

Itchy gloves, hay chaps, and hay hooks - those are my memories of hauling hay on the farm of my youth. We bought an old Mountain Fuel flat bed truck to haul. Once we got back to the barn, we used a hay elevator to move the small bales to the top of the stack. Dad would take old milk jugs, fill them with water, and put them in the freezer just for haying season. Little bits of hay would get in with your drink to make a kind of homemade tea. It didn't seem to matter, as long as it was cold and wet, we kept drinking it.

With the fall upon us, I often receive several questions about hay quality and nitrate testing. With a wet, cool spring, it's hard to miss all the hay bales out in the fields around the county. Custom haying operations are running full steam trying to cut, rake, and bale the hay in the surrounding area. I'd like to take a look at the quality found in hay, as well as a possible concern for those feeding hay.

"Hay" is a broad definition. Hay is grass or legumes that have been cut, dried, and stored for use as animal feed, particularly for grazing animals like cattle, horses, goats, and sheep. Pigs may be fed hay, but they do not digest hay very efficiently. Primarily, hay is used on ruminants (ie. cattle and sheep), but can be used effectively to feed horses.

Hay quality, as defined by Dennis Cash, MSU Extension Forage Specialist, is "the potential of a forage to produce a desired animal response. Hay quality includes palatability, digestibility, intake, nutrient content and anti-quality factors, but some of these characteristics are not measured by lab tests." It all depends on what you are feeding, what time of year you are feeding it, and what response you wish to get from the animal you are feeding.

I often hear the term "dairy quality". This implies a high crude protein and perhaps the most nutrient staple for animals. This hay is primarily alfalfa and is cut just before the alfalfa is in bloom. Dr. Cash explains, "For a winter feeding program in Montana, the primary forage quality tests to request are: crude protein (CP), acid detergent fiber (ADF) and neutral detergent fiber (NDF)." Crude protein for alfalfa-grass mixes and straight alfalfa are from 9-20% depending upon the content and the maturity of the plant at cutting. Higher quality hay has a crude protein of 20% or more.

"Laboratories use a variety of accepted testing procedures, and the cost for analysis of CP, ADF and NDF ranges from about \$15 to \$40, with a turnaround time of 2 to 14 days, depending on labs. Other useful analyses for Montana forages include calcium, phosphorus, potassium and magnesium, and in some known instance the trace minerals copper and zinc," Dr. Cash continues.

We offer a qualitative nitrate test here at our office in the Teton County Courthouse. This test is a simple yes/no test to determine if producers should pursue qualitative testing at a lab. This test is free to producers. Nitrates, or NO₃, can accumulate to toxic amounts in small grain hays (barley, hay barley, oat and wheat), as well as alfalfa, brome grass, orchard grass, sweet clover, fescue, sorghum, and sudan grass. Some weeds, such as pigweed, quackgrass, Russian thistle, lambsquarter, and kochia can also house toxic levels of nitrates.

According to Dr. Cash, "nitrate poisoning of livestock was reported as early as 1895. Livestock losses occurred for many years before elevated nitrate levels in forage were determined to be the cause of death. The term 'oat hay poisoning' was the common explanation for livestock losses in the 1930s, because large acreages of oats were harvested for forage during drought years." Clearly, nitrates in forages have been a historical concern and will continue to be.

Some symptoms of nitrate poisoning in livestock include: abortion, accelerated pulse rate, labored breathing, muscle tremors, weakness, staggering gait, and death. If you suspect your livestock are suffering from nitrate poisoning, contact your veterinarian immediately. Some acute cases are visible immediately upon consuming high nitrate forages.

Nitrates settle in the lowest nodes on a plant and are at their highest levels in the morning hours. Abnormal growing conditions such as drought, frost, unseasonable or prolonged cool temperatures, hail, shade, disease, high levels of soil nitrogen, soil mineral deficiencies or herbicide damage can cause high nitrate accumulation in forages.

If you are concerned about your nitrate levels, please bring a sample into the Extension office for testing. Three members of our staff are certified to test your nitrates. If a qualitative test shows up hot (a physical color that indicates some level of nitrates are present), we can send a sample to the MSU Analytical Lab to perform a nitrate test for \$12.00. They will need a one gallon sized sealable bag filled with a representative sample for testing. If you'd like to

get certified to test your own hay for nitrates, you can test online and receive a testing kit for \$20. You will need to recertify every year thereafter, but with gas hovering around \$4.00 a gallon, it may be worth it to you.

There's nothing like the smell of fresh cut hay. I will forever think of hard work, hay hooks, and cool water when I take that smell in. With a lot of hay being cut this year, and the prospect of a good winter, it might be worth it to test your hay for quality or nitrates. Feel free to stop in with a sample to the Extension office, or give me a call at 466-2491 for more information.