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D.G. Gray

L.R. Corah

John A. Unruh

See next page for additional authors

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Effect of Ralgro® implantation periods on masculinity and carcass traits of young bulls and steers

Authors

D.G. Gray, L.R. Corah, John A. Unruh, and Michael E. Dikeman

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Effects of Ralgro® Implantation Periods on Masculinity and Carcass Traits of Young Bulls and Steers.

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D.G. Gray, J.A. Unruh, M.E. Dikeman, and L.R. Corah

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Summary

Repeated Ralgro® implantation of young bulls from birth to slaughter resulted in gains and carcass traits intermediate between non-implanted bulls and steers, and meat palatability traits similar to steers. On the other hand, implanting bulls near birth reduced postweaning gains and both live and carcass masculinity. There is little advantage to implanting bulls from weaning to slaughter without initial implantation at birth.

Introduction

The increased performance and efficiency of young bulls in the feedlot coupled with advantages in carcass cutability makes their feeding attractive. However, problems arise with the handling, slaughtering, grading and merchandizing of bulls and beef from them. Using growth promoting-implants near birth in young bulls has been indicated as a possible method of relieving some of these problems while retaining many of the advantages.

Experimental Procedure

Fifty-five fall-born Simmental crossbred bull calves were allotted randomly at birth to one of five treatments: non-implanted bulls (NIB); bulls implanted from birth to weaning (BI-BW); bulls implanted from weaning to slaughter (BI-WS); bulls implanted from birth to slaughter (BI-BS); and steers (St) castrated at 5 mo and implanted from birth to slaughter. All implant treatments were of 36 mg of Ralgro® every 100 days. Calves were weaned at an average age of 8.3 mo. and fed an 85% concentrate (corn-based) diet for 259 days until slaughter at 17 mo. of age. Hip height and scrotal circumference were measured at weaning and slaughter, and live masculinity was scored prior to slaughter. Cattle were slaughtered commercially and all carcasses were electrically stimulated. Testicles were weighed, and USDA carcass grade data were collected at 24 hr. postmortem. Carcasses also were scored for masculinity or bullock appearance. The wholesale rib from one side was shipped to KSU where two 1 in. steaks from the 12th rib region were removed 7 days postmortem for shear force determinations and sensory evaluations by a taste panel.

Results

Implanting did not affect ($P>.05$) weaning weights or hip heights, but steers tended to be the lightest and shortest ($P<.01$) at slaughter. Scrotal circumference was markedly decreased by implanting from birth to weaning (Table 4.1). Steers gained slowest ($P<.01$) and bulls implanted from birth (BI-BW and BI-BS) were intermediate and slower gaining ($P<.10$) than BI-WS and NIB. Although there was a 56 lb spread in average slaughter weights of bulls, the difference was not significant. NIB were taller ($P<.05$) at slaughter than BI-WS and BI-BS. Scrotal circumference was larger ($P<.05$) for NIB and BI-WS bulls than either BI-BS or

BI-BW bulls. Steers were scored as the least masculine ($P < .05$) live, and BI-BS were less masculine ($P < .05$) than the other bull treatments.

Steers had the lightest ($P < .05$) carcasses while NIB were heavier ($P < .10$) than BI-BS (Table 4.2). Dressing percentage was similar among treatments. Steers had more ($P < .05$) fat cover than NIB or BI-BW, with all other treatments being similar. Steers also had the smallest ($P < .05$) ribeyes and the most ($P < .05$) kidney knob. USDA Yield grades were least desirable for steers and BI-WS but still averaged below Yield Grade 3. Steers showed younger maturity, more marbling and higher USDA Quality grades than bulls ($P < .05$), with all bull treatments being similar.

Carcass masculinity was determined by evaluating crestiness, jump muscle and pizzle eye size of the carcasses. Steers were the least ($P < .05$) masculine with BI-BS being less ($P < .05$) masculine than the other bull treatments. NIB had the heaviest ($P < .05$) testicles of any of the bull groups.

Taste panel evaluations of ribeye steaks indicated that steers were generally superior in all traits (Table 4.3). BI-BS, however, were similar ($P > .05$) to steers for connective tissue amount, myofibrillar and overall tenderness. BI-BS tended ($P < .10$) to have higher taste panel scores and lower Warner-Bratzler shear values than NIB and BI-WS.

