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RESEARCHARTICLE

EFFECT OF ADDING DIFFERENT LEVELS OF (*THYMUS VULGARIS*) POWDER LEAVES TO THE DIET ON SOME EGG QUALITY TRAITS

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ABSTRACT

This study was conducted to investigate the effect of adding different levels of (*Thymus vulgaris*) leaves powder to the diet on some egg quality traits. A total of 300ISA Brown hens, 23 weeks old were randomly assigned for 4 treatments of 75 laying hens each. Each treatment constitutes of 3 replicates with 25 laying hens each. (*Thymus vulgaris*) leaves powder was supplemented to the diet of hens at the levels of 0 (control group; T_1), 500 mg/Kg of diet (T_2), 750 mg/Kg of diet (T_3) and 1000 mg/Kg of diet (T_4). Egg quality traits included in this study were: egg weight, yolk diameter, yolk height, yolk weight, shell weight, shell thickness and haugh unit. Results revealed that feeding the birds diet contains different levels of (*Thymus vulgaris*) leaves powder (T_2, T_3, T_4) resulted in significant improvement as regards egg weight, yolk diameter, yolk height, yolk weight, shell thickness and haugh unit during the periods of this experiment and concerning the (*Thymus vulgaris*) leaves powder means of these traits. Thus, (*Thymus vulgaris*) leaves powder can be used as one of the important nutritive additives that added to laying hens for improving some egg quality traits.

INTRODUCTION

Thyme plant is famous plant of the platoon oral abound grown generally in the Mediterranean basin countries and call it a recipe delightful mountains because perfumed mountains smart scent has a strong aromatic smell and taste spicy slightly bitter, and spread the cultivation of thyme in Jordan, Syria and northern Iraq is thyme Thymus vulgaris one of the important medicinal plants, one of the herbs that are characterized by being a natural source of antioxidants (Miura *et al*., 2000) contains basic materials antioxidant which phenols and flavonoids (Haraguchi *et al*., 1996) and self-oxidation process Autooxidation can stop or discourage the addition of anti materials-oxidant and is considered thyme one aromatic and medicinal plants which are used in food to prevent self-oxidation (Yodium, 2000) and the effective portion and user medically in thyme is a securities and developing peaks floral where the leaves contain essential oils volatile oils by (5-25%) and contain this oil on about 55% of the phenolic substances delusional Thymol (44.58–58.1%) and Carvacrol (2.4 – 4.2%) These compounds are highly anti-microbial who attributed them to the medical benefits of thyme (Bartosikova *et al*., 2003), as well as the gummy resin materials resins and Tanin and Linoleic acid (Stahl-Biskup, 1990) and thyme contain active substances Next : Thymol both types of phenols, a medically important and carvacrolBorneol, menthone, pinene, cymene, linalool.

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One of the main uses of the plant medical thyme leaves pointed (Manou, 1998) to the thyme leaves ground used as a substance that has the properties of a portfolio of damage where used in keeping the pharmaceutical and cosmetic and add aromatic odor of medical preparation in addition to its role in protecting the skin to prevent bacteria growth as it works to inhibit bacterial positive and negative growth when the concentration thymol 38.60%, while fungi (Bruneton, 1999) were among the possibility of using the painkiller for colic intestinal to address the inflammation of the stomach and intestines and stomach ulcers thyme is the regulator of the functions of the digestive system is also used thymol internally repellent worms as well as used in the sterilization of the mouth, teeth and skin, which is an anti-inflammatory (Deans, 1987) and current research aims to study the effect of adding thyme leaves (Thymus vulgaris) powder into the diet in some egg quality traits.

