Feed additive effect of jatropha (*jatropha tangorensis*) on haematology of growing rabbits

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ABSTRACT

This study was carried out to determine the effect of Jatropha (*Jatropha tangorensis*) as feed additive on the hacmotology of growing rabbits. A total number of sixteen rabbits were randomly assigned to four dietary treatments (T_1, T_2, T_3 and T_4) in a Completely Randomized Design (CRD) consisting of 4 rabbits per treatment with 2 rabbits per replicate, the rabbits were given a standard routine practices throughout the experiment that lasted for a period of 8 weeks. The Jatropha was included at graded levels of 0g, 50g, 70g, 90g per kg feed in T_1, T_2, T_3 and T_4 respectively. At the end of the experiment, one rabbit was randomly selected per treatment replicate and the blood sample was collected for haematological analysis. There was no significant difference in the haematological values, but the values falls within the normal range and mean values of rabbits. Therefore the results shows that the addition of Jatropha as feed additive to rabbit diets do not alter their haematological parameters.

Keywords: Feed additive, Jatropha, haematology and Rabbit

INTRODUCTION

To maximize food production and meet up protein requirements in Nigeria, feasible preference need to be investigate and evaluate. Rabbit farming in Nigeria is faced with limitless problems which have resulted to a coarse scarcity to meet up the change in population in our country. Consumption of animal protein remains at about 6.0 – 8.4g/head/ day which is below 13.5 per day prescribed by the WHO (Egbunike, 1997).

Rabbit production is a genuine approach of alleviation animal protein deficiency in Nigeria (Ajala and Balogun, 2004). The rabbit has enormous potential and good attributes which includes high growth rate, high efficiency in converting forage to meet short gestation period and relative low cost of production, low cholesterols levels, protein level at about 20.8 and its consumption is bare of cultural and religious biases (Biobaku and Oguntona, 1997).

Jatropha is a perennial and multipurpose shrubs or tree, similar to the cassava plant (Elbehri *et al.*, 2013). It is oil plant belonging to the Euthorbiaccae Family which consists of more than 175 genus species. They have very good medicinal potentials which meet the standard requirement for drug formation and serves as a good source of energy and nutrients except for the presence of anti-nutritional elements predominate in the leaves,(Atamgba *et al*., 2015). Jatropha is widely grown in different parts of the world and has been used to promote health. Numerous analysis of jatropha has revealed the presence of more than 50 different demand constituents. Recent studies in broiler showed that using jatropha in blend with other medical parts and as additive had positive effects on performance, carcass traits, blood biochemistry and immunity parameters.

The haematlogical constituent of an animal reflects the physical responsiveness of the animal to its internal and external environments (Esonu *et al.,* 2001). Haematological and biochemical parameters analyzed are influenced

by many factors such as breed , age, gender, feeding, environmental conditions, disorders, stress, pregnancy and cardiac thythm (Chineke *et al.,* 2006, Melillo, 2007, Jeklova *et al*, 2009, Abdel-Azeem *et al,* 2010).

MATERIALS AND METHODS

Experimental Location and Duration

The experiment was carried out at the rabbit unit of the University of Port- Harcourt Research and Demonstration Farm Choba, Port Harcourt Rivers State and it lasted for 8 weeks.

Experimental Animals housing and Management

A total number of sixteen (16) Chinchilla rabbits (aged 6-7 weeks old) were used for this experiment. The rabbits were procured from the Rabbitry Unit of the University of Port-Harcourt Research and Demonstration Farm Choba and all the animals in each treatment were identified on individual basis using labeled tags. The rabbits were kept in a well wired merged cage for easy collection, feeding and cleaning. Feeders and drinkers were cleaned daily before fresh feed and water was added all routine management was observed and they were administered other antibiotics and vitamins drugs.

