



EFFECT OF USING FIGS AND OLIVE LEAVES POWDER IN THE DIET ON PRODUCTIVE PERFORMANCE FOR BROILER CHICKENS (ROSS-308)

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Abstract

This study was conducted in the field of poultry birds belonging to the Department of Animal Production, College of Agriculture, Al-Qasim Green University for the period from 09/18/2019 to 10/25/2019. Where 315 bird Ross-308 were used for the age of one day of unsexed, randomly distributed to 21 cages, with 7 experimental treatments, each treatment included 3 replicates per replicate of 15 birds. Treatment birds T1 were fed on a basic diet without adding and treatment birds T2 and T3 on a basic diet added to it (10 and 15 g) fig leaf powder/kg feed and birds T4 and T5 were fed on a basic diet added to it (10 and 15 g) olive leaf powder / T6 feed and treatment birds were fed T6 on a basic diet added to it (5 g fig leaf powder and 5 g olive leaf powder) / kg feed and T7 treatment birds were fed on a basic diet added (7.5 g fig leaf powder and 7.5 g olive leaf powder) / Kg feed. The results showed that the adding treatments were significantly excelled ($P < 0.01$) in the live body weight ratio compared to the control treatment birds (T1) and the adding treatments birds significantly ($P < 0.01$) were significantly excelled to the control treatment birds in the on weight gain rate, while decreased the on feed consumption rate was significant ($P < 0.01$) between the T6 and T7 treatment birds compared to the other treatment birds. The results indicated a significant improvement ($P < 0.01$) in the traits of the total food conversion factor between the adding treatments birds compared with the control treatment birds.

Keywords : Figs, olive leaves powder, productive performance, broiler

Introduction

Poultry is one of the most important sources of meat today to shorten its rearing period and its meat contains the elements necessary to meet the body's need (Ouda, 2009; Benjamin and Spener, 2009), so one of the most important foundations of the poultry industry is to achieve high production and reach the best feed efficiency and maintain the best levels of bird health (Mohammed, 2018), and this requires adopting several strategies, including the use of feed additives, where herbs, trees and extracts are considered good feed additives, as they are safe and contain antioxidants, enzymes, vitamins, minerals and the required and cheap organic acids (Ravindran, 2013; Bagal *et al.*, 2016). The divine section of the fig and olive trees in the Holy Qur'an is a clear statement of the economic, nutritional, and medicinal benefits of these two blessed trees (Al-Musli, 2007; Belarbi *et al.*, 2011), that their chemical analysis shows that they contain sugars, trans fats, vitamins, minerals, and antioxidants, thus completing one of them. The other contains most of the body's needs (Fatayer, 2013). The researchers concluded that the figs and olive leaves are no less important than the fruits, and they reached their great role in human and animal health, as they are a complete pharmacy (Al-Kenzawi, 2008; Jun *et al.*, 2012). Fig belongs to family Moraceae and its scientific name *Ficus carica* L (Patil and Patil, 2011), researchers found that when adding fig leaf powder to poultry feeds, they reduced the formation of very-low-density lipoproteins (VLDL) and triglycerides as well as harmful cholesterol (Canal *et al.*, 2000; Al-Asadi *et al.*, 2006) This preserved the health of the heart and liver of birds and consequently restored to the health of the consumer. Olives from Oleaceae family are an evergreen plant whose scientific name is *Olea europaea* L. (Karakaya, 2011), and the researchers found that when adding olive leaves to poultry feeds, they improved the respiratory system of birds, increased the weight and number of eggs, increased the birds weight, and improved the feed conversion rate. Reducing blood MDA levels and an increase in the number

of beneficial Lactobacillus bacteria versus a decrease in the number of harmful E. coli bacteria (Al Bandar, 2017; Karim, 2018). So the aim of the study was to determine the effect of using different levels of figs and olive leaf powder and their mixture together in the diet on the productive performance of the broiler chicken Ross-308.

