RUMENSIN®-TYLAN® COMBINATIONS IN LIMIT-FED GROWING DIETS: EFFECTS ON GROWING AND FINISHING PERFORMANCE AND CARCASS CHARACTERISTICS

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Summary

Five hundred seventy-two crossbred beef heifers were used to compare gain and feed efficiency of cattle consuming restricted quantities of energy-dense growing diets containing varying concentrations of Rumensin® and Tylan®. Growing treatments consisted of providing Rumensin at 30 grams per ton of dry matter (R30), or 250 mg per head per day (R250). A third treatment consisted of a Rumensin/Tylan combination, providing 250 and 90 mg per head per day of Rumensin and Tylan, respectively (R250/T90). Average daily gain and feed efficiency during the growing phase were not different (P>0.90) among treatments. Heifers that received R250/T90 during the growing phase exhibited lower dry matter intakes (P<0.05) during the finishing phase. Although not significant (P>0.50), R250/T90 increased finishing-phase feed efficiency by 6.1 and 3.5% compared to R30 and R250, respectively. Liver abscesses were lower (P<0.10) for R250/T90 and R30 than R250.

(Key Words: Rumensin, Tylan, Limit Feeding.)

Introduction

Food and Drug Administration regulations currently limit Rumensin concentrations to not more than 30 grams per ton of diet (90% dry basis). Although this level is adequate to enhance growth and increase feed efficiency in cattle fed *ad libitum*, it may be less than optimum when cattle are fed restricted amounts of high-concentrate growing diets. Furthermore, cattle grown on high-concentrate diets and then subsequently fed finishing diets are subjected to prolonged periods of high grain intake. Feeding high-grain diets for extended periods may predispose cattle to ruminitis, thus increasing the incidence of liver abscesses. This study was conducted to determine if higher levels of Rumensin as well as the use of Tylan in limit-fed, high-energy growing diets would improve cattle performance during the growing phase and subsequent finishing period.

Experimental Procedures

Five hundred seventy-two crossbred beef heifers weighing 593 lb were used in a randomized complete block design. Heifers were fed a common diet *ad libitum* for 14 days preceding the growing study to minimize differences in gastrointestinal tract fill. Heifers were blocked by weight and allotted to pens containing 47 to 48 animals per pen, with four pens per treatment. Growing diets (Table 1) provided 30 grams of Rumensin per ton (dry matter basis), 250 mg of Rumensin per head per day, or 250 mg of Rumensin plus 90 mg of Tylan per head per day. Diets were fed once daily at 1.6% of body weight (dry matter basis) for 99 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 were provided *ad libitum* access to a common diet for 14 days. Heifers were then stepped up to a common finishing diet, fed for 80 days, and slaughtered. The final finishing diet provided 300 mg of Rumensin

[1]Elanco Animal Health, Indianapolis, IN.

and 90 mg of Tylan per day and was fed once daily *ad libitum*.

Results and Discussion

Increasing Rumensin intake of heifers consuming limit-fed growing diets did not effect weight gain or feed efficiency (P>0.90) during the growing phase (Table 2), which suggests that 30 grams of Rumensin per ton was sufficient to elicit maximal growth response. Heifers receiving the R30 treatment averaged 168 mg of Rumensin per head per day. Finishing average daily gains were not significantly different (P>0.80) among treatments (Table 3). Finishing dry matter intakes were lower (P<0.05) for heifers that had received R250/T90 during the growing phase, resulting in a numerical improvement in feed efficiency compared to R30 and R250 (6.1% and 3.5% respectively). Liver abscesses were lower (P<0.10) for R250/T90 and R30 compared to R250, and the percentage of yield grade 2 carcasses was greater (P<0.05) for R250/T90 compared to R30. The results of this study suggest that feeding 250 mg of Rumensin as well as 90 mg of Tylan per day to heifers consuming limit-fed, high-energy growing diets may reduce dry matter intake during the subsequent finishing period without negatively affecting gain.

