



Original article

A study of some serum biochemical values of Japanese quails (*Coturnix Coturnix Japonica*) fed graded levels of energy diets in Northwestern Nigeria

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ARTICLE INFO

ABSTRACT

Article history:

Received 13 December 2013

Accepted 18 January 2014

Available online 26 January 2014

Keywords:

Japanese quails

Energy level diets

Biochemical values

Nigeria

Study involving six weeks feeding trials was conducted at the college experimental farm, college of agriculture, Hassan Usman katsina polytechnic, katsina to determined the effect of different energy levels (2400kcal/kg and 2600kcal/kg) diets on the serum biochemical parameters of Japanese quails (*coturnix coturnix japonicum*). Fifty (50) day old Quails chicks were procured and divided randomly into two treatment groups designated as T1 and T2. Each treatment was replicated three times with eight birds per replicate. Both treatments indicate no significances difference ($P>0.05$) in the biochemical parameters of quails. Both T1 and T2 showed an increase in the value of sodium and total protein and the values of urea, T bilirubin, direct bilirubin, alanine aminotransferase (ALT), Aspartate transaminase (AST) and albumin were lower than the references values. Feed and water were given ad libitum daily. At the end of the trial period two birds were chosen randomly and blood sample were collected through the jugular vein. Two milliliters of blood was collected from the bird in sterile test tubes without anticoagulant and allowed to clot. The samples were processed and analyzed at Rahusa Medical Diagnostic laboratory katsina. From the result obtain in the study, it was deduced that different energy levels

as included in these diets of Japanese Quails have no adverse effect on the serum biochemical parameters of the birds.

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1. Introduction

Japanese quail (*Coturnix coturnix japonica*) possesses distinct characteristics which include rapid growth, early sexual maturity, high rate of lay and much lower feed and space requirement than the domestic fowl (Muhammad, 2006). They are also small sized and disease resistance (Edache et al., 2005; Tuleun and Dashe, 2010). *Coturnix coturnix* or common quail are migratory birds of Asia, Africa and Europe (Sahin, 2001). In any event, quail was first domesticated in the orient (countries of east, especially East Asia) and not the Middle East as has been claimed by some authors (Sahin, 2001). Domesticated quails do not have the tendency for brooding and hence eggs must be incubated under a broody live, or by artificial incubation (Varghese, 2011). Nowadays, quail farming is cropping up as a new venture of diversification of poultry farming, not only to diversify the choice of taste but also to strengthen the meat production unit for fulfilling the shortage of animal protein demands of the people (Deka and Borah, 2008).

Japanese quails are small animals which require little space and start to lay eggs at 6 weeks old. A female Japanese quail has the capacity to lay 24 eggs in one month, their natural foods are grains, seeds and oats feeds. They can equally grow on poultry feeds. Their meat is cholesterol free, the best meat for people that are hypertensive, so can be eaten by young and old. Both the eggs and the meat are good source of protein. Quails possess an excellent disease resistance quality than those of chickens and have been chosen for its economical viability in farming. Japanese quails are rapidly gaining popularity for its commercial exploitation and in near future may acquire an important segment in rapidly expanding poultry industry (Deka et al., 2008). Currently there is no commercial feed for quails in the Nigerian livestock feed industry (Bawa et al., 2011). Against this background, this study was designed to assess the effect of different energy level on the biochemical values of Japanese quails reared under semi arid zones, Nigeria. The objectives of the study is to determine the effect of feeding different energy levels (2400kcal/kg and 2600kcal/kg) on the serum biochemical values of Japanese quails.

2. Materials and methods

2.1. Study Area

This study was conducted at the experimental site of the department of animal health and production technology, college of agriculture, Hassan Usman Katsina Polytechnic, Katsina state, Nigeria. Katsina is located between latitudes 11°08'N and 13°22'N and longitudes 6°52' E and 9°20' E. It is bounded by Niger republic to the north, Jigawa and Kano state to the east, Kaduna state to the south and Zamfara state to the west. The state forms part of the extensive plain known as the plains of Hausa land. It has an average temperature 28°C and annual rainfall of 198mm per annum.

2.2. Feeding and management

The birds were fed with the experimental diets for two weeks in a brooder house at the experimental farm. Afterward, they were randomly divided into two different groups T1 and T2. Each group was replicated three times containing eight birds per replicate making a total of six replicates. T1 was fed feed that contained 2400kcal/kg while T2 was fed feed that contained 2600kcal/kg throughout the trial period. Feed and water were given ad libitum.

