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Effect of Adding Local *Anemone coronaria* L. Flower Powder and Vitamin C in the diet on Egg Quality of Laying Hens Exposed to Heat Stress in Summer

Mohammed Fadhil Abed Al-Khayyat [1] **Ammar Qahtan Shanoon [2]**

[1] *Ministry of Environment, Baghdad, IRAQ.*

[2] *Department of Animal production, College of Agriculture, University of Kirkuk, Kirkuk, IRAQ.*

*Corresponding Author: mfkyatt@gmail.com.

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ABSTRACT

The effect of adding powdered local *Anemone coronaria* L. flowers and vitamin C on the qualitative traits of eggs of laying hens raised in summer and exposed to heat stress was studied. The experiment was completed using (120) Lohmann Brown birds at (30) weeks old, during July, August, and September, for (84) days, which included a 14-day preparatory period. The experiment period was divided into (5) productive periods, where the birds were randomly distributed into (6) treatments with (5) replicates, and for each replicate (4) birds, the treatment were T1: control diet free of any additives, T2: control diet with adding 250 mg/kg of vitamin C, T3: control diet with adding 2 g/kg of *Anemone coronaria* L. flower powder, T4: control diet with adding 4 g/kg of *Anemone coronaria* L. flower powder, T5: control diet with adding 2 g/kg of *Anemone coronaria* L. flower powder and 250 mg/kg of vitamin C, T6: control diet with adding 4 g/kg of *Anemone coronaria* L. flower powder and 250 mg/kg of vitamin C, The results showed that there were no significant differences in ($P \leq 0.05$) for most of the qualitative characteristics of eggs, which included (yolk height, Albumin height, Haugh unit, shell thickness, relative weight of the shell, and yolk color), but it was found significant differences ($P \leq 0.05$) in the characteristics of the diameter of the yolk and the relative weight of the yolk. Treatments T4 and T6 recorded the highest diameter of the yolk (39.65 and 39.61) mm, respectively, and the highest relative weight of the yolk was for treatment T4 (24.61%). It is noted from the results of the experiment that the additions of Anemone coronaria L. flower powder and vitamin C led to a reduction in the effects of heat stress that affects birds when they are exposed to high temperatures in the summer, and thus improved some quality characteristics.

***Keywords*:** *Anemone coronaria* L., Vitamin C, quality characteristics of eggs, Laying hens, Heat stress.

INTRODUCTION

High temperatures pose a serious threat to animal production. They are among the seasonal problems facing breeders in Iraq, where poultry are exposed to heat stress, which negatively affects the type and quality of production [1,2]. With a significant decrease in egg production rate, egg weight, and shell thickness [3].

The poultry industry is considered one of the most important food industries that would improve economic conditions in many countries [4]. Therefore, most recent studies related to poultry farming focused on food additives that would contribute to improving production, quality and other characteristics [5,6].

Using plant additives as alternatives to traditional antibiotics has received great attention. They are natural products accepted by consumers and have promising results in improving production quality, feed consumption, digestion, conversion efficiency, promoting growth, and improving the immune system [7]. The *Anemone coronaria* L. plant is considered one of the medicinal plants of great importance because its various parts contain one or several active substances with biological effects in treating diseases, whether in their natural form or when extracted [8,9]. The extract of *Anemone coronaria* L. flowers also improves production performance, is an antioxidant, analgesic, and antipyretic, and enhances the health of birds exposed to stress, thus reducing the rate of economic losses resulting from weight loss or deaths due to heat stress [10,11].

Therefore, this study, which is considered the first of its kind in Iraq and the world, aims to use powdered flowers of the local *Anemone coronaria* L. plant as a safe feed additive and to know its effect on the qualitative characteristics of eggs in poultry birds exposed to heat stress in the summer, relying on available natural sources and comparing them to vitamin C and studying the changes occurring. In the qualitative characteristics of eggs.

