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Fishmeal, Cottonseed Meal, and Corn Supplements With Rumensin for Stockers Grazing Hybrid Sorghum x Sudangrass Pastures

D. HUTCHESON, J. MCNEILL, F. M. ROUQUETTE,
B. ELLIS

Summary

Supplemental protein or energy provided in the forms of corn, fishmeal, or cottonseed meal increased average daily gains when fed to steers grazing sorghum x sudangrass pastures. Assuming the extra gain over non-supplemented cattle to be attributed to the supplement, the feed to gain ratios would be 9.2, 2.0, and 3.6 for corn, fishmeal, and cottonseed meal, respectively. However, the protein supplements could have resulted in either an increased energy intake or a better utilization of energy from the pasture.

Introduction

Cattle grazing hybrid sorghum x sudangrass pastures during the summer in the Texas Panhandle usually gain only 60 to 75 percent of their projected gain. The specific cause for this lack of gain is not known. Hybrid sorghum x sudangrass forages are considered adequate in nitrogen

for stocker cattle. However, a portion of that nitrogen may be in the form of non-protein nitrogen; thus, these forages may actually be protein deficient for stocker cattle. Fishmeal appears to be a particularly effective source of escape or by-pass supplementary protein for the ruminant. Cottonseed meal is a typical oil seed meal and is readily available for incorporation into cattle feeding systems and may have escape protein potential. Corn, primarily an energy source, is available to incorporate into supplements and has a relatively high percentage of its protein in by-pass or escape form. Identifying the nutrient, whether it be by-pass or escape protein or energy, to be supplemented to cattle grazing hybrid sorghum x sudangrass pastures that would improve performance and profitability of grazing stocker animals in the High Plains would be a major contribution to animal production. The objective of this study was to compare responses in liveweight gain of growing steers to supplements containing either mineral, fishmeal, cottonseed meal, or ground corn when cattle grazed hybrid sorghum x sudangrass pastures.

Procedure

Seventy-two acres of an annual hybrid sorghum x sudangrass, planted in April to provide grazing from June through September, were divided into eight pastures. Two replicate pastures were used for each supplement treatment. The treatments were minerals only and three self-limiting supplements of fishmeal, cottonseed meal, and corn. A commercial mineral was used in the non-

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supplemented group (Table 1). The formulation of the supplements used in this study are presented in Table 2. Sixty-four steers were blocked by weight, allotted into eight groups and randomly assigned to the eight test pastures. Grazing started July 23, 1985 and terminated October 22, 1985. Cattle were weighed at the beginning of the trial, at day 28, and at the end of the trial (day 89).

Results and Discussion

Because of good growing conditions, the sorghum x sudangrass pastures produced more forage than anticipated. In order to facilitate pasture management and prevent excessive leaf-stripping, calves on replicate pastures were combined after 28 days of grazing. Thus, 16 cattle were on each of four 8-acre pastures for the last 61 days of the study. The average final weight of the supplemented cattle (712) was significantly higher ($P < .05$) than unsupplemented cattle (665). No significant differences were detected at the end of the first 28-day period. A significantly higher final weight was observed for all cattle supplemented when compared to the control group.

Significant differences were detected for the average

daily gains for the last period (61 days) and the total period (89 days) (Table 3). All cattle receiving supplements gained better than cattle receiving mineral alone. The mineral and supplement consumption for the study is presented in Table 4. The supplements were formulated to give consumption of 2 lb/hd/day; however, steers receiving corn consumed 56 percent more than projected, and steers receiving fishmeal and cottonseed meal consumed 36 and 31.5 percent less, respectively, than projected.

It is difficult to formulate supplements for specific intakes with different feedstuffs and combination of pastures. However, the Rumensin® and salt in the formula probably exerted the major effect on limiting intake of the supplements. Since the protein-source supplements were consumed less than the grain-source, the protein-source could be involved in limiting intake when steers grazed hybrid sorghum x sudangrass pastures in these formulas. Mineral consumption was high during the first 28 days, then was reduced during the last 60 days. It was also apparent that gains were significantly higher for cattle receiving supplements after daily consumption exceeded 1.5 lb/hd.

TABLE 1. ANALYSIS OF COMMERCIAL MINERAL USED IN THE NON-SUPPLEMENTED GROUP

Mineral	Percent
Calcium	7.8
Phosphorus	6.0
Magnesium	14.0
Salt	14.75
Iodine	.005
Vitamin A	20,000 IU/lb
Vitamin D	5,000 IU/lb

TABLE 3. INITIAL WEIGHT AND AVERAGE DAILY GAINS OF STEERS FOR THE TRIAL

	Initial Weight (lb)	Days		
		1-28	27-89	1-89
		—lb/day—		
Minerals	531	2.32	0.97	1.50
Corn	536	2.52	1.31	1.84
Fishmeal	534	2.69	1.62	2.14
Cottonseed Meal	535	2.52	1.53	1.88

TABLE 2. COMPOSITION OF PROTEIN/ENERGY SUPPLEMENTS OFFERED TO STOCKER CALVES GRAZING SORGHUM X SUDANGRASS PASTURES

Ingredients	Supplements		
	Fish	Cotton	Corn
	—Percent Composition—		
Fishmeal	50.00	—	—
Cottonseed Meal	—	85.85	—
Corn, Ground	—	—	90.35
Dried Molasses	3.00	3.00	3.00
Calcium Carbonate	—	4.50	1.00
Dicalcium Phosphate	—	2.50	—
Ammonium Sulfate	0.25	0.25	0.25
Salt	3.00	3.00	3.00
Magnesium Oxide	0.75	0.50	1.00
Ruminant Trace Minerals Premix ¹	0.25	0.25	0.25
Rumensin 60®	0.15	0.15	0.15
Cottonseed Hulls	30.00	—	—
Wheat Mill Run	12.60	—	—
Fat	—	—	1.00

¹Trace mineral mix contains Mg (15%), Zn (23.2%), Fe (14.1%), Mn (3.0%), Cu (2.8%), Ca (.5%), I (.3%), K (.2%), and Co (.2%).

TABLE 4. CONSUMPTION OF MINERAL AND SUPPLEMENTS DURING TRIAL (LB/HD/DAY)

	Days		
	1-28	29-89	Total
	—lb/hd/day—		
Mineral only	.38	.14	.21
Corn	2.23	3.52	3.12
Fishmeal	0.51	1.62	1.28
Cottonseed Meal	0.91	1.79	1.37