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Haematology and biochemical profile of shika brown and sasso chickens raised in the South-south region of Nigeria

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ABSTRACT

The haematology and biochemical profile of Shika brown, Sasso and their crosses was assessed in this study using a total of 18 birds that were randomly selected from a population of 91 chickens that comprised 56 Sasso, 23 Shika brown and 12 Sasso x Shika brown crosses. Blood samples from four (4) male and two (2) female from Sasso, Shika brown and their crosses were collected and taken to the laboratory for haematology and biochemical profiling. Data collected were subjected to a 2 factor factorial analysis comparing the effect of breed and sex on the haematology and biochemical parameters using analysis of variance done with SPSS (Statistical Package for Social Sciences) version 16. The results revealed that only White Blood Cell (WBC) was significant among the breeds. Sex did not significantly affect any of the haematological parameters. A significant effect ($p < 0.05$) of the interaction between breed and sex was observed in Packed Cell Volume (PCV). The highest PCV value was observed in males of Sasso (33.75%) and the least in the males of Shika brown (24.50%). A significant effect ($p < 0.05$) of the interaction between breed and sex was also observed in haemoglobin, red blood cells, white blood cells and platelets. Only total protein and urea was significantly ($p < 0.05$) affected by breed with the highest value of 44.20g/dL observed in Sasso and the least observed in Sasso x Shika brown (38.00g/dL). The effect of breed was not significant ($p > 0.05$) in AST, ALT, ALP, LDH, ALB, Na, K, Ur and Cr values. ALP was significantly ($p < 0.05$) affected by sex where values were higher in males (34.25u/L) than females (30.00u/L). All other parameters were not significantly ($p > 0.05$) affected by sex. AST was significantly ($p < 0.05$) affected by the interaction between breed and sex with the highest value observed in females of Shika brown (119.00u/L) and the least seen in females of Sasso (85.67u/L). Also, ALP, ALB, Ur and Cr were significantly affected by sex ($p < 0.05$). The results of this study revealed that combined effect of breed and sex has significant effect on haematological and biochemical parameters more than their individual effects. These results can be harnessed in planning for better management and improvement programmes for poultry breeds in Nigeria.

Keywords: Haematology, biochemical, Shika brown, Sasso, Nigeria

INTRODUCTION

The population of poultry in Nigeria has been put at 114.3 million. This is comprised of 82.4 million chickens and the remaining 31.9 million accounts for other poultry like pigeons, ducks, guinea fowls and turkeys (RIM, 1992). Poultry in

Nigeria is more than all other forms of livestock., Poultry is found throughout the country wherever there is a human settlement (Ojedapoet *al.*, 2012). Furthermore, indigenous chickens in Nigeria are maintained under traditional, low input, free range systems of

management. However, a good number are also raised intensively for commercial bases (Ojedapoet *al.*, 2012). The protein need of humans supplied by livestock products has been estimated to be only 3.0 g/caput/day in 1993 and a projection of 5.32 g/caput/day was estimated for the year 2010 (Shaibet *al.*, 1997) which falls below the 35g recommended by FAO (1993). Haematology is the study of the numbers and morphology of the cellular elements of the blood like the red blood cell (erythrocytes), the white blood cells (leucocytes) and the platelets (thrombocytes). These indices are used in the diagnosis and monitory of disease (Merck Manual, 2012). Animals with good blood composition are likely to show good performance (Ogunbajoet *al.*, 2009). This study therefore assesses the variation in the haematological and biochemical profile of Shika brown, Sasso and their crosses.

MATERIALS AND METHODS

The research was carried out at the Poultry Unit, University of Port Harcourt Demonstration Farm, Choba, Rivers State, Nigeria. Artificial Insemination was carried out at ACGG (African Chicken Genetic Gains) Poultry unit, Eneka, Rives State and the eggs were hatched at Gofon Hatchery, Owerri, Imo state, Nigeria. Chicks generated were wing-tagged according to the strain and housed in the brooding pen for five weeks and later transferred to the rearing pen until they were 12 weeks old. The chicks were fed *ad libitum* with a commercial chicks starter diet that supplied 18.49% crude protein and 2522.9 Kcal kg⁻¹ metabolizable energy. Thereafter, they were fed on a growers ration that supplied 15.85% crude protein and 2400.8 Kcal kg⁻¹ metabolizable energy. The birds were fed the same feed throughout the experimental periods. Clean water was supplied *ad libitum* throughout the experimental period and administrations of vaccines and drugs were carried out. Six (6) chickens per

