

EFFECT OF FEEDING GRADED LEVELS OF CASHEW NUT (*Anacardium occidentale*) MEAL TO QUAILS (*Coturnix coturnix japonica*) AS A SOURCE OF PROTEIN

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ABSTRACT

This experiment was carried out to determine the effect of cashew nut (*Anacardium occidentale*) meal (CNM) fed to quails (*Coturnix coturnix japonica*) at graded levels of 0%, 5%, 10% and 15% representing four dietary treatments T1, T2, T3 and T4 as a source of protein. One hundred and eighty (180) quail chicks at two (2) weeks were randomly allotted into these treatments each containing three replicates which were having fifteen birds per replicate to determine the carcass characteristics and haematological parameters in a Completely Randomize Design (CRD). The result of carcass characteristics showed that there was no significant ($P>0.05$) difference across the dietary treatments. The haematological parameters also showed no significant ($P>0.05$) difference. All the values fall within the normal range which suggest that CNM had no negative effect on the carcass and health status of the birds. Therefore, it can be concluded that CNM can be fed to quail birds up to 15% without any adverse effect on their health status.

INTRODUCTION

Quail (*Coturnix coturnix japonica*) is a small bodied bird belonging to the order galliforms. It has an attractive plumage and with mature body weight between 200g-500g. The females are slightly heavier than the males. The quail, due to its short generation interval, has enabled scientists to conduct various quantitative genetic analyses and suggesting that suitable breeding models for better growth and egg production (Abubakar and Oni, 2002). According to Chindo and Oluwanniya (2002) feed constitute about 60-80% of the cost of production of quails reared in total confinement. Consequently, a good understanding of the nutrient requirement is necessary for a successful quail production. Quail needs proper nutrition for growth, bone formation, feature development, egg production and health. Birds are hardy and can be raised in urban or rural areas. Quail production requires good management, proper feeding, availability of fresh clean water all the time and a good market outlet (Dafwang, 2006). According to Dafwang and Ogundipe, (1987) cashew nut is noted to meet such requirements with no adverse effect on the normal function of the quails. Cashew nut (*Anacardium occidentale*) is a highly nutritional and concentrated form of food providing a substantial amount of energy. The cashew nut kernel has a pleasant taste and flavor, when fried sometimes salted or sweetened with sugar (Akinhanmi *et al.*, 2008). Odunsi (2002) reported no negative effect of cashew kernel meal on

broiler quail carcass quality indices. Further observation showed that the young growing quails fed CNM had higher weight gains and protein efficiency ratio than those fed soya bean meal. This non-conventional feeding resource may be a viable alternative for achieving optimum performance and curtailing production cost that is presently the bane of poultry production in the develop countries.

MATERIALS AND METHODS

This study was carried out in LID farm, FCAH&PT, Vom, Nigeria. The cashew nut used in the experiment was obtained from a village market near Lafia, Nassarawa State, Nigeria. A total of 180 quail chicks at two weeks old were purchased from the poultry division of NVRI, Vom. The birds were randomly allotted into four treatments, with 12 replicates having 15 birds each in a completely randomize design (CRD). The poultry house was cleaned, washed and disinfected, and wire mesh was used to cover open places to discourage predators from attacking the birds. The experiment lasted for 28 days and the birds were fed with feeds formulated according to Dafwang, (2006) at 24% CP, containing 0%, 5%, 10% and 15% CNM representing treatment 1, treatment 2, treatment 3 and treatment 4 respectively. The CNM served as protein source. At the expiration of the experiment, blood samples were collected from 2 birds in each replicate, which were collected from the jugular veins into plain and EDTA bottles

which were taken to the Central Diagnostic Department, NVRI, Vom, for chemistry and haematological analyses using Buret method Reinhold, (1953) for total protein; glucoseoxidase method Trinder, (1969) for glucose and enzymatic method as described by (Randox kit, 2002). And Auto Haemo Analyser (BC-300^{plus} Mindray Auto Haematology Analyser was used for the haematological analyses. For the carcass evaluation, 2 birds from each replicate were randomly selected based on average group weight, were bled, dressed and eviscerated and each part and organ were weighed using an electronic digital scale, the values were expressed as a percentage of live weight. All data collected were subjected to analysis of variance using SPSS software version, Nouis, (1999) and means were separated using Duncan Multiple Range Test, (Duncan, 1955).

