

## Use of Local Feed Sources as Feedstuffs for Japanese Quails (*Corturnix Corturnix japonica*)

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**Abstract:** Six weeks feeding trial was conducted to evaluate the utilization of maize offal, rice offal and local sorghum beer residue as feedstuffs for Japanese quails. Ten percent (10%) each of maize offal, rice offal and local sorghum beer residue were included in diets two (T2), three (T3) and four (T4), respectively. Diet one (T1) had zero inclusion level and served as control. Sixty Japanese quail chicks were randomly allocated to the four dietary treatments with three replications of five birds each in a complete randomize design with pen location serving as the blocking factor. The result of feed intake, daily weight gain and feed conversion ratio showed no significant ( $P>0.05$ ) difference at both phases of growth. Daily feed intake, daily weight gain and feed conversion ratio ranged from 7.72 to 8.33 g, 2.50 to 2.55 g and 3.05 to 3.31 for treatments one (T1), two (T2), three (T3) and four (T4), respectively. Mortality rate of 3.33% was recorded during the experimental periods. This study revealed that, maize offal; rice offal and local sorghum beer residue can be included in the diet of Japanese quail at 10% without any adverse effect and is therefore recommended for inclusion in the diets of Japanese quail.

**Keywords:** Japanese, quail, local, feed, sources.

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### Introduction

The urgent need to balance the gap between demand and supply of animal products in Nigeria and other developing countries of the world requires that the production of animal species with quick turn over rates be given priority (Damang *et al.*, 2010). The continued rise in the cost of production of sheep, goat, cattle and chicken which are the major sources of animal protein in Nigeria has made it necessary to explore other sources of animal protein. Quail production is an important source of quality meat and egg for the rapidly growing population because of their short generation interval, fast growth rate and high rate of lay.

The major problem facing the livestock sector in Nigeria is the scarcity and high cost of conventional feed ingredients (Bawa *et al.*, 2010a). The problem of feeding poultry in Nigeria can be reduced by exploring the use of non-conventional agro-industrial by-products such as maize offal, rice offal and brewers dried grains. Although the nutritional properties and recommended dietary inclusion levels for poultry have been extensively studied (Aletor 1996; Bawa *et al.*, 2010b). However, the inclusion levels and utilization of maize offal, rice offal and local sorghum beer residue as feedstuffs for Japanese quail has not been fully establish and therefore this present study was aimed at assessing the performance of Japanese quail fed diets containing 10% each of maize offal, rice offal and local sorghum beer residue.

## Materials and methods

### Study area

The study was conducted at the Livestock Teaching and Research Farm Poultry Unit of the Federal University of Technology Yola now known as Modibbo Adama University of Technology. The area lies between latitudes 7° and 11°N of the equator and longitudes 11° and 14° E of the Greenwich meridian. The minimum and maximum temperatures of the area are 39.6<sup>oc</sup> and 18.4<sup>oc</sup> (Adebayo and Tukur, 1999).

### Experimental diets and treatments

Four experimental diets for both starter (23% crude protein) and finisher (21% crude protein) phases were compounded with maize offal, rice offal and local sorghum beer residue included at 10% level each in diet two (T2), three (T3) and four (T4), respectively (Tables 1 and 2).

**Table 1. Ingredient Composition and Calculated Analysis of the Experimental Starter Diets (1-2 weeks)**

Ingredients (%)	T1	T2	T3	T4
Maize	57.00	48.00	46.00	48.00
Maize offal	0.00	10.00	0.00	0.00
Rice offal	0.00	0.00	10.00	0.00
Brewers dried grains	0.00	0.00	0.00	10.00
Soya bean meal	36.00	35.00	37.59	35.99
Fish meal	3.39	4.39	2.80	2.40
Premix	0.25	0.25	0.25	0.25
Lysine	1.25	1.25	1.25	1.25
Methionine	0.45	0.45	0.45	0.45
Bone meal	1.41	1.41	1.41	1.41
Salt	0.25	0.25	0.25	0.25
Total	100.00	100.00	100.00	100.00
Calculated analysis				
Crude protein (%)	23.17	22.77	22.99	22.52
Crude fibre (%)	3.51	4.47	4.75	4.50
Calcium (%)	0.78	0.69	0.76	0.74
Phosphorus (%)	0.58	0.56	0.58	0.63
Metabolizable energy (kcal/kg)	2924.39	2830.16	2700.38	2762.96

T1=0% offal; T2=10% maize offal; T3=10% rice offal; T4=10% local sorghum beer residue.

**Table 2. Ingredient Composition and Calculated Analysis of Experimental Finisher Diets (3-6 weeks)**

Ingredients (%)	T1	T2	T3	T4
Maize	62.00	52.00	52.00	55.00
Maize offal	0.00	10.00	0.00	0.00
Rice offal	0.00	0.00	10.00	0.00
Brewers dried grains	0.00	0.00	0.00	10.00
Soya bean meal	31.19	32.19	30.89	29.29
Fish meal	2.20	2.20	3.50	2.10
Premix	0.25	0.25	0.25	0.25
Lysine	1.25	1.25	1.25	1.25
Methionine	0.45	0.45	0.45	0.45
Bone meal	1.41	1.41	1.41	1.41
Salt	0.25	0.25	0.25	0.25
Total	100.00	100.00	100.00	100.00
Calculated analysis				
Crude protein (%)	21.38	21.37	21.05	21.41
Crude fibre(%)	3.36	4.37	4.67	4.31
Calcium (%)	0.75	0.69	0.79	0.71
Phosphorus (%)	0.55	0.53	0.58	0.59
Metabolizable energy (kcal/kg)	2974.16	2930.16	2864.18	2832.48

T1=0% offal; T2=10% maize offal; T3=10% rice offal; T4=10% local sorghum beer residue.

