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## EFFECT OF DIFFERENT CONCENTRATIONS OF BEE GLUE EXTRACT AS REPLACEMENT OF ANTIBIOTIC ON THE CHEMICAL COMPOSITION OF THE OF BROILER CHICKEN

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### ABSTRACT

The current study was designed with the aim of affecting of different concentrations of Bee Glue extract as replacement of antibiotic as (growth promoters) on some of blood parameters and carcass traits and meat quality, breast and thigh weight, and lipid oxidation stability of broiler chicken. This study was conducted at poultry farm, Department of Animal Production, College of Agriculture, Kirkuk University for 35 Days during the period from 8<sup>th</sup> of May to the 13<sup>th</sup> of June 2019. A total number of 200 unsexed one-day-old ROSS308 chicks were distributed randomly into five experimental treatments. Each of 40 chicks in 4 replicates (10chicks/ replicate). The first experimental group T1 was fed on the control diet. T2 was fed on control diet supplemented with (5mg/kg) Neomycin. T3, T4, T5 were fed on control diet supplemented with 250, 500, 750 mg/kg Bee Glue (BG) respectively. The experiment was terminated when chicks were 35 day of age. The results were shown that Feed additives with Bee Glue showed significantly ( $p \leq 0.05$ ) on the chemical composition of the meat, were a noticeable improvement in the moisture and ash content in the fifth group, the protein content improved in the groups fed on bee glue, and the percentage of fats and carbohydrates in the groups decreased compared to the control.

**Keywords:** Bee glue, antibiotic, broiler

### Introduction

Animal husbandry is prepared for food, whether meat, milk, or for other products such as wool and leather (Al-Aswad, 2000). The importance of poultry is at the forefront of projects, especially meat chicken projects. This importance lies in the advantages of poultry meat, which is lacking in red meat, in addition to the low cost and effort in obtaining its products compared to the projects of ruminants, and the poultry meat is easy digestion and contains calories, carbohydrates, vitamins and animal protein in good proportions (Naji *et al.*, 1985). The prices of chicken meat are low compared to the prices of other meat (Massoudi, 2007). Chicken breeding projects are characterized by a short duration of the breeding cycle and the speed of capital recovery (Zubeidi, 1986). However, the use of additives has a significant negative impact on the bird's body because their use in this way leads to health problems and exposes birds to the infection of microbes that cause diseases, weaken their immune system and activate many fungi that harm the health of the bird (Apajalahit *et al.*, 2004). Therefore, the addition of natural substances has had a positive impact on the performance of the bird. Bee Glue is a gluey resin collected by bees from rose, buds and plant secretions produced by bees and has the ability to fight antimicrobials and consists of more than 300 compounds of phenolic dehydres, amino acids, steroids and inorganic compounds (Mahmad, 2006). Bee Glue is a product of resins sorority collected by honeybees from flowers (Vatansavar *et al.*, 2010). Bee Glue is used to protect the bee colony from external factors and prevents the cracking of the outer and internal walls of the cells, used as an anti-insect material and anti-microbial infection to protect

honey stores inside the hive as well as works to block or close open areas to protect them from germs and rebuilding the hive and softening the internal surface of the hive (Roth, 2003). Protects hives from air currents and external moisture with negative impact on cell construction and It stabilizes moisture steadily in hives (Visscher, 1980). The main substances concentrated in the Bee Glue are flavonoids and phenols Against the production of free radicals and acts as a protective material to protect cellular membranes from oxidative reactions (Lotfy, 2006). Bee Glue is anti-celling that hinders its activity (Banskota *et al.*, 2000). These biological properties are attributed to its chemical composition, which consists of polyphenole, flavonoids, phenolic acids, aromatic aldehydes, esters, amino acids, minerals and vitamins (Schnitzler, 2010). Bee Glue ingredients generally contain 50% Resin, 30% wax, 10% aromatic oils, 5% pollen 5% impurities (Thomson, 1990). Bee Glue contains high content of caffies, quercetin and Chrysin and that the water Bee Glue extract contains 11% caffeine acid, asstrata and phenolic acids by 72.7% (Abd El-Hady, 1994). Bee Glue contains enzymes such as glucose oxidase, catalase and peroxidase. Bee Glue contains a range of biologically active compounds like phenol compounds, flavonoids (primuletin, chrysin, tecochrysin, akacetine, galangine, morin, robinetin) terpenes, lipid-wax substances, bioelements, vitamins (A, D, F, K, E, B1, B2, B5, B6, B12, C and biotin) minerals (Mg, Ca, I, K, Na, Cu, Zn, Mn, P, Fe, Si and Co). This study aimed to evaluate the effects of different concentrations of Bee Glue extract as natural alternative to antibiotics on some blood parameters, carcass traits and meat quality of broiler chicken.

