ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 7, Issue, 11, pp.23011-23014, November, 2015

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

EFFECT OF ADDING LYCOPENE TO THE RATION ON PRODUCTIVE TRAITS OF BROILER ROSS 308

[1,*]Nihad A. Lateef Ali and [2]Motasem Al Massad

[1]Department of Animal Resources, College of Agriculture, University of AL-Qasim Green, Iraq
[2]Department of Animal Resources, College of Agriculture, University of Jerash, Jordan

ARTICLE INFO

Article History:
Received 24th August, 2015
Received in revised form
05th September, 2015
Accepted 27th October, 2015
Published online 30th November, 2015

Key words:

Lycopene,
Productive traits,
Broiler

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 on productive 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: control group without adding lycopene to the ration, add lycopene by 250 mg / kg feed (first treatment) and add lycopene by 500 mg / kg feed (second treatment). The experiment included a study of the following characteristics: body weight, weight gain, feed consumption, feed conversion efficiency and mortality. The results indicated that the addition of lycopene by 250 mg / kg feed to broiler diet led to a significant improvement in the body weight and to a significant decrease in the mortality. In the rest of the qualities of productivity there has not been significant differences between all treatments. It concluded from this experience, that the addition of lycopene by 250 mg / kg feed to the ration can lead to improved performance of the broiler production.

***Citation*:** Nihad A. Lateef Ali and Motasem Al Massad. 2015. "Effect of adding Lycopene to the ration on productive traits of broiler ROSS 308", *International Journal of Current Research*, 7, (11), 23011-23014.

INTRODUCTION

The tomato is one of the basic human health fruits where tomatoes contain vitamin A, and vitamin C, potassium, folate and beta-carotene and carotenoids, which the most important of lycopene and beta-carotene and lutein and proved that the lycopene found in tomatoes of the most powerful antioxidants which protect against chronic diseases (Agarwal and Rao, 2000) confirmed Many studies that whenever tomato products consumption average, the lower the proportion of cancer and heart disease incidence and this is due to the lycopene found in tomatoes (Wu *et al*., 2004) and is lycopene one of the most important carotenoids and pigments responsible for the red color in mature tomato (*Lycopersiconesculentum*) and products tomato (Shi and Maguer, 2000), which is a natural red dye made by some plants and microorganisms during the process of photosynthesis to protect it from the optical activity (Rao and Rao, 2004) is found in vegetables and some types of fruit with red dye (such as pineapple, orange, tomato, grapefruit, strawberries and sweet peppers) and is the main source of his in the human diet tomato, only been identified six forms of carotenoids found in food and in the blood and body tissues and these carotenoids are: α- and β-carotene, lycopene, β-cryptoxanthin, lutein, zeaxanthin (Borel *et al*., 2007).

Corresponding author: Nihad A. Lateef Ali,
Department of Animal Resources, College of Agriculture, University of AL-Qasim Green, Iraq.

The antioxidants important fodder as additives and to its 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.*, a 2006) 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. You may not animals as well as human lycopene manufactured within the body (Shi and Maguer, 2000; Willis and Wians, 2003) must therefore be obtained from the basic sources such as tomato and its products, one of the richest sources such as tomato paste, ketchup, sauce and supplying human to 85% of Lycopene food, (Giovannucci, 2002) and due to lack of research and studies on the effect of lycopene on the productive performance of poultry as this is the first study of its kind in Iraq on broiler chickens strain 308 Ross. So the goal of this study was to determine the effect of lycopene in addition to ration in broiler chickens productive performance.

MATERIALS AND METHODS

This study was carried out at the poultry farm of Animal Resource college of Agriculture, University of AL-Qasim Green from14/3/2015 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 threetreatments (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: control group without adding lycopene to the ration, add lycopene by 250 mg / kg feed (first treatment) and add lycopene by 500 mg / kg feed (second treatment) . The experiment included a study of the following characteristics: body weight, weight gain, feed consumption, feed conversion efficiency and mortality. 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).

RESULTS AND DISCUSSION

Results of the experiment showed no significant effect of the treatments lycopene on mean body weight (g)the first and the second from the age of chicks table (2), either when the third week of age chicks outperformed the first treatment and the second was significantly ($p<0.05$) on the control group with the highest weight the neighborhood of the body was (673.33 and 654.72 g / bird) respectively, while the control group recorded a body live weight was (615.21 g / bird) and showed the results of the fourth and fifth week to outweigh the moral first treatment ($p<0.05$) in the average of live body weight compared to a set of control.

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).

The second treatment, where the first treatment recorded live body weight was (1060.42 and 1450.38 g), respectively, while all of the control group and the second treatment the following values recorded (1020.53 and 1030.32 g), respectively, and (1410.34 and 1415.59 g) respectively.

