor production, we need to be very mindful of nitrates in our feed this year. Nitrates can be present in just about any forage, but of most concern this year are small grains harvested for forage and forage used as silage. Nitrates do not accumulate in the grain.

When fertility plans are put together for fields in the spring, or even the previous fall, nitrogen application is a big part of that. If nitrogen is taken up by the plant, but the plant fails to convert it to protein, then we have nitrate accumulation in the feed. Nitrate levels in your feed can vary widely across a field and can vary from field to field based on growing conditions and timing of rainfall and nitrogen uptake and time of harvest in relation to that.

Signs of nitrate toxicity in cattle may include respiratory distress, muscle tremors, weakness and uncoordinated movement. However, often the first sign is a dead animal. The nitrates results in poor oxygen carrying capacity in the blood and so the tissues, including the brain, are deprived of oxygen. This results in fairly rapid death when toxic levels are present, which is generally over 1000 ppm total diet for cattle. If lower levels are consistently present or we get a high level, but not enough to kill the animal itself, nitrates can also cause abortions in pregnant cows because of lack of oxygen to the fetus. Treatment of nitrate poisoning is to give methylene blue intravenously, likely requiring a veterinarian. It is also unlikely that you will be in the right spot at the right time to catch them, and if you are and stress them to get them gathered for treatment, that can actually make the problem worse by furthering oxygen deprivation. If you have an animal that dies from suspected nitrate poisoning, the mucous membranes (like inside of the mouth and the gums) will be brownish in color. Blood will be very dark, maybe a chocolate-brown color.

In a Nutshell

- *Check nitrates in small grains, sorghum/sudan, and silages
- *Nitrates will vary across and within fields
- *Nitrate toxicity includes muscle tremors and death
- *Toxicity interferes with oxygen transmission
- *Ensiling can reduce nitrates by 50%, baling will not
- *Check water sources for nitrates and sulfates

Nitrate Nitrogen, ppm	Feeding recommendations
0-1000	Safe to feed if adequate feed and water are available
1000-1500	Safe for non-pregnant animals, limit to 50% of total ration DM for pregnant animals
1500-2000	Limit to 50% of total ration DM for all animals; may experience some symptoms
2000-3500	Limit to 35-40% of the total ration DM; DO NOT FEED to pregnant animals
3500-4000	Limit to 25% total ration DM; DO NOT FEED to pregnant animals
More than 4000	TOXIC; DO NOT FEED

Nitrates in silage are going to need to be monitored this fall. Dry conditions make corn silage more prone to high nitrates and sorghum/sudan are even more problematic for nitrates than corn. Nitrates concentrate most in the stalk and so chopping a little higher will help decrease the total amount of nitrates you put into the pile. As a plant matures, the nitrates will decrease, so harvesting the crop closer to maturity will also help decrease nitrates

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but it may not be possible. Ensiling will help dissipate up to 50% of the nitrates, so sample your silage after it has had time to ferment (approximately 3 weeks). Baling and dry down will NOT reduce nitrates.

Water sources are also a major concern right now. In the next couple of weeks, dugouts and stock dams will continue to evaporate, resulting in concentration of the sulfates and nitrates that are present and could be potentially toxic. **Keep an eye on your water sources because they could become toxic.** Below are the levels of nitrates to watch for in water. There can be a difference in the way the levels are reported. Some reports list nitrate-nitrogen and others report nitrates, and which units are reported will make a difference on the level considered safe. When it comes to sulfates in the water, anything over 2000 ppm sulfates needs to be watched very closely. If water is over 3000 ppm, you need to try to find a different water source for the cattle or at least blend it with another source if you can. Between sulfur in the feed and water, we could reach the point of toxicity.

We can deal with nitrates and sulfates if we know what is there. We need to have nitrates tested in the feed so we can still utilize the feed, but in a safe manner. Killing an animal with nitrates at this point is just adding insult to injury. High nitrate feeds need to be blended off, typically in a TMR, to help ensure that no single animal gets

too much nitrate at one feeding. When grinding hay, you will want to grind a separate pile of the high nitrate feed so that you can adjust it and blend it off with low nitrate feeds or hay. If you combine all of your hay into one pile at grinding time, you may have just ruined the entire pile with high nitrate feed. Under no circumstances should we feed high nitrate feed free-choice or undiluted. Rolling out bales with over 1000 ppm is not safe.

If you have high nitrate feed, we can also consider the class of cattle we are feeding it to. The lowest risk group to feed high nitrate feed is backgrounding steers, then we would move to non-pregnant replacement heifers, and then bred females. We have the potential to cause abortions with high nitrate feed and so we want to avoid feeding it to bred females if we can. It would be better to feed it to cows post-calving because we don't run the risk of abortions. There should not be negative reproductive effects if we monitor the nitrates to a safe level.

This has been a tough year all the way around. If we know what is there for nitrates and sulfates along with the nutrient value, we can deal with it and use it in an appropriate manner. Contact your local Dakotaland Feeds consultant if you have further questions on nitrates and testing.

Roxanne Knock, PhD

Guidelines for Nitrates in Water	
ppm	Estimated Effects
0-44	Not harmful
45-132	Slight possibility
132-220	Risky, especially over a long period
221-440	Rumenitis, founder, abortions, decline in lactation
441-660	More serious, possible acute losses
661-880	Increased acute losses
881+	Heavy acute losses

Adapted from Faulkner and Hutjens

Things to be thinking about:

- *Get preconditioning shots in calves to wean early
- * Keep mineral in place for the cows
- * Feed Altosid to control horn fly populations
- * Use an ionophore if you are supplementing cows or feeding in a drylot
- * Prepare for heat stress for cattle in the lots- shades, sprinklers, extra water tanks, etc.
- * Check water sources regularly, sample dugouts or stock dams for nitrates and sulfates
- * **Get feed lined up for early weaning-** Stress Care 10, Stress Care 5, Stress Care Balancer, Stress Tubs
- *Talk to your veterinarian about ultrasounding for pregnancy so you can sell the opens
- *Get your feed storage area ready for silage season and get your inoculant lined up