breed that included four (4) males and two (2) females summing up to 18 chickens of Sasso, Shika brown and Sasso x Shika brown randomly selected from a population of 91 chickens that comprised 56 Sasso, 23 Shika brown and 12 Sasso x Shika brown crosses. 3ml of blood was collected from each of the sampled chickens from the wing vein which was transferred into a 5ml sample bottle of EDTA treated tubes. Haematological parameters determined included Pack Cell Volume (PCV), Haemoglobin (Hb), Red Blood Cell (RBC), White Blood Cell (WBC), Neutrophil (N), Lymphocytes (L), Eosinophil (E) and Monocytes (M). Also, biochemical parameters determined are Aspartate aminotransferase (AST), Alanine transaminase (ALT), Alkaline phosphate (ALP) Lactate dehydrogenase (LDH), Total protein (TP), Albumin (ALB), Sodium (Na), Potassium (K), Urea (Ur), Creatine (Cr). Data generated were subjected to Analysis of Variance (ANOVA) using Statistical Package for Social Sciences (SPSS) version 16. Significant means were separated using the Duncan Multiple Range Test at P<0.05.

RESULTS

Table 1 shows the effect of breed on the haematological profile of Sasso, Shika brown and Sasso x Shika brown chickens raised in the South-South region of Nigeria. Only White Blood Cell (WBC) was significant among the breeds. PVC values varied from 31.63% in Sasso to 27.50% in Sasso x Shika brown. The same trend was observed in Hb which varied from 10.55g/dL in Sasso to 9.16g/dL in Sasso x Shika brown. RBC was not significantly different across breeds however, values varied from 4.68 x10¹²/L in Sasso to 3.96 x10¹²/L in Sasso x Shika brown. WBC was significantly (p<0.05) different across breeds with the highest value observed in Sasso (7.09 x10⁹/L) and the lowest in Shika brown (5.03 x10⁹/L). Number of blood platelets varied from 187.5 x10⁹/L in Shika brown to 145.0

$\times 10^9/L$ in Sasso x Shika brown. Also, values of neutrophils varied from 53.38 $\times 10^9/L$ in Sasso x Shika Brown to 42.13 $\times 10^9/L$ in Sasso. Lymphocytes varied from 56.63 $\times 10^9/L$ in Sasso to 45.13 $\times 10^9/L$ in Shika brown.

Table 2 shows the effect of sex on the haematological profile of Sasso, Shika brown and Sasso x Shika brown chickens raised in the South-South region of Nigeria. Sex did not significantly affect any of the haematological parameters. However, females chickens had Packed Cell Volume of 29.17% and 29.08% was observed in males. Haemoglobin and Red Blood Cells values in females were 9.73g/dL and $4.23 \times 10^{12}/L$ respectively. However, platelets values in males was $160.83 \times 10^9/L$ compared to $158.33 \times 10^9/L$ seen in females. Females neutrophils values was $50.83 \times 10^9/L$ while males had lymphocytes value of $53.50 \times 10^9/L$. Eosinophil and monocytes values in females were $0.50 \times 10^9/L$ and $1.08 \times 10^9/L$ respectively.

Table 3 shows the interactive effect of breed and sex on the haematological profile of Sasso, Shika brown and Sasso x Shika brown chickens raised in the South-South region of Nigeria. A significant effect ($p < 0.05$) of the interaction between breed and sex was observed in PCV. The highest PCV value was observed in males of Sasso (33.75%) and the least in the males of Shika brown (24.50%). Also, a significant effect ($p < 0.05$) of the

