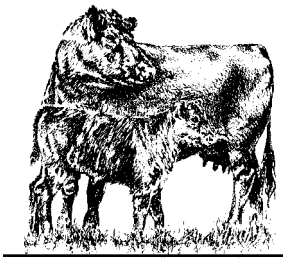

Western Beef Resource Committee *Fourth Edition*

Cattle Producer's Handbook

Nutrition Section 314

Alternative Winter Nutritional Management Strategies

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One of the main challenges to beef producers in the western U.S. is to develop a cost-effective winter-feeding program while still maintaining acceptable levels of beef cattle production. Many producers in the Pacific Northwest and Intermountain West feed between 2 and 4 tons of hay to their mature cows during the winter feeding period. It is estimated that feed and supplement costs account for 50 and 70 percent of total production costs; therefore, a producer's ability to compete with other regions is dependent in large part on the ability to reduce these costs. Producers can consider a variety of management alternatives when developing economical alternatives to feeding harvested forages.

Swath/Windrow Grazing

Costs associated with hay production vary widely according to location, yield, and cultural practices but can exceed $40/cow for producers in the western states (Short 2001). Swath or windrow grazing is the process of cutting hay and leaving it in windrows for cows to graze in the winter. Allowing cows to harvest cut forage directly can result in lower production and labor costs. Swath grazing has been shown to cost over $30/ton less than traditional haying systems due to the savings in baling and bale moving costs (Thomson 1999; Volesky et al. 2002).

Forage quality of swaths is generally similar to that of baled forage; however, a general decline in quality can be expected over the winter months. Energy or protein supplements may be warranted if grazing pregnant or lactating cows, and forage analysis is recommended.

A summary of 10 years of data from the Eastern Oregon Agricultural Research Center demonstrated that cows wintered on swaths had increased body condition and did not require supplements of additional hay compared to cows fed baled forage. Likewise, conception rates, calving interval, weaning weights, and attrition rates were equal between control and treatment groups.

The practice of swath grazing can generally be used with success in snow depths of up to 2 feet; however, producers may encounter forage loss and reduced forage accessibility in windy areas or areas with extreme weather conditions such as crusting snow or ice. In order to optimize success with windrow grazing, forage crops should be cut in the fall and windrows should be no more than 4 feet wide. Cross fencing with electric fence at right angles to the windrows will increase forage utilization and minimize waste.

To estimate swath utilization, assume a cow will consume 2 to 2.5 percent of its body weight. Thus, a 1,200-pound cow will consume about 24 dry matter pounds of swath feed per day. If fences are moved to limit cattle to one day's feed, wastage could be lower than 5 percent (Surber et al. 2001).

Winter Grazing

Another alternative to traditional winter-feeding may be the winter grazing of "stockpiled" forage. To effectively use this alternative, the producer must defer grazing of irrigated pasture and native range to the fall or winter months. The range forage base will be dormant and, as a result, will likely need some level of supplementation depending on quality of selected diets, body condition status of mature cows, and stage of gestation (Brandyberry et al. 1994). Quality of standing forage may decline faster than forage stored in bales or windrows (Streeter et al. 1966). Controlling grazing with an inexpensive electric fence that allows access to a 3- or 4-day supply of forage at a time can increase forage utilization and reduce waste by up to 40 percent (Boyles et al. 1998).

Like swath grazing, winter grazing may decrease winter feed costs by $20 to $30 per cow during mild to average years. To effectively use winter grazing as part of a management program, the producer should have relatively easy access to grazing animals to accommodate supplementation programs. In addition, it

is a good idea to have water available throughout the grazing period, although Canadian researchers have shown that cows can effectively consume snow as a water source.

Indirect benefits of winter grazing relate to the increased management opportunities of traditional hay meadows for spring and early summer grazing. In addition, fall and winter grazing is an alternative use of native rangelands that may provide these significant advantages:

1. Grazing dormant forage minimizes damage to native plants from defoliation as compared to traditional spring and summer grazing.
2. Research has shown that non-lactating, gestating cows are better distributed over the grazing area, resulting in more uniform use of the grazed area.