Table 2. Effect of lycopene in addition to the ration on mean body weight (g)
Age (week)

5	4	3	2	1	Treatments
7.65±1410.34b	5.96±1020.53b	5.44±615.21b	8.00±362.67a	8.40±141.66a	control group
9.63±1450.38a	8.17±1060.42a	9.31±673.33a	9.20±371.10a	7.26±140.30a	first treatment
8.26±1415.59b	6.44±1030.32b	8.10±654.72a	6.08±355.41a	9.66±140.21a	second treatment
*	*	*	N.S	N.S	Level of significance

Table 3. Effect of lycopene in addition to the ration on weekly weight gain (g)
Age (week)

5	4	3	2	1	Treatments
4.05±389.81a	405.32 8.42±a	22.01±252.54b	9.22±221.01a	6.52±98.56a	control group
3.11±389.96a	387.09 9.10±ab	9.10±302.23a	8.10±230.80a	8.31 ±97.20a	first treatment
3.20±385.27a	5.21±375.60b	17.30±299.31ab	9.42±215.20a	8.40±97.11a	second treatment
N.S	*	*	N.S	N.S	Level of significance

NS: No significant.*: P<0.05

Table 4. Effect of lycopenein addition to the rationon weekly feed intake (g)
Age (week)

5	4	3	2	1	Treatments
7.77±892.71a	756.496.55±a	5.10±710.43a	8.44±397.50a	5.31±193.75a	control group
7.75±884.17a	741.726.50± a	3.41±690.52b	5.13±393.00a	4.45±188.50a	first treatment
7.35±891.80a	± 750.896. 46a	5.21±672.31b	7.51±384.00a	4.53±191.05a	second treatment
N.S	N.S	*	N.S	N.S	Level of significance

NS: No significant.*: P<0.05

Table 5. Effect oflycopenein additiontothe ration on the feed conversion ratio (g feed/ g gain)
Age(week)

5	4	3	2	1	Treatments
2.29±0.12a	1.86 0.11±a	0.11±2.81a	0.07±1.79a	1.96±0.08a	control group
0.06±2.26a	1.91 0.09±a	0.14±2.28b	0.06±1.70a	1.93±0.03a	first treatment
2.31±0.03a	1.99±0.06a	0.12±2.24b	0.04±1.78a	0.05±1.96a	second treatment
N.S	N.S	*	N.S	N.S	Level of significance

NS: No significant.*: P<0.05

The results of Table (3) no significant on weekly weight gain (g) during the first week and the second week of the experiment and all transactions. While his outweigh the moral ($p<0.05$) at the third week of age chicks where treatment recorded the first outweigh the moral to the control group recorded the highest increase grains average of (302.23 g / bird), while the control group recorded a average increase by weight was (252.54 g / bird) The second treatment there were no significant differences between them and other treatments and recorded an increase average of grains (299.31 g / bird). But when the fourth week recorded a control range of the highest average of increase in the weight and total (405.32 g), followed by the first treatment and recorded (387.09 g) and without significant differences between them, while the second treatment recorded the lowest average of increase in the weight and lead a moral ($p<0.05$) for the control group where recorded (375.60 g) either in the last period of age experience productivity (fifth week) did not record any significant differences between all treatments.

Notes from the Table (4) no significant in feed in take for all experimental treatments average in the first and second weeks of age chicks, either when the third week of age chicks control group recorded a difference of moral ($p<0.05$)higher feed in take average (710.43 g / bird), while the first and second recorded treatments feed in take average (690.52 and 672.31 g / bird), respectively, either when the fourth week, the fifth week of age and experience, there were no significant differences between experimental treatments in a recipe feed intake. Significant differences did not appear in the feed conversion ratio weekly broiler chickens for all three experimental treatments per week (first and second) (Table 5) either when the third week the control group the highest recorded mean of feed conversion ratio and are significantly ($p<0.05$) on each of the first treatment and the second and recorded (2.81 g), while the first and second treatment recorded the following values (2.28 and 2.24 g weight / g feed) respectively, while significant differences between all treatments were recorded in the fourth and fifth weeks of age experience in this trait.

Table 6. Effect of addinglycopeneto the ration on mortality rate

1-5 week		Treatments
a	**0.04**±2.26	control group
b	**0.00**±1.17	first treatment
b	**0.02±1**.22	second treatment
*		Level of significance

*: P<0.05

Table (6) shows the effect of addinglycopene to the ration on mortality rate of broilers during experiment, amounting to 35 days where the high note smortality rate ingroup (control) were significantly ($p<0.05$) compared treatment first and second where mortality rate recorded reached (2.26%), while both of the first and second treatment recorded the following ratios (1.17 and1.22%) respectively. That foods rich in carotenoids consumption, particularly lycopene is linked to a lot of health benefits for their ability to protect tissues and cells and protect them from oxidative stress that is associated with many chronic diseases (Giuseppe *et al*., 2007) and the positive results that were obtained when adding lycopene concentration of 250 mg / kg feed (the first treatment) with respect to the weight of the living body and the proportion of mortality may be due to the fact that lycopene antioxidant effectively enhances the protection against oxidative damage living cells and this role is positive in poultry as it reduces oxidative stress, it is clear that the high growth speed and efficiency of feed conversion High lead to the occurrence of stress oxidative for the birds, and that lycopene plays an important role in enhancing the antioxidant defense system in the body, where he studied Ševčíková *et al*. (2008).

