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COMPARISON OF CARCASS CHARACTERISTICS BETWEEN PHENOTYPIC GROUPS OF DIFFERENT FEATHER-COLOR QUAIL AND ITS CROSSBREEDING

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ABSTRACT

This experiment was conducted to compare the characteristics of the carcass between the phenotypic groups of different quail birds with the different plumage-colored and it's crossbreeding. In this experiment, 120 quail birds were used (parents of different color of feathers) (brown, white and desert). The eggs were collected and hatched and the resulting chicks were divided into four groups. It is brown ♂ × white ♀ And white ♂ × desert ♀ and white ♂ × brown ♀ and desert ♂ × white ♀ They were compared with the parents in the carcass characteristics, which are body weight, carcass weight, chest weight, back weight, thighs, and viscera weight. Brown and desert birds surpassed brown over white and desert birds in the weight of the gizzard, which gave a higher weight. As for liver weight, significant differences appeared in favor of desert birds that outperformed brown and white birds. While the results of the statistical analysis did not show any significant differences for the characteristic of back weight, thigh weight, and heart weight between the three phenotypic groups. As for the effect of the phenotypic group of the offspring resulting from the crossbreeding, it was noticed that there are significant differences in the characteristics of the carcass between the four groups, where the first hybrid scored the highest body weight, followed by the third group, then the second and fourth. The first three groups outperformed the fourth group. As for the weight of the liver, significant differences appeared between the four hybrids in favor of the first hybrid over the rest of the hybrids, and the results of the statistical analysis did not show any significant differences in the characteristic of the heart weight between the phenotypic groups of the crossbreeding offspring.

Keywords : Phenotypic groups , quail, carcass traits, color of feathers.

Introduction

The Japanese quail (*Coturnix japonica*) is the smallest bird species raised to produce both meat and eggs. There are many aspects that explain the benefit of the quail bird, as it provides an economical alternative to chickens, and for this reason these birds have gained remarkable economic importance as an agricultural species that provides special meat that has a unique flavor with high nutritional value (Kayang *et al*., 2004). It is also characterized by the lower cost of breeding compared to commercial broiler breeding (Jeke *et al*., 2018). In addition, there are many factors that make these birds suitable in scientific experiments, such as their resistance to diseases that are associated with higher egg production (Scholtz *et al*., 2009).

The inheritance of the color of feathers is important, as the wild color is mainly dark brown, and there are different strains of the color of feathers, which are black, light brown and desert, and there are also strains, including albino, which are the result of genetic isolations in Japanese quail. Results of some studies indicated that white-feathered quail had lower body weight than wild type in research (Petek *et al*., 2004; Minvielle *et al*., 2005; Yilmaz and Caglayan, 2008). The white color is due to a genetic mutation (Badyaev *et al*., 2017). Quantitative traits related to plumage color can be measured on the growth performance of quail. That is why this study was conducted to determine the weight of birds and the carcass characteristics of Japanese quail with different feather colors.

Materials and Methods

This research was carried out in the field of poultry of the Agricultural Research Department / Nineveh Research Department for the period from 1/10/2018 to 15/3/2019, during which it studied the comparison of carcass characteristics between different phenotypic groups with the color of feathers for quail birds. The main flock is divided into three groups. Different phenotypes of the color of the feathers (brown, desert and white) each group includes 40 birds distributed into four replicates for each group (2 males and 8 females). The eggs were collected and hatched in the circle hatchery to obtain pure offspring from each group, then the males were excluded from the females for a period of 15 days and then re-mixed To get four groups, the first group is brown males and white females, the second group is white males with desert females, the third is white males with brown females, and the fourth is desert males with white females, and eggs were obtained from these groups and hatched The striking offspring were obtained from the first generation of these groups, bred and compared. The carcass characteristics were studied from live body weight, empty carcass weight, chest, back and thigh weight. The weights of the eaten guts (heart, liver and gizzard) were measured, and

birds were fed on a diet (beginning and end) formed according to (N.R. C, 1994) Table 1. The water and fodder

Table 1 : The components of the ration used in the study.

Ingredients	Growth ration %	Productive ration %
Yellow corn	37	37
Soybean Meal	30	22
Proteins concentrate	8	8
Wheat	22	30
Soybean oil	2	2
Limestone	0.7	0.7
Salt	0.3	0.3
Total	100	100
Protein Ratio	22.23	19.62
Calculated energy kcal/kg	2958	3030.10

Computed based on N.R.C (1994).

