GROWTH PERFORMANCE AND CARCASS CHARACTERISTICS OF FINISHING BEEF STEERS IMPLANTED WITH COMPONENT TE-S OR COMPONENT TE-S WITH TYLAN

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Summary

Component TE-S and Component TE-S with Tylan growth-promoting implants were compared in an experiment conducted at a commercial feedlot operation (Ward Feed Yard; Larned, Kansas) to evaluate effects on growth performance and carcass characteristics. Crossbred steers (n=1843; 827 lb body weight) were implanted with either Component TE-S or Component TE-S with Tylan and were fed a finishing ration based on steam-flaked corn for an average of 116 days before slaughter. Cattle were assigned randomly to the implant treatments at processing and were allotted to 12 pens, containing an average of 154 steers each. No differences were detected in dry matter intake (P=0.18), average daily gain (P=0.41), or feed efficiency (P=0.59) of cattle administered the different implants. Component TE-S with Tylan produced fewer (P<0.05) buller steers. Cattle implanted with Component TE-S with Tylan were more heavily conditioned than cattle implanted with Component TE-S. Cattle with the implant including Tylan had a greater percentage of USDA Choice or Prime carcasses (P=0.11) and a greater percentage of USDA Yield Grade 4 carcasses (P=0.03). Component TE-S with Tylan also tended to produce fewer (P=0.12) USDA Yield Grade 1 carcasses compared with cattle implanted with Component TE-S. Total carcass value was also greater for the Component TE-S with Tylan cattle, as calculated by either a muscle-based or quality-based marketing grid. Inclusion of a pellet of the antibiotic Tylan within Component TE-S implants seems to result in modest changes in carcass fattening, as well as significant reductions in the incidence of buller activity among feedlot steers.

Introduction

Growth-promoting implants are widely used in the feedlot industry to improve animal performance and feed efficiency. Implant effectiveness is a function of proper administration. Aseptic techniques, such as cleaning the surface of ears and using clean needles, are important factors contributing to effectiveness of implants. Even with proper techniques and visually clean ears and needles, problems can still exist. Bacteria may be present on the surface of the ear and may be introduced to the subcutaneous tissue of the ear during implanting. Abscess formation due to contamination may account for 50 to 60% of the observed problems with implants. Inflammation around the abscessed site may increase localized blood flow, potentially increasing payout of active components. As scar tissue develops,

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release of growth-promoting compounds may ultimately be reduced, thereby decreasing overall effectiveness of the implant. Component TE-S with Tylan implants include a single blue pellet containing 29 mg tylosin tartrate, which goes into the ear first and dissolves quickly to release the antibiotic. Tylosin tartrate is a broad-spectrum antibiotic that is added to deliver a localized antibacterial dose in an attempt to prevent abscess formation and, hence, improve animal performance.

Experimental Procedures

Yearling crossbred steers (n=1,843; 827 lb body weight) were transported to a commercial feedlot in Larned, Kansas. Upon arrival, a standard processing regimen was applied to each animal, which consisted of animal identification, vaccination against common viral diseases, and treatment for internal and external parasites. Steers received a single implant of either Component TE-S or Component TE-S with Tylan at the time of processing.

Cattle within each load were blocked by arrival date, and one of every two animals was assigned randomly to either Component TE-S or Component TE-S with Tylan by using a predetermined randomization schedule. Each block was represented by one pen of steers receiving Component TE-S and one pen of steers receiving Component TE-S with Tylan. Six pens were assigned to each treatment. Pens contained an average of 154 steers, which were placed on feed between June 3 and June 14, 2003. Feedlot personnel were blinded to implant treatments and were responsible for daily observations of each pen for symptoms of sickness or buller activity. Cattle identified as sick were treated in accordance with standard procedures of the feedlot. Cattle identified as bullers were removed from the pen immediately and placed into a separate pen. Buller steers were combined with their contemporaries immediately before shipping to a commercial abattoir in Emporia, Kansas.

Steers were adapted to their final finishing ration (Table 1) during a period of two to three weeks after arrival and were fed for an average of 116 days. Cattle were offered ad libitum access to feed and water.

Total weight of cattle in each pen was determined upon initiation of the experiment and immediately before cattle were transported for slaughter. Cattle were shipped by replicate (one pen Component TE-S and one pen Component TE-S with Tylan). Shipping order within each block was randomized. Closeout data for each pen included daily gain, feed intake, feed efficiency, and percent bullers. Cattle were slaughtered on the same day they were shipped. Carcasses were chilled for 24 hours before USDA yield and quality grading.

