



RESEARCH ARTICLE

Effect of Feeding Fermented Taro Cocoyam Meal (*Colocasia esulenta* var. *Esulenta*) on Haematological Parameters of Lying Quails (*Coturnix coturnix Japonica*)

Abang FB¹, AA Ayuk² and BI Okon²

¹Department of Animal production, college of Animal science University of Agriculture Makurdi – Makurdi, Nigeria;

²Department of Animal science, Faculty of Agriculture, Forestry and Wildlife Res. Mgt, University of Calabar, Calabar, Nigeria

ARTICLE INFO

Received: June 12, 2013
Revised: July 09, 2013
Accepted: August 04, 2013

Key words:

48 h fermented taro cocoyam
Haematological parameters
Japanese quails
Maize

*Corresponding Address:

Abang FB
egahijoseph@yahoo.com

ABSTRACT

Two hundred and twenty five Japanese quails (*Coturnix coturnix Japonica*) were randomly allotted to five dietary treatments (I-V) of 36 hens and 9 cockerels each. Each treatment was replicated thrice with 12 hens and 3 cockerels per replicate. In each of the five diets, 48- h fermented taro cocoyam meal (*Colocasia esculenta* var. *esulenta*) replaced maize at 0%, 25% 75% and 100% as treatments I, II, III, IV and V, respectively. The Packed cell volume (PCV), Haemoglobin concentration (Hb), White blood cell (WBC) Red blood cell (RBC), total differential counts were determined at the 70th day (that is, 10th week). Marked leukocytosis and lymphocytosis were observed across treatments. The Red blood cell count was seen to have reduced slightly in all the treatments. However, Hb, PCV, Neutrophils, Basophils, Eosinophiles and monocytes of quails fed fermented taro cocoyam were within normal range. The results revealed that, the abnormalities observed were not limited to quails fed fermented taro cocoyam, thereby, confirming that, fermented taro cocoyam was not responsible for the abnormalities observed in haematological parameters of laying quails.

Cite This Article as: Abang FB, AA Ayuk and BI Okon, 2013. Effect of feeding fermented Taro cocoyam meal (*colocasia esulenta* var. *esulenta*) on haematological parameters of lying quails (*Coturnix coturnix Japonica*). Inter J Agri Biosci, 2(4): 168-169. www.ijagbio.com

INTRODUCTION

High cost and scarcity of formulated feed is one of the problems affecting the livestock industry in Nigeria. The problem emanated as a result of high competition between man and monogastric animals for grain sources (Agunbiade *et al.*, 2002), hence the need to assess the potentiality of identified non-conventional energy sources to meet the increasing feed demand of our poultry industry to enable it increase its productivity and profitability since these alternative feed stuffs are cheap, readily available and less competed for by man and industry (Akinmutimi, 2004).

One of such is cocoyam. Cocoyam is a tuberous crop that has carbohydrate (energy) as its major nutrient with trace protein and trace minerals and their associated anti-nutritional factor which may be rid-off through proper processing (Okon *et al.*, 2007).

Even though, the proportion of dress weight to live weight is used as a measure of productivity in farm animals (Ijaiya and Fasinya, 2004), it is equally very important to consider the health status of animals used in

various feeding trials. One of the ways of assessing it, is by the use of haematological studies (Ojebiyi *et al.*, 2007, Sobayo *et al.* 2013). The aim of this study therefore is to evaluate the effect of replacing maize with (48 h) fermented taro cocoyam meal on the haematological parameters of laying quails.

MATERIALS AND METHODS

A total of 225 quails (180 hens and 45 cockerels) were studied over a period of ten weeks (70days). The birds were raised in Cross River University of Technology, Calabar and randomly assigned to five dietary treatments I, II, III, IV, and V formulated with 48hours fermented taro cocoyam meal at 0%, 25%, 50%, 75%, and 100% levels respectively (Table 1). Each treatment had 3 replicates with 12 hens and 9 cockerels per replicate. The experimental quails were housed in three tier cages made up of wood and wire mesh, water was supplied ad lib for 10 weeks but a known quantity of feed was served on daily basis and was increased weekly. At the end of the experiment, three (3) laying quails per

treatment (one from each replicate) were randomly selected weighed and slaughtered using a sharp knife. The blood samples were collected at slaughter into bottles coated with ethylene diamine tetracetic acid (EDTA) as an anti-coagulant for hematological assay. The samples were then analyzed for packed cell volume (PCV) using the micro haematocrit method (Coles, 1986). Haemoglobin concentration (HB) was determined by the cyanomet haemoglobin method (Kachmar, 1970). Total white blood cell (WBC) count was determined using the standard method described by Schalm *et al.* (1975). Differential leucocytes count was obtained by Lishman staining technique and counting with differential cell counter (Schalm *et al.*, 1975) The results were interpreted using the normal reference range of haematological test for female Japanese quails (Campbell, 1988) Table 2.

