BEEF CATTLE RESEARCH UPDATE

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Comparison of Feeding DDGS in a Bunk or on the Ground to Grazing Cattle

Oklahoma State University research has demonstrated that dried distillers grain plus solubles (DDGS) is an excellent source of energy and protein for growing cattle.[1] DDGS generally contains about 30% crude protein, 10% fat, 90 to 100% TDN, and 0.65% phosphorus (dry matter basis, DM) making it an excellent supplement in many grazing situations. However, since DDGS is a meal, it is advisable that it be fed in a bunk. University of Nebraska researchers speculated that feeding DDGS on the ground may result in higher waste levels when compared to feeding it in a bunk, but may increase its use in practical grazing situations and increase profitability.[2] These researchers compared feeding DDGS in a bunk or on the ground to steer calves (615 lb initial weight) grazing subirrigated meadow over 72 days. The steers were fed the daily equivalent of 2 lb/head (DM basis) and the supplement was delivered three days per week. For bunk fed steers, the bunks were not moved for the duration of the study. Whereas, steers fed on the ground received supplement in a different location within the pasture at each feeding. After completion of the feeding period, soil samples were collected from three sites where DDGS was fed on the ground and three control sites from a 0 to 20 cm depth (0 to 7.9 inches).

It was reported that no significant differences were seen in soil components between DDGS and control sites ($P > 0.3$). However, it was noted that the grass was slightly greener in fed areas compared to control areas. The researchers speculated that since samples included soil from a depth of nearly 8 inches that this may have diluted the soil components compared to those present at a shallower depth. It was reported that steers fed in a bunk gained faster than steers fed on the ground (1.17 vs. 0.93 lb/day, $P < 0.001$). Using net energy equations, the difference in DDGS intake between treatments was calculated. For steers fed in a bunk, a reduction in DDGS intake between 0.79 and 0.90 lb/day would have resulted in a 0.24 lb/day reduction in daily gains which is the equivalent of 36-41% waste. Obviously, ground condition would affect the amount of waste. To determine, the feasibility of feeding on the ground, the cost of feed wastage needs be compared to the cost of providing a bunk. In this experiment, the researchers reported that profitability was greater for steers fed in bunks due to greater gains and no feed wastage.

Variation in Nutritive Quality of Grazed and Clipped Forage from Native Range

Recent University of Idaho research evaluated changes in the nutrient content of grazed and clipped forages during the growing season (April to October) over a two year period using samples from native range in in southwestern Idaho.[3] Mature, ruminally fistulated beef cows were used in this study to collect masticated diet samples every 2 to 4 weeks during the growing season. Clipped grass samples were collected concurrently with the rumen samples. These researchers attempted to clip forage similar to what the cows had been observed to be consuming.

It was reported that substantial variation existed for most feedstuff nutrient quality traits by month, year, and source (grazed vs. clipped). The researchers concluded that these results suggest that producers should be aware of changes in forage quality during the grazing season to accurately determine the timing and amount of protein, mineral supplementation, or both that they should provide. They also noted that clipped samples provided a good prediction of the nutrient quality of grazed samples. However, they also observed that cattle often select a higher quality diet for most nutrients than what clippings represent, particularly in regards to crude protein content of the forage. On average, grazed samples were 2.8 percentage points higher in protein than clipped samples (Figure 1).

Research conducted over 40 years ago also illustrated the ability of grazing animals to enhance quality of diet by selection.[4] This research conducted on grassland near Tucson, AZ used rumen-fistulated steers to study the botanical composition of the diet. This early research showed that the species composition of rumen samples was considerably different from available forage on the range. These researchers reported that the crude protein content of rumen samples was markedly greater (~3 to 4%) than the estimated protein content based on a weighted average of percent composition of the predominant plant species of the diet and the protein values for hand-clipped species (Figure 2).