Were provided to the birds freely, the chicks were weighed, the carcass trait weights were calculated, and the statistical analysis was performed using the random design CRD.The averages were compared according to the Duncans Test for all the traits addressed by the study by means of the statistical analysis program (SAS, 2001).

Results and Discussion

The effect of the phenotypic group of the fathers on the carcass weight Table (2): The results of the statistical analysis showed significant differences between the phenotypic groups of the fathers where the brown and desert groups outperformed the white in live body weight, carcass weight and chest weight, which gave a group of white birds a body weight (212, 10) Less than the brown and desert birds (248, 60, 246, and 77) grams, respectively, and a lower carcass weight was recorded for white birds, which amounted to (134.47) g, while it was higher in brown and desert birds, which reached (164, 17, 155, 73) gm Respectively, As for the breast weight, white birds recorded the lowest breast weight (46.40) g, while the brown and desert birds were (55, 70, 55 and 20) gm respectively. While the results of the statistical analysis did not show any significant differences in the characteristic of back weight and thigh weight between the three phenotypic groups that recorded back weight (68, 74, 56, 47, 68, 07) gm for the phenotypic groups (brown, white and desert) respectively, and the weight of the thighs was (35, 30, 30, 03, 34, 00) gm for the phenotypic groups (brown, white and desert) respectively. These results are in agreement with (Hassan *et al*., 2016) and (Inci *et al*., 2015) as well as, Genchev *et al*., Oguz and Minvielle (2001), and Marks

(1990) who reported that differences in quail feather color had a significant effect on live weight and carcass weight and that the wild group had live weight and the carcass weight was heavier. And Tarhyel *et al.* (2012). In their comparative study, live weight of white and wild quail, reported that feather color had a significant effect ($P < 0.05$) on live weight **.** But the white group had a lower live weight. Table (2) the effect of the phenotypic group of parents (first generation) in carcass traits (gm) **the effect of the phenotypic group of the children resulting from the beating on the carcass weight**. Table (3): The results of the statistical analysis showed significant differences between the phenotypic groups of the struck sons, where the first hybrid was recorded as brown males and white females with the highest body weight of (217.03) g, followed by the third group with white males with Brown females (207, 73) gm, then the second group, white males with desert females (199, 83) gm, then the fourth group, desert males with white females (186, 70) gm. As for the carcass weight, the first hybrid is brown ♂ × white x white ♀ and the third white ♂ × brown♀ over the second hybrid white ♂ × desert ♀ The fourth is desert ♂ × white ♀ , where the values were (141.57, 139, 60) gm and (131. 67, 123. 43) gm, respectively. As for the chest weight, the results of the statistical analysis showed significant differences between the phenotypic groups of the offspring, where the first three groups outperformed the fourth group, which gave the lowest chest weight (41.67), while the first group gave (50.67) gm, then the third hybrid (48). 20) gm, then the hybrid

Table 2 : The effect of the phenotypic group of parents (first generation) on carcass characteristics (GM)

Parameters	Brown	White	desert	moral level
Body weight 6week g	248.60± 12.40 a	212.10±4.19 b	246.77± 5.39 a	*
Carcass weight (g)	164.17±6.30 a	134.47±4.36 b	155.73± 2.75 a	*
Breast weight (%)	55.70± 1.17 a	46.40± 2.28 b	55.20± 0.99 a	*
Back weight (%)	68.47± 3.82	56.47± 3.99	68.07± 2.45	N.S
Thigh weight (%)	35.30±2.41	30.03 ± 1.56	34.00± 0.61	N.S

Values means ±S.E with different horizontal letters indicate significant differences at the ($p<0.05$) .

Table 3 : The effect of the phenotypic group of the second-generation sons) on carcass characteristics (gm).

Parameters	first hybrid Brown ♂ × white♀	second hybrid White ♂ × desert♀	third hybrid White ♂ × brown♀	fourth hybrid Desert ♂ × white♀	Moral level
Body weight 6week g	217.03 ±5.67a	199.83 ± 4.54 ab	207.73± 6.41ab	**186**.70 ± 3.11b	*
Carcass weight (g)	141.57 ± 6.09 a	131.67 ±2.83 ab	139.60 ± 1.00 a	123.43 ± 3.04 b	*
Breast weight (%)	50.67 ±2.22 a	46.63 ±1.77 a	48.20 ± 0.72 a	41.67 ±1.85 b	*
Back weight (%)	58.33 ±3.89 a	57.33 ±2.89 a	58.73 ± 1.47 a	44.93 ±4.09 b	*
Thigh weight (%)	33.80 ±2.14 a	29.43 ±0.41 b	31.93 ±0.93 ab	29.00 ±0.25 b	*

Values means ±S.E with different horizontal letters indicate significant differences at the ($p<0.05$).

