



ANABOLIC AGENTS FOR SPAYED (OVARIECTOMIZED) FEEDLOT HEIFERS

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ABSTRACT:

A 108-day commercial feedlot trial that used 2,925 spayed, yearling heifers (average initial weight = 849 lb.) was conducted to evaluate the effect of implant type on finishing performance and carcass characteristics. Heifers were from several origins and contained mixed crossbreds with 75% or more European-Continental influence, filling enough pens to comprise 5 replicates per treatment. The implant strategies compared were: 1) Synovex®-H (SYN); 2) Revalor®-H (REV); 3) Synovex®-H + Finaplix®-H (SYN/FIN). No MGA® was fed during the trial. Contrasts were written to compare SYN versus the pooled REV and SYN/FIN treatments, as well as REV and SYN/FIN. The estrogen plus trenbolone acetate treatments (E+TBA = REV and SYN/FIN) improved live weight gain by 11.4 lbs (P=.15), ADG by 0.11 lbs/day (P=.13), F/G by 0.21 lbs/hd/day (P=.12), but decreased prime and choice carcasses by 4.7% (P=.10) compared to the SYN treatment. All of the depression in prime and choice carcasses took place in the SYN/FIN treatment. Dry matter intake, dressing %, USDA yield grade, and % dark cutters did not differ between treatments. Percentage of hard-boned carcasses tended (P=.08) to be higher for REV versus SYN/FIN, although the incidence was the same (P=.24) in REV versus SYN heifers. The REV treatment had 10.54% more (P=.01) prime and choice carcasses and 11.52% less (P<.01) select carcasses than the SYN/FIN treatment. No heifers were removed from their home pen due to riding activity in any treatment.

INTRODUCTION

Revalor®-H (trenbolone acetate and estradiol) is an implant for confinement heifers which contains 140 mg trenbolone acetate (TBA) and 14 mg estradiol 17-beta (E2), and was approved in December, 1994. Little information exists at this point as to efficacy of TBA + E (estradiol 17 beta or estradiol benzoate) in spayed heifers. The anabolic response in "non-spayed"(intact) heifers may be the result of exogenous TBA and endogenous estrogens and therefore less dependent on exogenous estrogenic compounds from implants, such as Synovex®-H, Ralgro®, Compudose®, or Implus®-H. However, several trials indicate that combining TBA with an estrogen implant or MGA® (melengestrol acetate) or both increases gain and improves feed efficiency more than would be obtained when these anabolic agents are used singularly in intact heifers (Preston, 1987; Bartle et al., 1988; Hartman et al., 1989; Moran et al., 1989; Stanton et al., 1989; Clay, 1991). Nichols et al. (1994) found that Revalor®-H significantly improved average daily gain and feed efficiency compared with Synovex®-H in intact heifers.

Few studies have evaluated implant effects on spayed (ovariectomized) heifers (Adams et al., 1990; Garber, et al, 1990; Perino, et al, 1995). None of these studies used commercially available E plus TBA, or single TBA implants. Androgen replacement with trenbolone acetate and estrogen replacement with estradiol 17B or estradiol benzoate would appear to have value in the spayed heifer, based on the "hormone replacement and/or supplementation" concept to stimulate performance improvements. This trial was conducted to compare different implant strategies on spayed heifers in a commercial feedlot setting.

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MATERIALS AND METHODS

A commercial feedlot trial was conducted between August 14, 1995 and December 29, 1995 (average DOF = 108 days) to compare the effect of the growth promotant implants Revalor®-H (REV) and Synovex®-H plus Finaplix®-H (SYN/FIN) to Synovex®-H (SYN) on performance and carcass traits of spayed heifers, under practical feedlot conditions. Economic return of the heifers was calculated from performance data.

