Equine Forage Quality Guidelines

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Most universities and equine nutritionists encourage horse owners to have their hay or pasture analyzed, especially if the quality of hay is a concern or the horse is having nutritional problems. However, most horse owners need help interpreting the results of their analysis. Below is a list of some common components analyzed in hay and a basic interpretation of each. Keep in mind that additional components can be analyzed for by request and/or for an additional cost. When your sample is returned, there will be two columns of numbers: "as sampled" and "dry matter." As sampled reports nutrients in their natural state; this includes moisture. Dry matter reports nutrients with the water (moisture) removed. Results reported as dry matter allow for the direct comparison of nutrients across different feeds and often simplifies the ration-balancing process. Either can be used for ration balancing, but it's very important to be consistent and use one or the other.

• Moisture: The optimum horse hay moisture ranges from 10 to 15 percent. Hay under 10 percent may be too dry, leading to brittle and dusty hay. Hays over 17 percent moisture have a high probability of molding (unless propionic acid is used), and hays over 25 percent moisture pose the threat of severe heat damage and serve as a potential fire hazard.

• Dry matter (DM): Amount of the sample left after the water (moisture) is removed.

• Crude protein (CP): A measure of the protein concentration in the hay. CP can range from 6 to 14 percent in grass hays (depending on nitrogen fertilization), 14 to 17 percent in mixed hays and 15 to more than 20 percent in legume hays. Hay containing approximately 10 percent CP meets the CP requirements of most horses, lactating mares and foals being the exception.

• Acid detergent fiber (ADF): ADF primarily represents cellulose and lignin, the highly indigestible fractions of plant material. The lower the ADF value, the more digestible the nutrients in the hay are. Hays with ADF values of 30 to 35 percent are readily digested, while those above 45 percent are appropriate for feeding horses with lower energy needs.

• Neutral detergent fiber (NDF): NDF is a measurement of the insoluble fiber. The higher the NDF, the less a horse will consume. NDF levels between 40 and 50 percent are good, while those above 65 percent will likely not be readily consumed by most horses but can be used as "busy hays" to pacify obese horses on restricted feed.

• Relative feed value (RFV) or relative forage quality (RFQ): RFV and RFQ are commonly used when selecting quality dairy hay but are not used in balancing equine rations. Generally speaking, higher RFV and RFQ reflect higher quality, greater intake and digestibility.

• Fat (sometimes referred to as crude fat): This is a measure of fat content. Fat is an energy-dense nutrient and contains about 2.25 times the energy found in carbohydrates. Forages are typically low in fat.

•Digestible energy (DE): This is a measure of the digestible energy in the hay and is used to balance the energy portion of the equine diet.

•Total digestible nutrients (TDN): This is a measure of the total digestible nutrients in the hay or its energy value (may be used in place of DE, or offered in addition to DE), which may range from 40 to 55 percent.

• Calcium (Ca) and phosphorus (P): These two macrominerals are required in the diet by all horses in specific amounts. The levels of these minerals can vary among different types of hay; for example, legume hays have high calcium levels relative to phosphorus.

• Potassium (K): This is an electrolyte. Legume forages are higher in potassium than grasses. Since hay is generally high in potassium, and usually constitutes a significant portion of the equine diet, potassium requirements are usually met with hay alone.

As mentioned above, there are additional tests that may be desired and available at an additional charge. Next weeks article will focus on proper sampling techniques.