BLOOD PROFILE OF RED SOKOTO BUCKS PRESENTED FOR SLAUGHTER DURING THE RAINY SEASON AT JOS ABATTOIR, PLATEAU STATE

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ABSTRACT
Haematological and serum biochemical parameters of 24 adult Red Sokoto bucks within the age range of 7 to 12 months presented for slaughter at Jos abattoir during the rainy season were studied. The haematological parameters studied were: Packed Cell Volume (PCV), with 19.50 ± 1.12g/l indicating normal within the reference range of 22 to 38g/l, White Blood Cell count (WBC) with 5.314 ± 0.430g/l indicating normal within the reference range of 4.0 to 13.0g/l, Haemoglobin (Hb) value was 6.600 ± 0.363g/l above the normal reference range of 8.0 to 12.0g/l, Red Blood Cell count (RBC) was 3.929 ± 0.183g/l above the normal reference range of 8.0 to 18.0g/l, while Neutrophil was 40.14 ± 2.45g/l and within the normal range of 30 to 48g/l; Lymphocytes was 59.64 ± 2.43g/l indicating normal within the reference range of 50 to 70g/l. For serum parameters, Total Protein was 66.93 ± 23.66 µ/l, far above the reference range of 6.2 to 8.0µ/l, Albumin was 31.18 ± 6.80µ/l also above the reference range of 3.5 to 5.0µ/l, Aspartate Transaminase (AST) was 14.86 ± 1.77µ/l, above the reference range of 12µ/l, while Alanine Transaminase (ALT) was 10.11 ± 1.34µ/l below the reference range of 12µ/l. Some values obtained in this study are comparable with values obtained in other parts of the country while others did not follow any particular trend. It is recommended that similar studies be carried out in households and farms in the study area, as well as in the dry season to ascertain if there could be marked variations attributable to seasonal factors.

Key words: Red Sokoto, bucks, blood profile, rainy season

INTRODUCTION
Goat represents a valuable resource for economic development, poverty alleviation and sustainable livelihood in addition to meeting several cultural imperatives (Oseni *et al.,* 2006).Nigeria has important role in goat production in the African continent and the world in general (Ngere*et al.,* 1984). Red Sokoto goat is the most numerous and most widely distributed throughout the various ecological zones, particularly Guinea and Sudan Savannah vegetation belts (Odo*et al.*,2000).The life of all flesh is the blood and its usefulness for assessing the health status, clinical evaluation for survey, physiological diagnostic evaluation of various types of diseases in animals cannot be over emphasized (Tambuwal *et al.*, 2002; Alade, 2005). Haematological and serum biochemical values are widely used to determine systematic relationship and physiological adaptation including assessment of general health conditions of animals (Kamal *et al.*, 2007).The blood picture also helps in distinguishing normal state from state of stress, which can be maturational, environmental or physical (Aderemi, 2004). Blood composition of an animal might be influenced by certain factors such as nutrition, management and growth of animals, sex, age, diseases and stress factors. Despite the high demand for Red Sokoto goats for their meat and high-valued skin, their blood profile has not been well studied especially for those presented for slaughter at the abattoir in the study area. Differences in values have further necessitated the need to establish appropriate physiological baseline values for various breeds of livestock in Nigeria, which could help in the realistic evaluation of the management practices especially in terms of nutrition, transportation and accurate diagnosis of their health condition especially for goat breeds raised under free range system. This study was designed to determine the haematological and serum biochemical parameters of Red Sokoto bucks presented for slaughter during the rainy season at Jos abattoir, Plateau State.

MATERIALS AND METHODS
Jos is located on latitude 8.4^0 east and longitude 9.9^0 North with a total land area of about 130km^2 and 1,500m above sea level with a corresponding cool temperate climate (NPC, 2006). Average monthly

temperature ranges from 21 to 25^{0}C (70-77^{0}F). Jos receives about 1,305mm of rainfall annually (Eziashi, 2007).Blood samples were collected on Fridays, between 6:00 and 7:00am during which most slaughter take place for a period of 3weeks in the month of July, 2019. 10mls of blood was collected via the jugular vein of the animals and 5mls was placed in EDTA bottle for haematological analysis and the other 5mls in plain tubes for serum biochemical analysis. The samples were placed on ice packs and respectively transported immediately to the laboratory for analysis.

RESULTS AND DISCUSSION

Results of analysis of haematological parameters for Red Sokoto bucks presented for slaughter at Jos abattoir are presented in Table 1.

Table 1: Haematological parameters of Red Sokoto bucks presented for slaughter at Jos abattoir

Parameter	Mean ± Sem	Normal range	Decision
PCV	19.50 ± 1.12	22 – 38	Abnormal
Haemoglobin	6.600 ± 0.363	8.0 – 12.0	Abnormal
RBC	3.929 ± 0.183	8.0 – 18.0	Abnormal
WBC	5.314 ± 0.430	4.0 – 13.0	Normal
Neutrophils	40.14 ± 2.45	30 – 48	Normal
Lymphocytes	59.64 ± 2.43	50 – 70	Normal

KEY: PCV = Packed cell volume. **RBC** = Red blood cell. **WBC** = White blood cell.

Packed Cell Volume (PCV): The mean value for packed cell volume (PCV) was 19.50±1.12g/l. This value was lower than the normal range of 22-38 g/l (Merck, 2010), and as reported by Tambuwal *et al.* (2002) and Njidda *et al.* (2013) for clinically healthy Red Sokoto goats fed on natural grazing rangeland of Northern Nigeria. PCV value is beneficial in assessing the protein status and possibly forecasting the degree of protein supplementation (Dargie, 1975).

