Revalor®-200
(trenbolone acetate/estradiol)

Technical Bulletin 4

The Effect of Different Implant Strategies on Heifer Performance and Carcass Characteristics (Texas)

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Summary Points

- Three thousand one hundred and fourteen heifers of predominately English breed (avg. wt. 570 lbs.) were utilized in this study. All heifers were fed MGA® (melengestrol acetate). Heifers were reimplanted at 90 days on feed.

- All four implant treatments were represented in a pen. A total of 20 pens containing animals with all four implant treatments were used in this trial.

- Treatments were as follows:
  1) Revalor®-IH (80 mg trenbolone acetate & 8 mg estradiol) /Revalor-H (140 mg trenbolone acetate & 14 mg estradiol) (IH/RH)
  2) Revalor-H/Revalor-H (RH/RH)
  3) Revalor-H/Revalor-200 (200 mg trenbolone acetate & 20 mg estradiol) (RH/R200)
  4) Component®-EH (200 mg testosterone propionate & 20 mg estradiol benzoate) + Tylan® (tylosin tartrate) + Component-TH (200 mg trenbolone acetate) + Tylan/Component-TH+Tylan (EHT+THT/THT)

- Carcass-adjusted final weight, average daily gain and hot carcass weight were similar among treatments.

- Adjusted final weight at 28% body fat was greater (P< .05) in the RH/R200 implanted heifers when compared to all other treatments.

- Heifers implanted with IH/RH had the highest (P< .05) amount of empty body fat and the greatest (P< .05) number of Choice and Prime carcasses when compared to all other treatments.

- Heifers implanted with RH/R200 had the greatest (P< .05) number of Yield Grade 1 and 2 carcasses and the largest (P< .05) ribeye area and lowest (P<.05) amount of body fat when compared to all other treatments.

- Heifers implanted with RH/R200 had fewer (P< .05) Yield Grade 4 carcasses when compared to EHT+THT/THT and IH/RH implanted heifers.

- IH/RH can be used to increase carcass fatness resulting in more Choice and Prime carcasses, and RH/R200 can be used to increase the number of Yield Grade 1 and 2 carcasses and decrease the number of Yield Grade 4 carcasses versus IH/RH and EHT + THT/THT treatments.

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The Effect of Different Implant Strategies on Heifer Performance and Carcass Characteristics (Texas)

I. Summary

Three thousand one hundred and fourteen heifers of predominately English breed (avg. wt. 570 lbs.) were utilized in this study to determine the effect of different implant strategies on heifer performance and carcass characteristics. All heifers were fed MGA® (melengestrol acetate). Heifers were assigned to one of four implant treatments at initial processing and weighed individually. All four implant treatments were represented in a pen. A total of 20 pens containing animals with all four implant treatments were used in this trial. The four treatments were 1) Revalor®-IH (80 mg trenbolone acetate & 8 mg estradiol) day 0 reimplanted with Revalor-H (140 mg trenbolone acetate & 14 mg estradiol) (IH/RH); 2) Revalor-H day 0 reimplanted with Revalor-H (RH/RH); 3) Revalor-H day 0 reimplanted with Revalor-200 (200 mg trenbolone acetate & 20 mg estradiol) (RH/R200); and 4) Component®-EH (200 mg testosterone propionate & 20 mg estradiol benzoate) with Tylan® (tylosin tartrate) and Component-TH (200 mg trenbolone acetate) with Tylan day 0 and reimplanted with Component-TH with Tylan (EHT+THT/THT). Heifers were fed for 182 days and were reimplanted on day 90. Heifers were slaughtered at a commercial packing plant, and trained individuals collected carcass data on an individual animal basis. Overall, there were no differences (P> .10) in carcass adjusted final weight or average daily gain among treatments. Adjusted final weight at 28% body fat was greater (P< .05) for RH/R200 when compared to all other treatments. Heifers implanted with IH/RH had the lowest (P< .05) adjusted weight at 28% body fat with RH/RH and EHT+THT/THT being intermediate in adjusted weight at 28% body fat. Hot carcass weight was similar (P= .37) among treatments. Heifers initially implanted with Revalor-IH had the highest (P< .05) amount of empty body fat, the greatest (P< .05) number of Choice and Prime carcasses and the highest marbling score. Cattle implanted with RH/R200 had the largest (P< .05) ribeye area and ribeye area per cwt of carcass weight, the lowest (P< .05) percentage of empty body fat and the greatest (P< .05) number of Yield Grade 1 and 2 carcasses when compared to all other treatments. Heifers implanted with RH/R200 had fewer (P< .05) Yield Grade 4 carcasses when compared to the EHT+THT/THT and IH/RH treatments. Overall, implanting heifers with IH/RH increased the percent Choice and Prime carcasses, and RH/R200 increased ribeye area and the number of Yield Grade 1 and 2 carcasses, compared to other treatments evaluated in this study.

