



INFLUENCE OF WATTLE ON BODY MEASUREMENTS, SCROTAL AND SEMEN OF RED SOKOTO BUCKS KEPT SEMI-INTENSIVELY IN MINNA, NIGER STATE, NIGERIA

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ABSTRACT

This study aims at assessing the influence of wattle on body measurements, scrotal and semen was carried out on eight Red Sokoto bucks in Niger State, Nigeria. The experiment lasted twelve months within which data was collected on Body weight, Body length, Head length, Head width, Height-at-wither, Chest girth, Rump length, Rump width, Fore leg length, Hind leg length, Shine circumference, Scrotal length and Scrotal Circumference. The semen of the bucks were analyzed to evaluate the effect of wattle on the semen. At the end, wattle had significant influence ($P < 0.05$) only on the head width and the fore leg length (for body measurement) of the bucks used. Bucks with wattle had longer fore leg length than those without wattle while bucks without wattle had wider head width than those with wattle. Other parameters measured including all semen, scrotal and rectal temperature were not significantly influenced ($P > 0.05$). Based on the result of this study wattle trait is not reliable means of assessing large body size and fertility in red sokoto bucks.

Keywords: Red Sokoto, Wattle, Bucks, Scrotal, Semen

INTRODUCTION

Wattle have been regarded as a structural outgrowth in the body of animals (goats) whose function is still under debate (Sabbioniet *al.*, 2011) but was of the opinion that wattle could be utilized during selection for productive purposes. Studies that will actually prove the contribution of wattle in productive efficiency will be a breakthrough as wattle can be used as a structural pointer to productive superiority, if proven it save the farmer the stress of excising the wattle out of ignorance and also prevent the development of cysts which often result after surgical excision of wattle. Testicular size is considered the most important criterion from physiological, genetic and practical perspective to improve reproductive performance of female (Palaszet *al.*, 1994). Keeton *et al.* (1996) indicated that scrotal characteristics are genetically and phenotypically



associated with essential growth character and other body measurement used in most selection programmes.

Research on the incidence and relative effect of wattle traits and its association with body measurements have been done by Ozoje (2002) in West African Dwarf goat. Similarly, several research findings on the association between wattle traits and performance (Growth, reproduction and heat tolerance) have been done by Casuet *al.* (1970; Osinowoet *al.* (1988); Shonjiaet *al.* (1992) and Ozoje and Mbere(2002) on West African Dwarf goats. Shonjiaet *al.* (1992) worked on the effects of wattle on litter size and milk yield in Sannen does. Research on the effect of wattle traits on body sizes and scrotal dimension have been done by Adedeji(2012) in West African Dwarf goat but similar works on the relationship between wattle and linear body measurement, growth, reproduction, heat toleranceand scrotal size on the Red Sokoto goat are limited.

This study is aimed at evaluating the effect of wattle on body measurements, scrotal, semen and rectal temperature of red sokoto bucks reared semi intensively in Niger State Nigeria.

MATERIALS AND METHODS

Location of study

This study was conducted at the ruminant unit of the teaching and research farm, School of Agriculture and Agricultural Technology, Federal University of Technology, GidanKwano Campus, Minna, Niger State. Minna is located at the Southern Guinea savanna zone between latitude $9^{\circ} 37'$ North and longitude $6^{\circ} 33'$ East of the equator. Minna has a mean annual rainfall of 1,300 mm, with an average highest temperature in the month of March and lowest temperature in the month of August. The mean annual temperature is between 22 to 40° C. Minna is located in the Southern Guinea Savannah vegetation belt of Nigeria and has two distinct seasons; wet from March to October and dry from November to March (F.U.T Minna Student Handbook, 2017).



Source of Experimental Animals

The Red Sokoto bucks (ranging from 12 – 15 months of age) used for the study were purchased from Mariga, Kanfaninbobi and Bida goat markets in Niger State.

Management of Experimental Animals / Experimental Design

The eight red sokotobucks were allotted to two (2) treatments groups. Each treatment comprises of four (4) bucks in a Completely Randomized block Design. Treatment 1 contained bucks without wattle. Treatment 2 of contained bucks with wattle. The animals were given routine treatment using prescribed dose of penstrep, oxytetracycline, ivometin and multivitamins. The bucks were also vaccinated against PPR. The bucks were managed under a semi-intensive system. The animals were provided feed supplement such as maize bran/offal, beans husk, and guinea corn shaft and mango leaves. Animals were also left to graze freely on natural rangeland daily from 10:00 am until 6:00 pm after which they were returned to the pen. The animals were tagged using rope and well label plastic material for identification. The experiment lasted for one year (January- December, 2017).

Data Collection

Data were collected on the body weight, body length, head length, head width, height-at-withers, chest girth, rump length, rump width, fore leg length hind leg length, shine circumference, left and right scrotal length, left and right scrotal width, scrotal circumference, semen and rectal temperature.

Body weight (kg): The weight was taken using hanging weighing balance.

The following measurements were done in cm using tailors measuring tape:

Body length: This was measured as the horizontal distance from the shoulder point to pin bone.

Head length: This was measured as the distance from the nostril to the poll.

Head width: This was taken as the distance between the outer canthus of the right and left eye.

