

EVALUATION OF BODY MORPHOMETRIC AND RECTAL TEMPERATURE OF UDA RAMS SUPPLEMENTED WITH GRADED LEVELS OF TWO FORMS OF KANWA (MAIFATSI AND YAR ZANKOWA)

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ABSTRACT

This study evaluated the effects of natron (*kanwa*) on hematological and morphometric responses of Uda rams. Twenty Eight (28) Uda rams were allotted to seven Treatments; with Yar Zankowa and Mai Fatsi at 0.5, 1.0 and 1.5% of the dities as Treatments 1, 2, 3 and 5, 6, 7 respectively while Treatment 4 with 0.0% as control in a Completely Randomized Design (CRD). The experiment lasted for 84 days (12 weeks), twenty eight (28) rams were used in this experiment, four rams were allotted to each treatment and each ram serve as replicate. Data were collected weekly to assess morphometric indices and rectal temperature. The results revealed no differences ($p>0.05$) in the linear body measurements between all the Treatments. Treatment 2 (1.0% *Yar Zankowa*) had higher final weight gain compared to other Treatments. The rectal temperature showed no significant ($P>0.05$) difference across the Treatments. It was recommended that farmers are encouraged to use *Yar Zankowa* form of *kanwa* at 1.0% for better performance. It was concluded that the two forms of *kanwa* had no deleterious effect on the health of the animals as also indicated by rectal temperatures of the animals.

INTRODUCTION

Background of the Study

In Nigeria, potash mostly occurs as a common deposit of saline lakes, the deposit is usually covered by shallow water, less than two feet deep (Makanjuola and Beetlestone, 1975). Its occurrence is common in the northern part of the country, especially in Kano and Maiduguri areas, extending to neighboring countries like Chad and Niger. According to Makanjuola and Beetlestone (1975), *kanwa* is the second most commonly used salt in Nigeria. It is next important table salt with very low amounts of potassium as compared to sodium (Ekanem, 1977). There are basically varieties of potash that are well known in Nigeria and their uses have also been noted. It is known locally by different tribes such as *Kaun* by Yoruba in Southwest Nigeria and Igbos in Eastern Nigeria, *Kanwa* or *karu* by Hausa in Northern Nigeria and *Okanwa* and *Ikoru* by Igalas and Egbira ethnic groups, respectively, in the middle belt of Nigeria (Makanjuola and Beetlestone, 1975). *Kanwa* also serves as a salt lick and mineral supplement for ruminants (Alawa *et al.*, 2000) and used in decoctions for the Treatment of reproductive ailments such as retained placenta and difficulty in urination. Its ethno-medicinal potency has been documented for ailments such as stomach ache, constipation and toothache (Alawa *et al.*, 2000). Based on these evidences, it can be established that *Kanwa* can be classified among the functional foods that provide health benefits beyond the traditional nutrients it contains (Ross, 2000). Functional food is similar in appearance to, or may be, a conventional food supplement, consumed as part of a usual diet, and demonstrated to have physiological benefits or reduce the risk of chronic diseases beyond basic nutritional functions (Huggett and Schliter, 1996). However, many of the work done on functional foods are from plants perspective (Scicchitano *et al.*, 2014). Studies involving rats have indicated that high levels of *kanwa* in cooked foods and drinking water may be detrimental to health (Oyeleke, 1988) and hemolytic to human (Sodipo *et al.*, 1993).

MATERIALS AND METHODS

Experimental Site

This study was carried out at the Department of Animal Science Livestock Teaching and Research Farm, Main Campus, Usmanu Danfodio University, Sokoto. Sokoto is located between latitudes 13°

08°04'N and longitudes 5° 13'00'E in the Northern part of Nigeria and at an altitude of 283m above the sea level (Google Earth, 2019). The annual rainfall is about 700mm (Malami *et al.*, 2001). Potential evapotranspiration has been reported to be 162mm, maximum temperature of 41°C occurs in April and minimum of 13.2°C in January (Malami *et al.*, 2001).

