

**SEMEN CHARACTERISTICS AND SCROTAL
BIOMETRY OF WEST AFRICAN DWARF (WAD)
SHEEP FED AMMONIUM SULPHATE
FORTIFIED DIETS**

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**SESSION: ANIMAL PHYSIOLOGY AND
REPRODUCTION**

INTRODUCTION

- In Nigeria, a major limitation to animal production is poor reproductive performance
- Enjalbert (2006) attributed many reproductive health disorders in animals to diet inadequacy
- Testicular traits are important variables closely associated with sperm features and animal fertility
- The shape and content of the scrotum are associated with fertility parameters (Coulter and Foote, 1977)
- Scrotal circumference and testicular consistency have been widely used in predicting the reproductive capacity of male domestic animals.
- Hence, use of ammonium sulphate becomes a viable source of sulphur and nitrogen to improve semen characteristics and scrotal biometry

JUSTIFICATION OF THE STUDY

- A major limitation to animal production is poor reproductive performance
- Low sperm count is one of the major problem affecting productivity in sheep. Hence, the need for improvement.

OBJECTIVES OF THE STUDY

- Evaluation of semen characteristics and scrotal biometry of WAD rams fed ammonium sulphate fortified diets
- Determination of optimum inclusion level of ammonium sulphate in WAD rams diets

MANAGEMENT OF EXPERIMENTAL ANIMALS

- The experiment was conducted at the sheep unit of the Teaching and Research farm, University of Ibadan
- Sixteen WAD rams weighing 12.8 ± 0.12 kg were used for the experiment
- The rams were treated with Tetracycline LA at 1ml/25kg body weight and Ivomectin ® at 1ml/50kg body weight before the commencement of the experiment
- The rams were adapted to the feed and environment for 14 days prior the experiment
- The fortified diets were served at 5% body weight of the ram with wilted guinea grass

EXPERIMENTAL DESIGN

Completely Randomized Design (CRD) involving 4 treatments and 4 replicates each for sixteen WAD rams were used for 105 days.

$$Y_{ij} = \mu + T_j + \ell_{ij}$$

Y_{ij} = Individual observation,

T_j = Effect of j^{th} treatment,

μ = General mean,

ℓ_{ij} = Experimental error.

STATISTICAL ANALYSIS

Data collected were subjected to Analysis Of Variance (ANOVA) and Least Significance Difference (LSD) using Statistical Analysis System (SAS, 2002)

TABLE 1: GROSS AND CHEMICAL COMPOSITION OF EXPERIMENTAL DIETS (% DM)

INGREDIENTS		CHEMICAL COMPOSITION	
Dry Cassava Peel	60.00	Dry Matter	94.65
Brewers Dry Grain (BDG)	23.00	Crude Protein	11.01
Palm Kernel Cake (PKC)	10.00	Ether Extract	0.98
Oyster Shell (OS)	2.00	Total Ash	12.43
Salt	2.00	NDF	32.20
Urea	1.00	ADF	27.48
Dicalcium Phosphate	1.00	ADL	6.11
Premix (Growers)	1.00	Gross Energy	311.00
Total	100.00	(Kcal/kg)	

EXPERIMENTAL LAYOUT

Treatment 1: Concentrate + 0g/kg $(\text{NH}_4)_2\text{SO}_4$ = T1

Treatment 2: Concentrate + 2.5g/kg $(\text{NH}_4)_2\text{SO}_4$ = T2

Treatment 3: Concentrate + 5.0g/kg $(\text{NH}_4)_2\text{SO}_4$ = T3

Treatment 4: Concentrate + 7.5g/kg $(\text{NH}_4)_2\text{SO}_4$ = T4

MATERIALS AND METHODS

- Semen samples were collected using electro-ejaculator as described by (Jibril *et al.*, 2011) from rams in each group and evaluated.
- The Sperm concentration was determined using a haemocytometer.
- Sperm motility was assessed by the method described by Zemjanis (1977)
- Testicular Weight (TWT) : This was determined using Bailey *et al* (1996) formulae as:

$$\text{TWT} = 0.5533 \times \text{TL} \times \text{TW}$$

Where: TWT = Testicular weight, TL = Testicular length, TW = Testicular

**TABLE 4 SEMEN CHARACTERISTICS OF WAD RAMS FED
AMMONIUM SULPHATE FORTIFIED DIETS**

	T ₁	T ₂	T ₃	T ₄	SEM
Colour	Creamy	Creamy	Creamy	Creamy	
Volume (ml)	0.73 ^d	0.83 ^b	0.83 ^b	0.96 ^a	0.01
Mass Activity (1-5)	3.00 ^b	3.00 ^b	3.00 ^b	3.33 ^a	0.01
Motility (%)	84.71 ^d	89.05 ^c	92.25 ^b	97.05 ^a	0.04
Livability (%)	85.05 ^c	88.26 ^b	88.29 ^b	90.71 ^a	0.07
Morphology (%)	0.91 ^c	1.60 ^b	1.68 ^b	2.33 ^a	0.03
Sperm Conc. (x 10 ⁹ /mL)	136.00 ^b	139.25 ^b	152.75 ^b	160.25 ^a	0.76
Total Sperm Ejaculate	98.24 ^d	114.35 ^c	124.41 ^b	150.66 ^a	0.82

