K-STATE Research and Extension

2025 SEREC AGRICULTURAL RESEARCH

Form of Supplement and Addition of Ionophore Effects on Steer Performance while Grazing Bromegrass – Year 2

J. K. Farney, J. Jacquez

Summary

Stocker steers were grazed on bromegrass from April to end of August and were supplemented with several different types of products. Treatment structure was a completely randomized design with five treatments. Treatments evaluated included mineral only (MIN); free-choice supplementation in a block format (Mintrate 40: BLOCK); and hand-fed supplement of corn:dried distillers grains at 0.25% of body weight on a dry matter basis offered three times per week (HAND). Additionally, ionophore (Rumensin; RU) was included in one block and one hand-fed supplement. Steers were weighed every 28 days while on grass. Steers received an ultrasound scan prior to placement in a feedlot. Monthly pastures were clipped to measure biomass. Steers that were hand-fed had greater ADG and were heavier at the end of the grazing period as compared with self-fed supplementation ($P = 0.02$). There was no difference in ADG, total gain, or final weight based on addition or not of an ionophore ($P > 0.37$). Hand-fed steers tended ($P = 0.07$) to have greater gains and final weight as compared to mineral only steers. There was no difference in gains between steers that were self-fed protein blocks as compared to MIN ($P = 0.78$). The gain advantages for hand feeding were observed by 84 d of grazing ($P = 0.03$). Steers that were supplemented tended to have greater muscle depth than MIN ($P = 0.07$) while there were no differences in marbling scores ($P > 0.27$) nor backfat thickness ($P > 0.52$) between any comparisons. There was no difference in available biomass between treatment groups ($P > 0.50$). Hand feeding supplements to cattle results in greater performance as compared to self-fed feeds evaluated. Cost of gain (COG), based on 2024 cost of products and assuming a 20-mile delivery, calculated to the lowest COG for MIN cattle, followed by hand-fed supplements, with the most expensive being the protein blocks. During the finishing period there were no differences in total gain, ADG, dry matter intake, nor feed to gain conversion for any treatments or specific comparisons ($P > 0.16$). However, the steers that were hand-fed supplements on grass were heavier at 140 days on feed as compared to self-supplemented steers ($P = 0.06$) and there was a tendency for steers that were supplemented on grass to have heavier weights at the end of feeding than those receiving only mineral ($P = 0.06$). Overall, if a producer was retaining ownership of calves through both the stocker and feedlot phase, they will gain an additional 46 pounds per head by supplementing with a corn:dried distillers grains delivered daily while in the stocker period over mineral only or a self-fed protein block.

Introduction

Supplementation is important in cattle production because it can (1) fill a need for a necessary nutrient; (2) allow increased gains on same acreage; (3) could allow for increased number of cattle on same acreage; (4) supply feed additives; (5) better monitoring of animals from a husbandry perspective; and (6) stretch forage supply, to name a few. Cattle management is different based on geographic location, access to labor, distance to cattle from feed source, forage types, and economic goals, and thus a variety of supplements for grazing cattle have been developed to meet operational objectives. Determining which supplement best fits an operation can be daunting. Therefore, the purpose of this study is to evaluate the effect on weight gain of stocker steers grazing bromegrass during the summer based on (1) method of supplementation (hand-fed versus self-fed); and (2) addition of ionophore into the supplement.

Methods

Twenty brome pastures were used at the Southeast Research and Extension Center in Parsons, KS. Pastures were fertilized in March based on recommendations from soil test for P and K and all pastures had 100 lbs N applied in 46-0-0 form.

Supplement specifics: The hand-fed supplement (HAND) is a 50:50 blend of cracked corn:dried distillers grains (DDG) with or without Rumensin (138 g/ton; HANDRU) fed at 0.25% of body weight daily, offered 3 times a week on Monday, Wednesday, and Friday. The block treatments were Mintrate 40 Red Block (ADM Alliance Nutrition; BLOCK) and the Mintrate Red RU (BLOCKRU). Blocks were fed free-choice to the steers and placed in bunks to contain all pieces of the block. The control (CON) treatment were steers that were fed a free-choice mineral (MIN).

Weekly, the blocks were weighed to estimate intake. A new block was added when less than ¼ of the old block remained in the feed tub.

Cattle specifics: Weaned and vaccinated steers (584 ± 10.2 lb) were used and stocked at four head per pasture on 5-acre pastures. There were four pastures of each treatment. To manage for rumen fill effects, four days before turnout steers were fed a 50:50 diet of wheat middlings and DDG at 2% of body weight for three full days. On days -1 and 0 (day of turnout) steers were weighed on two consecutive days and placed on brome pastures (May 23, 2024). Steers were wormed prior to turnout with a white wormer (Valbazen, Zoetis Inc.). During May, insecticide eartags were inserted. Steers received an ultrasound scan (Aloka 500 with CPEC feedlot software) to detect any differences in ribeye area, backfat, and marbling on the last day of the grazing period (September 24, 2024; 121 days on grass).

Feedlot specifics: Steers were placed in a feedlot at Mound Valley, KS; implanted with a terminal implant (Revalor XS), then placed on a step-up diet to reach a finishing diet. Steers were penned in feedlot by contemporary pasture group. The finishing diet (on DM basis) was 85% whole shelled corn, 10% corn silage, and 5% supplement (contains minerals, vitamins, urea, Tylan, and Rumensin). Steers were weighed every 28 days.

