
HEMATOLOGY AND SERUM BIOCHEMISTRY OF MONGREL RABBITS FED SUPPLEMENTARY GROUNDNUT HAULMS

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ABSTRACT

An experiment was conducted in teaching and research farm Binyaminu Usman Polytechnic, Hadejia. To determine the effect of groundnut haulms supplementation in the diet of mongrel rabbit twelve Weaned Mongrel Rabbit was purchased from Hadejia market (14 weeks average). The experimental animal were allotted in to 4 deity treatment (supplemented with groundnut haulms) which are T1, T2, T3 and T4 0%, 5%, 10% and 15% respectably. Twelve rabbit was use with three rabbit per treatment. The experiment lasted for 6 weeks water and feed was provided ad libitum. Antibiotic and multivitamin was provided to experimental rabbit to tracts mange and other infectious disease. Blood sample was collected after slaughter in using EDTA and Non EDTA bottle and transported to the laboratory for blood metabolite analysis Results of haematological parameters showed there were significant ($P<0.05$) differences in packed cell volume (PCV%), haemoglobin (hbm/dl), red blood cells (RBCx10¹²/L), white blood cells (WBCx10⁹/L), neutrophils (%), while lymphocytes(%), eosinophil(%), monocyte(%), basophils(%) and mean corpuscular volume(MCH fl) were not different ($P>0.05$) across the treatments. All data generated was subjected to analysis of variance (ANOVA) were there were significance ($P>0.05$) differences means was separated by using Duncan multiples range using SAS. It is concluded that; groundnut haulms is safe and can be supplemented partially or fully as protein sources and use as a supplementation in the diets of weaned rabbits without no adverse effects on the heamatological and biochemical indices of growing rabbit.

Key-words: Groundnut, supplementation, Heamatology, Serum and Mongrel Rabbit

INTRODUCTION

Rabbit (*Cryptolagus cuniculus*) has been identified as the one of the animals that can be reared successfully at family level (FAO, 2016) because of favorable biological characteristics as most monogastric species short gestation interval and a high prolificacy (Beaumont *et al.*, 2002). Rabbit is also reputable in the field of medicine research and biotechnological application (Oladunjoye *et al.*, 2006) and can be therefore be categorized as multi-purpose animals for feed, easily constructed housing and do not compete with humans for cereals as strongly as chickens or pigs for instance (Nister *et al.*, 2013) Rabbit meat has amazing protein (about 22%) low fat (4%) and cholesterol (5%) and therefore has health promoting qualities Oladunjoye *et al.*, 2006; Nister *et al.*, 2013). Rabbit have extraordinary reproductive potentials because of their rapid growth rate short gestation period and capability to breed immediately after parturition (Aduku and Olukasi, 1990). Animals blood parameters provides the opportunity to analyze it's physiological nutritional and pathological status and it's acids in diagnosing nutritional and can be associated with certain production characteristics for examples, packed cell volume and haemaglobin have been reported as nutritional indicator which are largely influence by the diets feed to the animals.

MATERIALS AND METHODS

Description of the study area

The survey was conducted at Hadejia local government area Jigawa State. Hadejia town is the capital of Hadejia and is located in the central part of the emirate. Hadejia lies between 10°10'E longitude and between 12° 25'N and 12°30'N latitude. The town is served by federal trunks roads, linking it to Nguru on the East, Kano on the North West. Katagun on the South and Dutse (The capital city of Jigawa) on the South West.

Experimental Diets

Four experimental diets were formulated and designed as T1, T2 T3, and T4. Diet 1 contain (0% Groundnut haulms) serve as control, while the remaining diets contain groundnut haulms supplementation at 5 10 and 15% respectively.

Experimental Animals and Their Management

Total of 12 mongrels weaned rabbits of an averagely equal weight (1.5 kg) was purchased from the market for the experiments. The rabbit was balanced for weight and their fore allocated in to four treatments with three replications. The rabbit were housed individually in wire mesh cage. The animals were treated against external parasite. Water was supplied *ad-libitum*. Feeders were cleaned after every two days to avoid the buildup of diseases. The rabbits were weighted before the next morning.

Experimental Design and Treatment

Experiment was laid in to completely randomized design (CRD). The 12 experimental animals were randomly allocated to four treatments and replicated three times, with one rabbits per replication. The rabbits were housed in cage hutch partition with wire mesh in to twelve compartments as capable to occupy one rabbit per compartment as experimental unit.

Data Collection

Blood sample was collected at the end of the feeding trial for hematological and serum biochemistry analysis. All three animals from each treatment were used for blood sampling. The blood samples were drawn via the jugular vein using sterile 18 gauge needle and syringe. Bleeding was done early in the morning before feeding. About 10 mL of the blood was collected from each animal which was used for the indices. Five mL of each blood sample collected was placed into a bottle containing ethylene diamine tetra acetic acid (EDTA) as an anticoagulant for hematological studies. The remaining 5 mL was placed in a universal bottle and allowed to stand for about 2 hours at room temperature, this allows for coagulation to take place. The blood sample in the universal bottle was thereafter be centrifuged at x 3000 rpm for 20 minutes to separate and decent the serum. The serum was stored at -20°C for biochemical analysis (Nister *et al.*, 2013).

Haematological parameters determination

Blood sample was determined at Aminu Kano Teaching Hospital diagnosis laboratory and whole blood sample in ethylene diaminetetraacetic acid (EDTA) bottle was analyzed for heamoglobin (Hb) content using cyamethemoglobin method (Coles, 1986).

