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## SPERMATOZOAN CONTENT AND CHARACTERISTICS OF THE TESTIS AND EPIDIDYMIS IN THE AXIS DEER

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**Background.** Deer farming has progressively grown into an industry in Texas, as well as other regions in the United States. Venison and seed stock production have become the focus in deer production systems due to an increasing consumer demand for leaner alternative red meat sources and a need for more diversified agriculture to compliment current livestock production schemes. One species of deer, the Axis (*Axis axis*), may be non-seasonal in their reproductive cycles, providing an economic advantage to the deer producer. To determine whether axis bucks were capable of maintaining testicular function throughout the year, thirty-eight testis were collected from slaughtered postpubertal ( $\geq 1.5$  yrs) Axis bucks from Sept. 1991-Sept. 1992 and frozen at  $-20^{\circ}\text{C}$ . Antler status (hard or velvet) and carcass weights were recorded at slaughter. Testes were thawed and length (L), width (W), depth (D), testis weight (TWT) and total epididymal weight (TEWT) were recorded. Left epididymal caput (CAP), corpus (CORP) and caudal (CAUD) regions were separated and weighed. A 1.5 g sample taken from the left testis parenchyma was homogenized for 2 min, incubated for 24 hrs at  $4^{\circ}\text{C}$  and sperm content (SPERM;  $\times 10^9$ ) determined. Left epididymal CAP, CORP and CAUD were homogenized and SPERM ( $\times 10^9$ ) determined. Data were analyzed by grouping bucks according to antler status (hard vs velvet) and season (winter, spring, summer, fall).

**Research Findings.** There was a greater percentage of hard antlered (HA) bucks in the fall (90.5%) and a greater percentage of velvet antlered (VA) bucks in the spring (90.0%). Carcass weights (kg) tended ( $P < .06$ ) to differ between seasons with bucks being heavier ( $P < .03$ ) in the fall ( $36.8 \pm 1.1$ ) than in the spring ( $32.1 \pm 1.6$ ) or summer ( $31.8 \pm 0.0$ ). Carcass weights were similar between HA and VA bucks ( $36.0 \pm 1.0$  and  $33.6 \pm 1.3$ , respectively). Testis L, W, D, TWT and TEWT were not affected ( $P > .10$ ) by season or antler status (Table 1). Total left testis SPERM were greater ( $P < .03$ ) in VA ( $14.2 \pm 2.8$ ) than in HA ( $8.5 \pm 1.3$ ) bucks and greater ( $P < .01$ ) in the spring ( $17.1 \pm 3.6$ ) than in the fall ( $8.0 \pm 1.3$ ). Total SPERM in the epididymal CAP, CORP and CAUD regions were not affected ( $P > .10$ ) by season or antler status.

While Axis bucks can be found in various stages of antler development throughout the year, antler status appears to be somewhat seasonal. Total testis SPERM, however, was greater in VA than HA bucks and greater in the spring than in the fall. This is opposite to other

seasonally breeding deer species, Thus, while total testis SPERM appear to be affected by season and antler status, readily available stores for sperm output do not appear to be affected, as indicated by total, CAP, CORP and CAUD epididymal SPERM.

**Application.** Determining the reproductive cycle of Axis deer, as well as other farmed species of deer, will provide deer producers with a means to formulate production strategies for their farm or ranch. Reports from Axis deer producers indicate that fawns are present year-round. The ability of Axis males to maintain testis and epididymal function throughout the year, regardless of antler status, suggests that Axis females may be estrous cycling at any time of the year, unlike most other deer species. Further investigations into the reproductive cycle of Axis males and additional studies on the reproductive cycle of Axis females will continue.

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Table 1. Testicular and epididymal characteristics of postpubertal Axis bucks.

Item	Season				Antler Status	
	Spring	Summer	Winter	Fall	Hard	Velvet
<b>Testis<sup>a</sup></b>						
Length <sup>b</sup>	4.9±.18	4.9±.13	4.7±.23	4.7±.10	4.8±.09	4.8±.17
Width <sup>b</sup>	2.8±.07	2.7±.10	2.6±.08	2.7±.07	2.7±.06	2.7±.08
Depth <sup>b</sup>	2.9±.15	2.9±.14	2.8±.11	2.8±.06	2.8±.05	2.8±.12
Testis Wt. <sup>c</sup>	18.7±2.0	17.5±.46	15.2±1.8	17.1±1.2	17.4±1.0	17.1±1.8
<b>Epididymis</b>						
Total Wt. <sup>d</sup>	4.0±.23	3.9±.26	3.9±.82	5.8±1.4	5.4±1.1	3.9±.22
Caput Wt. <sup>d</sup>	1.7±.14	1.6±.24	1.5±.14	1.6±.13	1.5±.08	1.6±.13
Corpus Wt. <sup>d</sup>	.71±.07	.53±.08	.78±.10	.89±.09	.83±.08	.73±.07
Caudal Wt. <sup>d</sup>	1.4±.08	1.4±.04	1.4±.12	1.7±.11	1.6±.09	1.5±.07

<sup>a</sup>Pooled means of right and left testis.

<sup>b</sup>Measurements in cm.

<sup>c</sup>Measurements in g.

<sup>d</sup>Measurements of the left epididymis in g.