ejpmr, 2016,3(8), 138-141

SJIF Impact Factor 3.628

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 3294-3211

EJPMR

EFFECT OF ADDING *SALVIA OFFICINALIS* OIL TO THE RATION ON SOME BLOOD SERUM BIOCHEMICAL TRAITS OF BROILER ROSS 308

[1]Nihad Abdel Latif Ali and [2]*Dr. Sarmad Abdul Razak Alsaadi

[1]Department of Animal Resources, College of Agriculture, University of AL-Qasim Green, Iraq.
[2]Department of Basic Sciences, College of Dentistry, University of Kirkuk, Iraq.

***Correspondence for Author: Dr. Sarmad Abdul Razak Alsaadi**

Ph.D. Neuroendocrine Physiology Head of Basic Science Department College of Dentistry University of Kirkuk Iraq Baghdad Road Iraq 36001.

Article Received on 08/06/2016 **Article Revised on 28/06/2016** **Article Accepted on 18/07/2016**

ABSTRACT

This study was conducted to investigate the effect of adding Sage Oil (*Salvia officinalis)* to the ration on some blood serum biochemical traits of broiler Ross 308. 108 broiler chicks Ross 308 are used at one day-old were randomly assigned to three treatments (by 3 replicates per treatment; 12 chicks per replicate) and treatments were as follows: (Control group) without adding Sage Oil to the diet, (First treatment) add Sage Oil by 1% and (Second treatment) add Sage Oil by 2%. The experiment included a study of the following biochemical parameters: Concentration of Blood Glucose, Total Protein, Cholesterol and Triglycerides. The results indicated that the addition of Sage Oil by 1 and 2% to broiler diet led to a significant improvement in blood serum biochemical traits of broiler.

KEYWORDS: Sage Oil, Blood serum, Biochemical traits, Broiler chicks.

I. INTRODUCTION

Plants or medicinal herbs occupy privileged position in the pharmaceutical, industrial and agricultural fields in most parts of the world, the people knew the risk of side effects of chemical drugs, which led to a rush of people to return for using of medicinal plants, which have little side effects or virtually non- existent compared to chemical treatments (Marcus, 2002). On the other hand, several studies have proved the positive role of effective compounds in *Salvia officinalis* especially volatile oils in improving the process of digesting food (Abu-Darwish, et al., 2013) and increase stimulated to secrete digestive enzymes and bile salts secretion (Ninomiya, et al., 2004). The essential oils extracted from Sage oil have a catalytic effect for the digestive system for poultry (Jamroz and Kamel, 2002), as improved liver function and increase the production of digestive enzymes in pancreatic juice, also it had a role in increasing the digestion of protein, cellulose and fats (Williams and Losa, 2001) and improved digestion of food in the small intestine, particularly the ileum (Hernandez, et al., 2004).

Bassett,) 2000 (has explained that The basic oils and active components in *Salvia officinalis* have direct correlation with the poultry's ability to grow and this is due to the fact that these active compounds have a positive role in promoting the growth of poultry and then improve its capacity to the production performance.

Salvia officinalis is herbal perennial plant strong, sustainable growth evergreen covered by leathers (Bernotiene, et al., 2007).

The effective sage oil, materials is Cineole, Camphor, B-Thujone and A-Thujone (Pitarevic, et al., 1984). Because the lack of research concerned with the impact of medicated oils on the physiological characteristics, so the aim of this study to determine the effect of adding a bush sage oil to chicken ration on some blood biochemical characteristics.

II. MATERIALS AND METHHODS

This study was carried out at the poultry farm followed to the private sector in the province of Babylon, for the period from 20/04/2015 up to 15/05/2015. Use 108 broiler Ross 308, an average weight of 45 g/chick. Has been raising chicks in cages ground in (2×2) m^2 dimensions, the chicks were distributed randomly on three groups, each of which consists of three replications, with each duplicate contained 12 chicks. It has been providing feed for the birds freely and fed the birds on the starter ration at the age 1- 21 days and Grower ration from the age 22-35 days (Table 1). Sage oil has been added to the diet from the first day of the age, as follows:
Control group: without adding sage oil to the diet.
First treatment: adding sage oil by 1% concentration.
Second treatment: adding sage oil by 2% concentration.

