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EFFECT OF THE TREATMENT WITH ACETIC AND LACTIC ACID ON SOME OF THE PRODUCTIVE CHARACTERISTICS IN STRAIN QUAIL

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Abstract

This experiment was conducted to assess the response of the local quail to the different genotypes of exporters of organic acids (acetic and lactic) and their effect on the production performance and weight of the carcass and measure correlation and regression. The experiment included 126 one-day old quail of the brown and black strain with 63 bird of each strain and placed in wooden cages at a rate of 14 bird each cage to be three treatments three by 3 replicates to 42 days and fed and water freely. There was a significant superiority (P <0.05) in body weight between the black and brown strains during the ages of 28, 35 and 42 days. The black strain reached the highest weight for brown strain. And high growth rate of blacks compared with brown strain, which gave a growth rate for the successive stages of life. The addition of organic acids (acetic and lactic) significant differences in weight The body on the control treatment. The black strain gave a high growth rate at age 28 days 51.06 g on the desert 43.16 g. There were no significant differences in growth rate at the age of 35 and 42 days between the two strain. The weight of the carcass was the advantage of the black strain with a significant value (P <0.05) 161.77 g higher than the brown148.67g and also gave a higher percentage of reflux 64.31% than the brown strain 62.74%. There were also significant differences in acetic and lactic acid in carcass weight, higher percentage of control treatment and high correlation coefficient in black strain than brown strain of body weight on feed And the efficiency of dietary conversion on feed intake. We conclude from this experiment that the black strain is better than the brown strain and that the addition of organic acids had an effect on the productive qualities of the fat.

***Keywords*:** Correlation, regression, productive, quail.

Introduction

Most countries of the world tended to find new ways to increase production to meet the growing population in the world, so chickens are no longer the only project for the production of meat and eggs, but participated by different types of poultry in varying degrees, including Japanese bird *Coturnix coturnix* japonica, which entered strongly in these industries, One of the good economic projects (Saadi 2008). The quail is characterized by high production of eggs, shorter hatching time and less feed consumption compared to other poultry, as well as being economical and low production costs compared with chicken (Erheem, 2002). Hatching varies between 16-18 days (Reddish and others 2003). The goal of the animal breeder is to change the heredity of their herds for the purpose of increasing returns and facilitating management at a certain level of production, which can be achieved by regulating the registration of ratios and examining the performance and finding genetic parameters of the clans and genetic assessment of individuals In order to make the right decision to identify animals that can be used as parents (Kinghorn, 1997), poultry lines have evolved considerably depending on the processes of selection of production traits (Jones *et al*., 1997) And (Minirielle *et al*., 2002). Genetic selection has played a vital role in improving the efficiency of its production (Marks *et al*., 1999), making it one of the most important tools in the genetic improvement of poultry. Individual selection was the most important genetic criterion, considering body weight as a key indicator of the encouraging qualities of Japanese annual meat production (Marks, 1989). (Wilson 1991) considered the Japanese bird as a guide to the most expensive selection experiments conducted on chickens or turkeys. The speed of the succession of generations (short generation period) The Japanese quail bird will be allowed to use it as a guide animal, especially in Genetics studies.

Materials and Methods

This study was conducted in the poultry field of the Faculty of Agriculture and Forestry, Department of Animal Production of the University of Mosul for the period from 1/2/2018 to 15/3/2018 for a 6 weeks, during which he studied the effect of the response of two types of quail (brown and black) When adding different levels of organic acids (lactic and acetic) in some of the productive qualities, 129 birds were used for black and brown strains divided into three treatments by 3 replicates in each repeater. 14 birds were added organic acids In percentages (zero and 2.5 mg acetic acid / kg feed) And (2.5 mg lactic acid / kg feed) Put all the birds in wooden cages (50 × 50 × 50) cm and feeding the birds by the feed (Starter and Finisher) Configured by

(N. R. C, 1994). Table 1 Food and water were provided free of charge N and birds was weighed at the age of 28, 35 and 42 days. The feed intake was calculated up to 46 days of age. Nine chickens were slaughter for each strain at the age of 42 days and the carcasses were weighed with the meat portions. The studied traits were the body weight and the amount of feed eaten (one gram per day). On this basis, According to Broody (1969).

Table 1 : The components of the bush used in the study are constructed.

Feeding Material	Starter (14-28)d	Finisher (28-42)d
Yellow corn	49	41
Wheat	—	21
Proteins Center	15	10
Soybean Meal	32	21
Sun flower oil	3	2
Calcium	0.9	4.5
Salt	0.1	0.5
Total	100	100
Protein Ratio	23.89	20.4
Calculated energy kg / kg	2971	2834

$$\textbf{Relative Growth Rate} = \frac{\text{Weight2} - \text{Weight1}}{\text{Weight1}} \times 100$$

The weight of the carcass, the weight of the Viscera and the percentage of dissolution and the statistical analysis were calculated using the design of the global experiments (3* 2* 3). The averages were compared by the Duncan test For all the characteristics studied in the study and estimation of regression and simple correlation coefficients by statistical program (SAS 2001).

