Effects of Feeding 44 g/ton Rumensin® During Grain Adaptation on Animal Performance and Carcass Characteristics

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Summary

Cattle were adapted to a finishing diet over 20 days while feeding 33 or 44 g/ton (DM) of Rumensin. Following grain adaptation, all cattle were fed a common finishing diet containing 33 g/ton Rumensin for the remainder of the feeding period. Feeding 44 g/ton of Rumensin during the adaptation period did not affect performance during the adaptation period or over the entire feeding period when compared to the 33 g/ton adaptation level.

Introduction

Rumensin is widely used in the feedlot industry to improve feed efficiency. Reduced incidence of acidosis is likely a contributing factor to observed improvements in feed efficiency when feeding Rumensin. University of Nebraska research suggests Rumensin reduces the area of ruminal pH below 5.6, ruminal pH change, and variance when cattle are offered ad-libitum access to feed (1997 *Nebraska Beef Cattle Report,* p.49). Another study found that feeding 44 g/ton Rumensin led to a 3% improvement in feed efficiency over the feeding period and an 8% improvement in feed efficiency over the first 56 days of the trial when compared to 33 g/ton (*2010 Plains Nutrition Council Proceedings,* p. 112). More substantial performance improvements observed early in the feeding period may be due to a reduction in acidosis because of a decrease in intake variability as a result of feeding a higher level of Rumensin during grain adaptation. The objective of this trial was to evaluate the effects of feeding either 33 or 44 g/ton Rumensin during the grain adaptation period to evaluate the influence of higher Rumensin levels on animal performance and carcass characteristics over the entire feeding period.

Procedure

Yearling crossbred steers (n = 197; BW = 827 ± 64 lb) were separated into three weight blocks, stratified by BW, and assigned randomly within strata to 18 feedlot pens, with 10 or 11 steers per pen and nine pens per treatment. Treatments were imposed during grain adaptation (20 days) feeding 33 or 44 g/ton (DM) of Rumensin. Excluding Rumensin level, the grain adaptation program was the same for all cattle. The adaptation program (Table 1) involved three grain adaptation diets fed for six days each which increased dry rolled corn (DRC) inclusion while alfalfa hay inclusion was decreased. All step diets and the finishing diet contained 25% wet distillers grains with solubles (WDGS), 12% corn silage, and 6% liquid supplement (DM basis). Subsequent to grain adaptation, all steers were fed a common finishing diet that contained 33 g/ton of Rumensin. In addition, 90 mg of Tylan® was fed per steer daily during the trial. All additives were incorporated into step diets and the common finishing ration using a micro machine. All cattle were offered *ad libitum* access to feed and water for the duration of the study.

Prior to initiation of the trial, steers were limit fed a diet consisting of 55% alfalfa hay, 40% WDGS, and 5% supplement for 5 days at a level of 1.8% BW to minimize variation in gut fill. At the beginning of the trial cattle were poured with Ivomec®, tagged, weighed, and vaccinated with Bovishield™ Gold 5 and Vision® 7. Weights were measured on two consecutive days (days 0 and 1) to determine initial BW. Feed ingredient samples were collected weekly throughout the trial, dried in a forced-air oven at 60°C for 48 hours, and analyzed for nutrient content. On day 26, following grain adaptation, and after being on a common finishing diet for six days, BW was measured and cattle were implanted

Table 1. Dietary composition (%) and DOF for grain adaptation diets and the finishing diet.

Days fed:	1-6	7-13	14-20	
Adaptation:	1	2	3	Finisher
Ingredient, %				
Alfalfa hay	30	20	10	0
Corn silage	14	14	14	14
Dry rolled corn	25	35	45	55
WDGS[1]	25	25	25	25
Supplement[2]	6	6	6	6
Analyzed Composition, %				
CP	16.39	15.55	14.71	13.87
NDF	36.73	31.71	26.69	21.67
Ca	0.93	0.79	0.65	0.51
P	0.39	0.39	0.39	0.40
K	1.41	1.24	1.07	0.80
S	0.25	0.23	0.22	0.20

[1]Wet distillers grains with solubles.
[2]The same supplement was used for all diets while 33 or 44g/ton Rumensin and 90 mg/head/day Tylan. (DM) was added using a micro machine.

