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Effect of Adding Lycopene to the Ration in some Blood Traits of Broiler Ross 308

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Abstract
This study was conducted at Poultry Farm of Animal Resources Dept., College of Agriculture, University of AL-Qasim Green to investigate the effect of adding Lycopene to the ration in some blood traits of broiler Ross 308 . Use the 90 broiler chicks Ross 308 day-old were randomly assigned to three treatments (by 3 replicates per treatment 10 chicks per replicate), and treatments were as follows : (first treatment) without adding lycopene to the diet, add lycopene by 250 mg / kg feed (second treatment) and add lycopene by 500 mg / kg feed (Third treatment) . Blood traits included in this study were red and white blood cell counts, hematocrit, hemoglobin concentration and differential leucocyte count .
The results indicated that the addition of lycopene by 250 and 500 mg / kg feed to broiler diet led to a significant improvement ($p<0.05$) in red and white blood cell counts, hematocrit and hemoglobin concentration and significant decrease ($p<0.05$) in heterophil to lymphocyte ratio .It concluded from this experience, that the addition of lycopene by 250 and 500 mg / kg feed to the ration can lead to improve in some blood traits of the broiler .
Keywords : lycopene , blood traits , broiler

Introduction

Lycopene is a pigment red or infrastructure that exist in some vegetables and fruits (pineapple, orange, tomato, grapefruit, strawberries and sweet peppers) but found high concentrations in tomato (Agarwal and Rao ,2000) and lycopene derived carotenoid is a natural dye manufactured Some plants and microorganisms during the process of photosynthesis to protect it from the optical activity (Rao and Rao, 2004) has indicated a lot of studies that the more tomato products consumption rate, the lower the proportion of cancer and heart disease incidence and this is due to the lycopene found in tomatoes (Wu et al., 2004) also it has been associated with eating lycopene reduce the incidence of osteoporosis and lack of intensity (Maggio et al., 2006). As has been proven many recent studies the ability of this chemical on prevention, protection or reduce the harmful effects of free radicals and reduce oxidative stress in vivo and reduce the incidence of many diseases whether in humans or animals (Purnima et al., 2012).
The antioxidants important fodder as additives so as to their role in improving the qualities of productivity and physiological poultry and strengthen the immune status and improve the quality of the eggs as well as the impact of anti-oxidation (Sahin et al., 2006 a) and lycopene is a powerful antioxidant which provides protection against the body's cells damaged by free radicals and this importance be helpful to poultry as free radicals formed in the body of the chicken at higher temperatures and in cases of stress and when rapid growth and higher production and metabolism and that most of the studies have focused on the role of lycopene in the promotion of public health for humans and its role antioxidant naturally effective in addition to his role in the protection of humans from diseases heart attack and various cancers. There were no studies on this article in the field of poultry, but in a limited way so it was the aim of this study was to determine the effect of lycopene in addition to ration broiler in some bloody qualities.

Materials and methods

This study was carried out at the poultry farm of Animal Resource college of Agriculture, University of AL-Qasim Green from 14/3/2015 to 18/4/2015. Use the 90 chick broiler chickens Ross and an average weight of 43 g . Been raising chicks in cages ground dimensions (2 × 2) m, and chicks were distributed randomly on three treatments (by 3 replicates per treatment 10 chicks per replicate), It has been providing feed for the birds freely and fed the birds on a ration (Table 1). Treatments were as follows :(first treatment) without adding lycopene to the ration, add lycopene by 250 mg / kg feed (second treatment) and add lycopene by 500 mg / kg feed (Third treatment) . The experiment included a study of the following characteristics: The red blood cells count, The White blood cells count, PCV , hemoglobin concentration and count Differential blood cells White as was the blood collection in weeks 3 and 5 of 9 birds of each transaction (3 birds from each repeater) wildly as the collection of blood from a vein brachial where the use of pipeline container blocker Potassium EDTA anticoagulant to prevent blood clotting PCV been calculated using the lattice tubes at a private container mind clotting by the way in which he referred Archer (1965). Hemoglobin concentration was estimated by turning it

into a complex compound Cyanomethemoglobin using reagent Drabkins reagent and by the way in which it pointed (Varley et al. 1980) and as the red blood cells count and Whits according to the method referred to by Natt and Herrick (1952). Was estimated proportion heterogeneous / lymphocytes (Heterophil / lymphocyte ratio) using glass slides where the drop of blood on the glass slide placed and published carefully glass other chip placed over the blood drop and pulls up the first slide 45-degree angle without pressing them strongly and leave to dry an average of 10 minutes is then dab with a mixture of slides Tincture Wright Gimsa according to the way Shen and Patteron (1983). Counting is performed by using an optical microscope under the power of magnification (1000) put a drop of oil on the slide according to the way Burton and Guion (1968) are then calculate the proportion of heterogeneous cells to lymphocytes.

