Effect of Breed on Weekly Body Weight and Morphometric Traits of Nigerian Goats

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Abstract

This experiment was conducted to study the effect of breed on weekly body weight and morphometric traits of Nigerian goats. A total of 36 weaner goats of two breeds (West African dwarf, n=18; 9 males + 9 females) and Red Sokoto goats, n=18; 9 males + 9 females) of about 3-4 months of age were used for the experiment and the treatments comprise of 2 breeds. Data collected were body weight, body length, withers height, chest girth, chest depth, rump height, cannon circumference, chest width, hind leg length, fore leg length, and ear length. The data on body weight and morphometric were analysed using Statistix Analytical software, file version 8.0. Where significant differences were observed, means were compared using T-test. The results indicated that breed had significant (P<0.05) effect in some morphometric traits throughout the 8 weeks of the experiments with Red Sokoto breed having significantly higher values. The conclusion drawn from the study is that the Red Sokoto breed possesses superior morphometric traits, which could be attributed to its genetic potential and adaptability. This suggests that the breed is well-suited for specific agricultural practices and may offer advantages in terms of growth performance. It is recommended that farmers focus on breeding programs that prioritize the Red Sokoto breed due to its advantageous morphometric traits. This could enhance productivity and profitability in goat farming.

Keywords: Effect; breed; body weight; weekly; morphometric; Nigerian goats

Introduction

One of the main livestock species is goat, which is an important source of meat, milk and income for the local population [1]. However, several factors, such as the breed, sex, type and diet composition can influence the growth performance and productivity of goats [2]. The study of Nigerian goats has garnered significant attention due to the diverse breeds and their unique adaptations to local environments. Understanding the effects of breed, diet, and sex on the weekly body weight and morphometric traits of these goats is crucial for optimizing their management and improving productivity. [3] reported that breed plays a pivotal role in determining the growth characteristics and morphometric traits of goats. Different breeds of goat's exhibit varying body weights and physical measurements, influenced by genetic factors and environmental conditions [4]. The objective of the study was to determine the effect of breed on weekly body weight and morphometric traits of Nigerian goats.

Materials and Methods

The Study Area

The research was conducted at the Teaching and Research Farm, Department of Animal Science, Faculty of Agriculture Shabu-Lafia Campus, Nasarawa State University, Keffi. The study area located in the guinea savanna zone of North Central Nigeria, and found on latitude 080 33' N and longitude 080 32' E.

Experimental diets

The grass (Digitaria smutsii) was sourced from the National Animal Production Research Institute/Ahmadu Bello University, Shika, Zaria, Nigeria while the two legumes (groundnut haulms and cowpea husk) were sourced from farms after harvest in Lafia, Nasarawa State. After collection, the haulms were brought to the Faculty Livestock Farm, where they were shade-dried and debris was removed before being fed to the experimental goats. The

Digitaria smutsii, groundnut haulms and cowpea husk were fed to the experimental goats.

Experimental design

The experiment comprises of 2 breeds, West African Dwarf (WAD) and Red Sokoto (RS) goats in a Completely Randomized Design (CRD). The goats were tagged and distributed into 18 pens with 2 goats (male and female) in each pen and they were balanced on the basis of weight to avoid bias.

Experimental goats and management

Physically sound goats were randomly sourced from reputable local farms in Lafia, Nasarawa State. A total of 36 weaner goats of two breeds (West African dwarf, n=18; 9 males + 9 females) and Red Sokoto goats, n=18; 9 males + 9 females) of about 3-4 months of age were sourced for the experiment. On arrival, the goats were allowed to acclimatize for a period of 2 weeks during which they were dewormed against endo- and ecto-parasites and vaccinated against Peste des petits ruminants (PPR). The experimental diets and water were given ad libitum. Any goat with any sign of disease was treated by Veterinarian.

The body weight and morphometric traits

Body weight (BW) was taken using industrial hook hanging weight Crane scale to the nearest 0.1 kg. The goats were turned on their back in a Hessian Jute bag/sack and the weight taken as the difference between the weight and the weight of the bag/sack. Data on body weights were taken on a weekly basis.

