WHEAT MIDDLINGS VERSUS SOYBEAN MEAL AND TWO WHEAT MIDDLINGS/SOYBEAN MEAL SUPPLEMENTS FOR WINTERING FALL CALVING BEEF COWS

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Story in Brief

Fifty-eight mature fall calving Hereford, Hereford x Angus and Limousin x Angus beef cows wintered on native tallgrass range were allotted to four supplemental feed treatments to provide equal daily amounts of crude protein. The supplements consisted of soybean meal (40% Crude Protein), soybean meal and wheat middlings (32% Crude Protein), wheat middlings and soybean meal (24% Crude Protein) and wheat middlings (16% Crude Protein). Each supplement was fed to provide .8 lb of protein per day from November 29 to December 9, 1987 and 1.2 lb of protein per day from December 9, 1987 to March 15, 1988. There were no significant differences in cow weight or condition score changes between the four supplemental treatments. No significant differences were noted in calf weight gains or weaning weights. Additionally, rebreeding rates of cows were not affected by the treatments.

(Key Words: Beef Cows, Soybean Meal, Wheat Middlings, Native Tallgrass Range, Winter.)

Introduction

Wheat middlings are the offal of the wheat kernel after the milling process for removal of flour and germ. Over 140,000 tons per year are available for use in livestock feeds in Oklahoma. Wheat middlings contain about 16% CP but are discounted for their relatively high (8%) crude fiber content. Fiber from bran-type feeds has been shown to be highly digestible and is an excellent energy source for grazing cattle. A previous study, Lusby and Wettemann, 1988b) demonstrated that spring calving cows wintered on wheat middlings performed similarly to cows fed 16% protein supplements of

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corn and soybean meal. A companion study (Lusby and Wettemann, 1988a), however, suggested that while increased supplemental energy increased body weight in spring calving cows before calving, weight was not increased with lactating fall calving cows. The objective of this study was to compare winter performance of lactating, fall calving beef cows and their calves when supplemented with soybean meal, wheat middlings or one of two mixtures of soybean meal and wheat middlings fed at rates to provide the same amount of daily protein.

Materials and Methods

Fifty-eight mature fall calving Hereford, Hereford x Angus and Limousin x Angus cows were allotted by breed and body weight to four supplemental feed treatments to provide equal daily amounts of crude protein (CP). Supplements consisted of soybean meal (40% CP), soybean meal and wheat middlings (32% CP), wheat middlings and soybean meal (24% CP) and wheat middlings (16% CP). Each supplement was fed to provide .8 lb CP/head/day from November 29 to December 22, 1987 and 1.2 lb CP/head/day from December 22, 1987 to March 15, 1988. Supplements were formulated to provide equal daily amounts of calcium, phosphorus and potassium. Composition of supplements and daily amounts fed are shown in Table 1.

Table 1. Composition of supplements and daily amounts fed.

	Treatments (% crude protein)			
	40% SBM[a]	32% SBM/MIDDS	24% MIDDS/SBM	16% MIDDS
Ingredients, %				
Soybean meal	94.45	63.4	31.05	
Wheat middlingss		31.95	66.85	98.35
Dicalcium phosphate	5.0	3.0		
Limestone	.5	.5	2.05	1.625
Vit A (30)[b]	.05	.05	.03	.025
Crude protein, 90% DM basis, %	44.4	35.6	26.7	17.8
Feeding rates/day, lb[c]				
11/29/87 to 12/22/87	2.0	2.5	3.3	5.0
12/22/87 to 3/15/88	3.0	3.75	5.0	7.5

[a]SBM is soybean meal, MIDDS is wheat middlings.
[b]30,000 IU/lb.
[c]7-day basis.

All cows were grazed in a single pasture of native tallgrass range and were gathered 6 days each week for supplement feeding in individual covered stalls. Supplement amounts were prorated for 6-day per week feeding. Cows and their calves were weighed at 28 day intervals after overnight withdrawal from feed and water. Cows were also scored visually for body condition (scale of 1 = very thin, 5 = moderate and 9 = very fat) at each weigh period. All cows were treated with Ivermectin on September 25, 1987. Prairie hay was fed during 27 days when snow or ice covered standing forage or when extremely cold temperatures were encountered. All calves were born from August 29 to November 2, 1987. Cows were exposed by natural service to Hereford bulls from November 30, 1987 to January 20, 1988 (a 51-day breeding season). Calves were weaned on May 17, 1988. Pregnancy was determined by rectal palpation on May 24, 1988. Weaning weights were adjusted for sex, age of calf and age of dam.

Results and Discussion

Cow weight and condition changes over the total trial were not significantly different for the four treatments (Table 2). In contrast, spring calving cows fed these same supplemental diets had increased weight gains to calving with increasing amounts of wheat middlings (Cox et al., 1989). Calf gains tended to be greater during the supplementation period for calves of cows fed greater daily amounts of middlings. Weaning weights in May reflected the slight increases in gain made during the supplementation period. The small increases in calf gains, however, suggest that milk production of the cows was not greatly improved by feeding additional energy in the form of wheat middlings. Rebreeding rates were high and similar for all treatments, ranging from 87 to 96%.

The amount of wheat middlings fed and lack of significant improvements in cow and calf weight changes strongly suggests that forage intake and(or) digestibility was reduced as the amount of energy in the form of wheat middlings was increased. Forage supply was adequate during the trial period. Because pregnant, nonlactating cows fed the same supplements (Cox et al., 1989) responded differently, these results suggest that stage of production can affect performance responses to supplements. The excellent rebreeding rates for all treatments indicate that body condition and nutrition were adequate and supplemental protein requirements were met. In agreement with a previous experiment (Rakestraw et al., 1986), if fall calving cows are in good body condition at the start of breeding (BCS =55) and lose a minimal amount of weight during the breeding season (approximately 50 lb), a high percentage of cows will become pregnant (>90%).

Table 2. Effects of supplement treatments on lactating, fall calving cow and calf performance.

	Treatments (% crude protein)			
	40% SBM[a]	32% SBM/MIDDS	24% MIDDS/SBM	16% MIDDS
No. of cows	14	15	15	14
Initial wt 11/29/87, lb	1009	1011	1000	1001
Initial cond. score[b]	5.5	5.4	5.4	5.3
Weight changes, lb				
Nov 29 to Dec 22	-59	-50	-54	-55
Dec 22 to Jan 20	15	4	1	8
Jan 20 to Feb 16	0	-15	-1	-4
Feb 16 to Mar 15	-70	-58	-42	-51
Nov 29 to Mar 15	-114	-118	-96	-102
Mar 15 to May 24	176	183	154	177
Nov 29 to May 24	61	64	58	75
Body condition changes				
Nov 29 to Mar 15	-.8	-.8	-.9	-.7
Mar 15 to May 24	1.3	1.2	1.2	1.4
Nov 29 to May 24	.5	.4	.3	.7
Rebreeding rate, %	87	96	90	93
Calf data				
Weight gains, lb				
Nov 29 to Mar 15	98	109	113	113
Nov 29 to weaning	207	215	224	223
Weaning weights, lb	367	387	393	384

[a]SBM is soybean meal, MIDDS is wheat middlings.
[b]Body condition scale: 1 = very thin, 5 = moderate, 9 = very fat.

In conclusion, when fall calving beef cows are in good body condition, have adequate forage and are provided hay during conditions of extreme cold and snow cover, performance may not be improved by feeding additional energy supplements after protein needs have been met. The effects of protein or energy supplements on cow weight and condition change are apparently influenced by stage of production.

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