Effects of Reimplanting Feedlot Cattle

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Story in Brief

Feedlot and carcass performance was evaluated on 499 three-breed cross cattle fed a high concentrate ration from weaning to slaughter. All calves received an implant (Synovex-H and Synovex-S for heifers and steers, respectively) when entering the feedlot at an average age of 207 days. One-half of the animals received a second Synovex implant at approximately 129 days on feed.

Over the entire feeding period, reimplanted steers gained .26 lb/day (9.6 percent) more rapidly than non-reimplanted steers. Although not statistically significant overall daily gain was .06 lb/day (2.6 percent) more rapid for reimplanted than non-reimplanted heifers. Despite being on feed 11 fewer days, reimplanted steers were 27 lb heavier at slaughter and had carcasses that were 21 lb heavier than non-reimplanted steers. Reimplanted steers and heifers tended to produce trimmer carcasses with more muscle than non-reimplanted animals.

Reimplantation resulted in considerable improvement in feedlot daily gain of steers and lesser improvement in heifers. Based on actual feedlot performance and exclusive of reimplanting costs, the value of reimplantation was estimated to be $13.88 and $5.67 per head for steers and heifers, respectively.

Introduction

Growth-stimulating implants have been shown in many studies to increase gains of feedlot cattle, as well as increase muscling and decrease fat of carcasses. However, the effects of frequency and number of implants has not been thoroughly determined. The objective of this study was to determine the effects of reimplantation with Synovex on the feedlot performance and carcass merit of steers and heifers.

Experimental Procedure

Cattle used in the study were produced in the spring of 1979 and 1980 from eight two-breed cross cow groups (Hereford X Angus, Angus X Hereford, Simmental X Angus, Simmental X Hereford, Brown Swiss X Angus, Brown Swiss X Hereford, Jersey X Angus and Jersey X Hereford) mated to Charolais and Limousin bulls. The three-breed cross calves remained with their dams until weaning on native and bermuda grass pastures at the Lake Carl Blackwell Research Range with the exception that 35 of the calves born in 1980 were reared by their dams in a drylot.

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Calves were weaned in October at an average age of 207 days and immediately transported to the Southwestern Livestock and Forage Research Station near El Reno and placed in the feedlot. Calves of a specific three-breed cross and of the same sex were fed together in a pen assigned at random. Ad libitum consumption of the finishing ration shown in Table 1 was allowed. All calves received a Synovex implant prior to entering the feedlot. A random half of the animals in each pen were reimplanted at 132 and 125 days on feed for the first and second year of the study, respectively. Cattle were individually removed from the feedlot for slaughter when attaining an estimated low choice carcass grade. A total of 259 heifers and 240 steers were involved in the study over the two years. Consideration of reimplantation effects on feed intake or feed efficiency were not possible since half the animals in each pen were reimplanted.

Table 1. Finishing ration

Ingredient		Percent of ration
Corn		78
Alfalfa		8
Cottonseed hulls		4
Molasses		5
Supplemental pellets[1]		5
	Total	100

[1]Supplemental pellets consisted of 67.6% soybean oil meal (44%), 12% urea, 10% calcium carbonate, 8% salt plus Aurofac, vitamin A and trace minerals.

Results and Discussion

Preliminary analyses indicated that treatment X crossbred group and treatment X year interaction effects were not important, meaning that treatment differences were similar from one crossbred group to another and from one year to the next. Thus, treatment means and differences between treatments have been averaged over crossbred groups and years. On the other hand, the treatment X sex interaction was significant for several traits and so treatment means are presented separately for each sex.

Feedlot performance of heifers and steers is presented in Table 2. Within each sex, weights were similar for treatment groups when entering the feedlot and at the time of reimplantation. The effect of reimplantation on daily gain was positive for both sexes but considerably more pronounced for steers than for heifers. From reimplantation to slaughter, reimplanted steers gained .5 lb (21.4 percent) more weight per day than non-reimplanted steers and .26 lb (9.6 percent) more per day for the entire feedlot period. Reimplanted heifers gained .12 lb (6.0 percent) more weight per day following reimplantation and .06 lb (2.6 percent) more weight per day overall (non-significant) than non-reimplanted heifers.

Reimplanted heifers were in the feedlot eight fewer days and were 10 lb lighter (non-significant) at slaughter than non-reimplanted heifers. However, reimplanted heifers had a lower carcass grade (Table 3) which means they

Table 2. Feedlot traits of reimplanted and non-reimplanted steers and heifers averaged over crossbred groups and years

	Heifers			Steers		
	Reimplanted (A)	Non-reimplanted (B)	Difference (A - B)	Reimplanted (A)	Non-reimplanted (B)	Difference (A - B)
Weights (lb)						
Initial	510	514	−4	540	545	−5
Time of reimplant	848	854	−6	939	936	3
Slaughter	1079	1089	−10	1248	1221	27*
Daily gain (lb/day)						
Pre-implant	2.63	2.65	−.2	3.10	3.04	.06
Post-reimplant	2.13	2.01	.12+	2.84	2.34	.50**
Total feedlot period	2.40	2.34	.06	2.96	2.70	.26**
Other						
Age at initial wt (days)	206	209	−3	205	206	−1
Days on feed	240	248	−8*	242	253	−11**

**Means differ significantly ($P<.01$).
*Means differ significantly ($P<.05$).
+Means differ significantly ($P<.10$).

should have remained in the feedlot longer. Had this been done, slaughter weight may have ended up heavier for the reimplanted heifers. In contrast, although reimplanted steers were in the feedlot 11 fewer days, they were 27 lb heavier at slaughter and had the same carcass grade as non-reimplanted steers. For both steers and heifers, it appears that reimplanted animals may need to be fed to a heavier slaughter weight to attain a given carcass grade.