II. Introduction

Growth-promoting implants have been proven to be safe and highly beneficial management tools for beef production during the finishing phase. However, little research has been conducted in lightweight heifers. Therefore, it is of interest to evaluate different implant strategies with varying levels of trenbolone acetate and estradiol on heifer performance and carcass traits. The objective of this trial was to measure the impact of different doses of trenbolone acetate and estradiol on average daily gain, carcass quality and yield grade variables of lightweight heifers. It has been demonstrated in previous research that different implant strategies can impact finish weight of heifers. One must design an implant strategy that optimizes both carcass weight and quality traits.

III. Materials and Methods

Heifers were received from one source, eastern Oklahoma, into the feedyard from January 6, 2001, through March 22, 2001. All heifers were ear-tagged with two uniquely numbered ear tags to preserve individual identity. One ear tag had the lot number and an individual serial number, and the second ear tag consisted of a colored pen tag with the treatment number and individual serial number at time of initial implanting.

Heifers were allotted to one of the four implant treatments as they came through the processing chute. The four treatments were 1) Revalor-IH day 0 reimplanted with Revalor-H (IH/RH); 2) Revalor-H day 0 reimplanted with Revalor-H (RH/RH); 3) Revalor-H day 0 reimplanted with Revalor-200 (RH/R200); and 4) Component-EH with Tylan and Component-TH with Tylan day 0 and reimplanted with Component-TH with Tylan (EHT+THT/THT). Allotment to treatments was accomplished by assigning every fourth heifer within a pen to one of four treatments as they went through the processing chute. A total of twenty pens containing an equal number of cattle from each treatment for a total of three thousand one hundred and fourteen head were utilized for this trial. Individual weights were obtained and recorded at initial processing and at reimplant time for each animal.

The final adjusted weight was determined by dividing hot carcass weight by a constant dressing percent of 64%. Final adjusted weight at 28% empty body fat was determined by the procedure outlined by Guiroy et al, (J. Anim. Sci. 79: 1983-1995, 2001).

Animals were slaughtered when the pen reached sufficient weight and finish as determined by feedyard personnel. Animals were shipped and slaughtered in complete pens. A trained carcass collection team collected individual carcass measurements. Chill time across all pens averaged 48 hours with a range of 24-72 hours.

Performance data were analyzed by ANOVA procedures using Statview (1998). The statistical model included treatment and pen as independent variables. The treatment x pen interaction term was used as the error term to determine if there were any treatment differences. Means were separated using least significant difference at $P < .05$ when a significant treatment effect was found. Individual animal was used as the experimental unit for both gain and carcass data.

IV. Results and Discussion

There were no differences among treatments for initial weight, final carcass-adjusted weight, weight at reimplant, overall average daily gain and average daily gain from reimplant to the end of the study (Table 1). During the initial implant period, cattle implanted with RH had higher rates of gain than did heifers implanted with IH. The weight at which heifers reached 28% body fat was influenced by implant treatments. Heifers implanted with EHT+THT/THT and RH/RH reached 28% empty body fat at the same weight which was greater ($P < .05$) than IH/RH and less ($P < .05$) than RH/R200. Heifers implanted with RH/R200 had the heaviest weight at 28% body fat. It has been demonstrated in other implant studies that implants increase the weight at which animals reach a certain level of body fat.

