EFFECTS OF SPRING PASTURE BURNING, PASTURE DEWORMING, AND GRAIN SUPPLEMENTATION ON PERFORMANCE OF STOCKER STEERS GRAZING NATIVE FLINTHILLS PASTURE

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Summary

A grazing study was conducted using 445 crossbred beef steers (496 lb) to determine the benefits of feeding a grain-based supplement on burned and unburned native pasture, with and without a Safe-Guard[2] (fenbendazole) treatment while on pasture. Treatments consisted of mineral only, mineral with Safe-Guard treatment at day 29, and a supplement based on dry-rolled corn with a Safe-Guard treatment on day 29. All three treatments provided GainPro[3] to the steers. Twelve pastures were used, six that were burned and six that were not burned during the month before the start of the trial. The control pastures were stocked at 272 lb per acre; the pastures with cattle receiving supplements were stocked at 312 lb per acre, 15% more than controls. Cattle grazing burned pastures had greater daily gains (1.81 vs. 1.65 lb/day; P=0.05) and gained 9 lb more per acre (85 vs. 76 lb/acre; P=0.03) than those grazing unburned pastures. Supplementation with grain mix improved the pounds of gain per acre, compared with cattle not receiving supplement (95 vs. 76 lb/acre; P<0.01). Steers treated with Safe-Guard while on pasture tended to have greater daily gains (1.73 vs. 1.61; P=0.17) and gained slightly more weight per acre, but this increase was not significant (P=0.24). Analysis of fecal samples indicated that deworming while on pasture did not reduce the average number of eggs shed per animal, but did increase the percentage of steers shedding no eggs.

Introduction

Providing supplemental energy to grazing steers is an effective way to increase animal performance while also increasing stocking density. Grain supplements also provide a means to include growth promotants into the diet. GainPro (bambermycins) is a growth promotant that is a non-ionophore antibiotic. GainPro can improve efficiency of ruminal fermentation of forage, as well as enhance amino acid digestibility and increase nutrient uptake in the small intestine. This product is commonly fed to range and backgrounding cattle to improve performance. One of the goals of this study was to compare daily gain of steers receiving mineral that contained GainPro with that of steers receiving a grain mix supplement that contained GainPro.

Deworming of grazing cattle is an important management practice that improves animal health and appetite, and can increase performance. Ivomec® pour-on is used externally to protect cattle from internal as well as external parasites, and Safe-Guard (fenbendazole)

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[1]Land O'Lakes Purina Feed, Longview Animal Nutrition Center, Gray Summit, MO.
[2]Safe-Guard is a registered trademark of Hoechst Celanese Corporation.
[3]GainPro is a registered trademark of Intervet International.

is an oral dewormer used strictly for internal parasite control. Another goal of this study was to measure the effects on performance of grazing steers when dewormed with Safe-Guard 29 days after treating them with Ivomec® pour-on, to determine the frequency of deworming that might be advantageous for stocker cattle in this area.

Burning native range in the spring of the year is a management tool that increases grass quality and controls brush. Due to inclement weather in April of 2004, only the south half of the Kansas State University research pastures could be burned in a safe and controlled manner, which left the north half unburned. This provided an opportunity to compare animal performance on burned and unburned pastures.

Experimental Procedures

Four hundred forty-five crossbred beef steers of Oklahoma origin were used in this experiment (496 lb initial body weight). Upon arrival the steers were identified, weighed, randomized, and assigned to treatment according to weight and breed. Ivomec® pour-on, Vision 7® (clostridial vaccine), Revalor®-G (growth promoting implant), and Titanium® 5 (5-way viral vaccine) booster were given to all steers.

The grazing season began on May 17 and ended on August 4. The steers were assigned to three treatments, with four replicates per treatment. Treatments were divided across burned and unburned pastures. The first treatment consisted of free-choice mineral containing GainPro and white salt blocks (control). The second treatment consisted of free-choice mineral containing GainPro and white salt blocks, as well as a Safe-Guard treatment on day 29 of the grazing period (June 15) (SG). The third treatment was a grain-based protein/energy/mineral supplement containing GainPro, with a Safe-Guard treatment at day 29 (SGGRAIN). The grain mix consisted of a protein supplement blended with dry-rolled corn. As the trial progressed, the percentage of protein supplement in the grain mix was increased relative to the rolled corn to offset the declining protein content of the grass. Protein content of the grain mix ranged from 12% at the beginning to 22% at the end of the study. The steers were allowed access to the grain mix through a self-feeder. Grain-mix consumption was controlled with a proprietary intake regulator, along with feeder gate adjustment. Separate free-choice mineral (containing 8% phosphorus) and free-choice white salt blocks were available in each pasture receiving the grain mix.

