Kansas Agricultural Experiment Station Research Reports

Volume 0
Issue 1 *Cattleman's Day (1993-2014)*

Article 394

2000

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Abstract

One hundred sixty-four crossbred beef steers were used to determine optimal Rumensin ® concentrations in limit-fed, high-energy, growing diets. Diets contained 30, 40, or 50 grams of Rumensin per ton of dry matter (R30, R40, and R50). Average daily gain and feed efficiency during the growing phase were not different (P>.80) among treatments. Steers that received R50 in the growing phase had the highest average daily gains during the finishing phase (P<.05). This resulted in heavier carcass weights for R50 than R30 (P<.05) and R40 (P<.12). Feed efficiencies during the finishing phase were not different among treatments (P>.40).

Keywords

Cattlemen's Day, 2000; Kansas Agricultural Experiment Station contribution; no. 00-287-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 850; Beef; Rumensin; Limit feeding; Finishing cattle

Authors

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INCREASING LEVELS OF RUMENSIN® IN LIMIT-FED, HIGH ENERGY, GROWING DIETS FOR BEEF STEERS AND EFFECTS ON SUBSEQUENT FINISHING PERFORMANCE

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Summary

One hundred sixty-four crossbred beef steers were used to determine optimal Rumensin® concentrations in limit-fed, high-energy, growing diets. Diets contained 30, 40, or 50 grams of Rumensin per ton of dry matter (R30, R40, and R50). Average daily gain and feed efficiency during the growing phase were not different (P>.80) among treatments. Steers that received R50 in the growing phase had the highest average daily gains during the finishing phase (P<.05). This resulted in heavier carcass weights for R50 than R30 (P<.05) and R40 (P<.12). Feed efficiencies during the finishing phase were not different among treatments (P>.40).

(Key Words: Rumensin, Limit Feeding, Finishing Cattle.)

Introduction

Currently, Food and Drug Administration regulations limit Rumensin to not more than 30 grams per ton of diet. Although this level is adequate to enhance growth and increase feed efficiency in cattle feeding ad libitum, it may be less than optimum when cattle are fed restricted amounts of high-concentrate growing diets. This study was to determine if levels of Rumensin higher than those currently approved by the FDA, when added to limit-fed, high-energy, growing diets, would increase average daily gain and feed efficiency of cattle during the growing phase and subsequent finishing period.

Experimental Procedures

One hundred sixty-four crossbred beef steers weighing 574 lb were used in a randomized complete block design experiment. They had ad libitum access to a common diet for 14 days preceding the growing study to minimize differences in gastrointestinal tract fill. Steers were blocked by weight and allotted to pens containing five to seven animals per pen, with nine pens per treatment. Growing diets (Table 1) provided 30, 40, or 50 grams of Rumensin per ton (DM basis). Diets were fed once daily at 1.8% of body weight (DM basis) for 88 days. Intakes were adjusted weekly, assuming an average gain of 2 lb per head daily. Prior to obtaining final weights for the growing phase, cattle had ad libitum access to a common diet for 14 days. At the end of the growing phase, steers were placed onto a common finishing diet, fed for 101 days, and then slaughtered. The final finishing diet (Table 1) contained 30 grams of Rumensin per ton (DM basis) and was offered once daily for ad libitum feeding. Steers were weighed approximately every 28 days throughout the entire 203-day growing-finishing trial.

Results and Discussion

Increasing the level of Rumensin in limit-fed, high-energy, growing diets did not affect weight gain or feed efficiency (P>.80) during the growing phase, which suggests that 30 grams of Rumensin per ton were sufficient to elicit maximal growth response.

[1]Department of Statistics.

During the finishing phase, average daily gain was greater (P>.05) for steers fed R50 during the growing phase than for steers fed R40 or R30. This resulted in heavier carcass weights for steers fed R50 than those fed R30 (P<.05) or R40 (P<.12). Feed efficiency during the finishing phase improved numerically as concentration of Rumensin during the prior growing phase increased, but these differences were not significant (P>.40). Including higher concentrations of Rumensin in limit-fed, high-energy, growing diets may increase subsequent average daily gain and carcass weight in the finishing period.

Table 1. Experimental Diets (% of Dry Matter)

	Growing Diet			
Ingredient	R30	R40	R50	Finishing
Steam-flaked corn	65.08	65.11	65.13	81.98
Alfalfa hay	20.53	20.54	20.55	6.57
Soybean meal	5.35	5.32	5.28	2.73
Cane molasses	3.77	3.77	3.77	3.70
Tallow	2.04	2.04	2.04	2.01
Urea	1.13	1.13	1.12	1.17
Limestone	.95	.94	.94	1.14
Sodium chloride	.39	.39	.39	.28
Potassium chloride	-	-	-	.04
Ammonium sulfate	.10	.10	.10	.19
Calcium phosphate	.58	.57	.57	.11
Vitamin/trace mineral premix[1]	.10	.10	.11	.08
Rumensin, grams/ton	30	40	50	30
Tylan, grams/ton	-	-	-	10
Crude protein, analyzed	16.7	16.7	16.7	14.5

[1]Vitamin/trace mineral premix formulated to provide (total diet dry matter): 1,470 IU/lb vitamin A, .05 p.m. cobalt, 10 p.m. copper, .62 p.m. iodine, 60 p.m. manganese, .30 p.m. selenium, and 60 p.m. zinc.

Table 2. Performance during the Growing Phase for Cattle Fed High Concentrate Diets Containing 30, 40, or 50 grams/ton Rumensin

	Growing Diet			
Item	R30	R40	R50	SEM
No. of steers	56	52	56	
Initial weight, lb	576	578	571	8.4
Final weight, lb	855	863	853	12.3
Dry matter intake, lb/day	12.7	12.7	12.6	.16
Average daily gain, lb	2.74	2.79	2.76	.056
Gain:feed	.217	.220	.220	.0036

Table 3. Finishing Performance and Carcass Characteristics Following a Growing Period during Which Cattle Were Fed Diets Containing 30, 40, or 50 grams/ton Rumensin

	Previous Growing Diet			
Item	R30	R40	R50	SEM
No. of steers	55	52	52	
Initial weight, lb	853	862	859	12
Dry matter intake, lb/day	20.7[a,b]	20.3[a]	21.5[b]	.38
Average daily gain, lb	3.14a	3.15[a]	3.38[b]	.059
Gain:feed	.152	.155	.158	.0034
Hot carcass weight, lb	758[a]	762[a,b]	778[b]	6.8
Ribeye area, in^2	12.8	12.8	13.1	.22
Fat thickness, in	.44	.45	.46	.021
Kidney, pelvic & heart fat, %	2.2	2.2	2.2	.053
Liver abscesses, %	2	11	2	3.8
Yield grade 1, %	9	10	3	3.7
Yield grade 2, %	34	37	35	5.2
Yield grade 3, %	53[a,b]	41[a]	57[b]	5.4
Yield grade 4 & 5, %	3[c]	14[d]	5[c,d]	4.3
Marbling score[e]	Sl[82]	Sl[75]	Sl[82]	6.0
USDA Choice, %	47	44	53	6.9
USDA Select, %	47	53	45	6.0
USDA Standard, %	2	2	2	2.0
Dark cutters, %	4	1	-	2.0

[a,b]Means within same row without a common superscript differ (P<.05).

[c,d]Means within same row without a common superscript differ (P<.10).

[e]Sl=Slight.