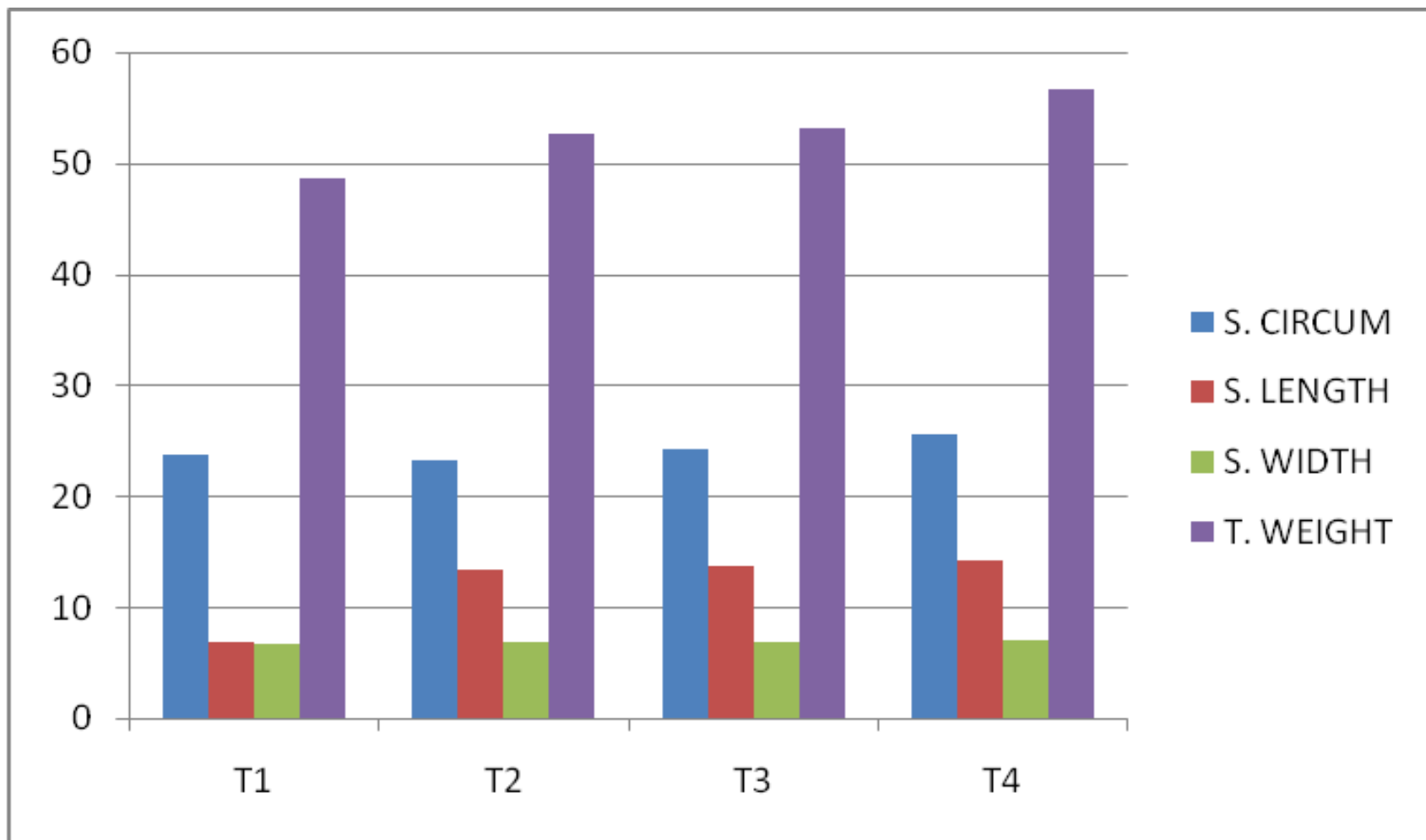


Fig 1: Scrotal biometry of West African dwarf rams fed varying levels of ammonium sulphate fortified diets

T₁: 0g/kg (NH₄)₂SO₄, T₂: 2.5g/kg (NH₄)₂SO₄, T₃: 5.0g/kg (NH₄)₂SO₄, T₄: 7.5g/kg (NH₄)₂SO₄

CONCLUSION

- Fortification with ammonium sulphate at 7.5g/kg showed improved semen characteristics and scrotal biometry of WAD rams

RECOMMENDATION

- Farmers can include ammonium sulphate at 7.5g/kg in the diet of their rams to improve semen characteristics and scrotal biometry of WAD rams
- Research should also be carried out to determine its effect on carcass quality

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