The morphometric traits were taken from animals in a standing position with a raised head. The morphometric traits were carried out using a measuring tape. The morphometric traits taken include, body length, withers height, chest girth, chest depth; rump height, cannon circumference, chest width, rump width; hind leg length, fore leg length and ear length were measured.

The below morphometric traits were measured as:

Body length (BL): It was measured from the point of the shoulder to the pin bone (cm).

Withers height or height at withers (WH): This measured from the surface of the platform on which the animal stood to the withers of the animal (cm).

Chest girth (CG): It was measured as the body circumference just behind the forelegs (cm).

Chest depth (CD): This was measured from the most dorsal point of the withers to the ventral surface of the sternum (cm).

Rump height (RH): This was measured from the surface of a platform to the rump.

Canon circumference (CC): Cannon circumference (CC) was measured from the left mid metacarpus (region between wrist and the toes) (cm).

Chest width or shoulder width (CW): This was measured as the distance from the left to right shoulder blade (cm).

Rump width (RW): This was measured as the distance between two tuber coxae (hip bone or hip joint) (cm).

Hind leg length (HL): This was measured from the hip joint down to the base of the hoof (cm).

Fore leg length (FL): This measurement was taken from the shoulder down to the hoof (cm).

Ear Length (EL): This was taken as the length of the external ear from its root to the tip (cm).

Statistical analysis

T-test was used to test the fixed effect of breed on body weight and morphometric. Significant differences among means were separated using the T-test option of the Statistix Analytical software, file version 8.0.

The mathematical model employed was:

$$Y_{ijkl} = \mu + B_i + e_{ij}$$

Where;

Y_{ij} = individual observation,

μ = general or overall mean,

B_i = effect of factor B (breed) (B_i =WAD, RS)

e_{ij} = experimental error.

Results

Table 1: Effect of breed on body weight and morphometric traits of goats at week 1

Traits	Breeds			
	WAD	RS	P-value	LOS
BW (kg)	6.45±0.35	7.13±0.35	0.1849	NS
BL (cm)	43.56±0.76	44.18±0.77	0.5617	NS
WH (cm)	37.18±0.82[b]	42.81±0.86[a]	0	*
CG (cm)	44.28±0.84	45.61±0.80	0.2649	NS
CD (cm)	15.24±0.23[b]	16.43±0.43[a]	0.0218	*
RH (cm)	42.19±0.59[b]	46.35±0.82[a]	0.0002	*
CC (cm)	7.04±0.07	7.23±0.13	0.2319	NS
CW (cm)	18.45±0.57	18.63±0.40	0.7996	NS
RW (cm)	19.04±0.50	19.95±0.49	0.2068	NS
HL (cm)	40.72±0.67[b]	45.67±0.97[a]	0.0002	*
FL (cm)	33.31±0.49[b]	38.13±0.51[a]	0	*
EL (cm)	10.76±0.17[b]	12.04±0.29[a]	0.0007	*

[ab] Means in the same row bearing different superscripts differ significantly (P<0.05; 0.01),WAD= West African Dwarf, RS= Red Sokoto, BW= Body weight, BL= Body length, WH= Withers height, CG=Chest girth, CD= Chest depth, RH= Rump height, CC=Cannon circumference, CW= Chest width, HL= Hind leg length, FL= Fore leg length, EL= Ear length, LOS= Level of significance, *= Significant at 0.05, NS= No significant, kg= Kilogram, cm= centimeter.

Table 1 presents the effect of breed on body weight and morphometric traits of goats at week 1. The results obtained shows that breed had significant (P<0.05; 0.01) effect on WH, CD, RH, HL, FL and EL and no significant (P>0.05) effect on BW, BL, CG, CC, CW and RH at week 1. The Red Sokoto breed had significantly (p<0.05) higher CD, RH and had highly significant (P< 0.01) difference for WH, HL, FL and EL than WAD goats.

