EFFECT OF COMBINATION OF DILL AND YOGURT ON GROWTH PERFORMANCE AND SOME PHYSIOLOGICAL TRAITS IN LOCAL QUAILS

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ABSTRACT

The current study aimed to determine the effect of adding mixture of dried dill (*Anethum gravelens*) powder at levels 0.2 % with yogurt to the quail diet on the productive and physiological characteristics of male and female quails. The experimental birds were divided into four treatments, and each treatment was divided into three replicates, with 8 birds for each replicate. The results showed a significant superiority of quail birds in the fourth treatment in the body weight at 42 days (210.08±3.34 g/bird), carcass weight (125.50±1.9 g/bird), highest value of HDL (14.50 ± 0.33 mg/dL) and the number of white blood cells (123.21 ± 5.66100/µL). While the birds of the second treatment excelled in the hemoglobin ratio in the blood (22.50 ± 0.31 g/dL) and recorded the lowest percentage of total cholesterol (188.63 ± 47 mg/dL) and the lowest LDL value (22.58 ± 1.66 mg/dL). Female quail were significantly superior in body and carcass weight at 42 days of age, while males were superior to females in most of the physiological traits studied. Brown quails also significantly outperformed white quails in body weight at 42 days (215.52 ± 4.83 g/bird), carcass weight (127.66 ± 2.33 g/bird), and white blood cell count (120.49 ± 4.16µL/10^0).

Keywords: local quail, body weight, dressing percentage, dill, biochemical characteristics.

تأثير مزيج الشبت واللبن في أداء النمو وبعض الصفات الفسيولوجية في طيور السمان المحلي

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المستخلص

أستهدفت الدراسة الحالية معرفة تأثير أضافة خليط مسحوق االشبت المجفف (*Anethum gravelens*) بنسبة 0.2% مع اللبن إلى عليقة طيور السمان في الخصائص الإنتاجية والفسلجية لذكور وأناث طيور السمان. قسمت طيور التجربة على أربعة معاملات وكل معاملة قسمت الى ثلاث مكررات بواقع 8 طيرا لكل مكرر. أظهرت النتائج وجود تفوق معنوي لطيور السمان المعاملة الرابعة في كل من وزن الجسم عند 42 يوما (210.08±3.34 غم/طير) و وزن الذبيحة (125.50 ± 1.9 غم/طير) وأعلى قيمة HDL (14.50 ± 0.33 mg/dL) وعدد كريات الدم البيضاء (123.21 ± 5.66 µL/10^0).قي حين تفوقت طيور المعاملة الثانية في نسبة هيموكلوبين الدم (22.50 ± 0.31 g/dL) وسجلت أقل نسبة من الكوليسترول الكلي (188.63 ± 47 mg/dL) وأقل قيمة LDL (22.58 ± 1.66 mg/dL). تفوقت أناث السمان و بمعنوية في وزن الجسم والذبيحة عند عمر 42 يوم في حين تفوقت الذكور في غالبية الصفات الفسلجية المدروسة على أأناث ، كذلك تفوقت طيور السمان ذات اللون البني وبمعنوية على طيور السمان ذو اللون الأبيض في وزن الجسم عند 42 يوم (215.52 ± 4.83 غم/طير) و وزن الذبيحة (127.66 ± 2.33 غم/طير) و عدد كريات الدم البيضاء (120.49 ± 4.16 µL/10^0).

الكلمات المفتاحية: السمان المحلي، وزن الجسم، نسبة التصافي، الشبت، الصفات البايوكيمياوية.