Data were subjected to an ANOVA using the General Linear Models (GLM) procedures of SAS (2010). Significant treatment means were separated by using the multiple range test of Duncan (Duncan, 1955) .

Table 1. Composition of experimental ration.

Ingredients (%)	Starter	Grower
	1 – 21 days of age	22 – 35 days of age
Yellow corn	59	35
Wheat	-	32.5
Soybean meal	30	20
Protein concentaverage [1]	10	10
Sunflower oil	-	1.5
Limestone	0.7	0.7
Salt	0.3	0.3
Total	100	100
Calculated chemical structure [2] (%)		
Crude protein	23.12	20.42
ME, Kcal / Kg feed	2936	3068
Lysine	1.30	1.07
Methionine	0.53	0.48
Calcium	0.92	0.91
Available phosphorus	0.55	0.46

[1] Protein concentaverage used was Golden which imported from Jordan. However, this concentaverage provided per Kg: 49% crude protein; 2900 ME K cal / Kg; 15% crude fat; 20% Ash; 5.6% calcium; 3.1% available phosphorus; 3.4% lysine; 2.4% methionine; and 3.2% methioinine + cystine.
[2] Chemical structure was calculated according to the analysis of diet material found in NRC (1994).

Results and discussion

Table shows (2) that the use of lycopene in ration for broiler chickens has led to increasing the red blood cells count and significance (P<0.05). The nature of this increase was in sync with the increase in the concentration of lycopene in the feed and in the third and fifth weeks where the third-treatment recorded the highest level, reaching 2.26 million cells / mm 3 of blood in the third week and 2.31 million cells / mm 3 of blood in the fifth week and then followed by treatment The second recorded 2.20 and 2.23 million cells / mm 3 of blood for two weeks, third and fifth, respectively, then the control treatment came and the lowest recorded level of red blood cells count, reaching 2.05 million cells / mm 3 of blood in the third week and 2.14 million cells / mm 3 of blood in the fifth week This increase was attributed of red blood cells count as a result of the body's need to meet the new requirements for the transfer of nutrients and oxygen to cells because of the increased metabolic rate of birds that dealt with lycopene added to the diet, may be the reason for the high red blood cells count in lycopene treatments being an antioxidant effective where It helps protect blood cells from damage that may occur as a result of oxidation (Agarwal and Rao ,2000) where Acharo to the importance of lycopene being an antioxidant highly effective by protecting many important representative materials such as lipoprotein low for density Low density lipoprotein and red blood cells against various stress factors oxidizing through mechanical rid of free radicals and inhibiting oxidation of fat cell membranes. shown in Table (3) With regard to the preparation of white blood cells, the treatment Lycopene led to a significant increase in the preparation of blood cells eggs with the increase in the concentration of lycopene in the feed at the third and fifth weeks has been shown that the greater the concentration of lycopene increased with the number of white blood cells and that there are significant differences (P<0.05) between all transactions, which recorded the highest number in the third treatment, reaching 25.38 and 29 670 cells / mm 3 and then followed by a second treatment where recorded 24.11 and 25.74 thousand cells / mm 3 blood and then came the last stage of the first treatment, reaching 20.73 thousand cells / mm 3 blood and 22.05 thousand cells / mm 3 of blood in the weeks third and fifth, respectively. He noted Wu et al (2004) that lycopene important for the body and immunity., said Sahin et al., (2006 a) that

lycopene has the capability great to enhance the function of the immune system in the body, as Shi pointed and Maguer (2000) to that lycopene is antibacterial and thus may lead to an increase in the white blood cells count .

