PERFORMANCE AND CARCASS CHARACTERISTICS OF CULL BEEF COWS IMPLANTED WITH GROWTH PROMOTANTS AND FED A HIGH CONCENTRATE RATION

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Summary

Open, cull beef cows fed a high concentrate ration for 28 or 56 days and implanted with Finaplix-H®, Synovex-H®, or both had improved gain and feed efficiency compared to controls (nonimplanted cows). Changes in ultrasound-measured backfat (12th rib) of implanted cows and controls were similar in both feeding periods. Marbling, fat color, and tenderness, as measured by Warner-Bratzler shear force, were not improved by feeding cows for 56 days compared to 28 days. However, lean color, dressing percent, and ribeye area were improved by feeding for 56 days. Numerical yield grade was lower ($P < .05$) in 28-day fed cows. Implanting with Synovex-H or Finaplix-H resulted in leaner carcasses with lower yield grades compared to controls. Ribeye area was increased by using Synovex-H compared to controls and Finaplix-H. These data indicate that the benefits in gain, feed efficiency, and carcass traits from implanting cull cows can be obtained by using either Synovex-H or Finaplix-H alone.

(Key Words: Cull Cow, Implant, Gain, Efficiency, Carcass.)

Introduction

If a beef cow fails to conceive, economics usually dictate culling her from the herd. An estimated 300,000 cull beef cows are sold annually in Kansas. Most are culled after weaning and are sold in thin condition after coming off late-season pasture. The potential exists for exploiting compensatory gain in these thin cows. However, little research has examined implant strategies for use while feeding thin, mature, nonpregnant, beef cows. Therefore, this project was designed to examine the effect of growth-promoting implants on live animal performance and carcass characteristics of cull beef cows fed a high concentrate ration.

Experimental Procedures

Forty-eight, predominantly British breed cows were stratified by weight and randomly assigned to an implant treatment, feeding period (28 or 56 days), and one of three replications (16 cows per replication).

All cows were nonpregnant and between 4 and 10 years old (as determined by mouthing) and had an average of .13 inch of ultrasound-measured backfat at the 12th rib. Treatments included: 1) nonimplanted (controls), 2) Synovex-H (200 mg testosterone + 20 mg estradiol benzoate), 3) Finaplix-H® (200 mg trenbolone acetate), or 4) both implants. Cows were fed in individual pens, systematically increased from a 56% to an 80% concentrate (DM basis) grain plus sorghum silage ration balanced to contain 11.9% crude protein, and full fed for either 28 or 56 days.

Weights were taken on 3 consecutive days at the beginning of the trial and on 2 days prior to each slaughter date. Differences between averaged weights were used to calculate gain and feed efficiency. Changes in external fat cover were monitored using ultrasound.

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Cows were slaughtered at the Kansas State University meats laboratory. Carcass data collected included: USDA yield grade factors, marbling score, fat and lean color, and dressing percent. A steak was removed at the 12th rib for determination of Warner-Bratzler shear force.

Results and Discussion

Performance results are presented in Table 1. Implanting cull cows improved daily gain and feed efficiency compared to controls. Cows receiving both implants performed similarly to those receiving either implant alone. Implanted cows had greater ($P < .10$) daily gains at 28 days than controls. At 56 days, Finaplix-H implanted cows and those receiving both implants had greater ($P < .05$) gains than controls. Cull cow gains on all implant treatments were similar ($P > .05$) at 56 days. However, gain of Synovex-H implanted cows was not different ($P > .05$) from that of controls. Feed intake did not differ ($P > .05$) among experimental groups in either feeding period. However, implanted cows required less ($P < .05$) feed per pound of gain, with no difference ($P > .05$) among implant treatments. Ultrasound fat thickness changes were similar ($P > .05$) for all treatments at both 28 and 56 days.

Cull cow gain and feed efficiency of all experimental groups exceeded the authors' expectations. In an effort to minimize measurement error, multiple live cattle weights were taken to calculate gain. Actual unshrunk weights were used in the analysis. It is likely that mature cows eat more when changed from limited nutritional management to a high quality diet. Therefore, the reported gains would be skewed upward by increased fill. Nevertheless, differences in performance between control and implanted cull cows should be biologically significant.