The trial was conducted at a central Nebraska feedlot. There were 2,925 head of medium flesh, good to excellent mixed crossbred heifers, with 75% or more European-Continental influence, spayed by the Overton, NE Veterinary Clinic, and pastured in Nebraska prior to feedlot entry. Three of the blocks had been implanted with Compudose® and two with Ralgro® prior to being placed on grass, approximately 150 days before feedlot entry. Upon arrival at the feedlot, each of five sources of cattle were randomly allotted (every other animal) into fifteen pens (five replications per treatment). Each block had the same origin, were started on feed and shipped at the same time, as well as slaughtered on the same day, except for a portion of the cattle in the SYN treatment in the second replication. Remaining animals in this replicate were slaughtered the following morning, as a result of slaughter plant breakdown the previous day. Treatments were: 1] Synovex®-H (20 mg estradiol benzoate + 200 mg testosterone propionate), 2] Revalor®-H, or 3] Synovex®-H in one ear + Finaplix®-H (200 mg trenbolone acetate) in the opposite ear^a, administered day 1 of the trial, with no reimplant. No MGA® (melengestrol acetate) was fed during this trial. After random allotment, each animal in a pen was individually weighed at processing, and starting weights were adjusted back to pay weight on a proportional basis.

Heifers were allowed access to feed and water upon arrival at the feedlot, and were then allotted and processed within 48 hours. Processing procedures included color coded ear tagging, Safe-Guard® (fenbendazole) 10% suspension dewormer¹, De-Lice®² for lice control, C & D Toxoid³ and IBR-BVD-BRSV-Lepto³ vaccines. Implanting and processing procedures, as well as post-implant technique evaluations on animals pulled for treatment, were supervised by Overton Veterinary Clinic personnel. Attempts were made to standardize pen space, bunk space, and pen location. There were no apparent advantages or disadvantages in pen condition in any of the replications.

All heifers were fed twice daily. A series of six rations were used to adjust heifers to the finishing ration (Table 1) in 18-20 days, and ration changes were made on the same day for all heifers within each replication. Diets were the same for all heifers. Rumensin⁴ and Tylan⁴ were included in the finishing rations. All pens were ridden daily for health status evaluation. Sick cattle were pulled, treated, and returned to their original pens upon recovery. Daily feed intakes were estimated and accounted for while cattle were in the sick pen. Adjustments were made in feed intake for dead and "realizer" animals by deducting the estimated feed consumed by the cattle that were removed from the trial. Feed weigh-backs were taken at the end of the feeding period for each pen of cattle, and adjustments made in total feed intakes.

Final weights were gross weights adjusted by a 3% pencil shrink. All heifers were slaughtered at Monfort, Inc., Grand Island, NE. Carcass data were taken from the formula data sheets supplied by the packing plant.

Statistical analysis was done by Dr. T.C. Chu, Hoechst Roussel Vet. The unit of statistical analysis was individual pen. The statistical analysis was conducted using analysis of variance procedures of SAS for a randomized complete block design. Pre-planned contrasts were written to compare the effects of E versus TBA + E (Treatment 1 versus Treatments 2 and 3), and to compare REV to SYN/FIN (Treatment 2 versus Treatment 3).

a The concomitant use of Synovex®-H and Finaplix®-H has not been approved by the FDA.

1 Safe-Guard® is a registered trademark of Hoechst Roussel Vet.

2 De-Lice® is a registered trademark of Mallinckrodt Veterinary, Inc.

3 Lextron, Inc.

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4 Rumensin® and Tylan® are registered trademarks of Elanco Animal Health.

RESULTS

The estrogen plus trenbolone acetate treatments (E+TBA = REV and SYN/FIN) improved live weight gain by 11.4 lbs (P=.15), ADG by 0.11 lbs/day (P=.13), F/G by 0.21 lbs/hd/day (P=.12), but decreased prime and choice carcasses by 4.7% (P=.10) when compared to SYN (Table 2). All of the depression in prime and choice carcasses took place in the SYN/FIN treatment. Dry matter intake, dressing %, USDA yield grade, and % dark cutters did not differ between treatments. The REV treatment had 10.54% more (P=.01) prime and choice carcasses, 11.52% less (P<.01) select carcasses, and 0.98% more (P=.08) hard bones than the SYN/FIN treatment. The percent hardbones were similar between SYN and REV (1.64% and 1.60%, respectively). No heifers were removed from their home pen due to riding activity in any treatment.

After implant and other costs were deducted, the estrogen plus trenbolone acetate (REV and SYN/FIN) heifers lost \$4.71 per head less than the SYN heifers when sold on a live basis and \$5.21 less than the SYN heifers when sold on a carcass basis, using a \$5.00 spread between choice and select grades (Table 3). Economic return was computed using all contrasts of the mean values of REV and SYN/FIN versus SYN listed in Table 2. Comparing the two E+TBA treatments (\$5.00 price spread between choice and select), the SYN/FIN heifers lost \$2.86 less on a live basis and \$0.51 less on a carcass basis than the REV heifers, despite the fact that there were 10.54% less choice and prime carcasses for SYN/FIN.