Table 2. **Feedlot performance and carcass characteristics of cattle fed 33 g/ton or 44 g/ton Rumensin during the adaptation period.**

Item	Treatment		SEM	*P*-value
	33 g/ton	44 g/ton		
Performance				
Initial BW, lb	827	827	42	0.49
Final BW, lb[1]	1403	1409	19	0.59
DMI, lb/day				
26 days	20.0	19.9	0.4	0.39
Final	26.9	26.7	0.7	0.42
ADG, lb				
26 days	3.83	3.95	0.3	0.49
Final[1]	4.59	4.64	0.5	0.66
F:G[2]				
26 days	5.21	5.03	—	0.44
Final[1]	5.78	5.78	—	0.96
Final live BW, lb	1401	1403	23	0.81
Carcass characteristics				
HCW, lb	884	888	12	0.59
Dressed yield, %	63.1	63.3	0.3	0.45
LM area, in^2	12.8	12.7	0.3	0.45
12th rib fat, in	0.57	0.58	0.02	0.55
Yield Grade[3]	3.68	3.76	0.04	0.21
Marbling[4]	589	589	9	0.99
Liver abscess, %	15.2	10.2	—	0.35

[1]Final BW was calculated from HCW using a common dressed yield of 63%.
[2]Statistics performed on carcass adjusted G:F, the inverse of feed efficiency.
[3]Calculated as 2.5+ (2.5 x 12th rib fat) + (0.2 x 2.5[KPH]) + (0.0038 x HCW) − (0.32 x LM area).
[4]400 = Slight, 500 = Small, 600 = Modest.

with Component TE-S. A 4% pencil shrink was used for analyzing 26-day performance.

After 113, 127, or 141 days on feed (depending on BW block), cattle were weighed and transported to a commercial abattoir (Cargill Meats Solutions, Fort Morgan, Colo.). A 4% pencil shrink was subtracted from final BW to obtain final live weight. Hot carcass weights (HCW) and liver abscess scores were obtained at the time of slaughter. Following a 48-hour chill, USDA marbling score, 12th rib fat thickness and LM area were recorded. Yield grade was calculated using HCW, 12th rib fat thickness, LM, and percent of kidney, pelvic, and heart fat (KPH) using the following formula: 2.5+ (2.5 x 12th rib fat) + (0.2 x 2.5[KPH]) + (0.0038 x HCW) − (0.32 x LM). Carcass adjusted performance was calculated using a common dressing percentage (63%) to determine carcass adjusted final BW, ADG and F:G.

Animal performance data and carcass characteristics were analyzed as a randomized block design using the MIXED procedure of SAS (SAS Inst. Inc., Cary, N.C.) Pen was the experimental unit, fixed effect was treatment, and block was treated as a random effect. Prevalence of liver abscesses was analyzed using the GLIMMIX procedure of SAS.

Results

Feedlot performance data and carcass characteristics are summarized in Table 2. Rumensin level did not affect ($P \geq 0.39$) DMI, ADG, or F:G during the grain adaptation period. These findings are in contrast to the observations of a previous trial where improvements in feed efficiency were observed early in the feeding period as a result of feeding 44 g/ton Rumensin compared to 33 g/ton (*2010 Plains Nutrition Council Proceedings*, p. 112). Among day DMI variance was not different as a result of Rumensin level during the adaptation period ($P = 0.56$) or for the first six days cattle were fed a common finishing diet ($P = 0.75$; data not presented). Although individual animal intake can be masked in a pen setting, intake variation for a pen is one of the methods available to estimate incidence of subacute acidosis in a feedlot setting. Since performance and DMI variation were not different as a result of Rumensin level in this trial, incidence of acidosis was likely not affected by Rumensin level. Similarly, in an acidosis challenge trial feeding 40 g/ton Rumensin compared to 30 g/ton did not improve time below ruminal pH of 5.6 or pH variation which are measures of acidosis (*1999 Nebraska Beef Cattle Report,* p.41).

No effects ($P \geq 0.42$) of Rumensin level during the grain adaptation period were observed over the entire feeding period for DMI, ADG, or F:G. Carcass characteristics were not affected by Rumensin level during the adaptation period. Hot carcass weights were not different ($P = 0.59$) among treatments and dressing percentage was not different ($P = 0.45$). No differences were observed in LM area, calculated YG, USDA marbling scores, or 12th rib fat thickness. Feeding 44 g/ton Rumensin during the adaptation period did not improve feedlot performance or carcass characteristics when compared to 33 g/ton Rumensin.

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