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## EVALUATION OF SUN-DRIED SHEEP RUMEN CONTENT AS A REPLACEMENT FOR RICE OFFAL ON BLOOD AND BIOCHEMICAL PROFILES OF WEANER RABBITS

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### ABSTRACT

An experiment was conducted at Bauchi State College of Agriculture, Bauchi Rabbitry Unit for eight weeks to determine the haematological and serum biochemical parameters of weaner rabbits fed varying levels of Sun-dried Sheep Rumen Content (SDSRC) as replacement for rice offal (RO). Fifty (50) weaner rabbits were assigned to five dietary treatments with SDSRC replacing RO at 0, 25, 50, 75 and 100%, designated as diet 1, 2, 3, 4 and 5, respectively each diet was replicated five times with two rabbits per replicate in completely randomized design, feed and water were supplied ad libitum. Data collected were subjected to analysis of variance and the results portrayed non-significant difference ( $P > 0.05$ ) in all the parameters except blood platelets ( $P < 0.05$ ) (107.67-547.67x10<sup>3</sup>dL). Most of the serum biochemistry values revealed statistical similarity ( $P > 0.05$ ) apart from total cholesterol (1.83-3.77mol/L) ( $P < 0.05$ ). Therefore, it can be concluded that SDSRC could replace RO without affecting the health status of the weaner rabbits.

**Keywords:** Sheep rumen content, Weaner rabbits, Rice offal, Blood and Biochemical profiles

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### INTRODUCTION

Rabbit production is suitable because as non-ruminant herbivores, rabbits do not compete directly with man for cereal and legume grains. Rabbit is also favoured over other livestock species because of its high fecundity, low cost of investment, short generation interval and ability to utilize diverse forages (Apori *et al.*, 2014). To reduce the problems of food shortage in developing countries, scientists of various disciplines such as animal scientists, biologists, economists, biochemists, manufacturers and consumers are involved in the investigations of the use of many types of non-conventional feedstuffs that are either partly in use, or are considered to have reasonable potential in the nutrition of livestock. Cereal offal's are by-products from cereal grain after processing, and it had been observed to contain appreciable quantity of nutrients that can be exploited in rabbit diet, the offal's are particularly rich in dietary fibre and essential fatty acids and contain significant quantity of starch, protein, vitamins, and dietary minerals etc. (Barron, 2010). Rumen contents are very rich in crude protein (10-25%) and high (25%) in crude fibre. The later limits its use in poultry nutrition. Several relevant trials have been conducted on the suitability of sun-dried rumen contents (SDRC) as feedstuff for livestock such as rabbits and fish (Okpanachi *et al.*, 2010). Preliminary studies of Mohammed *et al.* (2011) indicated that differences exist between the rumen contents of cattle, camel, sheep and goat with respect to nutrient composition, amino acid profile, and microbial assay. Therefore, rumen content which is available in all abattoirs in Nigeria could be good sources of protein as well as fibre in livestock feed if properly processed and harnessed (Adeniji and Balogun, 2002). Rumen digesta causes environmental pollution by entering into rivers, stream and local free water bodies and eventually imitate methane and carbon dioxide in the air. Environmental pollution could mitigate by recycling the slaughter house waste (Uddin *et al.*, 2018).

### MATERIALS AND METHODS

The experiment was conducted at Bauchi State College of Agriculture, Bauchi Rabbitry Unit, located at Yelwan Makaranta along Bauchi – Dass Road. The rumen contents were collected from certified healthy sheep slaughtered at Bauchi main abattoir immediately after the rumen was incised, the collection of the rumen contents was done in the early hours of morning while slaughter is going on to avoid mixing the rumen contents with that of other species of animals as while as their faeces and blood. The rumen contents were spread on concrete floor and sun dried for seven days by constant

