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J.A. Christopher

T.T. Marston

J.R. Brethour

See next page for additional authors

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Comparison of Dectomax and Valbazen on beef cattle carcass traits (2006)

Authors

J.A. Christopher, T.T. Marston, J.R. Brethour, and Gerald L. Stokka

COMPARISON OF DECTOMAX[1] AND VALBAZEN[1] ON BEEF CATTLE CARCASS TRAITS

J. A. Christopher, T. T. Marston, J. R. Brethour, and G. L. Stokka

Summary

The objective of this trial was to determine if types of dewormers affected carcass characteristics. Crossbred steers (n=428) were stratified by weight and ultrasound marbling score and administered either Dectomax (subcutaneous injection) or Valbazen (oral) dewormer. Fecal egg counts indicated that both dewormers cleared internal parasites from the cattle. Carcass data indicated that Dectomax increased fat deposition as measured by 12th rib back fat; kidney, pelvic, and heart fat; and marbling score, when compared with Valbazen. Deworming products may affect carcass traits that are used to value cattle.

Introduction

Cattle are routinely dewormed at feedlot arrival, during processing. Research indicates that a reduced internal parasite load will increase appetite and the amount of nutrients available for animal utilization and, therefore, improve body weight gain and feed conversion. The increases in available energy may be partitioned within the body to enhance growth of tissues (skeletal, muscle, and adipose) at different rates. The objective of this study was to determine if Dectomax Injectable Solution and Valbazen differently affected carcass traits, including marbling scores.

Experimental Procedures

Crossbred steers (n=428) from various sources were fed finishing diets during a 2-year period at the Western Kansas Agricultural Research Center – Hays. Most of the calves originated from the commercial cow/calf units of the KSU Department of Animal Sciences and Industry, Manhattan, and the Western Kansas Agricultural Research Center – Hays. These calves were primarily of British breed descent, and all contained some percentage of Angus genetics. Additional calves were purchased from a local feeder-calf provider to fill pens to capacity. These calves were gathered from herds within 50 miles of Hays and were of genetics similar to the University cattle. For statistical analysis, cattle were blocked into feeding groups (n=3) that reflected the date they were placed on feed.

Upon arrival, cattle were commingled, vaccinated for bovine respiratory disease, and administered an estrogenic implant. The first two feeding groups were fed a common finishing diet for about 60 days before being allotted to treatment. Steers were ultrasounded for marbling score (Cattle Performance Enhancement Company, CPEC, software), and the initial marbling score was used to determine changes in marbling during the finishing period. The first two feeding groups of steers

[1]Dectomax and Valbazen are registered trademarks of Pfizer, Inc.

averaged 103 days on feed from the time of ultrasound measurement and treatment application to slaughter. The third group was managed similarly, with the exception that steers were assigned to treatments approximately 45 days after weaning. Treatments and ultrasound in group 3 were initiated 203 days before slaughter. Treatments consisted of: 1) Valbazen oral drench at 4 ml/100 pounds body weight or 2) subcutaneous injection of Dectomax at 1 ml/110 pounds body weight.

Steers were fed a common finishing ration consisting primarily of finely ground grain sorghum (Table 1). The diet also contained sorghum silage, soybean meal, urea, and ammonium sulfate. The diet also included 100 g calcium carbonate, 25 g sodium chloride, 300 mg of Rumensin®, 90 mg Tylan®, and 30,000 IU vitamin A per steer daily, and a trace mineral premix that provided amounts of copper, manganese, zinc, iron, iodine, and cobalt to meet or slightly exceed requirements. Initial body weights were measured after about 12 hours of feed deprivation. Cattle were harvested at a commercial facility (National Beef, Dodge City, Kansas), and carcass data were collected after a 24-hour carcass chill.

Table 1. Composition of the finishing ration

Ingredient	Percentage of Diet, dry matter basis
Sorghum silage	32.4
Finely ground grain sorghum	59.1
Soybean meal	6.0
Rumensin®/Tylan® premix	0.5
Ammonium sulfate	0.2
Limestone	1.1
Urea	0.3
Salt	0.4

Statistical analysis was used to determine the effects of the treatments on animal performance and carcass traits. Comparisons of carcass traits took into consideration the different feeding groups and sources of cattle, as well as their initial body weight and ultrasound marbling and back fat measurements. Comparison between percentages of USDA quality grades used appropriate chi-square statistical analysis.

