TESTICULAR HOMOGENATE AND FILTRATE VOLUME OF KANO BROWN BUCKS AS AFFECTED BY TEMPERATURE, CHANGES IN RELATIVE HUMIDITY AND FEEDING REGIME

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ABSTRACT

The study was conducted to evaluate the seasonal and nutritional effect on testicular homogenate and filtrate volume of Kano brown bucks. Baseline data was collected at University Teaching and Research Farm of and laboratory of the Department of Animal Science, Bayero University, Kano. Sixteen (16) Kano brown bucks with an average of 15 kg, 10-12 month of age were used. Four bucks one from each treatment were orchidectomised for the determination of testicular homogenate and filtrate volume. The result obtained were significant ($P < 0.05$) different T3 recorded the highest mean value of 81.00 ml while T4 had the lowest mean values of 39.00 ml right testis homogenate volume. It can be concluded that temperature, humidity changes and feeding regime has a significant effect on testicular homogenate and filtrate volume of Kano brown bucks, goat should be allowed to go grazing and supplemented twice per day.

Keywords: Testicular, homogenate, filtrate, volume, temperature, humidity, feeding regime, Kano brown bucks.

INTRODUCTION

In tropical and subtropical environments, small and large ruminants may often be under heat stress. When the environmental temperature exceeds the upper critical level of 48°C, depending on the species, there is usually a drop in production or a reduced rate of weight gain. Furthermore, when the temperature falls outside the comfort zone, other climatic factors assume greater significance. Humidity becomes increasingly important as do solar radiation and wind velocity. In a hot-dry climate evaporation is rapid, but in a hot humid climate the ability of the air to absorb additional moisture is limited and the inadequate cooling may result in heat stress. Too low humidity in the air will cause irritation of the mucous membranes, while too high humidity. The nutrient requirements of goat are determined by age, sex, breed, production (dairy, or meat), body size, climate and pregnancy. Feeding strategies should be able to meet energy, protein, mineral, and vitamin needs depending on the condition of the goats. When goats are in lactation for an extended period of time, they will require supplemental feeding on a higher plane of nutrition. The daily feed intake is influenced by body weight, dry matter in the feeds (12-35% in forages, 86-92% in hays and concentrates), palatability physiological stage of the goats such as growth, pregnancy, and lactation (Rashid, 2008).

MATERIAL AND METHODS

Study area

The study was carried out at the University Teaching and Research Farm and Laboratory of the Department of Animal Science, new site of Bayero University, Kano. Kano is located within the latitude 9^0 30 and 12^0 30 North and the longitude $9^0$30 and $8^0$42 East in Sudan Savannah region of Nigeria. The annual temperature and relative humidity ranged between 38^0C to 43^0C and 40 to 51.3%, respectively (Olafin, 2007). The region is characterized by tropical wet and dry climate; wet season (May to September) and dry season (October to April) with annual rainfall that ranges between 787 - 960mm (KNARDA, 2001).

Experimental animals and their management

Sixteen (16) Kano Brown bucks with average initial body weight of 15 kg agedbetween 10 to12 months were used for this study. The scrotum and testis for each bucks were visualized, palpated and carefully inspected before the selection of experimental animals so as to rule out any form of abnormalities. Animals were quarantined, antibiotics prophylaxis were given also using 20% Oxytetracycline (long acting) at the dose rate of 10 mg per kg^{-1} body weight, dewormed using Albendazole at the dose rate of 7.5 mg per kg^{-1} body weight, vaccinated against Pneumo-enteritis Complex/PestePestits de ruminant (PPR) using PPR Vaccine at dose rate of 0.5 ml subcutaneously.

Treatments	Feeding regime
Treatment I:	Browsing only (zero supplementation)
Treatment II:	Supplementation in the morning with browsing
Treatment III:	Supplementation in the morning and in the evening with browsing
Treatment IV:	Supplementation only (Zero browsing)

Feeding and management

The experimental bucks were divided in to four dietary treatments of four animals each. Treatment one browse only (zero supplementation), treatment two browse and supplementation in the morning only, treatment three browse and supplementation in the morning and in the evening and treatment four zero browsing (Supplementation only). Basal diet of groundnut hay was given to only treatment four. Water and minerals salt lick were provided *ad-libitum*. The composition of the supplement include 19% maize offal, 30% cotton seed cake, 30% wheat offal, 20% cowpea husk and 1% salt which will give 16% CP and 2381 kcal/1kg energy.