raking to ensure complete drying. Fifty mongrel weaner rabbits of mixed sexes between 5 and 7 weeks of age were purchased from rabbit keepers within Bauchi town and its environs for the study. The weaner rabbits were allowed one-week acclimatization period, during which commercial growers mash (vital feed), groundnut haulms and water were supplied *ad libitum*. After the first week of acclimatization the rabbits were randomly allotted to five dietary treatments replicated five times with two rabbits per replicate in a completely randomized design. Five diets were formulated in which sun-dried sheep rumen contents replaced rice offal at 0, 25, 50, 75 and 100% levels coded as diet 1, 2, 3, 4 and 5 respectively (Table 1). At the end of the research three rabbits from each treatment were randomly selected and 10mL of blood was collected from the ear vein. 5mL was placed in labelled sterile vacuum tube containing Ethylene Diamine Tetra Acetic Acid (EDTA) an anti-coagulant which was used for haematological analysis while the remaining 5mL was placed into labelled sterile sample bottles without anti-coagulant and used for the serum biochemical analysis and were taken Abubakar Tafawa Balewa Teaching Hospital, Bauchi for analyses. Data generated were subjected to analyses of variance using SPSS version.

Table.1: Composition of Experimental Diets Containing Sun-dried Sheep Rumen Content (SDSRC) as a Replacement for Rice Offal

Ingredients	Diets				
	1(0%)	2(25%)	3(50%)	4(75%)	5(100%)
Maize	32.0	32.6	33.1	34.3	35.4
Soybean meal	15.3	15.0	14.3	13.0	11.9
Rice offal	30.0	22.5	15.0	7.5	0.0
Sun-dried sheep rumen content	0.0	7.5	15.0	22.5	30.0
Bone meal	2.0	2.0	2.0	2.0	2.0
Groundnut haulms	20.0	20.0	20.0	20.0	20.0
Premix*	0.25	0.25	0.25	0.25	0.25
Common salt	0.25	0.25	0.25	0.25	0.25
Lysine	0.1	0.1	0.1	0.1	0.1
Methionine	0.1	0.1	0.1	0.1	0.1
<b>TOTAL</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Calculated Composition (%)</b>					
Crude Protein (%)	15.71	15.99	16.16	16.00	16.03
Crude Fibre (%)	15.61	15.86	16.03	16.22	16.39
Ether Extract (%)	3.36	3.41	3.41	3.45	3.47
Ash (%)	5.93	5.60	5.26	4.90	4.54
ME (Kcal/kg)	2468.70	2435.20	2389.10	2351.10	2314.60

## RESULTS AND DISCUSSION

The haematological responses of rabbits fed the dietary treatments are presented in Table 2. White blood cell, red blood cell, haemoglobin, packed cell volume, means corpuscular volume, means corpuscular haemoglobin and mean corpuscular haemoglobin concentration were not significant ( $P>0.05$ ). The platelets count recorded in this study ranged from  $107.67 \times 10^3$  dL to  $547.67 \times 10^3$  dL for rabbits fed diet 2 (25% SDSRC) and diet 4(75% SDSRC) respectively which were significantly ( $P<0.05$ ) different, but they all fall within the normal range for healthy rabbits. Serum biochemical indices measured were total protein, albumin, total cholesterol and globulin. There was no significant difference ( $P>0.05$ ) among dietary treatment in total protein, albumin and globulin they were generally similar across the various test diets. The values of the total protein, albumin and globulin ranged from 5.66 to 6.05g/dL, 3.50 to 6.65g/dL and 1.7 to 2.37g/dL respectively and were within the ideal range for rabbit health development. Result as shown in Table 2, showed significant difference ( $P<0.05$ ) in the total cholesterol, with the reference diet having the highest value (3.77mol/L) and lowest value was recorded in diet 4(1.70 mol/L). The haematological and serum biochemical indices of rabbits fed the dietary treatments were not significant ( $p>0.05$ ) with the exception of platelets and total cholesterol ( $P<0.05$ ). The WBC ( $9.50-12.80 \times 10^3$  dL), red blood cell ( $6.01-6.14 \times 10^6$  dL), haemoglobin (13.00-13.73 g/dL) in this study were within the normal range for healthy rabbits, and is

