EFFECT OF ADDING AQUEOUS AND ALCOHOLIC EXTRACT OF LEAVES OF IRAQI JASMINE (LONICERA JAPONICA) TO DRINKING WATER IN PRODUCTIVE PERFORMANCE OF LAYING HENS TYPE LOHMANN BROWN

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ABSTRACT

This experiment was carried out in the poultry field of the Department of Animal Production at the College of Agriculture - Al-Qasim Green University, to study the effect of adding an aqueous

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and alcoholic extract of Iraqi jasmine leaves (Lonicera Japonica L.) to drinking water in the productive performance of laying hens, where 147 laying hens were used in this experiment. type Lohmann Brown, at the age of 50 weeks, and it is in the production stage. The experiment included seven treatments Each treatment included, three replicates, with 7 chickens in one replicate. The experiment lasted 12 weeks, and the water and alcoholic extract of Iraqi jasmine leaves were added to the drinking water for three production periods, each 28 days. The first treatment (control treatment) was without any addition, while the second, third and fourth contained the addition of the water extract of jasmine leaves at a dose of 10 ml / A liter of drinking water with a concentration of 15%, 30% and 45%, respectively. The fifth, sixth and seventh treatment added the alcoholic extract of jasmine leaves at a dose of 10 ml / liter of drinking water with a concentration of 15%, 30% and 45%, respectively. The results achieved in this experiment was a significant superiority ($P \leq 0.05$) in weekly egg weight, egg mass and cumulative number of eggs in all treatments of water and alcohol extract compared to the first treatment during the second and third periods and during the total period of production, as well as the feed conversion coefficient decreased significantly ($P \leq 0.05$) during the first, second and third periods and during the total period of production in the aqueous and alcoholic extract treatments compared to the first treatment, where it was the best food conversion coefficient in the treatments with a significant decrease.

INTRODUCTION

The poultry industry is one of the main sources on which humans rely by providing them with protein-rich sources of meat and eggs, which demand has increased due to the increase in human income (18). Where the poultry industry in the world witnessed during the past years a remarkable and wide development, whether in the level of meat or egg production, as the volume of meat production increased compared to other animal products, and the volume of increase in meat production was higher than eggs (23) This development was accompanied by the expansion of the use of multiple additives for the purpose of increasing productivity, such as organic acids, enzymes,

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herbs and medicinal plants as food additives, due to the natural chemicals they contain of great benefit and importance for their therapeutic activity and physiological effect (1) as well as their content of mineral elements and vitamins. Such as vitamins C and E, which play a major role in strengthening the immune system in the body of birds and reduce oxidative stress (19). One of these important medicinal plants is the Iraqi jasmine plant (Lonicera japonica L.) It is one of the species of aromatic plants, as this plant is found in East Asia including Japan, Korea, northeastern China (7،12) and other regions of the world (11) . It is an evergreen plant and belongs to the olive family, Oleacea. It is widely used in medical treatments because it contains a wide range of biological and pharmacological properties, in addition to its compounds possessing biological activity as antioxidants, anti-inflammatory (9), blood lipid-lowering, antibacterial and antiviral. , antipyretic and antitoxin (21) . The jasmine plant also contains a quantity of essential oil and is called jasmine oil (jasmine perfume), as the compounds responsible for the fragrance include benzyl acetate, benzyl alcohol, benzyl acetate, and linalool (3). Essential oils, organic acids, flavonoids, saponins, and inorganic elements are considered. The main chemical compounds of the Iraqi jasmine plant, including the important chlorogenic acid, which is considered a biologically active organic compound that has good pharmacological effects, as it is found in high concentration in the leaves of the plant (15).

MATERIALS AND METHODS

Preparation of The Aqueous and Alcoholic Extract of Iraqi Jasmine Leaves

The aqueous and alcoholic extract of the leaves of the jasmine plant was prepared in the laboratories of the College of Agriculture / Al-Qasim Green University, where Iraqi jasmine plants (Lonicera Japonica L.) were brought from the local markets, and then the leaves of the jasmine plant were separated from the stem, then washed with distilled water, and dried in an oven. Leaves were ground at a temperature of 30 ° C until drying, Then the leaves were crushed by an electric mill to obtain a homogeneous powder, then sieved by means of a fine sieve (mesh) 0.5 mm, then the powder was kept in sterile and clean glass containers in the refrigerator until use.

