

# SEXUAL BEHAVIOR AND TESTICULAR FUNCTION AFTER TREATMENT OF PREPUBERAL BOARS WITH TESTOSTERONE

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## Story in Brief

Ten groups of three littermate purebred Hampshire and Yorkshire boars were used to determine the influence of supplemental testosterone on testicular function and sexual behavior. Boars were born between November and May. At three months of age, one boar from each litter was assigned to control, low testosterone or high testosterone treatment, once weekly between 3 and 6 months of age. Between 6 and 7 months, boars were exposed to an estrous gilt for 15 minutes each week and sexual behavior was evaluated. At 7 months, boars were castrated and weights and sperm numbers in the testes and epididymides were quantified. Body weight gain was not influenced by treatment. Testicular weights of control boars were greater than weights of boars on the high testosterone treatments. Sexual behavior was not influenced by treatment. After 4 weeks of sexual behavior evaluation, 70% of the control boars, 50% of the low testosterone and 80% of the high testosterone boars had completed successful matings. We conclude that weekly treatment of prepubertal boars with sufficient testosterone to influence testes weights did not alter sexual behavior.

## Introduction

Much variation exists in sexual behavior of boars. The male hormone, testosterone, causes libido in boars. Removal of testosterone by castration or immunization to reduce testosterone in plasma reduces sexual interest of boars, and treatment with testosterone will restore sexual behavior. However, concentrations of testosterone in plasma of mature boars are not related to sexual aggressiveness.

Testicular weights increase very rapidly between 3 and 6 months of age in boars and the testes secrete increasing amounts of testosterone. This is

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also a time when boars and gilts attain the ability to respond differently to hormonal activation of mating behavior. The lack of female mating behavior in boars is associated with increased secretion of testosterone before puberty. Inadequate testosterone secretion during pubertal development may result in boars that have reduced libido.

The objective of this study is to determine the influence of supplemental testosterone before puberty on development of sexual behavior and testicular function of boars.

## Materials and Methods

Ten groups of three littermate, purebred Hampshire and Yorkshire boars were used. At three months of age, one boar from each litter was assigned to each of the treatments: control; (LTP) .5 mg/kg of testosterone propionate (TP) once weekly, or (HTP) 2 mg/kg of TP once weekly. Testosterone propionate was in a solution (40 mg/ml) of 60% propylene glycol, 30% ethyl alcohol and 10% benzyl alcohol. Boars were treated between 3 and 6 months of age and weighed every 2 weeks. Boars were maintained in an enclosed barn and exposed to ambient temperatures between 60 and 86F and natural photoperiod.

Between 6 and 7 months of age, sexual behavior was observed, at weekly intervals, during 15 minute mating tests. Individual boars were exposed to a single estrous gilt in an isolated 4x4m pen. Mating traits monitored were ano-genital sniffs, nose-to-nose contact, nosing the flanks, proper rear mounts and improper head or side mounts. Copulatory performance was evaluated as the number, total time ejaculating and average reaction time to first mount.

At 7 months of age, boars were anesthetized and castrated. Weights of the testes and epididymides were determined and samples of testicular parenchymae and complete capita-corpora and caudal epididymides were homogenized and numbers of sperm in the tissues was quantified.

## Results and Discussion

Body weight gain was not influenced by treatment. Testicular weights of control boars at seven months of age were greater than the weights of HTP boars. Total sperm numbers in the testes were significantly reduced in HTP compared to control boars (Table 1). The weights of the epididymides and numbers of sperm in the epididymides were also significantly reduced for HTP compared to control boars. The reduced testicular growth and function

**Table 1. Influence of testosterone treatment on body weight and testicular characteristics.<sup>a</sup>**

Characteristic	Treatment			SE
	Control	Low TP	High TP	
Boars, no	8	8	8	
Initial weight, lb	78.9	81.1	78.2	4.0
Final weight, lb	234.2	240.5	229.9	8.5
Testicular weight, g	330.0 <sup>b</sup>	286.8 <sup>b</sup>	223.8 <sup>c</sup>	21.2
Total testicular sperm, X10 <sup>9</sup>	38.0 <sup>b</sup>	28.6 <sup>bc</sup>	22.6 <sup>c</sup>	4.7
C-C <sup>d</sup> weights, g	33.9 <sup>b</sup>	31.1 <sup>b</sup>	24.5 <sup>c</sup>	2.4
C-C spermatozoa, X10 <sup>9</sup>	28.4 <sup>b</sup>	23.1 <sup>b</sup>	12.8 <sup>c</sup>	4.8
C <sup>e</sup> weights, g	33.4 <sup>b</sup>	33.8 <sup>b</sup>	26.9 <sup>c</sup>	2.1
C spermatozoa, X10 <sup>9</sup>	44.2 <sup>b</sup>	42.2 <sup>b</sup>	21.7 <sup>c</sup>	6.5

<sup>a</sup>Values for one testicle per boar.

<sup>b,c</sup>Means in a row with different superscripts differ ( $P < .05$ ).

<sup>d</sup>Capita-corpora epididymides.

<sup>e</sup>Caudae epididymides.

of treated boars is probably caused by reduced secretion of gonadotropins from the pituitary due to the negative feedback of the exogenous testosterone.

Sexual behavior of the eight littermate groups was not influenced by treatment with testosterone (Table 2). The percentage of proper mounts and erections were not different for boars on the three treatments. After 4 weeks of sexual behavior evaluation, 70% of the control boars, 50% of the LTP and 80% of the HTP boars had completed successful matings.

Season of puberty tended to influence sexual behavior (Table 3). The month during which boars attained 6 months of age was used to classify boars as to the season of puberty. The percentage of boars exhibiting successful mating was greatest when the boars attained six months of age (puberty) during January to June and least for boars attaining six months during July through September. Previous studies have indicated that heat stress does not influence sexual behavior of sexually active boars or estrous cycles of cyclic

**Table 2. Influence of testosterone treatment on reproductive behavior.**

Characteristic	Treatment		
	Control	Low TP	High TP
Boars, no	10	10	10
Boars that exhibited:			
Proper mounts %	100	80	90
Erections %	80	90	90
Successful mating %	70	50	80

**Table 3. Influence of season at puberty on the incidence of successful mating.**

Season when boars attained 6 months of age	Number of Boars		
	Total	Successful Matings	%
Jan - Mar	6	6	100
April - June	6	5	83
July - Sept	12	5	42
Oct - Dec	6	4	67

gilts. However, heat stress will delay puberty in gilts. Our results suggest the puberty may be delayed in boars during the summer months in Oklahoma.

Testicular characteristics and reproductive behavior are extremely variable traits. This study is continuing to increase the number of boars per treatment each season to complete the evaluation of the effects of exogenous testosterone and season on sexual behavior of boars. On the basis of the boars studied, we conclude that the weekly treatment of prepuberal boars with sufficient testosterone propionate to influence testes weight does not alter sexual behavior.