



CARCASS CHARACTERISTICS OF JAPANESE QUAILS FED DIETS CONTAINING GRADED LEVELS OF SUNDRIED CASSAVA PEEL MEAL FLAVOURED WITH MOLASSES AS A REPLACEMENT FOR MAIZE

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Abstract

A study was carried out to evaluate the carcass characteristics of Japanese quails fed diets containing graded levels of sundried cassava peel meal flavoured with molasses as a replacement for maize. A total of 500 two weeks old Japanese quails were used for the study, the birds were randomly allotted to four dietary treatments T₁, T₂, T₃ and T₄ containing replacement levels 0 %, 50 %, 75 % and 100 % sundried cassava peel meal flavoured with molasses for maize respectively. Each replicate had twenty birds and a total of 100 birds per treatment. The experiment lasted for four weeks and the data collected include: initial weight, feed intake, final weight and carcass characteristics. All data were subjected to oneway analysis of variance using SPSS 2007 and Duncan multiple range test was used to separate means where differences occurred. The results of carcass proportions showed significant ($P < 0.05$) difference among all body parts except the head. The results of the internal organs (liver, lungs, heart and gizzard) showed significant ($P < 0.05$) differences among all organs except the lungs. From the results of the present study, it was concluded that sundried cassava peel meal flavoured with molasses could replace maize completely in diets of growing Japanese quails without any deleterious effect on the carcass and organ characteristics.

Key words: Japanese quails; sundried cassava peel meal; molasses and carcass characteristics

Introduction

Quails, pheasant, partridges and swan belong to the order *Galliformes* and family *phaseonidae* (Shim, 2004). *Coturnix* in Africa, Asia and Europe are considered as migratory birds where they are generally found. They also include “inbreed” sub-species such as African quail (*Coturnix coturnix Africana*), European quail (*Coturnix coturnix*), Eussine quail (*Coturnix coturnix seriensis*) and Japanese quail (*Coturnix coturnix japonica*) (Shim, 2004). Japanese quail was first discovered in Japan in the eighth century (Nasrollah, 2008). This bird which was used as song birds in the eleventh century has suddenly become a valuable food animal (Kayang *et al.*, 2004). The cassava (*Manihot esculenta* crantz) is cultivated mainly in the tropic and sub-tropic regions of the world, over a wide range of environmental and soil conditions. It is very tolerant to drought, heat stress and produces well on marginal soils. It is an important dietary staple in many countries within the tropical regions of the world (Perez and Villamayor, 1984). Where it provides food for more than 800 million people (FAO, 2008). Various parts of the cassava plant can be successfully incorporated into diets of multiple species with by-products readily available in the vicinity of factories where cassava tubers are processed into starch or flour. Cassava is also processed into



finished products like *garri*, *fufu*, cassava chips and cassava flour for human consumption (FAO, 2008). The crop and its by-products can also be used to feed livestock. The cassava and its by-products that are used in feeding livestock have to undergo some processing to make it acceptable to livestock (Salami and Odunsi, 2003). *Molasses is the final effluent obtained in the preparation of sucrose by repeated evaporation, crystallization and centrifugation of juices from sugarcane or sugar beets (Curtin, 1983). It is a viscous and dark coloured liquid which is rich in soluble carbohydrate, vitamins, minerals and other materials (Olbrich, 1963). The aim of this research is to investigate the carcass characteristics of Japanese quails fed diets containing graded levels of sundried cassava peel meal flavoured with molasses as a replacement for maize.*

Materials and methods

The study was carried out at the School of Agriculture and Agricultural Technology Teaching and Research farm, Federal University of Technology Minna, Niger state Nigeria. Minna is located in the North Central zone of Nigeria, it is found in the Southern Guinea Savanna Vegetation Zone and it lies between latitude 9°36' North and 6°33' longitude East, Minna has an annual rainfall between 1000 and 1500 mm and mean ambient temperature range of 38 to 42°C (NSADP, 1995). The study lasted for four weeks, a total of five hundred, two weeks old Japanese quails (*Coturnix coturnix japonica*) obtained from National Veterinary Research Institute (NVRI) Vom, Jos, Plateau state Nigeria were used for the experiment. The birds were randomly allocated into four dietary treatments in which sundried cassava peel meal flavoured with molasses replaced maize at 0, 50, 75 and 100 % in T₁, T₂, T₃ and T₄ respectively (Table 1), each treatment had five replicates with 20 birds per replicate in a completely randomized design. The birds were given experimental diets which had 24 % CP and water *ad-libitum* throughout the experiment. The following parameters were measured; initial weight, feed intake, final weight and carcass proportion. All data were subjected to oneway analysis of variance (ANOVA) using SPSS 2007, Duncan multiple range test was used to separate the means where differences occurred.

Results and discussions

The results of the proximate composition of experimental diets fed to growing Japanese quails is presented in (Table 2). The crude protein levels were within 23.33 and 26.18 %, which were similar to the range of 24 – 26 % protein requirement for growing Japanese quails reported by Omidiwura, *et al.*, (2016).