Material and Methods

The experiment was conducted in the field of the Department of Animal Production, College of Agriculture, University of Al-Qasim Green and for a period of five weeks from 9/18/2019 to 10/25/2019, a leaf of figs and olives in the diet was used in different levels and their mixture together for the purpose of knowing their effect on the productive traits of broilers. Ross-308, where 315 unsexed Ross-308 chicks were used at the age of one day with an average weight of 40 g per bird. Breeding took place from the age of one day to 35 days in a room divided into (cages), according to the ground-based system, with sawdust used for floor cages mattresses of 7 cm thick. Water and feed were provided freely for them. The continuous lighting system (23 hours / day) was used, during the breeding period, with lighting turned off for one hour per day, to accustom the birds to darkness in the event of Sudden power outages.

Experiment treatments

The chicks were randomly distributed to 21 cages, with 7 treatments, and each treatment included 3 replicates, and each replicate included 15 birds. A fig and olive leaf powder was added to the diets in two concentrations separately and mixing them together as shown below: (T1) was fed on a basic diet without adding (control). (T2) was fed on a basic diet added 10 g of fig leaf powder per kg of feed. (T3) was fed on a basic diet added 15 g of fig leaf powder per kg of feed. (T4) Feed on a basic diet added 10 g olive leaf powder per kg of feed. (T5) Feed on a basic diet added 15 g of olive leaf powder per kg of feed. (T6) was fed on a basic diet added (5g fig leaf powder and 5g olive leaf powder) per kg of feed. (T7) was fed on a basic diet added (5.7 g) fig leaf

powder and 7.5 g olive leaf powder) per kg of feed. From the age of (21-1) the day, the birds were fed on the starter diet, and from the age of (35-22) days on the final diet, and Table 1

Shows the components of the starter and final diets as well as the chemical composition of them.

Table 1 : The percentages of the diets components used in the study and their calculated chemical composition

Calculated chemical analysis			Final diet (22-35) days%	Starter diet (1-21) days%	Feed materials
2944.34	2990	Energy kilograms / kg	65.7	61.5	yellow corn
19.70	21.92	Raw protein%	29.3	33	Soybean meal
1.25	1.35	Lysine%	2.5	2.5	Premix
0.270	0.55	Methionine%	0.4	0.6	Die Calcium Phosphite
0.85	0.91	Methionine + cysteine%	0.4	0.4	Poisons
0.85	0.93	Calcium %	0.7	1	limestone
0.45	0.48	Phosphorus%	1	1	oil
			%100	%100	Total

According to the chemical analysis of the diet according to NRC (1994).

The studied traits (productive traits) include: -

1. live body weight:

The chicks were weighed at the age of one day and then the weight at the end of each week for during of the study period, starting from weeks (1-5) and according to the formula indicated by (Al-Fayyad and Naji, (1989).

Average bird weight (g) = the total body weight of birds in the replicate at the end of the week (g) / number of birds in the replicate at the end of the week.

2. Weight gain

To calculate the average of weight gain achieved at the end of each week, the following law has been followed:

Weekly weight gain (g / bird) = live body weight of refined at the end of the week (g / bird) - average live body weight of replicates at the beginning of the week (g / bird) and for all treatments. (Al-Fayadh and Naji, 1989).

Feed consumption rate

The feed consumption rate for each replicate was calculated at the end of the week and for weeks (5-1) according to the formula indicated by (Al-Fayadh and Naji, 1989) according to the following:

The amount of Feed consumption rate (g) = the weight of the feed provided to the chicks per replicate at the beginning of the week (g / bird) - the remaining feed weight of each replicate at the end of the week (g / bird).

Feed conversion rate

The feed conversion rate was calculated according to the following equation that he referred to (Al-Fayadh and Naji, 1989).

Weekly feed conversion rate = average of the amount of Feed consumption (g) during the week / weight gain rate (g) during the week.

Results and Discussion

Live body weight (g)

Table 2 shows the average of the live body weight, as well as the standard error for the breeding period, and for all study treatments of 7 experimental treatments. The results of the statistical analysis showed that there were no significant differences between the birds of all the treatments during the

