BLOOD PROFILE OF GROWING YANKASA RAMS FED SORGHUMSTOVERSUPPLEMENTEDWITHGRADEDLEVELSOFDRIEDPOUL TRYDROPPINGSBASEDDIETS

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ABSTRACT

This study was conducted to determine the blood profiles of growing Yankasa rams fed sorghum stover supplemented with Sun-Dried Poultry Droppings diets (SDPD). Poultry dropping is a good source of protein supplement. Its high nitrogen content suggests feeding it to ruminantswouldbeanexcellentavenuetoconvertnutrientsinthewasteintoanimalproducts.Butamajorchallengeforit utilization is the danger of pathogenic organisms. Sun-drying of the droppings can render the waste free of pathogens. Thirty growing Yankasa rams aged 9-12 months, weighing 11.5-15.5 kg were randomly divided into five groups (3 in each) and assigned to five experimental diets T1-T5 which contained 0, 20, 40, 60 and 80%SDPD. Blood samples were analyzed for haematological and biochemical parameters. Results showed that WhiteBlood Cell (WBC), Haemoglobin (Hb) and Packed Cell Volume (PCV) were significantly influenced by SDPD.TheirvalueswereWBC,10.6,12.9,9.5,7.0and10.7L_1,Hb,8.6,9.3,8.6,8.4 and 9.7 g dL_1, and PCV, 22.9, 29.4, 27.1, 23.6 and 21.5%, respectively. Additionally, urea, sodium and totalprotein were significantly influenced by treatment diet. Their values were urea, 6.1, 6.3, 6.8, 6.9 and8.1 mg dL_1, sodium, 102.9, 128.8, 129.2, 130.7 and 130.7mmol L_1, totalprotein, 6.3, 6.5, 7.1, 7.2and 7.1 g dL_1,.Most haematological and biochemical values obtained were within the normal range for sheep. SDPD diet cansatisfactorilysupplementsorghumstoverwithoutanydeleteriouseffectonthebloodchemistryandhaematological profileofgrowingYankasarams.

Keywords: Blood profile, dried poultry droppings, growing Yankasa rams, sorghum stover

INTRODUCTION

The level of animal protein consumption has direct influence on the general well-being and health of nations. Additionally, poor nutrition in some countries or communities is almost always associated with a lack of animal proteins in the diet (Ositelu, 1981). In Nigeria, protein consumption is below 67 g recommended by the World Health Organization (WHO) (Akintola et al., 1999).There is therefore, the need to increase the protein intake to alevel which compares to that of the developed nations (Okereke et al., 2005), sheep which are primarily kept for meat production can bridge the supply-demand of animal protein gap in Nigeria. But effective and efficient sheep production cannot be enhanced with the use of conventional feedstuff such as maize, soybean cake, fish meal as supplement to low quality feed in present day Nigeria owing to their exhorbitant cost, erratic supply (Akinmutirni, 2004) and the competition both with humans and monogastric animals(Adama,2008). Itisinthislightthatnon-conventionalenergyandprotein materials offarmandagro-industrialwastesarepresentlybeingexploitedforlivestockproductioninNigeria(Ndubueze et al., 2006), such feedresourcesshould be cheap,have high nutritive value,non-toxic,readilyavailable,shouldhavelowornodemand by both human and other livestock species andwithout industrial usage (Ndubuezeetal.,2006).Poultry droppings are one of such non-protein nitrogen sources of farm wastes. Its highnitrogencontent (Jordaan, 2004) suggests thatfeeding it to ruminants would be an excellent avenue toconvert nutrients in the waste into animal's products forhuman consumption; hence it can be a valuable feed forruminants. However, a major obstacle in offering poultry droppings to ruminants is the danger of pathogenic organisms. Research work has shown that it can be rendered free of pathogens by sun-drying (Abdul et al.,2008). This study was therefore, designed to determine the blood profiles of growing Yankasa rams fed sorghum stover supplemented with sun-dried poultry droppings based diets.

MATERIALS AND METHODS

Theexperimentwascarriedout at the Department of Animal Production, TeachingandResearch Farmof FederalUniversityofTechnology, Minna Niger State, \Nigeria. Fifteen Yankasaramsaged9-12monthsandweighing11.5-15.5kgwas used for the experiment. Theexperimentaldesign usedwasComplete Randomized Design. The rams were randomlyassigned to five treatments (T1-T5)comprising of threereplicates with one animal per replicate.Treatmentone (T1,) were rams fed 0% Dried Poultry Droppings (DPD),T2 were