Table (2) Effect of lycopene in addition to the ration on the red blood cells count (million / mm 3)

Age (week)		
5	3	Treatments
c 2.14± 0.03	c 2.05± 0.016	first treatment
b 2.23± 0.06	b 2.20± 0.07	second treatment
a 2.31± 0.08	a 2.26± 0.05	Third treatment
*	*	Level of significance

* : P<0.05

Table (3) Effect of lycopene in addition to the ration on the of white blood cells count

Age (week)		
5	3	Treatments
c 22.05± 0.11	c 20.73± 0.15	first treatment
b 25.74± 0.14	b 24.11± 0.09	second treatment
a 29.67± 0.31	a 25.38± 0.18	Third treatment
*	*	Level of significance

* : P<0.05

The table (4) indicates that the (PCV) values were taken almost to changes in the preparation of red blood cells in the third and fifth week trend is identical, and is associated with PCV measure of the number of red blood cells, where the greater the number of blood cells Reds lead to an increase in the PCV scale (Sturkie ,1986). It was to focus lycopene significant impact on the PCV scale where note of the table (4) that whenever the concentration of lycopene increased in the diet increased blood hematocrit values (PCV), was the third transaction recorded (500 mg lycopene / kg feed) the highest level to measure hematocrit reaching 30.22% in the third week and 32.42% in the fifth week and a difference of moral (P<0.05) compared treatment first and second, followed by a second treatment (250 mg lycopene / kg feed) recorded a 27.15 in the third week and 28.91 in the fifth week has excelled significance (P<0.05) on the first transaction, which came in ranked last in terms it fell behind significantly (P<0.05) for the second and third treatments amounted to 24.71 and 25.11 in the third and fifth weeks in a row.

Table (4) Effect of lycopene in addition to the ration on PCV (%)

Age (week)		
5	3	Treatments
c 25.11± 0.15	c 24.71± 0.29	first treatment
b 28.91± 0.28	b 27.15± 0.31	second treatment
a 32.42± 0.44	a 30.22± 0.34	Third treatment
*	*	Level of significance

* : P<0.05

Table (5) Indicates to that the increase in hemoglobin concentration similar to those obtained for the preparation of red blood cells, where the concentration of hemoglobin that is directly linked to the number of red blood cells (Sturkie, 1986). Therefore, the nature of this increase in hemoglobin concentration was associated with strong links to a concentration of lycopene in the feed and in the third and fifth weeks of age where outperformed the third treatment, has registered 8.42 and 8.55 (g / 100 ml) respectively and significance (P<0.05) on the first treatment and second, The second treatment was also significantly outperformed ahead of the first treatment, with the lowest concentration of hemoglobin and stood at 7.82 and 8.07 (g / 100 ml) the third and fifth, respectively, for two weeks, from here to show that the concentration of an important role in increasing the

concentration of hemoglobin.

Table (5) Effect of lycopene in addition to the ration on Hemoglobin concentration (g / 100 ml)

Age (week)		
5	3	Treatments
c 8.07± 0.58	c 7.82± 0.51	first treatment
b 8.29± 0.46	b 8.16± 0.43	second treatment
a 8.55± 0.23	a 8.42± 0.26	Third treatment
*	*	Level of significance

* : P<0.05

Seen from the table (6) for High-low significance (P<0.05) in differentiated cells relative to the lymphocytes with an increased concentration of lycopene in the third and fifth weeks and recorded the lowest level for this third treatment ratio (500 mg lycopene / kg feed) and amounted to 0.22 for the week the third and 0 0.23 for the fifth week. Then this ratio rose in the second treatment (250 mg lycopene / kg feed) significance (P<0.05) from its predecessor third-treatment and recorded 0.24 and 0.26 the third and fifth, respectively, for two weeks, and then reached the level of differentiated cells relative to the lymphocytes to the highest level In the first transaction where recorded in the third week 0:27 and 0:30 in the fifth week and a significant difference (P<0.05) compared to transactions lycopene.

The low rate of heterophil cells to lymphocytes give a good impression about the health of the bird has that heterophil cells / lymphocytes ratio is the best measure for the detection of the state of public Birds and the level of stress on that high this ratio for the overall rate shows exposure Birds severe stress. The reason may be due to the decline in transaction lycopene which is one of the most powerful natural antioxidants, which leads important roles in strengthening health and reduce the risk of morbidity and works anti-inflammatory (Purnima et al., 2012).

Table (6) Effect of adding lycopene to the ration on (H / L)

Age (week)		
5	3	Treatments
a 0.30± 0.005	a 0.27± 0.006	first treatment
b 0.26± 0.006	b 0.24± 0.003	second treatment
c 0.23± 0.004	c 0.22± 0.005	Third treatment
*	*	Level of significance

* : P<0.05

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