Table 2 represents the effect of breed on body weight and morphometric traits of goats at week 2. Results obtained for breed effect at week 2 for body weight and morphometric traits indicates that breed had significant (P<0.05; 0.01) effect on WH, CD, RH, HL, FL and EL but have no significant (P>0.05) effect on BW, BL, CG, CC, CW and RW. The results showed that Red Sokoto (RS) goat had significantly (P<0.05; 0.01) higher WH, CD, RH, HL, FL and EL (46.85±0.74 cm, 19.50±0.47 cm, 48.27±1.08 cm, 47.32±1.21 cm, 39.85±0.71 cm and 13.48±0.39 cm), respectively than 41.49±0.79 cm, 17.35±0.39 cm, 45.22±0.92 cm, 43.46±0.79 cm, 36.63±0.64 cm and 13.02±0.27 cm, respectively for West African Dwarf (WAD) goat breed.

Table 2: The effect of breed on body weight and morphometric traits of goats at week 2

Traits	Breed			
	WAD	RS	P-Value	LOS
BW (kg)	7.00±0.44	8.15±0.37	0.062	NS
BL (cm)	45.81±0.91	47.71±0.79	0.1315	NS
WH (cm)	41.49±0.79[b]	46.85±0.74[a]	0.0001	*
CG (cm)	44.99±1.19	47.61±1.04	0.114	NS
CD (cm)	17.35±0.39[b]	19.50±0.47[a]	0.0018	*
RH (cm)	45.22±0.92[b]	48.27±1.08[a]	0.0414	*
CC (cm)	8.27±0.72	8.34±0.22	0.8099	NS
CW (cm)	24.39±0.72	26.23±1.23	0.2023	NS
RW (cm)	25.81±0.88	27.53±1.58	0.3373	NS
HL (cm)	43.46±0.79[b]	47.32±1.21[a]	0.0126	*
FL (cm)	36.63±0.64[b]	39.85±0.71[a]	0.0025	*
EL (cm)	13.02±0.27[b]	13.48±0.39[a]	0.0358	*

[ab] Means in the same row bearing different superscripts differ significantly (P<0.05; 0.01),WAD= West African Dwarf, RS= Red Sokoto, BW= Body weight, BL= Body length, WH= Withers height, CG=Chest girth, CD= Chest depth, RH= Rump height, CC=Cannon circumference, CW= Chest width, HL= Hind leg length, FL= Fore leg length, EL= Ear length, LOS= Level of significance, NS= No significant, *= Significant at 0.05, kg= Kilogram, cm= centimeter.

Table 3 shows the effect of breed on body weight and morphometric traits of goats at week 3. The results showed that breed had a significant (P<0.05) difference in all the parameters except on the BW, BL, CG, CD and CC. The results revealed that Red Sokoto (RS) goat had significantly (P<0.05) higher WH, RH, CW, HL, FL and EL than the West African Dwarf (WAD) breed.

Table 3: Effect of breed on body weight and morphometric traits of goats at week 3

Traits	Breed			
	WAD	RS	P-Value	LOS
BW (kg)	6.70±0.39	7.86±0.39	0.0501	NS
BL (cm)	46.85±1.27	47.58±1.08	0.6634	NS
WH (cm)	43.75±0.89[b]	47.54±1.76[a]	0.0038	*
CG (cm)	46.66±1.34	49.08±1.00	0.1624	NS
CD (cm)	20.73±0.63	21.73±0.44	0.2048	NS
RH (cm)	46.48±0.77[b]	49.59±0.76[a]	0.0069	*
CC (cm)	8.35±0.14[b]	8.68±0.18[a]	0.1545	NS
CW (cm)	23.00±0.59[a]	25.31±0.50[b]	0.0069	*
RW (cm)	24.22±0.66	26.06±0.79	0.0885	NS
HL (cm)	46.31±0.93[b]	49.04±0.93[a]	0.0499	*
FL (cm)	38.55±0.53[b]	39.98±0.43[a]	0.0466	*
EL (cm)	12.02±0.27[b]	14.05±0.33[a]	0.0029	*

[ab] Means in the same row bearing different superscripts differ significantly (P<0.05; 0.01), WAD= West African Dwarf, RS= Red Sokoto, BW= Body weight, BL= Body length, WH= Withers height, CG=Chest girth, CD= Chest depth, RH= Rump height, CC=Cannon circumference, CW= Chest width, HL= Hind leg length, FL= Fore leg length, EL= Ear length, *= Significant at 0.05, LOS= Level of significance, NS= Not significant, kg= Kilogram, cm= centimeter.