The following characteristics were estimated in the fifth week of the experiment: Concentration of Blood Glucose, Total protein, Cholesterol and Triglycerides as was the collection of blood occur in the fifth week that

has been taken randomly from nine birds from each experimental group (3 birds of each duplicate), as the collection of blood from brachial vein by using EDTA tubes container, then it was placed in a centrifuge on the speed of 3000 r / min for 15 minutes to separate blood plasma then kept as frozen at -20º temperature until conducting laboratory tests, which included the concentration of Blood Glucose and Trotein, Total cholesterol and Triglycerides, where they measuring the glucose occur by using of standard kit from production of Randox company which estimated concentration using optical method mentioned by Asatoor and King (1954). Total protein concentration was measured by use of standard kit supplied by Randox company which based on Biuret methods to estimate the total protein then all samples read by using Spectrophotometer at 546 nanometers as wavelength (Henry and others, 1974).

Estimation of cholesterol concentration in the blood plasma accordance with the annex of the directory with the standard kit, cholesterol interact with ferric chloride and concentrated sulfuric acid, then result a pink color can be measured optically using Spectrophotometer according to Franey and Elias (1968). Triglyceride concentration was estimated by using standard kit ready-made produced by Linear chemicals company Spanish (Toro and Ackermann, 1975).

Data were subjected to an ANOVA using the Completely Randomized Design (C.R.D.) procedures of SAS (2010). Significant treatment means were separated by using the multiple range test of Duncan (Duncan, 1955).

Table I. Composition of experimental ration

Ingredients (%)	**Starter**	**Grower**
1 – 21 days of age		22 – 35 days of age
Yellow corn	48.2	58.7
Wheat	8	7.5
Soybean meal (44% protein)	28.5	20.5
Protein concentaverage (1)	10	10
Sunflower oil	4	2.5
Limestone	1	0.5
Salt	0.3	0.3
Total	100%	100%
Calculated chemical structure (2) (%)		
Crude protein	22.06	19.37
ME, Kcal / Kg feed	3079	3102.6
Lysine	1.21	1.03
Methionine + cysteine Crude fiber	0.82 3.54	0.75 3.2
Calcium	1.2	0.95
Available phosphorus	0.44	0.42

(1) Protein Belgian origin, 1 kilogram per gram of it contains: 2,200 kilocalories energy represented 40% Crude Protein, 8% Fat, 3.5% Fiber, 25% Ash, 8% Calcium, 3.1 Phosphorus Ready, 1.2% Lysine, 1.2% Methionine, 1.8% Methionine +70 mg Cysteine, 30 mg of vitamin B_1, 300 mg vitamin E, 2500 IU D3, 2% Chlorine, 10,000 IU 12 mg Folic acid, 120 mg Pantothenic acid, 400 mg Niacin, 50 mg vitamin B6, vitamin B2 5000 mg Colin, 450 mg iron, 70 mg copper, 600 mcg biotin, 750 mg Manganese, 5 mg Iodine, 1 g Cobalt, 1 mg selenium and antioxidants.

(2) Chemical structure was calculated according to the analysis of diet material found in NRC (1994).

III. RESULTS AND DISCUSSION

The results in (Table 2) showed significant differences ($p<0.05$) in the concentration of glucose in the blood serum between experimental groups that treated with sage oil in comparing with the control group. The second treatment recorded the lowest rate (139.96) mg/100 ml of blood glucose concentration followed by the first treatment that recorded (150.77) mg/100 ml of blood glucose concentration in compared with control treatment, which recorded the highest average of blood glucose in the blood serum concentration that reached (165.82) mg / 100 ml.

The reason of decreasing of blood glucose concentration in the serum of treatment groups as compared to control group in line with what's referred to (Lenuta and Leonte, 2005) which stated that sage oil contain Menthol and Menthone substances that play an important role in reducing the level of sugar glucose in the blood serum; In accordance with the Ben Khayal, et al., (2006) that assert the antioxidant role of vitamin C in the metabolism of carbohydrates by lowering levels of glucose sugar in

the blood serum.

