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HAEMATOLOGICAL EVALUATION OF WEANED RABBITS FED DIET CONTAINING GADED LEVELS OF WATERMELON (*Citrullus lanatus*) RIND MEAL

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ABSTRACT
A 60 day study was conducted to determine haematological profiles of weaned rabbits fed diets containing graded levels of watermelon rind (WMR). Twelve (12) weaned rabbits of mixed breeds with initial weights of 760.00g-843.33g were used in a Completely Randomized Design (CRD) with three animals per treatment with each animal serving as a replicate. The animals were fed water melon rind at 0%, 4%, 8% and 12%. Results obtained revealed that there were significant ($p< 0.05$) differences for haematological parameters measured without any deleterious effect on the health status of the rabbits.
Keywords: Water melon rind; haematology; weaned rabbits.

INTRODUCTION

The use of agricultural wastes as alternative feed resources is one of the panaceas to inadequate availability of feed materials in livestock production. In spite of the bulky nature of non-conventional feed resources, they contain certain nutrients that can easily be utilized by monogastric animals for better productive performance. Most often, agricultural wastes which constitute menace to our environment can be properly harvested, harnessed and incorporated into the feeds of livestock as supplements. Also, expensive nature of conventional feedstuffs has called for the attention of animal nutritionist to the use of agricultural wastes and crop residues as feed stuffs. Rabbits are monogastric herbivores and are wild prey animals as well as domesticated form of livestock and pet (Rommer *et al*., 2001). Rabbits have the ability to convert forages and other farm by-products that are not consumed directly by humans into highly nutritious meat. One of these farm by-products is water melon rind. It is the outer cover of watermelon fruit, usually green and succulent when fresh. Haematological parameters are good indicators of the physiological status of farm animals (Etim, 2010). Therefore, this study was carried out to investigate the haematological indices of weaner rabbits fed diets containing graded levels of water melon rind.

MATERIALS AND METHODS

This experimental study was carried out at the Rabbitary Unit of the Teaching and Research Farm of the Department of Animal Production, Kogi State University Anyigba, kogi State, Nigeria. Twelve (12) weaned rabbits of mixed breeds were used for the study. They were confirmed healthy and were housed individually in rabbit hutches for ease of management and identification. The hutches were washed and disinfected at least 2 weeks before the arrival of the rabbits. Four diets were formulated to meet the nutritional requirements of growing rabbits. Control diet (T1) contained zero (0%) level of watermelon rind, while diets T2, T3 and T4 contained watermelon rind at 4.0%, 8.0% and 12.0% respectively. The rabbits were weighed before being randomly assigned to the dietary treatments in a Completely Randomized Design Each treatment had three animals, each serving as a replicate. Blood samples were collected from each animal from the ear lobe of the rabbit using syringes and needles at the end of the 60 days feeding trial. The blood samples were collected into bottles containing ethylene diamine tetra acetic acid (EDTA) as anticoagulant. The un-coagulated blood samples were analyzed for haematological parameters such as packed cell volume (PCV), haemoglobin (Hb), red blood cell count (RBC), white blood cell count (WBC) and lymphocytes. Samples of experimental diets were analyzed for proximate composition according to procedures of AOAC (2000). All data on haematological parameters were

subjected to analysis of variance (ANOVA) using SPSS version 20 (SPSS 2020). The differences between means were obtained using Least Square Difference (LSD).

Table1: Percentage Composition of Experimental Diets (%)

Ingredients	Inclusion Levels of WMR			
	0%	4%	8%	12%
Watermelon rind	0.00	4.00	8.00	12.00
Maize	30.00	26,00	22.00	18.00
Maize offal	16.00	16.00	16.00	16.00
Palm kernel cake	15.00	15.00	15.00	15.00
Full Fat soybean	20.00	20.00	20.00	20.00
Brewer Dried Grain	15.00	15.00	15.00	15.00
Bone meal	3.00	3.00	3.00	3.00
Salt	0.25	0.25	0.25	0.25
Lysine	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25
Premix	0.25	0.25	0.25	0.25
Total	100.00	100.00	100.00	100.00
Calculated Analysis				
Crude Protein (%)	18.76	18.71	18.67	18.62
Energy (kcal/kg)	2719.00	2671.04	2623.08	2575.12

WMR= Watermelon rind

RESULTS AND DISCUSSION

Proximate composition of experimental diets is shown in Table 2. The dry matter ranged from 86.63% to 89.15%. Diet with 8% inclusion level of watermelon rind had the highest dry matter value while the lowest dry matter value was observed in 12% inclusion level. Crude protein values ranged between 18.62-18.76% while crude fibre values ranged between 8.67%-10.64% were recorded. Proximate values of the diets are comparable to those reported by Olatunji (2016).