2.3. Sample collection

Blood was collected from the individual birds of each group at the time of slaughter from jugular vein. Two milliliters of blood was collected from the bird in sterile test tubes without anticoagulant and allowed to clot.

2.4. Sample processing

Serum was separated out and kept at 20°C until analysis. Total protein (g dLG1) and albumin (g dLG1) were estimated by Biuret and Dumas method as described by Dumas et al. (1971) by using SPAN diagnostic kit (Code No. 25931). The samples were sent to Rahusa medical diagnostic laboratory Katsina for processing and analysis. All the data obtained in respect to biochemical parameters studied during experiment were recorded (table 2 and 3).

2.5. Experimental diets

Two different diets were formulated and compounded for the study, diet 1 (D1) contained 2400kcal/kg while diet 2 (D2) had 2600kcal/kg, though the diets were iso-nitrogenous, but protein levels were balanced (24%) for both diets. The gross compositions of the formulated diets were presented in the table below;

Table 1

Gross composition of the experimental diets and their percentage inclusion.

Ingredients used	Inclusion (%)	
	D1	D2
Maize	34.00	44.00
Wheat offal	28.11	17.50
Groundnut cake (GNC)	18.10	19.23
Bone meal	05.65	06.20
Salt	00.25	00.30
Limestone	02.89	01.19
Fishmeal	08.55	09.50
Methionine	01.20	00.83
Lysine	01.00	01.00
Vitamins premix	00.25	00.25
Total	100.00	100.00

Source: Ukashatu, 2013

3. Results

The result obtained shows that there were some changes in the values of some parameters as compared to the reference value. The values of sodium and total protein raises above normal and the values of urea, T Bilirubin, Direct Bilirubin, ALT, AST and albumin are a bit below normal with no significance difference (Table 1 and 2).

Table 2

Serum biochemical values for group T1.

Parameters	Result obtained	Reference value*
Urea	1.3	1.7-9.2mmol/L
Creatinine	63	35-141umol/L
Na+	165	135-155mmol/L
K+	3.7	3.4-5.5mmol/L
T Bilirubin	3.0	17umol/L
Direct Bilirubin	1.2	4.3umol/L
ALT	4.0	12U/L
AST	10.0	12U/L
Alkaline Phosphatase	24.0	9-35u/L
Total protein	13.2	6.4-8.3g/dl
Albumin	1.7	3.8-4.4g/dl

Source: Ukashatu, 2013

*Rahusa Medical Diagnostic Laboratory Katsina

Table 3
Serum Biochemical Values for group T2.

Parameters	Result obtained	Reference value*
Urea	2.2	1.7-9.2mmol/L
Creatinine	58	35-141umol/L
Na+	159	135-155mmol/L
K+	4.3	3.4-5.5mmol/L
T bilirubin	3.0	17umol/L
Direct bilirubin	2.0	4.3umol/L
ALT	7.0	12U/L
AST	10.0	12U/L
Alkaline phosphatase	35	9-35u/L
Total protein	11.0	6.4-8.3g/dl
Albumin	2.0	3.8-4.4g/dl

Source: Ukashatu, 2013

*Rahusa Medical Diagnostic Laboratory Katsina

4. Discussion

In the present study, the sodium (N+) and Total Protein values increase with no significant difference contrary to earlier study by Deka, et al., (2008) and Tanwar et al., (2001). The values obtained for total protein and sodium may be influenced by the amount of crude protein and sodium chloride intake (Akade, et al., 2012.). The value records in this research fall within the normal ranges of Albumin and total protein as reported by Akade et al., (2012).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. This could be as a result of level of ingredient used and also environmental and health conditions. In both T1 and T2, the level of urea, bilirubin ALT, AST and albumin reduce with no significance difference ($P>0.01$). This finding is in agreement with work of Tanwar and Mishra, (2001) and Deka and Borah, (2008). The lower level of albumin recorded in this study could be attributed to the present of helminthes parasites in the intestine of the bird which increase albumin catabolism (Tanwar et al., 2001).

5. Conclusions

The result of this study indicated that different energy levels as included in these diets of Japanese Quails have no any adverse effect on the serum biochemical parameters of the birds. However further studies should be conducted to evaluate the hematology and histopathology of some selected organs to confirm the performance and safety of using different levels of energy in the diets of Japanese quails.

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