Experimental Animals and their Management

Twenty eight (28) Uda rams were used for this study. The experimental animals were sourced from Achida Livestock Market. The animals were dewormed with Ivermectin 5% (1ml/50kg body weight) and Albendazole against external and internal parasites, respectively before the commencement of the experiment. Also, Oxytetracycline (a broad-spectrum antibiotic) and multivitamins injections were given at rate of 1ml/10kg body weight for three days against any subclinical infections and to reduce stress. Feed and water were given to the animals *ad libitum*. The animals were housed in pens with adequate ventilation. An experimental diets were offered *ad libitum* as total mixed ration.

Table1. Composition of Experimental Diet

TREATMENT							
Ingredient	YZK			Control	MFF		
	T1(0.5%)	T2(1%)	T3(1.5%)		T5(0.5%)	T6(1%)	T7(1.5%)
Groundnut pods	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Maize Stover	15.0	15.0	15.0	15.0	15.0	15.0	15.0
CSC	17.1	17.1	17.1	17.1	17.1	17.1	17.1
Rice offal	25.6	25.6	25.6	25.6	25.6	25.6	25.6
Cowpea hay	18.3	18.3	18.3	18.3	18.3	18.3	18.3
Molasses	04.0	04.0	04.0	04.0	04.0	04.0	04.0
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Calculated Chemical Composition							
Energy (Kcal/Kg.ME)	2509.0	2509.0	2509.0	2509.0	2509.0	2509.0	2509.0
CP (%)	12.14	12.14	12.14	12.14	12.14	12.14	12.14
CF (%)	23.46	23.46	23.46	23.46	23.46	23.46	23.46

YZK= yar zankowa, MFF= mai fatsi fatsi, CP=crude protein, CF=crude fibre

Body Morphometrics

Measurements of body were performed with the aid of a measuring tape. The animals were kept in upright position. Height at wither was measured as vertical distance from thoracic vertebrae to the ground level, body length was measured from the cranial part of the major tuberosity of the humerus to the caudal portion of the ischial tuberosity. Scrotal circumference was measured using a tape at the broadest part of the scrotum. Hearth girth was measured using a measuring tape around the chest, just behind the front legs as described by Benoît *et al.* (2017). Rectal temperature was taken using clinical thermometer, inserted into the rectum for its recommended lapse time (60 sec).

Data Analysis

Data generated from the experiment were subjected to analysis of variance using Statview Statistical Package (SAS, 2002). Least significant difference (LSD) test was used to separate the means at 5% level of significance.

RESULTS AND DISCUSSION

Live Morphometry of Uda Rams Supplemented with Graded Levels of Kanwa

Values for the live morphometry of Uda rams fed graded levels of *Kanwa* were presented in Table 2. The results also showed significant ($P<0.05$) variation in most of the parameters measured except final HW, Initial SL and gain in BL, HW and SC. The results showed significant ($P<0.05$) difference in initial HW between Treatment T2 and T3. With regards to initial BL the only observed difference ($P<0.05$) was between Treatments T1, T5 and T7. Final BL was significantly higher ($P<0.05$) in T1. Treatment T3 recorded the lowest measurement. There was no significance difference ($P>0.05$)

between Treatments T2, T4, T5 and T6 so also between Treatments T5, T6 and T7 with regards to final BL, there is also no difference between Treatments T3 and T7 with regards to Final BL and Final CG. There was significant ($P>0.05$) difference in initial CG between Treatments T1, T2, T6 and T3. Final CG was higher in Treatment T2 and lower in Treatment T3. There was no difference between Treatments T1, T2 and T4 and between Treatments T1, T4, T5 and T6 in the final CG. There was a difference ($P<0.05$) with regards to gain in CG is between Treatments T4 and T7, and between Treatments T2 and T3 in final SC.

Table: 2 Live morphometry of Uda rams fed graded levels of *Yar Zankowa* and *Mai Fatsi Fatsi* forms of *Kanwa*.

