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## Effect of implantation and melengestrol acetate feeding on blood serum profiles and performance of heifers

### Abstract

Payout characteristics of Revalor-H and Finaplix-H were measured in 30 heifers (678 pounds) assigned to one of six treatments: 1) negative control, 2) melengestrol acetate (MGA) (.5 mg/hd/d), 3) Finaplix-Hfi, 4) Finaplix-H + MGA, 5) Revalor-Hfi, and 6) Revalor-H + MGA. Blood samples were collected by jugular puncture on days 0, 1, 3, 5, 7, 13, 21, 28, 42, 56, 84, 112, and 140. Following implantation with either Revalor-H or Finaplix-H, serum trenbolone (TB) increased markedly at 1 and 3 days after implantation, then decreased through day 42. A second peak in serum TB was observed on day 56. Between days 56 and 84, a drop in serum TB was observed. Although TB in heifers implanted with Revalor-H or Finaplix-H was lowest between 84 and 140 days, the observed TB may still have been adequate to modify heifer performance over this period of time. Average daily gain and feed efficiency demonstrated an implant MGA interaction. Heifers with no implant responded to MGA supplementation with increased rate of gain, whereas heifers receiving either Revalor-H or Finaplix-H had less weight gain when fed MGA.

### Keywords

Cattlemen's Day, 1996; Kansas Agricultural Experiment Station contribution; no. 96-334-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 756; Beef; Implants; Heifers

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### Authors

Robert T. Brandt Jr., C.T. Milton, N. Campbell, and Evan C. Titgemeyer

**EFFECT OF IMPLANTATION AND MELENGESTROL  
ACETATE FEEDING ON BLOOD SERUM  
PROFILES AND PERFORMANCE OF HEIFERS**

*E. C. Titgemeyer, R. T. Brandt, Jr.<sup>1</sup>,  
C. T. Milton, and N. Campbell*

**Summary**

Payout characteristics of Revalor-H and Finaplix-H were measured in 30 heifers (678 pounds) assigned to one of six treatments: 1) negative control, 2) melengestrol acetate (MGA) (.5 mg/hd/d), 3) Finaplix-Hfi, 4) Finaplix-H + MGA, 5) Revalor-Hfi, and 6) Revalor-H + MGA. Blood samples were collected by jugular puncture on days 0, 1, 3, 5, 7, 13, 21, 28, 42, 56, 84, 112, and 140. Following implantation with either Revalor-H or Finaplix-H, serum trenbolone (TB) increased markedly at 1 and 3 days after implantation, then decreased through day 42. A second peak in serum TB was observed on day 56. Between days 56 and 84, a drop in serum TB was observed. Although TB in heifers implanted with Revalor-H or Finaplix-H was lowest between 84 and 140 days, the observed TB may still have been adequate to modify heifer performance over this period of time. Average daily gain and feed efficiency demonstrated an implant MGA interaction. Heifers with no implant responded to MGA supplementation with increased rate of gain, whereas heifers receiving either Revalor-H or Finaplix-H had less weight gain when fed MGA.

(Key Words: Implants, Heifers.)

**Introduction**

Revalor-H is an implant recently approved for use in feedlot heifers. In order to help the industry use it to its greatest potential, information is needed relative to length

of payout and the relationship of circulating levels of anabolic hormones to finishing heifer performance. In our study, concentrations of trenbolone (TB) and estradiol (E2) in serum of heifers implanted with Revalor-H and Finaplix-H and fed with or without melengestrol acetate (MGA) were measured. Our objectives were to determine the payout characteristics of the implants and, to the extent that was possible, to establish relationships between serum hormone levels and performance