Materials and methods

The experiment was conducted in the summer for (84) days, divided into five productive periods (14) days/period in order to measure the characteristics studied for the experiment (yolk height, Albumin height, Haugh unit, shell thickness, relative weight of the shell, and yolk color), It was preceded by a (14) day preparatory period. The experiment was completed using 120 Lohmann Brown birds at 30 weeks. They were placed in cages consisting of four floors vertically. The cages contained automatic plastic feeders and nipples. Table (1) shows the feed components and the chemical

analysis. Based on NRC 1994 [12]. A lighting system of 16 hours of light and 8 hours of darkness was used, according to the recommendations of the breeding manual. The treatments were as follows: T1: control diet free of any additives, T2: control diet with adding 250 mg/kg of vitamin C, T3: control diet with adding 2 g/kg of *Anemone coronaria* L. flower powder, T4: control diet with adding 4 g/kg of *Anemone coronaria* L. flower powder, T5: control diet with adding 2 g/kg of *Anemone coronaria* L. flower powder and 250 mg/kg of vitamin C, T6: control diet with adding 4 g/kg of *Anemone coronaria* L. flower powder and 250 mg/kg of vitamin C. **Statistical analysis**

A completely randomized design (CRD) was used to study the effect of parameters on the studied traits using statistical program (SAS), and the significant differences between the means were tested using the Duncan multilevel test [13], according to the following mathematical model:

$Yij = \mu + Ti + eij$

Results

The effect of adding the local *Anemone coronaria* L. flower powder and vitamin C on yolk height: The results in Table 2 show that there are no significant differences in the first production period, but there are significant differences ($P \leq 0.05$) in the remaining periods. In the second and third production period, treatment T1 outperformed the rest of the treatments, recording (18.92 and 19.13) mm, respectively. In the fourth production period, treatment T2 outperformed the rest of the treatments, recording (19.1) mm. In the fifth production period, the highest yolk height was recorded in treatment T4 (18.67) mm, treatment T6 (18.66) mm, treatment T5 (18.63) mm, followed by treatment T1 (17.34) mm, treatment T3 (17.26) mm, and then treatment T2 (16.37) mm. As for the general average of productive periods, no significant differences were recorded in the yolk height.

Table 1 Percentages and chemical composition of the experimental diet

Feed ingredients	Percentage of feed ingredients
Wheat	16.32
Corn	40.5
Oil	1
Barley	4
Soybean meal 48%	25.7
Laymix-2.5	2.5
Lysine	0.01
Methionine	0.07
Limestone	9
T. Salt	0.2
Choline Chloride	0.25
DCP	0.45
Total	%100
Amount	chemical composition
Energy Kcal/kg	2708
Protein %	18.37
Lysine %	1
Methionine	0.47
Methionine & Cysteine %	0.69
Ca %	4.38
p %	0.6
ME/CP Ratio	167.03

Table (2) Effect of adding local Anemone coronaria L. flower powder and vitamin C on the yolk height (mm) in summer-raised and Heat-Stressed laying hens (mean ± standard error)

Treat.	Productive periods					Average productive periods
	1	2	3	4	5	
T1	16.08±0.37 a	18.92±0.27 a	19.13±0.40 a	18.04±0.34 ab	17.34±0.39 ab	17.90±0.27 a
T2	16.55±0.28 a	18.61±0.22 ab	18.19±0.39 ab	19.10±0.27 a	16.37±0.61 b	17.76±0.27 a
T3	17.09±0.44 a	17.67±0.28 c	18.92±0.48 ab	18.01±0.26 ab	17.26±0.85 ab	17.79±0.25 ab
T4	17.23±0.26 a	18.15±0.28 abc	18.72±0.37 ab	17.92±0.39 b	18.67±0.67 a	18.14±0.21 a
T5	16.80±0.49 a	17.75±0.29 bc	19.01±0.15 ab	17.87±0.44 b	18.63±0.13 a	18.01±0.21 a
T6	16.14±0.48 a	18.22±0.28 abc	17.91±0.24 b	18.21±0.35 ab	18.66±0.33 a	17.83±0.23 a

* Different letters within column indicate the presence of significant differences (P≤0.05) between the treatments.

