HAEMATOLOGICAL AND SERUM BIOCHEMICAL PARAMETERS OF LAMBS FED RICE STRAW ENSILED WITH UREA AND MOLASSES AT VARYING LEVELS

A.A.Kwaido[1], Sa'idu, M.[1] and Mikailu, M. M[2],
[1*] Department of Animal Science, Kebbi State University of Science and Technology, Aliero, P.M.B 1144 Aliero, Kebbi State, Nigeria.
[2]Department of Animal, Faculty of Agriculture, UsmanuDanfodiyo University Sokoto, Sokoto State, Nigeria.
Corresponding email address:aakwaido1711@gmail.com Phone No. 07032990735

ABSTRACT
The research was conducted at the livestock teaching and research farm department of animal science, Kebbi State University of Science and Technology Aliero. Twelve (12) male lambs were purchased from the livestock market in Dodoru market. The animals were balanced for weight for each treatment there after allocated to four treatment diet with four replicate each. The dried Rice Straw was ground into smaller pieces and ensiled with urea and molasses in large quantity. The treatments were A (100Kg feed +4kg molasses +4kg Urea), B (100Kg feed +6kg molasses +4kg Urea) and C (100Kg feed +8kg molasses +4kg Urea) The samples were thoroughly mixed and ensiled for a period of five weeks. The experimental diets were formulated in such a way that the ensiled materials will be included at 60%, while a concentrate diet of 10% maize, 20% cowpea husk, 20% wheat offal, 30% cotton seed cake, 20% groundnut hay and 1% salt will be included in each of the experimental diets. Randomized Complete Block Design (RCBD) was used in this experiment. The result in table 2 shows that there was no significant different in all the parameters measured. The White Blood Cell (WBC) recorded highest in T2 followed by T3 and the least was in T1 while RBC, PCV and MCH recorded highest in T1 then T2 and lowest in T3. The MCHC, MCV, MCH, are within the reference values, while the PLT, RBC, HGB, PCV are below the reference values.
Keywords: Ensiled rice straw, molasses, urea, haematology, growing lambs

INTRODUCTION

Haematological Parameters are good indicators of physiological status of an animal and can be used indiagonising and monitoring diseases and abnormalities in animals. Factors such as nutrition, age ,.breed, sex and climate have been known to affect haematological parameters of a clinically healthy animal. The Rice Straw is a residual by-product of rice crop production at harvest, it is composed primarily of the stalk, after the grain and chaffs have been removed (Gummert *et al.*, 2020). The Rice has a relatively large amount of residue identified as straw. Rice is used as part of the rations of ruminants animals. Van Soest (2006) reported that the high level up of lignation and solidification are the important factors that restrict bacterial breakdown in the rumen. Other factors that affect its value as feed for ruminants are the slow and inadequate ruminant degradation of the carbohydrates and the low content of nitrogen, minerals, and vitamins. There are different techniques for improving the nutritive value of rice straw to enhance feed intake and digestibility,such as cutting the straws (mechanical), and use of urea and molasses (Gummert *et al*., 2020)

MATERIALS AND METHODS

Experimental Location

The research was conducted at the livestock Teaching and Research Farm, Department of Animal Science, Kebbi State University of Science and Technology Aliero, Kebbi State.

Experimental animal and the Management

Twelve (12) male lambs were purchased from the livestock market in Dodoru market. The animals were quarantined, dewormed, treated against gastrointestinal parasites and also sprayed against ecto-parasite. The animals were balanced for weight for each treatment there after allocated to four treatment diet with four replicate each. The lambs were housed individually in a pen measuring 2m×1m, which was disinfected prior to the commencement of the experiments.

Experimental Feed Preparation and formulation

In this experiment the dried Rice Straw was ground into smaller pieces and ensiled with urea and molasses in larger quantity, in a tank container of about 300 litres capacity. The treatments were A (100Kg feed +4kg molasses +4kg Urea), B (100Kg feed +6kg molasses +4kg Urea) and C (100Kg feed +8kg molasses +4kg Urea) The samples will be thoroughly mixed and ensiled for a period of five weeks. The experimental diets will be formulated in such a way that the ensiled materials will be included at 60%, while a concentrate diet of 10% maize, 20% cowpea husk, 20% wheat offal, 30% cotton seed cake, 20% G/nut hay and 1% salt will be included in each of the experimental diets.

Table 1: Gross composition of the Ensiled FSD with Urea and RMW

	Inclusion Levels (%)		
Ingredients	A	B	C
Rice Straw	100	100	100
Molasses	4	6	8
Urea	4	4	4
Concentrate	40	40	40

40kg of the concentrate diet will be mixed in all the treatments

Experimental Design and Procedure

Randomized Complete Block Design (RCBD) was used in this experiment as outline by steel and Torrie (1980). A total of twelve (12) animals were use in which four animals per treatment were used, each animal served as replicated. Each group was served one of the experimental diet and fed ad_libitum for eighty four (84) days and water was offered *adlibitum*.

Data collection

Feed intake and Live Weight Changes

Induction body weight (IBW) of each of the animals was taken prior to the commencement of the trial and then followed by weekly body measurement which was done between the hours of 8-9 am after withdrawing feed for 14-16 hours, to avoid error due to gut fill. Feed intake (FI) of each animal was recorded daily based on the amount of feed offered every morning and the refusals collected the following morning before the next feeding.

