

# THE POWER of PROTEIN

*Evidence suggests strategic protein supplementation of cows pays off in heavier weaning and carcass weights.*

Story by  
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After putting a pencil to it, cow-calf producers are seldom surprised to find that feeding cows is their biggest expense. However, some are surprised to learn that cow feed can account for up to 75% of their total annual production costs.

That revelation has provided strong incentive for cost-conscious cowmen to rein in feed expenditures by utilizing low-quality, low-cost forages. During recent years, producers in drought-stricken areas sometimes have had little choice. Low-quality harvested forages may have been all that were available or affordable.

But whether harvested forages or extended grazing of range, pasture or crop residues are used in winter feeding programs, managers of spring-calving cow herds are wise to consider protein supplementation. Protein is the most limited nutrient in low-quality forages, and strategic supplementation can have significant effects on economic returns to the operation.

### **From protein to profit**

University of Nebraska beef nutritionist Don Adams says meeting the cow's protein requirement can do more than help her weather the winter. Providing supplemental protein, particularly during the last three months of pregnancy, can make her calf worth more money at weaning and when it goes to harvest.

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— *Don Adams*

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Adams often reminds producers that early weaning is one of the best tools for managing cow body condition. Weaning spring-born calves in August or early September stops lactation and allows cows to



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(PHOTOS BY SHAUNA ROSE HERMEL)

build body condition before entering the winter. By September, however, for every two weeks that weaning is delayed, cows grazing fall range or pasture may lose one-tenth of a body condition score (BCS).

Particularly on the northern Great Plains, adequate body condition at the beginning of winter is important, Adams stresses. Cows may be unable to gain body condition on diets consisting of low-quality forages, with or without supplementation.

“Cows whose calves are weaned late probably need more supplement just to maintain body condition,” Adams adds. “When calves are weaned early, cows may be able to get by with less supplementation, or producers may be able to delay the start of supplementation.”

Problems begin when cows are unable to derive enough nutrients from low-quality forage because nutrient density of the forage is low, or animal requirements are high — or both. Nutrient requirements increase as cow pregnancy advances. During the last trimester, protein and energy requirements are about 20% and 14% greater, respectively, than during the previous three months.

Because of its lower digestibility, low-quality forage passes through the cow's digestive tract at a slower rate. A slower passage rate results in increased fill — a greater volume of undigested forage in the rumen — which can restrict consumption. A cow's stomach can hold only so much. When her forage contains only 5% or 6% crude protein (CP),

the cow may be unable to consume enough forage to meet her protein requirement.

### **Improving calf production**

Most producers would want to make sure their cows come through the winter in fine fettle nutritionally to enhance chances for delivering a strong, healthy calf; to reach optimum milking ability; and to rebreed timely. But, Adams' research suggests that making sure cow protein requirements are met during late pregnancy also achieves a sort of “fetal programming” for calf performance.

The research was part of a two-year study conducted at the University of Nebraska Gudmundsen Sandhills Laboratory. Mature cows wintered on dormant range were divided into two groups during their last trimester of gestation. One group received the equivalent of 1 pound (lb.) per head per day of supplemental protein (32% CP). They were fed the supplement three times each week, from December through February, while the other group received no supplement.

Adams says the cows receiving protein supplement showed increased body condition at precalving and prebreeding, but their subsequent pregnancy rates did not differ significantly from cows not receiving additional protein. Supplementation did not appear to influence calf weight or vigor at birth, nor did it appear to affect antibody levels of colostrum.

However, calves born to cows receiving supplemental protein during the last trimester of gestation posted heavier weaning weights. On average, they were 14 lb. heavier.

Furthermore, after all calves were weaned, sent to a feedlot and fed to a common target end point, the calves born to cows receiving supplemental protein had heavier carcass weights — almost 22 lb. heavier. No significant differences were observed for average daily gain (ADG), dry-matter intake (DMI), feed efficiency or carcass quality.

“It is possible that the increased weaning and carcass weights resulted from permanently changing the endocrine system of the calf during gestation. The fetus is sensitive to the

nutritional status of the mother and adjusts its development accordingly. Further research is addressing this issue," Adams explains.

Economic analysis compared costs for cows receiving protein supplement vs. those receiving none, as well as the value of calves at weaning and carcass value of finished calves. It showed that the cost of feeding supplemental protein was profitable, regardless of calf-marketing end point. Returns were \$4.66 per head greater for weaned calves. More dramatic was the increase in profit when calves were taken through the feedlot. Returns of \$22.83 per head resulted from increased carcass weight among steers born to cows that were supplemented during late gestation.

"The profit difference between end points shows that the majority of return on the investment in supplemental protein occurs in the feedlot," Adams states. "Feeding supplemental protein during the last trimester of gestation to cows grazing dormant rangeland may be an economical method of increasing calf weight. The advantage is maximized when a carcass end point is used."



**A Nebraska study revealed the cost of feeding supplemental protein was profitable, regardless of calf-marketing end point, posting increased returns of \$4.66 per head for weaned calves and \$22.83 per head for calves retained through the feedlot.**