**Experimental Procedures**

Thirty heifer calves (678 pounds) with no previous anabolic treatments were used. Heifers were assigned to one of six treatments (five heifers per treatment): 1) negative control, 2) MGA (.5 mg/hd/d), 3) Finaplix-H, 4) Finaplix-H + MGA, 5) Revalor-H, and 6) Revalor-H + MGA. Heifers were housed individually and fed in open-front barns in a 140-day study. Blood samples were collected by jugular puncture twice (45 minutes apart) on days 0, 1, 3, 5, 7, 13, 21, 28, 42, 56, 84, 112, and 140. All implants were made in the right ears of heifers, and all blood samples were collected from the right jugular vein. Serum was harvested, composited within day for each animal, and analyzed for serum E2 and TB concentrations. Individual intakes were measured, and feed refusals were collected and weighed weekly. At the conclusion of the study, heifers were slaughtered in a commercial packing plant, and carcass data were collected.

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## Results and Discussion

Serum E2 concentration was not affected by feeding of MGA (data not shown). However, implantation with Revalor-H led to marked increases in serum E2 (Figure 1). Implantation with Revalor-H increased serum E2 from an initial level of 4 pg/ml to an average of 25 pg/ml from day 1 to 13 after implantation. Serum E2 then increased between days 21 and 56 after implantation (average E2 over this period was 67 pg/ml) before dropping to an average value of 19 pg/ml for days 84 through 140 after implantation. Although serum E2 remained moderately elevated by Revalor-H implantation for up to 140 days, a large drop was observed between 56 and 84 days.

Serum TB concentrations remained essentially zero for nonimplanted heifers, but increased markedly following implantation with either Revalor-H or Finaplix-H. Over the entire experiment, serum TB was greater for heifers receiving Finaplix-H than those receiving Revalor-H (259 vs 204 pg/ml; Figure 2) and for heifers fed MGA than those not fed MGA (187 vs 122 pg/ml; data not shown). The overall pattern of serum TB in response to implantation was similar for Finaplix-H and Revalor-H. It increased markedly at 1 and 3 days after implantation, then decreased through day 42. A second peak in serum TB was observed on day 56. Between days 56 and 84, a large drop in

serum TB was observed. Although TB in heifers implanted with Revalor-H or Finaplix-H was lowest between 84 and 140 days, the observed TB may still have been adequate to modify heifer performance over this period of time.

Averaged over the entire experiment, treatments did not alter feed intake (Table 1). Average daily gain demonstrated an implant MGA interaction ( $P < .05$ ). Heifers with no implant responded to MGA supplementation with increased rate of gain, whereas heifers receiving either Revalor-H or Finaplix-H had less weight gain when fed MGA. The depression in ADG with MGA was less for heifers implanted with Finaplix-H than for those implanted with Revalor-H. Feed efficiency showed a response similar to ADG; heifers with no implant were more efficient when fed MGA, whereas heifers implanted with Revalor-H were less efficient when fed MGA. Because dressing percents were not affected by treatment, hot carcass weights followed the same trends as did gain (Table 2). MGA supplementation increased marbling score ( $P < .05$ ). Nonimplanted heifers tended to have larger REA when fed MGA, whereas Revalor-H implanted heifers tended to have smaller REA when fed MGA. In summary, anabolic agents (implants or MGA) improved heifer performance. However, the effects of the implants in combination with MGA were not additive.

**Table 1. Effect of Anabolic Treatment on Heifer Performance (140 days)**

Item	Implant						SEM
	None		Revalor-H		Finaplix-H		
	0	MGA	0	MGA	0	MGA	
No. heifers	5	5	5	5	5	5	
Daily feed, lb DM	19.0	18.5	20.1	19.1	19.1	18.4	.8
Daily gain, lb <sup>a</sup>	2.93	3.36	3.79	3.21	3.43	3.21	.19
Gain/Feed <sup>a</sup>	.15	.18	.19	.17	.18	.17	.01