first week of the experiment. The second week was significantly excelled ($P < 0.01$) The average of the bird's weights of the treatment T7, T6, T3, T2, which reached (448.67, 448.67, 450.33, 451.0) g / bird respectively on the birds of the rest of the treatments, which did not differ significantly between them. Also, the results of the statistical analysis for the third week indicated a significant excelled ($P < 0.01$) for the treatment birds T6 and T7, for which there was no significant difference between them in the average live body weight on the rest of the birds of the other experiments treatments, where the average live body weight of them (926.33, (928.33 g / bird) Respectively, Also, the treatment birds T3, which recorded an average body weight (913.33) g / bird significantly ($P < 0.01$), excelled the T5, T4, T1 treatments birds, which recorded the average live body weight (903.00, 902.67 and 903.33 g/bird respectively). The fourth week, the treatment birds T2, T6, T3 and T7 did not differ significantly between them, which significantly differed ($P < 0.01$) on the rest of the treatments in the average live body weight. The results of the statistical analysis for the fifth week of the study also showed significant excelled of the T7 and T6 treatment birds, which recorded The average of live body weight (2221.33, 2225.33) g / bird, respectively ($P < 0.01$) on the rest of the experiment treatments birds T5, T4, T3, T2, T1 which recorded the average of live body weights (2137.67, 2195.67, 2195.67, 2148.67, 2149.00) g / bird, respectively.

Weekly weight gain (g)

The results of Table 3 indicate that there were no significant differences between the birds of different treatments in the average of weight gain during the first week, but in the second week, they significantly excelled ($P < 0.01$) birds of additional treatments on control treatment birds (T1), while the treatment birds T6 And T7 significantly ($P < 0.01$) on the birds of the rest of the treatments during the third week, the birds of these two treatments recorded a the average of weight gain (476.00 and 477.33) g / bird, respectively, and in the fourth week it was observed that the treatment birds T2, T1 and T3 were significantly excelled ($P < 0.01$) on other treatments birds. In the fifth week, the treatment birds T7 and T6 were significantly excelled ($P < 0.01$) on the other birds. As for the total weight gain rate, it was significantly ($P < 0.01$) in the T7 and T6 treatment birds on the rest of the other treatments birds, and the total weight gain rates were (2097.67, 2155.67, 2155.67, 2108.67, 2109.00, 2181.33 and 2185.33) g / bird For coefficients from T6, T5, T4, T3, T2, T1 and T7, respectively.

Weekly feed consumption rate (g / bird): -

Table 4 shows that there were no significant differences between the different treatment birds in the amount of feed Consumption during the first week of the experiment. As for the rest of the weeks of the experiment, a significant difference (P <0.01) was observed for the T3, T2, T1 treatments birds compared to the T6, T5, T4, T7 treatments birds and this excelled continued in the total feed consumption rate as the average consumption (3406.00, 3401.00, 3404.00, 3333.00, 3328.00, 3314.33 and 3319.33) g / bird for the treatments birds T6, T5, T4, T3, T2, T1 and T7 respectively.

Feed conversion rate (feed consumption / g weight gain):

The results in Table 5 indicate that there were no significant differences between the birds of different

treatments during the first week in the average of feed conversion rate, while in the second week, the birds of adding treatments improved significantly (P <0.01) in this traits compared to the control treatment, and in the third and fourth week showed The treatments birds T6, T5, T4 and T7 significantly improved (P <0.01) in this characteristic compared to the coefficient birds (T3, T2, T1). At the fifth week, the birds of the different adding treatments achieved a significant improvement (P <0.01) in the feed conversion rate compared with the control treatment birds. The birds of different adding treatments continued to improve significantly (P <0.01) in the overall mean of this experiment where treatments birds (T6, T5, T4, T3, T2, T1 and T7) recorded average (1.616, 1.570, 1.573, 1.580, 1.573, 1.516 and 1.513) g / kg weight gain, respectively.

Table 2 : Effect of adding different levels of figs and olives powder and mixing them together to the diet in live body weight (g /bird) (mean ± standard error) (1-5) weeks.

Average ± standard error (g)					Treatments
The fifth week	fourth week	the third week	second week	The first week	
d 2.33± 2137.67	c 2.40± 1515.67	c 2.88± 903.00	b 0.57± 439.00	0.57± 160.00	T1
b 4.25± 2195.67	ab 2.88± 1524.00	bc 2.90± 911.67	a 0.88± 448.67	1.15± 160.00	T2
b 1.45± 2195.67	ab 2.64± 1525.00	b 1.20± 913.33	a 0.88± 448.67	0.88± 161.33	T3
c 2.03± 2148.67	c 4.40± 1510.33	c 3.84± 902.67	b 0.57± 439.00	0.57± 160.00	T4
c 2.31± 2149.00	c 2.72± 1510.67	c 2.96± 903.33	b 1.45± 439.67	0.57± 160.00	T5
a 2.60± 2221.33	a 3.84± 1533.67	a 3.48± 926.33	a 0.67± 450.33	0.88± 161.33	T6
a 3.48± 2225.33	a 5.29± 1535.00	a 3.75± 928.33	a 1.52± 451.00	0.88± 161.33	T7
**	**	**	**	NS	Level of significance

The different letters between one row indicate significant differences at the probability level. ** (P <0.01). NS = not significant.

