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HAEMATOLOGICAL AND SERUM BIOCHEMICAL INDICES OF JAPANESE QUAILS *(COTURNIX COTURNIX JAPONICA)* FED GRADED LEVELS OF CASSAVA PEEL MEAL FORTIFIED WITH DRIED BREWERS GRAINS.

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ABSTRACT

One hundred and thirty two (132) Japanese Quails aged four weeks were used for the study. They were divided into four (4) groups of 33 birds each used in a 6 weeks feeding trails to evaluate the blood biochemistry and haematology of Japanese Quails fed cassava peel meal fortified with Dried Brewers grains (CPMFBDG). The CPMFDBG which contained 20% crude protein was included at 0%, 10%, 20% and 30% level in diets 1, 2,3 and 4 respectively to replace maize in the diets. The haematological indices measured include packed cell volume (PCV) haemoglobin Concentration (Hb) red blood cells (RBC) white blood cell (wbc) mean corpuscular volume (mcv) mean haemoglobin concentration (MHC) and Mean corpuscular haemoglobin concentration (MCHC). The result indicated insignificant difference ($p > 0.05$) among the groups. Biochemical indices such as total protein, globulin and Albumin were equally not effected ($p>0.05$) by the treatment diet. The result of cholesterol showed no significant different ($p>0.05$) among treatment. These results underline the usefulness of CPMFDBG for Japanese quails feeding. The normal indices obtained in this study indicated that up to 30% CPMFDBG could be incorporated into the diets of Japanese Quails without compromising the health status of the birds.

Keywords: *Cassava peel meal fortified with Died Brewers grains, Japanese Quails, blood parameters.*

INRODUCTION

Generally, both the serum biochemistry and haematological Components of the blood are influenced by the quantity and quality of feed and also the level of ant-nutritional elements or factors present in the feed (Akinmutimi, 2004) Biochemical Components are sensitive to elements of toxicity in feeds. They can also be used to monitor protein quality of feeds, haematological Components of the blood are also valuable in monitoring feed toxicity especially with feed constituents that affect the formation of blood (oyawoye and Ogunkunle, 1998). Feed supply has remained a major constraints in Livestock production due to the over increasing cost of Conventional feedstuffs occasioned by the competition between man and livestock (Amaefule *et al,* 2004) consequently the price of the finished products (meat and egg) are not affordable hence the reduce protein intake. An average Nigeria does not consume enough of protein of animal origin that nourishes the body and needed for tissue development, repairs and healthy living (FAO, 1992) serious malnutrition has been reported among children and pregnant women of the poor/low class people that form the majority in the society (Taiwo *et al* 2006). Therefore any attempt to substitute the conventional feedstuff in poultry feed will greatly reduce cost of production. The Japanese quail *(Cotumix Cotumix Japonica)* which is now being bred for meat and eggs has the potential to serve as an excellent and cheap source of

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animal protein for Nigerians (Babangida and ubosi, 2006) quails are so precocious that they can lay eggs when hardly more than five weeks old and it is said that about twenty of them are sufficient to keep an average family in eggs all year round. The quail meat is renowned for its low Caloric value in addition to having high quality protein of high biological value (Haruna *et al,* 1997). Therefore research efforts should be geared towards utilization of alternative feed sources to improve cost effectiveness or gain in the finished products. In search for cheapest, locally available and nutritionally viable alternative feed ingredients is agro-industrial by-products and farm waste among which, is dried brewers grain and Cassava peels meal (DBG, CPM) (Mufwa *et al.* 2011) efforts therefore, were made in this study to assess the effect of feeding graded levels of Cassava peel meal fortified with Dried Brewers Grain on haematological and biochemical blood components of Japanese Quails *(Coturnix Coturnix Japonica).*

MATERIALS AND METHODS

Experimental site: This study was carried out at the poultry unit of Teaching and Research Farm College of Agriculture Jalingo. The geography and location is as described in (mufwa *et al;* 2011).

