

COMPARATIVE ASSESSMENT AND PERFORMANCE OF THREE QUAIL COLOUR LINES

Jubril, A.E., Ufomadu, C.J., Oyinlola, K.T. And Chimezie, V.O.

Department of Animal Science, University of Abuja- Nigeria

Agricultural and Rural Management Training Institute, Ilorin- Nigeria

Corresponding Author: superiorknight4rill@gmail.com

ABSTRACT

This study was conducted to compare and assess the productive performance amongst the three colour lines of quails: black, white and brown. A total of one hundred and fifty (150) birds were used for the experiment and the experimental animals were randomly distributed into three treatments, and further divided into five replicates per treatment and ten birds per replicate laid out in a completely randomized design (CRD). Feed and water were provided ad libitum while standard management were strictly followed during the study. Data was collected on their body weight bi-weekly. The result of the experiment revealed that there was significant difference ($p < 0.05$) between the colour lines as their weight progressed. However the brown quails showed superior performance compared to the other two colour lines. The study also revealed that there was a positive correlation between the three colour lines, however, their level of relationship was generally low, with brown and black having a relatively higher value of 0.420 and the lowest level of correlation between the black and white quail with value of 0.252. Therefore this study concludes that brown line can be developed and put into intensive selection program to improve the weight for better productivity and utilization.

Keywords: Colour, Correlation, Growth, Plumage, Quail,

INTRODUCTION

Quails (*Coturnix japonica*), are the smallest avian species raised for producing both meats and eggs. Several aspects account for the utility of this important bird, it provides an economic alternative to chickens. These birds attained a remarkable economic importance as an agricultural species that provide a special meat enjoyed for a unique flavor with a high nutritional value (Kayang *et al.*, 2004). They have a remarkable low risk than commercial broiler farming (Prabakaran, 2003). Furthermore, the early puberty, short generation interval (3-4 generations per year), and lower feed requirements make these birds the most suitable and effective poultry which may boost farmers to go on in its production (Vali, 2008).

Body weight, and carcass yield are important traits to poultry breeders and processors. Body weight plays an important role in determining several other economic characteristics in farm animals. It is an important attribute as it forms the basis for assessing growth, feed efficiency and also in making economic and market decisions in farm animals. In addition, there are several factors that contribute to the utility of these birds in scientific experiments.

Plumage color has been reported to significantly associate with body weight and abdominal fat, and egg characteristics (Minvielle *et al.*, 1999). Information about growth performance and plumage color mutations are insufficient in commercial production. The approach of the desired improvement strategy could be performed by making a direct comparative study among several lines of quails (Inciet *et al.*, 2015). Noteworthy, the plumage color phenotype draws the attention of recent genotyping studies as it is the main reactive manifestation of the complicated genetic composition of Japanese quails (Badyaev *et al.*, 2017). However, the plumage color mutants in Japanese quail have received little attention. This is due to the limited number of stock available in different countries. The comparative assessment of performance of these colour lines based on body weight, will help to ascertain which colour line is best for meat production, for better utilization and would also increase the production and farming of the quail birds.

MATERIALS AND METHOD

Experimental Site

This experiment was conducted at the poultry unit of University of Abuja teaching and research farm which is located along Airport Road, Gwagwalada, and FCT-Abuja.

Experimental Animals and Management

A total of One hundred and fifty Japanese quail birds (*Cortunix japonica*) of two weeks of age were used for the study. The quails were purchased from National Veterinary Research Institute (NVRI) Vom in Plateau State. They were weighed individually at the beginning of the experiment and tagged for identification purpose. Antistress was added into their drinking water. They were kept under the same management conditions throughout the study at the University of Abuja Teaching and Research farm. The brown quails were housed in battery cages raised under the same conditions. A standard commercial diet (super starter) containing 22% crude protein and 3000kcal of ME (Metabolized Energy) as well as water was provided ad-libitum during the rearing period. Standard management and medication practices were provided throughout the experimental period. Farm biosecurity and standard hygienic precautions were maintained to prevent the outbreak of any potential infections.

Experimental Design

A total of 150 quails which comprised of black (50), brown (50), white (50) were randomly allocated to specially designed battery cages for quail, using completely randomized design (CRD). The study lasted for a period of six weeks.

