

PERFORMANCE OF LIGHT-WEIGHT CALVES FED HIGH OR MEDIUM PROTEIN SUPPLEMENTS ON SUMMER RANGE

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Story in Brief

Fifty-eight fall-born Hereford and Hereford X Angus calves weighing 350 lbs grazed native grass range from June 6 to September 2. Treatments were: 1) control, no supplement, 2) 4 grams/day of B-hydroxy, B-methyl butyrate (HMB), 3) 1 lb/day soybean meal (SBM, 40% protein) or 4) 1 lb/day soybean meal plus 1.5 lb/day wheat middlings (SBM/WM, 25% protein). Supplement amounts were prorated for individual feeding on Monday, Wednesday and Friday. From June 6 to July 15, gains were 1.54, 1.53, 2.04 and 2.29 lb/day for treatments 1, 2, 3 and 4 respectively. Feeding HMB had no effect on calf gain. In conclusion, feeding a 25% protein supplement composed of soybean meal and wheat middlings at a rate of 2.5 lbs/day efficiently (3.16 lb supplement/lb added gain) increased daily gain of light-weight stockers. During late summer from July 15 to September 2, gains of all treatments were less than for early summer. The excellent responses to supplementation in early summer probably resulted in calves that were fatter by mid-summer and less able to maintain a high rate of gain on the low quality native range available during that period. Depending on feed prices and market goals for the calves, this type of supplement may be a useful alternative to low levels of high protein supplements to increase gains of light-weight calves.

(Key Words: Native Range, Protein, Wheat Middlings, HMB.)

Introduction

Most research with feeding supplements to summer stockers has been with yearlings. However, the average weight and age of summer stockers have decreased substantially during the past few years. Recent studies suggest that younger calves may respond to supplemental protein earlier in the summer than do yearlings (Scott et al., 1988). Because the forage in early summer will give

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a higher ratio of TDN to protein, the opportunity may exist to increase gains with added energy in the supplements. There has also been some preliminary evidence that a new compound, B-hydroxy-B-methyl butyrate (HMB) may improve the efficiency of protein utilization. The objectives of this study were to compare the effects of supplementation of protein and added energy and the value of supplemental HMB on gains of summer stocker calves.

Materials and Methods

Fifty-eight Hereford and Hereford X Angus calves, raised at the Range Cow Research Center west of Stillwater, Oklahoma, were used. On June 9, calves were weighed after overnight withdrawal from feed and water and were allotted to four treatments by weight, sex, and previous spring treatment. The study included four treatments: 1) Control, no supplement, 2) 4 grams/day of HMB, 3) 1 lb/day soybean meal and 4) 1 lb/day soybean meal plus 1.5 lb/day wheat middlings (Table 1). Supplement amounts were prorated for a Monday, Wednesday and Friday feeding schedule. HMB was administered in .25 lbs of wheat middlings which was also fed to the Control calves. Calves were grazed in common pasture and brought into an individual feeding barn for supplementation on Monday, Wednesday and Friday of each week. Data were analyzed using least squares analysis. The model for weight gain included sex, and breed with previous gain as a covariate.

Table 1. Composition of supplements and amount fed.

Ingredient	Percent in ration as fed			
	Control	HMB ^a	SBM	WM/SBM
Wheat middlings	95.64	87.70		58.00
Soybean meal			96.00	38.00
Molasses	4.36	4.00	4.00	4.00
HMB ^a		8.30		
Feeding rate lbs/day	0.25	0.25	1.00	2.50
Nutrients (DM)				
NE _m , Mcal/cwt.	73.86	69.95	86.67	80.49
NE _g , Mcal/cwt.	45.58	41.74	58.67	50.79
TDN	69.11	63.28	83.60	74.88
Protein	17.93	16.42	47.45	29.72
Calcium	0.16	0.15	0.18	0.17
Phosphorus	1.14	1.04		1.00

^aB-hydroxy, B-methyl butyrate.

Results and Discussion

Calves weighed approximately 350 lbs at the start of grazing (Table 2). Gain was not altered with supplemental HMB. This is the first study in which HMB has been fed to grazing cattle. It is possible that HMB may need to be fed more frequently than the 3 day per week feeding schedule used in this study.

Unsupplemented calves gained 1.5 lbs/day from June 9 to July 15. Gains were increased ($P < .05$) to 2.04 lb/day with 1 lb of SBM and to 2.29 lb/day with 2.5 lb of SBM/WM. The conversion of supplement to added gain was 1.85 for SBM and 3.16 for SBM/WM. At a cost of \$.11/lb for SBM, the cost of added gain would have been \$.20 compared to \$.25 for SBM/WM if priced at \$.08/lb.

During late summer, from July 15 to September 2, gains of all treatments were less than for early summer. Calves fed supplements tended ($P < .08$) to gain faster than unsupplemented calves although supplement responses were less than observed for early summer. Based on previous studies, the response in daily gain to feeding 1 lb of SBM should have been about .4 lb/day. The excellent responses to supplementation in early summer probably resulted in calves that were fatter by mid-summer and less able to maintain a high rate of gain on the low quality native range available during that period. When late summer gains were statistically adjusted for differences in gains during early summer, the late summer added gain was .42 lb for SBM and .62 lb for SBM/WM, only slightly less than observed during early summer.

In conclusion, feeding a 25% protein supplement composed of soybean meal and wheat middlings at a rate of 2.5 lbs/day efficiently increased daily

Table 2. Gains of calves fed soybean meal (SBM), soybean meal/wheat middlings (SBM/WM) or B-hydroxy, B-methyl butyrate (HMB) on summer range.

	Treatments			
	Control	HMB	SBM	WM/SBM
Initial weight, lbs	351	351	346	340
Daily gain, lbs				
6/9 to 7/15	1.50 ^a	1.44 ^a	2.04 ^b	2.29 ^c
7/16 to 9/2	0.84	0.88	1.06	1.15
6/9 to 9/2	1.12 ^a	1.12 ^a	1.47 ^b	1.63 ^c
Lb supp/lb added gain				
6/9 to 7/15			1.85	3.16
7/16 to 9/2			4.54	8.06
6/9 to 9/2			2.85	4.90

^{a,b,c} Means in same row not sharing a common superscript differ ($P < .05$).

gain of light-weight stockers. Depending on feed prices and market goals for the calves, this type of supplement may be a useful alternative to low levels of high protein supplements to increase gains of light-weight calves. This supplement may be especially viable if calves are grazed on programs that require removal from range by mid-summer.

Literature Cited

Scott, R.R., et al., 1988. Soybean meal supplementation of light weight beef calves grazing spring-burned tallgrass range. Okla. Exp. Sta. Misc. Pub. MP-125:91.