

Contents lists available at [Sjournals](http://Sjournals.com)Journal homepage: www.Sjournals.com**Original article****Effect of sex, colour and weight group on carcass characteristics of Japanese quail****R. Tarhyel^a, B.K. Tanimomo^b, S.A. Hena^{c,*}**^a*Department of Animal Science, University of Maiduguri, Maiduguri, Borno State*^b*Department of Animal Health and Production, Faculty of Veterinary Medicine, University of Abuja*^c*Department of Animal Health and Production, College of Agriculture and Animal Science, Bakura*

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ABSTRACT

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This work was conducted on Japanese quails (*Coturnix japonica*) to determine the effects of sex, colour and weight group on their carcass characteristics. The birds were housed in deep litter pen at the poultry unit of University of Maiduguri Teaching and Research Farm and fed with broiler starter mash from 5-8 weeks then later on from 8-52 weeks layer mash were introduced. The birds were divided into various groups (based on sex, colour and weight groups). The experiment lasted for 52 weeks in which the birds were slaughtered and divided into various parts and weighed. Results obtained were subjected to statistical analysis using Analysis of Variance (SPSS 16.0 statistical package) and the means were separated using Duncan Multiple Range Test. Effect of sex on carcass characteristics were significant ($p < 0.05$) with female having higher mean value than the male for live weight and bled weight respectively. Also, there were significant effect ($p < 0.05$) of color type and weight group on carcass traits. Results obtained from this research work will serve as a basis for selection of desirable traits in Japanese quail and may contribute to the body of knowledge with regards to this animal species.

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1. Introduction

The Japanese quail belongs to the order *Galiformes*, family *Phasidae*, genus *Coturnix* and species *japonica*. The scientific designation for Japanese quail is *Coturnix japonica*, different from common quail "*Coturnix coturnix*" (Thear, 1998; Mizutani, 2003). The first record of wild Japanese quail appeared in the eight century in Japan. The plumage color of the wild type is predominantly dark cinnamon brown. However, adult female have pale breast feathers that are speckled with dark colored spot. Adult males have uniform dark rust-red feathers on the breast and cheek (Mizutani, 2003). The Japanese quail originally domesticated around the 11th century as a pet song bird (Crawford, 1990; Kayang et al., 2004), has gained in value as a food animal (Wakasugi, 1984; Kayang et al., 2004).

Several aspect account for the utility of this bird; it has attained economic importance as an agricultural species producing eggs and meat that are enjoyed for their unique flavor (Kayang et al., 2004). Also, low maintenance cost associated with its small body size (80-300g) coupled with its short generation interval, (3-4 generation per year), resistance to diseases and high egg production, rendered it an excellent laboratory animal (Baumgartner, 1994; Yalcin et al., 1995; Oguz and Minvielle, 2001). Several research works showed that, fattening performance, carcass characteristics of quails are affected by length of growth period, genotype, selection, content of the ration used, sex and live body weight (Adedokun and Sonaiya, 2002). Body weight in poultry is known to be moderately to highly heritable and hence the selection of individuals in population of birds should result in genetic improvement of the trait. Selim, et al., (2006), studied the effect of sex on Live Body Weight (LBW) gain, slaughter weight and carcass weight and reported higher carcass characteristics and low feed conversion rate in female than males. Some of the estimated genetic parameters for different traits of Japanese quails were reported by several researchers. Seizai et al., (2010), discovered sex had significant effect on carcass weight and females had higher carcass weight than the males ($p < 0.01$). Carcass yield were found 75.47% for females and 73.4% for males. Altinel and Cerit, (1998), reported that average live body weight at the end of 6 weeks period was 159.01g in males and 179.9g in females and the average feed conversion rate of 5.41g for males and 4.74g for females. Although different works on Japanese quail had been conducted on: Carcass characteristics of quail (*Coturnix coturnix japonica*) slaughtered at different ages by Yalcin et al., (1995), Growth performance of meat male quails (*Coturnix* spp) of two line quails and two nutritional environment by Almeida et al., (2002), Carcass composition, feed intake and feed efficiency following long-term selection for four week body weight in Japanese quail by Marks, (1993) and

Effect of separate and mixed rearing according to sex on fattening performance and carcass characteristics in Japanese quails (*Coturnix coturnix japonica*) by Selim et al., (2006), no work has been seen by the authors on effect of sex, colour and weight group on carcass characteristics of Japanese quail in the study environment. Thus, the data obtained in this work could be of immense contribution to knowledge on Japanese quail.

2. Materials and methods

The experiment was conducted at the university of Maiduguri livestock Teaching and Research Farm, Borno State in the North Eastern part of the country. 120 birds (4 weeks old) Japanese quails (male and female) were obtained from the National Veterinary Institute (NVRI), Vom, Plateau State. They were housed in deep litter pens equipped with feeding and watering troughs. The floor was covered with wood shaving. The birds were first fed on commercial broiler starter ration containing 24% CP, 132ME kcal/Kg which was later change to layers mash. Other management practices like sanitation and weekly weighing were conducted to obtain various weights at different ages.

