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Effect of Implant Strategies on Feedlot Performance and Carcass Traits of Steers

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Summary

The role of implant selection on feedlot performance and carcass traits was evaluated in 200 yearling steers. The steers (initial body weight 709 lb) were implanted on day 1 or day 70 of the 140-day experiment. Implant combinations (day 1/day 70) included none/none, Synovex-S + Finaplix-S/Synovex-S + Finaplix-S, Ralgro (36 mg)/Revalor, Synovex-S/Revalor, and Ralgro (72 mg)/Revalor. Day 1 implants increased ($P<.05$) average daily gain and reduced feed/gain through 70 days on feed. During the 71- to 140-day period implanted cattle exhibited higher ($P<.05$) average daily gain and lower ($P<.05$) feed/gain than nonimplanted steers. Specific implant combinations were all of comparable value. Implants increased ($P<.05$) carcass weights by 55 lb over nonimplanted steers and increased ($P<.05$) rib eye area 1 in.^{2}. Rib fat thickness and rib eye area/cwt carcass were not affected by implanting. The percentage of choice grade carcasses was reduced ($P<.05$) from 82.5% to 62.3% by implanting. There were no appreciable differences in carcass traits attributable to specific implant combinations.

Key Words: Feedlot, Steers, Implant

Introduction

Implant programs designed to maximize the feedlot performance of steers are often credited with reducing carcass value. There is considerable interest in finding specific implant strategies that may optimize the relationships between performance and carcass quality. Strategy involves choice of implant, timing of administration, and sequence of implant use when reimplanting is practiced.

Commercially available implants contain different active ingredients and payout rates. We chose to consider whether the differences that exist among implants may be used to optimize performance and carcass traits. This experiment was designed to compare the efficacy of implant strategies on feedlot production rates and carcass value of yearling steers.

Materials and Methods

Two hundred yearling steers (709 lb) were allotted across five implant treatments. Implants were administered on day 1 and day 70 of the feeding period as noted in Table 1.

Yearling steers used in this experiment came from two sources. Most of the steers had been used in a backgrounding experiment at the feedlot during November 1992 through January 1993. The basal diet of the backgrounding experiment was composed primarily of corn silage. Backgrounding treatments used were 0, 11, 22 or 33 g monensin/T dry feed. Vaccinations and deworming of these steers was performed upon arrival in the feedlot the last week of October, 1992. The calves had never been implanted. At the termination of the backgrounding experiment (1-22-93) we began feeding a holding diet of 14 lb high moisture ear corn, .5 lb liquid supplement, and .5 lb SBM (as fed basis). This daily feeding rate continued through 2-7-93. An additional group of preconditioned steers were purchased 1-21-93 and were fed this same holding diet. They were vaccinated, dewormed, individually identified, and weighed on 1-25-93. Ears were inspected at processing with no palpable evidence of previous implants.

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Table 1. Implant administration

Treatment	1	2	3	4	5
Day 1	None	Synovex-S + Finaplix-S	Ralgro, 36 mg	Synovex-S	Ralgro, 72 mg
Day 70	None	Synovex-S + Finaplix-S	Revalor	Revalor	Revalor

The final BW from the backgrounding experiment and the BW measured on 1-25-93 were used to stratify BW across all treatments and replicates for allotment to the implant study. Origin of cattle and backgrounding experiment treatments were also balanced across implant treatments. There were 160 steers from the first source and 40 steers from the second source of steers used in this experiment.

Initial and final BW were the average of BW determined on consecutive days (Feb 8-9 and June 28-29, 1993) at 0800. These and all interim BW (35, 70, and 105 days) were determined prior to feeding. Cattle were fed a high concentrate diet (Table 1) once daily throughout the (140 days) experiment. On Feb 8 the diet was offered at a rate of 10 lb/head. Feed deliveries were then systematically increased as could be tolerated by each pen of steers. Daily bunk score readings indicated that ad libitum intake was achieved within the first 30 days. Feed ingredients were sampled weekly and submitted for laboratory analysis. Dry diet formulations and composition were then back calculated each week based on feed analysis and actual quantities of ingredients used in each batch of feed prepared. The data in Table 2 reflect 20 weekly feed summaries.