The effect of adding the local *Anemone coronaria* L. flower powder and vitamin C on the diameter of the yolk: The results are shown in Table (3). There are significant differences (P≤0.05) in the first, second, and third production periods. In the first and second productive periods, treatment T4 significantly outperformed the rest of the treatments, recording (40.26 and 41.26) mm, respectively, and in the third production period, treatment T6 outperformed the rest of the treatments, recording (38.61) mm. No significant differences were recorded in the diameter of the yolk in the fourth and fifth production periods. The general average of productive periods also witnessed significant differences, as the highest diameter of the yolk was recorded in treatment T4 (39.65) mm and treatment T6 (39.61) mm, followed by treatment T1 (38.83) mm, treatment T3 (38.63) mm, treatment T5 (38.6) mm, then treatment T2 (38.39) mm

Table (3) Effect of adding local Anemone coronaria L. flower powder and vitamin C on the diameter of the yolk (mm) in summer-raised and Heat-Stressed laying hens (mean ± standard error)

Treat.	Productive periods					Average productive periods
	1	2	3	4	5	
T1	38.20±0.70 ab	40.07±0.80 ab	38.07±1.04 ab	37.59±0.82 a	40.23±0.51 a	38.83±0.39 ab
T2	37.73±0.70 b	38.44±0.38 b	36.43±0.59 b	39.58±0.55 a	39.75±0.24 a	38.39±0.33 b
T3	39.13±1.15 ab	40.07±0.84 ab	36.95±0.24 ab	37.56±0.46 a	39.44±0.32 a	38.63±0.37 ab
T4	40.26±0.63 a	41.26±0.27 a	37.46±0.61 ab	38.79±0.57 a	40.48±0.70 a	39.65±0.36 a
T5	38.38±0.28 ab	39.58±0.59 ab	37.60±0.24 ab	38.06±0.60 a	39.36±0.42 a	38.60±0.24 ab
T6	39.73±0.71 ab	39.44±0.60 ab	38.6±0.43 a	39.38±1.11 a	40.88±0.99 a	39.61±0.36 a

* Different letters within column indicate the presence of significant differences (P≤0.05) between the treatments.

The effect of adding the local *Anemone coronaria* L. flower powder and vitamin C on the relative weight of the yolk: The results are shown in Table (4). There are significant differences (P≤0.05) in the first and third production periods. In the first production period, treatment T4 was significantly superior to the rest of the treatments, recording (25.68%), and in the third production period, treatment T5 was significantly superior to the rest of the treatments, recording (25.06%) of the egg weight. No significant differences were recorded in the second, fourth and fifth production periods. As for the general average of productive periods, there were significant differences, as all treatments were significantly superior to the control treatment T1. The highest relative weight of yolk was in treatment T4 (24.61%), followed by treatment T6 (24.29%), treatment T5 (24%), treatment T2 (23.915), and treatment T3. (23.52%) and the lowest relative rate of yolk in treatment T1 was (22.85%) of the egg weight.

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Table (4) Effect of adding local Anemone coronaria L. flower powder and vitamin C on the relative weight of the yolk % in summer-raised and Heat-Stressed laying hens (mean ± standard error)

Treat.	Productive periods					Average productive periods
	1	2	3	4	5	
T1	22.81±1.54 ab	23.78±0.50 a	22.35±1.41 b	22.94±1.10 a	22.36±1.20 a	22.85±0.50 b
T2	22.15±0.49 b	24.40±0.72 a	22.36±0.77 b	26.50±1.52 a	24.14±0.64 a	23.91±0.49 ab
T3	24.34±1.04 ab	22.61±0.55 a	23.00±0.36 ab	22.71±1.06 a	24.96±1.39 a	23.52±0.44 ab
T4	25.68±1.02 a	23.48±0.52 a	24.15±0.66 ab	24.55±0.72 a	25.17±1.41 a	24.61±0.41 a
T5	24.12±1.37 ab	22.74±0.63 a	25.06±0.38 a	25.21±0.99 a	22.87±0.50 a	24.00±0.41 ab
T6	24.02±0.13 ab	23.52±0.91 a	23.94±0.66 ab	26.26±1.69 a	23.71±2.27 a	24.29±0.59 ab