Data collection

Body weight (g): Body weight was recorded to two decimal places using a sensitive digital weighing scale, for the three colour lines of quails on weekly basis intervals

Statistical Analysis

Data was subjected to analysis of variance (ANOVA) using SAS software.

RESULTS AND DISCUSSION

Mean Body Weight of Three Colour Lines of Quails at Intervals

Table 1. shows the body weight of the three different colour lines of quails for first six weeks of raising the quails, in which both sexes were recorded. Results had revealed no superiority for any of the three lines for the first two weeks. Subsequently, a significant difference was observed regarding the superiority of brown lines. With exception of the sixth week, in which the white line had higher body weight values, the results had shown significantly higher values ($P < 0.01$) for brown line in Table 1. There was no significant difference ($p > 0.05$) in the first two weeks the values ranged between 75.00 and 76.08g. There was significant difference ($P < 0.05$) in the 4th week where the brown quail showed higher level of significance. In the 6th week significant difference ($P < 0.05$) was observed for white quails.

Table 1: Mean Body Weight of the Three Colour lines of quails at intervals

Plumage	Week 2	Week 4	Week 6
Black	75.00±2.409 ^a	119.25±2.356 ^a	145.76±2.238 ^a
White	75.08±5.580 ^a	132.99±5.805 ^b	163.66±4.517 ^b
Brown	76.08±3.200 ^a	166.20±2.925 ^b	166±29±2.866 ^b
Level of significance	NS	**	**

Significant differences in means represented by different letters in the same column

Correlation between bodyweight in the three colour lines of quail

In table 2, the result revealed a positive correlation bodyweight of the three colour lines. However, there was positive significant ($p < 0.05$) relationship between brown and white colour lines of quails, with value of 0.260, and a positive relationship between black and brown with a moderate positive correlation with value of 0.420 of ($p < 0.05$) and the correlation between white and black there was also positive significance with value of 0.252 which had the lowest correlation amongst the population.

Table 2: Correlation between bodyweight in the three colour lines of quail

Plumage	White	Brown	Black
White	1		

Brown	0.260	1	
Black	0.252	0.420	1

Discussion

The mean values and their standard deviation of the mean for body weight at various ages are shown in Table 1. The result analysis revealed that Brown quails were significantly heavier than the black strain across age groups. Standard deviation estimates indicated greater variation in body weight variables measured at 2,4, and 6 weeks of age in all quail colour lines, which indicates uniform expression of genes related to body weight in older quails. It was evident that regardless of sex, the mean body weight remarkably increased as the quail advanced in age. Several researcher reports agreed with the present findings of body weights values as they indicated a relatively high body weight for the brown line than other analyzed lines (Petek *et al.*, 2004; Minvielle *et al.*, 2005; Yilmaz and Çağlayan, 2008; Sogut *et al.*, 2015). These values are in agreement with the reports that body weights were significantly influenced by different types of color mutants or varieties of quails (Rahman *et al.*, 2010). On the other hand, the present study showed an obvious tendency of weight superiority toward the brown line. This observation indicated that there is a potential interaction between body weights and plumage colour. However, the higher body weight values for brown line indicates a preferable tendency for the meat type quail production for the brown line of quail other than the two studied lines. The correlation coefficients in table 2 indicated the strength of a linear relationship between two traits and thus provide useful information about the traits involved for the purpose of breeding and improvement plan. A positive correlation was observed between body weight, that the three colour lines were highly correlated. The coefficients of correlation from this study varied from low to moderate and where positive and significant in the relationship between most of the colour lines in the study. However, there was positive significant ($p<0.001$) relationship between Brown and white colour lines, with value of 0.260, between black and brown there was moderate positive correlation with value of 0.420 significance of ($p<0.01$) and the correlation between white and black there was also a positive significance with value of 0.252 which had the lowest correlation amongst the population. Values obtained for coefficients of correlation at week 2 agreed with literature values reported by Okon *et al.* (1996).

Recommendation

Due to the presence of a clear superiority of the brown and white lines in terms of the meat productivity, the study recommends that brown as well as the white colour line of quails can be developed and put into intensive selection program to improve the weight for better productivity and utilization.

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