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EFFECT OF ADDING DIFFERENT LEVELS FROM BEE POLLEN IN DIET ON PRODUCTIVE PERFORMANCE OF BROILER CHICKENS

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Abstract

This study was conducted in the poultry field of the Department of Animal Production - Faculty of Agriculture - University of Baghdad (Abu Ghraib) for the period from 28/9/2017 to 9/11/2017 for a period of six weeks (42 days), was used in the experiment 300 chick of broiler (Ross 308) one day old. The aim of this study was to effect of adding supplementing different levels of bee pollen (0, 250, 500, 750 and 1000) gm/100kg on Productive Performance. The chicks were randomly distributed in to five treatments, T1 control (without any addition), (T2, T3, T4 and T5) adding bee pollen in the diet 250, 500, 750 and 1000 gm/100kg respectively. The results showed that bee pollen in the diet level 1000 gm/100 kg led to significant increase in the weight body rate, Cumulative feed consumption rate, dressing with edible bowels and without Edible bowels. While, no significant differences were found in total weight gain, total the food conversion and relative weight for heart, liver and Abdominal fat.

Key words: Bee pollen, broiler, body weight, Food conversion ratio

Introduction

Over the several last years, use of natural products as substitutes for replacement of antibiotics for improving the performance and immune system in animal's life is being encouraged, One of the regarded candidates in natural products is bee-pollen. The bee pollen, which is the Sexual male of the flowers that are collected by bee workers (Al-Ali, 2011). Is the main source of larval feeding in the early stages of growth (Crailsheim *et al.*, 1992; Serra and Escola, 1997; Carpes *et al.*, 2008).

They are Chemically composed of carbohydrates 13-55%, proteins 10-40%, fats 1-20, water 3-8%, minerals 0.5-3%, vitamins 0.02-0.1%, flavonoids 0.04-3% and nucleic acids, the most important being Ribonucleic acid, and also contains a large number of enzymes and yeasts, most important

amylase and phosphatase, which are used as adjuvants in chemical reactions (Schmidt and Buchmann, 1992; Carpes *et al.*, 2008; Taha, 2015). Wang *et al.* (2007) reported that giving bee pollen to broilers at 1.5% resulted in a significant increase in the body weight rate. Fazayeli-Rad *et al.* (2015) pointed out that giving bee pollen at the level of chicken larvae (10, 15, and 20) g / kg increased significantly when calculating the relative weight of the liver. while Faraj and Harris (2016) pointed out that the addition of various bee pollen 0.2, 0.4 , 0.6% led to improve body weight, FCR, relative weight gain for heart, and significant effect on PCV and Hb. Therefore, the study aims to know the effect of adding different levels of bee pollen to diet chicken broiler on the productive qualities.

Materials and methods:

The experiment was conducted in the poultry field of the Department of Animal Production - Faculty of Agriculture - University of Baghdad (Abu Ghraib) for the period from 28/9/2017 to 9/11/2017 for a period of six weeks (42 days), was used in the experiment 300 chick of broiler (Ross 308) one day old. The chicks were randomly distributed in five treatments. Each treatment included three replicates and each repeater containing 20 chick, The continuous lighting system was used 23 hours a day, In the field experiment, natural bee pollen collected by bee breeders was used by bee pollen traps. The chemical analysis of bee pollen was conducted in the Central Laboratory of the Faculty of Agriculture /

University of Baghdad (Table 1), and the birds were fed during the duration of the experiment on the starter diet and Finisher diet. Feeding materials were mixed according to the percentages mentioned in (Table 2). The fodder was provided free(*ad-libitum*) of charge during the experimental period. It was weighed and Provides to the birds. The remaining feed was weighed at the end of the week to determine the amount of feed consumed per week, and the birds were weighed weekly for the body weight and average weekly gain.

Table 1: Chemical composition of bee pollen used in the experiment.