Aqueous Extract of Iraqi Jasmine Leaves

The aqueous extract of jasmine leaves was prepared according to the method of Shtayeh and Abu-Ghdeib (22), where 100 gm of jasmine leaves powder was weighed and placed in a glass flask with a capacity of 1 liter and 500 ml of distilled water was added to it, then the mixture was left for 24 hours in a rocking incubator at a temperature Then the mixture was filtered using a gauze cloth and then centrifuged at a speed of 3000 rpm for 10 minutes.

Alcoholic Extract of Iraqi Jasmine Leaves

The alcoholic extract of jasmine leaves was prepared according to (10), where 100 g of the powder was soaked in 1 liter of ethyl alcohol at a laboratory temperature of 26 °C for 48 hours, then the extract was filtered by Whatmann paper No.42 filter paper, then After that, the extract was concentrated by a Rotary evaporator in the presence of a water bath at a temperature of 40 ° C, then the extract was dried at the laboratory temperature, and after drying, it was collected in glass bottles and placed in the refrigerator until use.

Flock Management

In this experiment, 147 laying hens of the brown Lohmann type were used, at the age of 50 weeks, with an average weight of 1550 grams, while they were in the production stage. They were equipped after being vaccinated with full vaccinations, and the

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birds were fed with nutritional treatments (rations) and after two weeks of rearing as a preparatory period and adaptation in the hall before the start of the experiment, as they were not collected . Chickens at the age of 52 weeks were distributed to the treatments, as they were reared in a hall with dimensions of 45 m in length, 10 m in width, 3 m in height, divided by barriers of metal wire in the form of pens, the dimensions of each pen were 1.5 x 2 m included. The experiment included seven treatments , Each treatment included three replicates of 7 chickens in one replicate. The hall was equipped with all its requirements during the rearing period, and the flock was fed the ration shown in Table 1. The amount of feed ingested by the chicken was calculated according to what is found in the Rearing Manual of Lohmann Brown. The experiment lasted 12 weeks. The water and alcoholic extract of Iraqi jasmine leaves were added to the drinking water for three production periods, each period of 28 days. The treatments were as follows: The first treatment (control) without any addition to drinking water. As for the second, third and fourth treatment, the addition was at the rate of 10 ml of aqueous extract / liter of drinking water, with a concentration of 15, 30 and 45% for the treatments, respectively. As for the fifth, sixth and seventh treatments, the addition was at a rate of 10 ml of alcoholic extract / liter of drinking water with a concentration of 15, 30 and 45% for the treatments, respectively.

STUDIED TRAITS

Cumulative Number of Eggs : The cumulative number of eggs was calculated for each period of the experiment (28 days for one period) and for three periods by applying the following equation as stated by North (17).

$$\text{Cumulative number of eggs (egg/bird)} = \frac{\text{Percentage of egg production on the basis of (H.D)}}{100} \times \text{number of days}$$

The Weight of The Egg : The eggs of the replicates of each treatment were weighed weekly and individually by means of a sensitive scale of three decimal places, and the average egg weight (g) for each replicate in the treatment was extracted weekly during the experiment period.

Egg Mass (g/bird/day) : The egg mass of each replicate was calculated daily, then monthly, as well as according to the average egg mass for the months of the study, then the cumulative egg mass was calculated during the 84-day trial period according to the following equation according to Rose (13).

$$\text{Egg mass (gm egg/duration)} = \frac{\text{Egg production H.D x average egg weight (gm)}}{100}$$

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Food Conversion Factor : The feed conversion factor was calculated on the basis of the amount of diet (gm) needed to produce one gram of eggs, according to Al-Fayyad and Naji (2) according to the following equation:

$$\text{Food Conversion Factor} = \frac{\text{Average daily feed consumption (g / bird / day)}}{\text{average mass of eggs produced (gm of eggs / bird / day)}}$$

(gm of feed / gm of egg)

Statistical Analysis

The statistical analysis was carried out by adopting the ready-made statistics program (20) and comparing the significant differences between the means according to Duncan's multiple limit test (8) according to the following mathematical model:

$$Yij=\mu+Ti+eij$$

Table 1 The ration used in the first experiment with its proportions and chemical composition

components	**Usage rate**
yellow corn	36.5
wheat	12
barley	13.9
Soybean meal (protein 44%)	25
Premix*	2.5
limestone	8.3
Vegetable oil	1.8
total	100
chemical composition **	
Represented energy (kilo calories / kilogram of feed)	2756.19
Crude protein %	17.13
Crude fiber %	4
Calcium %	3.21
%available phosphorus	0.31
methionine + cysteine %	0.73
Lysine %	0.90