MATERIALS AND METHODS

This experiment was conducted at the poultry farm civil for the period from 20/2/2010 to 20/5/2010 and use the 300 laying hens 23 weeks. Hens were randomly assigned to four transactions by 75 hen per treatment, and each treatment consists of three replicates of 25 hens for a duplicate one. Bred hens in the (Pens) area of each Be (2 × 2) m. The transaction experience as follows : first treatment: the control group (T1), the second treatment (T2): Add thyme powder leaves to the diet concentration of 500 mg / kg feed, the third treatment (T3): Add thyme powder leaves to the ration concentration of 750 mg / kg feed and treatment fourth (T4): Add thyme powder

leaves of the diet to a concentration of 1000 mg / kg feed. Was presented thyme leaves powder to birds a week before the beginning of the experiment until the end of the probationary period amounting to 3 months in order to accustom the herd to taste thyme. It was getting powder thyme leaves from the local markets in Baghdad. The birds were fed on a commercial laying hens diet (Table 1). Was estimated qualitative characteristics of the eggs: the egg weight, yolk diameter, high-yolk, yolk weight, shell weight, shell thickness and haugh unit, integrity is every two weeks.

Table 1. Composition of experimental diets

Ingredients	(%)
Yellow corn	**33**
Wheat	**33**
Soybean meal	**18**
Limestone	**7.7**
Salt	**0.3**
Sunflower oil	**0.5**
Protein concentrate *	**7.5**
Calculated chemical structure (%)**	
ME, Kcal / Kg feed	2746.5
Crude protein	17.5
Lysine	156.94
Methionine	0.762
Methionine + Sistine	0.311
Calcium	**0.606**
Available phosphorus	3.601

*Protein Nassif sign center, Alcleo per gram of it contains: 2200 kilocalories energy represented 0.40% crude protein 0.8% fat, 3.5% fiber 0.25% ash 0.8% calcium, 3.1 Phosphorus Ready, 1.2% lysine, 1.2% methionine, 1.8% methionine + Sistine 0.2% chlorine, 10,000 IU A, 2500 IU D3, 300 mg vitamin E, 30 mg of vitamin B1, 70 mg vitamin B2, 120 mg acid Albantothink 0.400 mg niacin 0.50 mg B6, 250 Maam B12, 12 mg folic acid 0.600 mcg biotin 0.1000 mg vitamin C, 5000 mg Colin Kluzaad 0.450 mg iron 0.70 mg copper 0.600 mg special .750 manganese 0.5 mg wishes 0.1 g cobalt 0.1 mg selenium, and antioxidants.

**Chemical structure was calculated according to the analysis of diet material found in NRC (1994)

Data were subjected to an ANOVA using the General Linear Models (GLM) procedures of SAS (2001). Significant treatment means were separated by using the multiple range test of Duncan (Duncan,1955).

RESULTS AND DISCUSSION

The results indicate in Table (2) that the addition of thyme powder leaves to the diet (T2, T3, T4) led to a significant increase ($p < 0.05$) in egg weight in comparison with control (T1) during weeks 4, 6, 8 and 10 while there were no significant differences between experimental treatments during week 2 and 12 of the experiment.

Table 2. Effect of adding different levels of thyme powder leaves to the diet in the rate of egg weight (g)

Treatments				weeks
T_4	T_3	T_2	T_1	
1.476 ± 59.04	3.932 ± 58. 36	3.186 ± 56. 87	1.304 ± 52. 59	**2**
[a] 0.662 ± 58.45	[a] 1.141 ± 57.31	[a] 1.195 ± 57.72	[b] 0.630 ± 55.10	**4**
[a] 0.768 ± 57.31	[a] 1.024 ± 56.85	[a] 0.652 ± 57.80	[b] 0.483 ± 51.29	**6**
[a] 2.149 ± 76.05	[a] 0.372 ± 76.74	[a] 0.844 ± 73.77	[b] 2.518 ± 64.57	**8**
[a] 0.373 ± 74.32	[a] 2.468 ± 76.08	[a] 1.575 ± 74.12	[b] 0.639 ± 68.64	**10**
1.431 ± 72. 35	1.709 ± 69. 69	0.153 ± 71. 39	0.591 ± 69.25	**12**

Various characters within each class indicate the presence of significant differences at the level of probability ($p<0.05$).