Components of bee pollenDescent	Ratios
Humidity (%)	19.47
Dry matter (%)	80.53
Ash (%)	1.34
Fats (%)	3.12
Crude fiber (%)	6.19
Crude protein (%)	20.76
Glucose (%)	23.58
Fructose (%)	26.43
Palmitic acid (%)	25.982
Linolenic acid (%)	16.963
Stearic Acid (%)	71.279
Oleic acid (%)	32.530
Linoleic acid (%)	32.530
Sterol (%)	1.42
Flavonoids (mg / g)	375

Results and Discussion

The results of table (3), showed a significant increase ($P<0.05$) for the addition of bee pollen at age (7, 14, 21, 28 and 35). There were no significant differences at 42 days. In table (4) there was a significant increase ($P<0.05$) at age (7, 14 and 21) day in the weekly weight gain rate. While, no significant differences were found at ages 28, 35 and 42. day) and total weight gain rate (1-42) day. These results were consistent with Fazayeli-Rad *et al.* (2015), noting significant differences in mean body weight and rate of weight gain when feeding broilers (Ross 308) at different levels of bee pollen (10, 15, 20 g / kg), and consistent also with Farag and El-Rayes (2016) with a significant increase in mean body weight, when feeding to broilers at different percentages of bee pollen 0.2, 0.4, 0.6%. The significant improvement of the body weight of the birds is due to the high nutritional value of the pollen as a source of protein, amino acids, unsaturated fatty acids, carbohydrates and minerals, as well as bee pollen rich in enzymes that support the digestive system as it works to increase the area Surface Absorption (Wang *et al.*, 2007; Hašèík *et al.*, 2012).

Table 2: Composition and calculated analysis of the experimental diets

Ingredients	Starters	Finishers
Yellow corn	30.6	40.5
Wheat	28	22.7
Soybean Meal	31.7	24.9
Proteins(1)	5	5
Sunflower oil	2.5	4.7
limestone	1	1
Calcium diphosphate DCP	0.7	0.7
Salt	0.3	0.3
Mixes for vitamins and minerals(2)	0.2	0.2
Total	100	100
Calculated analysis(3)		
(%)Crude protein	23	20
Metabolizable energy(kcal/ kg)	3002.5	3200
(%)Lysine	1.29	1.1
(%)Methionine	0.49	0.458
(%)Calcium	0.89	0.87
(%)Available phosphorus	0.45	0.44

(1) Proteins type Brocon – 5 Special W. Each kg of it contains: 40% crude protein, 5% fat, 2.2% fiber,% 24.52 ash, 3.53% calcium, 5.35% phosphorus, 3.85% lysine, 3.7% Mithaaonin, 4.12% Mithaaonin + Sistine, 0.43% Terptovan, 2.57% arginine, 2.4% sodium, 2107 kg / kg energy represented, 200000 IU vitamin A, 600 mg vitamin E, 50 mg vitamin K3, 60 mg vitamin B1, 140 mg vitamin B2, 80 mg vitamin B6, 700 micrograms vitamin B12, 800 mg niacin, 20 mg folic acid, 1 mg iron, 200 mg copper, 1.6 mg manganese, 1.2 mg zinc, 20 mg iodine, 5 mg selenium.
(2) A mixture of vitamins and minerals Each kg contains: 500 IU Vitamin A, 600 IU D3, 10 mg E, 2 mg K3, 2 mg B1, 2 mg B2, 2 mg B6, 5 microgram B12, 10 mg C, 15 mg niacin, 500 ìg folic acid.
(3) Calculation of the chemical analysis of the mixture according to NRC (1994).

Table (5) showed a significant superiority ($P<0.05$) for treatments of addition of bee pollen in diet, when calculating the feed consumption rate at age (7, 14, 21 and 28) days, while there were no significant differences at age 35 and 42 days. Cumulative consumption of feed (42-1 days) indicates the superiority of T5. For the food conversion rate, there was no significant difference at ages 7, 14, 21, 35, and 42 days, and the overall rate in table (6) , while there were statistically significant differences ($P<0.05$) in 28 days. The improvement in feed consumption is due to the fact that the bee pollen contains the fat that increases the palatable taste and improves appetite. According to the close relationship between feed consumption, weight gain and food conversion rate, improved body weight and improved feed intake improve the food conversion rate. These results are not consistent with Attia *et al.* (2014), which observed a significant reduction in feed consumption in bee pollen