Table 1. Composition of Finishing Diet

Ingredient	% of Dry Matter
Steam-flaked corn	63.2
Wet distillers grain	15.4
Tallow	2.5
Mixed silage	7.0
Wheat middlings	4.0
Liquid supplement[a]	5.3
Corn screenings	2.6
Nutrient, calculated	
Crude protein	15.3
Fat	7.45
Calcium	0.74
Phosphorus	0.39

[a]Provided 320 mg Rumensin, 90 mg Tylan, 40,000 IU vitamin A, 4000 IU vitamin D, and 100 IU vitamin E per steer daily.

Results and Discussion

Animal performance is reported in Table 2. Initial body weights were similar between treatments. No differences were detected for dry matter intake, average daily gain, or feed efficiency. Component TE-S with Tylan produced fewer ($P<0.05$) buller steers than Com-

ponent TE-S. Overall, cattle implanted with the Tylan-enriched implants were more heavily conditioned, with a tendency for fewer (P=0.12) USDA Yield Grade 1 carcasses and a greater (P=0.03) percentage of USDA Yield Grade 4 carcasses (Table 2). Hot carcass weights for cattle implanted with Component TE-S with Tylan were numerically larger (P=0.32) than those of cattle administered the implant without the added antibiotic. Cattle implanted with Component TE-S with Tylan tended to have greater (P=0.11) percentages of carcasses that graded USDA Choice or Prime, with a concomitant non-significant reduction in the percentage of "No Roll" carcasses.

Total carcass value was calculated by using a quality-based (Figure 1) and muscle-based (Figure 2) marketing grid. The base price was set at $125/cwt and the Choice-Select spread was varied from $0 to $20/cwt in two-dollar increments. Carcass value from the muscle-based grid was greater (P<0.05) for Component TE-S with Tylan cattle at the Choice-Select range of $10 through $20/cwt. Likewise, carcass value from the quality-based grid was greater (P<0.05) for Component TE-S with Tylan cattle at the Choice-Select range of $8 through $20/cwt.

Key differences between implants used in this study are the smaller percentage of bullers and the tendency for an increase in carcass quality with the addition of Tylan in the growth-enhancing implant. The mechanisms for the reduction of buller steers with the addition of Tylan to the implant are not well understood. It is plausible that cattle implanted Component TE-S with Tylan had fewer abscesses and resulting scar tissue immediately surrounding the implant site, thereby retaining greater implant effectiveness. It also is possible that the addition of Tylan to implants may reduce variation in uptake of the growth-promoting compound. An infection due to an ear abscess may cause an increase in localized blood flow to the infected ear, resulting in rapid payout of the active ingredient, which could result in abnormal behavior, including increases in the incidence of buller-related activity. Results of this study suggest that the addition of Tylan to Component TE-S implants can result in significant reductions in buller activity of feedlot steers, as well as modest changes in carcass weight and carcass composition.

Table 2. Finishing Performance and Carcass Characteristics of Yearling Steers Implanted with Component TE-S or Component TE-S with Tylan

Item	Component TE-S	Component TE-S with Tylan	SEM	*P*-value
No. of head	919	924	-	-
No. of pens	6	6	-	-
Days on feed	116	116	-	-
Initial weight, lb	826	828	1.85	0.77
Final weight, lb[a]	1289	1297	5.21	0.32
Dry matter intake, lb/day	21.6	22.0	0.24	0.25
Average daily gain, lb/day	3.84	3.86	0.040	0.67
Feed:gain	5.61	5.69	0.06	0.42
Bullers, %	3.83	1.71	0.56	0.04
Hot carcass weight, lb	818	824	3.31	0.32
Dressing percentage, %	65.94	65.79	0.2	0.56
Liver abscess, %	10.8	8.5	0.94	0.15
USDA Yield Grade 1, %	18.8	14.8	1.47	0.12
USDA Yield Grade 2, %	52.2	49.6	1.59	0.30
USDA Yield Grade 3, %	27.2	32.0	1.94	0.14
USDA Yield Grade 4, %	1.6	3.4	0.42	0.03
USDA Yield Grade 5, %	0.1	0.2	0.08	0.36
USDA Prime, %	0.0	0.1	0.08	0.36
USDA Choice, %	26.6	33.1	2.41	0.11
USDA Select, %	61.7	58.8	2.86	0.51
No roll, %	11.1	7.5	1.57	0.17
Dark cutters, %	0.1	0.1	0.12	0.97

[a]Carcass adjusted final weight calculated by dividing hot carcass weight by a common dress yield of 63.5%.

