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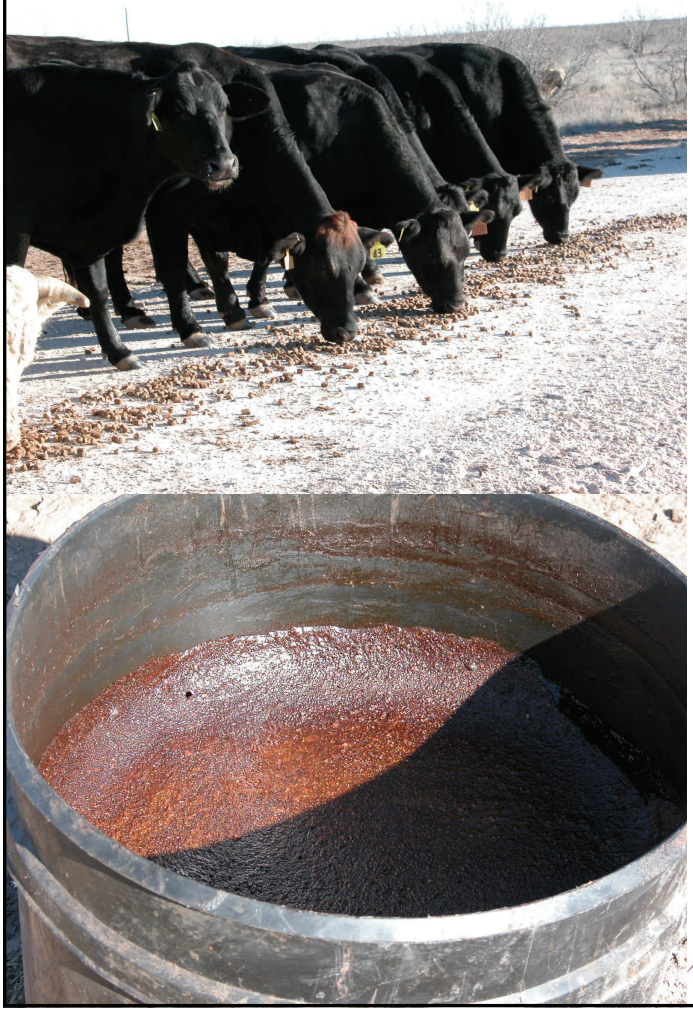
The *success or failure* of any range beef cow supplementation program depends primarily upon the quantity and quality of forage being supplemented.

MANAGING BEEF COW SUPPLEMENTATION COSTS



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Review the list of all production expenses for commercial cow/calf operations and you'll find supplementation expense among the top five; feed costs often occupy the #1 position on the out-of-pocket (variable cost) expense list. Large expense categories often receive the initial attention when it comes time to tighten the belt. Following is a ***prioritized*** **list** of suggestions to consider when developing a supplementation program for the cow herd.

1. An appropriate stocking rate is essential if efficiency and economy are expected of the supplementation program.

The purpose of supplementing grazing cattle is to correct a nutrient deficiency of the diet. The quantity and quality of available forage have as much or more to do with the success or failure of a feeding program as the characteristics of the supplement.

Cattlemen must also be good stewards of the natural resources entrusted to them. Long-term heavy stocking rates weaken the forage resource, subject the soil to erosion, reduce the efficiency of rainfall capture and use, and reduce the quality of water harvested from range and pasture watersheds.

2. Nutrient requirements of the cow must be matched with productivity of the environment.

Genotype x environment interaction is a critical management consideration with significant impact on the success of a supplementation program. Results of a Nebraska study indicate that, under liberal feed conditions and/or in the presence of a stress-free environment, larger mature size, heavier milking cows are more efficient that moderate size cows. However, when feed supply is restricted and/or environmental stress is present, moderate-size and moderate-milking cows are more efficient producers. Cows with smaller nutrient demands have a greater chance of achieving their biological production potential in any given environment.

3. For the commercial cow/calf producer, the production period with the greatest nutrient demand (calving, lactation) and the period of greatest expected nutrient availability should coincide.