Effect of different levels of lycopene to the ration on the amount of feed intake and the percentage of mortality weight body the final quarter of broiler chickens where It was fed chicks on three concentrations of 50.1002 million mg lycopene / kg feed where there was no significant effect of the treatments lycopene in the recipe feed consumption as compared to control, while I average mortality be moral to treatments three lycopene compared with the control group, also excelled lycopene treatments In the final live body weight compared with the control group, and stressed Englmaierova *et al*. (2011) on the positive role of lycopene in improving the productive performance of broiler chickens when it is used by 75 mg / kg feed. As for the second treatment add 500 mg lycopene / kg feed did not there were any significant differences between them and the control group for the first treatment and this is consistent with the findings of the Pozzo*et al*. (2013) where the use of high concentrations of lycopene in the diets of broiler chickens by 500 mg / kg feed did not have any significant effect on productivity and physiological characteristics as well as carcass traits at the significant level ($p <0.05$).

REFERENCES

Agarwal, S. and Rao, A. V. 2000. Tomato lycopene and its role in human health and chronic diseases. *C.M.A.J.,* September 19:163-166.

Borel, P., Moussa, M., Reboul, E., Lyan, B., Defoort, C., Vincent-Baudry, S., Maillot, M., Gastaldi, M., Darmon, M., Portugal, H., Planells, R. and Lairon, D. 2007. Human plasma levels of vitamin E and carotenoids are associated genetics polymorphisms in genes involved in lipid metabolism. *J. of Nutrition*. 137, 2653–2659.

Duncan, B.D. 1955. Multiplerange and multiple f-test Biometrics , 11:1-42.

Englmaierová, M., Bubancová,I., T. Vít., and Skřivan, M. 2011. The effect of lycopene and vitamin E on growth performance, quality and oxidative stability of chicken leg meat. *Czech J. Anim. Sci.,* 56 (12): 536–543.

Giovannucci, E. 2002. Areview of epidemiologic studies of tomatoes, lycopene, and prostate cancer. *ExpBioland Med*., 227: 852 –859.

Giuseppe, S., Alfonso, D. G., Giuseppina, T., Caterina, L. P., Annarita, P., Barbara N., Rocco, D. P. and Carmela, S. 2007. Antioxidative activity of lycopene and ßcarotenecontents in different cultivars of tomato (*Lycopersiconesculentum*). *Int. J.Food Prop*. 10:321–329.

National Research Council (NRC). 1994. Nutrient requirement of poultry then. National Academy press. Washington. D. C. USA.

Pozzo, L., Tarantola, M., Biasibetti, E., Capucchio, M. T., Pagella, M., Mellia, E., Bergagna, S., Gennero, M. S., Strazzullo, G. and Schiavone, A. 2013. Adverse effects in broiler chickens fed a high lycopene concentration supplemented diet. *Can. J. Anim. Sci*. 93: 231–241

Rao, A. V. and Rao, L. G. 2004.Lycopene and human health. *Nutraceut. Res.* 2:127–136.

Sahin, K., Onderci, M.C., Sahin, N., Gursu, M.F. and Kucuk O. 2006a. Effects of lycopene supplementation on antioxidant status, oxidative stress, performance and carcass characteristics in heat-stressed Japanese quail. *J. of Thermal Biology,* 31, 307–312.

SAS, 2010. SAS/ STAT Users Guide for Personal Computers Release 9.1 SAS .Institute Inc. Cary and N.C USA.

Ševčíková S., Skřivan M. and Dlouhá G. 2008.The effect of lycopene supplementation on lipid profile and meat quality of broiler chickens. *Czech J. of Animal Sci*. 53, 431–440.

Shi, J. and Maguer, L. 2000. Lycopene in tomatoes: chemical and physical properties affected by food processing. *Crt. Rev. Food Sci. Nutr.* 40:1–42.

Willis, M. S. and Wians, F. H. 2003. The role of nutrition in preventing prostate cancer: a review of the proposed mechanisms of action of various dietary substances. *Clinica. Chimica. Acta*. 330:57–83.

Wu, A., Andriotis, V., Durrant, M. and Rathjen, J. 2004. A patch of surface-exposed residues mediates negative regulation of immune signaling by tomato. *Pto. Plant Cell.*16: 2809–2821.

****