Determination of testicular homogenate and filtrate volume

Four bucks one from each treatment were orchidectomised. The whole epididymis was removed from the testis, tunica albuginea and visiral viginal tunic were removed from each testis using scaple blade. Each testis was homogenized in 50 ml normal saline containing antibiotic (streptomycin and Benzyl Penicillin G) to prevent the microbial contamination. The Homogenate volume were measured after rinsing the blender with 20 ml of normal saline, it is further diluted with 80 ml of normal saline after transferring 5 ml of the homogenate to a conical flask. The homogenate were stored overnight at 5^0C. Retwot *et al.*1(987), the caput, corpus and cauda epididymides length and weight were measured, minced in 20 ml of saline with Sharpe scissors and stored overnight at 5^0C. The caput, capus and cauda epididymides will be filtered through gauze and filtrate volume was measured. One millimeter of epididymal filtrate was diluted with 2ml of saline.

Statistical analysis

Data collected were coded and then subjected to analysis of variance (ANOVA) using general linear model procedure of SAS (2008) in arandomized complete block design, where significance difference observed mean were separated using Fishers Least significance Difference (LSD) method of analysis.

RESULTS AND DISCUSSION

Seasonal and nutritional effect on testicular homogenate and filtrate volume (ml) of Kano Brown bucks are showed in Table 1. The result noticed a significant ($P < 0.05$) difference in all the treatment groups observed. T_3 81.00 ml and 81.00 ml right and left testis homogenate volume was the highest and lowest mean value was observed in T_4 60.00 ml and 59.00 ml. However, T_3 had the highest value of 61.00 ml right testis filtrate and T_4 39.00 was the lowest. The means value of epididymal homogenate volume ml of Kano Brown bucks are presented in Table 2. Significant ($P < 0.05$) difference was observed among the treatment groups studied. Highest and lowest mean values was observed in T3 12.01 ml right caput epididymides and 9.50ml T2respectively.Table 3 shows the result of seasonal and nutritional effect on epididymal filtrate volume of Kano Brown bucks. Parameters studied differed significantly ($P < 0.05$). Highest and lowest mean value of

epididymal filtrate volume showed that T1 left caput epididymides 8.73 ml and T1 7.80 ml respectively. No significant ($P > 0.05$) difference noted in right caput epididymides volume among the treatment studied.

The mean value of epididymal homogenate volume (ml) obtained in this study was shown in Table 1. Epididymal homogenate volume shows some variation in this finding the disparities was observed as a result of differences in epididymal weight and lengthy. Fadason (2001) reported that the only difference between epididyal homogenate and filtrate volume is the tissue and it rate of absorbing water. This report was supported by the findings of Nasir *et al.* (2014b) who observed similar value in Red Sokoto bucks fed cotton seed cake diet. The mean value of epididymal filtrate volume (ml) of Kano Brown bucks observed in this study differed significantly among the treatments this could be due to differences observed in epididymal homogenate volume. Nasir *et al.* (2014b) reported that epididymal filtrate volume was not found to be affected by diets. The findings agreed with the finding of Shayonbo, (2012) in Red Sokoto bucks, Oyeyemi and Obiogoro (2005) large white Boar, Oyeyemi *et al.*(2012) Sahel Buck in humid zone of Nigeria.

CONCLUSION

Based on the result of this study, it can be concluded that seasonal temperature of 46^0C and relative humidity of 20% shows significant effect on testicular homogenate and filtrate volume of Kano brown bucks.

REFERENCES

Fodison, S. (2001). Effects of intratesticular injection of chlorhexidinegluconate and cotton seed oil of some reproductive parameters of bucks, MSc. Thesis. Ahmadu Bello University, Zaria. Un-published

Hassan A. M. (2010). Effect of groundnut haulms supplementation on growth and reproductive performance of Kano Brown bucks (Msc) thesis, ABU-Zaria. Unpublished.

KNARDA (2001). Kano State Agricultural and Rural Department Authority. Metrological station report book. Page 11 - 13.

Nasir, M., Njidda, A. A., Duwa, H. and Chibuogu, C.I (2014b). Testicular Morphometry of Red Sokoto buck fed cotton seed cake. *Schoolar Journal of Agriculture and Veterinary Sciences,* (4a) 242-248.

Nasir, M., Njadda, A. A., and Hassan, A.M (2014c). Testicular histometry, gonadal and extra gonadal sperm reserve of Red Sokoto bucks fed cotton seed cake. *Journal of Science,* 4: 227-232.

Olofin, E. A. (2007). Some aspect of physical geography of Kano region and related human resources. Departmental Lecture note series Vol. 1 Pp 50, Geography Department, Bayero University, Kano

Oyeyemi, M. O. O., Fayomi, A. P., Adeniji, D. A., Ojo, K. M. (2012). Testicular and epididymal parameters of sahel buck in the humid Zone of Nigeria. *International Journal of Morphology.* 30(2): 489-492.

