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Supplemental Protein Requirements for Beef Cows Grazing Stockpiled Bermudagrass

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Story in Brief

Eighty-eight mature beef cows were used in a completely random design to determine supplemental protein requirements when grazing stockpiled bermudagrass pastures during late fall and winter. Forty-four cows were allotted to one of four supplemental treatments at each of two locations, one in Central and one in East Central Oklahoma. Treatments were no supplement (CON) or one of three supplements individually fed at 2 lb per head per day and containing 12.5, 25, or 37.5% crude protein from a blend of soybean meal and soybean hulls. Bermudagrass pastures were grazed or clipped to an approximate 4-inch stubble height during late August and fertilized with 50 lb of actual N per acre. Grazing was deferred till November 4, 1997, at which time grazing and supplemental treatments were initiated and continued for 79 d. Initial herbage dry matter mass was 2723 lb per acre. Strip grazing was used to decrease forage waste and prolong forage quality. During the first 30 d of grazing, forage nutritive value was adequate to maintain acceptable animal performance without supplementation. However, a minimum of 25% CP in the supplement was required to minimize weight loss during the final 49 d of the study.

(Key Words: Beef Cattle, Stockpile, Forage, Supplementation.)

Introduction

Cow-calf producers face increasing challenges to maintain profitability. A large portion of production costs is associated with hay feeding which occurs when forage nutritive value and quantity is low. The use of stockpiling bermudagrass may prove to be an alternative to reduce production costs. Bermudagrass has traditionally been managed as though its productive use ends in late August. Late summer and fall precipitation combined with late summer N fertilization offers the potential to stockpile forage with acceptable nutritive value for fall and winter grazing. Data collected by Taliaferro et al. (1987), indicated that fertilized bermudagrass can maintain high levels of crude protein through mid February; high enough to maintain a cow without expensive supplement. Hence, the objective of this study was to determine the protein requirements of spring calving beef cows grazing stockpiled bermudagrass.

Materials and Methods

This study was conducted at Eastern Oklahoma Research Station, near Haskell, OK and the Range Cow Research Station near Stillwater, OK. At each location, 44 cows grazed 45 acres of stockpiled bermudagrass from November 4, 1997, to January 22, 1998, for a total of 79 d. Average initial weight and BCS was (1203 ± 14.06 lb) and (5.47 ± .07), respectively. During the third week in August, bermudagrass pastures were clipped to an approximate 4-inch stubble height and fertilized with 50 lb of actual N per acre. Grazing was deferred till November 4, 1997, and continued for 79 d. Cows were allowed to strip graze the forage to decrease waste and prolong forage nutritive value. As a result of above average rainfall in September, initial herbage dry matter mass was 2,723 lb per acre.

Treatments were: 1) CON, 2) 2 lb per day supplement containing 89 g of crude protein (12.5%), 3) 2 lb per day supplement containing 197 g of crude protein (25%), and 4) 2 lb per day supplement containing 307g of crude protein (37.5%). Supplement composition is shown in (Table 1). Cows were assigned to treatments on November 4, 1997, and were individually fed in portable supplementation wagons. Supplements were prorated for 4 d/wk feeding.

All cows were weighed on days 0, 30, and 79 following a 16 h shrink period where both feed and water were withheld. Body condition scores (scale 1=emaciated, 9=extremely fat) were assigned by two independent evaluators. Weights and body condition scores were taken on November 4, 1997, December 2, 1997, and January 22, 1998. Data were analyzed using the general linear models of (SAS, 1985) and the least squares means were calculated. The final model included location, treatment, and the location by treatment interaction. Because there was no location by treatment interaction, the data were pooled. Treatments were orthogonally arranged with respect to protein, therefore treatments were tested for linear and quadratic effects.

Results and Discussion

During the first 30 d, all cows maintained weight and condition score with no significant differences among treatments (Table 1). The similarity in cow performance among treatments suggests that the nutritional value of the stockpiled bermudagrass was sufficient to meet the cows' nutritional requirements during this period.

During the months of December and January (days 30-79), cows receiving no supplement lost more weight ($P<.05$) compared with cows receiving supplement (Table 2). As CP increased in the supplement, BCS loss (linear effect $P<.05$) and weight loss (quadratic $P<.05$) declined.

Overall, weight loss decreased in a quadratic ($P<.05$) fashion as CP increased in the supplements. Cows receiving no supplement lost more weight ($P<.05$) than cows receiving supplement. The data indicates forage quality was adequate to maintain acceptable animal performance without supplementation during the first 30 d. However, a minimum of 197 g CP was required to minimize weight loss during the final 49 d of the study.

Literature Cited

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Taliaferro, C.M. 1987. Crop Sci. 27:1285.

Table 1. Supplement composition.			
	% of dry matter		
Treatments	12.5%	25%	37.5%
Soyhulls	92.5	60.4	30.6
Soybean meal	0	31.9	62.2
	Nutrients supplied per day, g		
CP	88.9	197.2	306.7
Ca	11.5	11.7	11.5
P	6.4	6.6	6.0
K	13.8	13.4	15.9
Mcal/d NEm	1.5	1.5	1.6

Table 2. Live weight and BCS change in spring calving cows grazing stockpiled bermudagrass.

			Supplements		
Days		CON	12.5%	25%	37.5%
0-30	Wt, lb	39.6	46.2	46.2	44.0
	BCS	.13	-.02	-.02	.03
30-79	Wt, lb[a]	-83.8	-33.0	-19.6	-18.9
	BCS	-.74	-.28	-.40	-.11
0-79	Wt, lb[a]	-44.7	13.0	26.2	25.3
	BCS	-.65	-.31	-.42	-.09

[a]Linear and Quadratic Effect ($P<.05$).

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