Salt blocks and the contents of the mineral feeders were weighed weekly to measure intake. Target intake rates of GainPro were between 10 mg and 20 mg per steer daily across all treatments. For treatments receiving mineral only, we moved the mineral feeders relative to the water source, and added or removed white salt blocks as necessary to achieve appropriate intake of GainPro.

On day 27 and 28, all steers received a blend of rolled corn, molasses, and CTC-50 to combat a widespread outbreak of pinkeye. On days 29 and 30, steers receiving the SG and SGGRAIN treatments received a blend of Safe-Guard mineral and rolled corn. This mixture was blended at a ratio of 0.5 lb of Safe-Guard mineral to 2 lb of rolled corn, and was fed at a rate of 2.5 lb per steer to deliver 5 mg fenbendazole/kg of body weight. The steers were presented with the entire recommended amount of dewormer blend on day 29, and any of the feed that was not consumed on the first day was saved, mixed with dry molasses, and presented again on day 30, at which time it was consumed. Control cattle received an equal amount of corn on day 29 to equalize energy across treatments.

Fecal samples were collected from steers (control and SG treatments only) on day 29, before feeding Safe-Guard, to determine if

internal parasite eggs were present after the Ivomec® treatment on day 0. Fecal samples were also collected on day 51 to determine the effect of the Safe-Guard treatment on days 29 and 30.

At the end of the grazing period, steers were gathered according to the treatment block of burned and unburned pastures. On the evening of day 80, steers from all of the unburned pastures were gathered, penned overnight without feed and water, and weighed individually on the next morning. On the evening of day 81, steers from the burned pastures were gathered and handled in the same manner.

Results and Discussion

There were no significant treatment by pasture burning interactions for gain per acre or for daily gains. Steers grazing burned pastures had greater average daily gains, total weight gain, and gain per acre than did those grazing unburned pastures, when compared across treatments (Table 1).

Although grain supplementation did not increase daily gain statistically (Table 2; P=0.19), the numeric increase was 0.12 lb/day, indicating a marginal advantage in average daily gain to grain-based supplementation within either pasture condition. Because steers receiving SGGRAIN consumed 1.86 lb/day of the grain mix, conversion of the grain mix to gain was 15.5:1. Because stocking rate was greater for SGGRAIN than for SG or control pastures, gain per acre was 19 lb/acre greater for SGGRAIN than for SG (P<0.01).

Steers treated with Safe-Guard while on pasture tended to have greater average daily gain than those not receiving Safe-guard (1.73 vs. 1.61 lb/day for SG vs. control; P=0.17). Fecal egg counts showed no differences between the control steers and those that received Safe-Guard, either before or after the Safe-Guard treatment (Table 3). More of the steers receiving Safe-Guard, however, had zero eggs present on day 51 (P=0.04), indicating a response to the Safe-Guard. In light of the difficulty in achieving consumption of the Safe-Guard mix by the steers, it is likely that consumption of the grain mix containing Safe-Guard was variable among animals, and this may have prevented thorough deworming of steers that did not consume adequate amounts of the product.

Table 1. Grazing performance of steers on burned and unburned pastures

	Burned Pastures	Unburned Pastures	SEM
Number of steers	181	261	-
Number of pastures	6	6	-
Stocking rate, lb/acre	291	288	-
Starting weight, lb	497	495	0.58
Final shrunk weight, lb	643	627	3.45
Average daily gain, lb	1.81	1.65	0.05
Gain per acre, lb	85	76	2.19

Table 2. Grazing performance of steers receiving a mineral supplement, without (control) or with Safe-Guard treatment on day 29 (SG), or a grain-based supplement with Safe-Guard treatment on day 29 (SGGRAIN)

	Mineral Supplement		Grain Supplement	
Item	Control	SG	SGGRAIN	SEM
Number of steers	133	122	187	-
Number of pastures	4	4	4	-
Stocking rate, lb/acre	273	271	315	-
Starting weight, lb	497	496	496	0.71
Final shrunk weight, lb	626	635	644	4.23
Average daily gain, lb	1.61	1.73	1.85	0.06
GainPro intake, mg/steer daily	17.3	13.7	22.2	1.80
Grain-mix intake, lb/steer daily	-	-	1.86	0.030
Grain-mix conversion	-	-	15.5	-
Gain per acre, lb	71	76	95	2.7

Table 3. Egg counts from fecal samples collected before and after Safe-Guard treatment

	Treatment			
Item	Control	SG[1]	SEM	P-value
Fecal egg counts, eggs/3 grams				
Pre-treatment (day 29)	64	69	10.9	0.75
Post-treatment (day 51)	38	36	7.0	0.77
% with zero eggs	10	29	4.4	0.04

[1]SG = Safe-Guard treatment on day 29.