* Different letters within column indicate the presence of significant differences (P≤0.05) between the treatments

The effect of adding the local *Anemone coronaria* L. flower powder and vitamin C on the height of egg Albumin: The results in Table (5) show that there are no significant differences in the first, second, fourth, and fifth production periods, but there are significant differences (P≤0.05) in the third production period only, in which the T4 treatment was significantly superior to the rest of the
treatments, recording the highest egg Albumin height of (9.27) mm, followed by treatment T3 (8.79) mm, treatment T2 (8.49) mm, treatment T1 (8.41) mm, treatment T6 (8.07) mm, and then treatment T5, with an egg Albumin height of (7.61) mm. As for the general average of productive periods, no significant differences were recorded in the height of egg Albumin between the treatment.

Table (6) Effect of adding local Anemone coronaria L. flower powder and vitamin C on the relative weight of egg Albumin % in summer-raised and Heat-Stressed laying hens (mean ± standard error)

Treat.	Productive periods					Average productive periods
	1	2	3	4	5	
T1	63.18±1.92 a	65.97±0.73 a	67.51±2.17 a	65.54±1.16 a	67.19±1.08 a	65.88±0.69 a
T2	64.76±0.41 a	65.57±1.39 a	67.68±0.79 a	62.06±1.57 a	65.48±0.93 a	65.11±0.58 a
T3	62.66±1.00 a	67.60±0.79 a	67.27±0.51 a	66.15±1.39 a	64.97±1.41 a	65.73±0.57 a
T4	62.00±0.92 a	66.37±0.66 a	65.61±0.65 a	64.69±0.79 a	64.32±1.18 a	64.60±0.46 a
T5	62.94±1.29 a	67.70±0.96 a	65.81±0.75 a	63.78±1.40 a	66.86±0.76 a	65.42±0.57 a
T6	61.86±0.61 a	66.54±0.61 a	66.14±0.80 a	63.42±1.84 a	65.79±2.07 A	64.75±0.66 a

* Different letters within column indicate the presence of significant differences (P≤0.05) between the treatments

The effect of adding the local *Anemone coronaria* L. flower powder and vitamin C on the Haugh unit: The results in Table (7) show that there are no significant differences in the first, second, fourth, and fifth production periods, but there are significant differences (P≤0.05) in the third production period only, which Treatment T4 was significantly superior to the rest of the transactions, recording the highest value of (95.94) units, followed by Treatment T3 (93.92) units, Treatment T2 (92.43) units, Treatment T1 (90.11) units, Treatment T6 (89.21) units, and then Treatment T5, which amounted to (87.66). units. As for the general average of productive periods, no significant differences were recorded between the treatments in the Haugh unit

Table (7) Effect of adding local Anemone coronaria L. flower powder and vitamin C on the Haugh unit in summer-raised and Heat-Stressed laying hens (mean ± standard error)

Treat.	Productive periods					Average productive periods
	1	2	3	4	5	

T1	88.30±3.42 a	95.16±1.71 a	90.11±3.93 ab	99.46±3.27 a	89.88±4.44 a	92.58±1.65 a
T2	84.84±3.89 a	94.53±3.01 a	92.43±1.41 ab	100.1±2.30 a	93.04±4.05 a	92.99±1.61 a
T3	83.28±1.37 a	94.92±1.43 a	93.92±2.58 ab	100.8±4.72 a	92.42±1.87 a	93.06±1.60 a
T4	86.81±3.58 a	98.95±1.45 a	95.94±2.03 a	92.60±3.29 a	95.23±0.77 a	93.91±1.31 a
T5	91.06±4.23 a	99.80±2.68 a	87.66±1.58 b	96.88±1.84 a	86.73±2.51 a	92.43±1.53 a
T6	83.07±2.09 a	94.58±2.73 a	89.21±2.49 ab	94.62±0.63 a	94.21±1.45 a	91.14±1.24 a

* Different letters within column indicate the presence of significant differences (P≤0.05) between the treatments.