It is notedfromTable (3) that thethymepowderleaves treatments (T4, T3, T2) has significant improvement ($p < 0.05$) comparison with control group (T1) in a diameter of yolk in the weeks 4,8 and 12 while were not there are significant differences between experimental treatments in the weeks 2,6and 10 . It is clear also from the results of Table (4) The thyme powder leaves (T4, T3, T2) has recorded the highest rates of high- yolk in comparison with control (T1) and were significantly ($p < 0.05$) in the weeks 2,10 and 12 while not there were significant differences between experimental treatments during weeks 4,6 and 8 of the experiment

Table 3. Effect of adding different levels of thyme powder leaves into the diet in diameter of yolk (mm)

Treatments				weeks
T_4	T_3	T_2	T_1	
0.404 ± 39.80	0633 ± 38.40	0.557 ± 37.33	1.506 ± 33.83	**2**
[a] 0.777 ± 38.10	[d] 0.384 ± 38.70	[b] 0.322 ± 35.55	[c] 0.677 ± 33.35	**4**
0.611 ± 43.80	1.020 ± 43.47	0.784 ± 43.53	1.419 ± 44.23	**6**
[b] 0.589 ± 42.43	[b] 0.926 ± 41.37	[a] 0.219 ± 44.17	[c] 0.233 ± 41.63	**8**
0.384 ± 43.37	0.819 ± 44.40	1.011 ± 42.47	0.819 ± 42.47	**10**
[a] 0.802 ± 47.53	[a] 0.520 ± 46.27	[a] 0.677 ± 45.40	[b] 1.224 ± 36.50	**12**

Table 4. Effect of adding different levels of thyme powder leaves into the diet in high-yolk (mm)

Treatments				weeks
T4	T3	T2	T1	
b 0.429 ± 16.48	a 0.006 ± 18.08	a 0.625 ± 17.04	c 0.260 ± 15.25	**2**
0.120 ± 16.16	0.007 ± 17.35	0.433 ± 17.40	0.464 ± 16.10	**4**
0.680 ± 18.23	0.916 ± 17.83	0.524 ± 17.12	0.482 ± 17.45	**6**
0.606 ± 17.53	0.346 ± 16.87	0.241 ± 17.67	0.254 ± 16.58	**8**
b 0.717 ± 16.89	a 0.355 ± 18.69	a 0.182 ± 17.97	b 0.270 ± 16.85	**10**
b 0.167 ± 17.65	a 0.005 ± 18.37	ab 0.010 ± 17.33	c 0.115 ± 15.21	**12**

Various characters within each class indicate the presence of significant differences at the level of probability($p<0.05$)

The results are shown in Table (5) The thyme powder leaves treatments (T2, T3, T4) has a significantimprovement ($p < 0.05$) comparison with control group in the weight of the yolk during weeks 2, 4, 6.8 and 12, while not there were significant differences between experimental treatments during the week from the age of 10 experience.

Table5.Effect ofadding different levels ofthyme powder leavesintothe dietin yolkweight (g)

Treatments				weeks
T_4	T_3	T_2	T1	
[a] 0.473 ± 15.32	[a] 0.389 ± 15.60	[a] 0.193 ± 15.70	[b] 0.732 ± 13.67	**2**
[a] 0.471 ± 15.57	[a] 0.488 ± 15.65	[a] 0.601 ± 15.44	[b] 0.684 ± 13.22	**4**
[a] 0.286 ± 20.37	[a] 0.629 ±19.22	[a] 0.873 ± 19.33	[b] 0.404 ± 18.60	**6**
[b] 0.623 ± 19.61	[b] 0.154 ± 18.75	[a] 0.396 ± 20.51	[c] 0.813 ± 17.90	**8**
0.757 ± 19.00	0.509 ± 20.66	1.155 ± 19.47	0.809 ± 19.61	**10**
[a] 0.449 ± 17.21	[a] 0.429 ± 17.23	[a] 0.348 ± 17.54	[b] 0.685 ± 14.22	**12**

Various characters within each class indicate the presence of significant differences at the level of probability ($p<0.05$).