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INTRODUCTION

Despite the significant advancements in science, medicinal plants and herbs have attracted more attention recently due to their use as feed additives for poultry birds' diets as growth stimulants (20) and antifungals (24), as well as their enhancement of antioxidants (25) and immunological state (9). One of these herbs, dill, has been used for medicinal purposes and as a food flavoring since ancient times (19). Dill is the popular name for the plant worldwide, while its scientific name is *Anethum graveolens*. It is a herbaceous plant with smooth, dark green leaves that have a sweet taste and a fragrant scent. Dill has a number of active ingredients, including carvone and limonene, which have been shown to be effective against fungi (8). It also contains phenolic acids, volatile oils, and numerous vitamins, including pyridoxine and niacin, as well as minerals that the body needs, including copper, potassium, calcium, manganese, and iron (2). Additionally, it has an antioxidant role (19), and it clearly lowers blood cholesterol and lipid levels (5). Broiler performance has already been tested with dill seed supplementation (16). Essential oils such as carvone, limonene, and dill-api ole (23) are found in dill seeds. These oils are the main active ingredients and have a great potential to lessen oxidative stress in birds by scavenging reactive oxygen species (ROS). Additionally, it is discovered that dill seed possesses hypolipidemic (10) and antimicrobial (22) qualities. In the poultry industry, yogurt is the best-fermented dairy product that effectively demonstrates a wide range of probiotic qualities. Its main constituents include Lactobacilli and other helpful bacteria that aid in the breakdown of CHO, proteins, and fats in diet. It improves the metabolized feed elements' absorption and digestibility. Gut-friendly bacteria called lactobacilli are affixed to intestinal epithelial cells and may help prevent the growth of infections. By boosting macrophage activity, it also aids in immunological activation. Since scientists are looking for an alternative to IFAs, yogurt is employed as a probiotic. It is a typical and natural probiotic used in poultry rearing operations. Although it has a similar impact to broiler and layer quails, it is still infrequently used in Japanese quail (*Coturnix coturnix japonica*) farming. The purpose of this study was to evaluate the impact of yogurt as a probiotic on the performance of Japanese broiler quails and compare it with the cost-benefit analysis of commercially available probiotic protexin (13). The current study sought to introduce varying amounts of a mixture of dried dill powder with yogurt into the diets of quail birds and study its effect on the characteristics of productive and physiological performance, as there are currently no studies on the use of a mixture of dried dill powder with yogurt in the diets of poultry birds.

MATERIALS AND METHODS

Birds and Treatments: This study was carried out at the Grdarash station at of the College of Agriculture Engineering Science, Salahaddin University-Erbil. Ninety-Six quail birds 7-day old male and female, white and brown local quail were under this study. The quails were divided randomly to four groups and each group had 0.2% of the mixture of dill powder and yogurt added to its diet, as follows:

T1= Control 0% dill + yogurt,
T2= 25% dill +75% yogurt,
T3= 50% dill + 50% yogurt and
T4= 75% dill +25% yogurt.

The birds were housed in 12 cages and each cage content 8 numbered quail as experimental unit/ treatment. The dimension for the cages was 100cm × 45cm × 25 cm (length, width, height). Feed and water were supplied ad libitum. The experimental diet contained 22% protein and 2700 Kcal – ME / Kg from 7 days of age to 42 days, the end of experimental.

Studied Traits: Body Weight: Live body weights (BW) of quail chicks for each group were weighted (g) at 7 days and 42 days using sensitive electronic scale (accuracy up to 1 g).

Carcass Traits: The quails from each treatment were slaughtered at 42 days of age, after 4-hour fasting, but given enough water. The quails were individually weighed and slaughtered by cutting the jugular vein. Blood from each quail was collected for physiology analysis according to the procedure of (17) as described by (27). The birds are then properly bled (about 4 minutes) and feathers removed manually. calculations of carcass and dressed

percentage were obtained according to the procedure and formulae of (3). The dressed % calculated according to following equation:

Dressed (%) = (Carcass weight /Live weight) x 100

Physiological and Biochemical Analysis

At 42 days old of quail birds, 12 [6 Brown (3 female + 3 male) and 6 white (3 female + 3 male)] quail were collected randomly for blood sampling of each treatment. Blood samples were collected from jugular vein of each bird (total = 48) in sterile tubes and transferred to laboratory for further processing. The blood serum of the collected samples was separated by centrifugation at 3,000 rpm for 10 min and poured into aseptic vials and stored at −20◦C in deep freezer for further analysis. The serum glucose concentrations, urea, lipids (total cholesterol, concentration of serum high-density lipoproteins HDL, lower-density lipoproteins LDL and triglycerides), RBC, WBC and Hb were determined according to (6) using available commercial diagnostic kits by used COBAS INTEGRA® 400 plus (Switzerland).

Statistical Analysis: The following model was used in the PROC GLM (General Linear Model) program (21) to examine the data for quail traits:

$$Y_{ijkl} = \mu + T_i + S_j + C_k + TSC_{ijk} + \varepsilon_{ijkl}$$

Where: Y ijkl= Study traits of i treatments (I, i=1, Control, i=2, 25% dill +75% yogurt, i=3, 50% dill +50% yogurt, i=4, 75% dill +25% yogurt, Sj (J, j=1, Male and j=2, Female), Ck (C, c=1 White, c=2 Brown), TSC (TSC, interaction among 4 treatment with male and female birds and white and brown color), μ = Population mean; E = random error. It was assumed to be independently and normally distributed with mean zero and variance. Duncan multiplied range test used to compared among treatments mean.