## Materials and Methods

This study was conducted at poultry farm belongs to Department of Animal and Poultry Production, Faculty of Agriculture/Kirkuk University, Iraq. ROSS 308 chicks provided by Reva Hatcher in Kirkuk city and was sponsored under controlled conditions inside the Poultry during the five-week trial period. Crude Bee Glue was supplied from an Iraqi honeybee keeper. The price of commercial Bee Glue in Iraqi market about 100\$/ kg, during the experiment time.

The study included (200) unsexed one-day old strain " ROSS 308" chicks of nearly similar live body weight, weighed and randomly distributed into five treatments with four replicates (10 chicks each). Distributed in 20 cages isolated from each other by metal wire. brushed the floor of the cages sawdust with a height of 5\_7 cm and was used thermal heat incubators and ventilation conditions under the conditions of cold conditions and conditions provided Controlled, the lights were continuous in the first week of life and then started reducing one hour in a week. The chicks were fed basal diet (control) or basal diet containing 5 mg/kg neomycin for treatments T2 or basal diet containing 250, 500 or 750 mg Bee Glue/kg for treatments T3, T4 and T5, respectively. The water extract for the bee glue was prepared based on the method described by the researcher (Suzuki *et*

*al.*, 1990) with some modifications by (Nagai *et al.*, 2003) as follows: The Bee Glue was extracted for each group, where 132.5 g of glue was mixed with 300 ml of ethanol alcohol and left for ten days in a dark place at room temperature and wrapped in black bags, After the tenth day, it is filtered and stored in a dark, dry bottle, and filtered alcohol through filter sheet No. 1 and restocked and adjusted to the original size with alcohol.

After reaching the end of the fifth week of the experiment, eight birds were slaughtered from each treatment, and a piece of chicken thigh was taken and the chemical composition study was conducted in the laboratory.

### Statistical analysis:-Statistical analysis

The statistical data of the study was prepared by analysis using the statistical analytical program (SAS, 2001) in the method of complete random design CRD, (Duncan, 1955) multi-border to estimate the differences and moral differences between the trial groups according to the mathematical formula: -

$$Y_{ij} = \mu + t_i + e_{ij}$$

Where it represents; Where :  $Y_{ij}$  = the observation ;  $\mu$ = overall mean ;  $t_i$ = effect of treatments ;  $e_{ij}$  = random error component assumed to be normally distributed.

**Table 1 :** Composition and chemical analysis of the basal experimental dities

Ingredients	Sstarter	Grower	Finisher
Yellow corn	322.500	470.000	515.000
Wheat	250.0	150.0	150.0
Soybean meal (44%)	377.000	340.000	282.000
Sunflower oil	12.000	6.000	20.500
Limestone	3.500	1000	0.500
Birmix M 102	25.00	25.00	25.00

### Calculated analyses

Concentrated	0 – 14 Day	15 – 28 Day	29 – 35 Day
Protein	23.03	21.34	19.01
Enerji	2,957.50	3,028.80	3,092.50
Ash	4.39	3.08	3.39
Fibers	3.48	3.46	3.28
Oil	3.94	3.28	4.79
Methionine	0.54	0.52	0.49
Met + Cystine	0.87	0.83	0.78
Lysine	1.54	1.41	1.24
Thronine	0.89	0.84	0.75
Ca	1.06	0.91	0.85
Phosphor.Av	0.50	0.45	0.42
Phosphor.Tot	0.59	0.53	0.49
Na	0.16	0.16	0.16
Cl	0.21	0.21	0.21
K	0.95	0.88	0.78
Lineolik Acid	1.58	1.50	2.29
Ca <sub>p</sub>	2.10	2.01	2.02
Na+k-cl	200.477	235.518	209.655
Me/Cp	128.437	141.941	162.675

### The chemical composition of the meat

It is noted in Table (2) the chemical analysis of the thigh meat piece of broiler meat. It is noticed from the table that the freezing of chicken thigh meat led to an increase in the fifth group in the humidity characteristic, which reached 74.3725, followed by the fourth group, which reached

74.3700, and the humidity decreased in the second group, which amounted to 74.3400 Compared to the control group, 74.3700. As for the ash percentage in the table, it is noticed that it increased slightly with very few differences, as the ash percentage increased in the fifth group, which reached 1.2400, followed by the fourth group, which amounted to 1.3275, followed by the group and the lowest in the second

group was 1.2225 compared to the control group 1.2325, and it did not show an advantage. In the third group, 47.3575. As for the protein, the highest percentage in the fourth group exceeded the other groups, which amounted to 17.2900, followed by the fifth group, which amounted to 17.2775 compared to the control group 17.0175. As for the lipid profile, it increased in the control group with a rate of 6.5750., Followed by the second group, which amounted to

6.525. There were no differences between the third group, the fourth group and the fifth group, which amounted to 6.4875, 6.3025, and 6.3150 respectively. Regarding carbohydrates, they decreased in the fifth group, which amounted to 0.7950 compared to the control group, and no differences were observed between the second, third and fourth groups, which amounted to 0.8125, 0.8100, and 0.8000, respectively.

