



Pasture Medicated Feed Additive Comparison

Efficacy of ionophores and antibiotic medicated feed additives on growth and health of stocker cattle grazing pasture or rangeland.

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Summary

Aureomycin[®], Bovatec[®], Gainpro[®] and Rumensin[®], four medicated feed additives approved for use in cattle grazing pasture and rangeland, were included in digestible fiber based supplements at optimal levels to compare their effects on cattle health and performance. Difference in cattle performance were not detected ($P > 0.20$) in the small (4 acre) improved forage pastures grown under center-pivot irrigation in the sandhill area of Nebraska. Foot rot was noted in all treatment groups (Bovatec = 4; Gainpro = 2; Rumensin = 1) except those receiving Aureomycin; however, differences among treatment groups were not significant. Likewise, differences in cattle performance and health were not detected ($P > 0.10$) in the large (140 - 160 acre) short grass native range pastures used in eastern Colorado. Large pastures appear to amplify supplement consumption differences among treatment groups. Steers in eastern Colorado consumed more of supplements containing Aureomycin, Bovatec, or Gainpro than the supplement containing Rumensin. Additional beneficial characteristics of individual medicated feed additive products must be considered when selecting a feed additive for use in a pasture supplementation program and not just the magnitude of growth response.

Introduction

Medicated feed additives are widely used in supplements provided to yearling cattle grazing pasture and rangeland to improve the efficiency of forage resource utilization, enhance cattle performance, improve cattle health and ultimately improve profitability of cattle grazing operations. Four medicated feed additives, two ionophores (Bovatec and Rumensin) and two antibiotic medicated feed additives (Aureomycin and Gainpro) have approvals that allow their use in grazing situations. However, comparisons of the health and performance benefits from all medicated

feed additives have not been conducted. The objective of these experiments was to evaluate the efficacy of ionophores and antibiotic medicated feed additives on growth and health of stocker cattle grazing high quality improved pasture and variable quality native rangeland.

Experimental Methods

Two studies were conducted to evaluate the performance and health of yearling heifers and steers supplemented with commercial supplements containing one of the four approved medicated feed additives that can be used in cattle grazing pastures and rangeland. Common treatments of 350 mg of Aureomycin, 200 mg of Bovatec, 20 mg of Gainpro and 200 mg of Rumensin per head per day were formulated into commercially produced pelleted digestible fiber based supplements designed to complement forage conditions at each location. One study was conducted in the sandhill area of north central Nebraska using small pastures composed of improved forage species under a center-pivot irrigation system. The other study was conducted in large pastures located in eastern Colorado composed of native cool and worm season forage species.

The Nebraska location used 160 yearling, British crossbred spayed heifers (avg. initial wt. 556 lb), randomly allotted to one of four treatment groups. Heifers were placed into groups consisting of eight animals/group with each treatment replicated in five paddocks. Heifers grazed 4 acre pastures consisting of improved mixed-species cool season grasses (7.7% birdfoot trefoil, 7.7% Garrison creeping foxtail, 23% Oathe intermediate wheat grass, 30.8% smooth brome grass, 30.8% Sterling orchard grass) which were grown under center-pivot irrigation. Nutrient analysis of clipped forage samples confirmed that forage remained in good to excellent quality throughout the 99 day summer grazing season (early June until early September).

All supplements were group fed daily to provide one pound of supplement per head per day. Ingredient composition and calculated nutrient content of the supplement is shown in Table 2. Samples from each supplement were analyzed for respective medicated feed additives to insure that additives were present at formulation levels. Heifers also received 4 oz/hd/day of mineral supplement fed with the daily concentrate supplement resulting in a total supplement intake of 1.25 lb/hd/day. During the final three weeks of the study, an additional one lb/hd/d of non-medicated supplement was provided to insure adequate forage availability and maintain a desired growth rate in the cattle.

Table 1. Composition of medicated supplements from Nebraska site

Ingredient	% of Dry Matter
Soybean hulls	40.0
Grain mix	25.0
Limestone	15.0
Wheat midds	10.0
Bentonite	5.0
Liquid fat	4.0
Medicated premix ^a	1.0
Calculated Supplement Nutrient Content	
Crude protein, %	8.0
Crude fiber, %	16.0
Calcium	6.0

^a Bovatec and Rumensin = 400 g/ton; Gainpro = 40 g/ton; Aureomycin = 700 g/ton.

The Colorado location used 400 yearling steers purchased from ranches in Nebraska and Oklahoma with an average initial weight of 581 lb. Steers were randomly allotted to treatment groups consisting of 100 animals. Cattle were placed on pasture May 30 and 31 by randomly allotting cattle to specific pasture groups consisting of 25 head each. Steers grazed short grass native range pastures typical of the central and southern Great Plains region that were approximately 140 to 160 acre in size. Native pastures consisted primarily of blue grama, buffalograss, and western wheat grass. Steers were rotated among four pastures comprising a block at approximately two-week intervals to reduce potential bias due to an individual pasture. As typical of native rangeland, forage quality was high at study initiation and declined as the 124 day summer grazing season progressed. Interim body weight measurements were not collected across all blocks.

