ADDING DIFFERENT LEVELS OF GREEN TEA AS ANTIOXIDANT AND EFFECT OF IN CARCASS QUALITY AND INTERIOR GUT WEIGHT IN BROILER CHICKEN

Osama Ahmed Latif and Ammar Taleb Dhiab

Department of Animal Production, College of Agriculture, University of Diyala, Iraq

Corresponding authors: dr.ammaraltememey@gmail.com, osama.aldulimi81@gmail.com

Abstract

This study was conducted in Department of Animal Production in the college of Agriculture, University of Diyala during the period 25/10/2017 to 7/12/2017, the study aimed to investigate the effect of adding green tea as an antioxidant to the diet on the carcass characteristics, parts in broiler Rose 308. The experimental units consist of 225 one day chicks which distributed randomly on four groups(45 chick for each treatment) and three replicates and an initial weight of 38 grams chick , where the number of birds in each replicate 15 chick and the treatments as following: standard diet without additions as a control (T1); standard diet with 1 kg/ton green tea Powder (T2); Add 2 kg/ton green tea powder (T3); Add 3 kg/ ton green tea powder (T4); Add 4kg/ ton green tea powder (T5).

Keywords : green tea, broiler Ross 308, antioxidant

Introduction

Modern breeds of broiler are characterized by rapid growth and high body weights during the marketing and consuming large quantities of feed to meet the growth requirements (Jackie, 2003). The genetic improvement result an increased in metabolic processes, produce large amounts of free radicals that damage the vital molecules in body cells such as fats, proteins, Carbohydrates and nucleic acids. There is an imbalance in the natural balance system in the body between the production of free radicals and oxidation resistance through the natural antioxidants in the body and then occurred an oxidative stress that works to damage the genetic material (DNA), proteins, vitamins and carbohydrates, as well as unsaturated fatty acids in cell membranes (Altan *et al.*, 2003) and there are several types of antioxidants in the body, which produce naturally but to of vital processes such as Clotathaion and Clotathion Peroxidase and the Catalyze, in case of insufficiency of these antioxidants, it is necessary to add antioxidants that works to stop the effect of free radicals (Durand *et al.*, 2013). Herbal plants have a great contribution in the agricultural and industrial production in recent time, because it contain effective natural chemical compounds which are very useful in their effect on the productive and physiological performance in the body (Dalla and Sheboun, 2013). Among these medical plants is green tea. Green tea is important but to its contain of many active compounds in the form of flavonoids, alkaloids, glycosides, soaps and volatile compounds (Aljanabi and Altikrity, 2015). Green tea contains carbohydrates, proteins, amino acids, chlorophyll, minerals and minor elements (Lien *et al.*, 2003), Green tea is a highly effective antioxidant because it contains high levels of polyphenols known as cation (Apak *et al.*, 2006) which has multiple properties with positive effects as it inhibits free radicals (Lien *et al.*, 2008) and contributes to lower cholesterol level. (He *et al.*, 2009) and used as antimicrobial (Friedman, 2007) antiviral (Isaaca *et al.*, 2008).

Materials and Methods

This study was conducted in the Poultry house of the Animal Production Department, college of Agriculture, Diyala University, during the period from 25/10/2017 to 7/12/2017 to investigate the effect of adding green tea powder antioxidant to the chicken diet on the traits of carcass, carcass parts and the dress percentage of broiler ROSS 308, the experimental flock consist of 225 chicks with an initial weight of 38 g / chick. The chicks were reared in a pens 2 x 1.5 m, the chicks were randomly distributed to the treatments by 45 chicks per treatment and using three replicates per treatment (15 chicks / replicate), the treatments were as following: standard diet without additions as a control (T1); standard diet with 1 kg/ton green tea Powder (T2); Add 2 kg/ton green tea powder (T3); Add 3 kg/ ton green tea powder (T4); Add 4 kg/ ton green tea powder (T5).

1. Hatchery Management

The checks reared on litter with 5 cm thickness and covered a layer of paper in order to prevent contamination of fodder and drinker in the first week of breeding when using feed dishes and inverted drinker.

The chicks were ad libitum on a starting diet until 21 days, then a growth diet up to 42 days of tearing period. Table 1 shows the component of diets which used during the experiment.

2. Source of green tea (*Camellia sinensis*)

Green tea get from herbal shop in the Iraqi markets.

How the alcoholic extract of green tea works:

100 g of green tea powder put in 1000 ml of 75% ethanol in a 35 °C incubator for three days, Then the filter was mixed with gauze, where the plant tissue was eliminated, then by the nomination papers, After that put the mixture in dishes and then placed in the incubator at 45 ° C for 24 hours to get dry powder of the extract, put in a sealed tube, and kept in the refrigerator until use.

3. Studied qualities

(i) The net ratio and carcass pieces: According to fayad and naji(1989).

(ii) The relative weight of the carcass pieces: According to fayad and naji(1989).

(iii) Phenotypic changes of (Morphology) the internal organs: According to Fayad and Naji (1989).

Table 1 : The component of diets that used in the experiment.

BROMUS material %	Onset feed (1-21 days)	growth feed (42-42 days)
yellow corn	45	63.5
soybean meal 44% protein	30	31
protein concentrate	5	2.5
Sunflower oil	3	3
Limestone	1	0
Di calcium phosphate	0.5	0
Total	100	100
calculated chemical analysis *		
Represented energy (price of kg / kg)	3028	3153.65
Raw protein (%)	20.77	20.28
Lysine (%)	1.16	1.33
Methionine (%)	0.47	0.53
Methionine + cysteine (%)	0.80	0.83
Calcium (%)	0.86	0.70
Phosphorus (%)	0.49	0.77

*By chemical composition according to the analysis of feeds material mentioned in NRC (1994) Continuous lighting system used 23 hours a day in the first week, and gas incubators used to provide the appropriate temperature for the chicks.