**Table 2 :** Effect of Bee Glue Extract on Moisture, Ash, Protein, Fat and Carbohydrate Concentration n Meat Analysis of Broilers (Ross 308) at 35 days of age (mean  $\pm$  standard error).

Treatments	Humidity %	Ash%	Protein%	Fat%	Carbohydrates
T1 Control	0.070 $\pm$ 74.3700	0.047 $\pm$ 1.2325	0.022 $\pm$ 17.017 B	0.026 $\pm$ 6.5750 A	0.010 $\pm$ 0.8050
T2	0.091 $\pm$ 74.3400 B	0.025 1.2225 $\pm$ B	0.009 $\pm$ 17.1000	0.002 $\pm$ 6.5250	0.004 $\pm$ 0.8125 A
T3	$\pm$ 0.04774.3575	0.064 $\pm$ 1.2350	0.008 $\pm$ 17.1150	0.020 $\pm$ 6.4875	0.000 $\pm$ 0.8100
T4	0.070 $\pm$ 74.3700	0.025 $\pm$ 1.2375	0.021 $\pm$ 17.2900 A	0.022 $\pm$ 6.3025 B	0.007 $\pm$ 0.8000
T5	0.025 $\pm$ 74.3725 A	0.040 $\pm$ 1.2400 A	0.008 $\pm$ 17.2775	0.006 $\pm$ 6.3150	19.553 $\pm$ 0.7950 B

Means in the same row having different letters are significantly different ( $P \leq 0.05$ ).  
T2 5mg/kg neomycin, T3=250, 4=500 and T5=750 mg Bee Glue

It is clear from the table that the addition of bee glue in different proportions led to the preservation of the amount of moisture in the meat, as the bee glue works to kill harmful bacteria and raise the number of beneficial bacteria such as lactic acid bacteria (Gunal *et al.*, 2006). And increasing this bacteria reduces the pH, which prevents Fluid loss, so the groups treated with bee propolis maintained a high level of moisture. As for fat, the decrease was evident in the experimental groups that were treated with bee glue since fat has an inverse relationship with humidity, so the higher the humidity, the lower the fat content in the meat (Aswad, 2000). The protein content was high in the groups that were fed bee glue and this is in accordance with the study of Haščík *et al.* (2016) as the crude protein content increased in both breast and thigh muscles 24.99 and 23.19%, respectively compared to control 24.42 and 21.65%, respectively. The results coincide with the findings of Sksivan *et al.* (2012). Which reported the highest protein content, as low pH raises the total protein content, and bee propolis has the ability to inhibit proteolytic enzymes because it belongs to a group of terpenoids such as (artepillinc, cape) and caffeic acid (galanging chrysin) (Huang, 2014). It consists of polyphenol compounds, especially flavonoids and phenolic acids, and contains fatty acids (Polyakov *et al.*, 1988). Bee glue has a high concentration of aromatic acids such as nitrate benzene, cinnamic acid such as caffeine, cinnamil, cinnamina and cinellicin, these organic compounds are responsible for antimicrobials, fungi, and infections (Aungulu *et al.*, 2007). As for ash, it increased with an increase in the percentage of mucilage in the groups, as it is inorganic products of about 1% consisting of mineral elements in the form of oxides, sulfates and chlorides (Perez and Andujar, 1980). Na, Mg, Fe, K, Zn, Cu, Mn, I) (Moreia, 1986). Carbohydrates were decreased in the table because they are inversely proportional to humidity (Fayyad and Naji, 1989). The second group was the highest in support of what was reported by El\_Ansary *et al.* (1987). In our current study, 5 mg/kg of neomycin did not affect the moisture, ash and lipid content in a good way, but

there was an improvement in the protein ratio compared to the control group.

### Conclusion and Discussion

The results showed that bee glue added at a rate of 750 mg/kg of feed improved the humidity rate when storing as well as the protein value was not lost, and it improved in the groups to which bee gum was added compared with the control group. And the second group treated with the antibiotic neomycin did not. It shows no superiority compared to bee glue groups.

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