EARLY SUMMER SUPPLEMENTS FOR WEANED FALL-BORN CALVES GRAZING TALLGRASS PRAIRIE

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Story in Brief

Weaned, fall-born calves were used in a trial lasting from late May to mid July. A control group received no supplement, a second group received 1 lb/day of a 38% crude protein supplement and a third group received 3 lb/day of a 15.5% crude protein supplement for the first 28 days and then received 3 lb/day of a 25% crude protein supplement for the final 28 days. Both supplemented groups gained more weight (91.4 lb on average) than the unsupplemented calves (70.4 lb). Performance was similar for the two supplemented groups (94.3 and 88.5 lb). The efficiency of supplement conversion to additional gain (lb supplement/lb added gain) was 2.3 for the 38% crude protein and 9.2 for energy supplement. If the 38% crude protein supplement cost $225/ton, the other supplement must cost less than $56/ton to be competitive. This study suggests that young, light weight calves will respond to supplemental protein earlier in the summer than previously believed.

(Key Words: Calves, Rangeland, Supplementation.)

Introduction

Previous studies have demonstrated the benefits of feeding high protein supplements to stocker cattle in the last half of the summer grazing season. In general, the supplements are converted to gain at an efficiency of 2 to 3 lb supplement/lb added gain.

Supplementation during the early portion of the grazing season (May through June) has not been studied in depth. Kansas researchers have fed low rates of sorghum supplements containing ionophores and improved average daily gain of stocker cattle on early summer pasture about .1 to .15 lb/day with an efficiency of 8 to 10 lb sorghum/lb of added gain. Weight gains of weaned calves grazing tallgrass prairie in May, June and July were

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improved by feeding a low rate of soybean meal (Scott et al., 1987) at an observed efficiency of 1.7 to 4 lb supplement/lb added gain.

A potential problem with energy supplements is an imbalance in protein levels in the total diet. In the current study, calves were supplemented with low levels of a high protein supplement or with higher levels of an energy supplement. Protein levels of the energy supplement were adjusted every four weeks to account for the decline in forage protein.

Materials and Methods

Forty nine fall-born Hereford and Hereford x Angus calves that had been weaned in April were used in a 56-day supplementation trial. The trial began May 23 and ended July 19, 1987. On May 23 the calves were weighed (Table 1) and sorted into three treatment groups based on breed and sex. The treatment groups were maintained on three separate pastures. The pastures were stocked lightly to eliminate potential pasture differences. One treatment group acted as a control and received no supplemental feed during the trial. The second group was fed 1 lb/day of a 38% crude protein (CP) supplement (Table 2). The third group was fed 3 lb/day of an energy supplement containing 15.5% CP from May 23 until June 21. From June 21 to July 19, the third group was switched to an energy supplement containing 25% CP. The energy supplements were formulated and fed in an effort to provide supplemental energy, but balance protein intake with the estimated decline in forage protein. Wheat middlings were the primary energy source (other than oilseed meals) in the supplements. All supplements contained Bovatec and were fed in prorated amounts Monday through Friday. A free choice salt/mineral supplement (12% Ca, 7% P) was also provided. The

Table 1. Weights and performance of calves.

	Supplement group		
	Control	High protein	Energy
Initial wt, lb (5/23)	376	375	374
Gain, lb/head			
5/23 - 6/21	43.5[a]	56.3[b]	53.8[b]
6/21 - 7/19	26.7[a]	38.0[b]	34.7[b]
5/23 - 7/19	70.2[a]	94.3[b]	88.5[b]
Efficiency of supplement conversion, lb/lb added gain			
5/23 - 6/21	---	2.2	8.2
6/21 - 7/19	---	2.5	10.5
5/23 - 7/19	---	2.3	9.2

[a,b]Means are different, P<.05.

Table 2. Supplement composition (% as-is).

	High protein	Energy 15.5%	Energy 25%
Wheat midds	6.9	90.9	57.5
Cottonseed meal	61.0	3.0	18.9
Soybean meal	26.7	--	18.0
Molasses	2.5	2.5	2.5
Limestone	2.1	3.0	3.0
Dicalcium phosphate	.06	--	--
Potassium chloride	--	.5	--
Bovatec 68	.3	.07	.07
NEg (Mcal/lb)	48.3	43.1	45.0
Crude protein	38.3	15.5	24.8
Calcium	1.1	1.2	1.3
Phosphorus	.9	.8	.8
Potassium	1.3	1.3	1.2

calves were weighed following overnight shrink on May 23, June 21 and July 19.

For analysis, effects of supplement, breed and sex were included in the model. Breed and sex effects were not significant ($P>.05$).

Results and Discussion

Drought conditions existed in 1987. Therefore, the response to supplements may be biased due to relatively unusual forage conditions. The unsupplemented cattle gained approximately 1.25 lb/day from May to July (Table 1). During the first 28 days, the cattle gained 1.55 lb/day; gains decreased to .95 lb/day during the final 28 days.

Supplementing with 1 lb/day of the 38% CP feed increased average daily gain .43 lb/day (Table 1). This response is very similar to the gain response observed with growing cattle in July, August and September. The gain response was consistent over the entire 56 days.

Weight gains of the cattle receiving the energy supplement were slightly lower, but not different ($P>.05$) from the high protein group (Table 1).

The efficiency of supplement conversion to additional gain (lb supplement/lb added gain) was 2.3 for the high protein supplement and 9.2 for the energy group (Table 1). If the 38% CP supplement could be purchased for $225/ton, then the energy supplement would not be competitive unless priced less than $56/ton.

The efficient conversion of the high protein supplement can be attributed to two factors. First, young, lightweight calves require more protein than heavier, aged stockers. Scott et al. (1987) reported efficient

conversion of high protein supplement in weaned fall-born calves grazing from May to August. Second, poor forage growing conditions may have enhanced response to the high protein supplement. Therefore, the response to high protein supplement might have been different if: 1) older or heavier cattle had been tested, and 2) drought conditions had not existed. However, the studies of Scott et al. (1987) were conducted during years with precipitation that exceeded long-term averages.

Response to the energy supplements was also consistent with previous observations. On average, energy supplements are converted to gain at an efficiency of 8 to 10 lb supplement/lb added gain unless forage availability is limiting performance. Based on supplemental energy intake, an efficiency of 9:1 suggests that supplement was substituting for forage, thereby reducing forage intake. Care was taken to utilize a low starch energy source in an effort to reduce negative impacts on forage digestion and intake. Once again, the size of cattle may have influenced these results. Average supplement intake was 3 lb/day, but the calves were actually fed 4.2 lb, 5 days per week. This level is equal to .9 to 1.1% of body weight in a calf ranging from 374 to 463 lb. This level of intake was probably great enough to limit intake and possibly hamper daily grazing behavior regardless of the influence of supplement on forage digestion.

It is questionable whether feeding energy supplements at high intakes (i.e., 3 lb/day) will ever prove to be economical unless forage availability is lacking. However, feeding lower amounts (i.e., 1 lb/day) has not been thoroughly investigated. The results of this trial and those of Scott et al. (1987) would suggest that light weight calves will economically respond to protein supplements in the early summer.

Literature Cited

Scott, R.R. et al. 1987. Response of fall-born calves to spring pasture burning or early summer protein supplementation. Okla. Agr. Exp. Sta. Res. Rep. MP-125:283.