Table 4: Effect of breed on body weight and morphometric traits of goats at week 4

Traits	Breed			
	WAD	RS	P-value	LOS
BW (kg)	7.70±0.44	8.63±0.48	0.1741	NS
BL (cm)	47.14±1.32	48.47±0.99	0.4261	NS
WH (cm)	44.46±0.92[b]	48.31±0.79[a]	0.005	*
CG (cm)	47.99±1.21	49.92±1.00	0.2352	NS
CD (cm)	22.11±0.41	22.41±0.52	0.6553	NS
RH (cm)	46.84±0.75[b]	50.84±0.83[a]	0.0019	*
CC (cm)	8.81±0.15	9.13±0.13	0.1269	NS
CW (cm)	25.04±0.62[b]	27.31±0.78[a]	0.0339	*
RW (cm)	25.85±0.66[b]	28.45±0.78[a]	0.0188	*
HL (cm)	46.56±1.01[b]	50.47±0.69[a]	0.0045	*
FL (cm)	39.93±0.82	42.06±0.69	0.0619	NS
EL (cm)	12.73±0.28[b]	14.56±0.32[a]	0.0004	*

[ab] Means in the same row bearing different superscripts differ significantly (P<0.05; 0.01), WAD= West African Dwarf, RS= Red Sokoto, BW= Body weight, BL= Body length, WH= Withers height, CG=Chest girth, CD= Chest depth, RH= Rump height, CC=Cannon circumference, CW= Chest width, HL= Hind leg length, FL= Fore leg length, EL= Ear length, LOS= Level of significance, *= Significant at 0.05, NS= Not significant, kg= Kilogram, cm= centimeter.

Effect of breed on body weight and morphometric traits of goats at week 4 is represented in Table 4. The results showed significant (P<0.05; 0.01) different in terms of WH, RH, CW, RW,

HL and EL. In the other hand, breed at week 4 had no significant (P>0.05) effect on BW, BL, CG, CD, CC and EL. The results of all the parameters with significant difference revealed that Red Sokoto (RS) goats had higher values (48.31±0.79 cm, 50.84±0.83 cm, 27.31±0.78 cm, 28.45±0.78 cm, 50.47±0.69 cm and 14.56±0.32 cm) for WH, RH, CW, RW, HL and EL) respectively than the values (WH = 44.46±0.92 cm, RH= 46.84±0.75 cm, CW= 25.04±0.62 cm, RW= 25.85±0.66 cm, HL=46.56±1.01 cm and EL=12.73±0.28 cm) obtained for West African Dwarf (WAD) goats,

Effect of breed on body weight and morphometric traits of goats at week 5 is shown in Table 5. The results showed no significant (P>0.05) effect for BW, BL, CG, CD, CC and FL but breed had significant (P<0.05; 0.01) effect on WH, RH, CC, RW, HL and EL. In all the morphometric traits with significant effect revealed that Red Sokoto (RS) goats had significantly (P<0.05; 0.01) higher values than the West African Dwarf (WAD) goats. Although the BW and BL and among other traits had no significant (P>0.05) difference, but RS breed had higher numerical values than the WAD breed.

Table 5: Effect of breed on body weight and morphometric traits of goats at week 5

Traits	Breed			
	WAD	RS	P-value	LOS
BW (kg)	7.80±0.48	8.62±0.40	0.2091	NS
BL (cm)	47.46±1.30	48.77±0.94	0.4217	NS
WH (cm)	44.92±0.78[b]	48.54±0.78[a]	0.0037	*
CG (cm)	48.26±1.27	49.44±0.90	0.4572	NS
CD (cm)	22.11±0.43	22.44±0.42	0.6012	NS
RH (cm)	47.10±0.62[b]	50.63±0.69[a]	0.0011	*
CC (cm)	8.81±0.16	9.14±0.13	0.5869	NS
CW (cm)	25.50±0.52[b]	27.64±0.84[a]	0.0425	*
RW (cm)	26.30±0.58[b]	28.78±0.77[a]	0.0184	*
HL (cm)	46.86±0.97[b]	50.83±0.67[a]	0.0032	*
FL (cm)	40.18±0.81	42.26±0.70	0.0675	NS
EL (cm)	12.81±0.26[b]	14.61±0.33[a]	0.0004	*