Crop Residue

Crop aftermath can be used in several ways as part of a winter-feeding program. Residue may be grazed, baled, or chopped. Grazing reduces additional harvesting expenses, and also allows animals to select a higher-quality diet. Lack of water supplies and fencing are considerations when grazing crop residue.

Corn stalks are a viable winter feed source in corn-producing areas in the Northwest. In general, it is estimated that one acre of cornstalks can support a 1,000-pound cow or animal equivalent for 1.5 to 2 months. Whole-field grazing is the most common strategy; however, strip grazing may provide a more uniform nutrient intake and also increase utilization.

Producers should supply phosphorus and vitamin A to cattle consuming corn stalks, and protein supplements may or may not be necessary depending on the amount of grain remaining in the residue. In some regions, it may be advisable to have an emergency feed source on hand due to the possibility of snow cover limiting grazing.

Straw, a common crop aftermath in the western U.S., can be a good alternative in wintering rations for beef cows if properly supplemented with energy, protein, minerals, and vitamins. In general, oat straw has the highest feeding value, followed by barley straw and wheat straw. Beef cows can efficiently use rations containing up to 50 percent straw when combined with high quality forage.

North Dakota researchers reported similar performance and feed costs between heifers fed alfalfa hay- and corn silage-based diets compared to diets based on wheat straw and wheat middlings (Anderson 1998). It is essential to provide a properly balanced ration when feeding straw in order to avoid problems such as stomach impaction, grass tetany, lowered conception rates, and malnutrition.

In addition to corn and straw, other types of residue that can be used include barley, field peas, sorghum, soybeans, and sunflowers. These vary in nutrient content and may require additional supplementation.

Substituting Grain for Hay

Hay often costs 50 to 100 percent more than grain per unit of energy. If forage supplies are limited due to price and/or availability, grain can be substituted for hay as an economical alternative energy source. The purpose of this feeding program is to reduce feed costs as much as possible; therefore, only a minimum amount of hay is provided. The minimum amount of roughage that should be fed is 0.5 percent of body weight (6 pounds roughage for a 1,200-pound cow) in order to maintain proper digestive function. Straw or other low quality roughage may be used rather than providing additional hay.

The amount of grain necessary will depend on weight and body condition of cows. In general, 1 pound of grain or other concentrate is equal in energy to 2 pounds of hay. It is important to realize the difference between substitution and supplementation. Energy supplements containing high levels of starch are rapidly fermented in the rumen, resulting in a lower rumen pH. This has negative effects on fibrolytic or fiber-digesting microbes in the rumen, and may decrease forage intake and digestibility if concentrates are fed at levels greater than about 0.5 percent of body weight. If the primary goal is to make up for energy deficiencies in forage, grain may not be the most efficient option. In this management approach, diets should be grain-based with hay used as a supplement. Protein and mineral supplements should be provided.

There are also several management considerations in limit-feeding grain that need to be carefully examined. High-concentrate diets require increased levels of management to ensure consistent feed consumption and avoid digestive disturbances such as acidosis and bloat. In order to prevent wastage, cattle should be fed in bunks, with at least 24 to 30 inches of bunk space per head. It may be a good idea to sort the herd into smaller groups based on nutritional requirements to minimize competition due to social interactions. In addition, producers must have access to adequate facilities to control hungry cattle.

Researchers at the Ohio State University have examined the efficacy of limit-feeding grain-based diets as an alternative to hay for gestating beef cows (Loerch 1996; Schoonmaker et al. 2003). Results indicated that a limit-fed corn-based diet had no detrimental effects on cow performance, conception rates, or calf weaning weights compared to cows fed ad-libitum hay or stockpiled orchardgrass. In addition, cost of feeding hay was nearly double that of limit-feeding a corn-based diet. With appropriate management strategies in place, the practice of limit-feeding grain could serve as an economically viable way for producers to meet animal performance goals.