The second (46.63) gm, and the results of the statistical analysis showed significant differences in the back weight trait between the phenotypic groups of the four stripped hybrids, as the fourth hybrid was desert ♂ × white ♀ less back weight (44.93) gm on the three groups, while the first hybrid was given a brown ♂ × white ♀ The highest weight of

thighs is (33, 80) g, followed by the third hybrid, white ♂ x brown ♀ (31.93) g, then the second white ♂ × desert ♀ (29.43) g and the lowest weight of the fourth hybrid was desert ♂ × white ♀ (29.00) gm). Improved performance of white-feathered birds. The effect of the parent phenotypic group on the weight of the eaten viscera, Table (4): The results of the statistical analysis did not show any significant differences in the characteristic of heart weight between the three phenotypic groups that recorded the weight of the heart (2.00, 1977, 1, 93) gm for the phenotypic groups (brown, white and desert) In a row, while the results of the statistical analysis showed significant differences between the phenotypic groups of the parents, where the brown over the white and the desert in terms of the weight of the gecko gave a group of brown birds a higher gecko weight (3, 44) g of the white and desert birds (3, 33, 3, 80) gm, respectively, as for the weight of the liver, the results of the statistical analysis showed The presence of significant differences in favor of birds with desert feathers, which outperformed brown and white birds, and the values were as follows (5, 90, 5, 67, 7, 74) gm for the phenotypic groups (brown, white and desert) respectively. These results were in agreement with (Minvielle *et al*., 2007). This difference may be attributed to the recessive genetic act, which has a lesser effect on the weight of the quail. It was more pronounced in black, golden, and brown quail, as it gave higher values than white The effect of the phenotypic group of the children resulting from the multiplication on the weight of the eaten viscera, Table (5): The results of the statistical analysis did not show any significant differences for the weight of the heart between the phenotypic groups of the crossbreeding offspring, which gave the heart weight (1.63, 1.173, 1.177, 1.57) gm for the four subgroups (the first hybrid is brown ♂ × white ♀ and the hybrid The second is white ♂ × desert ♀ And the third hybrid is white ♂ x brown ♀ And the fourth is desert ♂ x white ♀), Respectively, while the results of the statistical analysis showed significant differences between the four hybrid groups, where it exceeded.

The first hybrid was brown ♂ x white ♀ over the rest of the other hybrids in the weight of the Gizzard, which gave (4.33) grams of the second hybrid white ♂ × desert ♀ And the third hybrid white ♂ x brown ♀And the fourth desert ♂ x white ♀ (3. 20, 3. 37, 3. 17) g, respectively, as for the weight of the liver, the results of the statistical analysis showed significant differences between the four hybrids in favor of the first hybrid between ♂ x white ♀ and the second hybrid white superior to the third and fourth hybrid, and the values were As follows for the first and second group (6. 73, 5.5) gm, and for the third and fourth group (3.93, 3.93), respectively. Where the multiplication improved the white strain in liver and gizzard weight traits.

Table 4 : The effect of the phenotypic group of papa (first generation in the weight of eaten viscera (gm)

Parameters	Brown	White	desert	moral level
Heart weight %	2.00±0.06	1.77±0.03	1.93±0.12	N.S
Gizzard weight %	4.33± 0.13 a	3.33± 0.19 b	3.80± 0.11 b	*
Liver weight %	5.90± 0.46 b	5.67± 0.49 b	7.47± 0.29 a	*

Values means ±S.E with different horizontal letters indicate significant differences at the (p<0.05).

Table 5 : Effect of the phenotypic group of the second-generation children (weight of the eaten viscera (g)

Parameters	first hybrid Brown ♂ × white♀	second hybrid White ♂ × desert♀	third hybrid White ♂ × brown♀	fourth hybrid Desert ♂ × white♀	moral level
Heart weight %	1.63±0.09	1.73±0.8	1.77± 0.03	1.57±0.3	N.S
Gizzard weight %	4.03±0.09 a	3.20± 0.12 b	3.37± 0.26 b	3.17± 0.09 b	*
Liver weight %	6.73±0.07 a	5.57± 0.28 ab	3.93± 0.41 b	3.97±0.64 b	*

Values means ±S.E with different horizontal letters indicate significant differences at the (p<0.05).

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