



Study the effect of cumin and garlic powders on the blood picture, production performance and liver function in turkey

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Abstract

This experiment was conducted to study effect of addition of garlic powder and cumin powder on blood picture and liver enzymes function in turkey, the experimental group randomly divided in to three groups as following: group one control the second and third group was given garlic powder and cumin powder respectively then, these groups were given garlic and cumin for aged 32 days in the drinking water at dose (2 g /5 liters). Blood samples were taken from each group at day 52, 72 respectively. The results showed significant increased at $p < 0.05$ for parameters of hematological analysis. There were significant ($p > 0.05$) differences between garlic and cumin groups with control to blood plasma GOT and GPT. There were significant increase in body weight at ($p > 0.05$).

Key words: Garlic, Cumin, hematology, liver enzymes function, weight gain, turkey.

دراسة تأثير مسحوق الكمون والثوم على الصورة الدموية والزيادة الوزنية ووظائف الكبد في التركي

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الخلاصة:

أجريت الدراسة الحالية على ثلاثين من الرومي في حقول كلية الطب البيطري حيث قسمت الى ثلاثة مجاميع ١٠ لكل مجموعة المجموعة الأولى مجموعة السيطرة حيث اعطيت عليقة اعتيادية على طول مدة التجربة والمجموعة الثانية والثالثة أعطيت مسحوق الثوم ومسحوق الكمون على التوالي ثم اعطي الثوم والكمون للرومي بعمر ٣٢ يوم في ماء الشرب حيث أعطيت ٢ غم

لكل ٥ لتر من ماء الشرب لكل مسحوق، تم اخذ الدم من كل مجموعة بعمر ٥٢ يوم وعمر 72 يوم للرومي، تم تحليل الدم وقياس معايير الصفائح الدموية وعدد كريات الدم الحمراء والبيضاء والخلايا اللمفية والهيموغلوبين وحجم خلية الدم المتوسط، أظهرت النتائج بعد التحليل الإحصائي بأن هنالك فروقات معنوية على مستوى 0.05 بالنسبة للصفائح الدموية وعدد كريات الدم الحمر والبيض والخلايا اللمفاوية وحجم خلية الدم المتوسط. كما كان هنالك فروقات معنوية بالنسبة الى انزيمات الكبد على مستوى 0.05 . كما وجدت زيادة معنوية في الوزن على مستوى 0.05 خلال فترة التجربة.

Introduction:

Cuminum cyminum (Apiaceae) is an annual herbaceous plant (height: 15–50 cm) with fruits each one contains a green seeds which has aromatic characteristics. It is applied in Iranian folk medicine since more than 200 years ago. It has been shown that its fruits have medicinal application in treatment of diarrhea, toothache and epilepsy (1).

the huge development in poultry industry that interests researchers and rears to find different methods and means to maintain the development and continuity of this industry, to the increase in productive capacity of poultry projects and then increasing the concentration on nutritional and hygienic aspects of birds resistance against different outbreaks which of mortality causes a high economic losses (2). One of the methods is to introduce medical plants to poultry through their diets as nutritional and medical sources for different purposes. Cumin plant is considered as one of these sources because of its nutritional and medical properties. Scientific information from American Ministry of Agriculture has shown that cumin contains most dietary nutrients such as

carbohydrates, fat of both saturated and unsaturated fatty acids, proteins.

Moreover minerals, vitamins and water. (3) Have indicated the potential use of cumin essential oil for the control of some diseases caused by *Pseudomonas aeruginosa* infections. *Allium sativum* (garlic) has been shown to have a lot of therapeutic potentials such as; antihypertensive (4), anti-rheumatic, stimulant, in treatment of asthma, cold, diabetes, paralysis and chronic fever (5, 6). It was also found to possess hypocholesterolemic effect (7) and strong antimicrobial activity (8). (9) has shown its high potential in the prevention of cancer. (10) have demonstrated that garlic oil is effective against fat infiltration of the liver. In combination with propranolol, garlic homogenate offered protection from myocardial injury (11). Garlic has also been reported to exert protective effect on isoprenaline induced myocardial infarction (12) and nephrotoxicity caused by amikacin (13). *Allium sativum* (*A. sativum*) , commonly known as garlic, is a species in the onion family Alliaceae. It is a perennial herb with a tall, erect flowering stem that grows up to 3 feet.

