Equine Forage Research Updates

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At the 2013 Equine Science Society Meeting, several equine-forage related research papers were presented. Three of these presentations focused on the use of Teff in horse pastures, the accumulation of nonstructural carbohydrates (NSC) during the day and evening hours, and the use of hay nets.

Using Teff in Horse Pastures

The warm season annual grass Teff is native to Ethiopia and recognized for drought tolerance, low nitrogen (N) requirement, and productivity in marginal soils. To determine the value of this grass as a horse pasture, Teff was planted in a pasture in Virginia. Horses began grazing 54 days after the initial planting. During the grazing of each group, forage samples were randomly harvested throughout the pasture at a height of 4". During grazing, horses were approached and samples of the long forage were grabbed as the horses began to chew the forage bites. "Stolen" samples were collected from each horse as they grazed for approximately 10 minutes. All samples were analyzed for dry matter (DM), crude protein (CP), neutral detergent fiber (NDF), and acid detergent fiber (ADF). Although Teff was a novel grass (i.e., the horses had never grazed the grass) to the horses in this study, they grazed the Teff within 5 minutes of entering the paddock. Nutritional data indicated CP averaged 9% for clipped samples, while the stolen forage samples had higher levels of CP, averaging around 12%. NDF averaged 64% and was not different between clipped and stolen samples.

Accumulation of NSC

Non-structural carbohydrates (NSC) are often associated with increased risk of laminitis and insulin resistance in horses. NSC are highly fermentable carbohydrates and excessive consumption can lead to negative consequences such as accelerated hindgut pH which has been implicated in pasture associated laminitis. Concentrations of NSC can fluctuate throughout the growing season, in response to stress (i.e., drought), and throughout each day (usually increasing during daylight hours and falling at night). The goal of the study, conducted at North Carolina State University, was to determine how time of day affected daily pasture NSC concentrations, fecal pH, fecal lactate concentrations, and total volatile fatty acid concentrations. Twelve mature geldings were grazed during the fall and were rotated through three treatments. The treatments consisted of: 1) 24 hours of continuous grazing; 2) 10 hours of grazing overnight beginning at 9 p.m.; and 3) 10 hours of grazing during full daylight beginning at 10 a.m. The highest NSC concentrations occurred around 9 p.m., peaking at 20%. Even though pH was lower in both of the 10-hour grazing groups, it was not low enough to be of concern for causing any detrimental health effects. This is most likely due to the fact that pasture NSC content likely did not reach high enough levels to induce problems. However, owners with horses prone to laminitis should try to avoid grazing them at the end of the day, when grasses peak in NSC concentrations.

Use of Hay Nets

Horses have evolved to consume several small forage-based meals throughout the day and will often graze 16 hours or more each day. However, modern horse management systems can alter this behavior by limiting the amount of time horses spend foraging. The objectives of this study, conducted at the University of Minnesota, were to investigate the effect of hay net design on the rate and amount of forage consumed by adult horses. Eight adult horses in light work were fed in individual boxstalls. Horses were fed hay off the boxstall floor (control), or from one of three hay nets: a large net with 15.2 cm openings, a medium net with 4.4 cm openings, and small net with 3.2 cm openings. During the data collection periods, horses had access to hay inside the nets for two 4-hour periods each day. Throughout the trial, grass hay was fed at 1% bodyweight twice each day. To determine the forage consumption rate, stopwatches were started once horses began eating and stopped once horses either finished all of the hay offered, were no longer interested in eating the hay, or the 4-hour time period had expired. All refused hay was collected and weighed. Mean consumption rates were 1.49 kg/h for the control, 1.33 kg/h for the large net, 1.11 kg/h for the medium net, and 0.88 kg/h for the small net, with all of the treatments being different from one another. The study results demonstrate the medium and small nets were effective in decreasing the rate of forage consumed by adult horses.