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Effects of Ralgro® Implants from Birth to Slaughter on Performance, Masculinity, and Behavior of Young Bulls

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Summary

Implanting bulls with Ralgro® from birth to slaughter resulted in performance similar to that of nonimplanted bulls. However, implanted bulls were less masculine, had smaller scrotal circumferences up to 16 months of age, had lower serum testosterone levels up to 13 months of age, and were less aggressive from 12 to 14 months of age compared to nonimplanted bulls.

Our results indicate that Ralgro® implantation of young bulls from birth to slaughter has minimal effects on performance, yet delays masculinity and adverse behavioral development.

Introduction

Improved production efficiency, performance and carcass leanness makes feeding of bulls for slaughter an attractive alternative. However, early masculinity development and aggressive behavior of feedlot bulls often offsets some of these advantages. Our study was designed to investigate the effects of implanting young bulls with Ralgro® from birth to slaughter on performance, masculinity and behavioral traits.

Experimental Procedures

Seventy-two Simmental bull calves were allotted randomly at birth to either a Ralgro® implanted (I) or nonimplanted control (C) treatment. At birth, I bulls were implanted with 36 mg of Ralgro® and reimplanted at average intervals of 84 days until slaughter. Calves were weaned at 7.7 months, randomly assigned to slaughter ages of 12.0, 13.8, 15.7 and 17.4 months, and fed on 85% concentrate corn-based diet until slaughter. Four or five calves of the same treatment and slaughter age were assigned partially covered, concrete floored, 14 x 28 ft. pens.

Individual weights, hip heights, scrotal circumferences and masculinity scores were taken at 7.7 months and prior to each slaughter time. From 12 months until slaughter, pens were observed 1/2 hr. each week during the time of maximum daily activity (1/2 hr. prior to and after sunset) to study behavior.

Blood samples were obtained at regular intervals and serum was assayed for testosterone by radioimmunoassay.

Results

Weights and hip heights were similar ($P>.10$) for I and C bulls (Table 15.1). In addition, I and C bulls had similar average daily gains (3.44 vs 3.37 lb/day) and feed efficiencies (5.55 vs 5.66 feed DM/gain, respectively). Masculinity scores for coarseness and development of the head, crest and forequarter, and hair texture

were lower ($P < .05$) for I bulls than for C bulls (Table 15.2). Scrotal circumferences were smaller ($P < .05$) for I bulls at all ages except at 17.4 months. The largest differences were observed early in the feeding period. Associated with the lower masculinity scores and smaller scrotal circumferences, I bulls also had decreased ($P < .05$) serum testosterone levels at 8.3 and 12.9 months compared with C bulls (Figure 15.1).

From 12.0 to 13.8 months of age, I bulls had fewer ($P < .05$) encounters of passive butting, mounting, facility rubbing, and lower ($P < .05$) activity scores than C bulls (Table 15.3). During the same time, I bulls had fewer ($P < .05$) aggressive butting encounters for the first 5 weeks, but had similar numbers of encounters as C bulls for the last 2 weeks. During the 13.8 to 15.7 months and 15.7 to 17.4 months observation periods, I and C bulls were similar ($P > .10$) for all behavioral traits. The behavioral differences between I and C bulls occurred at the same ages when differences in serum testosterone were observed. During the 12.0 to 13.8 month period, I bulls had lower ($P < .05$) testosterone levels (12.0 and 12.9 months) but were similar ($P > .10$) to C bulls from 13.8 to 16.6 months of age (Figure 15.1).

According to our results, implanting young bulls with Ralgro® from birth to slaughter retards masculinity and behavioral development with no detrimental effects on performance. This could eliminate some of the problems associated with feeding bulls.

Table 15.1. Weights and Hip Heights at Different Ages of Ralgro® Implanted and Control Bulls

Age (mo)	No. Bulls	Weight, lbs		Hip Height, in.	
		Implanted	Control	Implanted	Control
7.7	72	472	484	42.8	43.0
12.0	72	908	935	47.3	47.7
13.8	54	1143	1139	51.9	52.0
15.7	36	1288	1281	52.9	53.4
17.4	18	1338	1314	54.1	54.3

Table 15.2. Masculinity Scores and Scrotal Circumferences at Different Ages of Ralgro® Implanted and Control Bulls

Age (mo)	No. Bulls	Masculinity Score ^a		Scrotal Circumference, cm	
		Implanted	Control	Implanted	Control
7.7	72	2.0 ^b	3.1 ^c	17.7 ^d	25.7 ^e
12.0	72	2.2 ^b	3.9 ^c	26.6 ^d	36.1 ^e
13.8	54	3.0 ^b	3.9 ^c	32.8 ^d	38.8 ^e
15.7	36	3.1 ^b	3.7 ^c	36.8 ^d	39.3 ^e
17.4	18	3.2 ^b	3.9 ^c	37.7	38.3

^a Scores of 1 to 5: 2=slightly masculine; 3=moderately masculine; 4=masculine.