interaction between breed and sex was observed in haemoglobin concentration. Sasso males had the highest value of haemoglobin (11.25g/dL) and the least was observed in males of Shika brown (8.00g/dL). Furthermore, a significant effect ($p < 0.05$) of the interaction between breed and sex was observed in values of red blood cells reported in this study. Red blood cell values were highest in Sasso males ($5.05 \times 10^{12}/L$) and the least was found in males of Shika brown ($3.30 \times 10^{12}/L$). A significant effect ($p < 0.05$) of the interaction between breed and sex was observed in White blood cells with the highest value was seen in Females of Sasso ($7.25 \times 10^9/L$) with the least values observed in males of Shika brown ($4.30 \times 10^9/L$). Significant effect ($p < 0.05$) of the interaction between breed and sex was observed also in platelets. The highest platelet value was in males of Shika brown ($255.00 \times 10^9/L$) and the least in males of Sasso x Shika brown ($125.10 \times 10^9/L$). Neutrophil was not significantly ($p > 0.05$) affected by the interaction between breed and sex however, neutrophil values ranged from $57.50 \times 10^9/L$ in females of Sasso x Shika brown to $41.00 \times 10^9/L$ in females of Sasso. Also, lymphocytes values were not significantly ($p > 0.05$) affected by the interaction between breed and sex however, values ranged from $57.50 \times 10^9/L$ in Sasso females to $41.00 \times 10^9/L$ in Sasso x Shika brown females. Eosinophils and monocytes were not significantly ($p > 0.05$) affected by the interaction between breed and sex.

Table 1. Effect of breed on the haematological profile of Sasso, Shika brown and Sasso x Shika brown chickens raised in the South-South region of Nigeria

Breed	PCV (%)	Hb (g/dL)	RBC ($\times 10^{12}/L$)	WBC ($\times 10^9/L$)	Platelets ($10^9/L$)	N ($10^9/L$)	L ($10^9/L$)	E ($10^9/L$)	M ($10^9/L$)
Sasso x Shika Brown	27.50	9.16	3.96	5.30 ^a	145.0	53.38	46.88	0.25	0.75
Shika	28.25	9.34	3.95	5.03 ^b	187.5	50.25	45.13	0.25	1.38
Sasso	31.63	10.55	4.68	7.09 ^a	146.25	42.13	56.63	0.50	0.75
Standard Error Mean	1.758	0.601	0.269	0.595	16.093	4.173	4.421	0.33	0.576

^{a, b, c}: Means with different superscripts in the same column are significantly different ($p < 0.05$). Key: PCV – pack cell volume, Hb – Haemoglobin, RBC - red blood cell, WBC - white blood cell, N – neutrophil, L – lymphocytes, E – Eosinophil, M - Monocytes

Table 2. Effect of sex on the haematological profile of Sasso, Shika brown and Sasso x Shika brown chickens raised in the South-South region of Nigeria

Sex	PCV (%)	Hb (g/dL)	RBC ($\times 10^{12}/L$)	WBC ($\times 10^9/L$)	Platelets ($10^9/L$)	N ($10^9/L$)	L ($10^9/L$)	E ($10^9/L$)	M ($10^9/L$)
Male	29.08 ± 1.35	9.64 ± 0.46	4.16 ± 0.21	5.41 ± 0.46	160.83 ± 12.39	46.33 ± 3.21	53.50 ± 3.40	0.17 ± 0.26	0.83 ± 0.44
Female	29.17 ± 1.51	9.73 ± 0.51	4.23 ± 0.23	6.20 ± 0.51	158.33 ± 13.85	50.83 ± 3.59	47.58 ± 3.81	0.50 ± 0.29	1.08 ± 0.49

Key: PCV – pack cell volume, Hb – Haemoglobin, RBC - red blood cell, WBC - white blood cell, N – neutrophil, L – lymphocytes, E – Eosinophil, M - Monocytes

Table 3. Interactive effect of breed and sex on the haematological profile of Sasso, Shika brown and Sasso x Shika brown chickens raised in the South-South region of Nigeria

Breed	Sex	PCV (%)	Hb (g/dL)	RBC ($\times 10^{12}/L$)	WBC ($\times 10^9/L$)	Platelets ($10^9/L$)	N ($10^9/L$)	L ($10^9/L$)	E ($10^9/L$)	M ($10^9/L$)
Sasso x Shika brown	Male	29.00±2.03 ^{ab}	9.68±0.69 ^{ab}	4.13±0.31 ^{ab}	5.00±0.69 ^{ab}	125.10±18.58 ^b	49.25 ± 4.82	52.75 ± 5.11	0.00 ± 0.00	0.00 ± 0.00
	Female	26.00±2.87 ^{ab}	8.65±0.98 ^{ab}	3.80±0.44 ^{ab}	5.60±0.97 ^{ab}	165.00±26.28 ^{ab}	57.50 ± 6.82	41.00 ± 7.22	0.50 ± 0.54	1.00 ± 0.94
Shika brown	Male	24.50±2.87 ^b	8.00±0.98 ^b	3.30±0.44 ^b	4.30±0.97 ^b	255.00±26.28 ^a	46.50 ± 6.82	52.00 ± 7.22	0.50 ± 0.38	1.50 ± 0.94
	Female	32.00±2.03 ^{ab}	10.68±0.69 ^{ab}	4.60±0.31 ^a	5.75±0.69 ^{ab}	150.00±18.58 ^{ab}	54.00 ± 4.82	44.25 ± 5.11	0.50 ± 0.38	1.25 ± 0.67
Sasso	Male	33.75±2.03 ^a	11.25±0.69 ^a	5.05±0.31 ^a	6.93±0.69 ^{ab}	132.50±18.58 ^b	43.25 ± 4.82	55.75 ± 5.11	0.50 ± 0.38	0.50 ± 0.67
	Female	29.50±2.87 ^{ab}	9.85±0.98 ^{ab}	4.30±0.44 ^{ab}	7.25±0.97 ^a	160.00±26.28 ^{ab}	41.00 ± 6.82	57.50 ± 7.22	0.50 ± 0.54	1.00 ± 0.94