Oyeyemi, M. O., Obiogoro, O. (2005). Spermiogram and morphological characteristics in testicular and epididymal spermatozoa of large white boar in Nigeria. *International Journal of Morphology.* 23(3): 235-239.

Rashid, M. (2008). Sheep and Goat Specialist. Manitoba Agriculture, Food and Rural Initiatives. March 2008. Pp 1-4

Sakesena, S. K. and Salmonsen, R. A. (1982): Antifertility effects of gossypol in male hamsters. *Fertility and Sterility,* 37: 689-690.

Shoyonbo, A., Fasanya, O., Bunjah, U., Yakubu, H. (2012). On-farm prediction of testicular characteristics in bucks at specific Ages. *World Journal of Life Science and Medical Research.* 2(3): 115-119.

Taha, T. A, Shaaban W. F. El-Mahdy A. R, El-Nouty F. D, Salem M. H (2006). Reproductive toxiological effects of gossypol on male rabbits: Semen characteristics and hormonal levels. *Journal ofAnimal Science,* 82: 259-269

Tibbo, M (2006). Reproductivity and health of indigenous sheep breeds and crossbreds in the central Ethipian highland. Ph.D. Dissertation, Swedish University of Agricultural Science, Uppsala, Sweden. Un-published

Van-soest, P. J., Robeertson, J. B. and Lewis, B. A. (1991). Method for dietary fibre, neutral detergent fibre and non-starch polysaccharides in relation to animal nutrition. *Journal of dairy Science.* **74.** 3583: 3597

Valasquez-Pereira, J., P. J. Chenoweth, L. R. McDowell, C. A. Risco, C. A. Staples, D. Prichard, F, G. Martin, M. C. Calhoun, S. N. Williams and Wilkinson, N. S. (1998). Reproductive effects of feeding gossypol and Vitamin E to Bulls. *Journal of Animal Science*, 76: 2894-2904.

Table1: Nutritional effect on testicular homogenate volume (ml) of Kano Brown bucks (ml) at high temperature (46^{0}C) and low humidity (20%).

	Treatments				
Parameters	T_1	T_2	T_3	T_4	SEM
Right testis homogenate volume	61.00^{c}	65.33^{b}	81.00^{a}	60.00^{d}	0.14
Left testis homogenate volume	63.33^{c}	64.00^{b}	81.00^{a}	59.00^{d}	0.32
Right testis filtrate volume	40.00^{b}	40.00^{b}	61.00^{a}	39.00^{a}	0.43
Left testis filtrate volume	37.00^{ba}	38.00^{a}	35.00+	36.00^{ba}	0.52

^{abc} means within the same rows with different super script are significantly different (P < 0.05). SEM standard error of means.

Table 2: Nutritional effect on epididymides homogenate volume (ml) of Kano Brown bucks at high temperature (46^{0}C) and low humidity (20%).

	Treatments				
Parameters	T_1	T_2	T_3	T_4	SEM
Right caput epididymides	11.96^{a}	9.50^{c}	12.01^{a}	11.03^{b}	0.15
Left caput epididymides	11.63^{a}	9.50^{c}	11.06^{a}	10.23^{b}	0.17
Right capusepididymides	7.66^{d}	8.30^{c}	9.33^{b}	10.13^{a}	0.46
Left Capusepididymides	9.83^{a}	8.33^{b}	9.31^{a}	9.60^{a}	0.21
Right caudaepididymides	12.03^{b}	10.56^{d}	13.06^{a}	11.16^{c}	0.14
Left caudaepididymides	7.33	10.56	13.10	11.00	0.45

^{abc} means within the same rows with different super script are significantly different (P < 0.05). SEM standard error of means.

Table 3: Nutritional effect on epididymides filtrate (ml) volume of Kano Brown bucks (ml) at high temperature (46^{0}C) and low humidity (20%).

	Treatments				
Parameters	T_1	T_2	T_3	T_4	SEM
Right caput epididymides	9.00	8.96	8.00	9.33	0.36
Left caput epididymides	7.80^{b}	8.73^{a}	8.33^{ab}	8.50^{a}	0.15
Right capusepididymides	9.56^{a}	8.00^{c}	8.56^{bc}	9.33^{ba}	0.2
Left Capusepididymides	9.50^{a}	7.56^{c}	8.63^{b}	8.60^{b}	0.18
Right caudaepididymides	9.33^{ba}	8.83^{b}	8.83^{b}	9.66^{a}	0.14
Left caudaepididymides	8.46^{b}	8.33^{b}	9.47^{a}	9.83^{a}	0.18

^{abc} means within the same rows with different super script are significantly different (P < 0.05). SEM standard error of means.