Feeding Beef Cows During the Winter

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Beef cows are fed to maintain themselves and produce one live calf per year. This concept reflects a situation far simpler than it actually is. Too simplistic an approach to feeding beef cows may lead to over- or underfeeding. Both outcomes are detrimental to profits - one results in greater-than-required expenses, the other in less production. A cow/calf operator has a small margin of error to remain profitable which is reason enough to pay careful attention to detail, including forage quality and amount to offer.

Quality and Quantity. What quality? Same as for a dairy producer? Likely not. Beef cows survive on low quality feeds when not supporting calf growth in last trimester of gestation, during lactation, or for body weight recovery due to a "harsh" summer (poorly managed pastures, excessive milk production, late calving). Quantity? Refer to Table 1 for total forage pounds a cowherd needs (needs of all beef herd classes of cattle prorated to a brood cow basis) assuming no extra feed is needed to replenish summer weight loss. Since no operation relies on a single source of forage, the table serves as a guideline to determine whether over/ under-feeding is occurring.

Table 2 lists total feed and forage use by high/low-profit cow-calf producers in Minnesota for 2003. Several items of interest can be gleaned from comparisons within Table 2 (between high- and low-profit producers) and from comparisons between Tables 2 and 1. Using Tables 1 and 2, one can determine the high-profit producers are feeding cows more on target with dry matter (DM) required. If all theoretical values apply, high-profit producers feed at less than 10% over required DM. In contrast, low-profit producers are within the 30% over-feeding bracket. This is the type of cost/feed control producers must exercise to remain profitable in the cattle business.

Similarly, one can make comparisons between forage and feed use by high- or low-profit producers. High-profit producers utilize almost 50% less grain, 14% more corn silage, 60% less alfalfa hay, 33% more grass hay, and must watch use of protein, vitamins and minerals and other feedstuffs carefully. This simple analysis reveals that high-profit producers rely on relatively low-cost feeds such as non-alfalfa hays and watch the use of expensive feeds such as protein, vitamin and mineral supplements, but most importantly watch over-feeding forages.

Feeding beef cattle in the winter. As soon as the forage is harvested, producers are encouraged to inventory, sample and analyze it to determine whether quality and quantity meet the requirements for their herd (Table 3). As a rule of thumb, cows will consume 1.8%-2.2% of their body weight in DM (DM intake of pregnant cows is ~1.8%, 2.0%, and 2.2% of their body weight for low, medium, and high quality forage, respectively). This means a 1350 lb cow will consume ~1000 lb of hay a month (~1 large round bale/cow/month).

Determining forage quality supply allows producers to decide whether they require additional nutrient supplementation (even with sufficient feed). Minimum forage quality for pregnant cows is 56% total digestible nutrients (TDN) and 8% crude protein (CP); lactating cows require at least 62% TDN and 11% CP (Table 3). Heifers with their first/second calf should be fed a diet that closely resembles a lactating diet (>60% TDN and >10% CP) as they come off grass in the fall.



Once diets have been formulated for wintering cows and heifers, body condition scoring (Figures 1-5) permits managing cows so they remain in condition to optimize nutrition while ensuring adequate reproductive performance post-calving. Optimum body condition score for reproductive performance is 5 (6 for heifers); however, producers must evaluate/manage body condition almost a full year before bulls are turned out. In late summer, body condition score should be at least 5 (Figure 3); preferably 6 (Figure 4) to ensure cows are storing body fat for winter. If cows are below a score of 5 (Figure 5), calves should be weaned and/or cows should be supplemented. Under adequate management, cows should come off grass with a condition score of 5 or 6. This allows for feeding cows the lowest quality feeds post-weaning and working up to higher quality feeds or diets once they calve in the spring. Body condition score of cows at calving should be 5 (heifers should calve at 6) and this condition should be maintained for pregnancy rates to be maximized.

Vitamin/Mineral Nutrition. Vitamins and minerals are often overlooked nutrients in winter and summer diets. Calcium and phosphorus are typically high in forages or diets fed to cows in the Upper Midwest. Magnesium may need to be supplemented when nitrogen or potassium concentration of forages is elevated due to fertilization and when high-milk-producing cows graze lush spring pastures (grass). Also, many forages are limited in copper and zinc. The concentration of selenium is highly variable and can fluctuate from limiting to excessive in various regions of the country.

Minimum trace mineral concentrations (when feeding 2 oz/cow/day) for zinc, copper and selenium in the supplement are 4000 ppm or .40% from zinc sulfate or zinc oxide, 800 ppm or .08% from copper sulfate, and 10-20 ppm or .001%-002% selenium in areas where selenium is needed. When formulating mineral supplements for Simmental, Limousin, Charolais, or Maine-Anjou cattle and their crosses, it is important to remember that their requirement for copper is 1.5 times higher than the base requirement (10 ppm). Similarly, Jersey and Brahman cattle are more susceptible to Cu toxicity. Producers and researchers are often interested in differences in performance in response to various sources of minerals (organic vs inorganic). Although still under study in various universities, organic mineral sources were observed to improve growth and reproductive performance in three studies (Colorado & Minnesota) where high levels of performance were expected. In these studies, the base forage was deficient in copper and zinc.

Table 1. Annual forage and feed needs (lbs) for a beef cow

Table 2. Forage and feed use by high-/low-profit cow-calf producers^a



^a Applicable if all forage is derived from a single source.

^b Post-storage waste (i.e., during delivery and feeding).

^c Approximate energy (corn) and protein, vitamin and mineral needs.





To determine how much forage to feed, divide nutrient requirement by nutrient concentration from forage test. Ex: late pregnant 1300 lb cow needs to consume 21.7 lb DM of a forage containing 58% TDN (12.6 lb TDN/.58 TDN) and 12% CP. This will also provide 2.6 lb CP (21.7 x .12).