Experimental Diet

The whole fresh jatropha (*j. tangorensis*) Leaf was harvested around the premises of the University of Port Harcourt Research and Demonstration Farm, Port-Harcourt. They were harvested and washed then oven dried at 70°C for two hours then milled into powered form. The milled jatropha (*j. tangorensis*) was stored in air tight clean and protected containers to avoid the contact of micro-organisms which can cause contamination. The jatropha Leaf was added as additive to the formulated concentrate at 0.0g, 50.0g, 70.0g and 90.0g for T_1, T_2, T_3, T_4, respectively then offered to the rabbits.

Experimental Procedure and Design

16 growing rabbits was randomly selected and divided into four (4) treatment groups (T_1 T_2 T_3 T_4). There were 4 rabbits per treatment and 2 replicate, each replicate consists of 2 rabbits in a completely randomized design (CRD). The dietary treatment consists of four graded levels of jatropha (*J. tangorensis*) meals. The first treatment (control) which had Og of jatropha and other treatments (T_2, T_3, T_4) which had 50g, 70g, 90g, in the formulated feed respectively was given to the animal.

Parameters Measured

Blood Collection

At the end of the (8th week) of the experiments one rabbit was randomly selected from each group. 2ml of blood samples were collected from the veins in the ears of the rabbits with the use of sterile needles (5rn1 syringe and 23G needles). The blood samples were gradually expelled into graduated tube containing K_3-EDTA (ethylene diamine tetracetic acid) as anticoagulant for hematological analysis which includes PVC. RBC. WBC, HB, PLT., N and L.

Statistical Analysis

All data obtained was subjected to the Analysis of Variance (ANOVA) according to Steel and Torrie (1980) and their means separated using Duncan Multiple Range Test (DMRT) according to Duncan (1955) using the statistical package for Social Science (SPSS) software.

RESULTS AND DISCUSSION

Hematological studies

The results of the hematological indices are presented in Table 2. There were significant differences ($P>0.05$) among treatments for packed cell volume (PCV) and the hemoglobin. Though, there were significant difference in the packed cell volume, it was within the normal range of 31 to 50% as reported by NseAbasi *et al.* (2014). Also, the hemoglobin (Hb) increased with increase in the levels of *jatropha tangorensis* leaf with the lowest value (10.17g/d1) for T1 and highest values (12.59g/d1) for T4. These values were within the range of 10.67 to 12.60g/dL by Njidda *et al.,* (2006). Packed Cell Volume and haemoglobin are major indices for evaluating circulatory erythrocytes, and are significant in the diagnosis of anaemia and also serve as useful indices of the bone marrow capacity to produce red blood cells as in mammals (Awodi *et al.,* 2005; Chineke *et al.,* 2006). The results show that the experimental diets contain good quality proteins (Kumar *et al*., 2014) that met the rabbits nutritional requirements

The values of the WBC counts also increased with increase level of *jatropha tangorensis* leaf ($P<0.05$) with T4 having the highest value of 5.8 x 103mm3 and T1 having the lowest value of 4.6 x 10^3/mm^3. The WBC counts was within the range of 4.5 to 11.0 x 10^3/mm^3 reported by NseAbasi *et al.* (2014). This indicates that the rabbits are in very good condition. The RBC counts, platelets, neutrophils and lymphocytes showed no significant difference ($P<0.05$) among treatments.

Table 1: Feed Composition and Calculated Analysis of Experimental Diet

Ingredient	T_1	T_2	T_3	T_4
Yellow Maize	39.0	39.0	39.0	38.47
Soybean meal	16.0	16.0	15.74	15.74
Groundnut cake	5.34	5.34	5.34	5.34
Wheat bran	22.67	22	21.87	21.87
Fish meal	4.0	4.0	4.0	4.0
Vit/Min	0.32	0.32	0.32	0.32
Palm oil	2.0	2.0	2.0	2.0
Palm kennel cake	10.67	10.67	10.67	10.67
Total	**100**	**100**	**100**	**100**
Jatropha	**0g**	**50g**	**70g**	**90g**
Calculated Analysis	T_1(0g)	T_2(50g)	T_3(70g)	T_4(90g)
Crude protein	20.983	21.095	21.068	21.156
ME (Kcal/kg)	2636.14	2662.93	2671.24	2672.23
Crude Fibre (%)	6.237	6.310	6.356	6.432
Fat	5.747	5.841	5.888	5.931
Calcium (%)	0.3672	0.3735	0.3757	0.3790
Potassium (%)	0.6376	0.6245	0.6235	0.6246