Results and Discussion

Grazing (stocker phase)

There was no difference in grazing ADG when comparing all the treatments ($P = 0.13$; Table 1). However, grazing ADG was affected by category of supplementation where hand-fed steers had a greater ADG than free-choice supplements ($P = 0.02$; Table 1). This advantage was observed after cattle had been on trial for 84 d and was maintained until reaching the feedlot ($P < 0.05$; Table 1) and resulted in heavier final weight off-grass ($P = 0.07$; Table 1). There was no difference in grazing ADG based on addition of ionophore ($P = 0.13$) nor was there a difference in ADG based on whether the calves were supplemented or received mineral only ($P = 0.13$). This result is slightly confusing, as the weighed average for the block fed calves was the same as the mineral calves and this treatment lowered the gain of "supplemented" calves so that we could not distinguish the difference in supplemented versus non. Ultrasound data at the end of the grazing period (d 121) indicated very few differences between the feeding systems. The only difference detected was a tendency ($P = 0.07$) for greater back fat in hand-fed calves.

Forage biomass

There was no difference in forage biomass production based on supplement ($P = 0.33$; Table 1). The amount of forage available was sufficient to meet animal needs and intakes.

Feedlot

The steers that were hand-fed started the feedlot phase numerically heavier in weight than other treatments, even though it was not statistically significant. During the feeding period, there was no difference in ADG, total gain, gain to feed, nor dry matter intake based on stocker supplement system. However, the numerically heavier steers that were hand-supplemented on grass did have significantly heavier weights at 140 days on feed as compared to BLOCK and MIN treatments, with BLOCKRU being intermediate ($P = 0.03$; Table 1). This heavier weight at 140 days on feed resulted in whole system gains being larger for HAND than MIN and BLOCK treatments ($P = 0.09$; Table 1) with BLOCKRU and HANDRU being intermediate.

Table 1. Steer gain and carcass measures during the grazing, feedlot, and entire system

Item	*P*-value					SEM[4]	Trt[5]	Supp vs No[6]	Hand vs Self[7]	Ion.[8]
	CON[1]	BLOCKk[2]	BLOCKRU[2]	HAND[3]	HANDRU[3]					
Start weight, lb	584	585	586	582	587	11	0.99	0.93	0.95	0.74
Final grazing weight, lb	759	750	762	792	800	21	0.39	0.49	0.07	0.63
Grazing gain, lb	175	164	174	208	212	20	0.37	0.54	0.06	0.72
Grazing ADG, lb/d	1.45	1.36	1.44	1.72	1.76	0.16	0.13	0.37	0.02	0.39
Final feedlot weight, lb	1313[c]	1323[bc]	1341[abc]	1406[a]	1390[ab]	25	0.03	0.06	0.01	0.97
Feedlot ADG, lb/d	4.00	4.1	4.14	4.41	4.19	0.13	0.29	0.17	0.19	0.50
Feedlot gain, lb	560	575	581	618	587	18	0.29	0.16	0.19	0.50
Dry matter intake, lb/hd/d	23.3	24.6	23.9	24.6	24.0	0.9	0.78	0.35	0.96	0.46
Feed:Gain	4.07	4.21	4.04	3.91	4.01	0.03	0.67	0.90	0.28	0.85
System ADG, lb/d	2.82	2.83	2.88	3.16	3.13	0.03	0.09	0.13	0.02	0.98
System gain, lb	735[b]	739[b]	752[ab]	826[a]	826[ab]	8	0.09	0.13	0.02	0.98
Back fat, mm	4.20	3.94	3.64	3.90	4.02	0.54	0.98	0.57	0.95	0.87
Marbling[9]	4.92	4.91	5.04	4.86	5.11	0.16	0.82	0.76	0.89	0.28
Loin depth, mm	46.8	49.1	48.9	51.5	49.1	1.4	0.27	0.07	0.13	0.840
Pasture biomass, DM lb/acre	5851	6300	6920	6605	5809	429	0.33	0.26	0.36	0.84

[abcd]Values indicate treatment differences within row with $P < 0.05$.

[1]CON: control treatment received free choice mineral (Wildcat Feed, LLC).

[2]BLOCKk: Mintrate 40 block (ADM Alliance Nutrition) and BlockRU: Mintrate RedRU block includes Rumensin at 300 g/ton (ADM Alliance Nutrition).

[3]HAND: 50:50 blend of dried distillers grains (DDG) and cracked corn offered at 0.25% of body weight, 3 times per week (Monday, Wednesday, and Friday) and HandRU: 50:50 blend of DDG and cracked corn with Rumensin as 139 g/ton offered at 0.25% of body weight, 3 times per week (Monday, Wednesday, and Friday).

[4]SEM: standard error of means.

[5]Trt: *P*-value comparison between all 6 treatments.

[6]Supp. vs. No: *P*-value comparison non-supplemented (CON) and supplemented (MIX30, Block, BlockRU, Hand, and HandRU).

[7]Hand vs. Self: *P*-value comparison between free-choice treatments (MIX30, Block, BlockRU) and hand-fed treatments (Hand and HandRU).

[8]Ion.: *P*-value comparison between treatments with ionophore (BlockRU and HandRU) or without ionophore (Block and Hand).

[9]Ultrasound marbling score: 5.0-5.9 is Small 00-90 (CUP labs, 2007; https://www.cuplab.com/Files/content/V.%201%20IMF%20or%20Marbling%207-1-07.pdf).

[10]U.S. Department of Agriculture marbling scores: 300-399: Slight 0-90; 400-499: Small 0-90; and 500-599: Modest 0-90.