^{a, b}: Means with different superscripts in the same column are significantly different ($p < 0.05$). Key: PCV – pack cell volume, Hb – Haemoglobin, RBC - red blood cell, WBC - white blood cell, N – neutrophil, L – lymphocytes, E – Eosinophil, M - Monocytes

Table 4 shows the effect of breed on the biochemical profile of Sasso, Shika brown and Sasso x Shika brown chickens raised in the South-South region of Nigeria. Only total protein and urea was significantly ($p < 0.05$) affected by breed with the highest value of 44.20g/dL observed in Sasso and the least observed in Sasso x Shika brown (38.00g/dL). The effect of breed was not significant ($p > 0.05$) in AST, ALT, ALP, LDH, ALB, Na, K, Ur and Cr values.

Table 5 shows the effect of sex on the biochemical profile of Sasso, Shika brown and Sasso x Shika brown chickens raised in the South-South region of Nigeria. Only ALP was significantly ($p < 0.05$) affected by sex where values were higher in males (34.25u/L) than females (30.00u/L). All other parameters were not significantly ($p > 0.05$) affected by sex.

Table 6 shows the interactive effect of breed and sex on the biochemical profile of Sasso, Shika brown and Sasso x Shika brown chickens raised in the South-South region of Nigeria. AST was significantly ($p < 0.05$) affected by the interaction between breed and sex with the highest value observed in females of Shika brown (119.00u/L) and the least seen in females of Sasso (85.67u/L). Also, ALP values were affected by the interaction between breed and sex with the highest value seen in males of Sasso and Sasso x Shika brown (35.50u/L and 35.00u/L respectively). The lowest value was observed in Sasso x Shika brown females (29.00u/L). ALB was also significantly ($p < 0.05$) influenced by the interactive effect of breed and sex in this study. Males of Shika brown had the highest value of 24.00g/dL and the least observed in males of Sasso x Shika brown (20.50g/dL). Furthermore, Ur was significantly ($p < 0.05$) influenced by the interactive effect of breed and sex in this study with the highest value seen in Sasso x Shika brown males (2.63Mmol/L) and the least values observed in females of

Sasso (1.57Mmol/L). A similar trend was observed in Cr values. All other parameters were not significantly ($p < 0.05$) affected by the interaction between breed and sex.

Table 4. Effect of breed on the biochemical profile of Sasso, Shika brown and Sasso x Shika brown chickens raised in the South-South region of Nigeria

Breed	AST (u/L)	ALT (u/L)	ALP (u/L)	LDH (u/L)	TP (g/dL)	ALB (g/dL)	Na (Mmol/L)	K (Mmol/L)	Ur (Mmol/L)	Cr (mg/dl)
Sasso x Shika brown	92.75 ± 2.21	13.25 ± 2.39	32.00 ± 1.31	24.88 ± 2.74	38.00 ± 1.36 ^b	21.13 ± 0.39	149.75 ± 1.39	5.35 ± 0.22	2.44 ± 0.14 ^a	159.25 ± 7.02
Shika brown	101.60 ± 15.19	24.60 ± 6.42	32.40 ± 1.17	27.60 ± 3.26	42.20 ± 2.33 ^{ab}	22.80 ± 0.97	150.40 ± 1.63	4.92 ± 0.33	2.28 ± 0.31 ^a	158.80 ± 6.04
(Sasso)	89.20 ± 5.54	16.20 ± 4.52	31.20 ± 2.15	24.76 ± 4.34	44.20 ± 1.85 ^a	22.00 ± 0.45	150.00 ± 2.95	4.90 ± 0.24	1.68 ± 0.08 ^b	3.91 ± 1.75