Table 2: The effect of treatment on the haematological parameters of weaner

Haematological parameters	T_1(0g of jatropha/kg of feed)	T_2(50g of jatropha/kg of feed)	T_3(70g of jatropha/kg of feed)	T_4(90g of Jatropha / kg of feed)	SEM
HB(g/dL)	10.17^{ab}	10.20^a	11.36^a	12.63^b	0.431
PVC (%)	31.00^{ab}	32.00^a	34.00^a	34.50^b	1.302
WBC (x10^9/L)	4.60^{ab}	4.90^a	5.20^b	5.80^{ab}	0.123
RBC (x10^{12}/L)	3.80^c	4.00^b	3.90^a	3.92^d	0.213
Platelet(x10^9/L)	190.0^{ab}	180.0^b	195.0^a	1900^{ab}	10.42
N (%)	25.00^b	27.50^b	35.00^{ab}	47.50^a	3.62
L. (%)	75.00^a	72.50^a	65.00^{ab}	52.50^b	3.629

a, b, c, d, means along the same column with different superscripts differ significant ($p > 0.05$).

References

Abdel-Azeem A. S., Abdel –Azeem A. M. , Darwish A.A., Omar E.M. (2010). Haematological and biochemical observations in four pure breeds of rabbits and their crosses under Egyptian environment conditions. World Rabbit Sci., 18: 103 – 110

Ajala, M. K and Balogun , J. K . (2004). Economics of rabbit production in Zaria, Kaduna State. Tropical J. Anim Sci., 7 (1): 1-10.

Awodi, S, JO Ayo, AD Atodo and T Dzende (2005). Some haematological parameters and the erythrocyte osmotic fragility in the laughing Dove (*Streptopella Senegalensis*) and the village weaver bird (*Ploceus Cucullatus*). Proc. Of 10th Annual conference of Animal Science Association of Nigeria. Dairo FAS, SOK Fajemilehin and GE Onibi (Eds), held on 12– 15th September at University of Ado-Ekiti, Nigeria, pp: 384–387.

Atamgba A.A., Margaret A.A., Kayoed D and Amonor J. W (2015). The Biochemical significance of the polychemical, proximate, mineral composition of leaf, stem bark and root of Jatropha. Asia Pac. J. Biomed 2015: 650 – 567.

Biobaku , W. O. and , E.B. (1997). The effects of feeding multi – nutrient mini blocks and pelleted diet on the growth of rabbits. Nig. J. Anim. Prod., 24 (2): 147 – 149.

Chineke, C.A., Ologun, A. G. and Ikeobi, C., O, N (2006). Haematological parameters in rabbit breeds a crosses in humid tropics. Pakistan Journal of Biological science Sci. 9:2102 – 2106.

Elbehir, A., Segerstedt, A., Liu, P.(2013). A global assessment of sustainability biofuels and sustainability challenge: issues, trends and policies for biofuels and reluted feedstocks. FOA, Rome, Italy.

Jeklova E., Leva L., Knotigova P., Faldyna M. (2009). Age-related changes in selected haematology parameters in rabbits. Res. Vet. Sci., 86: 525 – 528.

Melillo A. 2007. Rabbit clinical pathology, J Exot. Pet Med., 16: 135 - 145

NseAbasi N. Etim, Mary E. Williams1, Uduak Akpabio, and Edem E. A. Offiong (2014). Haematological Parameters and Factors Affecting Their Values . Agricultural Science Volume 2, Issue 1 (2014), Published by Science and Education Centre of North America, pp37-47.

Njidda AA, JU Igwebuike and CE Isidahomeh, 2006: Haematological parameters and carcass characteristic of weanlig rabbits fed graded levels of molasses. Global J Agri Sci, 5: 167–172.