



## Effect added black tea residues powder in different proportion to the Rose chick diet on level of physiological, hematological, productive traits and antioxidant factor

Suhad H. Irhhaym<sup>1</sup> and Hind F. Alshemmary<sup>2</sup>

<sup>1</sup>Animal Department, Technical college of AL-Mussaib, Babylon, Iraq

<sup>2</sup>Animal production Department, Agriculture College, University of Kerbala Karbala, Iraq

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**Abstract:**

The aim of this study was to know of the effect of adding black tea powder residues to poultry diets. In this experiment ,120 birds were divided into three groups, each group was 4 replicates. The groups were control group (black tea residues powder was not added to the feed). first treatment group (added black tea residues powder at a ratio of 60 mg/ kg of feed. Second treatment group (added black tea residues powder at a ratio of 160 mg/ kg of feed). Blood samples were collected at the end of the experiment to measure packed cell volume (P.C.V), hemoglobin (H b) , total white blood cell count (W.B.C), total red blood cell account (R.B.C), also to calculated cholesterol low density lipoprotein (LDL), high density lipoprotein(HDL) , glucose and the levels of productive characteristic weekly such as average of weight rate ,adequate increase ,the average of feed consumption and the rate of food conversation .Then we measured the levels of antioxidant enzymes such as SOD (super oxide dismutase ), MDA (malondialdehyde), CAT (Catalas), GST (glutathione transferase (SSH) (Glutathion peroxidase )The result showed that there is significant  $P \leq 0.05$  effect of added black tea residues powder on the level of antioxidant enzymes ,and there is effect in lowering of cholesterol , glucose. there is no significant effect of added black tea residues powder on the level of H b, P.C.V, R.B.C. and W.B.C.

**Key words:** Black tea residue, poultry diet, physiology, hematology, protective , antioxidant.

### Introduction

Poultry products are one of the most important sources of animal food for humans because they are rich in protein in addition to egg production [1], herbs have recently been used as a feed additive that has been shown to improve the physiological and immunological proprieties of the chicken because they contain antioxidant that are effective in the physiological and immunological state [2] .Black tea is one of the most widely used herbs in the Arab world for humans .The effect of its use in the chick was studied to see how the antioxidants in tea enhance its physiological properties and act



on oxidant .The tea tree is an evergreen perennial tree and there are 300 species in the world [3] *Camellia Sinenses* it the leaves contain antioxidant like Catechins ,Thearubigins and Theaflavins, the black tea rich of multiple phenols that was inhibiting the regeneration of free radicals and remove them [4].In addition to antioxidant such as Theaflavins that have effective in replication facts like AP-1 or NFK13 they have effect inhibition of oxidative Enzymes such as Xanthine oxidase or replicating Nitricoxid [5].that witch crush the free radical and prevent per oxidation of lipids by activation antioxidant Enzymes like glutathione ,s-transferases ,catalase and Theaflavins . Theaflavins are given tea characteristic such as taste and color [6]. the antioxidant Thearubigins have the ability to prevent genetic mutation in DNA [7].

### Material and methods

This study was conducted in the poultry filed of technical college in Mussaib during the period 5 /9 /2019 to 20 /10 / 2019 in this experiment used 120 chick of Belgian Ross the initial mean weight of chicks was 45.2 .The chicks divided in to 3 groups and 4 replicators .

**1-Group 1 (T)** : number of hatchings 40 it was Control group .

**2- Group 2 (T1)**: initial treatment number of hatchings 40 it was added 60 mg of black tea powder residue to1 Kg of feed .

**3- Group 3 (T2)** :Second treatment number of hatchings 40 it was added 120 mg black tea powder residue to 1Kg of feed .

Diet composition and calculated analysis Table:

	Ingredient and analysis	(%) 1-21 day	(%) 22- 42 day
	Corn	56	61.9
1	Soybean meal	29.5	21.7
2	Concentrated portion	10	10
3	Vegetable oil	2.5	4.5
4	Ground limestone	0.7	0.8
5	salt	0.3	0.4
6	Dicalcium phosphate	1.0	0.7
<b>Chemical analysis</b>			
1	energy	3000 Kcl	3104 Kcl
2	protein	22.6	20
3	Methionine %	0.60	0.56
4	Lysine %	1.56	1.36
5	calcium	1.12	1.12
6	phosphorus	0.42	0.42

