January 2000

Growth Implants for Heifers

Terry L. Mader
University of Nebraska-Lincoln, tmader1@unl.edu

Growth Implants for Heifers

Terry Mader[1]

Synovex® Plus™ improves gain and efficiency in feedlot heifers.

Summary

In a 110-d experiment, feedlot heifers (mean initial weight = 820 lb) that received an estradiol benzoate (EB) + trenbolone acetate (TBA) implant, Synovex® Plus™, gained faster and more efficiently than sham-implanted (control) heifers. Heifers that received only TBA implants had lower intakes and lower quality grades than control heifers, but were more efficient in feed conversion than control and EB implanted heifers. On the basis of improved yield grade and larger ribeye areas, along with no increases in fatness, the combined use of EB and TBA provided for greater quantities of lean meat from higher priced cuts than did control or other implant groups.

Introduction

The use of products that promote growth through hormonal activity has received much attention in recent years. Trenbolone acetate (TBA), a synthetic anabolic androgen, stimulates growth and enhances feed efficiency as do implants that have estrogenic activity (Ralgro®, Synovex®-S, Implus® and Compudose®). However, because androgenic and estrogenic products tend to have different mechanisms of action, the combination of TBA and estrogen have been shown to act additively. Synovex® Plus™, a combination product containing 28 mg estradiol benzoate (EB) and 200 mg TBA, has been shown to be an effective implant in steers, particularly when used in feedlot cattle about 100 days prior to slaughter. The objective of this study was to evaluate Synovex® Plus™ for use in feedlot heifers.

Procedure

Three hundred fourteen British x continental crossbred heifers were purchased in early July. Cattle were immunized against *Clostridial* diseases and *Haemophilus somnus* (Fermicon 7/ Somnugen™) and bovine rhinotracheitis/ parainfluenza$_3$/respiratory syncytial virus (BRSV Vac®), dewormed with fenbendazole (Safe-Guard® pellets), treated for external parasites (Tiguvon®), checked for pregnancy and examined for the presence of previous implants. Twenty-six animals were excluded from the pool of animals for any one or more of the following reasons: 1) too heavy or

(Continued on next page)

too light for the preferred weight range, 2) signs of injury or disease (pinkeye, BVD, etc.) 3) the animal had short ears, 4) the animal was a freemartin, 5) breed type was not appropriate (dairy cross), and 6) animals were randomly excluded. Heifers (288) were assigned to one of nine weight blocks. Within block, heifers were stratified by weight and randomly allocated to four pens which were randomly assigned the following treatments: 1) control (sham implanted); 2) 28 mg estradiol benzoate (EB); 3) 200 mg trenbolone acetate (TBA); and 4) Synovex® Plus (28 mg EB + 200 mg TBA).

On the day the trial began (d 0), heifers were weighed, implanted according to treatment assignment, and placed in designated pens. Initial weight was based on the average of weights taken over two consecutive days. During the receiving period, heifers were stepped up to finishing feedlot diets. At the start of the study, heifers were fed a 62.1 NEg Mcal/cwt diet, which subsequently was adjusted to a 65.0 NEg Mcal/cwt finishing diet which contained (DM basis): 7% alfalfa hay, 85% dry rolled corn, 3% soybean meal and 5% liquid supplement. Diets contained (DM basis) 13.4% crude protein. No ionophores or antibiotics were fed. During the trial, one heifer implanted with TBA died of bloat. At the end of the 110-d feeding period, heifers were weighed and shipped for slaughter. Liver abscess scores, masculinity scores, and hot carcass weights were recorded the day of slaughter. Additional carcass data were obtained after a 24-h chill. Adjusted final weights used for performance calculations were computed from hot carcass weight, assuming a 62% dressing percentage.

Data were analyzed as a randomized complete block design using analysis of variance procedures with weight block and implant treatment as independent variables in the model. Protected LSD's were used as the mean separation technique.