The effect of adding the local Anemone coronaria L. flower powder and vitamin C on the egg shell thickness: The results in Table 8 show that there are no significant differences in eggshell thickness in the first, second, and third production periods, but there are significant differences (P≤0.05) in the fourth production period. And the fifth. In the third production period, treatment T3 significantly outperformed the rest of the treatments, recording (0.37) mm, followed by treatment T6 (0.35) mm, then treatment T4 (0.34) mm, and treatments T1, T2, and T5 (0.33) mm. In the fifth production period, all treatments significantly outperformed treatment T6, which recorded (0.33) mm, while treatment T1 recorded (0.43) mm, treatment T5 (0.42) mm, treatment T4 (0.41) mm, treatment T2, and treatment T3 (0.39) mm. As for the general average of productive periods, no significant differences were recorded in crust thickness between treatments.

Table (8) Effect of adding local Anemone coronaria L. flower powder and vitamin C on the egg shell thickness (mm) in summer-raised and Heat-Stressed laying hens (mean ± standard error)

Treat.	Productive periods					Average productive periods
	1	2	3	4	5	
T1	0.43±0.01 a	0.31±0.02 a	0.31±0.03 a	0.33±0.01 b	0.43±0.01 a	0.36±0.01 a
T2	0.41±0.01 a	0.27±0.02 a	0.31±0.02 a	0.33±0.02 b	0.39±0.01 a	0.34±0.01 a
T3	0.38±0.02 a	0.27±0.02 a	0.30±0.01 a	0.37±0.01 a	0.39±0.01 a	0.34±0.01 a
T4	0.40±0.02 a	0.28±0.02 a	0.30±0.01 a	0.34±0.01 b	0.41±0.01 a	0.35±0.01 a
T5	0.41±0.02 a	0.27±0.02 a	0.27±0.03 a	0.33±0.01 b	0.42±0.01 a	0.34±0.02 a
T6	0.42±0.02 a	0.29±0.01 a	0.31±0.01 a	0.35±0.01 ab	0.33±0.03 b	0.34±0.01 a

* Different letters within column indicate the presence of significant differences (P≤0.05) between the treatments.

The effect of adding the local *Anemone coronaria* L. flower powder and vitamin C on the relative weight of egg shells: The results in Table 9 show that there are no significant differences in all production periods except for the first production period, which recorded significant differences (P≤0.05) and in which the treatment was superior. T6 (14.12%), Treatment T1 (14%), followed by Treatment T2 (13.09%), Treatment T3 (13%), Treatment T5 (12.94%), and then Treatment T4 (12.33%). As for the general average of productive periods, no significant differences were recorded in the weight of egg shells between the treatments.

Table (9) Effect of adding local Anemone coronaria L. flower powder and vitamin C on the relative weight of egg shells % in summer-raised and Heat-Stressed laying hens (mean ± standard error)

Treat.	Productive periods					Average productive periods
	1	2	3	4	5	
T1	14.00±0.39 a	10.26±0.28 a	10.14±0.86 a	11.52±0.43 a	10.44±0.19 a	11.27±0.36 a
T2	13.09±0.33 ab	10.03±0.68 a	9.96±0.35 a	11.45±0.36 a	10.37±0.42 a	10.98±0.30 a
T3	13.00±0.31 ab	9.79±0.60 a	9.73±0.28 a	11.14±0.38 a	10.07±0.05 a	10.75±0.29 a
T4	12.33±0.24 b	10.16±0.27 a	10.24±0.16 a	10.76±0.47 a	10.51±0.33 a	10.80±0.21 a
T5	12.94±0.57 ab	9.56±0.53 a	9.13±0.69 a	11.01±0.73 a	10.26±0.55 a	10.58±0.37 a
T6	14.12±0.64 a	9.94±0.38 a	9.92±0.18 a	10.32±0.65 a	10.50±0.28 a	10.96±0.38 a

* Different letters within column indicate the presence of significant differences (P≤0.05) between the treatments.