fed with 20% DPD, T3 were fed with 40% DPD, T4were fed with 60% DPD and T5 were fed with 80% DPD. The experimental animals were fed with 600 g of chopped sorghum stover as basal diet and supplemented with sun-dried poultry dropping based diet. The supplements consist of the Maize Bran (MB) alone (100%), Maize Bran (MB)+DriedPoulliy Droppings (MB+DPD) (80:20), Maize Bran (MB)+dried poultry manure (MB+DPD) (60:40), Maize Bran (MB+DPD)(40:60), Maize Bran (MB)+dried poultry manure (MB+DPD) (20:80). Salt-licks were provided throughout the period of the experiment. And water was provided Ad libitum. The animals were raised under feedlot management in an individual pen. At the end of the feeding trial which lasted 106 days, blood samples were collected for the determination of both biochemical and haematological parameters.
The proximate compositions of experimental feeds and supplemental diets are presented in tables 1 and 2 respectively. Haematological and biochemical parameters measured were: WBC; lymphocyte; medium cell count; granulocyte; lymphocyte %; RBC; hemoglobin; PVC; MCV; MCH; MCHC; and urea; sodium; potassium; chloride; bicarbonate; creatinine; SGOT; SGPT; ALP; total protein; albumin. Data obtained in this study were subjected to analysis of Variance (ANOVA) using procedure of SAS (2008). Means were separated using Duncan's multiple range test (DMRT) of the same package.

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Table 1 Proximate composition of experimental feeds on (DM basis %)

Parameters	Sorghum stover	Maize bran	Dried poultry droppings
Dry matter (%)	94.09	84.20	93.00
Crude protein (%)	3.50	7.00	21.88
Crude fibre (%)	31.20	3.20	20.67
Ash (%)	3.90	5.50	33.00
Ether extract (%)	1.11	5.00	3.30
Nitrogen free extract (%)	54.39	63.50	14.15
Gross energy (kcal/g)	2.02	3.90	2.65

Table 2: Proximatecomposition(DMBasis %)ofsupplementarydietsfed *to Yankasarams*

Composition	T1	T2	T3	T4	T5
Dry matter	84.20	88.60	92.20	85.80	92.80
Crude protein	7.00	13.13	13.60	14.00	15.40
Crude fibre	3.20	6.70	9.30	12.50	8.00
Ash	5.50	12.00	12.50	16.50	25.00
Ether extract	5.00	20.00	12.50	12.50	17.50
Nitrogen free extract	63.50	36.77	44.30	30.30	26.90
Energy(kcal/g^{1})	2.27	2.53	2.81	3.90	4.23

Key: T1(MB)(100%), T2 (MB+DPD)(80:20), T3(MB+DPD)(60:40), T4(MB+DPD)(40:60), T5(MB+DPD)(20:80)
MB=Maize bran, DPD=Dried poultry droppings

RESULT AND DISCUSSION

In table 3, White blood cell count differ significantly ($p<0.05$) between T2, (12.9) and T4, (7.0).However, these values were within the range of 3.2-15.80and 6.8-20.1% reported for Afec-Awassi sheep and West African dwarf goats by Jawasreh *etal*.(2010)andDaramola etal. (2005). The values obtained in this studywere an indication that there were no microbial infectionsor presence of foreign bodies or antigens as was reported by Ahamefule et al.(2008)orparasitesinthecirculatorysystemof theexperimentalanimals. Similarly, significant differences ($p<0.05$)existedbetween T5, (9.7) and T4, (8.4) for haemoglobinlevel. The values reportedinthisstudywerewithintherange7-15and 8.15-10.75 g dL^{-1}, reported for WestAfrican

Dwarfgoats and WAD sheep byDaramolaetal.(2005). Theimplicationofthevaluesobtainedinthis study is that the dietary proteins were of high qualityasreportedbyAbuetal.(1998).Therewassignificant($p<0.05$)differencesbetweenT1,(29.4)andT2 (22.9)forPacked Cell Volume (PCV).Packed cell volume valuesof thisworkfallswithintherangeof21-35and20.10and48.00%reportedforWADgoatsandAfec-Awassisheepby Daramolaetal.(2005)and Jawasrehetal..(2010),thevaluesobtainedinthisstudysuggestthattherewerenopresenceoftoxicfactor(such ashaemagglutinin) whichhadadverseeffectonblood formation as was reported byOyawoyeandOgunkunle(1998). Serum Glutamic Oxaloacetate Transaminase (SGOT) (Table 4)valuesreportedinthisstudyfalls within the range12-38mg mL, reported for WAD goats byDaramola etal.(2005).Higherlevelsof values abovenormalrangesignalsnecrosisandMyocardialsp.infarction which are indicators of poor quality protein ofdiet fed (Fasina etal.1999). The implication of the valuesobtained in this study suggests that the dietary proteinsfedareofgoodquality.Alkaline phosphatase values reported in this studywere within the range 30.73-79.18 JU/I reported for WADgoats by Ikhimioya and Imasuen (2007). Values that fallswithin the range reported suggest high quality protein inthedietfedas was reportedbyAkinmutimi(2004). There was significantdifferencein the serumtotalproteinofthestudiedanimals.Thelowest valueswasobservedin T1 (6.3) and highest value was reportedin T_4 (7.2) respectively. However, these values were within t he rangeof6.3-8.5and 5.0-12.3(gdL^{-1},)reported forWAD goats and Afec-Awassisheep by Daramolaet al.(2005)andJawasrehetal.(2010),respectively.