* Maxcare premix of Belgian origin, each 1 kg contains: crude protein 7.9%, lysine 2.4%, methionine 7.7%, methionine + cysteine 7.7%, calcium 23.1%, phosphorus 3.3%, sodium 5.5%, represented energy 2903 Kcal / Kg, vitamin A 400,000 IU, Vitamin 3D 300,000 IU, Vitamin Hy.D 20,000 IU, Vitamin E 800 IU, Vitamin K 80 ppm, Vitamin B1 40 ppm, Vitamin B2 160 ppm, Calcium Pantothenate 320 ppm, Niacin 600 ppm, Biotin 1600 ppb, vitamin B12 1000 ppb, folic acid 40 ppm, vitamin B6 160 ppm, iron 2800 ppm, copper 600 ppm, zinc 2400 ppm, magnesium 4000 ppm, iodine 80 ppm, selenium 8 ppm

** Chemical analysis calculated according to NRC (1994).

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RESULTS AND DISCUSSION

As for the cumulative number of eggs, as shown in Table 2 , there was a significant difference (P≤0.05) in favor of the third and seventh treatments, which recorded the highest cumulative number of eggs compared to the first treatment (control), which recorded the lowest number of cumulative eggs, amounting to 21.63 (egg / chicken 28 / day). Which did not differ significantly from the ether treatments . As for the second productive periods (56-59) and the third (60-63) weeks, the fourth and seventh treatments recorded the highest cumulative number of eggs with a significant difference (P≤0.05) from the first (control) and fifth treatments, and the third and sixth treatments also excelled significantly (P≤0.05). The first treatment (control), which recorded the least cumulative number of eggs, was 22.91 and 22.25 (eggs/chicken 28/day), respectively. As for the total productive period (52-63) weeks for the number of cumulative eggs, there was a significant superiority (P≤0.05) in favor of all treatments of the water and alcoholic extract of Iraqi jasmine leaves, which achieved an increase in the number of cumulative eggs compared to the first treatment (control), while it recorded The seventh treatment had the highest cumulative number of eggs, which reached 24.13 (egg / chicken 28 / day), with a significant difference (P≤0.05) for the first, second and fifth treatments.

Table 2 Effect of adding the aqueous and alcoholic extract of Iraqi jasmine leaves (Lonicera Japonica L.) to drinking water in the number of cumulative eggs of laying hens for the period (63-52) weeks (standard error ± arithmetical mean)

Treatments	First period 55-52	Second period 59-56	Third period 63-60	Total period 63 - 52
First treatment	1.80 ±21.63 b	0.60 ±22.91 c	0.41 ±22.25 c	0.32 ±22.26 c
Second treatment	0.60 ±23.15 ab	0.67 ±23.82 abc	0.13 ±22.80 bc	0.20 ±23.25 b
Third treatment	0.52 ±24.04 a	0.24 ±23.99 ab	0.18 ±23.20 ab	0.25 ±23.74 ab
Forth treatment	1.77 ±23.60 ab	0.25 ±24.53 a	0.06 ±23.58 a	0.37 ±23.91 ab
Fifth treatment	0.82 ±23.64 ab	0.21 ±23.34 bc	0.16 ±22.87 bc	0. 17±23.28 b
Sixth treatment	0.55 ±23.62 ab	0.54 ±24.07 ab	0.27 ±23.30 ab	0.34 ±23.66 ab
Seventh treatment	0. 41±24.19 a	0.15 ±24.37 a	0.21 ±23.83 a	0.18 ±24.13 a
Significant level	*	*	*	*

- The first treatment (control) drinking water without any addition, the second, third and fourth treatment adding the aqueous extract of jasmine leaves at a dose of 10 ml / liter of drinking water with a concentration of 15%, 30% and 45%, respectively. The fifth, sixth and seventh treatment added the alcoholic extract of jasmine leaves at a dose of 10 ml / liter of drinking water with a concentration of 15%, 30% and 45%, respectively.
- * Means there is a significant difference at the level of significance (P≤0.05).