^{bc} Means in the same row with different superscripts differ ($P < .05$).

^{de} Means in the same row with different superscripts differ ($P < .05$).

Table 15.3. Behavioral Observations at Different Slaughter Ages of Ralgro® Implanted and Control Bulls

Trait	Observation Periods					
	12.0 to 13.8 mo.		13.8 to 15.7 mo.		15.7 to 17.4 mo.	
	Implant	Control	Implant	Control	Implant	Control
No. of Pens	6	6	4	4	2	2
Passive Butting ^a	5.8 ^c	8.6 ^d	6.3	7.0	10.4	11.9
Aggressive Butting ^a	2.0*	4.9*	.7	.7	1.3	2.3
Mounting Attempts ^a	.4 ^c	2.2 ^d	.4	1.2	1.3	1.9
Facility Rubbing ^a	2.9 ^c	5.0 ^d	3.9	6.0	5.7	5.7
Activity Score ^b	2.2 ^c	3.2 ^d	2.1	2.2	3.0	3.3

^a Encounters per 30 min.

^b Scaled from 1 to 6: 2=slightly inactive; 3=slightly active; 4=active.

^{c,d} Means in the same row within observation periods with different superscripts differ ($P < .05$).

*Implanted bulls had fewer ($P < .05$) aggressive encounters in 5 of 7 observations during the 12.0 to 13.8 month period only.

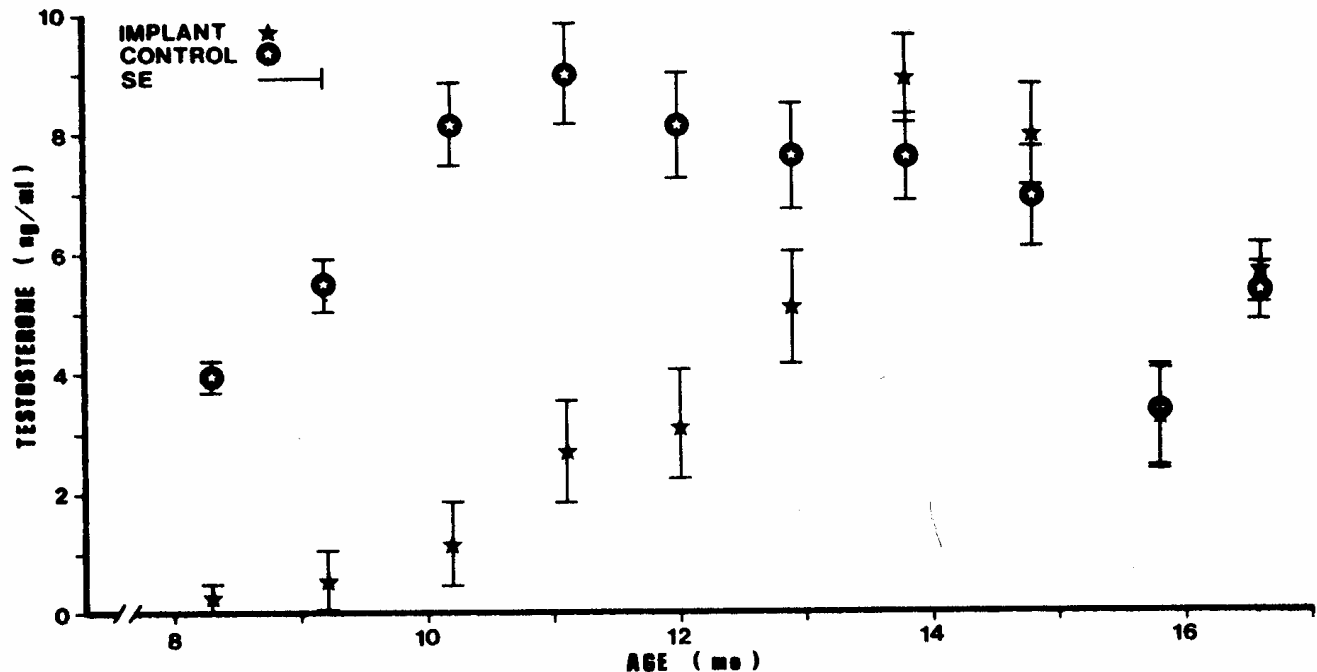


Figure 15.1. Serum Testosterone Levels at Different Ages for Ralgro® Implanted and Control Bulls