At 5 weeks of age, 84 pieces (12 birds per category/group) were selected based on weight, colour and sex groups into various groups. These birds were starved over night but water given *ad libitum*. Their weights were taken before slaughter to obtain the live weight. Bled weight was obtained immediately after slaughtering, while carcass weight was recorded after evisceration and defeathering using a sensitive scale balance. The carcasses were divided into major parts viz; breast, thigh and back. This procedure was done for all the groups as listed in the Table 1.

All data collected were subjected to Analysis of Variance (SPSS 16.0 statistical package) and the means were separated using Duncan Multiple Range Test.

3. Results and discussion

As shown in Table 1, the effect of sex on the carcass weight was not significantly different ($P > 0.05$), except for back weight, bled weight and live weight which showed significant difference ($p < 0.05$). This agreed with the

findings of Mark, (1990), who reported that males were significantly different from female, on live weight and other characteristics due to higher metabolic rate in males. Also, Selim *et al.* (2006), reported that decrease in live weight in male Japanese quail occurred as a result of performance of male sexual activities due to the hormonal change. They observed live weight at 42 days for female and male to be (192.08g vs. 176.67g) respectively. Sex was a significant source of variation for live weight at all the ages. Toelle, *et al.*, (1991) observed a significant of sex ($p<0.01$) for all carcass trait except thigh weight in their study.

It was observed from the result of this study, that, color type had a significant effect ($p<0.05$), on the carcass trait except for back weight. Higher means were found in the albino than the normal colors. This result however, does not agree with those of Minvielle, *et al.*, (1999), who observed higher weight carcass traits in the normal line.

Similarly, weight group had significant difference ($p<0.05$) value on the entire carcass trait. Heavy weight group had significantly higher value for all traits as shown in the table. This is supported by Genchev, *et al.*, (2008), who reported significant difference ($p<0.01$) for various carcass traits for different weight groups. They observed breast weight as 38.9g, 37.7g and 37.5g, thigh weight 23.1g, 22.9g and 22.8g, wing weight and back weight 23.7g, 23.3g and 22.4g for heavy, medium and light line respectively.

Numerous selection experiments on live body weight have been carried out by Oguz and Minvielle, (2001) and were quite successful at increasing or decreasing body weights. In some works, carcass and quality traits were also monitored (Marks, 1993). Similarly Marks, (1993), investigated body weight, feed intake, feed efficiency and carcass composition changes following 51 generation of selection for high 4 week body weight in Japanese quail. But in this present research our central aim was the evaluation of the effect of sex, color and weight group on the carcass traits of the Japanese quail.

Table 1

Effect of sex, colour and weight group on carcass characteristics of Japanese quail.

	Live weight (g)	Bled weight (g)	Breast weight (g)	Carcass weight (g)	Back weight (g)	Thigh weight (g)
Sex						
Male	126.41±2.48 ^b	117.79±3.09 ^b	25.63±0.72 ^a	92.57±2.38 ^a	34.93±1.30 ^a	17.70±0.48 ^{ab}
Female	134.73±2.93 ^a	127.13±3.13 ^a	27.39±0.73 ^a	90.53±2.41 ^a	30.49±1.31 ^b	19.49±0.48 ^a
Colour						
Albino	132.66±2.27 ^a	125.42±2.40 ^a	27.55±0.54 ^a	92.46±1.88 ^a	31.90±1.0 ^a	19.68±0.36 ^a
Normal	121.33±4.77 ^b	109.15±3.04 ^b	21.89±1.14 ^b	88.12±3.93 ^a	36.60±2.15 ^a	16.70±0.76 ^b
Weight group						
Light	114.77±3.40 ^c	108.81±3.82 ^c	23.43±0.91 ^c	78.56±2.81 ^c	26.69±1.54 ^b	17.17±0.59 ^a
Medium	118.75±0.54 ^b	119.53±3.56 ^b	26.53±0.84 ^b	89.99±2.62 ^b	30.09±1.44 ^b	18.75±0.54 ^b
Heavy	146.39±3.01 ^a	135.73±3.39 ^a	28.89±0.80 ^a	103.48±2.50 ^a	39.99±1.37 ^a	21.02±0.52 ^a

^{a, b, c} Means within columns with different superscript are significantly ($p<0.05$) different from other.

4. Conclusion

Results obtained from this research clearly showed that for all carcass traits, female had significant carcass characteristics than the male for the same quantity of feed given. This implied better feed conversion rate than male. Similarly, albino quail has higher carcass traits than the normal line. This work will serve as a basis for selection of desirable traits in Japanese quail as farmers are left with the choice of the varieties of quail he wants to raise based on the demand of the consumers.

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