Table 1: Composition of experimental diets fed to growing Japanese quails



Ingredients (g)	T1	T2	T3	T4
Maize	44.40	21.30	10.39	0.00
MFSCPM	0.00	21.23	31.16	40.67
Groundnut cake	38.9	40.84	41.75	42.63
Maize offal	10.00	10.00	10.00	10.00
Fish meal	2.00	2.00	2.00	2.00
Bone meal	2.50	2.50	2.50	2.50
Limestone	1.50	1.50	1.50	1.50
Premix	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25
Methionine	0.10	0.10	0.10	0.10
Lysine	0.10	0.10	0.10	0.10
Total	100.00	100.00	100.00	100.00
Calculated analysis				
ME(Kcal/kg)	2664.71	2396.71	2271.35	2151.47
Crude protein	24	24	24	24
Crude fibre	3.76	5.23	5.91	6.57
Lysine	0.98	0.95	0.94	0.93
Methionine	0.41	0.37	0.35	0.33
Calcium	1.62	1.62	1.62	1.62
Phosphorus	0.82	0.77	0.74	0.72

*premix supplied per 25 kg/ton contains: vitamin A (7,500,00iu), vitamin D (500,00iu), vitamin E (1,000 iu), vitamin B1 (3.75mg), vitamin B2 (125mg), vitamin B3 (500mg), vitamin B6 (150mg), vitamin B12 (2.5mg), vitamin K (15mg), vitamin C(10mg) and folic acid (150mg), Ca (12.5mg, Cu (8.0mg), Fe (32mg), I(0.8mg), Se (100mg), Mg (0.25mg), Chlorine (250mg), Panthotenic acid (14.4mg) MFSCPM= Molasses Flavoured Sundried Cassava Peel Meal; T1= 100 % maize 0 % MFSCPM; T2= 50 % maize 50 % MFSCPM; T3= 25 % maize, 75 % MFSCPM; T4= 0 % maize, 100 % MFSCPM

Table 2: Proximate composition of the experimental diets fed to growing Japanese quails

Nutrients (%)	T1	T2	T3	T4
Dry matter	92.00	92.00	90.40	91.40
Crude protein	26.18	24.83	24.14	23.33
Crude fibre	6.50	9.00	9.50	14.22
Ether extract	8.00	10.21	12.50	13.04
Ash	7.50	8.50	8.68	9.38
NFE	43.82	39.46	35.58	31.47

MFSCPM= Molasses Flavoured Sundried Cassava Peel Meal; T1= 100 % maize 0 % MFSCPM; T2= 50 % maize 50 % MFSCPM; T3= 25 % maize, 75 % MFSCPM; T4= 0 % maize, 100 % MFSCPM; NFE – Nitrogen free extract

The results of carcass proportions and internal organs characteristics of the birds fed experimental diets are presented in (Table 3). The results showed that slaughter weight, eviscerated weight, breast, thigh, wings and neck and drumstick were *significantly ($P<0.05$) influenced by dietary treatments*. The dietary treatments had no significant ($P>0.05$) effect on the head. The results showed that live weight, eviscerated weight and wings were not significantly ($P>0.05$) different among birds on 0 and 50 % replacement levels, the birds on 100 % replacement level had higher values for dressing percentage, drumsticks, thighs and shanks. Also birds on 75 % replacement levels were not significantly ($P>0.05$) different from birds on 0 % replacement level. Birds on different replacement levels performed better than the control in term of intestine, gizzard and crop. This is however, contrary to results obtained by Tarhyel *et al.* (2012). Reduction in body weight, carcass yield and organ weight as cassava peel increases may be attributed to depressed feed intake that led to low availability of nutrients needed for tissue, organ and body development (Ani and Okorie, 2008).



Table 3: The effect of sundried cassava peel meal flavoured with molasses on the carcass characteristics and internal organs of Japanese quails as a substitute for maize

Parameters	T1	T2	T3	T4	SEM	LS
Live weight (g)	110.40 ^a	113.40 ^a	104.49 ^b	96.04 ^c	1.26	*
Eviscerated weight (%)	72.38 ^a	71.94 ^a	65.32 ^b	64.56 ^b	0.93	*
Dressing weight (%)	61.02 ^b	46.56 ^d	55.16 ^c	63.61 ^a	1.09	*
Head (%)	5.35	5.23	5.46	5.44	0.04	NS
Breast (%)	26.70 ^a	13.39 ^c	21.64 ^b	21.73 ^b	0.79	*
Thigh (%)	9.45 ^b	9.14 ^b	9.28 ^b	13.63 ^a	0.32	*
Wings (%)	6.35 ^a	6.39 ^a	6.22 ^a	2.58 ^b	0.27	*
Neck (%)	5.19 ^a	4.18 ^c	4.02 ^c	4.82 ^b	0.09	*
Drumstick (%)	5.72 ^b	5.85 ^b	6.19 ^b	8.55 ^a	0.20	*
Shanks (%)	2.26 ^b	2.38 ^b	2.35 ^b	6.87 ^a	0.32	*
Internal organs						
Intestine (%)	3.76 ^c	4.11 ^c	5.31 ^a	4.71 ^b	0.11	*
Liver (%)	1.99 ^a	1.46 ^b	2.01 ^a	1.57 ^b	0.06	*
Heart (%)	0.94 ^a	0.96 ^a	0.92 ^a	0.67 ^b	0.03	*
Lungs (%)	0.93	0.87	0.84	0.80	0.02	NS
Gizzard (%)	4.29 ^b	4.67 ^a	4.02 ^b	4.08 ^b	0.07	*
Crop (%)	1.74 ^d	2.87 ^b	2.16 ^c	3.28 ^a	0.12	*

MFSCPM= Molasses Flavoured Sundried Cassava Peel Meal; T1= 100 % maize 0 % MFSCPM; T2= 50 % maize 50 % MFSCPM; T3= 25 % maize, 75 % MFSCPM; T4= 0 % maize, 100 % MFSCPM; NFE – Nitrogen free extract

Conclusions

From the results of the present study, it was concluded that sundried cassava peel meal flavoured with molasses could replace maize completely in the diets of growing Japanese quails without any deleterious effect on the carcass and organs characteristics.

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