Statistical analysis

The data statistically analyzed according to completely Randomized Design, and the significant differences among treatment meat detected by Duncan multiple ranges test at p ≤ 0.05

Result and Discussion

Table 2 represents dress percentage without visceral and with visceral, the result recorded no significant differences between the additive and control treatments in the dress without viscera or with viscera during the experimental periods in adding green tea as an antioxidant. The result agreed with (El Deek and Al Harith, 2004 ; Sarker *et al.*, 2010 ; Shahid *et al.*, 2013), where all those studies did not recorded significant differences among the treatments of addition of green tea and control treatment in the dress without and with viscera.

Table 2 : The effect of adding different levels of green tea as an antioxidant in the dress percentage with and without viscera (Means± standard error)

The treatment	Dress percentage without visceral (%)	Dress percentage with visceral (%)
T1 control	1.90±76.29	2.20±81.30
T2	1.69±75.68	1.60±81.45
T3	0.63±77.55	0.87±82.05
T4	0.23±78.38	0.36±82.78
T5	0.02±78.38	0.15±82.71
signi$ficance	N.S	N.S

N.S: refers to non-significant effect of treatments in the trait in ANOVA.
T1 (control): - was given a regular feed without any additions. T2: - Add 1 kg / ton of feed green tea powder. T3: - Add 2 kg / ton of feed green tea powder. T4: - Add 3 kg / ton of feed green tea powder. T5: - Add 4 kg / ton of feed green tea powder.

Table 3 represents the percentage of carcass parts in different treatment there were no significant differences between additive treatments compared with the control treatment breast weight, thigh weight, while there were significant different among treatments in back weight ,hence T5 apparel significant superiority compared with other treatments. There were no significant differences among treatments in using weight, while there were superiority of T1 compared with other treatments in neck weight.

The results agreed with El Deek and Al Harith (2004) hence there were no significant differences between green tea addition and control treatments in carcass weights, while the results differed (Sarker *et al.*, 2010), (Shahid *et al.*, 2013) and (Jozel, Cril, 2017) where all observed that the addition of green tea concentrations (0.5, 1 and 1.5%) kg / feed resulted to significant differences in the weights pieces of breast, thigh, back and wings compared to the control treatment.

Table 3 : Effect of adding different levels of green tea as antioxidant on gravity weighted gravity weights (means± standard error).

The treatment	Breast weight (%)	Thigh weight (%)	Back weight (%)	Wings weight (%)	Neck weight (%)
T1 control	2.47±35.80	0.26±24.42	1.12±20.73 ab	0.56±9.03	a 0.19±6.04
T2	1.19±35.19	1.95±24.05	0.74±21.24 ab	0.59±8.97	ab 0.05±5.74
T3	1.13±34.28	0.48±25.36	0.52±22.05 ab	0.37±7.74	b 0.18±5.08
T4	1.29±36.01	0.65±25.70	0.33±20.08 b	0.24±8.78	ab0.38 ±5.30
T5	1.41±35.80	1.59±25.63	1.33±23.71 b	0.41±8.88	ab 0.27±5.38
Significance	N.S	N.S	*	N.S	*

• means have different letters refer to significant differences at P ≤0.05.
• refers to significant effects in ANOVA table.
N.S refers to non-significant effects in ANOVA table.
T1 (control): - was given a regular feed without any additions. T2: - Add 1 kg / ton of feed green tea powder. T3: - Add 2 kg / ton of feed green tea powder. T4: - Add 3 kg / ton of feed green tea powder. T5: - Add 4 kg / ton of feed green tea powder.

There were no significant difference among treatment in the percentage weight of heart, liver and gizzard, while there were significant difference among treatment in spleen.
 These results were agreed with El Deek and Al Harithi (2004) ; Jozel and Cril (2017). No significant differences were found between the internal weights of carcass in the treatments which occurred by adding the green tea as an antioxidant and control treatment. These results differed with (Sarker *et al.*, 2010) and (Shahid *et al.*, 2013) where they observed when using green tea as an antioxidant in concentrations (0.5, 1 and 1.5%) kg / feed significantly overpass in favor of addition treatments in weight of liver, heart and snipers. And spleen compared to control treatment.

Table 4 : Effect of adding different levels of green tea as an antioxidant in the ratio of internal weights of broiler carcass (means ± standard error)

The Treatment	Heart Weight (%)	Liver Weight (%)	Gizzard Weight (%)	Spleen Weight (%)
T1	0.04±0.55	0.12±2.57	0.23±1.86	0.002±0.126 b
T2	0.002±0.52	0.13±2.42	0.39±1.77	0.02 ±0.136 a
T3	0.03±0.50	0.32±2.45	0.10±1.52	0.014 ±0.133 a
T4	0.02±0.53	0.46±1.92	0.07±1.47	0.003 ±0.176 a
T5	0.07±0.54	0.23±2.36	0.14±1.40	0.008±0.156 a
significance	N.S	N.S	N.S	*

• Different characters indicate within a single row on significant differences between the averages at a significant level (P ≤0.05)
• N.S No significant differences within the signal row.

Conclusion

The results showed that no significant differences between treatments of adding green tea and control in dressing percentage without viscera and with the viscera There were no significant differences between the addition treatments and control in the weight of the breast, thigh and wings, while there was a superiority of the addition treatments compared with control in both of back weight and percentage of neck weight. There were no significant differences between the addition treatments and control in the weight percentage of the heart, liver and gizzard.

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