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In the end of the experiment the blood samples was taken from the jugular vein and placed in laboratory tubes ,some containing an anticoagulant and the other not containing anticoagulant .The samples from which the serum was extracted were pleased in centrifuge .The blood cells were separated from the serum . The serum used to



determine the levels of antioxidant, blood glucose and total cholesterol as well as LDL, HDL TG . The sample collected in tubes that don't contain anticoagulant used to calculate the number of red blood cells and number of white blood cells, hemoglobin (H b), packed cell volume (PCV). and calculated the production characteristic weekly weight, weekly weight gain, feed consumption rate and food conversion efficiency according to the following equation:

$$\text{Food conversion} = \frac{\text{Amount of feed consumed in certain period}}{\text{weight gain during the same period}}$$

### Statistical analysis

Used the complete random design (CRD) to study the significance ,using the Statistical program SAS [9].

### Results and Discussion

#### Blood characteristics

**Table (1): Effect of and black tea powder in different proportion to diet in some physiological traits in ross chick.**

Blood characteristics	(T)	(T1)	(T2)
H b g/dl	13.3±0.9	14±0.2	14±0.23
P.C.V	40±0.1	41±0.2	40.5±0.15
RBCs ×10 <sup>6</sup> ml	20.93±0.23	21.04±0.21	21.45±0.02
WBCs×10 <sup>3</sup> ml	5.8±0.01	5.72±0.2	5.77±0.21

**The numbers represent the rates ± standard Error**

The results shown in the Table (1) showed that no significant differences in hematological parameters ( $P \geq 0.05$ ) among the treatments groups. Although preliminary research proved that tea has an effect on iron absorption due to the presence of caffeine [10].The current article did not notice an effect of tea on hemoglobin and red and white blood cells in relation to the experiment . This may be due to the presence of a large percentage of urinary antioxidants multiple phenols, which are important in maintaining the walls of blood cells from destruction due to oxidative factors [11].

#### Physiological traits

**Table (2): Effect of black tea residues on Glucose, Cholesterol, HDL, LDL and TG**

Traits	(T)	(T1)	(T2)
Glucose mg/dl	197±4.9	172±4.3*	162±3.9*
Cholesterol mg/dl	201±3.81	160±2.8*	140±2.5*
L.D.L	52.3±4.16	48.1±322*	45.5±4.01*
H.D.L	91±4.16	93±4.8*	95.01±2.12*
T.G mg /100ml	101±1.8	70±1.21*	64.5±2.2*

**The numbers represent the rates ± standard Error**

**The mark \* means that there is significant difference at the level ( $p \leq 0.05$ )**

The results shown in the Table (2) showed that significant differences were recorded at the level ( $P \leq 0.05$ ) In serum glucose, cholesterol, LDL and TG among group. The current results showed low significant value ( $p \leq 0.05$ ) in T2 when compared with T and T1, while HDL registered higher significant value ( $p \leq 0.05$ ) in T2 in comparison with T and T1. These results due to the effect of polyphenols, where it was found that the antioxidant effect on lipid metabolism. while the antioxidant therrubigins effect carbohydrate metabolism and it was found that theflavin has the ability to inhibit the activity of the pancreas in the synthetics of pancreatic lipase [12].

### Antioxidant enzyme

**Table (3): Effect of black tea residues on Antioxidant enzyme**

Antioxidant enzyme	(T)	(T1)	(T2)
SOD (IU/ml)	4.9±0.28	7.3±0.51*	8.2±0.5*
MDA (µM)	8. ±0.01	10.3±1.1	11.1±1.12*
GST (mmol /L)	0.9±0.2	1.6±0.7*	1.9±0.15*
CAT ( IU/L)	66.2±1.4	69.3±1.8*	70.8±1.6*
GPX ( IU/L)	102±1.0	128.3±1.2*	131±1.8*

The numbers represent the rates ± standard Error

The mark \* means that there is significant difference at the level ( $p \leq 0.05$ )

The results in the Table (3) showed that significant differences ( $p \leq 0.05$ ) in the level of antioxidant that increased in groups(T2 ,T1) compared with control group (T) because black tea is rich antioxidant such as polyphenols especially the flavin and therrubigins [3] . where the antioxidant black tea such as the flavin can inhibit or smash free radicals due to the presence of the hydroxyl group with Gallicaciamiety acid thus prevents lipid peroxide due to activation of antioxidant enzymes such as glutathione, S-transferases and Catalase [6]. thearubigins has effect in prevent DNA mutation [7].