Table 3 shows the effect of adding the aqueous and alcoholic extract of the leaves of Iraqi jasmine (Lonicera Japonica L.) to drinking water on the weekly egg weight (g) of laying hens for a period of (63-52) weeks, where the first productive period (52-55) weeks showed no Significant differences between all treatments of the experiment. In the second production period (56-59) weeks, the fifth, sixth and seventh treatments recorded the highest weight of eggs with a significant

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difference (P≤0.05) compared to the first treatment (control), which recorded the lowest weight of eggs and without a significant difference from the ether treatments. As for the third productive period (60-63) and the total period (52-63) One week, it was observed that the fourth, fifth, sixth and seventh treatments were significantly superior (P≤0.05) in egg weight compared to the first treatment (control), which recorded the lowest weight of eggs during the above two periods. As for the second and third treatments, no significant differences were recorded between them and the ether of the treatments. The reason for the increase in egg weight in the addition treatments may be attributed to the presence of phenolic compounds in jasmine extracts that work to hold metal ions necessary for the formation of free radicals, which increases the activity of antioxidant enzymes , Whereas this oxidative stress leads to the physiological function that includes growth and reproduction (14), which leads to a decrease in the secretion of F.S.H and L.H hormones (5), it is possible that these extracts have improved the increase in The secretion of the hormone thyroxin T4, which stimulated an increase in the secretion of growth hormone, and then improved food consumption and thus increased the weight of the eggs produced (4).

Table 3 Effect of adding the aqueous and alcoholic extract of Iraqi jasmine leaves (Lonicera Japonica L.) to drinking water in the weekly egg weight (g) of laying hens for a period of (63-52) weeks (standard error ± arithmetical mean)

Treatments	**First period 55-52**	**Second period 59-56**	**Third period 63-60**	**Total period 63 - 52**
First treatment	0.6 9± 63. 54	0.65± 64.33 b	0.62± 64. 28b	0. 25± 64.0 5b
Second treatment	0. 75± 64.31	0.58± 66.00 ab	0.57 ± 66. 12ab	0.46± 65. 47ab
Third treatment	1.33 ± 63.46	0.45± 66.10 ab	0.5 4±66.0 9ab	0.37± 65. 21ab
Forth treatment	0.8 9± 64.23	0.81± 66. 41ab	0.49± 67. 17a	0. 32± 65. 93a
Fifth treatment	0. 93± 63. 28	0.6 8± 67. 52a	0.63± 66.46 a	0.41± 65. 75a
Sixth treatment	0.71± 63.72	0.56± 66. 84a	0.46± 67.63 a	0.29± 66.06 a
Seventh treatment	0. 84± 63.91	0.63 ± 67.3 1a	0.33 ± 67.6 2a	0.5 2± 66. 28a
Significant level	**N.S**	*	*	*

- The first treatment (control) drinking water without any addition, the second, third and fourth treatment adding the aqueous extract of jasmine leaves at a dose of 10 ml / liter of drinking water with a concentration of 15%, 30% and 45%, respectively. The fifth, sixth and seventh treatment added the alcoholic extract of jasmine leaves at a dose of 10 ml / liter of drinking water with a concentration of 15%, 30% and 45%, respectively.
- * Means there is a significant difference at the level of significance (P≤0.05).
- N.S means that there are no significant differences between the treatments.

As for the egg mass of laying hens, it is clear from Table 4 that there were no significant differences between all treatments during the first production period. As for the second productive period (56-59) weeks, there was a significant improvement (P≤0.05) in the rate of egg mass in the treatments of adding water and alcohol extract of Iraqi jasmine leaves, compared to the first treatment (control), which recorded the lowest rate of egg mass and reached 52.64 (gm). /bird/day). As for the third productive period (60-63) and the total period (52-63) weeks, the addition

treatments continued to outperform with a significant difference (P≤0.05) over the first treatment (control), which recorded the lowest rate of egg mass, which reached 51.15 and 51.01 (g / bird / day) respectively, while the seventh treatment recorded the highest rate of egg mass, which was 57.60 and 57.07 (gm / bird / day).