### Experimental design and management of the quails

Sixty Japanese quail chicks were managed in a constructed wooden cages and were fed with the experimental diets for six weeks. The chicks were randomly allocated to the four dietary treatments with three replications of five birds per replicate in a randomized complete block design. Known quantity of feed and clean drinking water was offered *ad libitum* throughout the experimental period. Conventional quail management practices were adopted during the experimental period. No vaccination program was observed; however amprolium and keproceryl were given at preventive doses to guard against bacterial and protozoa infections. Daily feed intake, daily weight gain and feed conversion ratio were recorded. Mortality was recorded as it occurs.

### Analysis of diets

Proximate composition of the experimental diet was determined using the standard procedure described by AOAC (1990).

### Statistical analysis

Data obtained were analyzed using a computer statistical package (Statistix, 9.0).

### Results and discussion

The proximate composition of the experimental diets (Tables 3 and 4) revealed that the diets are adequate in meeting the nutritional requirements of Japanese quail in the tropics. The

result of daily feed intake (Table 5) showed no significant difference ( $P>0.05$ ). This therefore indicated that inclusion of 10% each of maize offal, rice offal and local beer sorghum residue in the diets of Japanese quail had no effect on their feed consumption.

**Table 3. Proximate Composition of the Experimental Quail Starter Diets (1-2 weeks)**

Nutrients	T1	T2	T3	T4
Crude protein (%)	23.14	21.57	21.96	23.42
Crude fibre (%)	5.04	6.01	8.11	7.01
Fat (%)	8.97	7.22	5.02	9.04
Calcium (%)	1.03	1.10	0.96	0.89
Phosphorus (%)	0.31	0.24	0.26	0.37
Metabolizable energy (kcal $kg^{-1}$ )	2914.60	2812.73	2745.43	2994.84

T1=0% offal; T2=10% maize offal; T3=10% rice offal; T4=10% local sorghum beer residue.

**Table 4. Proximate Composition of the Experimental Quail Starter Diets (1-2 weeks)**

Nutrients	T1	T2	T3	T4
Crude protein (%)	20.37	19.47	18.97	20.24
Crude fibre (%)	7.53	8.55	9.05	8.75
Fat (%)	8.88	7.00	6.03	7.67
Calcium (%)	1.02	0.98	1.26	1.31
Phosphorus (%)	0.23	0.17	0.24	0.33
Metabolizable energy (kcal $kg^{-1}$ )	2994.84	2895.61	2794.21	2843.57

T1=0% offal; T2=10% maize offal; T3=10% rice offal; T4=10% local sorghum beer residue.

**Table 5. Pooled Performance of Quails Fed the Experimental Diets**

Parameters	T1	T2	T3	T4	Sem
Mean initial weight (g/bird)	41.33	43.50	37.35	37.15	5.18 <sup>NS</sup>
Mean final weight (g/bird)	147.00	149.70	142.56	144.28	3.08 <sup>NS</sup>
Overall weight gain (g/bird)	105.67	106.20	105.15	107.13	1.79 <sup>NS</sup>
Total feed intake (g/bird)	349.86	324.24	332.64	337.68	9.30 <sup>NS</sup>
Daily weight gain (g/bird)	8.33	7.72	7.92	8.04	7.50 <sup>NS</sup>
Feed conversion ratio	3.31	3.05	3.16	3.15	0.23 <sup>NS</sup>
Mortality (%)	0.00	0.00	3.33	0.00	-

T1=0% offal; T2=10% maize offal; T3=10% rice offal; T4=10% local sorghum beer residue  
NS = Not significant at  $P>0.05$ .

The result suggests that inclusion of 10% each of maize offal, rice offal and local beer sorghum residue in the diets of Japanese quail had little or no influence on the concentration of energy which might have caused significant variation in their Feed intake. Feed consumption of poultry is affected by dietary concentration of energy and this corroborates the report of Peter *et al.* (2006) who pointed out that energy has the most marked influence on feed intake and that birds will usually consume feed to meet their energy requirement. The feed intake obtained in this study is however lower than the values reported by Bawa *et al.*

(2010a). The weight gain was not significantly ( $P>0.05$ ) affected by the dietary treatments throughout the experimental period. This may be attributed to the similarity in their feed intake resulting to uniform growth pattern. The result of feed conversion ratio followed similar trend as that of feed intake and daily weight gain. The low mortality rate recorded, revealed that inclusion levels up to ten (10%) of the test ingredients (maize offal, rice offal and sorghum beer residue) had little or no deleterious effects on Japanese quails.

### Conclusion

In conclusion, the inclusion of up to 10% of maize offal, rice offal and local sorghum beer residue had no significant effects on the productive performance of Japanese quails. It is therefore recommended that up to 10% each of maize offal, rice offal and brewers dried grains can be included in the diet of Japanese quail without any adverse effects on their productive performance.

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