Parameters	Inclusion Levels of WMR			
	0%	4%	8%	12%
Dry Matter Content	88.83	88.99	89.15	86.63
Crude Protein Content	18.76	18.71	18.67	18.62
Ether Extract	6.28	6.65	6.89	6.60
Crude Fibre	8.67	9.33	10.00	10.64
Ash Content	5.75	9.05	10.28	5.00
Nitrogen Free Extract	49.37	45.25	43.31	45.77

WMR= Watermelon rind

Result of haematological parameters of weaner rabbits fed diets supplemented with water melon rind is presented in Table 3. White blood cell count showed significant difference ($p<0.05$) with 12% inclusion level having the highest value. The white blood cell values obtained were significantly ($P<005$) influenced by dietary treatments. The values obtained were lower than 10.02-11.35×10^3µl reported by Alagbe (2018) but were within the normal range for rabbits reported by Ahamefule *et al*. (2018). High white blood cell count is usually associated with microbial infection or the presence of foreign body antigen in the circulatory system (Rose, 2009). The experimental animals used for this study did not appear to have suffered from microbial infection or the presence of foreign body antigen, because the white blood cell values were within the normal range (5.5×10^3µl -12.5×10^3µl). Red blood cell count values were significantly ($P<0.05$) influenced by levels of inclusion of water melon rind. The values fell

within the range among the treatments but 0% inclusion level had the highest value(6.46×10^6µl) while 4% inclusion level had the lowest(5.40×106/µl) value. Higher values of red blood cell in the dietary treatments fell within the recommended range reported in the literatures indicated that animals were sufficiently nourished by the diets for healthy growth. Values of haemoglobin obtained indicated significant (P<0.05) values among the treatments. The values fell within the normal range 10.40-17.40g/l reported by Alagbe (2018). Values obtained for packed cell volume (PCV) significantly (P<0.05)fell between 31.10% and 42.00%. The observed values were within the normal range for rabbit (35-60%) as reported byFanimo e*t al.* (2003) and Flecknell (2000). Lymphocytes showed significant difference (P<0.05) among all the treatments ranging from 68.50% to 77.55%. These values were higher than 50.12%-52.33% reported by Alagbe (2018). The parameters observed in this study were within the normal range for rabbit reported by Rose (2009). Mean corpuscular haemoglobin (MCH) and lymphocytes values observed in this study were significantly (P<0.05) influenced by dietary treatments and fell within the normal ranges for rabbits reported by Flecknell (2000). Variations in values obtained by different researcher might be attributed to nature of diets, sex of the animals, stress condition of the animals as well as processing methods of the diets. Togun and Oseni (2005) reported that haematological analysis is useful in disease diagnosis and nutritional stress; it also provides the opportunity to clinically investigate the presence of several metabolites and other constituent in the body. This gives credence to the investigations carried out in this study that the experimental animals were not diagnosed of any disease and were not nutritionally stressed.

Table 3: Parameters of Weaned Rabbits Fed Graded Levels of Watermelon Rind

Parameters	0%	4%	8%	12%	LOS	SEM
White blood cell ($\times10^3$µl)	7.80^{ab}	6.60^{bc}	5.30^{c}	9.05^{a}	*	0.86
Red blood cell ($\times10^6$µl)	6.46^{a}	5.40^{b}	5.68^{b}	5.68^{b}	*	0.31
Haemoglobin (g/dl)	11.60^{a}	10.80^{b}	10.20^{c}	10.75^{b}	*	0.39
Packed cell volume (%)	42.00^{a}	31.10^{c}	34.00^{bc}	37.40^{b}	*	2.04
Mean corpuscular haemoglobin (pg)	17.95^{c}	20.00^{a}	18.30^{b}	18.95^{b}	*	0.39
Mean corpuscular volume (fl)	65.00^{a}	57.60^{b}	60.60^{b}	68.85^{a}	*	1.41
Mean corpuscular haemoglobin concentration (g/dl)	27.65^{c}	34.70^{a}	30.15^{b}	28.75^{bc}	*	1.03
Lymphocytes (%)	67.50^{b}	68.90^{b}	74.60^{a}	77.55^{a}	*	1.63

^{abc}= Means with different superscripts on the same row differ significantly LOS = Level of significance* = significant at (P<0.05).

CONCLUSION AND RECOMMENDATION

Based on the results garnered from this study, WMR can be included in the diet of weaned rabbits up to 12% without any deleterious effect on their health status.

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