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Report Type: Feed
Invoice No.:
Date Received: 10/14/2024
Date Reported: 10/17/2024
Lab Number: F24-022530

Results For: DAVID RASMUSSEN
Sample ID: BEHIND HURTES
Description: SORGHUM SUDAN GRASS

	Analysis As Received	Analysis Dry Basis
*Moisture (Oven) %	21.92	0.00
*Dry Matter (Oven) %	78.08	100.00
*Crude Protein %	4.77	6.11
Ruminant Total Digestible Nutrients (TDN), %		48.81
Ruminant Metabolizable Energy (ME), Mcal/kg		1.76
Ruminant Net Energy of Lactation (NEL), Mcal/lb		0.49
Ruminant Net Energy of Gain (NEg), Mcal/lb		0.17
Ruminant Net Energy of Maintenance (NEm), Mcal/lb		0.42
Relative Feed Value (RFV)		69
*Nitrate ppm NO ₃ -N		137
*Acid Detergent Fiber (ADF) %	36.80	47.13
*Amylase-treated Neutral Detergent Fiber (aNDF) %	54.94	70.36

Safe

*-Results By Wet Chemistry

Report Comment:

Reviewed by: Kern-Lunbery, Rebecca

Toxicity and Animal Health Related Tests

Nitrate Poisoning

Nitrate poisoning occurs when animals, most commonly cattle and horses, consume nitrates. There are two types of nitrate poisoning which depend on the physiological state of the animal and the level of nitrate exposure. Chronic nitrate toxicity occurs when animals under physiological stress, such as pregnancy, lactation or illness, consume moderate levels of nitrate for several days. The symptoms of chronic toxicity are reduced appetite, weight loss, diarrhea, or no symptoms at all. Chronic nitrate toxicity can result in abortions without warning signs. Acute nitrate toxicity is the consumption of high levels of nitrate rapidly which can result in cyanosis and sudden death. The nitrates are converted to nitrite in the rumen by the microorganisms, when the cattle belch, they inhale the nitrite which then binds to the hemoglobin in the cattle's blood preventing the binding of oxygen to the blood cells resulting in nitrate poisoning. Nitrate accumulation in a forage is dependent on plant species, maturity, part of the plant, environmental conditions, and management factors. Species of nitrate accumulating plants include sorghums, sudan grass, millets, oats, Johnson grass, broadleaf weeds, corn, sunflowers, and very rarely, under high stress conditions, soybeans and alfalfa. Mature plants tend to accumulate less nitrates than young plants or regrowth. Additionally, nitrates tend to accumulate in the lower third of the stock of the plant, making leaves and stems less likely to contain nitrates.

Stressful environmental conditions including drought and frost cause a plant to accumulate nitrates due to the inability to convert them into plant proteins. The most prevalent management practice resulting in high nitrate forages is nitrogen fertilization. Increased nitrogen in the soil may increase yields, but it will also increase the amount of nitrate uptake by the plant.

Table 10: Animal Response to Nitrate-Nitrogen Concentrations

NO ₃ -N ppm "dry basis" Animal Response	
< 1400	Safe
1400 - 2100	Marginal , use caution when feeding. Can cause reduced milk production, abortions and low rate of gain. It would be best to limit daily use to 1/2 of the total daily dry matter intake.
2100 - 3000	Potentially Toxic , feeds in this range should be limited to 1/3 of the total daily dry matter intake
3000 - 4000	Toxic , feeds in this range should be limited to 1/4 of the total daily dry matter intake.
4000 - 5000	Very Toxic , feeds in this range should only be 10 - 15 % of the total daily dry matter intake as a part of a well-mixed TMR.
> 5000	Do not feed - death may occur.

Feeding Forages with Nitrates

Several strategies can be adopted to use forages with high nitrate contents. Ensiling the forage can reduce nitrate levels

by 40 to 60%. High nitrate forages can be grazed, however; cattle should be fed a dry roughage first to decrease and control intake levels of the high nitrate forage. If the forage has been harvested and baled, dilution with other feeds, mixed into a balanced ration, or grain supplementation can be used to decrease nitrate levels. Cattle can adapt to moderate nitrate feeds gradually through feeding limited amounts of nitrate throughout the day rather than a high amount in one meal. Never feed high nitrate feeds to cattle in a stressed physiological state.