^{a, b}: Means with different superscripts in the same column are significantly different ($p < 0.05$). **NOTE:** Aspartate aminotransferase (AST), Alanine transaminase (ALT), Alkaline phosphatase (ALP) Lactate dehydrogenase (LDH), Total protein (TP), Albumin (ALB), Sodium (Na), Potassium (K), Urea (Ur), Creatine (Cr)

Table 5. Effect of sex on the biochemical profile of Sasso, Shika brown and Sasso x Shika brown chickens raised in the South-South region of Nigeria

Sex	AST (u/L)	ALT (u/L)	ALP (u/L)	LDH (u/L)	TP (g/dL)	ALB (g/dL)	Na (Mmol/L)	K (Mmol/L)	Ur (Mmol/L)	Cr (mg/dl)
Male	89.00 ± 3.74	14.25 ± 2.63	34.25 ± 0.88 ^a	28.75 ± 2.23	40.75 ± 1.53	21.75 ± 0.73	149.75 ± 1.18	5.24 ± 0.19	2.25 ± 0.15	156.38 ± 6.38
Female	98.40 ± 7.26	19.60 ± 4.00	30.00 ± 1.03 ^b	23.08 ± 2.62	41.00 ± 1.76	21.90 ± 0.35	150.20 ± 1.69	5.00 ± 0.23	2.13 ± 0.19	151.50 ± 5.30

^{a, b}: Means with different superscripts in the same column are significantly different ($p < 0.05$). **NOTE:** Aspartate aminotransferase (AST), Alanine transaminase (ALT), Alkaline phosphatase (ALP) Lactate dehydrogenase (LDH), Total protein (TP), Albumin (ALB), Sodium (Na), Potassium (K), Urea (Ur), Creatine (Cr)

Table 6. Interactive effect of breed and sex on the biochemical profile of Sasso, Shika brown and Sasso x Shika brown chickens raised in the South-South region of Nigeria

Breed	Sex	AST (u/L)	ALT (u/L)	ALP (u/L)	LDH (u/L)	TP (g/dL)	ALB (g/dL)	Na (Mmol/L)	K (Mmol/L)	Ur (Mmol/L)	Cr (mg/dl)
Sasso x Shika brown	Male	93.00±2.92 ^{ab}	10.50±2.50	35.00±0.91 ^a	28.50±3.40	37.00±0.82	20.50±0.50 ^b	150.25±1.65	5.58±0.26	2.63±0.12 ^a	167.25±10.42 ^a
	Female	92.50±3.77 ^{ab}	16.00±3.92	29.00±1.08 ^b	21.25±3.84	39.00±2.71	21.75±0.48 ^{ab}	149.25±2.49	5.13±0.36	2.25 ± 0.22 ^{ab}	151.25 ± 8.86 ^{ab}
Shika brown	Male	75.5± 2.50 ^b	25.00±1.00	31.50±0.50 ^{ab}	28.50±7.50	45.00±2.00	24.00±2.00 ^a	150.00±0.00	4.90±0.58	1.90 ± 0.10 ^{ab}	147.50 ± 2.50 ^{ab}
	Female	119.00±19.73 ^a	24.33±11.69	33.00±2.00 ^{ab}	27.00±4.04	40.33±3.53	22.00±1.00 ^{ab}	150.67±2.96	4.93±0.58	2.53 ± 0.48 ^a	166.33 ± 6.96 ^{ab}
Sasso	Male	94.50±9.50 ^{ab}	11.00 ± 1.00	35.50±2.50 ^a	29.50±3.50	44.00±1.00	22.00±1.00 ^{ab}	148.50±4.50	4.90±0.10	1.85 ± 0.05 ^{ab}	143.50 ± 1.50 ^{ab}
	Female	85.67±7.51 ^b	19.67 ± 7.26	28.33±1.76 ^b	21.60±6.80	44.33±3.33	22.00±0.58 ^{ab}	151.00±4.58	4.90±0.44	1.57 ± 0.07 ^b	137.00 ± 1.00 ^b