All supplements were group fed daily to provide one pound of supplement per head per day. Ingredient composition and nutrient content of the supplement is shown in Table 2. All medicated supplements were manufactured and pelleted at a commercial feed mill as one batch. Samples were collected for medicated feed additive analysis to insure that supplements supplied the correct amount of each additive. If the amount of supplement in the feed bunks accumulated to an excessive amount, it was removed and weighed.

Table 2. Composition of supplements from Colorado site.

Ingredient	% of Dry Matter
Dehydrated alfalfa	31.0
Wheat midds	53.3
Salt	10.0
Trace mineral premix	5.0
Medicated premix	2.0
Calculated nutrient content	
Crude protein, %	17.0
Calcium, %	1.40
Phosphorus, %	0.60

Results

Body weight and growth rate data were analyzed from the Nebraska study site as a completely randomized design and from the Colorado site as a randomized block design. Initial and final weight data from both locations are shown in Table 3. Medicated feed additive treatment did not affect interim weight ($P > 0.90$) at the Nebraska location or final weight ($P > 0.10$) at either study location.

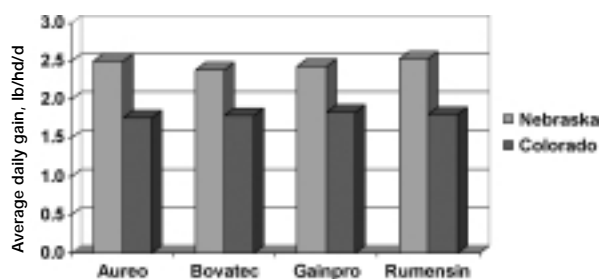
Table 3. Effects of medicated feed additives on interim and final body weight of heifers and steers grazing pasture in Nebraska and Colorado.

Item	Treatment				SE	Prob>F
	Aureomycin	Bovatec	Gainpro	Rumensin		
Nebraska						
Initial wt, lbs	547.2	564.7	555.9	560.1	10.2	0.893
Interim wt, lbs	690.9	708.0	700.0	704.9	11.4	0.917
Final wt, lbs	794.4	800.9	796.6	810.4	10.9	0.752
Colorado						
Initial wt., lb	578.2	580.3	584.0	582.0	5.3	
Final wt., lb	803.8	809.2	817.8	814.1	8.0	

Average daily gain measurements from the Nebraska and Colorado study locations are shown in Figure 1. Difference in average daily gain (ADG) resulting from

medicated feed additive treatments, were not observed in the small improved pastures at the Nebraska site ($P > 0.20$) or the large short grass native range pastures at the Colorado site ($P > 0.10$).

Figure 1. Effects of medicated feed additives on average daily gain of heifers and steers grazing pasture or rangeland in Nebraska and Colorado.



During both studies cattle were observed on a daily basis for health problems such as bovine respiratory disease, anaplasmosis, coccidiosis and foot rot. Neither location noted significant incidence of bovine respiratory disease (Nebraska site noted 0 BRD; Colorado site noted one death from chronic pneumonia), anaplasmosis or coccidiosis. At the Nebraska location, heifers were treated for foot rot in the Bovatec (4), Gainpro (2), and Rumensin (1) treatment but not in the Aureomycin treatment group.

The large pastures used in Colorado resulted in the need to weigh unconsumed supplement; whereas, the heifers

in the small pastures in Nebraska completely consumed their supplement each day. This effect is likely the result of differences pasture size rather than forage condition difference at the two locations. In small pasture environments cattle tend to socialize around water and supplement feeding locations often in close proximity to each other. However, in less densely populated large pasture environments supplement location may be further from water in an attempt to redistribute grazing pressures. In large pastures at the Colorado location, steers consumed more supplement containing Aureomycin (0.85 lb/d), Bovatec (0.92 lb/d) and Gainpro (0.86 lb/d) than supplement containing Rumensin (0.69 lb/d).

Implications

The results of these studies demonstrate the challenges of differentiating medicated feed additives approved for use in grazing cattle on the basis of animal performance. Study sites used to evaluate medicated feed additive program represent the extreme variation in pasture and range conditions typical of summer grazing programs in the Great Plains region. Regardless of forage quality, forage availability and stocking density, differences in cattle performance were not noted among medicated feed additive programs. Additional beneficial characteristics of individual medicated feed additives, such as control of bovine respiratory, control of anaplasmosis, and prevention and control of coccidiosis, must be considered when selecting a medicated feed additive for use in pasture supplementation conditions.