Management of the experimental stock: One hundred and thirty two (132) four week old unsexed Japanese quails *(Coturnix Coturnix Japonica)* purchased from certified farm within Jalingo, Nigeria were selected on the basis of fitness and relative body weight. Were randomly allocated to four treatments in groups of 33 replicated three times with 11 birds per replicate in a complete Randomized design (CRD).

Experimental diets: The composition of the experimental diets and cassava peel meal fortified with Dried Brewers grain (CPMFDBG) are shown in Table 1. The diets contain 0% 10% 20% and 30% CPMGDBG in diets I (control) 2, 3 and 4 respectively. The diet supplied approximately 20 % crud protein.

Table 1. Proximate Composition of the Experimental Diet; Cassava Peel Meal, (CPM) and Dried Brewers Grain (DBG).

	Diets					
Nutrient	0%	10%	20%	30%	CPM	DBG
Dried matter	93.40	94.50	93.50	87.20	88.00	92.30
Crude protein	21.00	20.40	20.18	20.41	4.50	24.10
Crude fibre	4.50	4.80	4.00	3.40	3.20	4.40
Ether extract	4.20	4.00	3.70	7.20	7.60	3.70
Ash	13.20	12.40	13.60	6.40	7.00	14.60
N. F. E	50.50	52.90	52.40	55.20	55.70	49.50
Calcium (Ca)	1.42	1.80	1.81	1.90	1.12	0.20
Phosphorus (p)	1.30	1.10	1.60	1.80	2.00	1.20
Energy (Kcal/Kg)	290.95	2956.75	2906.56	3297.97	2731.60	2948.65

Table 2. Composition of the Experimental Diet

Ingredient's (g)	Diets/Treatment 1	2	3	4
Maize offals	50	41	31	21
Maize	20	20	20	20
CPMFDBG	0	10	20	30
Fish meal	13	13	13	13
GNC	12	11	11	11
Bone meal	4	4	4	4
Premix	0.5	0.5	0.5	0.5
Salt	0.5	0.5	0.5	0.5
Total	100	100	100	100
Calculated Analysis				
Crude protein (%)	20.3	20.11	20.28	20.45
Crude fibre (%)	5.84	6.28	6.23	6.19
Phosphorus (%)	1.06	1.07	1.08	1.08
Calcium (%)	1.86	1.93	2.01	2.10
ME (Kcal/kg)	3080.66	2962.01	2834.33	2706.66

CPMFDBG = Cassava peel meal fortified Dried Brewer grain.
Premix contained the followings: (Univit is Roche) 1500 I.U Vit A. 1500 I.U. Vit D. 3000 I.U Vit E 3.0g, 0.3g, Vit B2, 8.0g Vit B6. 0.3g Vit B12, 3.0g, nicotinic Acid 5.0g ca, panthothenate, 10.00g fe, 0.2g AI. 35g cu. 0.15g Zn 0.02g 1.0.0lg co.o.olg se.

Blood Collection: At, week 6 of the experiments blood sample were randomly Collected from (9) birds per treatment for the determination of the haematological and serum biochemical indices. The birds were slaughtered by the throat cut method. At the point of slaughter 2mls of blood were collected into a bijou bottle containing ethelene tetra acetic acid (EDTA) as anticoagulant (Adekola and Ayo 2009). The blood samples were immediately taken to the laboratory for haematological analysis packed cell volume (PCV) heamoglobin concentration (Hb) red blood cell (RBC) and white blood cell (wbc) and others such as mean corpuscular haemoglobin (MCH) mean corpuscular volume (mcv) and mean corpuscular haemoglobin concentration (MCHC) were obtained by calculation according to standard formulae (schalm *et al,* 1972 and Jain, 1986) as shown below:

$$MCV = \frac{PCV \times 10}{RBC \text{ count (in } 10^8/mm^3)}$$

$$MCH = \frac{Hb\ (g/dl) \times 10}{RBC\ (\text{ in } 10^6/mm^3)}$$

$$MCHC = \frac{Hb\ (g/dl) \times 100}{PCV\ \%}$$

The other blood samples collected without coagulant were used to determine the biochemical components such as albumin total protein, Urea, Cholerol and Creating using

the methods described by other workers (Spence and price, 1997; Ajagbonna *et al* 1999; Uko *et al.* 2000).