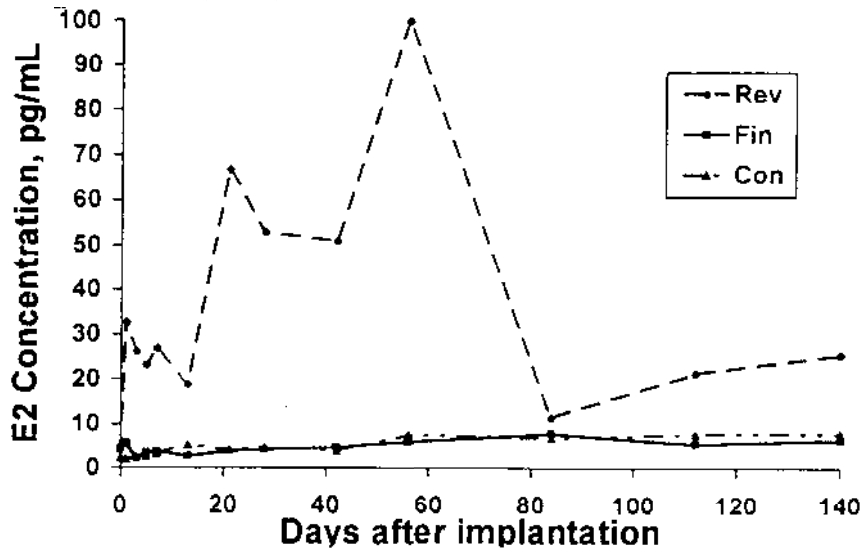
<sup>a</sup>Implant MGA interaction ( $P < .05$ ).

**Table 2. Carcass Characteristics of Heifers with or without Anabolic Treatment**

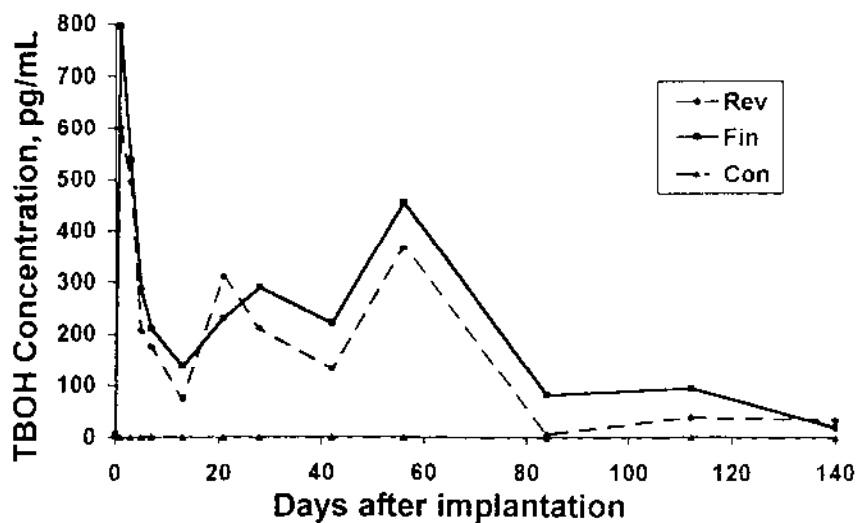
Item	Implant						SEM
	None		Revalor-H		Finaplix-H		
	0	MGA	0	MGA	0	MGA	
Carcass wt, lb <sup>a</sup>	680	700	759	676	709	686	17
Dressing %	61.8	61.7	61.9	60.7	60.8	61.2	.55
Back fat, in	.79	.87	.78	.75	.66	.84	.12
KPH, %	2.6	2.8	3.0	2.7	2.9	2.9	.25
Marbling <sup>b</sup>	5.8	6.8	5.7	6.6	5.0	5.9	.44
REA, in <sup>2</sup>	10.5	11.6	12.2	11.1	11.7	11.4	.47

<sup>a</sup>Implant MGA interaction (P<.05).

<sup>b</sup>Effect of MGA (P<.05).



**Figure 1. Serum Estradiol Concentrations**



**Figure 2. Serum Trenbolone Concentrations**