### Production traits

**Table (4): Effect of black tea residues on weekly weight rate (g)**

Weeks	(T)	(T1)	(T2)
Week 1	118±0.01	110±0.01	112±0.01
Week 2	214±0.02	216±0.01	212±0.03
Week 3	432±0.1	455±0.3	442±0.2
Week 4	735±0.8	730±0.82	750±0.9
Week 5	1035±1.4	1070±1.03	1085±1.02
Week 6	1565±2.2	1560±205	1568±2.1

The numbers represent the Rates ± standard Error

The results in the table (4) showed that no significant ( $p \leq 0.05$ ) differences were recorded at the level ( $P \leq 0.05$ ) between the groups T1, T2 compared with control group T .

**Table (5): Effect of black tea residues on weekly weight gain rate (g)**

Weeks	(T)	(T1)	(T2)
Week 1	72.8±0.1	64.8±0.2	66.8±0.2
Week 2	96±0.3	106±0.01	100±0.23
Week 3	213±0.22	239±0.4*	230±0.31
Week 4	303±0.31	275±0.34	335±0.85*
Week 5	300±0.43	340±0.75*	335±0.85
Week 6	530±1.04*	490±2.02	475±2.56

The numbers represent the rates ± standard Error

The mark \* means that there is significant difference at the level ( $p \leq 0.05$ )

The result in Table (5) showed there was mostly no significant differences ( $p \leq 0.05$ ) except for some variable and non-continuous significant differences over the week, The current results recorded that group T1 was significant ( $p \leq 0.05$ ) in the third week and T2 was significant ( $p \leq 0.05$ ) in the fourth week also T1 significant ( $p \leq 0.05$ ) in sixth week .the moral was continuous period the duration of the experiment as it fluctuates between high and low but the reason may be administrative .

**Table (6): Effect of black tea residues on weekly feed consumption rete (g)**

weeks	(T)	(T1)	(T2)
Week 1	300±2.08	225±2.01*	212.9±1.23*
Week 2	340±2.95	260±2.05*	250±1.28*
Week 3	390±3.30	305±3.30*	295±1.02*
Week 4	490±1.24	480±3.24	450±2.35*
Week 5	600±2.025	565±2.09*	560±1.2*
Week 6	730±4.033	700±3.22*	680±2.05*

The numbers represent the rates ± standard Error

The mark \* means that there is significant difference at the level ( $p \leq 0.05$ )

The results in the Table (6) showed that significant differences ( $p \leq 0.05$ ) were recorded among groups. the groups write where showed T2 significant compared with T1, T . and T1 showed significant compared with T group.

**Table (7): Effect of black tea residues on feed conversion efficiency weekly rate**

weeks	Group 1 (T)	Group 2 (T1)	Group 3 (T2)
Week 1	4.1±0.9	3.47±0.8*	3.1±0.08*
Week 2	3.5± 0.8	2.4 ± 0.02*	2.5 ±0.03 *
Week 3	1.78±0.03	1.27±0.02	0.95±0.02 *
Week 4	1.61 ±0.01	1.7± 0.2	1.4 ±0.02
Week 5	2.01 ±0.03	1.66 ±0.22 *	1.67 ±0.01 *
Week 6	1.3 ±0.01	1.42 ±0.05	1.43 ±0.02

The numbers represent the rates ± standard Error

The mark \* means that there is significant difference at the level ( $p \leq 0.05$ )



The results in the Table (7) showed that significant differences ( $p \leq 0.05$ ) were recorded among experimental groups.

From the above tables concerned with productive traits the current results recorded there are no significant differences ( $p \leq 0.05$ ) in weight but there are significant differences ( $p \leq 0.05$ ) in amount of feed consumption and the rate of feed conversion efficiency this can be explained by the presence of multiple phenols antioxidant which have an effect in improving metabolic levels [13]. there for the process of making full use of the feed materials provided to chicks in group T1, T2. with observation low feed consumption compared to the control group T this result effect on feed conversion efficiency rate when applying the food conversion efficiency equation.

### **Conclusion**

The results of this study concluded that the use of black tea residua powder had impact on the levels of physiological characteristics, level of antioxidant and the rate of the feed consumption. Because the beneficial effects of adding the black tea residue powder to chicks' diet due to its effects for increasing the antioxidant enzymes percentages.

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