Feeding By-products

By-product feeds offer significant potential to help producers increase animal performance and reduce feed costs. The by-products of food and fiber are commonly referred to as "co-products" because they have significant value as a feed while lowering the cost of feed input. Due to increased grain processing and expansion of the ethanol industry, co-products are readily available to livestock producers in many areas. Many of these feeds are quite palatable and relatively easy to mix into rations. These include grain co-products (e.g., corn screenings, wheat midds, corn gluten feed); oilseeds and oilseed co-products (e.g., canola, safflower meal, soybean hulls); and ethanol co-products (e.g., wet and dry distillers grains, condensed distillers solubles).

Co-products have a variety of uses in beef cow diets. High fiber co-products such as beet pulp and soyhulls can be used to replace forage at 20 to 30 percent of forage dry matter in the diet. Many oilseed co-products such as canola and safflower meal are good sources of escape or bypass protein. Ethanol co-products can be fed at 10 to 15 percent of diet dry matter in backgrounding and finishing diets as a protein source, or fed at higher levels as an energy source. These products may also be used in forage-based diets for beef cows as a source of supplemental protein and energy. Amount of co-product to be fed depends on economics, desired performance levels, nutrient analysis of the forage, and individual feeding restrictions of each product.

Producers should consider many factors when feeding by-products, including availability, shipping and storage costs, and seasonal price variation. There can be significant variation in nutrient content of by-product feeds due to different processing procedures; therefore, it is important to formulate rations based on a guaranteed laboratory analysis of each lot of feed. Unfamiliar feeds should be used with caution and introduced into rations gradually.

When using liquids or wet products such as wet distillers grains, spoilage can occur rapidly and additional feed handling equipment may be needed. Additional labor and equipment costs for by-products may offset any cost savings resulting from the use of by-products.

Grass Seed Residues

Another alternative to traditional winter management is the use of grass seed residues produced as a by-product of the grass seed industry. Only about 50 percent of these residues appear to be a viable livestock feed resource due to quality factors and problems with endophyte fungus; however, there are several benefits to using these feeds as part of a winter feeding program. First, many of the grass species are perennial forages (Kentucky bluegrass, tall fescue, perennial ryegrass, etc.) and have higher feeding value than annual cereal grain straws. In addition, grass seed residues are an economical feed source. In a 1997-98 Oregon study, grass seed straw was delivered about 300 miles from the source for approximately $40 to $50 per ton (total cost; straw plus shipping).

Grass seed residues are relatively weed free, and germination of perennial seeds from grass residues may be beneficial to winter-feeding sites. Also, feeding residues represents an increase in nutrients added to the site and may result in decreased fertilizer needs and improved organic matter of soil.

In most cases, grass seed residues should not be considered a complete feed for wintering mature beef cows. Instead, grass seed straws should be analyzed for nutrient content and supplements should be formulated to maximize the use of low-quality roughage. The nutrient needs of mature, non-lactating beef cows can often be met by supplementing grass seed residues with alfalfa hay (Chamberlain and DelCurto 1991; Turner et al. 1995).

Conclusions

Many potential tools or management strategies could help reduce winter feed costs. Obviously, whatever strategy is chosen should emphasize minimizing costs while meeting animal performance goals. It is not always economical to feed cattle to meet all of their nutritional requirements throughout the year. The most critical times to ensure that requirements are met are during the last one-third of pregnancy and the first 60 days of lactation. Failing to do so may cause decreased conception rates, increased postpartum intervals, increased calf death loss, and reduced calf weaning weights. Regardless of whether producers choose to adopt an alternative winter-feeding strategy or continue to use traditional methods, it is imperative to design a system that ensures health and productivity of livestock while returning a profit.

Cost is not the only factor that influences nutritional programs. When determining an alternative strategy to traditional winter-feeding programs, producers should consider forage quality and quantity, labor and equipment requirements, kind and class of livestock, and risks associated with each strategy. Many supplementation and substitution strategies are dynamic and can be adapted to fit a particular environment or production situation. Producers must take the time to evaluate their options and determine what will best fit their individual operations and management style. For further assistance and information, contact your local county extension agent or nutritionist.

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