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Abstract

A field study was conducted over 2 years at four different locations in south central Kansas to compare a feathermeal/bloodmeal (ESCAPE) liquid suspension to a molasses-based liquid supplement (ENERGY) and a dry mineral supplement (CONTROL) on the liveweight gain of 768 calves grazing wheat pasture. No significant differences occurred in supplement intake between ESCAPE and ENERGY across years (P=.88). Offering a liquid supplement containing either ES CAPE or ENERGY did not improve (P=.91) growth performance relative to CONTROL calves.

Keywords

Cattlemen's Day, 1997; Kansas Agricultural Experiment Station contribution; no. 97-309-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 783; Beef; Wheat pasture; Feathermeal; Liquid suspensions

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FEATHERMEAL/BLOODMEAL LIQUID SUSPENSIONS FOR CALVES GRAZING WINTER WHEAT PASTURE [1]

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Summary

A field study was conducted over 2 years at four different locations in south central Kansas to compare a feathermeal/bloodmeal (ESCAPE) liquid suspension to a molasses-based liquid supplement (ENERGY) and a dry mineral supplement (CONTROL) on the liveweight gain of 768 calves grazing wheat pasture. No significant differences occurred in supplement intake between ESCAPE and ENERGY across years (P=.88). Offering a liquid supplement containing either ESCAPE or ENERGY did not improve (P=.91) growth performance relative to CONTROL calves.

(Key Words: Wheat Pasture, Feathermeal, Liquid Suspensions.)

Introduction

Wheat pasture plays an important role in beef production systems in Kansas and other southern plains states. Despite the fact that it is a source of high quality forage, wheat forage has potential problems. Its crude protein has been calculated to be 58 to 70% degradable in the rumen. Consequently, only 30 to 42% of the crude protein is undegraded intake protein (UIP). Because of the extensive degradability, supplemental UIP may be needed to meet the metabolizable protein requirements of rapidly growing cattle. To determine the need for such supplementation, a study was conducted to evaluate the use of a liquid suspension that delivered supplemental UIP.

Experimental Procedures

This field study was conducted with four cooperating producers in south central Kansas, with each stocker operation representing a trial replicate. The study was conducted during the fall/winters of 1990-91 and 1994-95. The second year was delayed because of poor growing conditions for wheat pasture. For each year, replicate trials were conducted at three separate producer locations with 81 to 165 head of crossbred stocker calves at each location. The average initial weights were 430 lb for the first year and 450 lb for the second. The grazing period ranged from 78 to 119 days, depending upon prevailing environmental conditions.

All stocker calves were assembled 3 to 4 weeks prior to trial initiation and were vaccinated against common viral and bacterial diseases, treated for internal and external parasites, and implanted with an estrogenic growth implant at the onset of the trial. All 768 calves were weighed individually, identified with numbered ear tags and randomly allotted to one of three treatments. We used color-coded ear tags to ensure that calves remained pastured with their specific treatment group. At

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[2]South Central Area Extension Office, Hutchinson.

the conclusion of the study, calves were gathered and individually weighed. For each year, either heifer or steer calves were used exclusively at each location.

Each trial location was uniform in terms of cereal cultivar, fertility, topography and cultural management to ensure that any differences detected would be due to supplement. Each pasture was cross-fenced and stocked to ensure that forage availability was similar across treatment. During periods of snow cover or inclement weather, equivalent amounts of harvested forage were provided to all treatments.

The supplements were formulated and delivered to each location by a commercial feed company. For the ENERGY and ESCAPE treatments, the supplement was provided free-choice to calves in 1000-lb tubs equipped with grooved lick wheels. Supplement intake was projected to be 1.5 to 2 lb/head/day. At the onset of the trial, the tubs were calibrated so that supplement consumption could be measured. The ingredient composition and actual nutrient analysis of the ESCAPE and ENERGY liquid supplements are shown in Table 1. A typical dry mix containing Bloat Guard (48 grams poloxalene/lb) and accepted mineral levels for wheat pasture was provided free-choice to all groups. Controls received the mineral mix alone.

The data were analyzed by analysis of variance with year and supplement type as the sources of variation. Supplement intake and average daily gain were the response criteria.

Results and Discussion

During the 2 years when this study was conducted, wheat forage was abundant. No significant interactions occurred between year and treatment; therefore, only main effects are shown. Average daily gains across all treatments were 2.48 and 2.58 lb/head/day in year 1 and year 2, respectively, suggesting that plane of nutrition provided by the wheat forage was exceptionally high. Average daily gain and supplement intake for each treatment are presented in Table 2. Calves receiving ENERGY and ESCAPE liquid supplements had slightly higher weight gains relative to the CONTROL treatment, but these differences were not significant (P=.91). Differences in consumption rate of the ESCAPE and ENERGY supplements were statistically similar as well (P=.88). Previous research evaluating high UIP protein supplementation for growing stocker cattle grazing wheat pasture has yielded variable results.

Assuming that wheat forage protein is 58 to 70% DIP and using the gain performance from our study, the NRC 1996 software determined that metabolizable protein requirements were exceeded by 20% with consumption of wheat forage alone. The availability of high quality, abundant wheat forage was sufficient over the two years this study to meet metabolizable protein requirements without feeding a liquid supplement containing UIP.

Table 1. Composition of Supplements (% as fed)

Supplement	Energy Control	Feathermeal/Bloodmeal
Ingredient		
Cane molasses	81.50	53.75
Feathermeal/bloodmeal		26.75
Water	12.50	13.50
Urea liquor	4.60	3.00
Ammonium sulfate	1.00	2.50
Propylene glycol	.40	.40
Xanthan gum	.10	.10
Calculated analysis (actual)		
Dry matter, %	57.5	67.3
Crude protein, %	9	30
Crude fat, %	.70	3.25
Crude fiber, %	1.00	1.00
Phosphorus, %	.10	.18
Calcium, %	.61	.72
Potassium, %	3.29	2.46
Calories/lb	903	1,165

Table 2. Performance and Liquid Supplement Intakes of Calves Grazing Wheat Pasture (pooled across year)

	Treatment		
Item	CONTROL[a]	ENERGY[b]	ESCAPE[c]
Daily gain, lb/day[d]	2.47	2.54	2.58
Supplement intake, lb/day[e]	--	1.47	1.40

[a]Control=mineral mix containing Bloat Guard.
[b]Energy=molasses-based liquid supplement.
[c]Escape=feathermeal/bloodmeal.
[d]P=.91.
[e]P=.88.