The garlic plant's bulb is the most commonly used part of the plant. With the exception of the single clove types, the bulb is divided into numerous fleshy sections called cloves. The cloves are used for consumption (raw or cooked) or for medicinal purposes. Garlic has been used throughout history for both culinary and medicinal purposes(14, 15). Recent research revealed that garlic is not only beneficial as medicinal plant, but it can be used as repellent to some plant pests and diseases(16). Today, in many parts of the world garlic is being used both as prophylaxis and for the cure of variety of diseases including acute and chronic infections, gastritis, dysentery, typhoid fever, cholera, tuberculosis, pneumonia, diabetes mellitus, heart disease and hypertension (17)

Materials and Methods:

1. Animals:

This study is occurred in farm of College of Veterinary Medicine / University of Kufa. In this study, thirty turkey were divided into three groups of ten turkey for each and assigned to 2 treatment diet (cumin and garlic powders).

2. Experimental design:

The experiment was carried out at (32, 52, 72) day. The control group (T₁) the turkey were fed the basal diet with no

added garlic powder and cumin powder. The second and third groups (T₂ , T₃) were given garlic and cumin powder respectively. Cumin powder and garlic powder were added to drinking water at dose 2 g/5 L.

3. Blood samples and hematology analysis:

Blood samples were collected from each one of turkey from winger vein for hematological analysis. Platelets count, mean corpuscular volume (MCV) count, hemoglobin (Hb), lymphocyte, red blood cell (RBC) count, white blood cell (WBC) count were measured by standard methods (18). The blood sample was collected aseptically from each animal into tri-potassium ethylenediamine tetra-acetic acid (K3EDTA) anticoagulant tube (AFCO, Jourdan). This was well mixed by gentle inversion for following testes:-

1. Hematology profile by using Automated Hematology analyzer (Genx, USA)

4. Statistical analysis:

When applicable the data were subjected to analysis of variance followed by the least significance difference test was used for multiple *t*-test (ANOVA) (19). The level of significance was at $p < 0.05$, by using computerized program spss 13.

Results:

Table (1): show significant changes in hematology profile between control and treated groups.

Table (1): hematology profile of control and treated groups of turkey at the first pool (52 day).

	platelet	MCV	HGB
control	9.16± 0.79 a	140.7 ± 1.10 a	11.45 ± 0.24 a
Garlic	7.8± 0.70 b	147.35± 1.20 bc	9.31 ± 0.23b
Cumin	7.9 ± 0.52 b	157.5 ± 2.42 d	9.83 ± 0.29b

Differences in the same row with different superscripts are statistically significant at $P; < 0.05$

Table 2 show significant changes in hematology profile between control and treated groups.

Table (2): hematology profile of control and treated groups of turkey at the first pool (52 day).

	RBC	LYMPH	WBC
Control	2.50±0.06 a	63.56 ±7.93 a	81.36 ± 11.8 a
Garlic	2.03 ± 0.06 b	213.1 ± 4.17 b	230.8 ± 2.40 b
Cumin	2.03 ± 0.06 b	253.36 ± 0.75c	236.75 ± 1.97 b

Differences in the same row with different superscripts are statistically significant at $P; < 0.05$

Table (3): show significant changes in hematology profile between control and treated groups.

Table (3): hematology profile of control and treated groups of turkey at the second pool (72 day).

	PLAT.	MCV	HGB
Control	7.8±0.79 b	147.7± 1.1 a	11.45±0.24 a
Garlic	8.8±0.90 ab	141.2 ±1.6 b	10.43 ±0.18 c
Cumin	7.3 ±0.49 b	140.08 ±2.3 b	10.68 ± 0.13 bc

Differences in the same row with different superscripts are statistically significant at $P < 0.05$

Table (4): show significant changes in hematology profile between control and treated groups.