^{a, b}: Means with different superscripts in the same column are significantly different ($p < 0.05$). **NOTE:** Aspartate aminotransferase (AST), Alanine transaminase (ALT), Alkaline phosphate (ALP) Lactate dehydrogenase (LDH), Total protein (TP), Albumin (ALB), Sodium (Na), Potassium (K), Urea (Ur), Creatine (Cr)

DISCUSSION

The variation in the haematological and biochemical parameters studied in this work has been observed by some authors (Daramola *et al.*, 2005; Dawn, 2017; Addasset *et al.*, 2012). Breed did not significantly affect haematological parameters except for WBC values. This implies that the way a breed generated WBC to fight against diseases and foreign bodies differed from the way others did. Thus, some breeds are more resistant to diseases than others. The absence of significance in most of the haematological parameters across breeds show that they more majorly influenced by environmental factors. Addasset *et al.* (2012) reported that observation based on factors such as age, nutrition, health of the animal, degree of physical activities, sex and environmental factors affect haematological parameters in animals. According to Dawn (2017), low white blood cells counts can indicate viral infections, bone marrow abnormalities or overwhelming infections and sepsis (blood poisoning). Also, an increase in WBC count in the peripheral blood is often observed in stress, inflammatory conditions due to generalized or localized infections, trauma, toxicities, neoplasms, and so on, whereas a decrease could be an indication of chronic inflammation or infections (Doneley and Doneley, 2010). However, this result did not agree with the findings of Kuttapan *et al.* (2013) who observed that WBC did not reveal any significant difference. Ologunowa, *et al.*, (2000) also reported no significant breed effect on the blood parameters in their study. The results for platelets, neutrophils, lymphocytes, eosinophils and monocytes were similar to those reported by Ogunduet *et al.* (2013) and Ugwuene (2011). Dutta *et al.* (2013) in their work on haematological and biochemical profiles of gallus indigenous, exotic and hybrid chicken breeds (*Gallus domesticus l.*) from rajshahi, Bangladesh also observed highly significant variation of parameters difference between breeds. Dutta *et al.*

(2013) also observed highly significant differences for neutrophils, eosinophils, lymphocytes and monocytes across breed. Basophils, however, did not vary between the breeds.

Sex did not affect haematological parameters in this study which is contrary to the report of Ibrahim (2012) in their study on the hematological and some biochemical values of indigenous chickens in Al-Ahsa, Saudi Arabia during summer season.

Biochemical parameters did not vary significantly across breeds except in Total Protein (TP). This is an indication that the animals were prone to dehydration or inflammation as reported by Duraiet *et al.* (2012) who documented that the significant differences in haematological profile and erythrocyte indices among the different breeds of poultry can be considered as reference values and may serve as a guide to assess the state of health in the monitored birds. Marcos *et al.* (2012) reported higher total protein values differing only from 35 days. The significant variation in the values of TP across breeds indicates that protein demand in tissues is breed dependent. Elagib and Ahmed (2011) observed breed effect on haematological and biochemical parameters in their work on comparative study on haematology values of blood of indigenous chickens in Sudan. Sex did not affect significantly biochemical parameters. This report is supported by Ibrahim *et al.* (2013) who observed that TP and albumin in adult male were not significantly different than that of female. ALP (alkaline phosphatase) varied significantly across sex. This is an indication that the animal's ability to resist diseases varied across sex. Ur also had significant difference in the interaction between breed and sex. This is however contrary to the report of Ibrahim (2012), who observed that there were no differences in the levels of blood urea,

nitrogen, creatinine, phosphorus, and uric acid, suggesting a lack of differences in renal function between the birds. The conflict between present and previous results might be attributed to the environment, season or the condition of the environment, Ritchie *et al.* (1994). Dutta *et al.* (2013) also observed highly significant differences in creatinine across breeds.

CONCLUSION

Although haematological and biochemical parameters are majorly influenced by nutrition, environment and disease conditions, this study revealed that breed significantly affected only WBC for haematology parameters and TP and Urea for biochemical parameters. It was also observed that sex was only significant for ALP among all the biochemical parameters. Also, the interactive effect of breed and sex significantly affected PCV, Hb, RBC, WBC and platelet values for haematological parameters and AST, ALP, ALB, UR and CR for biochemical parameters. These results indicated that the combined effect of breed and sex influence haematological and biochemical parameters more than when the effect of breed and sex are assessed individually. The information revealed by this study can be harnessed in planning for better management and improvement programmes for poultry breeds in Nigeria.

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