higher than values reported by Ajayi and Raji (2012) and Yahya *et al.* (2020) when they fed weaner rabbits with blood and wild sunflower forage meal mixture and African locust bean (*Parkia biglobosa*) pulp, but the results agrees with values reported by Dairo *et al.* (2018) when they fed different plant fibre sources to growing rabbits. The results for the packed cell volume, MCV, MCH and MCHC reported for this study (41.67-43.30%), 68.23-71.33fl, 21.53-22.63pg and 20.05-31.70g/dL conform with the findings of Oluremi *et al.* (2018) in an experiment to assessed the blood profile of rabbits fed biodegraded sweet orange peel based diets where they obtained range values for PCV (37.00-46.00%), MCV (76.27-86.33fl), MCH (25.43-27.00pg) and MCHC (33.27-33.80g/dL). Serum biochemical indices obtained for this study which comprises the total protein (5.66-6.00g/dL), albumen (3.50-4.00g/d), total cholesterol (1.70-3.77Mol/L) and globulin (1.77-2.37g/dL) were within the range values reported by Ibrahim *et al.* (2018) and the values observed in the present study were within the normal range reported for healthy rabbits (Taiwo *et al.*, 2004).

Table 2: Haematology and Serum Biochemistry of Weaner Rabbits Fed Diets containing Graded Levels of SDSRC as Replacement for Rice Offal

Parameters	Diets					SEM
	1(0%)	2(25%)	3(50%)	4(75%)	5(100%)	
White blood cell (x10 <sup>3</sup> dL)	12.10	9.50	9.27	12.20	12.80	0.88 <sup>NS</sup>
Red blood cell (x10 <sup>6</sup> /ul)	6.11	6.14	6.11	6.01	6.12	0.32 <sup>NS</sup>
Haemoglobin (g/dL)	13.17	13.73	13.17	13.00	13.50	0.53 <sup>NS</sup>
Packed cell volume (%)	41.67	43.30	42.57	42.17	42.75	1.52 <sup>NS</sup>
Means corp volume(fl)	68.23	71.33	69.63	70.87	69.85	3.00 <sup>NS</sup>
Mean corp. haemoglobin (pg)	21.57	22.63	21.53	21.83	22.05	1.03 <sup>NS</sup>
Mean corp. haem. Conc.(g/dL)	31.57	31.70	30.93	30.83	22.05	0.24 <sup>NS</sup>
Platelets (x10 <sup>3</sup> dL)	322.00 <sup>ab</sup>	107.67 <sup>b</sup>	317.33 <sup>ab</sup>	547.67 <sup>a</sup>	292.50 <sup>b</sup>	73.72 <sup>*</sup>
Total Protein (g/dL)	6.05	5.66	5.76	6.00	5.70	0.24 <sup>NS</sup>
Albumin (g/dL)	3.50	3.80	4.00	3.67	3.85	0.17 <sup>NS</sup>
Total Cholesterol (mol/L)	3.77 <sup>a</sup>	2.97 <sup>ab</sup>	1.83 <sup>b</sup>	1.70 <sup>b</sup>	3.66 <sup>a</sup>	0.38 <sup>*</sup>
Globulin (g/dL)	2.37	1.87	1.77	2.33	1.85	0.17 <sup>NS</sup>

<sup>ab</sup> - Means bearing different superscripts within a row are significantly different (\*=p<0.05) SEM - Standard error of means NS - Not significant (p>0.05).

## CONCLUSION

Based on the result obtained it can be concluded that, sun-dried sheep rumen contents can replace 100% rice offal as a dietary source of fibre for weaner rabbits without affecting their health status, use of SDSRC is therefore recommended to be incorporated into rabbit diet to reduce cost of production and environmental pollution.

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