Treatment means of carcass traits are presented in Table 3. Carcass weight and carcass weight per day of age was similar for the reimplanted and non-reimplanted heifer groups. However, reimplanted steers gained carcass weight .09 lb per day more rapidly and were 21 lb heavier in carcass weight than non-reimplanted steers. Dressing percentage was similar for both treatment groups.

Treatment differences in fat thickness appear to be influenced by differences in maturity (carcass grade). Carcasses of non-reimplanted animals were fatter than those of reimplant animals for both sexes. However, the difference is more pronounced in the heifer groups, in which reimplanted heifers were slaughtered at an earlier maturity than non-reimplanted heifers. For steers, both treatment groups had the same average carcass grade and so treatment differences for fat thickness should not be influenced by stage of maturity at slaughter. Fat thickness was .03 in less (non-significant) taken as an average of three measurements and .04 in less ($P < .10$) taken as a single measurement for reimplanted than non-reimplanted steers. Kidney, heart and pelvic fat was also less for reimplanted animals (.21 and .10 percent for steers and heifers, respectively).

Carcass conformation, an indicator of muscling, was similar for heifer treatment groups, but somewhat higher for reimplanted than non-reimplanted steers. A similar pattern was observed for ribeye area. Reimplanted steers and heifers had .5 ($P < .05$) and .2 (non-significant) sq in larger ribeyes, respectively, than non-reimplanted animals. However, ribeye area per hundred weight of carcass is very similar for reimplanted and non-reimplanted steers (1.66 vs 1.68 $in.^2$). Cutability was .6 percent and .5 percent higher for reimplanted than non-reimplanted heifers and steers, respectively. The heifer difference may be somewhat inflated since differences in fat thickness, a primary component of cutability, appears to be inflated by differences in maturity at slaughter.

A summary of Oklahoma reimplant studies is presented in Table 4. Daily gain response of steers to reimplantation in the present study (9.6 percent for the total feedlot period) was similar to that reported in Trial 2 of Wagner et al., 1976 (11.3 percent), but higher than in Trial 1 of Wagner et al, 1976 (4.3 percent) and a trial reported by Owens et al., 1980 (4.1 percent). Several differences in the conduct of the various studies should be noted, as these may contribute to differences in response to reimplantation. Calves used in the present study were sired by large terminal sire breeds. Earlier studies involved Hereford, Angus, Hereford-Angus crossbred and Hereford X Angus-Holstein crossbred cattle. Steers used by Wagner et al. had initial weights of 487 and 638 lb for the first and second trial, respectively, compared to 754 and 543 lb for steers used by Owens et al. and the present study, respectively. Days from initial implant to reimplantation, as well as days from reimplantation to the end of the trial were longer in the present study than in earlier studies. Therefore (and perhaps this is the most important difference) total days on feed was greater in the present study. In addition, calves in the present study were individually removed from the feedlot for slaughter while in previous trials calves were taken off test as a group.

Table 3. Carcass traits of reimplanted and non-reimplanted steers and heifers averaged over crossbred groups and years

	Heifers			Steers		
	Reimplanted (A)	Non-reimplanted (B)	Difference (A - B)	Reimplanted (A)	Non-reimplanted (B)	Difference (A - B)
Carcass weight (lb)	696	701	−5	800	779	21*
Carcass wt/day of age (lb/day)	1.56	1.53	.03	1.79	1.70	.09**
Dressing percentage (%)	64.4	64.3	.1	64.1	64.0	.1
Average fat thickness (in)	.60	.69	−.09**	.67	.70	−.03
Single fat thickness (in)	.44	.49	−.05*	.48	.52	−.04+
KHP (%)	2.89	2.99	−.10	2.67	2.88	−.21**
Carcass grade[a]	9.3	9.7	−.4**	9.9	9.9	0
Conformation[b]	10.7	10.6	.1	11.3	10.9	.4**
Ribeye area (in^2)	13.2	13.0	.2	13.4	12.9	.5*
Cutability	50.8	50.2	.6**	49.8	49.3	.5*

[ab]9 = good +, 10 = choice −.
**Means differ significantly (P<.01).
*Means differ significantly (P<.05).
+Means differ significantly (P<.10).

Table 4. Summary of Oklahoma reimplant studies

Study	No. Animals	Implant type: Initial	Implant type: Reimplant	Days between initial and mid-trait implants	Days from reimplant to end of trial	Weight at reimplant	Improvement in total feedlot daily gain
Steers							
Wagner et al., 1976	36	Synovex-S	Synovex-S	113	58	864	4.3%
Wagner et al., 1976	18	Synovex-S	Synovex-S	77	65	892	11.3%
Owens et al., 1980	240	DES, 30 mg	Synovex-S	56	62	986	4.1%
Present Study	240	Synovex-S	Synovex-S	129	112	938	9.6%
Heifers							
Present study	259	Synovex-H	Synovex-H	129	119	851	2.6%

An economic analysis of reimplanted and non-reimplanted steers and heifers was conducted on the feedlot data. Feed costs, overhead costs and live animal value were based on prevailing prices for January 1983, and an annual interest rate of 14 percent was assumed. Differences in carcass merit due to reimplantation were not considered. Not including the cost of the implant itself, reimplantation resulted in $13.88 and $5.67 greater returns per head above feedlot expenses for steers and heifers, respectively. Any costs associated with the disturbance of animals caused by the implanting process were not considered in the economic analysis.

Literature Cited

Owens, F.N. 1980. Okla. State Animal Science Research Report MP-107:118.

Wagner, D.G. 1976. Okla. State Animal Science Research Report MP-96:65.