SUPPLEMENTS FOR LIGHT WEIGHT CALVES RECEIVED AND GROWN ON NATIVE GRASS HAY

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Story in Brief

Fifty-eight 3- to 4-month old Hereford and Hereford X Angus calves (240 lb) were used to compare the effects of protein and energy supplementation on gain and hay intake while fed low quality native grass hay in a drylot situation. Supplements were: 1) soybean meal to meet one-half of protein requirement, 2) soybean meal to satisfy protein requirement, 3) corn/soybean blend at one-half of protein requirement and 4) wheat middlings/soybean meal at one-half of protein requirement. Calves were allotted by sex, breed and weight to three replications per treatment. Calves were fed native grass hay free-choice in a single pen and sorted 6 days per week into replications and fed supplements by replication in small pens beginning February 5. Daily gains (84 days) were greater for Treatment 2 (high soybean meal, 1.17 lb/day) than for Treatments 1, 3 and 4 (1.08, 1.06 and 1.09 lb/day, respectively). Supplements were not pelleted and intake was sometimes slow for Treatments 3 and 4. Hay intake (dry matter basis), measured during a 9-day period in March was lower for Treatment 3 than for Treatment 4. The starch content of the corn based supplement may have suppressed hay intake when compared to the wheat middling-based supplement. The poor calf gains suggest that the amount of supplemental protein and energy was inadequate.

(Key Words: Supplementation, Protein, Wheat Middlings, Beef Cattle.)

Introduction

The stocker cattle industry has in recent years been forced to purchase younger, lighter-weight calves due to decreased cattle numbers. Frequently, these cattle must be purchased two to three months prior to the high quality forage grazing season. As a result, cattle are often backgrounded on low quality forage and supplement. While acceptable backgrounding gains on hay

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and supplements are often attainable with heavier, older calves, results may not be acceptable with very young, light-weight calves. Development of supplements that could produce gains adequate to cover fixed and variable costs (1.5 lb/day or more) during both receiving and growing periods would obviously be beneficial to producers. Such supplements may need to provide more protein and energy than needed for older stockers. This is the first of several studies designed to develop supplements for young, light-weight stocker calves received and grown on low quality hay and supplement.

Materials and Methods

Sixty Hereford and Hereford X Angus calves, raised at the Range Cow Research Center west of Stillwater, were initially allotted to four treatments by weight, breed, sex and age. At weaning, all calves were vaccinated with 5cc ULTRABAC CSNS (Beecham Labs) and 2cc Bovashield 3 IBR-PI_3 (Norden Labs). Two calves died shortly after starting the trial, therefore all data are based on the remaining fifty-eight head. Three sex classifications were used: 1) steers castrated two days prior to beginning the trial, 2) heifers and 3) steers castrated prior to weaning. Three replications were used per treatment: 1) lighter steers, 2) heavier steers and 3) four heifers and one steer. All calves were maintained in a common drylot, with ad libitum access to native grass hay and water. Monday through Saturday mornings, calves were sorted into replications and fed supplements in bunks measuring 3 x 6 feet, then returned to drylot. Treatments (as-fed) included: 1) 1.25 lb/day of SBM, 2) 2 lb/day of SBM, 3) 2 lb/day of corn/SBM and 4) 2 lb/day of wheat middlings/SBM (Table 1). Daily feed quantity was adjusted to the 6-day per week feeding schedule. Calves were weighed every 28 days following an 8-hr shrink.

Hay intake was measured for a 9-day period in March. During this period, calves remained in their feeding pens by replication and hay was provided each day in metal feed bunks. Fresh hay was placed in the bunks each day (about 3% of body weight on an as fed basis), with 40% fed in the morning following supplementation and the remaining 60% fed in late afternoon. Feed refusals were weighed back each morning prior to supplementation and fresh hay (10% in excess of expected daily intake) was provided following supplementation.

Calf weight gains and forage intake were analyzed using least squares analysis. Orthogonal contrasts were used to compare Treatment 1 versus 3 and 4, Treatment 3 versus 4, and Treatment 2 versus all other treatments.