Table3:HaematologicalparametersofgrowingYankasaramsfedsorghumstoversupplementedwithgrade dlevelsofdried poultrydroppingsTreatments

Treatments **Parameters**	**T1**	**T2**	**T3**	**T4**	**T5**	**SEM**
Whitebloodcell(L^{-1})	10.6ab	12.9a	9.5ab	7.0b	10.7ab	3.9
Lymphocyte(L^{-1})	3.6b	8.1a	3.0b	2.2b	4.3b	3.1
Mediumcellcount(L^{-1})	1.7ab	2.2a	1.2b	1.2b	1.8ab	0.8
Granulocyte(L-i)	5.3	4.4	4.4	4.1	4.5	1.4
Lymphocyte(%)	35.7	68.6	34.7	57.9	61.7	55.1
Monocyte(%)	16.8a	16.6a	13.6b	15.6ab	15.8ab	2.5
Granulocyte(%)	47.5ab	47.5ab	51.8a	51.5a	47.5ab	9.8
Redbloodcell(L^{-1})	7.2b	9.9a	9.1a	7.2b	6.4b	1.7
Haemoglobin(gdL^{-1})	8.6b	9.3ba	8.6b	8.4b	9.7a	0.9
Packedcell vol.(%)	22.9b	29.4a	27.1b	23.6c	21.5e	3.0
Mcv(fl)	33.2ab	29.8c	30.3bc	33.7a	33.9a	4.2
Mch(pg)	13.9ab	9.3c	9.9bc	12.6bc	17.7a	8.4
Mchc(gdL^{-1})	40.3ab	31.5c	32.5bc	37.3bc	48.3a	0.0

abc: Meanvalues with the same letters along the row are not significantly different ($p<0.05$), MCV: Mean Corpuscular Volume, MCH: Mean Corpuscular Hemoglobin,MCHC:MeanCorpuscularHemoglobinConcentration SEM: standard error of mean

Table4:BiochemicalprofileofgrowingYankasa ramsfedsorghumstoversupplementedwithgradedlevelsofdriedpoultrydroppingsTreatments

Treatments **Parameters**	**T1**	**T2**	**T3**	**T4**	**T5**	**SEM**
Urea($mgdL^{-1}$)	6.lb	6.3b	6.8b	6.9b	8.1a	0.9
Sodium($mmolL^{-1}$)	102.9b	128.8a	129.2a	130.7a	130.7a	2.6
Potassium($mmolL^{-1}$)	3.9	3.9	4.0	4.2	4.2	0.4
Chloride(gdL^{-1}	101.2	101.2		101.2	100.8	1.0

			101.4			
Bicarbonate(gdL-1	22.6	22.3	22.3	22.6	22.5	1.1
Creatinine(mgdL-1)	1.1	1.9	1.1	1.9	1.2	1.7
SGOT(mgmL-1)	27.3	19.6	17.2	19.8	21.3	15.2
SGPT(mg m1,-1)	30.8	29.6	22.1	23.9	31.5	15.2
ALP(mgm1,-1)	41.9	42.3	43.9	48.3	45.9	7.9
Totalprotein(gdL-1	6.3c	6.5bc	7.1ab	7.2a	7.lab	0.7
Albumin		3.6b		4.1a	3.5b	0.4
dL-'	3.8ab		3.7b			

abc: Mean values with the same letters along the row are not significantly different ($p<0.05$), SGOT: Serum Glutamate Oxaloacetate Transaminase, SGPT: Serum Glutamic Pyruvate Transaminase, ALP: Alkaline Phosphatases. SEM: standard error of mean

Theimplicationof this result is that highest increase intotal protein in the sera of the experimental animals in T_4wouldsuggestthatproteinsynthesiswasefficient.

CONCLUSIONS

Basedon the result of this present study, most haematological and biochemical values obtained werewithin the normal range reported for sheep. Thereforesun-dried poultrydroppingbased dietsat upto 80%inclusionlevel can satisfactorily supplement sorghumstoverwithoutanydeleteriouseffectonthebloodchemistry and haematological profile of growing Yankasarams.

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