Table (4): hematology profile of control and treated groups of turkey at the second pool (72 day).

	RBC	LYMPH	WBC
Control	2.50 ±0.065 a	63.56± 7.9 a	4.74 ± 0.05 a
Garlic	2.31 ±0.43 b	83.40 ±1.03 b	7.29 ± 0.04 b
Cumin	2.31 ±0.39 b	86.11 ±0.53 b	9.65 ± 0.11c

Differences in the same row with different superscripts are statistically significant at $P < 0.05$

Table (5): Effect of garlic and cumin in GOT.

groups day	52 day	72 day
Garlic	30 ± 3.7 bA	19.6 ± 0.74 aA
Cumin	45.6 ± 2.03 b B	35.6 ± 4.5 aB
Control	81.8 ± 3.38 aC	82 ± 3.4 aC

Differences in the same row with different superscripts are statistically significant at $P < 0.05$

Table (6): Effect of garlic and cumin in GPT.

groups day	52 day	72 day
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Garlic	86.6 ± 1.36 bB	74.4 ± 2.9 aB
Cumin	52 ± 2.6 bA	35.8 ± 3.3 aA
Control	115.8 ± 2.4 aC	110.4 ± 2.6 aC

Differences in the same row with different superscripts are statistically significant at $P < 0.05$

Table (7): weight increasing of turkey that giving cumin powder in 52, 72 day:

Groups	Weight/(kg.)
Control	2 ± 0.01 a
cumin (52) day	2.3 ± 0.01 b
cumin (72) day	3.1 ± 0.02 c

Table (8): weight increasing of turkey that giving garlic powder in 52, 72 day:

Groups	Weight/(kg.)
Control	2 ± 0.01 a
Garlic (52) day	2.3 ± 0.02 b
Garlic (72) day	3.4 ± 0.02 c

Discussion:

Blood is a good indicator to determine the pathological and physiological status of man and animal. Assessment of haematological parameters can be used to determine the extent of deleterious effect of foreign compounds including plant extracts on the blood. The significant effect of the

A. sativum powder on RBC, Hb and PCV implies that there was a change in the oxygen – carrying capacity of the blood and the amount of oxygen

delivered to the tissues, since RBC and Hb are very important in transferring respiratory gases (20). (21, 22) suggested that the *A. sativum* extracts

have the potential to stimulate erythropoietin release in the kidney which is the humoral regulators of RBC production. WBC were significantly improved an indication of a boost on the immune system by the *A. sativum* ex. The present result corroborate previous researches (23,24) on effects of garlic extracts on WBC. The outcome of this present study shows that powder of fresh garlic and cumin have significant ($P < 0.05$) impacts on some haematological parameters as evident by the active proliferations of blood components to varied extent as measured in the treated groups, compared to the control, this present study agree with that of (25). Cumin is one of the popular spices that regularly used as a flavoring agent and an alternative antimicrobial agent that is safe for human applications (26) These results suggest that these plants may contain materials involved in the derangement of the haemopoietic process of the body (27).

Table (5:6) shows the effects of garlic and cumin in turkey diets on GOT and GPT on (52-72) days. There is effective significant ($p < 0.05$) reduction in SGOT and SGPT of dietary garlic and cumin on days (52

and 72) on SGOT and SGPT of turkey compare with control group and this agree with (28). Generally GOT and GPT considered as liver enzyme which increased with liver damage (hepatocellular degeneration), so that, the decrease in SGOT and SGPT may provide evidence for the occurrence of hepatoprotective effect of anise and its essential oil (29, 30, 31) .

Table (7:8) shows the effects of garlic and cumin powders on weight gain in turkey during (52-72) days. Adding of these powders to diet showing increasing in weight of turkey. The level of powders had significant ($P < 0.05$) effect on days 52 and 72. These results agreement with (32, 33)Sohail *et al.* 2012, Ao *et al.* 2011) reported that medicinal plants causes performance weight and disagreey with (34)Aydin *et al.*

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