Table 3 : Effect of adding different levels of figs and olive leaf powder and their mixture together to the diet in the weight gain rate (g / av) (mean ± standard error) (1-5) weeks.

Average ± standard error (g)						Treatments
The total weight gain	The fifth week	fourth week	the third week	second week	The first week	
d 2.33± 2097.67	d 1.00± 622.00	a 0.88± 612.67	b 2.30± 464.00	c 0.00± 279.00	0.57± 120.00	T1
b 4.25± 2155.67	b 1.76± 671.67	a 0.33± 612.33	b 2.08± 463.00	ab 0.33± 288.67	1.15± 120.00	T2
b 1.45± 2155.67	b 2.18± 670.67	a 1.67± 611.67	b 0.33± 464.67	b 0.33± 287.33	0.88± 121.33	T3
c 2.03± 2108.67	c 2.40± 638.33	b 1.20± 607.67	b 3.33± 463.67	c 0.00± 279.00	0.57± 120.00	T4
c 2.30± 2109.00	c 0.88± 638.33	b0.33 ± 607.33	b 1.67± 463.67	c 1.20± 279.67	0.57± 120.00	T5
a 2.60± 2181.33	a 1.33± 687.67	b 1.20± 607.33	a 2.88± 476.00	ab 0.57± 289.00	0.88± 121.33	T6
a 3.48± 2185.33	a 1.85± 690.33	b 1.85± 606.67	a 2.72± 477.33	a 0.88± 289.67	0.88± 121.33	T7
**	**	**	**	**	NS	Level of significance

The different letters between one row indicate significant differences at the probability level. ** (P <0.01). NS = not significant.

Table 4 : The effect of adding different levels of figs and olives powder and mixing them together to the diet on the Feed consumption rate (g / bird) (mean ± standard error) (1-5) weeks.

Average ± standard error (g)						Treatments
Total Feed consumption	The fifth week	fourth week	the third week	second week	The first week	
a 8.71± 3406.00	a 1.73± 1161.00	a 2.33± 1001.67	a 3.21± 681.00	a 1.15± 416.00	0.33± 146.33	T1
a 9.23± 3401.00	a 1.73± 1158.00	a 2.33± 996.33	a 2.88± 684.00	a 2.02± 416.33	0.33± 146.33	T2
a 11.26± 3404.00	a 0.88± 1159.33	a 3.46± 998.00	a 3.75± 683.67	a 2.90± 416.67	0.33± 146.33	T3
b 8.08± 3333.00	a 2.33± 1158.33	b 2.03± 956.33	b 2.33± 663.67	b 0.88± 407.67	1.20± 144.33	T4
b 4.72± 3328.00	a 2.31± 1159.00	b 2.51± 952.00	b 3.17± 662.33	b 2.03± 409.67	1.20± 145.33	T5
b 8.81± 3314.33	b 1.76± 1142.67	b 2.08± 953.00	b 2.08± 663.00	b 2.03± 409.33	0.88± 146.33	T6
b 9.24± 3319.33	b 2.33± 1143.67	b 2.96± 953.67	b 4.25± 665.67	b 1.52± 410.00	0.33± 146.33	T7
**	**	**	**	**	NS	Level of significance

The different letters between one row indicate significant differences at the probability level. ** (P <0.01). NS = not significant.

Table 5 : Effect of adding different levels of fig and olive leaf powder and their mixture together to the diet in the feed conversion rate (g feed / gm weight gain) (mean \pm standard error) (1-5) weeks.