The effect of adding the local *Anemone coronaria* L. flower powder and vitamin C on the color of egg yolks: The results are shown in Table (10). There are significant differences (P≤0.05) in all production periods except for the second period. In the first production period, treatments T1 and T5 scored (3) superior to the rest of the treatments. In the third productive period, the T2 parameter outperformed the rest of the treatments (5) degrees. In the fourth production period, all transactions outperformed transaction T1, which recorded the lowest score (3.66). In the fifth production period, treatment T2 outperformed the rest of the treatments, recording (4.8) degrees, followed by treatment T6 (4.6) degrees, then treatment T3 (4.4) degrees, then treatment T1 (4.2) degrees, then treatment T5 (4) degrees, and then treatment T4 (3.8). Degree. As for the general average of productive periods, no significant differences were recorded between the treatments in egg yolk color

Table (10) Effect of adding local *Anemone coronaria* L. flower powder and vitamin C on the color of egg yolks in summer-raised and Heat-Stressed laying hens (mean ± standard error)

Treat.	Productive periods					Average productive periods
	1	2	3	4	5	
T1	3.00±0.00 a	3.20±0.20 a	4.20±0.20 b	3.00±0.00 b	4.20±0.20 abc	3.52±0.13 a
T2	2.60±0.24 ab	3.00±0.00 a	5.00±0.00 a	4.00±0.00 a	4.80±0.20 a	3.88±0.20 a
T3	2.40±0.24 ab	3.00±0.32 a	4.60±0.24 ab	4.00±0.00 a	4.40±0.24 abc	3.68±0.20 a
T4	2.40±0.24 ab	2.80±0.20 a	4.60±0.24 ab	3.60±0.24 a	3.80±0.20 c	3.44±0.18 a
T5	3.00±0.00 a	3.40±0.24 a	4.60±0.24 ab	3.80±0.20 a	4.00±0.32 bc	3.76±0.14 a
T6	2.20±0.20 b	2.80±0.20 a	4.80±0.20 ab	3.60±0.24 a	4.60±0.24 ab	3.60±0.22 a

* Different letters within column indicate the presence of significant differences (P≤0.05) between the treatments.

Discussion

The results of the study showed that there were no significant differences in most of the egg characteristics studied, except the two characteristics of egg yolk diameter and the relative weight of the egg yolk. The diameter of the egg yolk recorded the highest significant difference in treatment T4 and T6, reaching (39.65 and 39.61) mm, respectively, Table (12). As for the relative weight of egg yolks, it recorded its highest significant increase in treatment T4, amounting to (24.61%), which is the treatment with the highest percentage of addition of *Anemone coronaria* L. flower powder and without the addition of vitamin C. Since the *Anemone*

coronaria L. flower powder contains compounds Some of them are effective, including flavonoids and soaps. Flavonoids act similar to that of steroid hormones [9,14,15]. Studies have shown that estrogen plays a crucial role in regulating various aspects of egg production in chickens, including the stimulation of egg yolk synthesis. Estrogen influences the liver to increase the synthesis of hepatic apolipoprotein B (Apo B), which is essential for the formation and secretion of very low-density

lipoproteins (VLDL). These lipoproteins are crucial for transporting lipids to the ovary for yolk formation. Therefore, estrogen's action on egg yolk synthesis and Apo B production is critical for efficient egg production in poultry [16]. After these egg yolk precursors are synthesized in the liver, Apo B is packaged into very low-density lipoprotein (VLDL) particles for transport. In contrast, Vitellogenin (VTG) (egg yolk protein precursor) is released into the blood to be transported to the egg [17]. At the beginning of ovulation, estrogen converts almost all of the hepatic lipoprotein produced from general VLDL to very low density lipoprotein (VLDL) targeting the egg yolk, and triglycerides, lecithin, and total cholesterol produced are transported primarily by liver cells in the form

of VLDL y is the only substance that can reach the developing egg to form the yolk [16]. This may explain the significant superiority of the diameter and relative weight of the egg yolk for the treatments provided with the highest level of addition of 4 g/kg feed with *Anemone coronaria* L. flower powder. The results of the egg quality characteristics of this study are consistent with [18]. It was shown that when using powdered leaves and essential oils of the local myrtle plant and comparing it with the synthetic antioxidant (BHT) for laying hens, there was no significant difference in all the studied egg quality characteristics, and this is not consistent with the results of our study in yolk diameter and weight. Relative to the yolk only.