Treatments									
Parameter (cm)	YZK			CONTROL		MFF		P-values	SEM
	T 1	T 2	T 3	T 4	T 5	T 6	T7		
Initial HW	71.38 ^{ab}	71.00 ^{ab}	67.03 ^b	72.00 ^a	71.13 ^{ab}	70.13 ^{ab}	68.00 ^{ab}	0.040	1.59*
Final HW	74.13	73.88	70.28	74.13	72.65	73.25	70.75	0.080	1.42 ^{NS}
Gain HW	2.75	2.88	3.25	2.13	1.53	3.13	2.75	0.075	1.57 ^{NS}
Initial BL	63.63 ^a	58.93 ^{ab}	55.38 ^b	60.87 ^{ab}	57.38 ^{ab}	60.63 ^{ab}	55.38 ^b	0.023	2.36*
Final BL	66.25 ^a	61.93 ^b	58.13 ^d	62.50 ^b	60.75 ^{bc}	61.75 ^{bc}	58.25 ^{cd}	0.002	1.08*
Gain BL	2.65	3.00	2.75	1.63	3.38	1.13	2.88	0.066	1.81 ^{NS}
Initial HG	68.00 ^a	69.38 ^a	62.88 ^b	65.25 ^{ab}	66.63 ^{ab}	68.00 ^a	66.38 ^{ab}	0.012	1.51*
Final HG	69.00 ^{ab}	70.88 ^a	63.51 ^d	69.13 ^{ab}	67.25 ^{bcd}	68.92 ^{bc}	66.96 ^{cd}	0.003	1.06*
Gain HG	1.00 ^{ab}	1.50 ^{ab}	0.63 ^{ab}	3.88 ^a	0.62 ^{ab}	0.92 ^{ab}	0.58 ^b	0.032	1.38*
Initial SC	16.63	19.75	18.00	19.75	17.63	19.75	18.62	0.091	1.36 ^{NS}
Final SC	18.63 ^b	24.00 ^a	20.00 ^{ab}	24.13 ^a	17.98 ^b	21.63 ^{ab}	19.00 ^b	0.043	1.43*
Gain SC	2.00	4.25	2.00	4.38	0.35	1.88	0.38	0.065	1.40 ^{NS}
RT (⁰ C)	39.2	39.0	39.1	39.0	38.9	39.1	39.0	0.01	0.310

SEM = Standard error of means, NS = Not significant ($P> 0.05$); * = significant ($P< 0.05$); a, b = Means in the same row bearing different superscripts differ significantly ($P<0.05$); YZK= *Yar zankowa* ; MFF= *Mai ftsi fatsi*; HW= height at withers; BL= body length; CG= chest girth; SC= scrotal circumference; RT= rectal temperature

DISCUSSION

Live Morphometry and Rectal Temperature of Uda rams Fed Graded Levels of *Kanwa*

The findings of the study on body weight and linear body measurements obtained in the present study were similar to previous findings from the similar age animals reported by Cam *et al.* (2003). Morphometric measurements and the relationships between these measurements describe roughly animal's production status and breed characteristics. From the results (of morphometrics), there was no significant effects of either of the two forms of *kanwa* on gains in observed body measurement except for chest girth, which is significantly different among the groups. The significant gains in chest girth could be due to the gains in body weight which is closely correlated to chest girth than any other linear body measurement as observed from several studies conducted on various sheep breeds (Ozturk *et al.*, 1994; Boztepe and Dag, 1995; Topal *et al.*, 2003). However, chromium supplementation tended to increase the heart girth during the preweaning and overall periods and increased the hip width during the post weaning and overall periods in Kargar *et al.* (2017) which contradicts the finding of the present study.

Rectal temperature was not affected by both form and level of *kanwa* inclusion across the groups. This is corroborated by the findings of Kargar *et al.* (2017). This shows that the animals are not exposed to any stress due to *kanwa* inclusion.

CONCLUSION

It was concluded that the two forms of *kanwa* had no deleterious effect on the health of the animals as also indicated by rectal temperatures of the animals. Increased *Yar Zankowa* supplementation at the rate of 1.0% resulted in significantly increased growth as shown by the body morphometric indices.

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