Haemoglobin (Hb): The mean value for haemoglobin (Hb) was 6.600 ± 0.363g/l. This value was lower compared to the normal range of 8.0 – 12.0g/l (Merck, 2010). Hb is correlated with the nutritional status of the animal (Adejumo, 2004).

Red blood cells count (RBC): The mean value for red blood cells count (RBC) was 3.929 ± 0.183g/l, lower than the normal range of 8.0 – 18.0g/l (McDonald, 1996) and as reported by Schalm*et al.*(1975), Addass*et al*(2010) and Njidda*et al.,* (2013). This could be a wrong signal on the health status of the various age groups among the Red Sokoto bucks slaughtered in the study area. However, this could be attributable to the fact that most of these animals were brought in from neighbouring states of Bauchi, Kaduna and Taraba which share common boundaries with Plateau State.

White blood cells count (WBC): The mean value for white blood cells count (WBC) was 5.314 ± 0.430g/l. This value falls within the normal range of 4.0 – 13.0g/l (Merck, 2010) for Red Sokoto goats, and in line with the report of Tambuwal *et al* (2002). These low values may be suggestive of stress factors such as transportation on the Red Sokoto bucks involved in this trial.

N**eutrophils**: The mean value for Neutrophils was 40.14 ± 2.45g/l, within the normal range of 30-48g/l (Merck, 2010). Neutrophils are the main defenders of the body against infection and antigens. High levels of neutrophils may indicate an infection while low count may mean a compromised immune system or depressed bone marrow (Merck, 2010).

Lymphocytes: The mean value for Lymphocytes was 59.64 ± 2.43g/l, and falls within the normal range of 50-70g/l (Merck, 2010) and as reported by Tambuwal*et al.*(2002). In goats like other ruminants there are more lymphocytes than neutrophils in circulation (Olusanya*et al.*,1971). Lymphocytes are the key elements in the production of immunity. Low levels can be seen in some bacterial infections, aplastic anaemia, and in some forms of leukaemia while high values can be observed in viral infections and in some forms of leukaemia (Ganong, 2005).

Serum Biochemical Parameters

Results of serum biochemical parameters for Red Sokoto bucks presented for slaughter at Jos abattoir are presented in Table 2. Serum biochemical parameters considered were: total protein (TP), albumin, alkaline phosphatase, aspartate transaminase (AST) and alanine transaminase (ALT).

Table 2: Serum biochemical parameters of Red Sokotobucks presented for slaughter at Jos abattoir

PARAMETERS	MEAN ± SEM	NORMAL RANGE	DECISION
TOTAL PROTTEIN	66.95 ± 23.66	6.2 – 8.0 µ/l	Abnormal
ALBUMIN	31.18 ± 6.80	3.5 – 5.0 µ/l	Abnormal
ALKALINE	61.25 ± 47.92	9 – 35 µ/l	Abnormal
AST	14.86 ± 1.77	12 µ/l	Abnormal
ALT	10.11 ± 1.34	12 µ /l	Normal

KEY: AST = Aspartate transaminase **ALT =** Alanine transaminase

Total Protein: The mean value for total protein was 66.93 ± 23.66µ/l. This value was significantly ($p<0.05$) higher than the normal range of 6.2-8.0µ/l (Merck, 2010) and reports of Alex and Laverne(1983).Increased levels like this could be associated with dehydration (Gomall, 1949).Tambuwal *et al*. (2012) reported that high total protein could mean poor quality protein utilization.

Albumin: The mean value for serum albumin of Red Sokoto bucks presented for slaughter at the Jos abattoir as presented in Table 2 was 31.18 ± 6.80µ/l. This value was significantly ($p<0.05$) higher than the normal reference range of 3.5-5.0 µ/l (Idowu *et al*., 2018). Low albumin (hypoalbuminemia) maybe caused by liver disease, nephritc syndrome, burns, protein loosing enteropathy, malabsorption, malnutrition, late pregnancy, artefact, and genetic variations.. High albumin (hyperalbuminemia) is almost always caused by dehydration. In some cases of retinol (vitamin A) deficiency, the albumin level can be raised to normal values of 5.0µ/l (Njidda*et al.,* 2013). This is because of retinol causes cells to swell with water (Bhat *et al.*, 2011). This could also be due to long distance transportation of the animals from their original distant areas of domicile into Jos for the purpose of slaughter. Transport systems for animals often fall short of welfare considerations such as adequate provision of water.

Aspartate transaminase (AST): The mean value for Aspartate transaminase (AST) was 14.86 ± 1.77µ/l. This value is significantly ($p<0.05$) higher than the normal range of 12µ/l (Merck, 2010). The measurement of AST levels is helpful for the diagnosis and following cases of myocardial infarction, hepatocellular disease and skeletal muscle disorders (Alex and Laverne, 1983). In trauma or diseases affecting skeletal muscle, after a renal infarct and in various haemolytic conditions (Alex and Laverne, 1983), the concentration is higher. The trauma in this case could be attributed to poor transportation systems through which these animals are conveyed into the study area mainly for the purpose of slaughter.

Alanine transaminase (ALT): The mean value for Alanine transaminase(ALT) was 10.11 ± 1.34 µ/l. This value falls within the normal range of 12µ/l (Merck, 2010), but slightly higher than the values reported by Njidda*et al.*(2013).

Conclusion and Recommendation

The obtained values in this study were preliminary in the study area, but be used as reference values for further studies for Red Sokoto bucks. It could aid the veterinarian in the interpretation of disease, diagnosis and treatment. Having established the haematological and serum biochemical values of the bucks of the Red Sokoto bucks in the study area, it is recommended that similar studies should be carried out in farms and households breeding goats in the study area and also in the dry season, to ascertain if there could be any variations attributable to seasonal factors.

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