Table 4 Effect of adding the aqueous and alcoholic extract of Iraqi jasmine leaves (Lonicera Japonica L.) to drinking water in the egg mass of laying hens for a period of (63-52) weeks (standard error ± arithmetical mean)

Treatments	**First period 55-52**	**Second period 59-56**	**Third period 63-60**	**Total period 63 - 52**
First treatment	4.74 ±49.23	0.29 ±52.64 c	0.39 ±51.15 d	0.41 ±51.01 c
Second treatment	2.97 ±53.20	1.36 ±56.17 b	0.24 ±53.75 c	0.30 ±54.37 b
Third treatment	3.83 ±54.69	0.60 ±56.55 ab	0.56 ±54.69 bc	0.18 ±55.30 ab
Forth treatment	2.65 ±54.17	0.93 ± 58.13 ab	0.29 ±56.21 ab	0.45 ±56.16 ab
Fifth treatment	2.72 ±53.80	0.26 ±56.14 b	0.70 ±54.46 bc	0.51 ±54.80 b
Sixth treatment	1.42 ±53.67	0.49 ±57.31 ab	0.61 ±56.04 ab	0.79 ±55.67 ab
Seventh treatment	3.91 ±55.03	0.41 ±58.61 a	0.58 ±57.60 a	0.45 ±57.07 a
Significant level	N.S	*	*	*

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The first treatment (control) drinking water without any addition, the second, third and fourth treatment adding the aqueous extract of jasmine leaves at a dose of 10 ml / liter of drinking water with a concentration of 15%, 30% and 45%, respectively. The fifth, sixth and seventh treatment added the alcoholic extract of jasmine leaves at a dose of 10 ml / liter of drinking water with a concentration of 15%, 30% and 45%, respectively.

- * Means there is a significant difference at the level of significance (P≤0.05).
- N.S means that there are no significant differences between the treatments.

As for the characteristic of the food conversion factor for laying hens in Table 5, the seventh treatment recorded the best food conversion factor and amounted to 2.090 (gm of feed / gm of eggs), with a significant difference (P ≤ 0.05) over the first treatment (control), which recorded a food conversion factor of 2.346. (gm of feed / gm of eggs), while there were no significant differences between the second, third, fourth, fifth and sixth treatments between them and the first treatment on the one hand , and the seventh treatment on the other hand, and this was during the first productive period (52-55) weeks, as for the second production periods (56) (-59), and the third (60-63) and the total period (52-63) weeks were significantly superior ((P≤ 0.05) to the treatments of addition to the aqueous and alcoholic extract of Iraqi jasmine leaves, as it recorded the best

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food conversion factor compared to the first treatment (control). Which recorded a feed conversion factor of 2.176, 2.246 and 2.256 (gm of feed / gm of eggs), respectively. This improvement in the food conversion factor in the addition treatments may be due to the effect of effective compounds, especially phenols, terpenes, toluenes and hydrocarbons present in jasmine extracts, which work to reduce the multiplication of harmful bacteria in the intestine and thus improve the function and work of the intestine, which results in increased utilization of components and nutrients. (6), which led to an improvement in the feed conversion factor in the addition treatments of Iraqi jasmine extracts.

Table 5 Effect of adding the aqueous and alcoholic extract of Iraqi jasmine leaves (Lonicera Japonica L.) to drinking water in the feed conversion factor of laying hens for a period of (63-52) weeks (standard error ± arithmetical mean)

Treatments	**First period 55-52**	**Second period 59-56**	**Third period 63-60**	**Total period 63 - 52**
First treatment	0.230±2.346 a	0.020±2.176 a	0.056±2.246 a	0.041±2.256 a
Second treatment	0.066±2.156 ab	0.060±2.046 b	0.031±2.136 b	0.025±2.113 b
Third treatment	0.098±2.100 ab	0.037±2.026 b	0.040±2.096 bc	0.012±2.074 bc
Forth treatment	0.113±2.120 ab	0.036±1.976 b	0.017±2.040 cd	0.042±2.045 bc
Fifth treatment	0.116±2.136 ab	0.015±2.043 b	0.042±2.106 bc	0.031±2.095 bc
Sixth treatment	0.098±2.140 ab	0.021±2.000 b	0.035±2.046 cd	0.034±2.062 bc
Seventh treatment	0.036±2.090 b	0.025±1.956 b	0.032±1.993 d	0.037±2.013 c
Significant level	*	*	*	*

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The first treatment (control) drinking water without any addition, the second, third and fourth treatment adding the aqueous extract of jasmine leaves at a dose of 10 ml / liter of drinking water with a concentration of 15%, 30% and 45%, respectively. The fifth, sixth and seventh treatment added the alcoholic extract of jasmine leaves at a dose of 10 ml / liter of drinking water with a concentration of 15%, 30% and 45%, respectively.

• * Means there is a significant difference at the level of significance (P≤0.05).

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