RESULTS AND DISCUSSION

Body Weight: The results in Table (1) indicate that there are significant (P≤0.05) differences among the treatments for the weight and carcass characteristics of the quail birds, as the birds of the 1st (218.08 ± 5.5 and 130.33 ± 2.83 g/bird) and 4th (210.08 ± 3.34 and 125.50 ± 1.9 g/bird) treatment were superior in average weight at marketing and carcass weight to the birds of the other two treatments, while non-significant different were found among treatments for the FCR, but the differences were significant among treatments for total feed intake (4770 ±42.35 g) and daily feed intake (19.46 ± 0.17 g/bird/day) for birds in 3rd group. The superiority of the birds of the 4th treatment in body weight traits may be attributed to the effect of the active substances found in dill and yogurt such as Limonene and Carvone, which have proven effective against fungi (8) as well it contains phenolic acids, volatile oils and many vitamins such as niacin and pyridoxine and minerals necessary for the body such as copper, potassium, calcium, manganese and iron (2), and it also has an antioxidant role (19), which have an effective effect in stimulating and enhancing growth. Similar results were reported by (12, 14 and 26 in chicken and 15 in Japanese quails. A (4) investigated that the feed intake did not affected by using dill powder in diets especially in early period of growth.

Table 1. Mean ± SE for effect of treatments on body weight traits in local quail.

Traits	Treatments (Mean ± SE) T1(Control)	T2	T3	T4
Weight at 7 days (g/birds)	21.51 ± 0.15 a	21.28 ± 0.22 a	21.94 ± 0.17 a	20.85 ± 0.08 a
Weight at 42 days (g/birds)	218.08 ± 5.5 a	205.63 ± 3.33 b	207.50 ± 4.8 b	210.08 ± 3.34 ab
Body weight gain (g/day/birds)	5.62 ± 0.18 a	5.27 ± 0.14 a	5.30 ± 0.21 a	5.40 ± 0.13 a
Carcass weight (g/birds)	130.33 ± 2.83 a	122.25 ± 1.83 b	121.50 ± 2.1 b	125.50 ± 1.9 ab
Dressing (%)	59.76 ± 2.7 a	59.45 ± 4.18 a	58.55 ± 4.17 a	59.73 ± 3.62 a
Total Feed intake (g)	4227 ± 13.32 c	4468 ± 30.5 b	4770 ±42.35 a	4465 ±25.29 b
Daily Feed intake (g/bird/day)	17.25 ± 0.04 c	18.23 ± 0.12 b	19.46 ± 0.17 a	18.23 ± 0.10 b
FCR (Feed g/g of weight)	3.22 ± 0.13 a	3.34 ± 0.10 a	3.46 ± 0.08 a	3.45 ± 0.11 a

The different letters in same row means there are significant at (p≤ 0.05)

Females significantly (P≤0.05) outperformed males in average body weight at marketing and carcass weight, while males recorded the highest percentage of slaughter, significantly (62.12 ± 0.33%) compared to females, (57.07 ± 0.51) as in Table (2). This may be due to quail birds reaching sexual maturity and the formation of the female reproductive system, especially the oviduct, which leads to an increase in body weight and thus to a decrease in the dressing % in females compared to males. These results were agreement with what reported by (7) in local quails.

Table 2. Mean ± SE for effect of sexes on body weight traits in local quail.

Traits	Sex (Mean ± SE)	
	females	Males
Weight at 42 days (g/birds)	227.16 ± 3.83 a	193.58 ± 2.83 b
Carcass weight (g/birds)	129.58 ± 2.33 a	120.20 ± 1.83 b
Dressing (%)	57.07 ± 0.51 b	62.12 ± 0.33 a

The different letters in same row means there are significant at (p≤ 0.05).

The results also showed a significant (P≤0.05) superiority of brown quails in body weight (215.52 ± 4.83 g/bird) at 42 days and carcass weight (127.66 ± 2.33 g/bird) over white quails, while there were no significant differences in the percentage of cleanliness between the two colors. This result may indicate that the brown local quail is more suitable for meat production than the white local quail (Table, 3). This may be due to brown quails having distinct alleles for growth genes, which help them grow larger than white quails. Similar results were reported by (7) in local quails. A (11) noted that the brown quail gives significantly highest carcass weight and dressing percentage at marketing compared with white and desert quail birds.