Table 3: Effect of adding different levels of bee pollen in body weight of broilers chicks (mean±standard error)

Treatment	7 day	14 day	21 day	day28	35 day	day42
T1	124.58 ± 4.79^{B}	390.00 ± 21.05^{B}	788.30 ± 23.82^{C}	1176.42 ± 27.29^{B}	1709.42 ± 49.38^{B}	2125.33 ± 13.86
T2	139.92 ± 4.59^{A}	425.50 ± 8.74^{AB}	837.00 ± 18.99^{BC}	1268.25 ± 14.91^{A}	1799.38 ± 17.32^{AB}	2240.23 ± 16.01
T3	135.75 ± 4.99^{AB}	428.42 ± 8.46^{A}	851.83 ± 13.59^{AB}	1298.58 ± 24.23^{A}	1789.33 ± 30.93^{AB}	2233.00 ± 66.55
T4	139.75 ± 1.09^{A}	437.50 ± 7.47^{A}	873.92 ± 14.59^{AB}	1286.83 ± 12.32^{A}	1801.25 ± 20.86^{AB}	2267.75 ± 84.81
T5	144.25 ± 0.14^{A}	449.33 ± 2.87^{A}	899.83 ± 6.57^{A}	1275.83 ± 25.51^{A}	1819.00 ± 11.79^{A}	2255.50 ± 26.84
Significance	**	**	**	**	**	N.S

Means with different letters significantly different at (P<0.05).
T1: treatment of control, T2, T3, T4 and T5: the addition of bee pollen by 250, 500, 750 and 1000 g / 100 kg.
**: There are significant differences between transactions. N.S: No significant differences between transactions.

Table 4: Effect of adding different levels of bee pollen inweekly and total weight gain rate of broilers chicks (mean ± standard error)

Treatment	7 day	14 day	21 day	day28	35 day	day42	1-42 day
T1	86.00±4.79^{B}	265.42±16.55^{B}	398.30±14.37^{B}	388.12±4.01	533.00±22.12	415.92±38.33	2086.75±13.86
T2	101.34±4.59^{A}	285.58±4.76^{AB}	411.50±10.50^{B}	431.25±15.75	531.13±10.61	440.85±15.19	2201.65±16.01
T3	97.17±4.99^{AB}	292.67±3.72^{AB}	423.42±7.17^{AB}	446.75±31.03	490.75±13.59	443.67±37.32	2194.42±66.55
T4	101.17±1.09^{A}	297.75±6.43^{A}	436.42±16.16^{AB}	412.92±26.75	514.42±23.02	466.50±63.97	2229.17±84.81
T5	105.67±0.14^{A}	305.08±2.98^{A}	450.50±4.02^{A}	376.00±18.99	543.17±29.46	436.50±17.26	2216.92±26.84
Significance	**	**	**	N.S	N.S	N.S	N.S

Means with different letters significantly different at (P<0.05).
T1: treatment of control, T2, T3, T4 and T5: the addition of bee pollen by 250, 500, 750 and 1000 g / 100 kg.
**: There are significant differences between transactions. N.S: No significant differences between transactions.

Table 5: Effect of adding different levels of bee pollen in weekly and Cumulativethe feed consumption rate of broilers chicks (mean ± standard error)

Treatment	7 day	14 day	21 day	day28	35 day	day42	1-42 day
T1	110.58±2.48^{AB}	274.75±5.55^{C}	527.83±4.97^{B}	622.42±14.77^{B}	885.00±22.65	916.50±11.86	3337.08±37.81^{B}
T2	117.25±3.12^{AB}	319.67±9.22^{B}	535.25±9.54^{AB}	667.42±13.01^{AB}	878.17±14.54	905.62±15.19	3423.37±36.07^{AB}
T3	108.42±6.79^{B}	315.42±8.47^{B}	548.75±6.72^{AB}	687.17±19.21^{A}	884.58±1.96	899.00±35.38	3443.33±55.29^{AB}
T4	123.75±4.99^{A}	328.42±6.65^{AB}	551.00±7.15^{AB}	672.08±21.36^{AB}	902.08±10.53	880.00±24.91	3457.33±42.88^{AB}
T5	122.83±1.69^{A}	347.25±10.80^{A}	563.67±12.59^{A}	651.00±21.67^{AB}	919.58±16.04	911.58±25.37	3515.92±45.25^{A}
Significance	**	**	**	**	N.S	N.S	**

Means with different letters significantly different at (P<0.05).
T1: treatment of control, T2, T3, T4 and T5: the addition of bee pollen by 250, 500, 750 and 1000 g / 100 kg.
**: There are significant differences between transactions. N.S: No significant differences between transactions.