Average \pm standard error (g)						Treatments
Total feed conversion	The fifth week	fourth week	the third week	second week	The first week	
a 0.003 \pm 1.616	a 0.00 \pm 1.860	a 0.005 \pm 1.630	a 0.005 \pm 1.460	a 0.003 \pm 1.486	0.003 \pm 1.213	T1
b 0.00 \pm 1.570	c 0.003 \pm 1.723	a 0.003 \pm 1.623	a 0.003 \pm 1.497	cd 0.008 \pm 1.433	0.006 \pm 1.216	T2
b 0.003 \pm 1.573	c 0.006 \pm 1.723	a 0.003 \pm 1.626	a 0.008 \pm 1.466	bc 0.012 \pm 1.446	0.006 \pm 1.203	T3
b 0.005 \pm 1.580	b 0.00 \pm 1.810	b 0.005 \pm 1.570	b 0.016 \pm 1.426	b 0.003 \pm 1.456	0.015 \pm 1.200	T4
b 0.003 \pm 1.573	b 0.00 \pm 1.810	b 0.006 \pm 1.563	b 0.008 \pm 1.426	b 0.00 \pm 1.460	0.003 \pm 1.213	T5
c 0.003 \pm 1.516	d 0.006 \pm 1.656	b 0.003 \pm 1.566	c 0.010 \pm 1.390	d 0.008 \pm 1.413	0.006 \pm 1.203	T6
c 0.003 \pm 1.513	d 0.005 \pm 1.650	b 0.003 \pm 1.566	c 0.008 \pm 1.393	d 0.006 \pm 1.416	0.006 \pm 1.203	T7
**	**	**	**	**	NS	Level of significance

The different letters between one row indicate significant differences at the probability level. ** (P <0.01). NS = not significant.

Discussion

The improvement in the production performance and the productive traits represented by the average of the live body weight, the average of weight gain, the average of feed consumption as well as the feed conversion rate when adding the powder of figs and olives and their mixture to the broiler diets compared to the control treatment (without addition) This improvement may be due Until the powder of figs and olives contains polyphenols, which are in the plant in the form of phenols and flavonoids, including the European compound, which works to increase the production of the enzyme nitric oxide synthetize and in turn leads to the production of nitric oxide, which has the ability to Expanding or increasing the diameter of the blood vessels, which leads to an increase in the amount of blood flowing to the organs of the body, including the muscles, thus providing the number of nutrients needed for the growth of these organs, as well as improving the efficiency of the immune system and strengthening the nerves (Visioli *et al.*, 1998; Khazan and Hdayati, 2014). The Oleuropein have the ability to increase the elasticity of the capillary blood vessels that line the digestive system, and this, in turn, improves the process of digestion, absorption and makes the greatest use of the food consumption, which is reflected in the weight gain and increased body weight (Talhoui *et al.*, 2014). The phenolic compounds found in figs and olives increase the numbers of red blood cells, which in turn transport the required amount of both oxygen and food to the cells of the body and thus increase the metabolic rate, and that the fig leaves contain fibres insoluble in water, which reduces the survival of fats in the gut. Water-soluble fibres that prevent absorption of LDL and vLDL and scarves with faeces, thereby keeping the digestive system healthy, The chemical analysis of fig and olive leaves showed that the fig contains carbohydrates, proteins and vitamins dissolved in water and antioxidants and that the olive leaves contain unsaturated fatty acids and vitamins dissolved in water, minerals and antioxidants and thus are nutritional supplements of good and desirable specifications that achieve weight gain, live body and feed conversion rate, as well as a significant improvement in live weight gain and weight gain, may be due to improved feeding conversion ratio (Oliveras-Lopez *et al.*, 2008; Al-Maamouri, 2017). Ćabarkapa *et al.* (2014) that the phenol compounds, including the Europeans, when adding to birds 'diets has improved the food conversion factor by reducing the amount of feed needed for production and one kg live weight. The reason may be that the phenols raise the level of the metabolic rate in the body that leads to a feeling of

satiety, as the Oleuropein stimulates the thyroid gland to increase the hormones that regulate metabolism in the body, which leads to an increase in the activity of the digestive system and benefit from food, The results of the current study were in agreement with the findings of Abbas *et al.* (2012), who found that adding olive leaf powder in the flesh of chickens reduced the feed consumed and improved the feed conversion factor. The results of this study were also consistent with the results of Bahsi *et al.* (2016) who observed an increase in body weight and an improvement in the food conversion factor when adding Oleuropein to the Japanese quail diet.

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