Table 3. Mean ± SE for effect of bird's color on body weight traits in local quail.

Traits	Colors (Mean ± SE)	
	Brown	White
Weight at 42 days (g/birds)	215.52 ± 4.83 a	206.37 ± 3.82 b
Carcass weight (g/birds)	127.66 ± 2.33 a	122.74 ± 2.17 b
Dressing (%)	59.56 ± 0.51 a	59.62 ± 0.62 a

The different letters in same row means there are significant at (p≤ 0.05).

The results of the statistical analysis (Table,4) showed that there were significant (P≤0.05) differences in the interaction of the effects of treatments with both bird sex and color, as the highest average body weight and carcass weight were recorded at 42 days for brown females in the (1st treatment) control group (247.33±4.83 g/bird) and (142.33±3.51 g/bird), respectively, while the white males in the second treatment significantly superior in the dressing percentage (63.94±0.7%).

Physiological and Biochemical Traits

The treatments also had a significant (P≤0.05) effect on the physiological and biochemical characteristics of the birds' blood, as the highest value for blood Hb (22.50 ± 0.31 g/dL) and RBC (3.65 ± 0.42 10^6/µL) and the lowest value for LDL (22.58 ± 1.66 mg/dL) and total cholesterol were in the birds of the 2nd treatment, while the highest number of WBC (123.21 ± 5.66 10^0/µL), HDL (14.50 ± 0.33 mg/dL), triglyceride, and total cholesterol were recorded in the birds of the 4th treatment (Table, 5). These results may be attributed to the effect of the active substances found in dill such as phenolic acids, volatile oils and many vitamins such as niacin and pyridoxine and minerals necessary for the body such as copper, potassium, calcium, manganese and iron (2), and it also has an antioxidant role (19), and an obvious effect in lowering the level of lipids and cholesterol in the blood (5). Similar results were reported by (18) which showed the increasing levels of dill seeds improved performance and some blood biochemical parameters of broilers chicks. On the other hand, non-significant different were showed by (12), in RBC and Hb among birds feed on different ration of dill.

Table 4. Mean ± SE for effect of interaction among treatments, sexes and birds color body weight traits in local quail.

Factors			Traits (Mean ± SE)		
Treatment	Color	Sex	Body weight (g/ birds)	Carcass weight (g/birds)	Dressing (%)
T1(C)	Brown	Female	247.33±4.83 a	142.33±3.51 a	57.36±0.17 de
T1(C)	White	Female	240.0±1.85 ab	140.66±0.51 ab	58.66±0.66 cd
T1(C)	Brown	Male	185.33±4.17 e	115.0±1.83 fg	62.31±0.16 ab
T1(C)	White	Male	199.66±3.01 de	123.33±1.85 cdefg	61.76±0.2 ab
T2	Brown	Female	226.00±3.15 bc	126.00±.051 cdef	55.98±0.51 e
T2	White	Female	201±2.83 de	112.66±2.16 g	55.93±0.17 e
T2	Brown	Male	197.66±1.51 de	123.33±1.16 cdefg	62.36±0.8 ab
T2	White	Male	198.66±3.66 de	127.0±2.33 cdef	63.94±0.7 a
T3	Brown	Female	243.66±2.67 ab	134.00±1.83 abc	54.94±0.42 e
T3	White	Female	214.33±4.1 cd	120.33±2.17 defg	56.26±0.67 de
T3	Brown	Male	186.0±1.25 e	115.0±1.85 fg	61.82±0.5 ab
T3	White	Male	186.0±2.16 e	116.00±1.02 efg	62.44±0.16 ab
T4	Brown	Female	215.0±4.01 cd	132.0±2.03 abcd	61.47±0.18 ab
T4	White	Female	230.0±0.83 abc	128.66±1.16 bcde	55.95±0.9 e
T4	Brown	Male	197.5±1.33 de	124.0±1.02 cdefg	62.87±0.33 a
T4	White	Male	197.7±2.33 de	119.0±2.35 defg	60.02±0.67 bc

The different letters in same colom means there are significant at (p≤ 0.05).