Blood sample collection

Blood sample were collected from the experimental animals at the last week of feeding trial. Blood sample were collected from the jugular vein (Coles, 1986). Bleeding was done early morning before feeding. About 7mL of the blood was collected from each animal and 3ml of each sample was placed in an Ethylene DiamineTetraacetate (EDTA) bottle for haematological studies. The remaining 4ml was placed in a universal bottle and allowed to stand for about 2 hours at room temperature. The serum was stored in a freezer for biochemical analysis and liver function test. Total protein and Albumin was determined. The serum enzymes, Aspartate amino transferase (AST), alanine amino transferase (ALT), alkaline phosphate (ALP) activities were also determined.

Serum Electrolytes

The serum electrolytes such as serum sodium, calcium and potassium were also determined.

Statistical Analysis

All the data obtained from the experiment were subjected to analysis of variance (ANOVA) using completely randomized design (CRD) (Steel and Torrie, 1980).

Result and Discussion

The result in table 2 shows that there was no significant different in all the parameters measured. The White Blood Cell (WBC) recorded highest in T2 followed by T3 and the least was in T1 while RBC, PCV and MCH recorded highest in T1 then T2 and lowest in T3. The MCHC, MCV, MCH, are within the reference values, while the PLT, RBC, HGB, PCV are below the reference values. The WBC count in T1 was lower than the reference value but T2 and T3are within, this may be due to increase in the immune system as WBC are the soldiers of the animals body (Egbe-Nwiyi *et al*., 2000). The most common increased in PCV is dehydration, and with adequate fluid intake is normal. However it may

reflect a condition called polycythaemia where there is too many red cells. In this study only T1 have the normal PCV, whereas T2 and T3 were not within the reference value.

Table 2: Haematologicalcharecteristic of Rams fed with rice straw ensiled with urea and molasses at varying levels

	Inclusion levels (%)				
Parameters	A	B	C	SEM	Ref. values
WBC(x10^6/L)	3.9100	5.4600	4.9600	1.956	4-12
LYM (%)	96.3550	97.0550	97.0500	0.876	2-9
GRAN (%)	0.8050	0.4600	1.1100	0.292	-
MID (%)	0.1050	0.2150	0.0900	0.060	-
RBC (x10^6/L)	6.5800	5.2750	4.0650	1.409	9-15
HGB (g/dL)	5.9550	6.6500	5.4600	25.361	9-15
PCV (%)	29.8550	19.9550	16.3500	6.921	27-45
MCV (fL)	45.4600	37.7050	35.4100	4.735	28-40
MCH (pg)	15.2100	12.6050	11.8550	1.492	8-12
MCHC (g/dL)	33.3050	33.3000	33.3100	0.003	31-34
PLT (x10^6/L)	635.5000	342.0000	359.0000	165.143	400-2000

KEY: PCV=Packed cell volume, Hb=Haemoglobin, MCHC=Mean Corpuscular Haemoglobin Concentration, RBC= Red Blood Cell, WBC=White Blood Cell, MCV=Mean Corpuscular Volume, MCH= Mean Corpuscular Haemoglobin, LYM = Lymphocyte.

The Blood Urea differs significantly (P<0.05) across the treatments with T2 having the highest followed by T3 then T1. While albumin differs significantly (P<0.05) with T1 recorded the highest value, followed by T2 then T3 had the lowest.

Table 3: Serum biochemical parameters of rams fed with rice straw ensiled with urea and molasses at varying levels

	Inclusion levels (%)			
Parameters	A	B	C	SEM
Na (mmol/L)	137.00	144.50	144.0000	2.102
Chloride (mmol/L)	107.50	113.00	112.5000	2.799
Urea (mmol/L)	2.96^b	5.1150^a	3.5100^b	0.323
Creatinine (mmol/L)	40.00	48.50	47.0000	6.910
TP (g/L)	69.500	69.00	68.5000	1.871
Albumin (g/L)	29.00^a	22.00^b	21.5000^b	1.658
AP (g/L)	30.50^a	24.50^b	22.5000^b	0.957
AST (SGOT) (U/L)	18.00	19.00	19.0000	0.577
ALT (SGPT) (U/L)	5.50	5.00	3.5000	1.080
TB (g/L)	0.75	0.75	0.8000	0.041
DB (g/L)	0.225^a	0.21^b	0.2000^b	0.003
K (mmol/L)	4.5	4.5	4.5	1.05

abc= Means value along the row with different superscripts there is significant different (P<0.05)

CONCLUSION

It can be concluded that feeding Rams with of rice straw ensiled with urea and molasses at varying levels was not detrimental to the animals.

REFERENCES

AOAC (1990). Association of Official Analytical Chemists. Official methods of analysis, (15th edition) Washington,D.C.

Coles, E.H., 1980.Veterinary clinical pathology, 3rd Edition, W. B. Sanders Co. Philaelphia, pp 10-20.

Egbe-nwiyi , T. N., Nwosu, S.C., and Salami, H.A. (2000). Heamatological values of apparently healthy Sheep and Goats as influenced by age and sex in Arid zone of Nigeria. African Journal of Biomedical Research, vol. 3.

Gummert, M., Van Hung, N., Chivenge, P., and Douthwaite, B. (2020).Sustainable Rice Straw Management.ISBN 978-3-030-32373-8 (eBook).

Steel, R. G. D. and Torrie, J. H. (1980). *Principles and Procedures of Statistics*, McGraw Hill Book Co. Inc. N. Y.633.

Van Soest, P. J., Robertson, J. B and Lewis, B. A. (1991). Methods for Dietary fibre, Neutral detergent fibre, Non-starch polysaccharides in relation to animal nutrition. *Journal of Dairy Science* 74:3583-3597.