Serum metabolites

Blood sample collected for serum biochemical analysis was allowed to stand for two hours at 20 °C, this allows for coagulation to take place, thereafter centrifuged for 5-10 minutes at 3000 rpm to separate serum from blood cells (Coles 1986).

Statistical Analysis

The data obtained were coded to analysis of variance (ANOVA) using the procedure of SAS (2000). Means that are significantly different, Duncan multiple ranges (DMR) were used to compare the means at 5% level of probability.

Table 1: Heamatological Indices of rabbit supplemented with groundnut haulms

Parameters	Treatments				SEM
	T 1 (0%)	T 2 (5%)	T 3 (10%)	T 4 (15%)	
PCV (%)	33.400 ^c	36.00 ^{ab}	28.337 ^b	35.667 ^{ab}	1.172
RBC (x/10)	2.243 ^c	3.1267 ^{ab}	2.5600 ^b	2.6033 ^b	0.140
MCB (l/l)	135.483 ^a	141.833 ^a	144.600 ^a	148.567 ^a	2.178
MCHC (g/dl)	289.00 ^a	336.00 ^a	335.00 ^a	307.00 ^a	9.974
MCH (pg)	42.467 ^a	42.767 ^a	42.833 ^a	42.000 ^a	0.347
WBC (x10%)	75.800 ^a	65.233 ^{ab}	62.767 ^b	65.200 ^{ab}	1.977
Neutrophil (%)	12.033 ^b	12.6607 ^{ab}	12.6667 ^{ab}	12.833 ^{ab}	0.299
Lymphocytes (%)	83.667 ^a	79.667 ^a	85.333 ^a	74.333 ^a	2.359
Monocytes (%)	4.6700 ^a	5.6333 ^a	5.6667 ^a	5.000 ^a	0.302
Platelet count (x10%)	131.67 ^a	124.00 ^a	119.67 ^a	124.67 ^a	3.228
Test for Hb (g/dl)	11.433 ^b	11.733 ^{ab}	11.533 ^b	11.433 ^b	0.233

abc Means within the same rows with different superscript are significantly ($p < 0.05$) different. SEM =standard error of mean

Table 2: Serum biochemistry of rabbit supplemented with groundnut haulms

Parameters	Treatments				SEM
	T 1 (0%)	T 2 (5%)	T 3 (10%)	T 4 (15%)	
Urea (mmol/L)	5.900 ^a	5.667 ^a	18.800 ^a	5.133 ^a	2.861
Na (mmol/L)	136.00 ^a	135.00 ^a	131.00 ^a	136.33 ^a	0.915
K (mmol/L)	3.153 ^a	2.900 ^a	3.167 ^a	6.867 ^a	0.611
HCo3 (mmol/L)	25.00 ^a	25.667 ^a	25.333 ^a	22.00 ^a	0.957
CREATININE (mmol/L)	88.333 ^a	75.00 ^a	58.333 ^b	76.667 ^a	1.866
TRIG (mmol/L)	1.353 ^a	1.343 ^a	1.410 ^a	1.320 ^a	0.029
LDL (mmol/L)	4.446 ^a	3.993 ^a	3.976 ^a	4.260 ^a	0.047
BIL TOTAL (umol/L)	12.133 ^a	14.00 ^a	13.867 ^a	13.933 ^a	0.325
Total Protein (g/L)	109.00 ^a	101.67 ^a	94.33 ^a	101.00 ^a	3.280
ALBUMIN (g/L)	60.667 ^a	60.667 ^a	52.167 ^a	52.667 ^a	1.075
Globulin (g/L)	43.667 ^a	46.867 ^a	44.773 ^a	53.367 ^a	1.557

abc Means within the same rows with different superscript are significantly ($p < 0.05$) different. SEM = standard error of mean.

RESULT AND DISCUSSION

This study revealed that all experimental diets have significant effect on hematology of experiment rabbit across the treatment values recorded and supplementation level of 5, 10 and 15%. This is an indication that groundnut haulms had positive impacts on the hemopoietic center of rabbit. However, the red blood cells in all the treatments fell within the normal range as reported by Onyimonyi, and Enes (2003) this may have been attributed to the control of mange infection in all the experimental animals at the early stage of the experiment. White blood cell count are a rough indications of immune status of an animals it was observed that the WBC of all the experimental rabbit were within the normal range and its signifies that groundnut haulms had no depressing effect on the immune response of the experimental rabbits. Serum biochemical analysis is used to determine the level of heart attack lever damage and to evaluate protein quality and acid requirement in animals (Nister *et al.*, 2013). The blood urea range from 5.90 – 18.80mmol/l the value were higher than the range (2.50 to 5.80mmol/L) reported by Odunsi, (2003) when they fed sesame seed meal to rabbit in semi-arid environment. The albumin values showed in significant difference ($P > 0.05$) among treatments. And the value ranges between 52.66 – 66.66 groundnuts which fall within the normal range of 20.5 to 40.0 g/dl reported by Odunsi, (2003). Abnormal serum albumin usually indicates an alteration of normal systematic protein utilization (Nister *et al.*, 2013) and low dietary protein intake (Odunsi, 2003).

CONCLUSION

It is concluded that; groundnut haulms is safe and can be supplemented partially or fully as protein sources and use as a supplementation in the diets of weaned rabbits without adverse effects on the hematological and biochemical indices of growing rabbit.

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