RESULTS AND DISCUSSION

The result of the carcass characteristics is presented in Table 2, from the result obtained it can be observed that there is no significant ($P>0.05$) difference in the parameters analyzed i.e. carcass parts and organ parts. This result showed that CNM can be included into quail's diets up to 15% replacing soya bean cake as protein source and still obtained good carcass weight. However, the best result was observed at 5% level of inclusion. This is not in agreement with the findings of Odunsi, (2002) who reported that the more the rate of inclusion of CNM the heavier the birds. Probably the environmental weather contributed to the differences experienced. This also indicates that CNM can be fed to quails and still obtained good carcass quality. The result of Blood parameters is presented in Table 3. Blood parameters can be used to evaluate both pathological and nutritional status of individual animals (Owen, *et al.*, 2009, Owen, *et al.*, 2008, Owen, *et al.*, 2011). The non-significant difference in the values of blood parameters could be related to the nutritional adequacy and safety of the diets. This is because reduction or abnormal values of serum biochemistry and haematological parameters may indicate a low protein intake, liver damage, anaemia or parasitological infestation (Lindsay, 1977).

CONCLUSION

Based on the results obtained in this study, supplementing soyabeans with CNM has shown no

deleterious effect on the health status of the birds. This suggests that when CNM is used by farmers it can reduce the high cost of protein source in animals feed. It is also an eye opener, especially now that soybean is scarce and costly in the country. This is indicative of a way out for quail farmers in terms of availability of cheaper protein source, more so, that cashew nut is grown and found all over Nigeria.

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Table 1. Composition of diets containing cashew nut meal

Ingredients	Treatments			
	T1 (0)	T2 (5)	T3 (10)	T4 (15)
Maize	44.22	41.09	38.47	34.73
Soyabean cake	38.63	37.62	36.09	35.69
Wheat offal	10.00	10.00	10.00	10.00
Cashew nut meal	-	4.14	8.29	12.3
Fish meal	2.00	2.00	2.00	2.00
Bone meal	2.50	2.50	2.50	2.50
Limestone	2.00	2.00	2.00	2.00
Methionine	0.10	0.10	0.10	0.10
Lysine	0.10	0.10	0.10	0.10
Premix	0.25	0.25	0.25	0.25
Salt	0.20	0.20	0.20	0.20
Total	100	100	100	100
Calculated Analysis				
Cost/kg	32.05	32.06	32.02	32.08
Crude Protein	24	24	24	24
MEKcal/Kg	2569.07	2559.00	2555.33	2536.90
Lysine	1.35	1.40	1.38	1.40
Methionine	0.48	0.49	0.49	0.48

Premix biomix, provided per kg of diet:: Vit. A 10, 000, 000, 00 Iu, Vit. D₃ 2,000, 000, 00 Iu, Vit. E 23,000 Iu, Vit. K 2,000 mg, Vit. B 1,800 mg, Vit. B₂ 5,000mgr, Niacin 27, 500mgr, Pantothenic acid 7,500mg, Vit. B₆ 3,000, B₁₂ folic acid, 750mgr, Biotin H₂ 60, Choline Chloride, 300,000mg, Cobalt, 200, Copper 3,000, Iodine 1,000, Iron 20,000mg, Manganese 40,000mg, Selenium 200mg, Zinc 30,000mg, antioxidant, 1,250mg.

Table 2. Carcass characteristics of quails fed cashew nut meal

Parameters	0%	5%	10%	15%	SEM	LOS
Live weight (g)	120.83	120.83	114.83	115.00	10.62	NS
Carcass weight (g)	83.42	83.29	74.29	78.47	4.91	NS
Dressing percentage	69.16	68.17	65.07	68.45	3.95	NS
Back (g)	15.65	15.29	12.16	14.39	1.27	NS
Wings (g)	8.12	8.24	8.04	8.18	0.37	NS
Thigh (g)	11.04	10.49	9.40	10.17	0.78	NS
Drumstick (g)	8.10	7.82	7.15	7.41	0.47	NS

Breast (g)	31.09	32.03	28.82	29.65	2.00	NS
Neck (g)	6.49	6.97	5.57	5.30	0.58	NS
Parts of organ expressed as live weight percentage						
Liver (g)	2.85	2.82	2.50	2.54	0.38	NS
Gizzard (g)	2.46	2.62	2.65	2.54	0.17	NS
Heart (g)	1.35	1.38	1.20	1.25	0.15	NS
Crop (g)	0.74	0.75	0.66	0.73	0.12	NS
Lungs (g)	1.69	1.56	1.29	1.36	0.12	NS

SEM – Standard Error mean; LOS –Level of significance; NS – Not significant

Table 3. Blood parameters of quails fed cashew nut meal

Parameters	0%	5%	10%	15%	SEM	LOS
Glucose	14.58	14.70	14.98	15.68	1.42	NS
Cholesterol	5.13	4.03	5.07	6.20	0.95	NS
Total Protein	3.98	3.68	4.08	4.43	0.52	NS
PCV (%)	48.00	48.33	46.67	50.17	1.46	NS
Red blood cell ($\times 10^{12}$)	2.83	2.48	3.85	2.15	0.72	NS
Neutrophils (%)	67.17	71.50	67.00	72.60	1.21	NS
Lymphocytes (%)	32.60	27.33	33.17	29.00	1.97	NS
Haemoglobin (g/dl)	11.08	11.07	10.68	11.58	0.54	NS