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Effect of Thyroidectomy upon Sexual Behavior of the Male Bovine.

W. E. PETERSEN, ARLESS SPIELMAN, B. S. POMEROY
AND W. L. BOYD.

From the University of Minnesota, St. Paul, Minn.

While many workers have reported on the effects of thyroidectomy upon fertility and sexual behavior for many species, no reference has been found to the effects of such operation upon the behavior of the bull. In general it is reported that thyroidectomy is followed by involution of the sex organs with reduced fertility and sterility.^{1, 2, 3} Berliner and Warbritton⁴ found that thyroidectomized male sheep continued to produce semen but the ejaculates were smaller and the sperm abnormalities increased.

This report deals with the observations over a period of 15 months following thyroidectomy of a male Jersey, the operation being performed at the age of 4 months, and the effects of administration of desiccated thyroid, dinitrophenol, benzidine sulfate and testosterone propionate.

For approximately 60 days following thyroidectomy the animal behaved normally. After that time, however, myxedemic symptoms developed rapidly. The skin became thick and puffy; the hair became dry, brittle and sparse; body fat increased and the general appearance of premature aging is presented. One of the most striking effects is that of reduced activity. Apathy, lethargy, increased susceptibility to cold and diminished reflexes are marked.

Blood analysis, made semi-monthly, has revealed a marked lowering in hemoglobin and amino nitrogen. Values for blood fat, cholesterol, glucose and non-protein nitrogen increased. Blood phosphorus, calcium, ascorbic acid, creatine, total nitrogen, globulin and albumin were normal.

While the gonads appeared to develop normally there was complete absence of libido at sexual maturity. His reaction in this particular was tested at frequent intervals with females in estrus and in no instance could he be induced to mate.

Periodic ejaculates were obtained by rectal manipulation of the

¹ Krizenecky, J., *Verl.*, J. Springer, Berlin, 1932.

² Smelser, G. K., *Anat. Rec.*, 1934, **60**, 53.

³ Zalasky, M., and Wells, L. J., *Anat. Rec.*, 1937, **69**, 79.

⁴ Berliner, V., and Warbritton, V., *Proc. Am. Soc. Animal Prod.*, 1937, p. 137.

ampulla. Specimens so obtained were studied for normality and fertility. The amount of the ejaculates continued normal as did the number of spermatozoa. The sperm have also been normal in morphology, longevity and fertilizing ability. As a final test for normal sperm, semen samples obtained by manipulation were used in artificial insemination of cows and pregnancies have resulted.

After having determined the effects of thyroidectomy upon the sexual behavior it was decided to study the effects of administering desiccated thyroid, di-nitro phenol, benzedrine sulfate and testosterone propionate on the sexual behavior.

The test for sexual behavior consisted of observing the bull's reaction when present with females in estrus. Mounting of the female is considered as normal sexual behavior. Lack of interest in females in estrus and failure to mount them is considered as abnormal.

Oral administration of 25 g of desiccated thyroid over a period of 3 days restored normal activity and sexual behavior. These favorable effects were noticeable 24 hours after the thyroid feeding began and lasted for about 10 days after the last administration.

After a rest of 90 days from any medication and during which time he was watched for activity and frequently tested for sexual behavior, the effects of di-nitro phenol administration were tried. Administration of a single 5-g dose of di-nitro phenol restored normal activity and sexual behavior in 12 hours. These effects of this drug disappeared completely in 36 hours after its administration.

Forty-five mg benzedrine sulfate were administered orally for each of 4 consecutive days. This drug had no noticeable effect upon either his activity or sexual behavior.

To test the effect of testosterone 450 mg of testosterone propionate pellets were implanted subcutaneously and a total of 300 mg of the hormone in sesame oil were injected intramuscularly over a period of 13 days. This treatment markedly increased the activity and restored normal sexual behavior which lasted for 3 days after cessation of the injections.

From this study it appears that thyroidectomy of the male bovine causes a complete inhibition of libido but has no effect upon spermatogenesis or normality of the sperm. Desiccated thyroid and di-nitro phenol which increase metabolism restored normal activity and sexual behavior. Benzedrine sulfate was ineffective. Testosterone propionate improved both activity and sexual behavior.

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