Table 1: Normal reference range table of haematological test for female quails

Parameters	Normal range
Mean Corpuscular Volume (MCV)	78 to 101fL
Mean Cell Haemoglobin Concentration (MCHC)	31.35gm/dL
Packed Cell Volume (PCV)	37 to 69%
Haemoglobin (Hb)	12.0 to 15.2gm/dL
Red Blood Cell (RBC)	3.8 to 5.5x10 ⁶ /μL
White blood Cell (WBC)	4.1 to 10.9x10 ³ /μL
Neutrophils (%)	0 to 10%
Lymphocytes	20 to 50%
Monocytes	2 to 12%
Eosinophils	0 to 7%
Basophils	0 to 2%
Platelets	140 to 450x10 ³ /μL

Source: Campbell (1988).

Table 2: Hematological parameters for laying quails fed varying levels of 48 h fermented taro cocoyam meal (*Colocasia esculenta* var. *esculenta*)

Parameters	Treatment levels				
	0%	25%	50%	75%	100%
WBCx10 ³ /μL	20.95	20.40	20.50	20.80	20.25
RBCx10 ⁶ /μL	3.69	3.60	3.0	3.0	3.0
HB(gm/dL)	14.80	13.60	14.00	13.00	12.60
PCV(%)	46.70	46.90	44.00	40.00	38.50
Differential count:					
Lymphocytes	71.00	68.00	72.00	70.00	66.00
Neutrophils	5.00	10.00	5.00	8.00	10.00
Monocytes	2.00	2.00	2.00	2.00	2.00
Eosinophils	2.00	1.00	1.00	1.00	2.00
Basophils	0.00	0.00	0.00	0.00	0.00

RESULTS AND DISCUSSION

The result in Table 3 showed that, there was marked leukocytosis (increase in total white blood cell) and lymphocytes (increase in number of lymphocytes) across treatments. Since the abnormal increase in these parameters were not limited to quails fed fermented taro cocoyam meal, one could infer that, the increase (20.25 to 20.95 10³/μL and 66.0 to 72.0% for WBC and lymphocytes respectively) could be as a result of the intermittent treatment of quails with antibiotics (pantery) in drinking water. The normal reference range is 4.1 to 10.9 x 10³/μL and 20.0 to 50.0% for WBC and lymphocytes respectively.

The results of the Red blood cells were below the normal range (3.8 to 5.5x10⁶/μL) in all the treatments. This may be as a result of antibiotic which may have destroyed most of the RBCs. Haemoglobin and packed cell volume was within normal range (12.0 to 15.2g/dL and 37.0 to 69.0% respectively). This implies that the amount of phytate present in the fermented cocoyam was insufficient to limit the bio availability of iron (Fe) as Fe is a major constituent of haemoglobin.

It was observed that, fermented taro cocoyam had no effect on the Neutrophils, Basophils Eosinophils and monocytes as the result were within the normal range (0 to 10%, 0 to 2%, 0 to 7% and 0 to 12%, respectively).

Conclusion

The result of this findings revealed that the abnormalities observed in this experiment were not limited to quails fed fermented taro cocoyam, thereby confirming that fermented cocoyam did not affect the haematological parameter of laying quails.

REFERENCES

- Agunbiade JA, RA Bello and OA Adeyemi, 2002. Performance characteristics of weaner rabbits on cassava peel based balance diets. Nigerian Journal of Animal Production, 29: 171-175.
- Akinmutimi AH, 2004. Effects of cooking period on the nutrient composition of velvet beans (*Mucuna pruscens*). Proceedings of the 32nd Annual Conference of the Nigerian Society for Animal Production, March 18-21, 2007 Calabar, Nigeria.
- Campbell TW, 1988. Avian Haematology and Cytology (1st Edition) Iowa State University Press, Ames, USA
- Coles EH, 1986. Determination of packed Cell volume In: Coles, E.H. Edition, Veterinary Clinical Pathology, pp: 17-1s9.
- Ijaiya AT and OOA Fasanya, 2004. Effect of varying levels of dietary protein on the carcass characteristic of growing rabbits. Nigerian Journal of Animal Production, 3: 207-210.
- Kachmar JF, 1970. Determination of blood haemoglobin by the cyanomet haemoglobin procedure, In: Tietz New Edition, Fundamental of Clinical Chemistry, WB Saunders Company, Philadelphia, pp: 268-269.
- Sobayo RA, OA Adeyemi, AO Oso, JO Fafiolu, GS Daramola, ID Ogunade and OM Odetola, 2013. Hematological, Serum and Carcass Characteristics of broiler Chicken fed graded levels of *Garcinia kola* (bitter kola) use as phytobiotics, Niger J Agri, 40: 48-56.
- Okon BI, MB Obi and AA Ayuk, 2007. Performance of quails (*Coturnix coturnix japonica*) fed graded levels of boiled sun-dried taro cocoyam (*Colocasia esculenta*) as a replacement of maize, Medwell Online Agricultural journal. 2: 654-657.
- Ojebiyi OO, GO Farinu, VA Togun, JA Akinlade, OA Aderinmola, TB Olayemi and OO Moronfolu, 2007. Studies on growth and haematological attributes of weaned rabbits fed graded levels of sun-dried cassava peel-blood meal mixture. Proceedings of the 32nd Annual Conference of the society of Animal Production, March, 18-21.
- Schalm OW, NC Joan and EJ Carou, 1975. Veterinary haematology, 3rd Edition. Lea and Fabiger, Philadelphia, pp: 19-25.