THE EFFECT OF PRODUCTION PERIOD ON THE INTERNAL EGG QUALITY TRAITS IN JAPANESE QUAILS (*Coturnix coturnix japonica*) FED TWO COMMERCIAL BROILER DEITS

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ABSTRACT
The study was conducted at the Research Farm of Abubakar Tafawa Balewa University Bauchi; Nigeria, to study the effect of production period on the Internal Egg Quality Traits in Japanese Quails *(Coturnix coturnix japanica)*. The results showed that, there were no significant differences in internal egg quality parameters such as yolk height, yolk index, yolk weight, albumen thickness, albumen weight and haugh unit. However, the effect of diets on internal egg quality parameters showed significant difference (P<0.05) in yolk height, yolk index, haugh unit and albumen thickness with respect to two diets integrated. External egg quality traits were not affected by the diets, but more greatly influenced by the production period (P<0.01). Based on the result obtained, the production of quails in the study area, the improvement in the genetic make-up and the diets will go a long way towards improving their productivity.

INTRODUCTION
Quail production is becoming increasingly profitable as it has already gained consumer attraction in Nigeria and elsewhere. Owing to the very tender, tasty and highly acceptable meat, uniform low cholesterol eggs. Quails have a very short generation interval matures early (35 days) and quail hen lays from 200-300 eggs annually (Selim, K., and Ibrahim, S. 2004). In the wild, they lay 5-12eggs (Shin K.F., 2007). Quails egg weight approximately 10g (Smith, 1997). A very fast way of making animal protein available to the growing population is to intensify efforts in micro-livestock production, one of which is quails production. The most popular quails species is coturnix cortunix which includes *coturnix cotrunix coturnix* (European quail) *coturnix coturnix Africana* (African quail) and *coturnix coturnix Japonica* (Japanese quail). The Japanese quail is the most widely spread and its eggs are commercially produced (Randall & Bolla, 2007). The meat of quail is lean and the egg is low in cholesterol (Schwartz and Allen, 1987). (Agwunobi and Ekpengyoung 1990), reported that the meat of quail and the egg have low cholesterol, leas fat and higher protein content and is a good quality meat for diabetic and high blood pressure patients, hence quail is of public health significant (Edace et al; 2007). Quails therefore can be served as a source of fast and cheap animal protein for both rural and urban dwellers (Musa et al; 2007).

MATERIAL AND METHODS
Study Area
Bauchi is located in the Northern guinea Savannah and is situated between latitude $9^0$30'N and $12^0$30'N and longitude $8^0$45' and 11^0E. The state has an average altitude of about 600mm above sea level. The temperature ranges from minimum of 9-10^0c in December to January to a maximum of 35-45^0c between April and May. The annual rainfall ranges from 600mm-1300mm (National Office of Statistic 1999).

Source of Experimental Materials
About 230 quail birds were purchased from National Veterinary Research Institute (NVRI) Vom of about 5-6 weeks of age. The birds were transferred to fabricated metal cages inside the poultry house where they were grouped in a ratio of 1 male to 3 females per pen. They were housed in a cage petitioned into 8 units in a completely randomized block design. All the chicks were weighted in a group and individually before placing them into the units, each quail was weighted from each unit at weekly interval for seven weeks. Two treatments with four replicates each of 15 laying birds and 5 males were randomly selected and assigned to each treatment. The birds were properly housed in a fabricated metal cages were two commercial feeds and water were given *ad libitum*. Eggs collection, incubation and hatching procedure using manually operated waterbed incubator, brooding, rearing and other management practices were conducted. Mean daily feed intake, mean egg production, mean feed conversion and mean egg weight were recorded as described by Orunninayi (2008) and (Bawa *et al*, 2010).

Data Analysis
Data was subjected to analysis of variance (ANOVA) and means were separated using

general Linear Model as contain in SPSS (1996) statistical package procedure.

RESULTS

Data on internal egg quality parameters were presented in table 1 and 2. The results indicates traits such as yolk height, yolk index, haugh units and albumen thickness were significantly ($P<0.05$) influence by the diets in the parent stock, while traits such as yolk weight, albumen index, and yolk width were not significantly affected in the parent stock. However, in the F1 traits such as yolk weight, haught unit and albumen thickness were significantly ($P<0.001$) very high. External traits such as egg weight and shell thickness did not differ with the diets but shell weight differ significantly ($P<0.001$) in both parents and F1 generation. The effects of production period on internal egg quality parameters investigated shows that egg quality traits did not differ significantly in all the three productions periods investigated in both the parents and F1 generations as indicated in Table 2.