Results and Discussion

The results of the statistical analysis showed a table (2) of the effect of organic acids on the body weight at the age of 28 days exceeded the third treatment (add lactic acid 2.5%) significantly (P>0.05) On the rest of the treatments to be the order of treatments according to the best body weight (the third treatment Lactic 2.5%, then the second acetic 2.5% and then the first control 0%), which reached (181.83, 163.33, 149.83) g respectively, and also at the age of 35 days also exceeded the third treatment significantly (p<0.05) on the rest of the treatments followed by the second treatment and then the first treatment where the body weights were given (249.50, 237.48, 194.17) g respectively. And the same result at the age of 42 days also exceeded the third treatment significantly (p<0.05) on the rest of the treatments followed by the second treatment and then the first treatment where the body weights were given (289.22, 282.98, 281.00) g Respectively. These results were similar to those found by Ali and Al-Naimi (2006) and Nafeaa (2016) when they studied meat broilers. When comparing the genetic makeup (black and brown) in body weight at the age of 28 days significantly higher than the black strain (P <0.05) n the brown strain that gave a body weight (160.33) g as shown in Table (2). The results were similar to those found by Hassan and Abdul Sattar (2015). It was observed that the genetic structure had a role in body weight On brown and white during the age of 4 weeks and also al-hadethee and others (2007). Also at the age of 35 days, the black strain gave a body weight (236, 33) g, significantly higher than the brown strain, which gave a body weight of (217.77) g. The same result at the age of 42 days significantly exceeded the black strain (P <0.05) on the brown strain in body weight was 289.11 g for the black strain and 279.70 g for the brown strain, and these results were similar to those found by Hassan and Abd al-Sattar (2015) and contrary to what Jasim found (2011), where no significant differences were observed between The two generation Brown and black, but were differences in arithmetic only, and also contrary to what he found Bchberh and others (2017) and also Hayali and Tawfiq (2018).

As for the relative growth rate, as shown in Table (3), the third treatment was significantly higher with the addition of lactic acid (P <0.05) on the rest of the treatments, which gave relative growth higher than the second treatment. The first treatment was control at the age of 28 days and at the age of 48 days with a relative growth rate of 28 days (78.67, 58.13, 44.67) For the third, second, and first treatment at 35 days gave a relative growth rate (143.80, 130.65, 90.33), respectively. The high relative growth rate was due to the reduced pH of the digested food due to the addition of organic acids, Amino acids by increasing the activity of digestive enzymes such as microbial Phytase enzyme and pepsin enzyme and digestive enzyme. The enzymes

of the gastrointestinal protein and increased pancreatic secretions with the presence of beneficial microorganisms and intensively in the microvilli of the intestinal flora slow down the passage of the food mass and provide a greater opportunity for digestion and absorption, thus increasing nutrient readiness, Nafeaa and Muhammad (2016). At the age of 42 days, there were no significant differences in the addition of organic acids in the relative growth rate between the coefficients, but the differences were computed only for the third treatment followed by the second treatment and then the first treatment and these results came close to what Nafeaa and Muhammad found (2016). As for the genetic structure, there were no significant differences in the relative growth rate during the breeding period of 28, 30 and 42 days between the black and brown strain only. There were mathematical differences for the black strain Table (3). These results were similar to those found by Ali and others (2007) When they studied on chickens meat at the ages of 28 and 42 days, where the coob and ros generations were characterized by a faster growth rate and increased weight gain at those ages, as well as an approach to what Sindi and others (2006) The weight of the carcass table (4) showed that there were significant differences ($p < 0.50$) when adding the organic acids for the second treatment at the addition of the acetic followed by the third treatment addition of lactic and then the treatment of the first control amounted to (162.15, 158.75, 144.75) g For the second, third and first treatment respectively.

Table 2 : Effect of genetic structure and organic acid additive on the live body weight in strain quail

Parameters / **Treatment**	**Age 28 day**	**Age 35 day**	**Age 42 day**
Effect Treatments	*	*	*
T1 control 0%	149.83±3.70 c	194.17±7.55 b	281.00±4.34 b
T2acetic acid 2.5%	163.33±2.28 b	237.48±4.96 b	282.98±2.32 a
T3lactic acid 2.5%	181.83±5.04 a	249.50±3.78 a	189.23± 2.88 a
Effect of strain	*	*	*
Brown	160.33±5.36 b	217.77±9.11 b	279.70± 2.35 b
Black	169.67±5.23 a	236.33±8.76 a	289.11±2.36 a

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

Table 3 : Effect of genetic structure and organic acid additive on the relative growth rate in strain quail

Parameters / **Treatment**	**Age 28 day**	**Age 35 day**	**Age 42 day**
Effect Treatments	*	*	*
T1 control 0%	44.67±2.42 c	90.33±6.19 c	177.78±3.06
T2acetic acid 2.5%	58.13±3.07 b	130.65±65 b	178.82±2.56
T3lactic acid 2.5%	78.67±4.18 a	143.80±2.08 a	186.95±2.05
Effect of strain			
Brown	60.33±5.36	117.77±9.11	179.70±2.35
Black	61.11±5.79	125.42±8.07	182.67±2.94