Statistical Analysis: All the data collected were subjected to analysis of variance (ANOVA) using a complete randomized design (steel and Torrie: 1980). Means were separated where applicable using the Duncan's multiple Range test as outline by Obi (2002).

RESULTS AND DISCUSSION

Heamatological Indices: Heamatological Indices are presented in Table 2 all the heamatological parameter (PCV, WBC, RBC, and Hb) were similar in all the treatment and fall within the normal ranges for mature quail as earlier reported (Woodard et al, 1973: Babangida and Ubosi, 2006). The results of the present study indicate that the diets contain adequate nutrients to support the health of birds nutrient has been recognized as one of the factors that can compromise and cause alteration in the stability and functions of blood parameters.This study supports the earlier work of Tuleun et al (2007) in broiler chicken and that of Mohammed et al (2005) in rabbits.

Table: 2
Haematological and Biochemical indices of Japanese Quails *(Coturnix Coturnix Japonica)* fed graded levels of Cassava peel meal fortified with Dried Brewers Grains (CPMFDBG).

Parameter %	Inclusion Level of (CPMFDBG) 0%	10%	20%	30%	SEM
PCV (%)	40.00	44.00	42.50	43.50	3.20^{NS}
WBC ($x10^3/mm^3$)	3.28	2.08	2.78	2.28	0.43^{NS}
RBC ($x10^6/mm^3$)	4.58	4.71	3.59	4.70	0.73^{NS}
Hb (g/100ml)	10.33	10.67	11.00	12.00	0.79^{NS}
MCH (Pg)	21.14	25.26	25.28	33.67	5.25^{NS}
MCV (Fl)	63.41	75.77	75.85	81.01	5.77^{NS}
MCHC	33.36	33.33	33.33	33.34	0.01^{NS}
Biochemistry					
ALBUMIN (g/dl)	3.44	3.01	3.40	3.14	0.20^{NS}
Total protein (g/dl)	6.07	6.14	5.87	6.55	0.17^{NS}
Globulin (g/dl)	2.64	2.86	2.28	2.35	0.32^{NS}
Cholesterol (mg/dl)	39.31	41.14	37.00	38.00	1.59^{NS}

NS = Not significant (p>0.05)
SEM = Standard error of means
RBC = Red blood cell
WBC = white blood cell
MCV = Wean corpuscular volume
MVH = mean corpuscular Haemoglobin
MCHC = Mean corpuscular Haemoglobin concentration

Serum Biochemistry: The serum biochemical parameters are presented in Table 2. The albumin, Total protein, globulin and cholesterol were not significantly different (p>0.005) among the treatment groups. The value records in this research fall within the normal

ranges of Albumin, total protein globulin, respectively as reported by Anon (1980). The values obtained for total protein, Albumin and globulin are influenced by total protein intake. (Onifade and Tewe 1993). The value obtains in this study indicated nutritional adequacy of dietary protein. Abnormal serum albumin would have indicated an alteration of normal systematic protein utilization.

The result of cholesterol recorded indicated no significant different ($p>0.005$) among the treatment. The value fall within the normal ranges reported by other works (Anon 1980; Onifade and Tewe, 1983).

CONCLUSION

The result of this study indicated that the levels (10-30%) of **CPMFDBG** included in the diets of Japanese Quails have no any adverse effect on the haemotology and serum biochemical parameters of the birds. However further finding should be conducted to evaluate the histopathology of some selected organs to confirm the suitability and safety of CPMFDBG in birds' diets.

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