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Evaluation of a New Single Implant Strategy vs. Two Common Implant Strategies in Beef Finishing Steers

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Summary

A finishing trial was conducted to compare the response to three implant strategies on performance and carcass characteristics of feedlot steers: 1) Component TE-IS with Tylan followed with Component TE-S with Tylan (TE-IS/S); 2) Component TE-200 with Tylan (TE-200); or 3) Revalor XS (Rev-XS) single implant. Final BW, DMI and ADG were unaffected ($P > 0.05$) by implant strategy. Steers on the TE-IS/S treatment had a lower ($P < 0.01$) feed:gain ratio (F:G) compared to those on the Rev-XS and TE-200 treatments. F:G calculated on a live basis was improved ($P < 0.05$) for reimplanted cattle compared to those on the TE-200 treatment; F:G for the Rev-XS was intermediate. No differences ($P > 0.05$) were observed for HCW, 12th rib fat, percentage USDA Choice and calculated USDA yield grade among treatments. Cattle implanted with Rev-XS had greater ($P < 0.05$) marbling scores than those implanted with TE-IS/S. Carcasses from TE-IS/S implanted steers presented larger ($P = 0.03$) longissimus muscle areas than both the TE-200 and Rev-XS treatment groups. These results suggest that F:G was improved with reimplanting.

Introduction

Revalor XS (Rev-XS; Intervet/Shering-Plough, Millsboro, Del.) is a new 10-capsule implant containing 40 mg estradiol and 200 mg trenbolone acetate. The last 6 capsules are coated with a biodegradable polymer that provides extended release (200 days). This new implant was developed to eliminate the need to reimplant cattle. Component TE-IS with Tylan (TE-IS; VetLife, West Des Moines, Iowa) is a

growth promoting implant that contains 16 mg estradiol, 80 mg trenbolone acetate, and 29 mg tylosin. Component TE-S with Tylan (TE-S; VetLife) is an implant that contains a combination of 24 mg estradiol, 120 mg trenbolone acetate, and 29 mg tylosin. These compounds are typically used in programs in which TE-S is administered 80 days after the initial TE-IS implant. Component TE-200 with Tylan (TE-200; VetLife) is a single implant that contains 20 mg estradiol and 200 mg trenbolone acetate. This study evaluated both feedlot and carcass performance of cattle on a typical reimplant vs. the two single implant programs.

Procedure

A common reimplant program consisting of Component TE-IS/S was compared to single implant strategies using Component TE-200 and Revalor XS. A 167-day finishing trial utilized 360 yearling steers purchased from a commercial order buyer (British cross-breed; initial BW = 711 ± 48 lb) in a randomized complete block design experiment conducted at the Panhandle Research Feedlot (UNL Panhandle Research and Extension Center). Cattle were limit fed (2% of BW) a 50% forage diet for a total of 5 days before the initiation of the trial. Cattle were individually weighed 2 consecutive days (day 0 and day 1) after the limit feeding period to obtain an initial BW. Body weights measured on day 0 were used to block the animals into 3 weight blocks. Cattle were stratified by BW within respective weight block and assigned randomly to 24 pens. Pens were assigned randomly to 1 of the 3 treatments with 8 pens per treatment and 15 steers per pen.

A 21-day step-up period was used, in which incremental percentages of dry rolled corn replaced alfalfa hay to allow cattle to become acclimated to the final finishing diet. The final diet consisted of 55.6% dry rolled

corn, 30.0% wet distillers grains with solubles, 8.0% alfalfa hay, 6.0% liquid supplement, and 0.4% limestone (DM basis). The liquid supplement provided 339 mg/hd/day Rumensin (Elanco Animal Health; Greenfield, Ind.) and 85 mg/hd/d Tylan (Elanco Animal Health). On day 1, steers received a single implant of either TE-IS, TE-200, or Rev XS. Each implant was administered subcutaneously in the upper middle third of the ear. On day 85, IS-S cattle were reimplanted with TE-S and were injected (s.c.) with 2 ml of Bovi-Shield Gold (Pfizer Animal Health, New York, N.Y.) to vaccinate against IBR, BVD types I and II, PI3, and BRSV. Because vaccinating cattle during reimplant is part of the protocol at the Scottsbluff research facility, any differences in feedlot performance when comparing the reimplanted cattle to the two single implant treatments may be an effect of implant and revaccination. During time of reimplant, cattle in both the TE-200 and Rev-XS treatment groups were allowed to remain in their pens.

Feed bunks were visually evaluated each morning and were managed to allow for trace amounts of feed to remain in each bunk before feed delivery. Cattle were individually weighed at the end of the trial. This weight (shrunk by 4%) was used to calculate overall live performance and dressing percentage. Overall carcass adjusted performance was calculated using carcass weights adjusted to a common dressing percentage of 63%.

Cattle were slaughtered at the JBS Swift plant in Greeley, Colo. Carcass data were collected by Diamond T Livestock Services (Yuma, Colo.). Liver scores and HCW measurements were taken on the day of slaughter. Carcass 12th rib fat, preliminary yield grade, percentage of KPH, marbling score, LM area and USDA yield and quality grades were recorded following a 48-hour carcass chill. Animal performance and carcass data were

Table 1. Performance of steers implanted with either Component TE-200 with Tylan (TE-200) or Revalor XS (Rev-XS) on day 1 compared to steers implanted with Component TE-IS with Tylan on day 1 followed by Component TE-S with Tylan (TE-IS/S) on day 85.

