HAY TESTING AND SUPPLEMENTATION

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There are many factors that can impact forage quality, but the single most important factor is stage of maturity at harvest. When harvest is delayed, forage quality decreases rapidly. You are probably saying to yourself "those guys from the university are exaggerating how much delayed harvest decreases hay quality". Take a look at a study that was conducted at the University of Tennessee with tall fescue hay harvested at the late boot, early head, and seed formation stages. Crude protein, digestibility, and dry matter intake were all decreased. This resulted in a lower quality forage that the animal could eat less of. In this study, average daily gain of the steers were decreased by almost one pound per day (Figure I)! SO low quality hay is no joke.

In many areas of the Commonwealth, abundant spring rainfall delayed first cutting hay harvest. This likely resulted in a lot of lower quality hay being put up. In some years, we just can't avoid putting up some lower quality forage, but we do need to think about feeding strategies that will help to keep brood cows in good condition. The first thing that we need to do is to figure out the nutritional value of the hay that we have in the barn. This is done by sampling your hay and sending it in for analysis. Getting a representative sample of each hay lot (harvest and field combination) is critical. Below are tips that will help you get a representative sample.

Always use a hay probe to obtain a representative sample. A representative sample starts with cores taken with a properly designed and maintained hay probe. Collecting grab samples or bale slices does NOT provide a representative sample. The hay probe should have internal diameter of at least 3/8 inches and a probe length of 15 to 18 inches. Sample hay in lots. Hay should ALWAYS be sampled in lots. A lot consists of hay made from the same field and cutting. A lot should not represent more than 200 tons of dry matter. In the event that a lot exceeds 200 tons of dry matter, multiple samples should be taken, and forage quality results should be averaged to represent the overall lot. Don't sample hay immediately after baling. Delay sampling until three to four weeks after baling for hay stored out of the weather. During this period bales undergo the heating or sweating process and forage quality can decline. Sample hay stored outside just prior to feeding. Delay sampling hay stored outside until three to four weeks prior to feeding to account for weathering that occurs after harvest. Sample at least 20 bales from each hay lot. A representative sample will consist of at least 20 cores from 20 bales (one core per bale) resulting in a sample size of approximately one-half pound of hay from each lot. Sample at random and NOT on some leafiness, color, or weed content. Core rectangular bales from the end. Center the hay probe in the end of the bale and insert at least 15-18 inches. Core round bales from the side. Sample round bales by drilling or pushing the probe horizontally into center of the rounded side of the bale at least 15-18 inches.

Remove weathered material prior to sampling. For round bales stored outside, remove weathered material from the area to be probed prior to sampling. Weathered material represents refusal and should not be included in the sample.

Submit the entire sample for analysis. Do NOT subdivide the hay sample. This can result in the loss of smaller pieces of the sample that tend to be higher in nutritional value. Do NOT submit excessively large samples. Forage testing labs will subdivide samples. They will NOT grind entire sample. This can significantly impact test results. The sample submitted should be no larger than one-half pound.

Clearly label samples. The entire sample should be placed into a labeled plastic bag and sealed. Make sure that the bag is clearly labeled with your farm's name, a description of the hay lot sampled that will allow you to reference the results back to the hay lot, the type of hay, cutting, and year, and the date it was sampled.

Submit samples immediately. The sample should be sent immediately to the lab for analysis. Make sure and complete the sample submission form for the lab that you are using.

Sampling Baled Silage.
Sample baled silage in the same manner as hay. Delay sampling until at least four weeks after harvest to allow complete ensiling. Samples should be placed into labeled plastic bags as previously described. Submit the samples immediately or refrigerate until shipped. Remember to immediately repair holes caused by coring using aUV-resistant tape designed for silage film.

Using Your Hay Test Results
Hay testing by itself is worthless if you do NOT use the results to make management decisions. In fact, if you already know that you are NOT going to use your results to change how you feed or supplement your hay, then don't waste your time and money taking a sample. Once you get your results back, you will need to determine if the hay will meet the needs of your cows at a given production stage. Animals that are growing or lactating have a higher nutritional requirement than dry cows in
mid-gestation (Table 1).

Hay Test Example
The results found in Table 2 clearly indicate that this hay will NOT meet the nutritional requirements of a fall calving cow that is lactating. This hay will need to be supplemented in order to maintain body condition and production. The question then becomes with what and how much? The UK Beef Cow Forage Supplement Tool is an application that can be used on-line or down loaded to your smart phone. This application allows you to enter the results from your forage test (dry matter, neutral detergent fiber, crude protein, and total digestible nutrients) and gives you a range of supplement options and how much of each supplement must be fed to meet the cow's nutritional requirements
(Table 3).
The UK Beef Cow Forage Supplement Tool can be found on-line at http://forage-supplement-tool.ca.uky.eduj. This application indicates that the hay found in Table 2 would need to be supplemented with 10.6 lb of soybean hulls daily.

It is important to realize that both hay testing and the UK Beef Cow Forage Supplement Tool are NOT perfect. They are designed to get you in the ball park and let you know if there is going to be a real problem with the hay that you are feeding. The true test is how your cows perform on a given hay lot. As in most situations in life, it is always better to be proactive rather than reactive and hay feeding is no different. So don't wait until your cows loose condition before you get your get your hay tested!

If you need help with hay sampling or *interpreting your hay testing results, contact uour local extension agent.* . -~- -~

Forage testing is available from a number of commercial labs and the Kentucky Department of Agriculture. The Kentucky Department of Agriculture offers a standard forage analysis to Kentucky producers for a reduced cost. More information on this program
can be found at http://www.kyagr.com/marketing/forage-program.html.

Make sure and use a lab that has been certified for accuracy and precision by the National Forage Testing Association. A list of certified labs can be found at http://www.foragetesting.org/files/Certified_Labs.pdf .•

Table 1. *Nutritional requirement of various livestock classes.*

	Total Digestible Nutrients (%)	Crude Protein (~;')
Growing Steer @1.5 lb/day	65	12
Growing Steer @1.7 lb/day	68	11
Lactating Beef Cow	60	11
Dry Beef Cow	50	8

Adapted from Southern Forages, Third Edition

Table 2. *Hay test results.*

	Sample
Dry Matter	89.8%
Moisture	10.2%
10.2	

Constituent .	Dry Matter Basis .	As Fed Basis
Crude Protein	8.6	7.7
Acid Detergent Fiber	42.3	38.0
Neural Detergent Fiber	66.3	59.6
Total Digestible Nutrients	53.0	47.6

Table 3. *Results from the UK Beef Cow Forage Supplement Tool for the above hay sample.*

UKBeef Cow Forage SupplementTool

CALCULATION RESULTS
Lactation
Crude Protein: 8.6%
NDF: 66.3%
TDN: 53.0%
Expected daily intake of this forage for a 1250 lb cow is 1.81% of body weight, or 23 lbs on a dry matter basis, or 26 lbs on an as fed basis.