[ab] Means in the same row bearing different superscripts differ significantly (P<0.05; 0.01), WAD= West African Dwarf, RS= Red Sokoto, BW= Body weight, BL= Body length, WH= Withers height, CG=Chest girth, CD= Chest depth, RH= Rump height, CC=Cannon circumference, CW= Chest width, HL= Hind leg length, FL= Fore leg length, EL= Ear length, LOS= Level of significance, *= Significant at 0.05, NS= Not significant, kg= Kilogram, cm= centimeter.

Table 6 shows the effect of breed on body weight and morphometric traits of goats at week 6. The results indicated no significant (P>0.05) difference in all the parameters measured except WH, RH, CW, RW, HL and EL. The traits with significant (P<0.05) difference revealed that RS breed had higher values than WAD breed of goats. Although, breed had no significant (P>0.05) effect on BW, BL, CG, CD, CC and FL but RS breed has higher numeric values than WAD.

Table 6: Effect of breed on body weight and morphometric traits of goats at week 6

Traits	Breed			
	WAD	RS	P-value	LOS
BW (kg)	7.59±0.49	8.61±0.48	0.6121	NS
BL (cm)	48.74±1.40	50.83±1.29	0.3005	NS
WH (cm)	45.14±0.82[b]	49.04±0.76[a]	0.0038	*
CG (cm)	48.11±1.26	48.11±1.07	0.9988	NS
CD (cm)	21.46±0.48	21.86±0.43	0.5546	NS
RH (cm)	47.72±0.54[b]	51.44±0.73[a]	0.0007	*
CC (cm)	8.68±0.17	9.06±0.21	0.1682	NS
CW (cm)	25.59±0.53[b]	28.78±0.68[a]	0.0018	*
RW (cm)	26.77±0.50[b]	29.94±0.67[a]	0.0014	*
HL (cm)	48.31±0.79[b]	52.21±1.01[a]	0.0073	*
FL (cm)	40.61±0.81	42.35±0.67	0.1311	NS
EL (cm)	12.85±0.28[b]	14.78±0.35[a]	0.0005	*

[ab] Means in the same row bearing different superscripts differ significantly (P<0.05; 0.01), WAD= West African Dwarf, RS= Red Sokoto, BW= Body weight, BL= Body length, WH= Withers height, CG=Chest girth, CD= Chest depth, RH= Rump height, CC=Cannon circumference, CW= Chest width, HL= Hind leg length, FL= Fore leg length, EL= Ear length, LOS= Level of significance, *= Significant at 0.05, NS= Not significant, kg= Kilogram, cm= centimeter.

Table 7: Effect of breed on body weight and morphometric traits of goats at week 7

Traits	Breed			
	WAD	RS	P-value	LOS
BW (kg)	7.66±0.53	8.69±0.49	0.1856	NS
BL (cm)	48.76±1.39	50.83±1.29	0.3043	NS
WH (cm)	45.14±0.83[b]	49.29±0.59[a]	0.0014	*
CG (cm)	48.00±1.34	48.40±1.05	0.8239	NS
CD (cm)	21.46±0.49	21.86±0.43	0.5546	NS
RH (cm)	47.89±0.55[b]	51.65±0.82[a]	0.0011	*
CC (cm)	8.66±0.17	9.05±0.20	0.1514	NS
CW (cm)	25.57±0.54[b]	28.83±0.69[a]	0.0016	*
RW (cm)	26.77±0.50[b]	29.96±0.66[a]	0.0013	*
HL (cm)	48.37±0.80[b]	52.71±0.90[a]	0.0024	*
FL (cm)	40.75±0.79	42.49±0.62	0.1167	NS
EL (cm)	12.85±0.28[b]	14.78±0.35[a]	0.0005	*

[ab] Means in the same row bearing different superscripts differ significantly (P<0.05; 0.01), WAD= West African Dwarf, RS= Red Sokoto, BW= Body weight, BL= Body length, WH= Withers height, CG=Chest girth, CD= Chest depth, RH= Rump height, CC=Cannon circumference, CW= Chest width, HL= Hind leg length, FL= Fore leg length, EL= Ear length, LOS= Level of significance, *= Significant at 0.05, NS= Not significant, kg= Kilogram, cm= centimeter.

