Effect of cinnamon supplement to laying hens diet in blood and egg cholesterol concentration

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Abstract

The aim of this study was decrease the cholesterol concentration in egg yolk by feed additives(cinnamon). 100 hen was used strain ESA Brown in age 60 week were been grouped randomly into two groups: control group(50 hens) and eat basic diet according to age and production and treatment group(50 hens) it ate the basic diet plus the cinnamon 350 gm\kg feed. Results were show decrease concentration of cholesterol and LDL with increase in concentration of HDL in egg yolk and the blood in treatment group than control groups.

Key words: cinnamon ,hens ,HDL,LDL .

Introduction:

the eggs are characterized by high nutritional value because it contains proteins and fats, This makes it one of the most protein- foods compared to poultry and livestock[1] .it had amounts of Linoleic acid(18% of the egg contant of fatty acid) Which is important in protecting against coronary artery disease[2].the cholesterol was synthesis in human body and in animals , and it found in fats and meats[3] .the human body absorbed amounts of cholesterol do not pass 400 mg \ day, The excess amount of the need of the body is deposited in the walls of blood vessels, causing the narrowness of these vessels and the incidence of high blood pressure and atherosclerosis[4]. So doctors advise that you do not increase the amount of cholesterol 300mg \ day, Note that one egg contains approximately 200 mg of cholesterol Which is high compared to other foods[5] . In the field of poultry, plants and parts were used to treat various diseases **as afeed additives**[6] Cinnamon is available in either its whole quill form (cinnamon sticks) or as ground powder[7] . cinnamon is considered a remedy for digestive, respiratory, and gynecological ailments. Recent studies emerging from western countries have shown many potentially beneficial health effects of cinnamon such as anti-inflammatory properties,

anti-microbial activity, blood glucose control, reducing cardiovascular disease, boosting cognitive function, and reducing risk of colonic cancer[8] anther study found that cinnamon increase productivity qualities ,immunity and blood for poultry when .used food supplement [9].

Materials and methods

The research was carried out in a poultry breeding hall and 50 x 10 m containing all the requirements of raising the laying chickens. Was used 100 hen strain ESA Brown in age 60 week were been grouped randomly into two groups ,a period of one week was left before the experiment was a preliminary period to reflect on the conditions of the experiment and was put under control in terms of general health activity throughout the trial period. The groups were distributed as follows:: control group(50 hens) and eat basic diet according to age and production and treatment group(50 hens) it ate the basic diet plus the cinnamon 350 gm\kg feed. Cholesterol was measured in the egg yolk according to its method [10], while the estimate of the amount of HDL ,LDL in egg yolk method [11]. The method of measuring cholesterol concentration in serum was determined by[12] and the amount of HDL according to[13] ,LDL according to[14] . Statistical data were analyzed using full random design and T-test [15].

Results and Discussion:

Egg yolk cholesterol

The results of the current study showed that the addition of fodder to cinnamon has a clear effect on the concentration of total cholesterol of egg yolk. The results of the statistical analysis showed significant differences in the concentration of cholesterol between the two groups in the weeks following the start of the experiment, its the weeks2, 4 , 6, (Table 1). The cholesterol concentration in the cinnamon group was reduced in weeks 2, 4 ,6 weeks compared with the control group. This was due to a deficiency in the synthesis of cholesterol and the synthesis of lipoprotein molecules LDL and molecules vitllogenin(VTG) in the liver cells which was the chive part for cholesterol synthesis and than excreted it to blood steam with LDL and VTG. That is, lowering the mechanism of cholesterol production in liver cells is the best way to reduce the level of yolk cholesterol[16] .

Table (1) effect of cinnamon on cholesterol concentration in yolk(mg\ gm).

Week	Control group means± SD	Treatment group means± SD
2	$16.07 \pm 0.043_a$	$15.2 \pm 0.04_b$
4	$16.09 \pm 0.051_a$	$14.6 \pm 0.85_b$
6	$16.03 \pm 0.072_a$	$12.77 \pm 0.031_b$

The results of the study also showed the effect of adding cinnamon to the diet resulted in changes in the levels of lipoprotein concentration, low density and high density lipoprotein. Significant differences were recorded in these rates as of the second week. This effect continued during the fourth and sixth weeks compared with control group.

Table (2) effect of cinnamon on HDL in yolk(mg\ gm).

Week	Control group means± SD	Treatment group means± SD
2	$27.35 \pm 0.21_a$	$35.33 \pm 0.35_b$
4	$25.2 \pm 0.22_a$	$35.03 \pm 0.25_b$
6	$25.03 \pm 0.17_a$	$38.16 \pm 0.73_b$

Table (3) effect of cinnamon on LDL in yolk(mg\ gm).

Week	Control group means± SD	Treatment group means± SD
2	$61.34 \pm 0.31_a$	$38.3 \pm 0.45_b$
4	$62.2 \pm 0.52_a$	$41.4 \pm 0.25_b$
6	$58.77 \pm 0.37_a$	$35.6 \pm 0.23_b$

Of the results achieved we see the effect of cinnamon, which led to the reduction of the level of total cholesterol or that found in the low-density lipoprotein and cholesterol, which is high in cholesterol, unlike high-density lipoprotein, which contains a low rate of cholesterol [17]. The low concentration of total cholesterol and / or low-density lipoproteins in food intake significantly reduces the chance of atherosclerosis and its development [18].

Serum cholesterol:

The results of this study showed a significant decrease in the concentration of serum cholesterol compared to the control group. The results showed a significant increase in the concentration of high-density lipoprotein, which transfers the cholesterol from the arteries and returns to the liver to be expelled outside the body, accompanied by a significant decrease in concentration Low-density lipoprotein (LDL), which deposits cholesterol in artery walls.

This is consistent with a study conducted on type 2 diabetics patient found that , cinnamon reduced serum glucose, triglyceride, total cholesterol, and LDL-cholesterol levels in people with type 2 diabetes. Because cinnamon would not contribute to caloric intake, those who have type 2 diabetes or those who have elevated glucose, triglyceride, LDL-cholesterol, or total cholesterol levels may benefit from the regular inclusion of cinnamon in their daily diet. In addition, cinnamon may be beneficial for

the remainder of the population to prevent and control elevated glucose and blood lipid levels[19].

Table (4) effect of cinnamon on cholesterol concentration ,HDL, LDL in serum(mg\ dl).

In serum	Control group means± SD	Treatment group means± SD
cholesterol concentration	$212.3 \pm 3.01_a$	$126 \pm 2.55_b$
HDL	$58.7 \pm 1.40_a$	$75.4 \pm 1.15_b$
LDL	$75.7 \pm 2.07_a$	$38.5 \pm 1.33_b$

Conclusion:

From this results, we can give cinnamon in food of lying hens to decrease in concentration Low-density lipoprotein (LDL), cholesterol and increase high -density lipoprotein HDL in serum And yolk egg.

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