Table 1. Composition of supplements and amounts fed.

Ingredient	Percent in ration, as fed			
	Low SBM	High SBM	Corn/ SBM	WM/ SBM
Ground corn			45.59	
Wheat middlings				58.77
Soybean meal	90.92	92.09	47.92	34.82
Molasses	4.61	4.27	4.24	4.40
Dicalcium-phosphate	2.97	2.94	1.64	
Limestone			0.44	1.84
Potassium chloride	0.97	0.45		
Deccox	0.39	0.18	0.12	0.12
Vit A-30,000	0.14	0.06	0.04	0.04
Amt. fed per day, as-is	1.25	2.0	2.0	2.0
Nutrients (DM)				
NEm, Mcal/cwt.	73.86	74.59	81.3	69.76
NEg, Mcal/cwt.	49.97	50.47	53.89	43.88
TDN, %	71.22	71.93	76.33	64.79
Protein, %	40.21	40.72	24.96	25.14
Calcium, %	0.79	0.78	0.63	0.87
Phosphorus, %	1.22	1.22	0.78	0.88

Results and Discussion

Calves weighed approximately 250 lbs at the start of the study (Table 2). Consumption of supplements containing wheat middlings was slower than for soybean meal supplements. All supplements were unpelleted and the fine, dusty consistency of wheat middlings is apparently unpalatable to calves. Calf gain for the 84-day study was greater ($P<.06$) at the high level of soybean meal than for the other treatments. Inadequate protein probably limited the ability of the calves to utilize the additional energy fed from wheat middlings and/or corn. Lower gain for the high level of soybean meal during the first 28 days of the study was caused by sickness among several calves from this treatment. The high soybean meal group gained faster ($P<.05$) than the other treatments in the final two gain periods.

Forage intake was lower ($P<.05$) for calves supplemented with the corn/soybean meal supplement than for wheat middlings/soybean meal (Table 3). the starch content of the corn based supplement may have suppressed hay intake when compared to the wheat middling-based supplement. Cereal grain

Table 2. Gain of calves fed native grass hay and supplement containing soybean meal, corn and/or wheat middlings.

	Treatments			
	Low SBM	High SBM	Corn/SBM	WM/SBM
Initial weight	242	248	241	249
Daily gain, lbs				
2/5 to 3/4	1.11[a]	0.85[b]	1.00[a]	1.05[a]a
3/5 to 4/1	1.05[a]	1.21[b]	0.97[a]	0.98[a]
4/2 to 4/29	1.09[a]	1.46[b]	1.22[a]	1.24[a]
2/5 to 4/29	1.08[c]	1.17[d]	1.06[c]	1.09[c]

[a,b] Means in same row not sharing a common superscript are different (P<.05).

[c,d] Means in same row not sharing a common superscript are different (P<.10).

Table 3. Forage intake of calves fed native grass hay and supplements containing soybean meal, corn and/or wheat middlings.

	Treatments			
	Low SBM	High SBM	Corn/SBM	WM/SBM
Calf wt., lbs	301	288	292	291
Forage intake, % of BW[a]	2.47[c]	2.42[c]	2.17[bc]	2.75[3cd]
Actual intake, lbs/day[a]	7.44	6.96	6.33	8.00

[a] Dry matter basis.

[b,c,d] Means in same row not sharing a common superscript are different (P<.05).

supplements tend to reduce forage intake and digestibility due to starch effects (Chase and Hibberd, 1987). There is evidence that digestible fiber by-product feeds can provide acceptable gains when compared to grain based supplements (Trautman, 1987).

In conclusion, the relatively poor calf gains suggest that the amount of supplemental protein and energy was inadequate for improving weight gains of young calves to a level likely profitable when low-quality grass hay is fed as the roughage source. Supplements that permit greater gains of young, light-weight calves will need to be pelleted, provide greater amounts of protein and energy and have a limited amount of starch.

Literature Cited

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