The results indicate in the Table (6) The thyme powder leaves treatments (T2, T3, T4) has a significant improvement ($p < 0.05$) comparison with control group (T1) in shell weight during the 2 week, while there were no significant differences between treatments during the experiment period. It is noted from Table (7) The thyme powder leaves treatments (T2, T3, T4) has a significant improvement ($p < 0.05$) comparison with control group (T1) in shell thickness during

weeks 4, 6, 10 and 12 while were not there are significant differences between experimental treatments during week 2 and 8.

Table (8) The thyme powder leaves treatments (T2, T3, T4) has increased in a significant ($p < 0.05$) comparison with control group (T1) in haugh unit is through the weeks, 2,6 and 12 while were not there are significant differences between experimental treatments in 4,8 weeks and 10.

increase the calcium necessary to form the egg. As the estrogen stimulates the production of key components of the egg yolk and many components of the yolk produces just under the stimulating effect of estrogen to the liver and transferred to developing vesicle through the bloodstream and deposited Bmakant linked to specific receptors, as estrogen works to strengthen the oviduct growth and increased secretions of the glands pipe, assisting in special proteins industry in the oviduct, modify progesterone receptors in concentration in the cytoplasm of the oviduct, and also stimulate both the

Table 6. Effect of adding different levels of thyme powder leaves into the diet in the shell weight (g)

Treatments				weeks
T_4	T_3	T_2	T1	
[a] 0.205 ± 5.**91**	[b] 0.109 ± 5.34	[b] 0.174 ± 5.58	[b] 0.106 ± 5.**42**	**2**
0.005 ± 5.**37**	0.197 ± 5.39	0.234 ± 5.37	0.206 ± 5.**23**	**4**
0.105 ± 6.**78**	0.249 ± 6.82	0.526 ± 6.39	0.296 ± 6.**66**	**6**
0.170 ± 5.90	0.395 ± 6.71	0.492 ± 6.44	0.874 ± 6.**65**	**8**
0.307 ± 5.53	0.361 ± 6.33	0.341 ± 6.37	0.348 ± 6.1**6**	**10**
0.122 ± 5.41	0.005 ± 5.4**8**	0.153 ± 5.57	0.147 ± 5.32	**12**

Various characters within each class indicate the presence of significant differences at the level of probability ($p<0.05$).

Table 7. Effect of adding adding different levels of thyme powder leaves into the diet of shell thickness (mm)

Treatments				weeks
T_4	T_3	T_2	T1	
0.0023 ± 0.37	0.0017 ± 0.37	0.0017 ± 0.36	0.0012 ± 0.3**5**	**2**
[a] 0.0009 ± 0.38	[a] 0.0009 ± 0.38	[b] 0.0019 ± 0.36	[c] 0.0009 ± 0.3**3**	**4**
[b] 0.0009 ± 0.39	[a] 0.0012 ± 0.40	[a] 0.0024 ± 0.40	[c] 0.0015 ± 0.3**7**	**6**
0.0013 ± 0.38	0.0009 ± 0.37	0.0013 ± 0.38	0.0021 ± 0.3**8**	**8**
[a] 0.0006 ± 0.39	[b] 0.0007 ± 0.38	[a] 0.0009 ± 0.39	[c] 0.0007 ± 0.36	**10**
[a] 0.0016 ± 0.38	[a] 0.0005 ± 0.38	[a] 0.0003 ± 0.38	[b] 0.0007 ± 0.36	**12**

Various characters within each class indicate the presence of significant differences at the level of probability ($p<0.05$).

Table 8. Effect of adding different levels of thyme powder leaves into the diet in haugh unit

Treatments				weeks
T_4	T_3	T_2	T1	
[a] 3.841 ± 89.21	[b] 3.694 ± 86.45	[b] 2.881 ± 84.57	[c] 2.694 ± 8**2.3**2	**2**
1.517 ± 81.31	0.970 ± 80.21	2.952 ± 83.52	5.982 ± 83.56	**4**
[a] 0.821 ± 79.72	[b] 1.297 ± 77.89	[a] 6.227 ± 79.87	[c] 6.903 ± 71.72	**6**
0.663 ± 78.33	1.948 ± 76.41	2.203 ± 75.70	5.474 ± 75.32	**8**
2.428 ± 75.92	4.629 ± 72.61	4.089 ± 74.61	1.832 ± 74.62	**10**
[a] 0.893 ± 85.21	[a] 1.322 ± 85.31	[a] 2.040 ± 84.08	[b] 2.700 ± 79.91	**12**

Various characters within each class indicate the presence of significant differences at the level of probability ($p<0.05$).

