

EARLY POSTPARTUM PROTEIN SUPPLEMENTATION FOR FALL-CALVING BEEF COWS

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Story in Brief

Thirty-eight Angus-Hereford fall-calving cows were fed cottonseed meal (2.14 lb/day) or no supplement (control) to determine the effects of early postpartum (44 days) protein supplementation on changes in body weight, body condition, milk production and calf growth. Supplemented cows lost less body weight (55.7 lb) and body condition (.29 units) than control cows by the end of the 44-day study. Calves suckling supplemented cows gained 14.6 lb more weight (.33 lb/day) than calves suckling control cows. By the end of the trial, supplemented cows produced 4.9 lb of additional milk per day compared to the control cows. This study indicates that a low level of protein supplementation in early lactation can efficiently improve the performance of fall-calving cows and their calves.

(Key Words: Protein Supplement, Beef Cattle, Postpartum.)

Introduction

The crude protein (CP) content of tallgrass native pasture declines rapidly in the fall (< 4% by November 1). Gestating cows (1100 lb) require 7.8% CP while lactating cows require 9.4% CP in their diet. Thus, fall-calving cows (either pre- or postpartum) would be expected to be deficient in crude protein.

Many fall-calving cows are not supplemented until approximately December 1 when cow weight and body condition begin to decline rapidly. Weight and body condition score losses in early lactation could result in decreased milk production and calf growth in addition to decreased reproductive performance. Low levels of protein supplementation fed in early lactation should increase the digestibility and intake of consumed forage resulting in increased total energy intake. Improved cow performance should result in increased milk production and thus calf weight gain although the magnitude of this effect is not known. This study was designed to evaluate the effects of feeding a low level of protein supplement in early postpartum on cow performance, milk production and calf growth rate.

Materials and Methods

Thirty-eight Angus-Hereford cows calved from September 27 to October 20, 1985 and were maintained on native grass pastures at the Southwest Livestock and Forage Research Laboratory, El Reno, Ok. Cows were divided into two groups, pairing them as they calved. One group received 2.14 lb of cottonseed meal per day while the other group remained as the control (unsupplemented). Both groups had free access

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to a mineral mix containing 50% dicalcium phosphate and 50% trace mineralized salt. Postpartum cow weight and body condition (1=emaciated, 9=obese) were taken 2 to 5 days following parturition and calf weights recorded within 24 hours after birth. Cows were weighed and condition scored on an average of 16, 30 and 44 days postpartum following an 18-hour shrink. Calves were weighed on the same days with a 3-hour shrink. Milk production was measured by the weigh-suckle-weigh method on an average of 30 and 44 days postpartum. Calves were held off the cows for 8 hours and suckled twice at 6 hour intervals. The sum of milk produced in the two sucklings was doubled to estimate 24-hour milk production. Pastures were rotated following each weigh period. Data were subjected to least squares analysis for birthdate (covariate), birthweight (covariate), treatment and calf sex effects. Differences between treatments were detected by F-test.

Results and Discussion

Lactating cows receiving 2.14 lb of cottonseed meal lost 55.7 lb less body weight ($P<.0001$) and .29 units less body condition ($P<.07$) than unsupplemented cows by day 45 postpartum (table 1). Increased protein requirements in the early postpartum cow are attributable to protein needs for repair of reproductive organs plus milk synthesis. Supplemental protein increases ruminal ammonia concentrations resulting in increased fiber digestion and protein synthesis by ruminal microbes. Improved energy and protein status of the cow should result. Body weight loss appeared large in contrast to the change in body condition observed in this study. Loss of body fluid in early parturition coupled with lactational demands could account for this loss.

Calves suckling supplemented cows gained 14.2 lb (.33 lb/day) more weight ($P<.003$) during the 44-day trial (table 1). Supplemented cows produced 4.9 lb more ($P<.0001$) milk than unsupplemented control cows by

Table 1. Effect of early postpartum (44 days) protein supplementation on the performance of fall-calving cows and their calves^a.

	Treatment		SEM ^b
	Control	CSM	
Cow weight, lb			
Initial	1140	1144	16.8
Final	1030	1090	18.0
Change	-110	-54	8.6
Cow body condition, units			
Initial	5.93	5.75	.187
Final	5.61	5.72	.190
Change	-.32	-.03	.105
Calf weight, lb			
Initial	69.2	66.3	2.35
Final	150.1	164.4	3.07
Change	82.4	96.6	3.07
Milk production, lb/day			
30 days postpartum	17.8	22.3	.82
44 days postpartum	17.6	22.5	.77

^aLeast square means.

^bStandard error of the mean.

day 44 postpartum. The increased calf gain observed in this study is probably due to increased milk production. In addition, protein supplementation may have increased fiber digestibility and ruminal acetate production which may increase milkfat content and thus, milk energy.

This study indicates that the nutritional status of the fall-calving cow in early lactation should not be ignored. Low levels of supplemental protein efficiently minimize weight and body condition losses. In addition, calves suckling supplemented cows gained an additional 14.2 lb of body weight. If a pound of calf gain is worth 45¢, increased calf growth would pay for approximately 75 percent of the added cost of cottonseed meal supplementation. Thus, early postpartum protein supplementation cannot be justified solely by the increase in calf weight. Supplemented cows, however, would be expected to rebreed more efficiently resulting in a larger and older calf crop the succeeding year (Hancock et al., 1985).

Literature Cited

- Hancock, K.L., et al. 1985. The influence of postpartum nutrition and weaning age of calves on cow body condition, estrus, conception rate and calf performance of fall-calving cows. Okla. Agr. Exp. Sta. Misc. Pub. MP-117:180.