
HEMATOLOGICAL AND BIOCHEMICAL INDICES OF YANKASA SHEEP FED GRADED LEVELS OF *FICUS POLITA* AND *PENNISETUM PEDICELLATUM* WITH WHEAT OFFAL SUPPLEMENT

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ABSTRACT

The experiment was conducted to assess the effect of *Ficus polita* leaves and *Pennisetum pedicellatum* grass supplemented with wheat offal on the Haematological and serum biochemical parameters of Yankasa sheep. Sixteen (16) rams of average weight 25kg were allocated to four treatments for a period of nine (9) weeks. The treatments are (T1 100%PP), (T2 40%FP-60%PP), (T3 60%FP-40%PP) and (T4 100%FP) in a completely randomized design. The result showed significant differences ($P < 0.05$) in Packed cell volume (PCV), Red blood cells (RBC), Haemoglobin (Hb), Mean corpuscular volume (MCV) and White blood cell (WBC). Result on urea, total protein, albumen, creatinine, globulin shown significant differences ($P < 0.05$) except cholesterol level with significant difference (4.40-0.90). It is concluded that *Ficus polita* leaves and *Pennisetum pedicellatum* grass included in the diet of Yankasa rams and supplemented with wheat offal had no deleterious effect on the blood parameters evaluated. It therefore recommended that further studies including treatments for ant nutritional factors should be carried out on.

Key words: Biochemical Indices, Haematological, Yankasa, *Ficus polita*, Wheat Offal.

INTRODUCTION

Poor nutrition has remained one major factor limiting productivity of the indigenous sheep and goat in Nigeria (Ogundipe 2002). In tropical animals, feed is often lacking for at least a part of every year (Chesworth, 1992). During this period, animals will often stop growing and indeed may start to lose weight. However, once feed is again plentiful, it is hoped that they will start to gain more weight than they had originally lost. In some regions, there is a shortage of high quality feed that can be used to offset an abundance of poor quality grazing. It has been reported by Banerjee (2007), that browse plants and grasses play an important role in averting nutritional deficiencies in

ruminants particularly Sheep and provides cheapest source of ruminant feeds.

Sheep and goats are widely produced throughout Nigeria under variety of production systems. Although the most prevalent system of production is the extensive system (Lakpini *et al.*, 2002). The low level of input invested in sheep and goats" production can be said to be function of the level of income and awareness with regard to the use of available production inputs (Ogundipe, 2002).

While many factors are known to have contributed to the deterioration in the performance of the livestock and poultry sub-sector, the most important one is generally believed to be the feed problem in its

entire ramification (Ogunfowara *et al*, 1984). Feeding forms the largest component of production cost in livestock enterprise (Lakpini, 2002). Each of these situations bring different practical problems but the nutritional problems are similar. This experiment was therefore conducted to assess the effect of feeding graded levels of *Ficus polita* and *Pennisetum pedicellatum* supplemented with wheat offal on the haematological and biochemical indices of Yankasa sheep.

MATERIALS AND METHODS

Study Area

The study was conducted at the Teaching and Research Farm, Bayero University, Kano. Kano state is located in the Sudan Savana zone of Nigeria and it falls between latitude $10^{\circ} 27'$ to $11^{\circ} 17' N$ and longitude $7^{\circ} 34'$ to $9^{\circ} 29'$ east of Greenwich meridian. It is bordered by Jigawa and Kaduna state. The mean annual temperature of Kano is between $30^{\circ}C$ and $33^{\circ}C$. Rainfall reaches the pick during the month of August with an average of 600mm annually (Oni *et al*, 2010).

Experimental Animals and Animal Feeding

Sixteen (16) Yankasa rams with an average weight of 25kg body weight were used for the study. The animals were treated with a broad spectrum antibiotic (oxytetracycline HCl (L.A)), at 1ml/10kg, multivitamin induction at 2ml/10kg, Ivomectin at 1ml/50kg at 1-6th week of the experiment, and also animals were dewormed orally with albendazole at 3ml/10kg of the animal weight at each every 3 weeks of the experiment. A fresh leaves of *Ficus polita* (Fp) and *Pennisetum pedicellatum* (Kyasuwa) grass were collected and cut into smaller pieces and used to prepare the experimental diets. The diets were 1 (100%PP), 2 (40%Fp/60%PP), 3(60%Fp/40%PP), 4 (100%). In addition, wheat offal supplement was also offered at the rate of 300g per head perday.