Recommendations

The *Anemone coronaria* L. plant contains many active compounds in its various parts. Therefore, more biological, pharmaceutical, and nutritional studies are needed to describe these compounds and the extent of their effectiveness. In addition, studies of Anemone coronaria L. flower powder with higher addition rates than those used in this study are needed to find the best addition rate.

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تأثير إضافة مسحوق ازهار نبات *Anemone coronaria L.* المحلية وفيتامين C في العليقة على جودة بيض الدجاج البياض المعرض للإجهاد الحراري صيفاً

محمد فاضل عبد الخياط [1] **عمار قحطان شعنون [2]**

[1] *وزارة البيئة، بغداد، العراق.*

[2] *قسم الإنتاج الحيواني، كلية الزراعة، جامعة كركوك، كركوك، العراق.*

الخلاصة

تم دراسة إضافة مسحوق ازهار نبات ***Anemone coronaria L.*** المحلية وفيتامين ***C*** الى العليقة وتأثيرها على الصفات النوعية لبيض الدجاج البياض المربى في فصل الصيف والمعرض الى الاجهاد الحراري، وانجزت التجربة باستخدام (120) طائر من نوع ***Lohmann Brown*** بعمر (30) أسبوع وخلال أشهر تموز واب وأيلول ولمدة (84) يوماً تضمنت 14 يوماً كفترة تمهيدية، قسمت التجربة الى (5) فترات إنتاجية، حيث وزعت الطيور عشوائياً الى (6) معاملات وبواقع (5) مكررات ولكل مكرر (4) طيور، اذ كانت المعاملة ***T1***: عليقة سيطرة خالية من أي إضافة، ***T2***: عليقة سيطرة مضاف اليها 250 ملغم/ كغم من فيتامين ***C***، ***T3***: عليقة سيطرة مضاف اليها 2 غم/ كغم من مسحوق ازهار نبات ***Anemone coronaria L.***، ***T4***: عليقة سيطرة مضاف اليها 4 غم/ كغم من مسحوق ازهار نبات ***Anemone coronaria L.***، ***T5***: عليقة سيطرة مضاف اليها 2 غم/ كغم من مسحوق ازهار نبات ***Anemone coronaria L.*** و 250 ملغم/ كغم من فيتامين ***C***، ***T6***: عليقة سيطرة مضاف اليها 4 غم/ كغم من مسحوق ازهار نبات ***Anemone coronaria L.*** و 250 ملغم/ كغم من فيتامين ***C***. لقد اثبتت نتائج التجربة الحقلية عدم وجود فروقات معنوية في المعدل العام للفترات الإنتاجية عند مستوى ***(P≤0.05)*** لأغلب الصفات النوعية للبيض والتي شملت (ارتفاع الصفار، ارتفاع البياض، وحدة الهو، سمك القشرة، الوزن النسبي للقشرة، لون الصفار)، ولكن وجد هناك فروق معنوية لصفتي قطر الصفار والوزن النسبي للصفار، فقد سجلت المعاملتين ***T4*** و***T6*** اعلى قطر للصفار والبالغ (39.65 و39.61) ملم على التوالي، واعلى وزن نسبي للصفار كان للمعاملة ***T4*** (24.61%) من وزن البيضة. حيث يلاحظ من نتائج التجربة ان اضافات مسحوق ازهار نبات ***Anemone coronaria L.*** وفيتامين ***C*** أدى الى التقليل من اثار الاجهاد الحراري الذي يصيب الطيور عند تعرضها الى درجات الحرارة المرتفعة صيفاً وبالتالي تحسن في بعض صفات نوعية البيض المنتج.

الكلمات المفتاحية: شقائق النعمان الاكليلية، فيتامين ***C***، الصفات النوعية للبيض، الدجاج البياض، الاجهاد الحراري.