DISCUSSION

The results of the effects of diets on the internal and external egg quality traits indicate a highly significantly difference with respect to shell weight, both in parent and FI generation. The effect of production period with respect to egg production on internal and external egg quality traits indicate similarities with the findings of Nazligul *et al,* (2001) and Ozcelik (2002). However there is significant effect in the production period with respect of egg shell weight and shell thickness in both the parents and FI. This is supported by (Nagarajan 1991) and Nazligul (2001) Stadelman and Cotteral (1977) reported that, the quality traits of an egg include; egg shell condition, shape, haugh, albumen index, relative viscosity and yolk freedom from any defect. Although the results indicated differences with the findings of Ulaocack (1995) and Altan *et al,* (1998). The differences might have resulted from the genetic structure, health condition of the flock age, used of different content of diets in feeding and differences in care and management condition of the quails.

Conclusion

It can be concluded that quails can be successfully raised on commercial broiler diets rather than formulated layers diets. Quails production is profitable owing its very tender, tasty and highly acceptable meat uniform low cholesterol eggs and is a good quality meat for diabetic and high blood pressure patients, hence it is of good public health significance.

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Table 1. Effect of treatment diets on internal egg quality parameters of Japanese quails

Variables	Stocks	No	Yolk Ht(mm)	Yolk Index	Yolk wt (g)	Yolk Width (mm)	Haugh Unit	Albumen thickness (mm)	Albumen wt (g)	Albu index
Overall	Parents	160	1.14±0.02	051±0.01	4.15±0.00	2.22±0.01	58.59±1.09	1.08±0.14	3.60±0.06	0.51±0.01
Overall	F1	140	2.18±0.02	2.04±0.03	0.44±0.02	1.09±0.002	48.48±0.04	0.22±0.00	4.24±0.11	2.04±0.03
Diets	Parents		***	**	NS	NS	*	*	NS	NS
Ecwa		80	1.08	0.49	4.16	2.21	54.57	0.79	3.64	0.5
Vital		80	1.19	0.54	4.14	2.22	58.61	1.32	3.56	0.5
Diets	F1		NS	NS	***	NS	***	***	NS	NS
Ecwa		68	2.16	2.06	0.38	1.09	48.36	0.21	4.22	0.4
Vital		72	2.20	2.01	0.50	1.09	48.59	0.22	4.27	0.4

LOS = Level of significance NS = Not significance

* = P<0.05, ** = P<0.001, *** = P<0.001 Mean in homogenous subsets are similar

Table 2. Effect of production period on internal egg quality parameters of Japanese quails

Variables	Stocks	No.	Yolk Ht(mm)	Yolk index	Yolk wt (g)	Yolk Width (g)	Albumen thickness	Albumen wt (g)	Haugh Unit
Overall	Parents	160	1.14±0.02	0.52±0.01	4.15±0.08	2.22±0.01	1.08±0.14	3.60±0.07	56.59±1.09
Overall	F1	140	2.19±0.02	2.04±0.02	0.44±0.02	1.09±0.02	0.22±0.00	4.24±0.11	48.48±0.04
Production Periods	Parents		NS	NS	NS	NS	NS	NS	NS
6-9wks		32	1.13	0.51	4.13	2.20	1.12	3.51	57.54
10-18wks		72	1.15	0.51	4.20	2.23	1.00	3.68	56.11
19-26wks		56	1.14	0.51	4.13	2.22	1.02	3.61	56.11
	F1		NS	NS	NS	NS	NS	NS	NS
6-9wks		12	2.28	1.98	0.47	1.16	0.22	4.49	48.56
10-18wks		72	2.13	2.06	0.43	1.05	0.21	4.09	48.44
19-26wks		56	2.14	2.06	0.43	1.05	0.21	4.16	48.43

n= number of observations
F1 = first filial generation
Means in homogenous subsets are similar
NS = not significant
LOS = level of significance