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

The results of the statistical analysis showed significant differences ($p<0.05$) for the genetic composition of the black strain which gave a higher carcass weight of 161.77 g of the brown strain 148, 76. These results were similar to those found by Hayali and Tawfiq (2018) where significant differences were observed in the weight of the carcass in favor of the black and white strain on the brown, and in violation of what was found by Bashira and others (2017). (4). There were significant differences ($p<0.05$) when adding organic acids for the second treatment at the addition of acetic in the ratio of reflux followed by the third treatment addition of lactic and then the treatment of the first control was (64.50, 63.68, 62.39)% for the second, first and third treatment, respectively. The results of the statistical analysis showed significant differences ($p<0.05$). For the strain genotype in favor of the black strain, which gave a higher filtration rate of 64, 31% of brown strain 62.74%. These results were contrary to what Al-Hayali and Tawfiq found (2018). They did not notice any significant differences between the genetic makeup of the quail bird and were only arithmetic.

Table 4 : Effect of genetic structure and organic acid additive on the carcass weight and dressing percentage in strain quail

Parameters / Treatment	Carcass weight (g)	Dressing percentage %
Effect Treatments	*	*
T1 control 0%	144.75±1.68 c	63.68 ± 0.67 ab
T2acetic acid 2.5%	162.15± 3.64 a	64.50±1.34 a
T3lactic acid 2.5%	158.75± 3.47 b	62.39±0.42 b
Effect of strain	*	*
Brown	148.67± 1.96 b	62.74±0.47 b
Black	161.77±3.36 a	64.31±0.90 a

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

When studying the relationship between some economic characteristics of the strain at age 28 days as shown in Table (5) there was a significant relationship between the regression coefficients of the rate of increase of weight on feed intake in the brown strain. This means that the weight increase of each genetic structure was obtained due to differences in feed ability and conversion to meat, while the relationship was not significant in the black strain.

There was a significant relationship between the regression coefficients of the rate of increase of weight on feed intake in the brown strain. This means that the weight increase of each genetic structure was obtained due to differences in feed ability and conversion to meat, while the relationship was not significant in the black strain 0. 53 for the black strain and 0.37 For the brown strain, whereas the regression coefficient of the conversion efficiency was not significant for the brown and black crosses. The relationship was weak and the correlation coefficient was negative and both strains were 0.11- and 0. 23- for the brown and black strain respectively. This means that the increase in feed consumption The decrease in bird susceptibility to food conversion led to rapid growth, which came close to what it found Ali and others (2007) when they studied on the breeds of chickens meat breeds, while the regression coefficient of live body weight on the feed intake was significant for the brown and black strain and the correlation coefficient showed significant for the black strain 0.73.

Table 5 : Relationship between some economic characteristics of quail at the age of 28 days

Relationship	Strain	
	Brown	Black
Regression coefficient increase in weight / feed intake	0.139*	0.279
Correlation coefficient between the two	0.37	0.53
Regression line equation	Y=-23.912+0.389X	Y=-62.419+0.544X
Regression coefficient of feed conversion factor / feed intake	0.012	0.054
Correlation coefficient between the two	-0.11	-0.23
Regression line equation	Y=5.484-0.009X	Y=8.712-0.21X
Regression coefficient of body weight / feed intake	0.293	0.575
Correlation coefficient between the two	0.54	0.76*
Regression line equation	Y=-102.96+1.494X	Y=-26.23+1.406X

While the brown strain 0.54 At the age of 35 days, the relationship between the regression coefficients of the weight increase on feed intake was studied (Table 6). The relationship was linear for the brown and black crosses and the high correlation coefficient of the brown strain between the two cultivars was 0.84 and a significant correlation of 0.73 for the black strain, the efficiency of food conversion on feed intake was insignificant and both the black and brown strains showed a negative correlation coefficient of -0.76 For the brown strain and -0.52, and the significant relationship was shown that the mean weight of live body weight on the feed was better for the brown strain then the black strain and the higher mean correlation coefficient for the black strain was 0.87 And the mean for the brown strain was 0.83.

Table 6 : Relationship between some economic characteristics of quail at the age of 35 days

Relationship	Strain	
	Brown	**Black**
Regression coefficient increase in weight / feed intake	0.761	0.534
Correlation coefficient between the two	0.84	0.73
Regression line equation	Y=-71.30+0.550X	Y=-38.911+0.413X
Regression coefficient of feed conversion factor / feed intake	0.456	0.266
Correlation coefficient between the two	-0.67	-0.52
Regression line equation	Y=10.611-0.027X	Y=7.029-0.012X
Regression coefficient of body weight / feed intake	0.695**	0.757*
Correlation coefficient between the two	0.83	0.87
Regression line equation	Y=-25.267+1.039X	Y=29.242+0.786X

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