Effect of breed on body weight and morphometric traits of goats at week 7 is presented in Table 7. The results revealed no significant (P>0.05) difference in BW, BL, CG, CD, CC and FL.

Though no significant in the parameters mentioned above, but RS breed had higher numerical values than WAD breed. Meanwhile, breed had significant (P<0.05) difference in WH, RH, CW, RW, HL and EL with Red Sokoto (RS) breed having significantly higher values than West African dwarf (WAD) breed.

Table 8 showed the effect of breed on body weight and morphometric traits of goats at week 8. The results obtained revealed that breed has no significant (P>0.05) effect on BW, BL, CG, CD, CC and FL but has significant (P<0.05) effect WH, RH, CW, RW, HL and EL. The RS breed had significantly (P<0.05) higher WH, RH, CW, RW, HL and EL than WAD breed and the RS breed had higher numerical values for those with no significant difference.

Table 8: Effect of breed on body weight and morphometric traits of goats at week 8

Traits	Breed			
	WAD	RS	P-value	LOS
BW (kg)	8.13±0.56	8.92±0.47	0.307	NS
BL (cm)	49.68±1.32	51.04±1.29	0.4742	NS
WH (cm)	45.72±0.77b	49.38±0.59a	0.0022	*
CG (cm)	48.60±1.40	48.60±1.05	0.99	NS
CD (cm)	21.69±0.51	21.93±0.42	0.7279	NS
RH (cm)	48.07±0.64b	51.73±0.70a	0.0025	*
CC (cm)	8.66±0.19	9.05±0.20	0.1702	NS
CW (cm)	25.63±0.60b	28.96±0.70a	0.0025	*
RW (cm)	26.83±0.56b	29.09±0.66a	0.0023	*
HL (cm)	48.69±0.56b	52.86±0.89a	0.0047	*
FL (cm)	41.11±0.82	42.56±0.66	0.2141	NS
EL (cm)	12.93±0.31b	14.83±0.35a	0.001	*

ab Means in the same row bearing different superscripts differ significantly (P<0.05; 0.01), WAD= West African Dwarf, RS= Red Sokoto, BW= Body weight, BL= Body length, WH= Withers height, CG=Chest girth, CD= Chest depth, RH= Rump height, CC=Cannon circumference, CW= Chest width, HL= Hind leg length, FL= Fore leg length, EL= Ear length, LOS= Level of significance, *= Significant at 0.05, NS= Not significant, kg= Kilogram, cm= centimeter.

Discussion

The facts that breed had effect on WH, CD, RH, HL, FL and EL as observed in the present study at week 1 agreed with the findings of [5] who reported a significant variation in morphometric and carcass traits of different genotype of goats. Similarly, the work of [6] on effect of different breeds of goats (Kalahari and Red Sokoto, Sahel and WAD) native to Africa also detected a significant variation on morpho structural traits. It has been suggested that the variation observed between Red Sokoto and WAD goats could lead to heterotic gain [7]. [8] attributed the variations between some morphometric traits as a result of inherent genetic potential of each breed, geographical isolation and ecological differences. Meanwhile, the no significant difference in BW and BL is in

agreement with the report of [9] where no significant difference was found between Red Sokoto and Sahel goat in Jigawa State, Nigeria.

As obtained at week 1, some linear body measurements of RS goats were significantly (P<0.05; 0.01) higher than WAD goats. This corroborates the work of [10] that RS goats had higher values in parameters like heart girth or chest girth, body length, height at withers rump height and body depth than WAD goats. The study emphasized the importance of linear body measurements in predicting carcass composition and suggested that selective breeding based on these measurements could lead to genetic improvement in goat breeds.