Results

Heifers that received TBA or Synovex® Plus™ had greater ($P < .10$) gains and final weights than control heifers (Table 1). Dry matter intakes (DMI) by TBA-implanted heifers were lower ($P < .10$) than DMI by control and EB-implanted heifers. Compared to controls, all implanted heifers had lower feed to gain ratios ($P < .10$). However, heifers implanted with only TBA had lower ($P < .10$) feed to gain ratios than heifers implanted with only EB.

Implanted heifers had lower ($P < .10$) % KPH and marbling scores than control heifers (Table 2), while heifers implanted with TBA or Synovex® Plus™ had greater ($P < .10$) ribeye areas than control heifers. Heifers that received only TBA had lower quality grade (% Choice and Prime) than control heifers. Ribeye color and masculinity scores did not differ between control and implanted heifers. Only heifers implanted with Synovex® Plus™ had lower yield grade than control heifers, while heifers receiving only TBA implants tended to have a greater incidence of liver abscesses than control heifers. This is opposite to trends found in a previous study (1996 NE Beef Report, pp. 71) in which non-implanted cattle tended to have a greater incidence of liver abscesses than implanted cattle. The greater overall incidence of liver abscesses could likely be attributed to the absence of a feed-grade antibiotic fed to control abscesses. Data suggest Synovex® Plus™ implants effectively improve gain and feed efficiency in crossbred feedlot heifers without significantly altering color or masculinity score.

Table 1. Summary of heifer performance over a 110-day feeding trial comparing implant treatments.[a]

Item	Control	EB	TBA	EB + TBA
No. head	72	72	71	72
No. pens	9	9	9	9
Initial wt., lb	822	821	819	816
Average daily gain, lb/day[b]	2.78[c]	2.90[c,d]	2.98[d]	3.06[d]
DM intake (DMI), lb/day[b]	20.08[d]	20.07[d]	19.25[c]	19.90[c,d]
Feed efficiency, DMI/gain[f]	7.25[e]	6.92[d,e]	6.49[c]	6.52[c,d]
Final wt., lb[b]	1129[c]	1142[c,d]	1148[d]	1157[d]

[a]Control heifers were sham implanted, EB = 28 mg estradiol benzoate and TBA = 200 mg trenbolone acetate.
[b]Adjusted to a common dress of 62%
[c,d,e]Means with different superscripts differ ($P < .10$)
[f]DMI/gain was analyzed as gain/DMI.

Table 2.Summary of heifer carcass data comparing implant treatments.

Item	Control	EB	TBA	EB + TBA
Hot carcass weight, lb	700[b]	708[b,c]	712[c]	718[c]
Actual dress, %	62.2	62.1	62.2	62.7
KPH fat, % of carcass	2.19[c]	2.06[b]	2.05[b]	2.06[b]
Ribeye area, in^2	13.0[b]	13.4[b,c]	13.5[c]	14.0[d]
Estimated fat thickness, in	0.49	0.50	0.51	0.48
Marbling score[e]	507[c]	452[b]	447[b]	442[b]
Choice + Prime, %[f]	86.2	72.2	67.6	73.2
Color score[g]	4.96	4.82	4.74	4.97
Masculinity score[h]	4.85	4.92	4.88	4.86
Final yield grade[i]	2.66[c]	2.58[b,c]	2.55[b,c]	2.37[b]
Liver abscesses, %	5.6	9.7	19.7	13.9

[a]Control heifers were sham implanted, EB = 28 mg estradiol benzoate and TBA = 200 mg trenbolone acetate.
[b,c,d]Means with different superscripts differ ($P < .10$).
[e]Marbling score of 400 = Small, 500 = Modest, 600 = Moderate.
[f]TBA significantly different than control ($P < .10$) based on Chi-square analysis.
[g]Color score of 4 = light cherry red, 5 = cherry red, 6 = dark red.
[h]Masculinity score of 1 = least masculine, 9 = most masculine
[i]Final yield grade = 2.50 + (2.50 x estimated fat thickness) + (.20 x percent KPH) + (.0038 x hot carcass weight) - (.32 x ribeye area).

[1]Terry Mader, professor, Animal Science Northeast Research and Extension Center, Concord.