THE SAMUEL ROBERTS NOBLE FOUNDATION

Here's A New Kind of 'B.S.' Degree

by Matt Mattox

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It's been said that grazing management is both an art and a science. This is a statement that has been proven to me time and again. When you're trying to manage any living creature or ecosystem, things rarely go by the book. In fact, sometimes you can throw out the book. But the science side of managing grazing, livestock, wildlife, etc., serves to provide the fundamentals you need to know in order to apply the art of management.

An example of this comes to mind when trying to decide when and why to rotate cattle to another pasture. First of all, you have to have a reason to rotate cattle. Some reasons for rotating could be to maintain or improve the condition of forage resources, treading-in seed for seasonal grazing, or to accomplish livestock performance goals. If I was most concerned with the first reason, I would strive to rotate cattle before the proper stubble height for adequate regrowth is exceeded on tame pasture or on key range species. The science side of managing for proper stubble height has been well documented and discussed at some length over the years in this periodical. I could use this information to give me a start, but having experience with a particular bunch of cattle and knowing their grazing habits is required to successfully apply this method on pastures with different physical features.


1: 6-8% Crude Protein, 53-67% TDN Photo: Matt Mattox

If I were basing pasture rotation on livestock performance goals, such as average daily gain, I would try to keep the forage in the pastures in a vegetative state for as long as possible, and I also would monitor manure consistency.

Cattle producers have used consistency of manure to make rotation decisions for many years. I remember an old cowboy mentor of mine telling me that you want splatterers … not stackers. Of course, he was referring to the consistency of the manure in the pasture with the premise being the looser the stool, the better the quality of forage in the pasture, while harder stools indicate declining forage quality.


2: 9-11% Crude Protein, 60-70% TDN Photo: Matt Mattox

Basically, the higher the quality of the forage, the more digestible it is, and the softer the manure pile will be (barring sickness). As forages mature, there is an increase in structural carbohydrates during stem elongation and flowering that reduces digestibility. Lower-quality forages remain in the digestive tract longer, more moisture is removed from the fecal material, and the consistency of the manure pile is harder. So you have the two extremes — either the manure pile is soft, meaning better forage quality, or it's hard meaning reduced forage quality. R.L. Dalrymple (former Foundation forage specialist) took this concept one step further and developed a chart that


3: 12-15% Crude Protein, 62-74% TDN Photo: Matt Mattox

depicted cow manure of various consistencies along with descriptive labels such as "pancake batter" or "hockey pucks," and whether you could expect good, fair or poor cattle performance based on the corresponding manure consistency.

4: 16-19% Crude Protein, 66-77% TDN Photo: Matt Mattox

5: 20-28% Crude Protein, 68-84% TDN Photo: Matt Mattox

I thought that was a very good tool that most people could relate to, and I wasn't the only one. R.L. got a lot of interest out of that idea. About a year after I came to work at the Foundation, we began a project at the Red River Research and Demonstration Farm in Burneyville, Okla., that utilized the services of the Grazingland Animal Nutrition Laboratory at Texas A&M University to determine forage quality in our pastures based on fecal sample results. The lab uses near infrared reflectance spectroscopy (NIRS) technology to correlate the chemical bonds in the manure and their "reflectance signature" into useable forage quality information such as crude protein, digestible organic matter or total digestible nutrients (TDN). A computer program is then used to determine the least-cost supplemental feeding practice based on the fecal sample results.

Since I was taking pictures of the manure piles that were sampled, R.L. and I decided that we could use that information to "add some science" to his document. The included photographs and forage quality information are the result of that effort. Initially, we thought there would be more separation in forage quality based on the appearance and consistency of the cow manure. However, after several hundred samples, I was only able to confidently make five breaks. We also did not have any manure that was lower in crude protein than 6 percent. Once crude protein reaches 16 to 17 percent, it becomes more difficult to distinguish based on manure consistency. There also seems to be more overlap in TDN ranges between photos than there is with crude protein. Therefore, it seems that manure consistency is more correlated to forage protein than energy. You can use this simple guide to give you an idea of the quality of the forage that your cattle are grazing.

However, remember that this is what the quality of the forage was from one to three days earlier. The higher the forage quality, the less time it takes to digest. Another very important concept to understand is that lower forage digestibility results in a longer digestive process and reduced forage intake. So, if your cows are grazing your forages into the ground, or if they are consuming rank forages, they often cannot eat enough to satisfy performance goals due to the quality of the forages. You can use this guide and compare it to a table on livestock requirements or consult with a Foundation livestock specialist to help determine any necessary feeding requirements. Also, remember that the physiological stage of a cow will affect her digestive process. This is a subjective tool — a higher degree of accuracy can be obtained by getting forage and/or fecal samples analyzed through a lab.