Experimental Design

The experiment was conducted in a completely randomized design (CRD) with four treatments and four animals each (Harris,1995).

Feeding and Management

The experimental animals were housed individually and intensively managed for a period of 9 weeks following 2 weeks adaptation period. Each group was assigned to the treatments and fed according to their body weight (3-5% body weight). The rams were offered their respective diets every morning at about 7:30am. Total daily feed allowance was adjusted on the basis of the previous day's intake. The left over feeds of the previous day were weighed and discarded before adding fresh feeds. Rams were provided fresh drinking water in graduated plastic bucket at libitum.

Data Collection

At the 6-7 weeks of the experiment, blood samples were collected from the jugular vein of the animals using sample bottles diamine-tetra acetic (EDTA) as anticoagulant for haemetological evaluation. Another set of blood samples were collected into plain bottles without anticoagulant for blood chemistry evaluation. The haematological analysis was carried out within 3 hours of blood collection; the parameters determined were Red Blood Cells (RBC) count, White Blood Cells (WBC'S) counts, Packed Cell Volume (PCV) and Haemoglobin(HB) following standard procedures described by Davis and Lewis (1991) from the values of RBC, WBC, PVC, and Haemoglobin (Hb) the values of Mean Corpuscular Volume (MCV) Mean Corpuscular Haemoglobin (MCHb), Mean Corpuscular Haemoglobin Concentration (MCHC) were estimated. The blood without anticoagulant was used for blood chemistry. The serum were inter analyzed for determination of biochemical

parameters (cholesterol, total protein, album, globulin, blood urea and creatinine)

Results and Discussions

The results of haematological studies revealed that there was significant ($P < 0.05$) differences, in all the parameters measured. However, the values ranged from PVC 22.13 to 28.35%, RBC 4.89 to 6.96x10⁶µL, WBC 1.98 to 2.64x10³µL, Hb 7.98 to 10.65g/dl, MCV 30.55 to 32.12 f, MCHb 13.38 to 16.25pg and MCHC 31.83 to 51.13g/dl for packed cell volume, red blood cells, white blood cells, haemoglobin, mean corpuscular haemoglobin and mean corpuscular haemoglobin concentration respectively. Likewise the serum biochemical parameters result obtained were significantly affected by the dietary treatment ($P < 0.05$), but cholesterol differed ($P < 0.01$) significantly with the values of 3.45 to 4.70mmol/L, 53.00 to 69.50g/l, 27.50 to 33.50g/e, 25.50 to 37.25g/e, 0.90 to 2.40mg/de and 42.50 to 62.00mg/dl for blood urea, total protein, Albumin, globulin, cholesterol and creatinine respectively. Generally low values for most of the blood for most of the blood parameters may not be unconnected with presence of antinutritional factors in *Fiscus polita* (FAO, 2010). All the haematological parameters were significantly ($P < 0.05$) influenced by the dietary treatments. The packed cell volume (PVC) values ranged from 22.13 for animals on treatment 4 to 28.35 for those on diet 1. These values fall within the normal range of 25-36% earlier reported for healthy sheep by Pampori (2003). Haemoglobin (Hb) concentration values of 7.98g/dl for animals on diet 4 to 10.65g/dl for those on treatment 4. These value fall within the range of 8-16g/dl reported by Taiwo and Ogunsanmi (2003) for healthy sheep and those reported by Orcheruata et al/(2004) for West African dwarf (WAD) goat. Red blood cells (RBC) values ranged from 3.89x10⁶µL for animals fed diet 4 to 6.96x10⁶µL for those on treatment 1. The RBC values were however lower to the reported range of 9-11x10⁶µL by Campbell et al

