PUBLICATIONS

1996

FIELD DAY REPORT - 1996

TEXAS A&M UNIVERSITY AGRICULTURAL RESEARCH and EXTENSION CENTER at OVERTON

Texas Agricultural Experiment Station
Texas Agricultural Extension Service

Overton, Texas

April 18, 1996

Research Center Technical Report 96-1

TESTICULAR CHARACTERISTICS OF MALE ANGORA GOATS CONSUMING *Acacia berlandieri* (GUAJILLO)

H.R. Vera-Avila, R.D. Randel and T.D.A. Forbes

Background. Much of the rangelands in arid and semiarid regions are dominated by shrub vegetation. Although such vegetation represents an important source of food for wild and domestic ruminants many shrub species are known to contain high concentrations of phenolic amines. Pharmacological studies have demonstrated sympathomimetic properties of phenolic amines present in *Acacia berlandieri.* Due to these properties, overconsumption of the shrub plant can produce a toxic condition known as "guajillo wobbles" characterized by paralisis of the hindlimbs. Subtoxic effects on adrenal and reproductive functions have also been observed after administration of *A. berlandieri* phenolic amines as well as after long term consumption of the plant. The objective of this experiment was to further determine the effect of *A. berlandieri* consumption on testicular characteristics of male Angora goats.

Research Findings. Twenty four male Angora goats (8-10 mo) were randomly assigned within body weight (BW) and scrotal circumference (SC) to consume a Control diet (C, n=12) or to graze pastures dominated by *A. berlandieri* (G, n=12). SC and BW were recorded on days 10 and 66 and their relative changes were calculated. At day 90 animals were slaughtered and scrotal contents were collected. Right testes were weighed and stored frozen at -20° C until epididymal and testicular sperm reserves were determined from the respective tissue homogenates. BW increased in both C and G, however weight gain was greater ($P< .001$) in C than G. The changes in SC were negative in G and positive in C ($P< .001$). Spermatid reserves per testis and per gram of testicular parenchyma as well as testicular parenchymal weights were greater in C as compared with G ($P< .01$). Total epididymal weights and sperm reserves as well as head, body and tail epididymal weights and sperm reserves were reduced in G vs C ($P< .01$). Proportional distribution of sperm cells in the epididymal head, body and tail did not differ between groups ($P> .05$). Results for BW, SC and epididymal and testicular sperm reserves are depicted in Tables 1 and 2.

Application. Results of this study demonstrate that *A. berlandieri* consumption can affect male reproductive efficiency in terms of testicular sperm production and epididymal storage capacity. The present information indicates that development of complementary methods to avoid such detrimental effects may be required when animals are consuming plants with high phenolic amine content.

Table 1. Relative changes (mean ± s.e.) in Body Weight (BW) and Scrotal Circumference (SC).

GROUP	SC (cm)	BW (kg)
Control	+0.42±.45 [a]	5.83±.32 [a]
Guajillo	-1.96±.37 [b]	2.56±.27 [b]

Means with different superscripts are statistically different (P< .001).

Table 2. Testicular parenchymal (TPW) and epididymal (EW) weights, testicular (TSR) and epididymal (ESR) spermatid reserves (TSR and ESR), and epididymal sperm distribution (ESD).

Characteristic	Control	Guajillo
TPW (g)	64.8±3.5 [a]	36.5±3.7 [b]
TSR (x 10^9 cells)		
Per testis	10.99±1.0 [a]	4.35±.790 [b]
Per g	0.169±.01 [a]	0.111±.01 [b]
EW (g)		
Total	8.6±.4 [a]	4.9±.5 [b]
Head	3.1±.2 [a]	1.5±.2 [b]
Body	1.7±.1 [a]	0.9±.1 [b]
Tail	3.8±.1 [a]	2.3±.3 [b]
ESR (x 10^9 cells)		
Total	11.49±1.1 [a]	4.03±1.0 [b]
Head	1.16±.150 [a]	0.37±.10 [b]
Body	0.65±.120 [a]	0.17±.05 [b]
Tail	9.68±.900 [a]	3.49±.88 [b]
ESD (proportion)		
Head	.098±.02 [a]	.185±.26 [a]
Body	.056±.02 [a]	.052±.06 [a]
Tail	.844±.04 [a]	.761±.28 [a]

Means with different superscripts are statistically different (P< .01).