Forage maturity and quality are inversely related, while maturity and quantity are typically directly related. Native range forages traditionally exhibit their highest quality during the spring and early summer; hence one of the reasons a large portion of the cows in the Southwest calve during that time of year. Management decisions which ignore this nutrient supply: demand relationship may result in supplementation programs with reduced efficiency and increased costs. Production and/or marketing objectives for summer, fall, or early winter calving programs may compensate for this loss of efficiency.

4. Sort cows by physiological condition to improve supplementation efficiency and reduce costs.

The first 60-80 days post-calving is the period of greatest nutrient demand experienced by a cow during the production year. During this period, cows are trying to recover from calving, reach and maintain peak lactation, cycle and rebreed and thereby deserve more attention. Heifers with their first calf at side and going through this process demand special consideration if high conception rates for the second calf are a priority. Body condition adjustments are most efficiently made during the second and third trimesters of pregnancy.

Under today's production parameters (high feed costs, high fuel and overhead costs), open cows are a significant leech on the profitability of a cow/calf enterprise (see Table 1). Therefore, if possible, sort cows by age and expected calving date. Implementation of a 90-110 day breeding season greatly facilitates this sorting process.

5. Initiation and termination of the supplementation program are critical decisions.

A frequently asked question is "When should I start feeding?" The theoretical answer is as soon as the cows begin to experience a nutrient deficiency. Maintaining body weight is tough enough - attempting to replace lost weight/ condition and subsequently improve condition is economically inefficient. In reality, if cows are in "better than necessary" condition, some weight loss is tolerable and will result in feed savings. Tardy initiation and/or an unwarranted continuation of supplementation result in increased costs.

Computer modeling technology developed by Texas A&M offers cattlemen an opportunity to estimate the nutritional status of grazing cattle. The program, called NUTBAL (Nutritional Balance Analyzer), involves fecal analysis to predict nutrient intake and comparison of this intake with calculated requirements to yield an estimate of the nutrient balance of the grazing animal.

6. Nutrient content of the supplement has a significant impact on the response observed.

Protein is often the first-limiting nutrient for cattle grazing dormant forages or consuming poor quality hay. When compared to energy, protein is commonly the more expensive component. Feed purchasing decisions should be based on a $ per pound of nutrient (usually protein) basis, not simply on a $/cwt or ton basis. Comparing two feeds of differing nutrient content strictly on price per unit weight is like comparing apples and oranges.

High protein supplements (those >30% crude protein), fed at 0.1-0.3% of body weight per day, stimulate forage intake - research results indicate the intake improvement can be as large as 60%. Increases in forage intake provide a large boost in energy and demonstrate why correcting a protein deficiency is usually the first priority in supplementation programs.

Generally, crude protein content and cost *per unit of protein* are inversely related. Comparing extremes on a cost per unit of protein basis, the difference between whole shelled corn (10% CP, $180/ton) and cottonseed meal (44% CP, $300/ton) can be as large as 260% (the $/lb CP for corn can be as much

as 2.6 times higher than for cottonseed meal).

In contrast, starchy, high-energy supplements (i.e. cereal grains) tend to reduce forage intake and digestibility, a phenomenon referred to as negative associative effect - the net effect can be a reduction in performance. Energy supplements (10-18% crude protein), when fed at 0.7-1.0% of body weight daily, can be used to extend a limited forage or hay supply without reducing performance.

In between the high protein and energy supplements are the "general purpose" feeds, of which the 20% crude protein formulation is perhaps the most popular. Supplements of this type are an excellent choice when attempting to maintain forage intake and improve performance (body condition). Recommended feeding rates are 0.3-0.5% of body weight per day.

7. Purchasing and provision decisions also offer opportunities for reducing supplementation costs.

By-Products - Distillers grains are a significant by-product of the ethanol industry. The high moisture content of distillers grains makes long distance transportation economically unfeasible. However, as more ethanol plants come on line across the country, distiller grains will warrant consideration by an ever-increasing number of cattlemen.