Implant sites were palpated on day 35 and 105 and a record of observations was noted. Synovex and Ralgro implants were placed in the left ear and Finaplix and Revalor implants were placed in the right ear of steers.

Slaughter occurred over a 2-day period at a commercial packing plant 70 miles from the feedlot. Four steers from each pen were shipped to the packing plant the afternoon after the final BW were determined. Steers were randomly co-mingled during the shipping and slaughter procedures. Slaughter on this group started at 0700 the following day. Carcass data were collected 24 hours after slaughter. A

Table 2. Diet formulation and composition[a]

Corn silage, %	12.000
Whole shelled corn, %	39.408
High moisture corn, %	39.408
Liquid supplement, %	3.600
Dry supplement	
Ground corn, %	2.766
Corn gluten meal, %	1.004
Blood meal, %	.756
Urea, %	.918
Limestone, %	.080
Fat, %	.060
Crude protein, %	12.660
NE_m, Mcal/cwt	93.200
NE_g, Mcal/cwt	62.600
Ca, %	.510
P, %	.283
K, %	.819

[a]Dry matter basis.
[b]Diet provided 26.8 g monensin and 11 g tylosin per ton.

similar sequence was followed one day later for the remaining four steers in each pen. Hot carcass weight was recorded and rib eye area and rib fat thickness were measured on each carcass. The Federal Grader on duty assigned marbling scores to the nearest 1/10 score and KPH to the nearest .25%.

Data were analyzed by procedures appropriate for a completely random design experiment using the GLM procedures of SAS. Feedlot performance data were evaluated on a pen mean basis. Carcass data were evaluated using individual carcasses as the experimental unit. Percentage choice data were evaluated as discrete data by chi square analysis.

Results and Discussion

The initial 35-day feedlot performance was inflated by fill. Intake was only 10 lb when initial BW were determined and had increased to approximately 19 lb on day 34. Even so, relative gain differences between implant treatments can be considered. Cattle receiving Synovex-S appeared to start slower than steers implanted with either 36 or 72 mg Ralgro (Table 3). This numerical difference shifted to favor the treatments including estradiol from 36 to 70 days on feed.

All implants stimulated ADG ($P<.05$) during the initial 70 days (Table 4). Only Synovex-S increased DMI above that occurring in the nonimplanted treatment. Implanting reduced feed/gain ($P<.05$). In the comparison of nonimplanted vs Synovex-S the contrast approached significance ($P<.0524$).

Table 3. Feedlot Performance Responses to Implant Treatments[a]

	Implant treatment					
Day 1	None	Synovex-S + Finaplix-S	Ralgro, 36 mg Revalor	Synovex-S	Ralgro, 72 mg Revalor	
Day 70	None	Synovex-S + Finaplix-S		Revalor		SEM
Initial BW	709	708	709	714	707	4.8
Day 70 BW	947^{c}	984^{b}	972^{b}	980^{b}	975^{b}	7.2
Final BW	1150^{c}	1241^{b}	1228^{b}	1238^{b}	1232^{b}	11.0
1 to 35 days						
ADG	4.39^{c}	4.74^{bc}	4.81^{b}	4.77^{bc}	4.93^{b}	.123
DMI	16.45^{bc}	16.12^{c}	16.41^{bc}	16.66^{b}	16.56^{bc}	.159
F/G	3.77^{b}	3.41^{c}	3.41^{c}	3.50^{bc}	3.70^{c}	.095
36 to 70 days						
ADG	2.41^{d}	3.14^{b}	2.70^{cd}	2.85^{bc}	2.73^{bcd}	.137
DMI	19.35^{c}	19.37^{c}	19.83^{c}	20.87^{b}	19.92^{c}	.303
F/G	8.05^{b}	6.26^{c}	7.37^{b}	7.44^{b}	7.33^{b}	.327
71 to 105 days						
ADG	2.87^{c}	3.68^{b}	3.59^{b}	3.89^{b}	3.56^{b}	.184
DMI	19.75^{c}	20.30^{bc}	20.31^{bc}	21.41^{b}	20.53^{bc}	.456
F/G	7.07^{b}	5.86^{c}	5.67^{c}	5.55^{c}	5.79^{c}	.343
106 to 140 days						
ADG	2.93^{c}	3.66^{b}	3.71^{b}	3.46^{bc}	3.78^{b}	.196
DMI	20.17^{c}	21.27^{bc}	21.36^{bc}	21.88^{b}	22.10^{b}	.471
F/G	7.10	5.87	5.81	6.39	5.87	.400
1 to 140 days						
ADG	3.15^{c}	3.81^{b}	3.71^{b}	3.74^{b}	3.75	.077
DMI	18.93^{c}	19.27^{c}	19.48^{bc}	20.21^{b}	19.78^{bc}	.285
F/G	6.02^{b}	5.08^{c}	5.27^{c}	5.41^{c}	5.28^{c}	.139