Table 1. Finishing ration content and analysis

Finishing Ration Content (dry matter basis)

<u>Ingredients</u>	<u>Percentage</u>
Corn	66.26
HMC	16.57
Finisher	8.03
Alfalfa Hay	7.14
Soybean Meal 48%	2.00
 <u>Nutrient</u>	
Dry Matter, %	81.00
Crude Protein, %	13.65
Neg, Mcal/cwt	62.37
Nem, Mcal/cwt	92.21
NPN equivalent, %	3.00
ADF, %	7.65
Calcium, %	0.76
Phosphorous, %	0.35
Salt, %	0.50

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Table 2. Least-Squares Means and Contrasts for Performance and Carcass Data

Response Variable	Synovex-H	Revalor-H	Synovex-H + Finaplix-H	SEM	Estrogen (SYN) vs. Estrogen + TBA (REV and SYN/FIN) P value	REV vs. SYN/FIN P value
In Weight	851.4	853.0	842.2	7.07	0.55	0.16
Out Weight	1239.2	1249.4	1245.0	13.82	0.26	0.58
Live Weight Gain	387.8	396.2	402.2	9.73	0.15	0.49
Average Daily Gain	3.59	3.67	3.73	0.09	0.13	0.47
Dry Matter Intake	24.59	24.46	24.63	0.32	0.85	0.52
Feed/Gain	6.86	6.68	6.61	0.11	0.12	0.61
Hot Carcass Weight	781.0	788.6	786.4	10.71	0.24	0.72
Dressing %	63.02	63.12	63.16	0.40	0.47	0.83
USDA Yield Grade 1 & 2 (%)	73.08	71.88	78.81	3.67	0.63	0.22
USDA Yield Grade 3 (%)	26.92	26.01	20.99	3.71	0.47	0.37
USDA Yield Grade 4 & 5 (%)	0.00	0.10	0.20	0.09	0.22	0.47
Average USDA Yield Grade (%)	2.60	2.62	2.51	0.06	0.62	0.24
Choice & Prime (%)	66.15	66.72	56.18	3.14	0.10	0.01
Select (%)	31.88	31.47	42.99	2.94	0.05	< 0.01
Standard (%)	0.21	0.20	0.10	0.12	0.69	0.56
Utilities: Hard Bones (%)	1.64	1.60	0.62	0.45	0.24	0.08
Dark Cutters (%)	0.12	0.00	0.10	0.09	0.54	0.46

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Table 3. Economic Analysis per Head:

	E+TBA (REV and SYN/FIN)	E (SYN)	E+TBA Advantage
Feed Cost of Gain	\$61.51	\$63.46	\$ 1.94
Total Cost of Gain	\$66.29	\$67.59	\$ 1.30
Profit, Live Basis	(\$30.10)	(\$34.81)	\$ 4.71
Profit, Grade & Yield	(\$23.18)	(\$28.39)	\$ 5.21
Return on Equity, Live	(\$18.21)	(\$20.97)	\$ 2.76
Return on Equity, G&Y	(\$14.03)	(\$17.10)	\$ 3.07
Breakeven, Live	\$65.41	\$65.81	\$ 0.40
Breakeven, Carcass	\$104.08	\$104.90	\$ 0.82

Assumptions use for Economic Analysis

Feeder \$/CWT	\$ 65.00	Drop Credit	\$8.31
Ration \$/Ton	\$185.00	Kill Costs	\$4.00
Live \$/CWT	\$ 63.00	Interest	10%
Choice \$/CWT	\$ 99.00	Equity	30%
Select \$/CWT	\$ 94.00	Implant Cost:	
Standard \$/CWT	\$ 82.00	Synovex®-H	\$0.92
Utility \$/CWT	\$ 82.00	Finaplix®-H	\$3.20
Dark Cutter \$/CWT	\$ 69.00	Revalor®-H	\$3.95
Yield Grade 4&5 \$/CWT	\$ 84.25	E+TBA (ave.)	\$4.04

RELEVANT LITERATURE

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