Table 5. Mean ± SE for effect of treatments on blood physiological and biochemical traits in local quail

	Treatments (Mean ± SE)			
Traits	T1 (Control)	T2	T3	T4
Total cholesterol (mg/dL)	220.50 ± 52 a	188.63 ± 47 b	205.50 ± 70 b	205.58 ± 59 ab
Triglyceride (mg/dL)	139.16 ± 5.1 a	136.63 ± 4.33 a	127.41 ± 3.1 b	145.20 ± 2.8 a
HDL (mg/dL)	12.60 ± 0.83 b	12.77 ± 0.51 b	12.70 ± 0.66 b	14.50 ± 0.33 a
LDL(mg/dL)	26.83 ± 3.16 ab	22.58 ± 1.66 b	28.33 ± 2.65 a	24.66 ± 2.33 b
WBC (10^0/µL)	113.97 ± 1.05 b	117.85 ± 0.33 ab	111.74 ± 1.02 b	123.21 ± 5.66 a
RBC (10^6/µL)	3.66 ± 0.51 a	3.65 ± 0.42 a	3.57 ± 0.53 a	3.48 ± 0.82 a
HGB (g/dL)	22.04 ± 0.33 ab	22.50 ± 0.31 a	21.86 ± 0.28 ab	20.81 ± 0.66 b

The different letters in same row means there are significant at (p≤ 0.05).

The sex of the birds had a significant (P≤0.05) effect on the physiological and biochemical characteristics of the blood, as males were superior to females in most of the characteristics, except for the LDL (16.58 ± 0.82 mg/dL) and Triglyceride value (135.06 ± 4.01 mg/dL), which was better in females (Table, 6). Similar results were showed by (1) for effect of sexes of broiler on biochemical traits of blood.

Table 6. Mean ± SE for effect of sexes on blood physiological and biochemical traits in local quail.

	Sex (Mean ± SE)	
Traits	females	males
Total cholesterol (mg/dL)	175.54 ± 8.5 b	234.66 ± 8.33 a
Triglyceride (mg/dL)	135.06 ± 4.01 a	139.15 ± 4.33 a
HDL (mg/dL)	11.83 ± 0.66 b	14.45 ± 0.32 a
LDL(mg/dL)	16.58 ± 0.82 b	34.62 ± 1.66 a
WBC (10^0/µL)	113.80 ± 1.05 b	119.35 ± 3.85 a
RBC (10^6/µL)	3.33 ± 0.40 b	3.83 ± 0.66 a
HGB (g/dL)	20.25 ± 0.17 b	23.27 ± 0.51 a

The different letters in same row means there are significant at (p≤ 0.05).

It was noted that there were significant (P≤0.05) differences in a number of physiological and biochemical characteristics of the blood between the two colors of local quails, as the highest value was for WBC (120.49 ± 4.16 10^0/µL) and the lowest value for LDL (17.71 ± 0.83 mg/dL) and Total cholesterol (170.09 ± 6.33 mg/dL) was for brown quails, while the better value of RBC, HDL (13.42 ± 0.66 mg/dL) recorded for white quails (Table,7). The results of the statistical analysis (Table,8) showed that there were significant (P≤0.05) differences in the interaction of the effects of treatments with both bird sex and color, as the white male quails in the control treatment also recorded the highest value for triglycerides (185±1.65 mg/dL), HDL (15.33±0.66 mg/dL), and LDL (46.66±3.21 mg/dL), while the highest RBC (4.06±0.4 10^6/µL) and Hb (25.03±0.33 g/dL) was recorded for the white male quails in the second treatment. Similar results were reported by (1) for effect of interaction between sexes of bird with different ration of dill on biochemical traits of bird's blood.

Table 7. Mean ± SE for effect of bird's color on blood physiological and biochemical traits in local quail.

Traits	Colors (Mean ± SE)	
	Brown	White
Total cholesterol (mg/dL)	**170.09 ± 6.33 b**	**232.33 ± 9.51 a**
Triglyceride (mg/dL)	**139.06 ± 3.66 a**	**135.58 ± 4.51 a**
HDL (mg/dL)	**12.78 ± 0.51 a**	**13.42 ± 0.66 a**
LDL(mg/dL)	**17.71 ± 0.83 b**	**31.74 ± 1.89 a**
WBC (10^0/µL)	**120.49 ± 4.16 a**	**113.32 ± 1.33 b**
RBC (10^6/µL)	**3.51 ± 0.4 a**	**3.65 ± 0.6 a**
HGB (g/dL)	**21.61 ± 0.66 a**	**21.92 ± 0.51 a**

The different letters in same row means there are significant at (p≤ 0.05).