The significant differences observed between the two breeds in week 3 is accordance with the reports of [11] who reported significant differences between WAD and Red Sokoto goats in terms of body weight and some morphometric traits and the authors attributed these differences as a result inherent genetic potential of each breed. Meanwhile, the no significant difference in BW, BL, CG, CD, CC and RW is similar with the report of [9] who reported no significant difference between Red Sokoto and Sahel goat. The observed differences between WAD and RS breeds agreed with the reports of [10] that RS goats had higher values in terms of morphometric traits like heart girth or chest girth, body length, height at withers, rump height, chest width, leg length and ear length. The reason for these differences could be due to morpho-structural difference between RS and WAD and this indicates the distinct physical characteristics and potential for genetic improvement in these two important goat breeds in Nigeria.

The differences in some of the morphometric traits between the two breeds at week 4 is in agreement with the work of [12] who reported significant differences among Punjab goat across different age groups and breeds. Similarly, a study on local goat breeds in Burkina Faso revealed notable variations in the morphometric traits across breeds. The study highlighted high variability in morphometric traits between breeds, with distinct differences observed in body proportions across different and areas [13].

The observed results for BW and BL at week 5 of this present study is in agreement with the findings of [9] who reported that Red Sokoto and Sahel goats' breeds had no significant difference. But the authors observed significant difference for WH which was similar with the findings of this work that breed had significant effect on WH, RH, CW, HL and EL. The facts that breed had effect on WH, RH, CC, RW, HL and EL as observed in the present study agreed with the findings of [5] who reported a significant variation in morphometric and carcass traits of different genotype of goats.

Similarly, the work of [6] on different breeds of goats (Kalahari and Red Sokoto, Sahel and WAD) native to Africa also detected a significant variation on morpho structural traits and it has been

suggested that the variation observed between WAD and RS WAD goats could lead to heterotic gain [7] and need for selection and improvement.

The observed differences and higher values in RS breed over WAD breed at week 6 are in agreement with the report of [14] for RS and WAD goats in terms of body weight and linear body measurements. Although the body weight (21-23 kg in 2-3 years old WAD goats) and linear measurements reported by [14] were higher than the values reported in the present study. The differences could be due to age of the goats in this study and that of [14] among other environmental differences. Meanwhile, [15] reported lower mean body weight in RS goats over WAD goats, which is at variance with the present study. Variances between these studies may be as a result of the source of the animals, season and the environmental condition of the area.

The no significant difference in body length (BL) at week 6 as observed between the two breeds is in agreement with the work of [10] who reported no significant difference between RS and WAD goats breeds.

The observed consistent superior performances of RS breed over WAD for most of traits were observed at week 7 as previous weeks. The variation between some morphometric traits could be as a result of inherent genetic potential of each breed, geographical isolation and ecological variation [8]. The variation between breed is also in agreement with the finding of [13] who highlighted high variability in morphometric traits between breeds, with distinct differences observed in body proportions across different breeds. The values for Red Sokoto breed in this present study for body weight and morphometric traits are higher than the values reported by [16] of Red Sokoto goats of about 7 months but lower than 25.18±0.77 kg body weight of non-descript reported by [17]. The variations could be due to differences in breeds, age and environmental factors like nutrition. This trend observed at week 8 was similar as obtained in previous weeks with RS breed having significantly higher values for most of the morphometric traits than WAD goats. The results obtained corroborates the work of Sam and Ekpo (2022) that RS goats had higher values in most morphometric traits parameters like heart girth or chest girth, body length, height at withers rump height and body depth, ear length, chest width than WAD goats.

Conclusion and Recommendation

Based on the results of the findings, the Red Sokoto breed had superior morphometric features, which may be due to its genetic potential. This implies that the breed may provide benefits in terms of growth performance and is well suited for particular agricultural methods. Because of its beneficial morphometric features, farmers are advised to concentrate on breeding programs that give preference to the Red Sokoto breed. Goat farming could become more profitable and productive as a result.

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