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Forage Analysis; What Numbers Do I Need?

Following up on the purchasing hay article from last week, let us dive a bit deeper into conducting a proper forage analysis, with a certified testing laboratory. A fair number of forage samples come through the Extension office annually, with some folks knowing exactly what they want from a test and others asking "what do I need to test for?". My intent today is helping to determine where to start in running forage analysis. Accurate testing always starts with proper sampling, something discussed in a past article and referenced with a guide on our website. Dr. Justin Waggoner provided a good article on this subject, the foundation of what's shared here.

The basic components needed to evaluate a feedstuff or develop a ration are dry matter or moisture, crude protein, estimate of the energy content and the macro minerals, primarily Calcium (Ca) and Phosphorous (P). Energy levels are most often reported using Total Digestible Nutrients (TDN), Net Energy for Maintenance (NEm), Net Energy for gain (NEg) terms. These are the most basic numbers required, but labs offer many more tests and including additional analyses can give further insight into the quality of the feedstuff, which should improve the ability to predict animal performance, the primary reason to analyze feedstuffs.

The fiber component and related digestibility of the feedstuff, is something that is helpful and is recommended to be included while testing. This is reported as Acid Detergent Fiber (ADF) and Neutral Detergent Fiber (NDF). Not every packaged test gives these values, so take a look to see if they can be reported. NDF reflects the amount of cell wall contents and is associated with the corresponding bulkiness of forage, correlating directly with dry matter intake. The ADF number represents the amount of cellulose and lignin within the forage and is associated with the respective digestibility of the forage. In general, a higher ADF value the more likely the forage was at a greater maturity when harvested.

Additional considerations for testing would be other Macrominerals besides Ca & P, like Magnesium (Mg), Potassium (K), Sodium (Na), Chloride (Cl) and Sulfur (S). If the forage will be fed in combination with a byproduct feed such as wet distiller's grain, including an analysis for sulfur can be especially beneficial. Additionally, if the forage is a known nitrate accumulator (sorghums, sudangrass, etc..) or may have been stressed due to drought, including a nitrate analysis should always be considered, especially if being fed to pregnant animals. The flip side is also true. If you want to test for nitrates, go ahead and run a full analysis to determine quality.

Most analytical laboratories have a number of different analysis packages which encompass the most common procedures or numbers that a nutritionist or producer needs to know about their feeds. These packages will typically include the basic procedures (DM, CP, TDN) and then add on specific analyses such NDF, or the Macrominerals. Some laboratories may group analysis packages by the type of sample (forage vs. mixed ration) or production purposes (dairy vs. beef) for example. Packages are good, just know what's ran within each.

The objective of analytical testing of forages and feedstuffs is to improve our ability to meet the animal's nutrient requirements and ultimately predict animal performance. The unmistakable best method of evaluating the quality of a feedstuff is feeding the animal and evaluating performance over a set period of time, under a specific set of conditions. Since that would not be cost effective or timely, analytically evaluating feedstuffs in a laboratory is the next best thing. Although it is not perfect, it is most definitely better than the *"this looks like really good feed"* method of evaluating feedstuffs.