	TE-200	Rev-XS	TE-IS/S	SEM	P-value
<i>Carcass adjusted performance^{ce}</i>					
Pens, n	8	8	8		
Steers, n	127	126	126		
DOF, days	167	167	167		
Initial BW, lb	711.5	711.7	711.3	0.70	0.89
Final BW, lb	1385	1388	1410	10.9	0.23
DMI, lb/d	24.7	24.3	24.1	0.17	0.09
ADG, lb/d	4.03	4.05	4.18	0.06	0.22
G:F	0.163 ^a	0.166 ^a	0.173 ^b	0.002	0.01
F:G	6.13 ^a	6.02 ^a	5.78 ^b		0.01 ^f
<i>Overall live performance^d</i>					
Final BW, lb	1400	1396	1409	9.40	0.63
ADG, lb/d	4.12	4.10	4.17	0.06	0.63
G:F	0.167 ^a	0.169 ^{ab}	0.173 ^b	0.002	0.04
F:G	5.99 ^a	5.92 ^{ab}	5.78 ^b		0.04 ^f

^{ab}Within a row means without a common superscript differ ($P < 0.05$).

^cAll BW are shrunk 4% except initial BW.

^dOverall live performance calculated from live BW on a pen basis collected prior to study initiation and on day of slaughter.

^eOverall carcass performance calculated using 63% dressing percentage for all three treatments.

^fP-value calculated from G:F.

Table 2. Carcass characteristics of steers implanted with either Component TE-200 with Tylan (TE-200) or Revalor XS (Rev-XS) on day 1 compared to steers implanted with Component TE-IS with Tylan on day 1 followed by Component TE-S with Tylan (TE-IS/S) on day 85.

	TE-200	Rev-XS	TE-IS/S	SEM	P-value
<i>Carcass characteristics</i>					
HCW, lb	873	874	888	6.85	0.23
Marbling ^c	575 ^{ab}	592 ^a	554 ^b	9.90	0.04
% Choice	79.8	87.3	77.0	3.99	0.19
Fat depth, in	0.64	0.62	0.62	0.02	0.69
LM area, in ²	12.8 ^b	12.7 ^b	13.3 ^a	0.15	0.03
Calc. YG ^d	3.71	3.72	3.57	0.08	0.39

^{ab}Within a row means without a common superscript differ ($P < 0.05$).

^c450 = Slight⁵⁰, 500 = Small⁰, 520 = Small²⁰, etc.

^dCalculated as $2.5 + (2.5 * \text{fat depth}) - (0.32 * \text{REA}) + (0.2 * 2.0 \text{ KPH}) + (0.0038 * \text{HCW})$.

analyzed using the MIXED procedure of SAS (SAS Inst. Inc., Cary, N.C.) as a randomized complete block design with pen as the experimental unit.

Results

During the course of this trial, ears were examined by a VetLife representative to check for abscesses or missing implants. At reimplant time, cattle that received the Component TE-IS with Tylan implant presented no defects. On the final day of the trial, 14.4% of the cattle that were implanted with Revalor-XS had ears that were either abscessed or missing an implant. In the TE-200 and TE-IS/S treatment groups, 1.68% and 2.51%, respectively, had abscessed ears or were missing an implant. This difference in defects between the Revalor-XS treatment group and the Component treatments

is attributed to the tylosin tartrate that is added to both of the Component implants used in this trial. The results indicate tylosin in the Component implants acts as a local antibacterial significantly reducing the occurrence of abscesses. The cattle in the Revalor-XS treatment group that tested positive for ear abscesses most likely did not receive the full payout of this implant due to abscesses. In this study, reimplanted cattle had lower F:G than Revalor-XS cattle. The decrease in F:G may have been in response to the Tylan added to each Component TE-IS and TE-S implant.

Implant strategy had no effect on feed intake ($P > 0.05$) (Table 1). A decrease in DMI was not observed for cattle subjected to stresses of reimplant. Based on carcass adjusted final BW, there were no differences in final BW or ADG. Feed efficiency (F:G) was

($P < 0.01$) impacted by implant strategy. Cattle reimplanted at day 85 had lower F:G than both Rev-XS and TE-200 treatments. Final BW (shrunk by 4%) and ADG were not different ($P = 0.07$). Cattle in the TE-IS/S treatment group were more efficient ($P = 0.04$) than cattle in the TE-200 group. Animals that received the Rev-XS treatment were intermediate in feed efficiency compared to the other two treatment groups.

Hot carcass weight, percentage of choice carcasses, 12th rib fat, and calculated yield grade were not different ($P > 0.05$) across treatments (Table 2). Carcasses from cattle that received a Component TE-IS implant on day 1 followed by a terminal implant on day 85 presented larger ($P < 0.05$) LM areas (13.3 in²) than both the Rev-XS (12.7 in²) and TE-200 (12.8 in²) treatment groups. The Rev-XS treatment group had a significantly greater ($P < 0.05$) marbling score (592) than the TE-IS/S treatment group (554). Marbling scores were not significantly different when comparing TE-200 (575) to either Rev-XS or TE-IS/S.

In this trial, feed efficiency was improved when cattle were reimplanted rather than implanted at the beginning of the feeding period. Hormone concentration supplied should have been equivalent between Rev-XS and TE-IS/S treatments. Feedlot performance was not negatively impacted for cattle that were reimplanted in this study. However, treating with Rev-XS significantly improved marbling, compared to a reimplant program of TE-IS followed by TE-S. Interestingly, marbling was intermediate for cattle given TE-200 and not different from the other two treatments. It is not clear why differences in feed efficiency or marbling were observed in this study.

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