The effects of implant treatment and days on feed on carcass traits are presented in Table 2. Yield grade and ribeye area were the only carcass traits affected by implanting. Cows implanted with Finaplix-H or Synovex-H had leaner carcasses with lower ($P < .05$) numerical yield grades than controls. Cows receiving both implants did not differ ($P > .05$) from controls or single-implant groups with respect to yield grade. Cows implanted with Synovex-H had larger ($P < .05$) ribeye areas than control and Finaplix-H-implanted cows. Cows given both implants had ribeye areas similar ($P > .05$) to both single-implant groups and controls. Statistical analysis did not allow separation of treatment groups within a feeding period; however, hot carcass weights from implanted cows appeared heavier than those from controls at 56 days. This is consistent with differences observed in daily gain during the same period.

Several differences in carcass traits (Table 2) were found between feeding groups (28 vs. 56 days). Dressing percentage, hot carcass weight, ribeye area, and adjusted fat thickness were greater ($P < .05$) in 56-day fed cows than in those fed for 28 days. As would be expected from an increase in fat thickness, cows fed for 56 days had higher ($P < .05$) numerical yield grades. Subjective lean color scores were lighter ($P < .05$) in cows fed for 56 days compared to 28 days. Warner-Bratzler shear value, marbling score, and fat color were not influenced ($P > .10$) by feeding period. Lengthening the feeding period increased fat thickness, ribeye area, and dressing percentage.

Gain and feed efficiency were improved dramatically by implanting thin cull beef cows prior to high grain feeding. Yield grade and ribeye area were also increased by implanting. Our data indicate that live animal performance and carcass traits respond to Finaplix-H or Synovex-H alone, and it is not necessary to use both implants simultaneously.

Table 1. Feedlot Performance of Implanted and Nonimplanted Cull Beef Cows Fed for 28 or 56 Days

Item	Control	Finaplix-H®	Synovex-H®	Both Implants
28 Days on Feed				
Daily gain, lb	3.9[c]	5.1[b]	5.3[b]	5.8[b]
Change in fat thickness, in.[a]				
Feed/gain	7.2[e]	5.5[d]	5.4[d]	5.0[d]
Daily Intake, lb DM	26.0	26.8	27.5	26.8
56 Days on Feed				
Daily gain, lb	3.5[e]	4.8[d]	4.5[de]	5.3[d]
Change in fat thickness[a], in.				
Feed/gain	9.0[e]	6.5[d]	6.8[d]	5.5[d]
Daily intake lb DM	29.3	29.5	30.1	29.2

[a]Change in ultrasound measured fat thickness at the 12th rib (inches).
[bc]Values in the same row without a common superscript are different (P < .10).
[de]Values in the same row without a common superscript are different (P < .05).

Table 2. Carcass Traits of Implanted and Nonimplanted Cull Beef Cows Fed for 28 or 56 Days

Item	28 Days of Feed				56 Days of Feed				Response	
Implant[a]:	C	F	S	B	C	F	S	B	Day[b]	Trt[c]
Dressing percent	51.4	49.3	51.9	50.6	53.7	53.1	54.6	54.7	*	NS
Yield grade	2.3	1.8	1.6	1.9	2.5	2.4	2.4	2.6	*	†[g]
Adjusted backfat, in.	.36	.19	.25	.29	.38	.41	.42	.46	*	NS
Ribeye area, in.[2]	11.2	11.0	12.7	11.9	11.6	12.5	13.1	12.4	*	†[h]
Hot carcass weight, lb	585	562	600	580	652	678	690	712	*	NS
Fat color[d]	3.7	3.6	3.0	4.0	2.6	2.8	1.8	2.4	NS	NS
Lean color[e]	6.2	6.0	6.2	6.3	4.0	4.4	4.7	4.5	*	NS
Warner-Bratzler shear, lb	11.7	9.9	10.6	11.9	11.2	10.1	11.2	10.6	NS	NS
Marbling score[f]	269	315	334	267	287	347	294	311	NS	NS

[a]C = Control, F = Finaplix-H®, S = Synovex-H®, B = Both Implants.
[b]* indicates a difference exists between feeding periods (P < .05) across treatment groups. NS indicates no significant difference (P > .05).
[c]† indicates a difference exists between specific implant treatments (P < .05) across feeding periods. NS indicates no significant difference (P > .05).
[d]Subjective score: 1 = bleached white, 8 = dark yellow.
[e]Subjective score: 1 = pale red, 4 = cherry red, 8 = very dark red.
[f]Marbling score: 200 = Slight[0], 300 = Small[0].
[g]C > F and C > S, P < .05.
[h]C < S and F < S, P < .05.