(2003) for yankasa sheep. The low RBC counts obtained for all the animals could be likely due to higher susceptibility to anaemia related disease conditions (Adejumo and Onifade, 2005). White blood cells (WBC) values observed ranged from 1.98x10³µL for animals on diet 4 to 2.64x10³µL for those on treatment 1. The observed WBC values were lower when compared to the range of 2.25 to 3.31x10³µL reported for WAD rams (Ogundipe et al., 2002). Values for mean corpuscular volume (MCV) were in the range of 30.55 (diet 4) to 32.12 (treatment 1) and the values were slightly lower compared to the normal average range value of 35-60fl for healthy WAD sheep (Taiwo and Ogunsanmi, 2003). Mean corpuscular haemoglobin (MHC) (13.38-16.25pg) and mean corpuscular in this study were lower compared to the mean values of 31.13pg and 33.00g/dl for MCH and MCHC reported by Ikhiniya and Imasuen (2007). The low MCH and MCHC in addition to the lower RBC observed in this study may have aggravated the susceptibility of the animals due to anaemia related disease conditions. The generally low values for most of the blood parameters may not be unconnected with the presence of antinutritional factors in *Fiscus polita* which might have led to poor utilization of nutrients by the experimental animals. Another possible reason could be due to several factors such as age, breeds and physiological state (Jain, 1993).

The serum biochemical parameters observed were significantly affected ($P < 0.05$), influenced by the dietary treatments. The total protein value ranges (53.00-69.50g/dl). The values fall within the normal range of 35-52g/dl reported by Pampori et al/(2003) for healthy sheep. Globulin values range from 25.59 (diet 4) to 37.25g/dl (diet 1). Blood urea values of 3.45(diet 4) to 4.70 (diet 1), these values fall within the range of 1.7-8.4mol/µl. Creative values range from 42.50mg/dl (treatment 4) to 62.00mg/dl (diet 1) total cholesterol values range from 0.90mg/dl (diet 4) to 2.40mg/dl (treatment 1). These values fall below the normal range

of 3.2 – 6.2 mol/µl reported by Pampari (2003), and the reason could be due to several factors such as age, breed, sex and physiological state (Jain, 1993)

CONCLUSION

It is concluded that *Ficus polita* leaves and *Pennisetum pedicellatum* grass can be supplemented with other protein sources at various level in the diet of Yankasa sheep. However, this may need further study on other breeds or species for better utilization and productivity.

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Table 1: Gross composition of experiment rations

Parameters	Treatments			
	T1	T2	T3	T4
Ingredients	A(%)	B(%)	C(%)	D(%)
<i>Ficus Polita</i>	0	40	60	100
<i>Pennisetum, pedicellatum</i>	100	60	40	0
Total	100	100	100	100

Table 2: Haematological indices of Yankasa sheep fed various levels of *Ficus polita* leaves and *Pennisetum pedicellatum* grass with wheat offal supplement.

Parameters	Treatment				SEM	
	1	2	3	4		
Packed cell volume %	28.35	27.45	24.08	22.13	74.84	LS
Red blood cell ($\times 10^6 \mu\text{L}$)	6.96	6.06	5.89	4.89	3.89	*
White blood cells ($\times 10^3 \mu\text{L}$)	2.64 ^a	2.45 ^a	2.10 ^b	1.98 ^b	1.24	*
Haemoglobin g/dl	10.65 ^a	9.65 ^a	8.38 ^b	7.98 ^b	9.64	*
MCV Fl	32.12 ^a	32.08 ^a	31.98 ^a	30.55 ^a	141.58	
MCH Pg	16.25 ^a	16.00 ^a	15.25 ^a	13.38 ^b	24.19	*
MCHC (g/dl)	51.13 ^a	50.20 ^a	47.75 ^b	31.83 ^a	197.93	*

*= Significant at 0.05%

NS= Non Significant

Table3: Biochemical parameters of Yankasa sheep fed various levels of *Ficuspolita* leaves and *Pennisetumpedicellatum* grass with supplement.

Parameters	Treatments				SEM	LS
	1	2	3	4		
Blood urea Mmol/L	4.70 ^a	4.00 ^b	3.68 ^c	3.45 ^c	1.65	*
Total protein g/L	69.50 ^a	69.00 ^a	68.00 ^a	53.00 ^b	327.42	*
Albumin (g/L)	33.50 ^a	32.25 ^a	30.75 ^a	27.50 ^b	91.96	*
Globulin (g/L)	37.25 ^a	37.25 ^a	35.50 ^a	25.50 ^b	103.63	*
Cholesterol Mg/dl	2.40 ^a	1.88 ^a	1.70 ^b	0.90 ^c	0.41	**
Creatinine mg/dl	62.00 ^a	60.25 ^a	47.00 ^b	42.50 ^c	256.15	*

SEM = Standard error of mean

* = 0.05%

** = 0.01%