

Post Rock Extension District Column

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Forage analysis: Don't guess...Test!

Kansas experienced a wide range of forage growing conditions this year. Conditions that affect growth of forages can not only impact quality but can also increase the risk of nitrates, which can be harmful and toxic to livestock. Testing your forages is a good practice to implement into your yearly plans, but especially during a year with an impacted forage crop. As the old saying goes "don't guess...test".

When submitting a forage sample for testing, the basic components of a forage analysis are dry matter (moisture), crude protein, an estimate of the energy content of the feedstuff (Total Digestible Nutrients (TDN), Net Energy for Maintenance (NEm), Net Energy for gain (NEg), and the macro minerals, Calcium and Phosphorous. These are the most basic analytical procedures that are required to evaluate forages and balance rations. However, there are some additional analyses that can offer insight into the quality of the forage or improve our ability to predict animal performance. I recommend that the report include acid detergent fiber (ADF) and neutral detergent fiber (NDF).

The amount of NDF in forage reflects the amount of cell wall contents (hemicellulose, cellulose, and lignin) within the sample. The NDF fraction is often associated with the respective bulkiness of forage and is correlated with dry matter intake of the forage or feedstuff. Therefore, the amount of NDF may be used to estimate the expected dry matter intake associated with the forage. The ADF number represents the amount of cellulose and lignin within the forage and is correlated with the respective digestibility. In general, a higher ADF value is associated with forage that has a greater proportion of cellulose and lignin and would likely be more mature. Additionally, the ADF fraction is used to calculate the energy estimates TDN, NEm, and NEg that appear on the report. As forages mature, ADF increases and energy content decreases.

If the hay was put up under less-than-ideal harvest conditions or contains a large proportion of weeds, mold is a concern. A generic mold count may be requested at most labs. This analysis does not identify specific types of mold but simply tells us the concentration of mold within a forage sample. In addition, if the forage is a known nitrate accumulator (forage sorghums, crop residues, cereal hay), contains weeds that accumulate nitrates (kochia, lambsquarters, sunflower, pigweed, Johnsongrass) or was stressed (i.e. drought, hail damage) prior to harvesting, a nitrate analysis is recommended. Nitrates and mold can be managed by blending forages to dilute out the mold or nitrates. However, the concentrations must be known to accurately dilute the mold and nitrates to safe concentrations.

Most analytical laboratories have several different analysis packages available. These packages typically include the basic analytical procedures outlined above (DM, CP, TDN) and then add on

specific analyses such as NDF, or the Macrominerals (Ca, P, Mg, K, Na, Cl, S). Mold counts or nitrate analyses are usually offered as separate analytical procedures and must be requested separately for additional fees. In addition, some labs may not offer all services in-house and may send samples to other laboratories for analysis, which can require additional time.

Thanks to Justin Waggoner for sharing information related to forage analysis and for further information regarding forage sampling or if you need assistance submitting samples, contact me at any Post Rock Extension District Offices in Beloit, Lincoln, Mankato, Osborne, or Smith Center.

Post Rock Extension District of K-State Research and Extension serves Jewell, Lincoln, Mitchell, Osborne, and Smith counties. Blaire may be contacted at blairet@ksu.edu or by calling Beloit 738-3597, Smith Center 282-6823, Lincoln 524-4432, Mankato 378-3174, or Osborne 346-2521. Join us on Facebook at “Post Rock Extension” along with our website www.postrock.k-state.edu.