Repeated implanting of young bulls from birth with Ralgro®, although depressing gains compared to non-implanted bulls, yields carcasses with meat palatability traits similar to steers.

Table 4.1. Effects of Ralgro® Implant Periods on Live Weights and Development of Young Bulls and Steers.

Item	Treatment Groups				
	ST	BI-BS	BI-BW	BI-WS	NIB
<u>Weaning</u>					
Weight (lbs.)	465	516	523	506	528
Hip Ht. (in)	41.5	42.4 ^b	43.3 ^b	42.1 ^c	43
Scrotal Circum. (cm)	-	18.4 ^b	19.8 ^b	26.4 ^c	26.5 ^c
<u>Slaughter</u>					
Weight (lb.)	1104 ^b	1224 ^c	1233 ^c	1270 ^c	1280 ^c
ADG (lb.)	2.49 ^b	2.75 ^c	2.76 ^c	2.97 ^d	2.92 ^d
Hip Ht. (in)	49.2 ^b	50.3 ^b	51.9 ^b	50.9 ^c	52.7 ^c
Scrotal Circum. (cm)	-	34.5 ^b	35.0 ^b	37.6 ^c	39.3 ^c
Live Masculinity ^a	4.42 ^b	3.00 ^c	2.35 ^d	2.13 ^d	2.11 ^d

^a 1 = very masculine, 5 = steer

^{b,c,d,e} ($P < .05$)

Table 4.2. Effects of Ralgro® Implant Periods on Carcass Characteristics of Young Bulls and Steers.

Item	Treatment Groups				
	ST	BI-BS	BI-BW	BI-WS	NIB
<u>Yield</u>					
Hot carcass wt. (lb)	687 ^c	756 ^d	767 ^d	774 ^d	803 ^d
Dressing percent	62.0	61.8	62.2	60.9	62.8
Fat thickness (in ²)	0.36 ^c	0.34 ^{cd}	0.28 ^d	0.34 ^{cd}	0.26 ^d
Rib eye area (in ²)	12.4 ^c	14.2 ^d	14.7 ^d	13.6 ^d	14.6 ^d
% Kidney Knob	2.14 ^c	1.64 ^d	1.64 ^d	1.73 ^d	1.64 ^d
Yield Grade	2.54 ^c	2.02 ^{de}	1.77 ^e	2.31 ^{cd}	1.92 ^{de}
<u>Quality</u>					
Maturity	A ^{61c}	A ^{74d}	A ^{83d}	A ^{74d}	A ^{77d}
Marbling	Sm ^{33c}	Sl ^{75d}	Sl ^{78d}	Sl ^{63d}	Sl ^{92d}
Quality Grade	Ch ^{08c}	G ^{70d}	G ^{76d}	G ^{60d}	G ^{80d}
<u>Masculinity</u>					
Testicle wt. (gm)	-	377 ^c	449 ^c	488 ^{cd}	595 ^d
Crest ^a	5.18 ^c	4.14 ^d	3.59 ^{de}	3.59 ^{de}	3.45 ^e
Overall ^d	5.10 ^c	4.26 ^d	3.71 ^e	4.07 ^e	3.57 ^e

^a1 = extensive development, 6 = little development

^b1 = very bulky; 5 = steer

^{b,d,e}(P<.05)

Table 4.3. Effects of Ralgro® Implant Periods on Traits of Ribeye Steaks From Young Bulls and Steers Evaluated by a Taste Panel.

Item	Treatment Groups				
	ST	BI-BS	BI-BW	BI-WS	NIB
Juiciness ^a	6.33 ^d	5.91 ^c	5.86 ^c	5.83 ^c	5.73 ^c
Connective tissue ^b	7.02 ^e	6.82 ^{de}	6.61 ^{cd}	6.43 ^c	6.61 ^{cd}
Myofibrillar tenderness ^a	6.54 ^e	6.30 ^{de}	5.76 ^c	5.69 ^c	5.87 ^{cd}
Overall tenderness ^a	6.68 ^e	6.46 ^{de}	5.96 ^c	5.86 ^c	6.03 ^{cd}
W.B. shear values	2.71 ^e	3.32 ^d	3.27 ^d	3.48 ^{cd}	3.87 ^c

^a1 = extremely dry, tough; 8 = extremely juicy, tender

^b1 = extremely abundant; 8 = none

^{c,d,e}(P<.05)