



You Finally Got the Hay Made, How Good is It?

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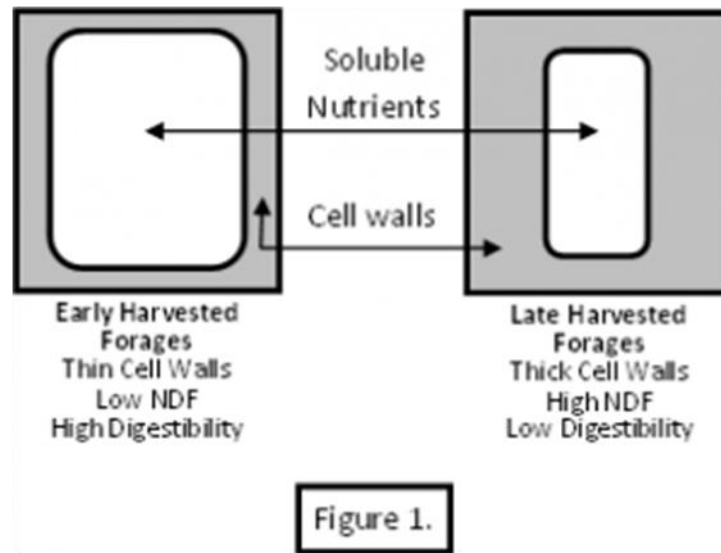
"You gotta make hay while the sun shines". How many times have you heard that said throughout the years? We've had some sunshine this spring/summer, but making first cutting "dry" hay has really been challenging for most farmers this year.

Making timely first cutting dry hay in Manitoba always has challenges with weather, but this year it definitely has been more than usual. Extremely good, high-quality hay is made from young leafy forage at boot stage, not fully mature long brown stems with dried up seed heads. The combination of maximum yield and highly digestible dry matter is usually obtained at the late boot, to early head stage of maturity for grasses and in the mid-to-late bud stage of maturity for our legumes. Forages that can be harvested at that time, most often meet nutrient requirements of beef cattle, but accomplishing that with dry hay this year has really been the exception, not the rule for most producers.

Beef cows do not require the same level of nutrition as dairy cows to maximize production. However, this year may be challenging to have enough nutrients in most beef producers first cutting hay to maintain the cow's minimum requirements without grain supplementation, mixing in high quality stockpiled forage, or adding good quality second cutting hay into the feeding program this winter. Forage testing should be done so producers know what their hay quality actually is and if adjustments need to be made.

Just because there is hay in the bale rings for the cows to eat does not mean she can eat enough, or that there are enough nutrients in the hay, for her to function properly. Extended periods of poor nutrition can lead to calving problems, weak newborns, poor quality milk, rebreeding problems and many other costly complications.

Forage tests results may be extra valuable this year. With forage tests results we usually look at total digestible nutrients (TDN) and crude protein (CP) to determine the forage quality and use this information to calculate if there are enough nutrients to meet the livestock's requirements in various stages of production. We may need to take a closer look at other information on the lab results this year as well.



I expect neutral detergent fiber (NDF) content is going to be higher than normal in many producer's hay bales because of the over mature condition of the hay. As forage plants mature, cell wall production in the plants increase and NDF content will increase, see Figure 1. As NDF content in a forage increases, dry matter intake decreases because it cannot pass through the cow's system as fast. Therefore, with NDF percentages, we can accurately predict forage intake as it relates to bulk; or we could say, how much an animal will eat before its stomach gets full and stops eating. The higher the NDF value, the less the livestock can physically eat of that forage/day.

Most mixed grass hay, after heading out, will have NDF values of 65 percent or greater. Beef cows can only consume about 1-1.2 percent of their body weight in NDF/day. So, a 1300 lb. beef cow could consume up to 15.6 lbs. of NDF/day on a dry matter (DM) basis. If our hay is 65 percent NDF a 1300 lb. cow can only eat 24 lbs. of this hay on a DM basis or approximately 27 lbs./day as fed. Without showing all the calculations in this article, this hay would cause more than a 2.2 lb. (± 14 percent) deficiency in TDN/day for a superior milking, early lactating cow's needs. This is why a cow can have a full stomach, but still lose weight.

Another point to consider this year is going to be heat damage to the forage.

Weather conditions during June and July may have resulted in hay that was baled wetter than optimum.

Suggested dry matter percentages of hay bale types when baling range from: small squares 20 percent or less, large round, 18 percent or less and large squares, 16 percent when baling. Small bales dissipate heat faster than large round bales so small bales are less susceptible to longer periods of heating than large round bales. The goal for long-term storage and stability is a moisture content of <15 percent. The larger and denser a bale is, the less likely it is to lose moisture in storage and reach the stability desired, so the moisture at harvest becomes more

critical.

When hay is baled too wet, excessive microbial action causes hay to heat and if internal temperatures get above 150-160 degrees F hay may ignite if exposed to air.

Aside from catching fire, there is the potential of heat damage. Crude protein could be lost due to heat damage. This shows up in the adjusted crude protein percentage in the analysis numbers and reflects what happens to bales that were baled wetter than optimum, but not wet enough to cause the fire problem. Once temperatures reach 115-120°F a chemical reaction occurs between the protein and carbohydrates present in the forage. This reaction, called the Maillard reaction (often referred to as the browning reaction), is responsible for the characteristic, sweet smelling cured tobacco odor you may notice around your hay bales. While cows seem to like the taste of this type hay, the process denatures proteins making part of them unavailable for digestion. Laboratory testing can show if an adjustment has been made for excessive heat damage. All rations should be balanced using the "Adjusted Crude Protein" rather than the other protein values listed on your forage analysis.

Lastly producers may have to deal with mold growth in hay bales this year. Mold and hay quality is a very difficult issue because the presence of mold does not necessarily mean that the feed cannot be used. However, poor palatability and lower intake can be an issue that results in lower performance of the livestock that eat it. In addition, problems from mold occur because mycotoxins are produced by certain mold fungi and can be harmful to livestock. This is part of the decision-making problem, since not all molds produce mycotoxins, and the amount produced by those that do is unpredictable.

So, what is the quality of the hay you made? Several factors effect quality and intake, but a forage test is the best starting point to know how to feed the hay you produced. One thing to remember, forage analysis results are only as good as the samples taken. Core samples should be taken with a forage sampler from 12-15 bales for each lot of hay being sampled. Place all of the core samples in a sealable plastic bag, taking care that fines material in the sample is not lost, which can skew the results.

With this information you can start planning for the winter feeding program to provide sufficient nutrients to all classes of livestock so maximum performance can be achieved.