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EFFECTS OF LEVEL OF ENERGY SUPPLEMENT IN EARLY WINTER AND LEVEL OF PROTEIN AFTER CALVING ON BEEF COWS GRAZING NATIVE RANGE

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Summary

Simmental-Angus crossbred cows grazing native range near Cottonwood, SD, were fed two precalving levels of energy supplement and two postcalving levels of protein supplement. Cow weight change and reproductive performance were similar for all treatments. Although calves from cows supplemented with higher levels of energy gained faster from birth to early May, gains to weaning were similar for all treatments.

(Key words: Beef Cow, Nutrition, Supplement, Native Range, Reproduction.)

Introduction

Mature forage is generally low in protein and digestibility. Supplementing such forage with small amounts of an all-natural protein supplement generally increases forage intake and digestibility and therefore available energy. Information from other research stations in regard to the value of increasing the level of concentrate (or grain) supplement to increase weight gains (or decrease weight loss) of beef cows under such conditions is not consistent. Many times beef cows maintained on native range are fed well below National Research Council (NRC) nutritional guidelines during certain times of the year and still maintain high levels of reproductive performance.

The information reported in this paper is from a preliminary study with a longer term interest in nutritional management of beef cows under western South Dakota range conditions to obtain optimum reproductive performance and maximize use of native range forage. The objective of the early winter treatment comparisons was to determine if increasing the level of supplement above that necessary to maximize forage digestibility improves cow weight change on mature native forage and cow and calf performance. The objective of the second part of this study was to determine if providing supplemental protein postcalving to increase total dietary protein to NRC requirements improves cow and calf performance compared to providing enough supplemental protein to maximize digestibility and intake of mature native forage.

Materials and Methods

One hundred twenty-six Simmental-Angus crossbred cows grazing native range at the SDSU Range and Livestock Research Station near Cottonwood, SD, were fed one of two precalving and one of two postcalving levels of supplement. Beginning December 15, cows were randomly allotted within age (approximately 21 and 45 months old) to a high or low level of energy supplement. One-half of all cows received .7 lb of protein in 2 lb per day of a concentrate cube (low energy,

table 1). The other half received the same amount of total protein per day in 4 lb per day of a concentrate cube (high energy, table 1). Following calving, cows were reallotted within early winter treatment and age to one of two postcalving supplement treatments. Cows received 4 lb per day of an all-natural protein containing a high (36% protein, table 1) or low (16% protein, table 1) level of protein.

Prior to initial, final and interim weigh days, cows and calves were held off feed and water overnight. Calving dates for the 2-year-old heifers ranged from February 14 to April 17 and from March 7 to May 1 for 3-year-olds. Only cows calving prior to April 1 were included in the analysis. Two Charolais bulls were turned in with the 3-year-old and two Angus bulls were turned in with the 2-year-old cows on June 7 and removed 68 days later. All bulls were semen evaluated prior to the breeding season and produced semen of acceptable quality. On November 5, all calves were weighed and weaned and cows were rectally palpated to determine pregnancy.

Results and Discussion

Although the high level of early winter supplement provided more supplemental energy than the low level, cow gains during the early winter were similar for both groups (table 2). This is probably due to lower forage intake and/or lower digestibility of grazed forage for cows fed higher levels of energy. Research in other states indicates, when cows are consuming mature forages, increases in the level of concentrates fed may not necessarily improve weight gains as long as enough protein is fed to maximize forage digestibility. In this trial, the amount of forage consumed was not limited by the amount of forage available. In cases where forage availability limits the amount consumed, the results may be different. Reproductive performance as measured by pregnancy rate and average calving date the following year were not affected by early winter supplement treatment. Calves nursing cows fed higher levels of energy precalving had higher ($P<.05$) average daily gains from birth to May 11 when winter treatments ended. This would suggest that cows fed the high level of supplement prior to calving produced more milk. By weaning time, calves nursing low energy early winter treatment cows had compensated so that calf gains from birth to weaning were similar.

Level of protein fed after calving until May 11 did not affect cow weight change or calf growth rate (table 2) . Feeding higher levels of protein did not improve pregnancy rates or average calving date the following year. There was no interaction between the level of late winter protein with early winter energy level for any of the variables studied. Results of this study indicate that future research should concentrate on lowering level of precalving nutrition to minimize feed costs and that level of protein after calving is not a critical area of research for March- and April-calving cows maintained under these conditions.

TABLE 1. COMPOSITION OF SUPPLEMENTS[a]

	Early winter supplements		Late winter supplements	
	Low energy	High energy	Low protein	High protein
Soybean meal, %	29.0	87.4	32.9	87.7
Corn, %	60.2	.0	53.7	.0
Sugar cane molasses, %	4.3	3.8	4.4	4.4
Dicalcium phosphate, %	1.6	3.2	3.8	2.7
Iodized salt, %	.5	1.0	.6	.6
Trace mineral premix, %	.3	.5	.3	.3
Binder, %	4.1	4.1	4.3	4.3

[a] Dry matter basis.

TABLE 2. EFFECT OF SUPPLEMENT TREATMENTS ON COW AND CALF PERFORMANCE[a]

	Early winter energy		Late winter protein	
	Low	High	Low	High
Number	45	57	50	52
Cow wt, lb, 12/15	879	882	879	883
Condition score, 2/10	4.5	4.7	4.6	4.6
Cow avg daily gain, lb				
12/15-2/10 or 3/1	.74	.82	.78	.78
2/10 or 3/1-5/11	-1.13	-1.05	-1.09	-1.09
Cow wt change, lb				
12/15-5/11	-51	-43	-45	-48
% pregnant	90.0	87.5	91.3	86.0
Calving date next year				
Number	33	46	40	39
Avg date, 1985	89.3	87.4	87.7	88.9
Calf avg daily gain, lb				
Birth-5/11	1.35[b]	1.50[c]	1.40	1.44
Birth-11/8	2.05	2.07	2.05	2.08

[a] There were no significant interactions between early and late winter treatments or treatments and cow age.