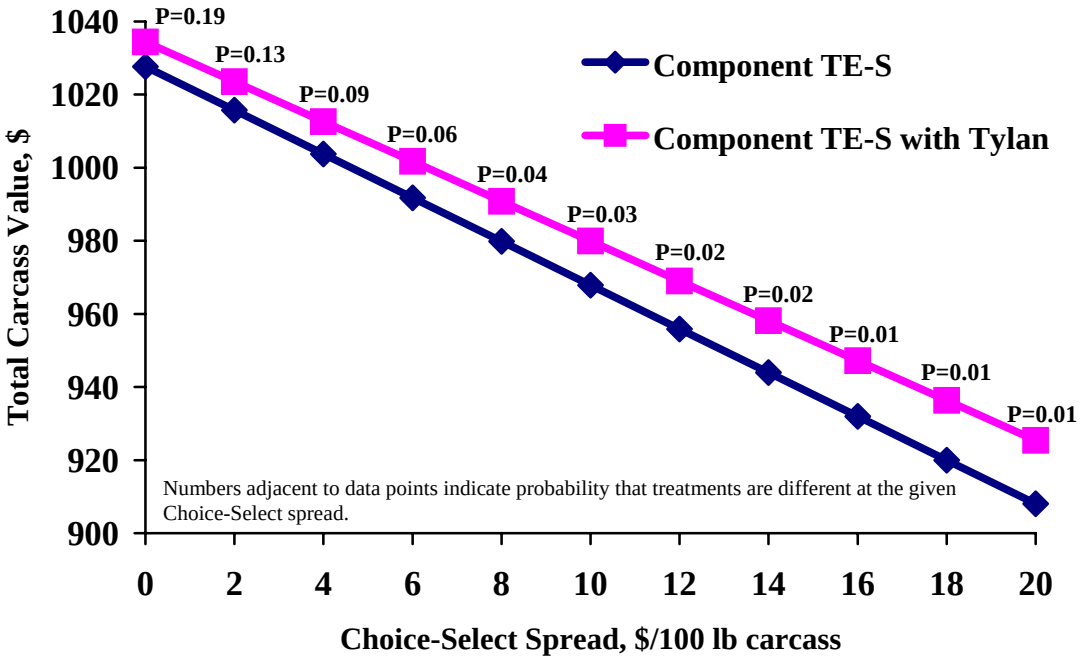

Figure 1. Total Carcass Value in Dollars at Different Choice-Select Spreads as Calculated by Using a Quality-Based Grid.

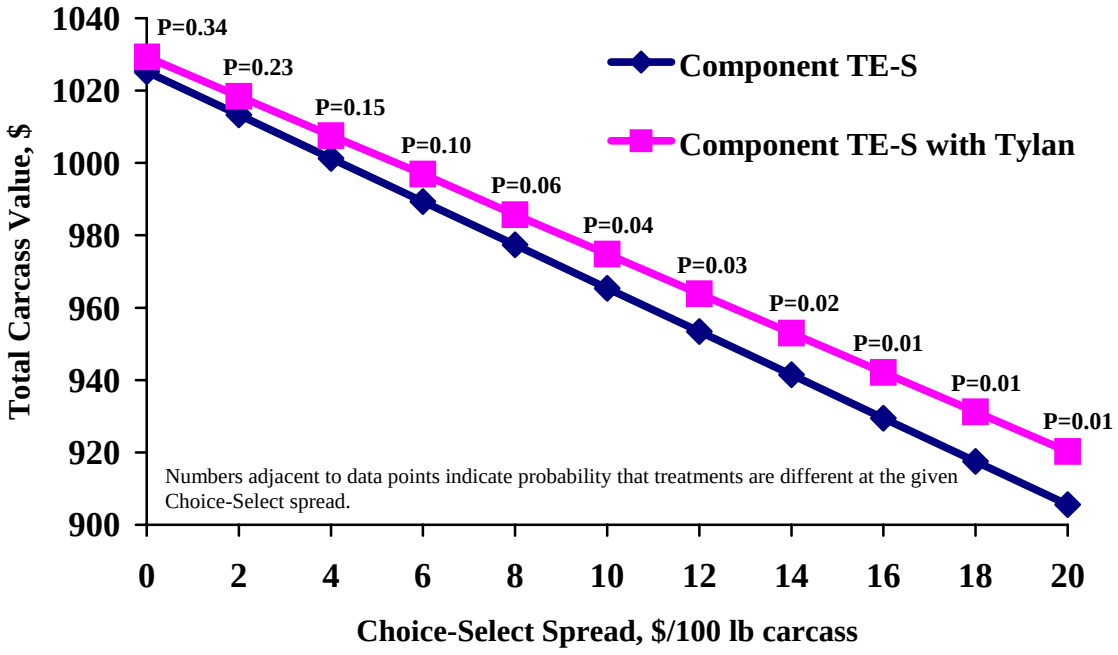

Figure 2. Total Carcass Value in Dollars at Different Choice-Select Spreads as Calculated by Using a Muscle-Based Grid.