Table 1. Experimental Diets (% of Dry Matter)

	Growing[1]			
Ingredient	R30	R250[2]	R250/T90[3]	Finishing[4,5]
Steam-flaked corn	66.4	67.8	67.8	80.7
Alfalfa hay	14.7	15.0	15.0	6.8
Soybean meal	8.5	8.7	8.7	3.0
Cane molasses	3.9	4.0	4.0	4.4
Tallow	2.1	2.1	2.1	2.1
Urea	1.1	1.1	1.1	1.3
Limestone	1.0	1.0	1.0	1.2
Sodium chloride	0.4	0.4	0.4	0.3
Potassium chloride	-	-	-	0.1
Ammonium sulfate	-	-	-	0.2
Calcium phosphate	0.3	0.3	0.3	0.1
Vitamin/trace mineral premix	0.1	0.1	0.1	0.1
Rumensin premix	2.1	-	-	-
Rumensin	30 g/ton	250 mg/day	250 mg/day	300 mg/day
Tylan	-	-	90 mg/day	90 mg/day
Melengestrol Acetate	-	-	-	.5 mg/day
Crude protein, analyzed	15.8	16.0	16.0	14.5

[1]Vitamin/trace mineral premix formulated to provide (total diet dry matter): 1,200 IU/lb vitamin A, 0.1 ppm cobalt, 10 ppm copper, 0.6 ppm iodine, 60 ppm manganese, 0.3 ppm selenium, and 60 ppm zinc.
[2,3] Rumensin/Tylan supplement fed at 0.22 lb per head per day (dry matter basis).
[4]Vitamin/trace mineral premix formulated to provide (total diet dry matter): 1,200 IU/lb vitamin A, 0.1 ppm cobalt, 8 ppm copper, 0.5 ppm iodine, 50 ppm manganese, 0.3 ppm selenium, and 50 ppm zinc.
[5]Rumensin/Tylan/Melengestrol Acetate supplement fed at 0.44 lb per head day (dry matter basis).

Table 2. Performance During the Growing Phase for Heifers Limit-Fed Growing Diets Providing 30 Grams/Ton of Rumensin (R30), 250 mg of Rumensin per Heifer Daily (R250), or 250 mg of Rumensin plus 90 mg of Tylan per Heifer Daily (R250/T90)

	Growing Diet			
Item	R30	R250	R250/T90	SEM
No. of heifers	190	192	190	
Initial weight, lb	595	587	596	13.1
Final weight, lb	811	801	811	13.0
Dry matter intake, lb/day	11.2	11.3	11.4	0.20
Average daily gain, lb	2.18	2.16	2.17	0.04
Feed:gain	5.15	5.21	5.24	0.15

Table 3. Finishing Performance and Carcass Characteristics Following a Growing Period During Which Heifers Were Fed Diets Providing 30 Grams/Ton of Rumensin (R30), 250 mg of Rumensin per Heifer Daily (R250), or 250 mg of Rumensin plus 90 mg of Tylan per Heifer Daily (R250/T90)

	Previous Growing Diet			
Item	R30	R250	R250/T90	SEM
No. of heifers	190	192	190	
Initial weight, lb	811	801	811	13.0
Final weight, lb[1]	1054	1044	1049	14.7
Dry matter intake, lb/day	20.0[a]	19.5[a]	18.4[b]	0.32
Average daily gain, lb	3.04	3.05	2.98	0.10
Feed:gain	6.55	6.39	6.17	0.26
Hot carcass weight, lb	675	669	672	9.4
Dressing percentage[2]	61.5	61.5	61.5	0.1
Ribeye area, in[2]	12.8	12.8	12.7	0.2
Fat thickness, in	0.40	0.39	0.37	0.02
Kidney, pelvic & heart fat, %	2.2	2.2	2.2	0.05
Liver abscesses, %	0.5[e]	4.2[f]	1.0[e]	1.1
Yield grade 1, %	18	16	11	3.0
Yield grade 2, %	38[a]	43[a,b]	50[b]	3.6
Yield grade 3, %	41	39	35	3.9
Yield grade 4 & 5, %	3	2	4	2.0
Marbling score[g]	Sl[79]	Sl[82]	Sl[77]	6.3
USDA Prime, %	0.5	1	0	0.46
USDA Choice, %	47	44	45	4.4
USDA Select, %	47	50	48	3.8
USDA Standard, %	5	5	7	1.4
Dark cutters, %	0	0.5	0	0.3

[1]Shrunk weight = hot carcass weight ÷ common dressing percent of 64.05%.
[2]Dressing percent = hot carcass weight ÷ live weight before shrink.
[a,b]Means within same row without a common superscript differ (P<0.05).
[c,d]Means within same row without a common superscript differ (P<0.01).
[e,f]Means within same row without a common superscript differ (P<0.10).
[g]Sl = Slight.