By-products (ex. Distillers grains, corn gluten, soybean hulls, wheat mids, etc.) are often overlooked by cattlemen for several reasons: sourcing, purchasing and payment challenges, necessity of using troughs or bunks, handling equipment and storage requirements, etc. *If high corn and protein prices persist, producers may need to take a closer look at by-products*. Many ranches have the equipment (tractor with front-end loader) to handle bulk commodities. If the cost of storage and feeding equipment is amortized over its useful life, the use of by-products as supplements for beef cattle becomes much more appealing.

Forward contracting - Traditionally, feed prices are the lowest in mid to late summer and highest in the winter. Contracting feed in late summer for use the following winter can result in substantial savings. Forward contracts are typically confined to larger volumes of feed and may not be applicable for smaller operations. In addition, cash flow restrictions may prohibit some cattlemen from forward contracting.

Bulk feed - Handling feed in bulk reduces labor inputs and generally results in a $5-20 per ton reduction compared to sacked prices. Again, bulk handling may not be applicable to smaller operations and does require some up-front investment in storage and feeding equipment.

Reduce feeding frequency - Research results from several universities indicate little or no difference in performance of cows supplemented 2 or 3 times per week compared to those fed daily. Recent studies would indicate that feeding once a week yields results comparable to those fed more frequently. Reduced feeding frequency saves labor, fuel and equipment wear.

High protein supplements (>30% CP) perform well when offered infrequently. However, high-energy supplements (10-18% CP) perform best when offered frequently and in small amounts. Infrequent feeding of large amounts of grain/high energy feeds can cause serious illness.

Reproductive performance (% calf crop weaned) is the key to survival during tough times. The profit margin (if any) per cow is small; therefore it takes the production of several cows to pay the expenses associated with non-productive cows. Cows can generate income in one of two ways: wean a marketable calf or go to market as a cull cow.

As previously mentioned, large expense categories often draw the most attention when it comes time to tighten the belt. However, those expenses that directly influence productivity must be evaluated with care. Sustainable grazing management systems, cost effective supplementation programs and an effective preventative herd health plan are fundamental requirements for achieving performance goals.

Calculating $/lb of crude protein:

1. % crude protein x volume of feed (cwt, ton) = lb crude protein
2. feed cost ($/volume of feed) / lb crude protein = $/lb crude protein

Example - A 20% CP feed costing $200/ton. What is the $/lb CP?

1. 20% x 2000 lb = 400 lb crude protein
2. $200 / 400 lb = $0.50/lb crude protein

Table 2 compares eight different supplements over a range of costs from $175 to $900 per ton.

To convert cost per 50 pound bag to dollars per ton, multiply by 40.

To convert dollars per hundredweight to dollars per ton, multiply by 20.

Table 1.
Relationship Between % Calf Crop Weaned and Breakeven Value at Weaning

	Productions Cost, $/cow/year*					
% Calves Weaned	150	200	250	300	350	400
	calf breakeven price, $/lb *					
100	.30	.40	.50	.60	.70	.80
95	.32	.42	.53	.63	.74	.84
90	.33	.44	.56	.67	.78	.89
85	.35	.47	.59	.71	.82	.94
80	.38	.50	.63	.75	.88	1.00
75	.40	.53	.67	.80	.93	1.07
70	.43	.57	.71	.86	1.00	1.14
65	.46	.62	.77	.92	1.08	1.23
60	.50	.67	.83	1.00	1.17	1.33

Calf Weaning Weight, lb …… 500

***Calculated as # calves weaned/# cows exposed to a bull**

****Market price required to cover production costs only**

Table 2.	**Calculating Cost per Pound of Crude Protein**						
	% crude protein in supplement						
$/ton	15%	20%	25%	30%	35%	40%	45%
	$ per pound of crude protein						
175	.58	.44	.35	.29	.25	.22	.19
200	.67	.50	.40	.33	.29	.25	.22
250	.83	.63	.50	.42	.36	.31	.28
300	1.00	.75	.60	.50	.43	.38	.33
350	1.17	.88	.70	.58	.50	.44	.39
400	1.33	1.00	.80	.67	.57	.50	.44
450	1.50	1.13	.90	.75	.64	.56	.50
500	1.67	1.25	1.00	.83	.71	.63	.56
700	2.33	1.75	1.40	1.17	1.00	.88	.78
900	3.00	2.25	1.80	1.50	1.29	1.13	1.00