There were no differences ($P > .10$) in hot carcass weight or the number of carcasses less than 550 pounds among treatments. There were no differences ($P > .10$) in backfat, backfat per hundred pounds of hot carcass, kidney-pelvic-heart fat (KPH) percentage, color score or bone maturity. Ribeye area was increased ($P < .05$) by RH/RH and RH/R200 when compared to EHT+THT/THT and IH/RH. Heifers implanted with RH/R200 had a greater ($P < .05$) ribeye area and ribeye area per hundred pounds of hot carcass when compared to all other treatments. Heifers implanted with RH/R200 had a lower ($P < .05$) overall yield grade and percent body fat when compared to all other treatments. Marbling score was highest for heifers implanted with IH/RH compared to all other implant treatments. Marbling score was not different ($P > .05$) between EHT+THT/THT and RH/R200 (5.22 vs 5.18).

Heifers implanted with RH/RH and RH/R200 had more (P< .05) carcasses grading Select and fewer (P< .05) grading Low Choice than EHT+THT/THT. Heifers implanted with IH/RH had more (P< .05) carcasses grading Average Choice than all other treatments. Overall, the number of Choice and Prime carcasses was greatest (P< .05) for IH/RH and the lowest for RH/RH and RH/R200. There were no differences (P> .05) between RH/RH and EHT+THT/THT for the number of Choice and Prime carcasses.

Heifers implanted with RH/R200 had more (P< .05) Yield Grade 1 & 2 carcasses compared to all other treatments. Heifers implanted with RH/R200 had fewer (P< .05) Yield Grade 4 carcasses when compared to IH/RH and EHT+THT/THT.

V. Conclusion

Implanting heifers with Revalor-IH/Revalor-H improves quality grade when compared to the other treatments. However, based on body fat calculations, heifers implanted with IH/RH had more body fat than any other treatment. This may, in part, explain the favorable carcass quality traits seen in IH/RH implanted heifers. Heifers implanted with RH/R200 had the lowest number of Choice and Prime carcasses but percentage Choice and Prime carcasses may have been increased if they had been fed to the same body fat as the other implant treatments.

When comparing heifers implanted with EHT+THT/THT and those implanted with IH/RH, there were similar performance and carcass traits with the exception of heifers implanted with IH/RH having more carcasses grading Choice and Prime. Implanting heifers with RH/R200 increased overall leanness by producing more Yield Grade 1 & 2 carcasses, fewer Yield Grade 4 carcasses, lower body fat percentage and lower number of Choice and Prime carcasses.

Table 1. The Effect of Different Implant Strategies on Heifer Performance

Initial Implant Day 0	IH	RH	RH	EHT +THT	SEM	Treatment P-Value
Reimplant Day 90	RH	RH	R200	THT		
No. of Head	825	739	806	744		
Days on Feed	183	182	182	182		
In Weight, lbs.	567	573	567	571	1.24	.24
Weight Day 90, lbs.	859	868	870	867	1.69	.07
Final Wt[d], lbs.	1073	1079	1079	1071	2.00	.37
AFBW[e], lbs.	1034[b]	1055[a]	1070[c]	1050[a]	2.54	<.001
ADG Day 0-90, lbs.	3.24[b]	3.29[ab]	3.36[a]	3.30[ab]	.01	.03
ADG Day 90-end, lbs.	2.33	2.32	2.29	2.24	.02	.18
ADG Day 0-end, lbs.	2.79	2.81	2.83	2.77	.01	.21

[a,b,c] Means in a row without a common superscript differ (P< .05)

[d] Final weight adjusted to a common dressing percent 64%

[e] Weight adjusted to 28% empty body fat Guiroy et al, (J. Anim. Sci. 79:1983-1995, 2001)

Table 2. The Effect of Different Implant Strategies on Heifer Carcass Characteristics