Height-at-wither: This was taken as the vertical height from the hoof to the highest point of the shoulder.



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Chest girth: This was measured as the circumference of the body immediately behind the shoulder blades in a vertical plane perpendicular to the long axis of the body.

Rump length: This was measured as the distance from the point of the ischium to the pin bone.

Rump width: This was measured as the distance between the two points of ischium.

Fore leg length: This was taken as distance between the shoulder and the hoof.

Hind leg length: This was measured as the distance between the pin bone and the hoof.

Shine circumference: measured as the canon bone perimeter.

Scrotal length:The length was taken as the distance from the point of attachment of the scrotal sac to the tip of the scrotum.

Scrotal Circumference:as the width of the upper, middle and lower parts of the scrotum added and divided by three.

The semen collected through electro-ejaculation method was transported in ice pack to the laboratory.

Statistical Analysis

Data collected was analyzed using SAS statistical package (SAS, 2000). Duncan's Multiple Range Test, Duncan (1955) was used to determine the significant differences ($p < 0.05$) among treatments means.



Table 1: Bodyweight and Morphometric parameter

Parameters	T ₁	T ₂	SEM
Body weight (kg)	15.71	15.45	0.33
Body length (cm)	65.23	66.93	5.04
Head length (cm)	15.38	15.70	0.22
Head width (cm)	15.10 ^a	14.20 ^b	0.22
Height-at-Wither(cm)	56.05	55.25	0.78
Chest Girth (cm)	57.62	58.14	1.49
Horn length (cm)	9.05	8.35	0.40
Rump length (cm)	14.40	14.90	0.24
Rump Width (cm)	13.97	14.90	0.28
Fore leg length (cm)	43.73 ^b	47.08 ^a	0.87
Hind leg length (cm)	53.58	51.28	1.66
Shine Circumference(cm)	7.05	6.48	0.20

^{a,b} Means within a row having different superscripts differed significantly (P<0.05)

T₁= non-wattled bucks

T₂=Wattled bucks

SEM= Standard error of mean

Table 2: Scrotal parameters

Parameters	T ₁	T ₂	SEM
Scrotal circumference (cm)	17.60	18.20	0.24
Right test length(cm)	10.35	10.05	0.18
Right test width (cm)	3.70	3.80	0.04
Left test length (cm)	9.60	10.00	0.30
Left test width (cm)	3.80	3.75	0.03

T₁= Non-wattled bucks

T₂=Wattled bucks

SEM= Standard error of mean



Table 3: Semen evaluation

Parameters	T1	T2	SEM
Semen Volume (ml)	1.49	1.11	0.26
pH	6.76	6.80	0.087
Motility (%)			
Active (%)	80.25	82.75	4.40
Sluggish (%)	15.50	13.50	3.64
Non-motile (%)	4.25	3.75	0.82
Mean rectal temperature	38.77	39.01	0.08

T₁= non-wattled bucks

T₂= Wattled bucks

SEM= Standard error of mean

The results of the body weight and morphometric parameters of bucks in Table 1 revealed significant difference ($P < 0.05$) in head width and fore leg length of the bucks used for the experiment. Body weight, body length, head length, height-at-withers, chest girth, horn length, rump length, rump width, hind leg length and shine circumference revealed no significant difference ($P > 0.05$).

The scrotal parameters of the males in Table 2 revealed no significant difference ($P > 0.05$) in the scrotal circumference, right testis length, right testis width, left testis length and left testis width.

Table 3 shows the results of the semen analysis and rectal temperature of males used for the experiment. The table revealed no significant difference ($P > 0.05$) in the semen volume, semen pH, semen motility and rectal temperature of the males used for the experiment.

DISCUSSION

Bucks with wattle showed superiority in the foreleg length. This is in line with the finding of Odubote (1994), Ozoje and Mgbere (2002), Adedeji (2009) and Adedeji (2012) who reported the superiority of wattled goat (West African Dwarf goats) over those without wattle in the parameters considered. This current study also revealed that bucks without wattle had wider head width than those with wattle. This result however, contradicts the earlier findings of authors stated above who reported the superiority of wattled goats over those without wattle.



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Adedeji (2012) reported higher scrotal length in wattled WAD bucks, which is an indication of improved reproductive performance, as testicular size is considered the most important benchmark from physiological, genetic and practical perspective to improve reproductive performance of related female (Palaszet *al.* 1994). This is not the case in this study as no significant difference was observed in the scrotal, semen and the rectal temperature of the bucks used. This is in line with the findings of Ijomana (2012) who observed no significant difference in the body parameters measured between red sokoto goats with wattle and those without wattle. Stultz (2016) carried out a study on dairy goats and observed no significant difference between dairy goats with wattle and those without wattle. Osinowo *et al.* (1990) found no significant influence of wattle on fertility of yankasaewes. Ozoje (2002) stated that wattle does not have any advantage in goats. Odubote (1994) and Ozoje (2002) only suggested that wattle possession in WAD goats could probably be for thermoregulatory role adapting animals to the environment.

CONCLUSION

Based on the outcome of this research, wattle had no special impact on rectal temperature, body measurements, scrotal and semen parameters of bucks raised semi intensively. However, it is advised that farmers should keep goats with wattle in order to preserve the wattle gene.

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