Results and Discussion

Fecal egg counts reported in an earlier summary of the first two feeding periods indicated that both treatments were efficacious in ridding the cattle of internal parasites. Table 2 describes the cattle as they were allotted to treatments. By using ultrasound, it was possible to balance the treatments for marbling score and back fat thickness.

Of particular interest in our study were the influences of the treatments on marbling scores used to determine USDA quality grade, the improvement in marbling score observed during the feeding periods, and the resulting USDA quality grades. These results are listed in Table 2. The marbling scores for steers treated with Dectomax were greater ($P<0.05$) than for steers treated with Valbazen. Research concerning growth and development of marbling during the finishing phase has indicated that the marbling score at the beginning of the feeding phase directly affects carcass marbling score. This trial is consistent with those findings, inasmuch as initial ultrasound marbling score was highly related to the final marbling score. Because we used initial ultrasound marbling scores as a covariate in the analysis, we conclude that the difference in treatment marbling score means is due to the dewormers and not a function of previous animal management or genetics.

Steers administered Dectomax had greater gains in marbling score from the date of ultrasound measurement until carcass data was collected ($P<0.05$) than did steers treated with Valbazen. While consuming the finishing diets, the cattle gained about one full increment of marbling score, which is equivalent to an increase in USDA quality grade from Select to Choice or from low Choice to Premium

Choice. Marketing grids usually use quality grades as major financial premiums offered to producers. Even though our study shows only trends (Table 2) of more Choice (3.8%) and Premium Choice (3.6%) carcasses by using Dectomax rather than Valbazen for parasite control, these differences could be financially significant under some marketing conditions.

Cattle administered Dectomax had greater 12th rib back fat measurements (P<0.006) and internal fat reserves (P<0.02) than did cattle treated with Valbazen. The reasons for differences in fat deposition between treatments are not explained by our experiment.

It was not the intent of this study to determine if treatment would affect cattle performance in the feedlot, but average daily gain and ending slaughter weight (P<0.92) did not differ between the treatments. The ability of cattle feeders to improve quality grade categories can have significant economic benefits. Often cattle are marketed by predicting the fewest number of days on feed to achieve a particular quality grade or mix of grades. This trial did not examine the effects that dewormers may have on carcass characteristics used to determine USDA yield and quality grades, but it was designed to examine the potential differences between two different classes of deworming agents available to cattle feeders. With the many factors (genetic and environmental) that affect marbling development, producers need to consider management decisions that increase the probability of cattle grading Choice and higher. The use of Dectomax rather than Valbazen may lead to increases in marbling scores.

Table 2. Steer performance and carcass characteristics

	Treatment			
Item	Dectomax	Valbazen	SEM	P-value
No. of steers	212	216		
Initial weight, lb	885	889	109	
Initial back fat, inches	0.14	0.14	0.003	
Initial marbling score[1]	430	431	48	
Hot carcass wt, lb	844	843	3.8	0.93
Back fat, inches	0.56	0.51	0.02	0.006
Kidney, pelvic, and heart fat, % carcass wt	2.46	2.38	0.03	0.02
Ribeye area, square inches	14.2	14.6	0.11	0.01
USDA yield grade[2]	3.04	2.79	0.05	0.0008
Marbling score[1]	527	511	5	0.02
Change in marbling score[3]	101	86	5	0.03
USDA quality grades				
No roll, %	4.25	1.85		0.15
Select, %	36.8	43.0		0.19
Choice, %	56.1	52.3		0.43
Premium Choice, %	20.3	16.7		0.34
Prime, %	2.8	2.8		0.97

[1]Scale of marbling score: 300 = Trace 00, 400 = Slight 00, 500 = Small 00, 600 = Modest 00, etc.
[2]Yield grade calculated using the official USDA formula = 2.5 + (2.5 × adjusted 12th rib back fat thickness) + (0.0038 × hot carcass weight, lb) + (0.2 × percentage kidney, pelvic, and heart fat) – (0.32 × ribeye area, square inches).
[3]Change in marbling score was calculated as the difference between the carcass marbling score and the initial animal ultrasound marbling score.