Initial Implant Day 0 Reimplant Day 90	IH RH	RH RH	RH R200	EHT +THT THT	SEM	Treatment P-Value
Hot Carcass Wt, lbs .	687	690	690	685	1.28	.37
<550 lb Carcass Wt, %	2.30	1.89	2.23	2.15	.003	.95
Backfat, in.	.61	.59	.57	.58	.004	.01
Backfat/CWT Carcass Wt	.089	.085	.082	.085	.006	.003
Ribeye Area, sq. in.	13.37[a]	13.54[b]	13.79[c]	13.30[a]	.03	<.001
Ribeye/CWT Carcass Wt	1.96[a]	1.97[a]	2.01[b]	1.95[a]	.005	<.001
KPH Fat, %	2.00	1.98	1.97	2.01	.006	.08
Color Score[d]	4.33	4.41	4.39	4.41	.02	.19
Bone Maturity[e]	105	104	105	105	.59	.88
Dark Cutters[g], %	3.1	3.6	3.5	2.6	.006	.69
Avg. Yield Grade	2.75[a]	2.65[a]	2.52[b]	2.70[a]	.02	<.001
Marbling Score[f]	5.46[a]	5.29[b]	5.18[c]	5.22[bc]	.02	<.001
Empty Body Fat, %	29.68[b]	29.28[a]	28.85[c]	29.21[a]	.07	<.001

[a,b,c] Means in a row without a common superscript differ (P< .05)

[d] Lean muscle color score on a scale from 1-9. One is the lightest and 9 the darkest. 4= light cherry red, 5 = cherry red, and 6 = dark red. Scores of 7, 8, or 9 are dark cutters with 7 being a 1/3 dark cutter, 8 being a 2/3 dark cutter and 9 being a full dark cutter

[e] Bone maturity 100 = A maturity, 200 = B maturity and 300 = C maturity

[f] Marbling Score: Standard = 3 to 4; Select = 4 to 5; low Choice = 5 to 6; mid-Choice = 6 to 7; high Choice = 7 to 8; low Prime = 8 to 9; mid-Prime = 9 to 10

[g] Dark cutters were determined by a color score of equal to, or greater than 7

Table 3. The Effect of Different Implant Strategies on Quality and Yield Grade Distributions

Initial Implant Day 0 / Reimplant Day 90	IH / RH	RH / RH	RH / R200	EHT + THT / THT	SEM	Treatment P-Value
QUALITY GRADE DISTRIBUTIONS						
Substandard[d], %	1.5	1.2	1.6	1.2	.002	.99
Standard, %	2.2	2.2	2.3	2.3	.003	.89
Low Select, %	16.6	17.2	21.4	18.9	.007	.07
Select, %	10.4[a]	18.1[b]	17.0[b]	13.0[a]	.006	<.001
Low Choice, %	45.2[ab]	43.9[b]	42.3[b]	50.1[a]	.009	.02
Choice, %	14.5[b]	11.1[a]	10.5[a]	9.9[a]	.006	.02
High Choice, %	3.8	2.2	2.4	2.1	.003	.11
Prime, %	5.8[b]	4.1[ab]	2.5[a]	2.5[a]	.003	.001
Choice+Prime, %	69.3[b]	61.3[ac]	57.8[c]	64.6[a]	.009	<.001
YIELD GRADE DISTRIBUTIONS						
Yield Grade 1, %	22.2[a]	24.1[a]	30.2[b]	22.2[a]	.008	<.001
Yield Grade 2, %	42.0	41.2	40.2	42.1	.009	.87
Yield Grade 1 & 2, %	64.2[a]	65.3[a]	70.4[b]	64.3[a]	.009	.03
Yield Grade 3, %	24.8	26.3	23.2	23.2	.008	.38
Yield Grade 4, %	9.0[a]	7.3[ab]	5.3[b]	8.4[a]	.005	.03
Yield Grade 5, %	2.0	1.1	1.1	.8	.002	.21

[a,b,c] Means in a row without a common superscript differ (P< .05)

[d] Includes Commercial and Utility Grades

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