

Effect of Implants and Breed Type on Testicular Function of Feedlot Bulls

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Story in Brief

Forty-eight yearling bulls of Charolais, Hereford and Hereford x Angus breeding (one-third per breed group) that weighed about 600 pounds were implanted with (1) nothing, (2) Compudose, (3) Synovex S or (4) Ralgro. Bulls were fed a high concentrate diet for 118 days and the latter two groups were reimplanted on day 75. Testes and epididymides were evaluated at slaughter. Implants increased live weight gains by about 6 percent. Neither implant treatment nor breed significantly influenced testicular or epididymidal weights or sperm numbers. These data indicate that implanting bulls with growth stimulants that are estrogens or have estrogenic activity after the time of puberty does not influence testicular growth and sperm production or epididymidal sperm reserves.

Introduction

Much interest exists in the feeding of young bulls. Gill et al. (1983) reviewed the variable responses observed in growth and feed efficiency when young bulls are implanted with growth stimulants. Implanting heifer calves with Ralgro will suppress pubertal development (Muncy et al., 1980) but implanting postpubertal bulls may not affect the function of the testis (Juniewicz et al., 1981). Testicular function of bulls implanted after puberty with Synovex or Compudose is not clear. The objectives of this experiment were to evaluate the influence of breed type and hormone implants on testicular function of bulls.

Materials and Methods

One half of the bulls of each breed and implant treatment that were used in a study described by Gill et al (1983) were evaluated in this experiment. Bulls estimated to be slightly over one year of age were selected for uniformity in weight from a large group of commercial animals. The bulls weighed about 600 pounds at the start of the 118 day feeding period and about 1075 pounds at slaughter. The implant treatments were (1) no implant, (2) a single Compudose implant at the start of the trial, (3) Ralgro implant at the start and on day 75 of the trial and (4) Synovex at the starts and on day 75 of the trial. Four bulls of each of the breed types (Charolais, Hereford, Hereford x Angus)

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were randomly allotted and evaluated for each treatment. Bulls were fed a diet consisting primarily of whole shelled corn ad libitum. Compudose implants were removed 6 days before slaughter.

One testis and epididymis from each bull was removed and frozen at slaughter. After thawing, the weights of the trimmed testis, testicular parenchyma, head and body of the epididymis and the tail of the epididymis were determined. After homogenization of the tissues in Saline-Triton-Merthiolate solution, testicular and epididymidal sperm numbers were quantified, using a hemocytometer and phase contrast microscopy. Data were analyzed by a two-way analysis of variance.

Results and Discussion

Testicular weights and sperm concentrations were not influenced by implanting yearling bulls with Compudose, Synovex-S or Ralgro (Table 1). Average testicular weights for the four treatments ranged from 165 to 184 g and sperm concentrations ranged from 77 million to 89 million sperm per gram of testicular tissue. Total sperm per testis averaged 13 billion. The influence of growth stimulants on the reproductive endocrine system of cattle may be related to the age at which animals are treated. We have demonstrated previously (Muncy et al., 1980) that implanting heifers before puberty with Ralgro will delay the onset of sexual maturity. The lack of an effect of implants on testicular function of the bulls in this experiment may be related to the age of the bulls. Since these bulls were about a year of age and weighed 600 pounds at treatment, puberty probably had occurred. Thus it appears that treatment of bulls with implants after puberty may not alter sperm production.

Weights of the head-body and tail of the epididymides were not altered by implant treatment (Table 1). Similarly, sperm reserves in the epididymides were not altered by implanting the bulls. This suggests that sperm maturation and transport in the epididymis was not altered.

Table 1. Testicular and Epididymidal Characteristics of Yearling Bulls Implanted with Nothing, Compudose, Synovex or Ralgro.^a

Criteria	Implant Treatment				Std. Error of mean
	None	Compudose	Synovex-S	Ralgro	
Testicular Weight (g)	168	184	181	165	14
Sperm Conc. ($\times 10^6/g$)	77.43	88.72	81.64	81.38	7.90
Total Sperm ($\times 10^9$)	13.13	14.31	12.93	11.58	1.60
Head-Body Epididymidal					
Weight (g)	12.7	13.4	13.1	12.6	.8
Total Sperm ($\times 10^9$)	4.18	5.12	4.00	3.67	.72
Tail Epididymidal					
Weight (g)	7.2	7.2	6.7	6.6	.6
Total Sperm ($\times 10^9$)	5.00	5.35	4.86	3.07	1.11

^aNo significant treatment effects.

Table 2. Testicular and Epididymidal Characteristics of Yearling Charolais, Hereford and Hereford x Angus Bulls.^a

Criteria	Charolais	Hereford	Hereford x Angus	Std. Error of mean
Testicular weight (g)	176	172	175	12
Sperm Conc. (x10 ⁶ /g)	83.06	77.18	86.64	6.92
Total Sperm (x10 ⁹)	13.31	12.02	13.63	1.41
Head-Body Epididymidal				
Weight (g)	13.4	12.2	13.2	.7
Total Sperm (x10 ⁹)	4.22	4.05	4.45	.63
Tail Epididymidal				
Weight (g)	6.9	7.0	7.0	.5
Total Sperm (x10 ⁹)	3.90	4.38	5.44	.95

^aNo significant breed type effects.

Breed type of bull did not significantly influence testicular weights or total testicular sperm (Table 2). Testicular weights averaged 174 g for these breed types of commercial bulls and the concentration of sperm in the testicular parenchyma ranged from 77 to 86 million per gram. Epididymidal weights and total sperm content were similar for the breed types.

These data indicate that implanting yearling bulls with Synovex-S, Ralgro or Compudose, after pubertal development has occurred, does not significantly alter testicular growth or sperm production. However, the influence of estrogenic implants on bulls before puberty, may be different from that which we observed with older bulls.

The excellent assistance of Marian Ringwall, Ginger Yoeman and Bill Womack is gratefully acknowledged.

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