BIOCHEMICAL AND HAEMATOLOGICAL INDICES OF WEANER RABBITS FED SORGHUM BREWERS DRIED GRAIN (SBDG)

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ABSTRACT

This study evaluated the biochemical and haematological indices of weaner rabbits fed sorghum brewer's dried grain (SBDG). Forty mixed breeds of rabbits (4-8weeks) were allotted into four experimental treatments in a completely randomized design. Four concentrate diets were compounded by replacement of maize with the inclusion of SBDG at 0, 20, 30 and 40%. The diets were fed to the rabbits at 5% of their body weight respectively. The diets containing SBDG (20%, 30% and 40%) had similar ($p>0.05$) value of glucose, total protein, globulin, albumin, AST and ALP. Animal fed diet 20%SBDG (85.63) had significantly highest ($p<0.05$) ALT compared to 0%SBDG (69.58), 30%SDBG (63.13) and 40%SBDG (58.99). The bilirubin total was significantly higher ($p<0.05$) than diets 0%SBDG and 30%SBDG.Rabbits fed diet 30%SBDG had significantly highest PCV value (36.65), followed by 40%SBDG (34.75), 20%SBDG (34.59) and 0%SBDG (35.55). The RBC was significant higher ($P>0.05$) in rabbits fed diets 30%SBDG (6.49) and 20%SBDG (6.14) than 0%SBDG (4.83) and 40%SBDG (4.20) whereas, the WBC count was significantly higher ($P>0.05$) in rabbits on diet 40%SBDG and 0%SBDG than 30%SBDG and 20%SBDG. It could be concluded that the total replacement of maize with SBDG in the diet of rabbits had no deleterious effect on the biochemical and haematological indices.

INTRODUCTION

Feed cost among other cost of production accounts for over 50% of intensively reared rabbit in the tropics (Ogunsipe *et al*., 2011). This can be attributed to high cost of conventional feed sources in formulated concentrate diets (Olomu, 2011). Their seasonality as well as competing demand by man as food and industrial raw material has not helped in this regard. Several studies have revealed that the development and utilization of unconventional feedstuffs can greatly reduce the overdependence on conventional feed sources and subsequently reducing the cost of production of livestock. A characteristic of such alternative feedstuff should be its non-competitive usage with man, brewery by-products fall into this category (Dowling *et al*., 2003). These alternative feed sources have been utilized successfully by several animal nutritionists in the formulation of feed which include the use of cassava peel meal in rabbits (Adegbola and Oduozo, 1992). Therefore of sorghum brewers waste (SBW) is derived from sorghum used solely. It is relatively cheap as large quantity is produced in local gin production (Awika *et al.*, 2001). It does not require much of additional processing such as grinding before being incorporated into livestock diets. The examination of blood provides the opportunity to clinically investigate the presence of several metabolites and other constituents in the body and it plays a vital role in the physiological, nutritional and pathological status of the animal (Aderemi, 2004). Hence, this study evaluates the biochemical and serum of rabbits fed sorghum brewers dried grain.

MATERIALS AND METHODS

Forty weaners rabbits of mixed sexes aged 4 - 6 weeks were used for the experiment. The rabbits were raised in hutches fitted with feeders and drinkers at The Oke-Ogun Polytechnic Saki, Teaching and Research Farm. There was two-week adaptation period during which the rabbits were treated against parasitic infestation with ivermectin subcutaneous and multivitamin added to their water. The forty rabbits were randomly allotted into four treatments (10 per treatment) in a completely randomized design. Fresh and wet local sorghum brewers waste was sourced from reputable local brewery in Saki metropolis, oven-dried for three days and store in polythene bags for subsequent use. Four concentrate mash diets were compounded by replacing of maize with LSBDG at 0%, 20%, 30% and 40% levels respectively. The diets were fed to rabbits at 5% of their body weight. On the last day of the experiment, blood samples were taken from the goats using 5 ml syringe. One ml blood sample was

collected into labelled sterile bottles containing anticoagulant free bottles, allowed to coagulate at room temperature and centrifuged at 3000 rpm for 10 minutes. The serum concentration of cholesterol, aspartate aminotransferase (AST), alkaline phosphate (ALP) and albumin were determined using commercial laboratory kit (Randox Laboratories Ltd, U.K). The red blood cell (RBC), white blood cell (WBC) and the packed cell volume (PCV) were determined using the method of Adedapo *et al*. (2007). Data collected were subjected to one-way analysis of variance procedure of the general linear model (SAS, 2008). The mean was separated using the Duncan Multiple Range Test.

