

EFFECTS OF TREMBOLONE ACETATE WITH OR WITHOUT ESTRADIOL,  
SYNOVEX H, AND RALGRO ON THE RATE AND EFFICIENCY  
OF GAIN BY FEEDLOT HEIFERS

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Story in Brief

One hundred forty yearling heifers were blocked by weight into four groups and assigned to 20 pens. One pen of seven heifers at each weight was implanted at the start of a 105 day feeding trial with: (1) no implant, (2) Trembolone Acetate, (3) Trembolone Acetate plus Estradiol, (4) Synovex H, or (5) Ralgro. There were no statistically significant differences in any of the live performance traits in this trial. Gains tended to be highest for heifers implanted with Trembolone Acetate plus Estradiol. Respective gains (lb/day) and feed efficiencies on a liveweight (shrunk) basis were: (1) 2.40, 7.15; (2) 2.45, 6.99; (3) 2.74, 6.56; (4) 2.49, 7.01; and (5) 2.44, 7.22. The Trembolone Acetate + Estradiol benefit appeared to be greater during the latter periods of the trial. The carcass data were obtained 22 to 33 days after the feeding trial and may not reflect implant effects. Metabolizable energy values calculated from liveweight gains tended to be higher for the Trembolone Acetate + Estradiol implanted heifers than for the controls (2.99 vs 2.84 mcals/kg) or other implants tested (2.81 to 2.88 mcals/kg).

(Key Words: Trembolone Acetate, Implants, Estradiol, Synovex-H, Ralgro, Feedlot Heifers.)

Introduction

Implants currently available to cattlemen in the United States do not improve either gain or efficiency for heifers as much as they do for steers. Trembolone Acetate has been used as an implant in other countries. The combination of Trembolone Acetate and Estradiol (Compudose and Finaplex) has been reported to give a large improvement over conventional implants with steers in trials from OSU and elsewhere (Trenkle, 1987). The optimum implant levels of Trembolone Acetate and Estradiol in a combination have not been established for heifers. This trial is part of a series of trials to determine the response of heifers to these implants. Combinations of Trembolone Acetate and Estradiol are not approved for use in the United States at the present time.

Materials and Methods

Heifers used in this trial were selected from a large group of crossbred heifers that had been pastured together at Purcell, Oklahoma. Animals were palpated and heifers that were estimated to be over 120 days pregnant were removed from the trial. The heifers selected

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averaged 616 lb and were treated with 1 mg fenprostalene (Bovilene). Heifers were vaccinated intramuscularly with IBR-PI<sub>3</sub> (MLV), *Leptospira Pomona bacterin* and *Clostridia chauvoei*, *septicum*, *novyi* and *sordellii* bacterin and received Ivermectin. The following day, the heifers were transported from Purcell, Oklahoma to Stillwater for feeding. Heifers were blocked by off-truck weights into four weight groups of 35 head each. Each block was further divided into five pens of seven head each with the five implant treatments being randomly assigned within each block. The implant treatments were: (1) no implant, (2) Trembolone Acetate (140 mg), (3) Trembolone Acetate (140 mg) + Estradiol (28 mg), (4) Synovex H (200 mg testosterone propionate and 20 mg estradiol benzoate), and (5) Ralgro (36 mg xeranol). All heifers were placed in a pasture for five days before being put into their feeding pens. The complete concentrate ration, which contained no feed additives, consisted of whole shelled corn, cottonseed hulls, supplement pellets and (initially) suncured alfalfa pellets with roughage sequentially removed until heifers were on their top ration in about 24 days (Table 1). The heifers were implanted 10 days after they were placed on feed. All weights were taken full early in the morning on days 35, 70 and 105 of the study. The heifers were fed for 127, 135 or 138 days and transported to Sand Springs, Oklahoma (59 miles) for slaughter. Because of the low capacity of the slaughter plant, heifers were killed on three different dates, though treatments were balanced within kill dates.

Means were compared by multiple range testing. In addition, individual contrasts were tested. These included (1) implanted vs control cattle, (2) TBA vs other implants, (3) estradiol effect and (4) Synovex vs Ralgro.

### Results and Discussion

Rate and efficiency of gain by these feedlot heifers were not significantly altered by any of the implant treatments in this trial (Table 2). However, mean gains and feed efficiencies were improved by 8 and 8.3 percent by the combination of Trembolone Acetate plus Estradiol compared to the controls. The other implants gave less response. Because of large variation among individual heifers, results of this trial must be combined with those of other similar tests (Table 4) to establish statistically whether the differences due to the implants are repeatable. Among the individual comparisons, daily gain during the third

Table 1. Composition of diets on a dry matter basis<sup>a</sup>.

Ingredient	Ration (Percent Roughage)					Final
	Starter	60	70	80	90	
Whole shelled corn	32.58	52.58	62.58	72.58	82.58	87.58
Cottonseed hulls	20.00	15.00	10.00	5.00	5.00	5.00
Suncured alfalfa pellets	40.00	25.00	20.00	15.00	5.00	----
Supplement pellets <sup>a</sup>	7.42	7.42	7.42	7.42	7.42	7.42

<sup>a</sup>Final ration ME=3.06 mcal/kg.