The positive results obtained in this experiment the result of adding thyme powder leaves to the diets of laying hens with respect to the egg weight, yolk diameter, yolk height, yolk weight, shell thickness, shell weight and haugh unit is in some weeks, the experiment may be the result to contain leaves thyme powder material Glycyrrhizin and that the similarity in structure installation of the sex hormones estrogen and progesterone, as this article linked receptors sex hormones making sex hormones are available with a greater degree within the body, as it's based inhibit decomposition of these hormones in the liver, leading to prolong the effectiveness of these hormones, in addition to its role in stimulating the secretion of sex hormones by stimulating the secretion of hormones FSH and LH (Bolukbasi, 2007). He Etches (2000) that sex hormones are structural hormones and thus lead to increased protein synthesis and reduce degradation, as it increases muscle and bone growth and lead to calcium remain in the body and increase metabolism base rate, although the secretion of estrogen by the ovary chicken blood works increased appetite and fat and vitamins in the blood and

composition of the yolk vitellogenesis (through its work on the liver), the food and the deposition of calcium and eating inside the endodontic bones that be the source of a reserve of calcium through the high production of eggs period. Because progesterone pre-estrogen by adding a ring aromatics in the theca cells theca cell (Mahmoud *et al*., 1996), the rise in estrogen concentration in blood plasma as a result of the treatment of bird leaves thyme ground may be the first plan in a series of events include a rise in the concentration of estrogen in the blood plasma and the high effectiveness of the enzyme 1 - α - hydroxylase, which converts to vitamin D3 effective derivatives [1,25 (OH) 2D3] and the high level of calcium in the blood which is reflected in a nutshell the moral improvement of the qualities of the egg shell. Noted Whitehead (1990) and no significant correlation between the concentration of estrogen in the blood plasma of all the neutral fat and fatty proteins and free fatty acids and protein in the blood plasma concentration. It was concluded Bolukbasi (2007) The high content relatively to some food ingredients and mineral elements in plant leaves powder thyme compared to many

other medicinal herbs made from thyme powder leaves one more medicinal herbs importance of being provides metal and nutrients necessary to sustain many events physiological within the body. Said Harvey and John (1998) The thyme powder leaves is a strong catalyst in the process of digestion and thus increases the rate of entry metabolic substances within the body Kalahmad acids and glucose and fatty acids, as he works to increase the blood flow rate in the mucous membranes of the digestive tract, thereby increasing the efficiency of utilization of food, which is reflected on the performance nutshell productive birds. On the other hand, the moral improvement in the average thickness of the crust may be the result of the role of thyme powder leaves in promoting move calcium and phosphorus into the bloodstream through an increase in estrogen concentration in blood plasma (Etches, 2000), as the estrogen leads to an increase in the level of calcium in blood plasma by promoting calcium absorption by the gut tissue and by bone resorption (Sturkie, 2000). He noted El - Aroussi*et al*.(1993) that estrogen increases the concentration of calcium in the blood plasma through adaptive changes in the college, which include increasing the effectiveness of the enzyme adenylatecyclase-dependent hormone Albaraterwid (thyroid hormone neighbor thyroid) parathyroid hormone responsible for regulating calcium and phosphorus levels in the blood and increase the preparation of the hormone receptors PTH and increase active form of vitamin D, a manufacturing 1,25 (OH) 2D3 is important in calcium absorption through the gut and increase its level in the blood plasma.Conclude from this experiment that add thyme leaves powder diet of laying hens to the level of 500, 750.1000 mg / kg feed led to a significant improvement in the quality of some of the qualities of the eggs. And thus can be used as ground thyme leaves as one of the important means to improve the productivity performance of laying hens.

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