Table 1: Table 1: Gross composition of the experimental diets

Ingredients	0%SBDG	20%SBDG	30%SBDG	40%SBDG
Maize	40.00	20.00	10.00	-
SBDG	-	20.00	30.00	40.00
Wheat offal	21.50	21.50	21.50	21.50
Groundnut cake	25.00	25.00	25.00	25.00
Palm kernel cake	10.00	10.00	10.00	10.00
Bone meal	2.00	2.00	2.00	2.00
Lysine	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25
Salt	0.50	0.50	0.50	0.50
Vitamin premix	0.50	0.50	0.50	0.50

RESULTS AND DISCUSSION

Table 2: Biochemical indices of rabbits fed SBDG

Parameter	0%SBDG	20%SBDG	30%SBDG	40%SBDG	SEM
Glucose (g/dl)	111.40	129.35	101.40	78.95	9.79
Total Protein (g/dl)	5.23	5.19	6.59	6.60	0.32
Globulin (g/dl)	1.86	1.58	1.40	1.76	0.12
Albumin (g/dl)	4.38	4.60	5.20	5.75	0.39
Creatinine (g/dl)	1.62^{b}	4.25^{a}	4.00	2.00^{b}	0.56
SOD (u/ml)	62.29^{a}	46.64^{b}	42.91^{b}	41.96^{b}	5.39
AST (m/l)	18.89	22.76	16.81	18.18	0.94
ALT (m/l)	69.58^{ab}	85.63^{a}	63.13^{b}	58.99^{b}	4.35
ALP (m/l)	55.66	50.44	64.40	38.92	4.76
Bilirubin Total (mg/dl)	4.77^{b}	9.31^{a}	4.28^{b}	9.87^{a}	1.04

Table 3: Haematological parameters of rabbits fed SBDG

Parameter	0%SBDG	20%SBDG	30%SBDG	40%SBDG	SEM
Packed cell volume (%)	35.55^{ab}	34.59^{b}	36.65^{a}	34.75^{b}	0.61
Haemoglobin (g/dl)	13.55^{b}	11.85^{c}	15.80^{a}	11.48^{c}	0.66
Red blood cell ($x10^{12}$)	4.83	6.14	6.49	4.20	0.85
White blood cell ($x10^{9}$)	6.65	4.80	5.90	6.75	0.49
Lymphocyte (%)	55.90	53.80	56.20	51.90	1.47
Middle cell (%)	4.15^{ab}	1.35^{b}	1.90^{b}	7.85^{a}	1.04
Granulocyte (%)	0.38^{b}	0.35^{b}	0.30^{b}	3.95^{a}	0.58
Haematocrit (HCT)	34.45^{c}	47.40^{a}	35.55^{c}	40.55^{b}	1.97
MCV	50.65	50.90	54.75	53.10	1.25
MCH	4.12	4.25	4.23	4.34	0.06
MCHC	65.35^{a}	32.53^{b}	15.00^{c}	29.00^{b}	10.82
Platelet	49.68	27.32	38.99	43.36	4.39

Blood is an important index of physiological, pathological and nutritional status in the organism (Olorode *et al*., 2007). The glucose values in this study were relatively similar to 111.13 – 124.93 reported by Terzungwe *et al.* (2013) for rabbits fed *Moringa oleifera* leaves. The total protein content reported in this study were slightly higher than the range (4.81- 5.48g/dl) reported by Odetola *et al.* (2012). The glubolin concentrations were lower than the values (2.55 – 2.77) reported by Olabanji *et al.* (2007). The albumin was similar to value recorded by Ayandiran *et al.* (2019) for rabbits fed bread waste and Moringa based diet. Mean values of ALT for rabbit fed SBDG were close to the normal range of (48.5-78.9) reported by Mutruka and Rawnsley (1997). The serum enzyme activities above the normal range are abnormal and are an indication that the animal might have suffered liver and/or kidney damage. The PCV in this study were lower than 43.30-46.77 (Federick, 2010) but higher than 32.25-34.78 reported by Ayandiran (2019). The RBC values (4.20-6.49) obtained in this study were close to the normal ranges of 5.0-8.0 as reported by (Ahamefule *et al*., 2008). The WBC values were slightly higher than 5.13-5.60 (Yakubu *et al*., 2008). Furthermore, the MCV values were close to the reference values of (60.00-69.00) reported for apparently healthy rabbits (Madirabbit, 2011); but higher than 32.75-34.00 reported by Bitto *et al*. (2006). The MCH values reported in this study was relatively low compared to the values reported (19.85-20.06) by Togun *et al*. (2007) while Njidda *et al*. (2006) posited that MCV, MCH and MCHC are used in diagnosing anaemic conditions. The lymphocyte values obtained were however above the stipulated values obtained were however above 41.0-53.5 reported by Aderemi *et al.* (2014) for rabbits fed Soybean with *Tephrosia linearis* meals.

CONCLUSION

It could be concluded that the total replacement of maize with SBDG in the diet of rabbits had no deleterious effect on the biochemical and haematological indices.

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