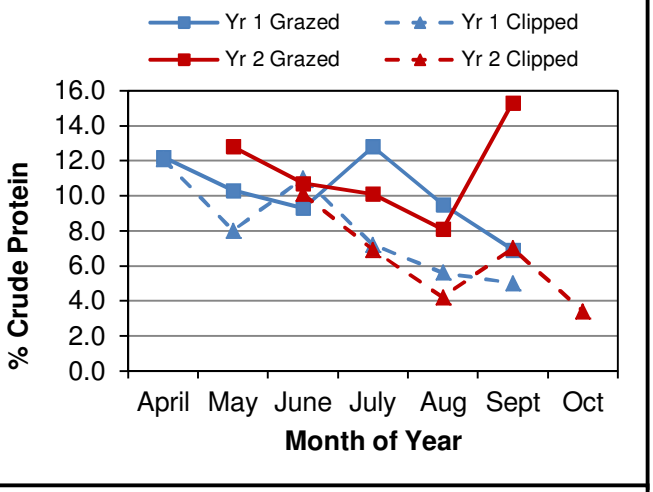

Figure 1. Changes in crude protein content between grazed and clipped grass samples during the growing season over a two-year period. Adapted from Wilson et al., 2011.

Data collected from esophageally-fistulated steers grazing big and little bluestem range in the Kansas Flint Hills in 1975 and 1976 shows the same effects of grazing selectivity on diet quality (Figure 3, 3 to 4% higher CP in esophageal vs. hand clipped samples).[5] A 2007 University of Nebraska and USDA study determined the effects of grazing selectivity on dietary quality of cattle grazing monoculture pastures of one cool-season grass, smooth bromegrass (SB), and two warm-season grasses, switchgrass (SG) and big bluestem (BB) as influenced by plant maturity.[6] Using ruminally-fistulated steers, it was reported that the crude protein content of dietary samples was higher than that in clipped samples, 3 to 4% for SG and BB, and 8% for SB.

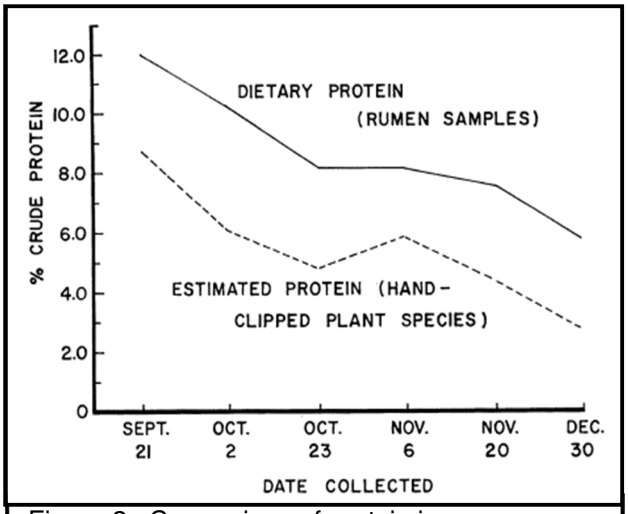

Figure 2. Comparison of protein in rumen samples from grazing steers with estimated average protein based on percent weight of plant species and protein content of hand-clipped species. Source: Galt et al., 1969

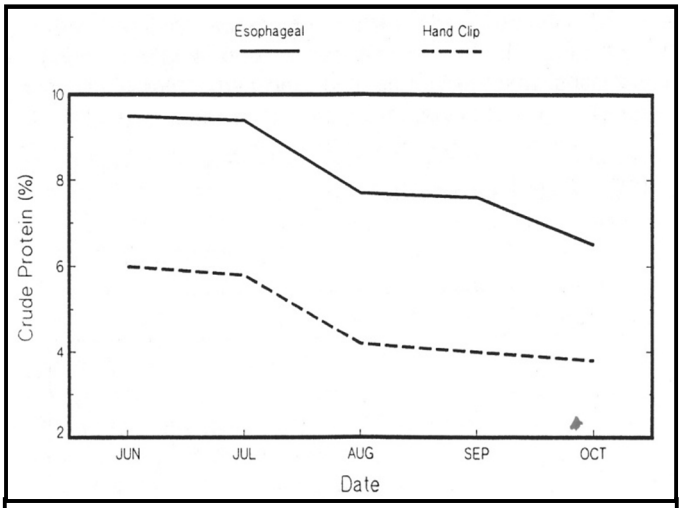

Figure 3. Crude protein content (%) of forages collected by esophageally-fistulated steers and hand clipping in the Kansas Flint Hills. Adapted from Woolfolk et al. (1975) and Allen et al. (1976). Source: Owensby, 1997

In conclusion, these studies clearly indicate that grazing cattle can select diets higher in quality than standing forage provided there is adequate forage available. This suggest that pastures could be stocked more heavily when forage quality is high and then stocking rates could be reduced when there is less opportunity for cattle to selectively graze. This grazing selectivity may also influence supplementation programs.

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