K-STATE Research and Extension | Meadowlark District

September 5, 2025

Ross Mosteller
District Extension Agent, Livestock & Natural Resources

Crop Residue Grazing Concerns

The month of September brings the Kansas State Fair, football lights on Friday nights and fall crop harvest. Most farmers become excited to harvest, but as a cow guy, I become excited for the ample new grazing resource provided behind the combine. While forages available in crop residues can provide the necessary nutritional requirements for a grazing ruminant, there are a few health conditions that need to be considered prior to turn out. If grazing crop residues have not been an option in the past, or maybe just if you need a refresher on the health concerns to consider, please read on.

There are two major classes of concerns to be aware of; those that cause digestive upset, acidosis and/or bloat and those that create toxicity, such as nitrates and/or prussic acid. Every crop can provide a different challenge, with environmental factors having an effect as well. Corn residue for example has a low risk of prussic acid, but higher risk of acidosis with dropped ears. Sorghums are known to be nitrate accumulators and run the risk of prussic acid poisoning. The University of Nebraska has a good resource titled Grazing Crop Residues with Beef Cattle to learn more.

Acidosis or grain overload occurs when ruminants consume large amounts of feed that contain high amounts of fermentable carbohydrates, leading to clinical signs in the animal. Whenever there is an excessive amount of grain drop, research shows eight bushel per acre as a threshold, this becomes a risk. Rumen microbes rapidly begin to ferment carbohydrates in the grain, which leads to an increase in lactate formation. When lactate production increases, the rumen pH drops below the normal range of 5.6-6.9 and begins to damage the rumen.

This leads to an increase in acid-loving bacteria and yeast in the damaged rumen. All of these affect the blood volume and hydration status of tissues throughout the body, leading to acute clinical signs of diarrhea, dehydration, depression, and anorexia. Bloat can also be a symptom of acidosis if the animal does not properly ruminate and expels rumen gases. Treatment involves restoring the rumen microbes, correcting dehydration and acidic rumen microenvironment, and managing secondary complications like bloat. Long term consequences of acidosis can include abortions and laminitis.

Management is key to preventing acidosis. Establish a grazing plan by first assessing the amount of downed grain within the field. Some strategies known to help with this management include introducing the animals to an increased amount of carbohydrates in the diet a week to ten days prior to grazing. Strip grazing the residue to help control access to grain and force the animals to balance roughage in their diet as well. Finally, never turn out hungry animals on high grain or lush crop fields.

Focusing on the toxicity side of the equation, nitrates accumulate in plants when uptake by the roots exceed the rate of conversion to protein within the plant. This occurs during periods of drought, plant stress and following rapid growth. When a ruminant consumes high-nitrate plants, the rumen microbes convert the nitrate to nitrite. Excess nitrite is absorbed into the bloodstream, where it changes the oxygen carrying capacity in red blood cells. This reduction of oxygen carrying capacity results in asphyxiation. Clinical signs of nitrate toxicity include weakness, rapid breathing, lethargy, muscle tremors and sudden death. Abortions may occur 10-14 days after ingestion of high nitrites due to lack of oxygen to fetus and is often a sign that high nitrate feed has been consumed.

The best plan for the prevention of nitrate issues is to know the nitrate levels of plants that will be used as feed, prior to utilizing them. Nitrate samples can be taken from standing plants or baled forages to be sent to the lab for analysis. Forages with greater than 9,000 ppm nitrate (NO_3) may lead to acute toxicity signs and sudden death. Levels over 5,000 ppm (NO_3) should not be fed to pregnant animals due to the increased risk of abortion and stillbirth and shouldn't be the sole ration source for all animals. A test result of less than 3,000 ppm (NO_3) is generally considered safe feed. More information on managing high nitrate forages can be found in the K-State publication Nitrate Toxicity MF-3029.