Table 6: Effect of adding different levels of bee pollen inweekly and total thefood conversion rate of broilers chicks (mean ± standard error)

Treatment	7 day	14 day	21 day	day28	35 day	day42	1-42 day
T1	1.30±0.10	1.04±0.06	1.33±0.05	1.60±0.02^{AB}	1.66±0.04	2.24±0.20	1.60±0.01
T2	1.16±0.04	1.12±0.02	1.30±0.01	1.55±0.07^{B}	1.66±0.06	2.06±0.04	1.55±0.01
T3	1.12±0.08	1.08±0.02	1.30±0.01	1.55±0.07^{B}	1.81±0.05	2.04±0.09	1.57±0.02
T4	1.22±0.04	1.10±0.01	1.26±0.03	1.63±0.05^{AB}	1.76±0.06	1.95±0.24	1.55±0.05
T5	1.16±0.03	1.14±0.01	1.25±0.02	1.73±0.04^{A}	1.70±0.13	2.09±0.03	1.59±0.00
Significance	N.S	N.S	N.S	**	N.S	N.S	N.S

Means with different letters significantly different at (P<0.05).
T1: treatment of control, T2, T3, T4 and T5: the addition of bee pollen by 250, 500, 750 and 1000 g / 100 kg.
**: There are significant differences between transactions. N.S: No significant differences between transactions.

processing by 300 mg / kg, and did not consistent also with Farag and Harris (2016). There were significant differences in the rate of consumption of broiler feed.

Table (7), showed a significant increase (P<0.05) for treatments the addition of bee pollen for Dressing with edible bowels and without edible bowels. While, no significant differences were found in relative weight for heart, liver and Abdominal fat. When calculating the relative weight of the gizzard showed a significant increase (P<0.05) for T3 (adding bee pollen of level 500

Table 7: Effect of adding different levels of bee pollen inrelative weight for Dressing, heart, Liver,gizzard and abdominal fat of broilers chicks (mean ± standard error)

Treatment	Dressing with edible bowels	Dressing without edible bowels	Heart	Liver	Gizzard	Abdominal fat
T1	74.49±1.22^{B}	70.11±1.21^{B}	0.47±0.03	2.61±0.10	1.30±0.08^{B}	0.82±0.12
T2	78.05±0.51^{A}	73.67±0.60^{A}	0.57±0.03	2.52±0.16	1.29±0.04^{B}	1.18±0.24
T3	78.65±0.40^{A}	73.79±0.38^{A}	0.53±0.05	2.77±0.21	1.56±0.09^{A}	0.95±0.18
T4	78.32±0.76^{A}	73.79±0.89^{A}	0.51±0.03	2.58±0.13	1.44±0.06^{AB}	1.02±0.09
T5	78.74±0.46^{A}	74.23±0.57^{A}	0.57±0.02	2.50±0.08	1.44±0.11^{AB}	1.02±0.11
Significance	**	**	N.S	N.S	**	N.S

Means with different letters significantly different at (P<0.05).
T1: treatment of control, T2, T3, T4 and T5: the addition of bee pollen by 250, 500, 750 and 1000 g / 100 kg.
**: There are significant differences between transactions. N.S: No significant differences between transactions.

gm/100 kg).

Conclusion

It was concluded that bee pollen proved to be an interesting source. It is used in broiler feed as a dietary supplement and able to improve the productive performance of the body weight, feed consumption rate and dressing. The best concentration of bee pollen in broiler chickens is 1000g / 100kg during starters and Finishers periods.

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