[a]Five pens/treatment.

[b,c,d]Means in the same row without common superscripts differ ($P<.05$).

Table 4. Cumulative 1 to 70 day or 71 to 140 day performance response to implant treatment

Day 1	Implant treatment					
	None	Synovex-S + Finaplix-S	Ralgro, 36 mg	Synovex-S	Ralgro, 72 mg	
Day 70	None	Synovex-S + Finaplix-S	Revalor	Revalor	Revalor	SEM
1 to 70 days						
ADG	3.40[b]	3.94[c]	3.76[c]	3.81[c]	3.83[c]	.094
DMI	17.90[b]	17.74[b]	18.12[b]	18.77[c]	18.24[bc]	.207
F/G	5.27[b]	4.53[d]	4.83[cd]	4.94[bc]	4.77[cd]	.115
71 to 140 days						
ADG	2.90[b]	3.67[c]	3.65[c]	3.67[c]	3.67[c]	.128
DMI	19.96[c]	20.79[bc]	20.84[bc]	21.65[b]	21.31[b]	.416
F/G	6.02[b]	5.08[c]	5.27[c]	5.41[c]	5.28[c]	.139

[a]Five pens/treatment.
[b,c,d]Means in the same row without common superscripts differ ($P<.05$).

Reimplanting at 70 days continued to cause higher ($P<.05$) ADG than that demonstrated by nonimplanted steers. The ADG among implanted steer treatments was similar. Steers implanted initially with Synovex-S or 72 mg Ralgro consumed more feed than nonimplanted steers during this period. Intake and feed conversions were similar ($P>.05$) for implanted steers. Implanting improved feed/gain ratios ($P<.05$).

Dressing percentage noted in Table 5 appears low by industry standards. This is because it was calculated using nonshrunk final body weights. If final body weight is shrunk 4%, dressing percentages range from 63.4 to 64.0% and were not affected by implant treatment. Several responses typical of implant studies terminated at a constant time endpoint are born out in these data. Carcass weight and rib eye area are increased ($P<.05$) by implanting. Rib eye area per cwt carcass and rib fat depth were not affected by implanting. Marbling score was reduced ($P<.05$) for the Synovex-S + Finaplix and 36 mg Ralgro + Revalor treatments and also reduced ($P<.06$) for the 72 mg Ralgro and Synovex-S treatments as compared to nonimplanted steers. Comparisons of carcass traits among implants used indicated no appreciable effects or trends due to implant choice.

Table 5. Carcass traits among implant treatments

	Implant treatment					
Day 1	None	Synovex-S + Finaplix-S	Ralgro, 36 mg	Synovex-S	Ralgro, 72 mg	
Day 70	None	Synovex-S + Finaplix-S	Revalor	Revalor	Revalor	SEM
Carcass wt, lb	701[c]	759[b]	755[b]	759[b]	753[b]	9.000
Dressing percent	60.99	61.20	61.44	61.38	61.11	.242
Rib eye area, in.^{2}	12.26[c]	13.22[b]	13.38[b]	13.04[b]	13.16[b]	.217
Rib eye area, in.^{2}/cwt	1.75	1.74	1.78	1.72	1.75	.043
Rib fat	.45	.51	.45	.49	.49	.022
Marbling score[a]	5.88[b]	5.23[c]	5.38[c]	5.44[bc]	5.44[bc]	.160
Choice, %	82.5	60.5	61.5	60.5	66.7	

[a]Five pens/treatment.
[b,c,d]Means in the same row without common superscripts differ ($P < .05$).