Table 8. Mean ± SE for effect of interaction among treatments, sexes and birds color on blood physiological and biochemical traits

Interaction			Traits (Mean ± SE)						
Treatment	Color	Sex	Total cholesterol (mg/dL)	Triglyceride (mg/dL)	HDL (mg/dL)	LDL(mg/dL)	WBC(10^0/µL)	RBC(10^6/µL)	HGB(g/dL)
T1(C)	Brown	Female	192.00±7.01 efg	115.33±1.51 f	10.70±0.83 bcd	18.66±1.16 b	119.02±0.50 b	3.63±0.47 abcd	20.76±0.16 cde
T1(C)	White	Female	215.66±5.83 cdef	112.66±1.66 f	10.75±0.88 bcd	20.0±0.83 b	115.01±0.87 b	3.59±0.46 abcde	21.20±0.33 bcde
T1(C)	Brown	Male	207.33±1.51 def	143.66±1.56 bcd	13.66±0.50 abc	22.0±0.50 b	113.80±1.16 b	3.48±0.71 abcde	22.66±0.64 abcd
T1(C)	White	Male	267±10.5 ab	185±1.65 a	15.33±0.66 a	46.66±3.21 a	104.41±0.98 b	3.96±0.36 ab	23.63±0.34 abcd
T2	Brown	Female	142±4.22 hi	151.33±4.33 b	13.40±0.51 abc	12.0±0.50 b	116.94±0.33 b	3.30±0.32 cde	20.65±0.31 de
T2	White	Female	173±7.83 fgh	148.14±4.48 bc	10.03±0.84 cd	18.0±1.16 b	117.08±0.51 b	3.41±0.41 bcde	20.40±0.40 de
T2	Brown	Male	192.33±2.33 efg	127.49±3.01 cdef	12.66±0.17 abc	23.33±0.83 b	119.63±0.34 b	3.69±0.37 abc	23.33±0.17 abcd
T2	White	Male	248±1.24 abcd	119.57±3.50 ef	15±0.1.05 a	37.0±0.85 a	117.42±0.5 b	4.06±0.4 a	25.03±0.33 a
T3	Brown	Female	119.66±4.33 i	140.33±3.51 bcde	10.3±0.66 cd	12.0±0.50 b	106.69±1.5 b	3.01±0.15 de	19.10±0.41 e
T3	White	Female	224.66±11.16 bcde	119.66±4.16 ef	8.46±0.67 d	21.66±0.33 b	112.29±1.05 b	3.37±0.3 bcde	20.90±0.68 bcde
T3	Brown	Male	159±4.10 ghi	129.28±1.98 cdef	13.0±0.60 abc	18.0±0.28 b	111.61±0.94 b	3.85±0.03 abc	24.20±0.98 ab
T3	White	Male	254.80±6.33 abc	123.92±2.33 def	16.60±0.16 a	44.20±2.01 a	114.36±1.02 b	3.98±0.6 ab	23.64±0.33 abcd
T4	Brown	Female	159.33±5.01 ghi	151.00±4.81 b	14.66±0.17 ab	18.33±0.16 b	111.38±.98 b	3.41±0.4 bcde	20.46±0.34 de
T4	White	Female	178±6.02 fgh	142 ±4.12 bcd	16.33±0.33 a	12.0±0.34 b	114.97±1.50 b	2.97±0.3 e	18.66±0.34 e
T4	Brown	Male	187.50±4.33 efg	151.8±2.31 b	14.50±0.50 ab	17.50±0.5 b	171.00±3.45 a	4.07±0.2 a	24.05±0.05 abc
T4	White	Male	270±7.83 a	139.97±5.82 bcde	13±0.70 abc	42.50±1.05 a	107.49±2.05 b	3.61±0.01 abcd	21.07±1.05 bcde

The different letters in same colom means there are significant at (p≤ 0.05).

CONCLUSIONS

It will be conclude from the above that the birds fed on a diet containing dried dill with yogurt (0.2%) specially the 4th treatment (75% dill+ 25% yogurt) were superior in most productive and physiological traits, compared to the birds in the other treatments. Result indicate that the brown local quail is more suitable for meat production than the white local quail. Also, the males were superior to the females, and a greater response was observed for the white-colored male quails with the treatments. In addition, more studies are needed to further discuss it explanations.

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