<sup>b</sup>Supplement composition: Calcium carbonate 14.82%, Salt 4.04%, Urea 6.06%, Vitamin A-30,000 IU/gram 0.30, Trace Mineral 0.17%, Soybean meal 23.58%, Potassium chloride 4.99%, Cottonseed meal 39.57%, Cane molasses 3.77% and Dicalcium phosphate 2.69%.

Table 2. Performance and carcass characteristics of heifers with the test implants.

Item	Implant				
	Control	TBA	TBA+E <sub>2</sub> B	Synovex	Ralgro
Number of heifers	28	28	28	27	27
Weight, lb:					
Initial	614	621	618	619	618
Final (105 days)	902	914	946	917	910
Daily gain, lb	2.40	2.45	2.74	2.49	2.44
Feed intake, lb	17.03	17.08	17.81	17.45	17.62
Feed/gain	7.15	6.99	6.56	7.01	7.22
Carcass weight, lb	556	562	571	564	551
Dressing percent	61.9	61.7	60.6	61.6	60.6
Rib eye area, sq in	11.4 <sup>ab</sup>	11.4 <sup>ab</sup>	11.7 <sup>a</sup>	11.7 <sup>a</sup>	11.0 <sup>b</sup>
Fat thickness, in	.41	.42	.45	.42	.47
Yield grade	2.52	2.60	2.61	2.50	2.83
Quality grade <sup>c</sup>	12.5	11.8	11.7	12.3	11.9
Metabolizable energy	2.84 <sup>ab</sup>	2.88 <sup>ab</sup>	2.99 <sup>a</sup>	2.86 <sup>ab</sup>	2.81 <sup>b</sup>

<sup>ab</sup>Means in a row with different superscripts differ ( $P < .05$ ).

<sup>c</sup>11=high good, 12=low choice.

period (days 70 to 105) and for the total trial tended to be increased with estradiol ( $P < .05$ ;  $P < .10$ ). Feed intake was also increased by estradiol during this period. Calculated metabolizable energy of the diet tended to be increased ( $P < .10$ ) more with TBA than other implants but tended to be lower than expected by about 7%. Quality grade tended to be reduced ( $P < .10$ ) by all implants and yield grade was poorer ( $P < .10$ ) with Ralgro than Synovex.

Analysis of the performance by initial weight blocks (Table 3) shows that the cattle of the lightest initial weights were more efficient than those started at heavier weights. This is consistent

Table 3. The effect of weight replication on heifer performance.

Weight Block	1	2	3	4
Number of heifers	35	33	35	35
Weight, lb:				
Initial	565 <sup>a</sup>	604 <sup>b</sup>	632 <sup>c</sup>	670 <sup>d</sup>
Final (105 days)	876 <sup>a</sup>	905 <sup>ab</sup>	921 <sup>b</sup>	969 <sup>c</sup>
Daily gain, lb	2.60	2.51	2.42	2.50
Feed intake, lb	16.6 <sup>a</sup>	17.5 <sup>ab</sup>	17.2 <sup>a</sup>	18.3 <sup>b</sup>
Feed/gain, live	6.45 <sup>a</sup>	7.01 <sup>ab</sup>	7.12 <sup>b</sup>	7.37 <sup>b</sup>
Carcass weight, lb	540 <sup>c</sup>	558 <sup>bc</sup>	565 <sup>ab</sup>	581 <sup>a</sup>
Dressing percent	61.9	61.7	61.4	60.0
Rib eye area, sq in	11.15	11.47	11.38	11.71
Fat thickness, in	.46	.42	.44	.42
Quality grade <sup>c</sup>	11.8	12.2	12.2	12.0
Metabolizable energy	2.92	2.84	2.87	2.87

<sup>ab</sup>Means in a row with different superscripts differ ( $P < .05$ ).

<sup>c</sup>11=high good, 12=low choice.

with several previous tests at OSU. Gains of the lighter group were more rapid than for the heavier groups.

Results of this trial are compared with previous results of five implant trials with steers in Table 4. Though responses are similar in direction and increased most with both estradiol and TBA, percentage responses tended to be lower for heifers than for steers. Addition of estradiol to TBA caused quite similar percentage responses in both sexes in gain (+11 to +13%) and efficiency (-5 and -5%). Hence, responses by heifers to TBA and estradiol, though variable, appear to parallel responses by steers.

Table 4. Comparison of results of this trial with heifers to five earlier trials with steers.<sup>1</sup>

Implant	Control	E <sub>2</sub> B	TBA	TBA+E <sub>2</sub> B
Daily gain:				
Five studies	3.06 <sup>a</sup>	3.41 <sup>b</sup>	3.27 <sup>ab</sup> (+7%)	3.67 <sup>c</sup> (+20%)
This trial	2.37	----	2.45 (+3%)	2.71 (+14%)
Feed/gain:				
Five studies	6.79 <sup>a</sup>	6.29 <sup>b</sup>	6.29 (-7%)	5.97 <sup>c</sup> (-12%)
This trial	7.23	----	6.99 (-3%)	6.63 (-8%)

<sup>1</sup>Summarized by Trenkle (1987).

#### Literature Cited

- Trenkle, A. 1987. Combining trembolone acetate and estrogen implants results in additive growth promoting effects in feedlot steers. *Feedstuffs*, Vol. 59, No. 4, 29 Jan 1987, p. 43-45.