Also the results of (Table 2) indicates to the presence of significant differences ($p<0.05$) in total protein level among all the experimental birds of the treatment groups. The highest concentration recorded in the plasma of second treatment group (4.01) g/100 ml compared with the another groups, which recorded its lowest level in serum was (3.2 and 3.41) g/100 ml plasma for control group and first treatments respectively, so the same table results indicated the existence of significant differences in the level of lipid profile in the blood of treatment and control groups and these results observe the lowest level of cholesterol in the blood serum had scored the second treatment amounted to (115.24) mg/100 ml followed by the first treatment that recorded (122.16) mg/100 ml plasma as compared to control group which recorded the highest level of cholesterol in the blood serum as it was (138.86) mg/100 ml plasma.

The same table as well as indicates the presence of significant differences ($p<0.05$) between the experimental treatments in the level of Triglycerides since the first and the second treatment recorded the lowest values of this trait, as was (88.25 and 71.80) mg/100 ml blood serum as compared to the control group that had the highest values for this trait, as was (110.12) mg/100 ml plasma, the reason for this decreasing may be lies in the the ability of sage oil to reduce the level of Cholesterol and Triglycerides due to the existence of effective materials represented by phenolic compounds, which plays a major role in curbing the free radicals and remove them and reduction of fatty acids in the blood plasma, in addition sage oil contain flavonoids that play an important role in reducing the esters of cholesterol and its role in preventing decomposition oxidative fat (Vichi, et al., 2001; Zhang, et al., 2005).

Lee, et al., (2004) has pointed out to the presence of phenolic acids, flavonoids and terpenes, which act as strong antioxidants that play an important role in reducing the level of fat in the blood serum. Moreover, the good content of vitamins, especially vitamin A and C that enhances the plant's role as an antioxidant in the cell and reduce the effort oxidative activates in somatic cells, as indicated of Siegal, (1980) to the ability of vitamin C to inhibiting the activity of adrenal gland secretion of corticosterone hormone as reflected on the thyroid gland and thus lead to reduce the level of cholesterol.

TABLE (II) THE EFFECT OF ADDING SAGE OIL INTO THE BUSH ON SOME BLOOD BIOCHEMICAL TRAITS OF BROILER CHICKENS (MEAN ± STANDARD ERROR) THE AGE OF 5 WEEKS

Parameters **Treatments**	**Blood glucose (Mg/100ml)**	**Total protein (Gm/100ml)**	**Cholesterol (Mg/100ml)**	**Triglycerides (Mg/100ml)**
Control group	165.82a ± 2.9	3.2b ± 0.015	138.86a ± 10.58	110.12a ± 2.32
First treatment	150.77a ± 3.39	3.41b ± 0.05	122.16b ± 11.57	88.25b ± 1.87
Second treatment	139.96c ± 2.67	4.01a ± 0.02	115.24c ± 15.52	71.8c ± 1.96

Different letters within the same column indicate the existence of significant differences at the level of probability ($p <0.05$.

IV. CONCLUSION

From the study, it might be concluded that the addition of sage oil to the broiler chicks feed led to a significant improvement in blood sugar, triglycerides and cholesterol concentration, especially in 2% concentration group in compared with 1% group.

REFERENCES

1. Asatoor, A. M. and King, E. J. 1954. Simplified calorimetric blood sugar method. *Biochem. J.* 56: 44-46.
2. Abu-Darwish, M. S., Cabral, C., Ferreira, V., Gonçalves, M. J., Cavaleiro, C., Cruz, M. T., Al-bdour, T.H. and Salgueiro, L. 2013. Essential Oil of Common Sage (Salvia officinalis L.) from Jordan: Assessment of Safety in Mammalian Cells and Its Antifungal and Anti-Inflammatory Potential. Biomed Res Int.: 538940.
3. Bassett. R., 2000. Oregano's positive impact on poultry production. *World Poultry*, 16: 31-34.
4. Bernotiene, G., Nivinskiene, O., Butkiene, R. and Mockute, D. 2007. Essential oil composition variability in sage (*salvia officinalisl*.). *chemia*. 18(4): 38 – 43.
5. Ben Khayal, F. A., Al- Saadi, M. H. and Al- Sinusy, H. M. 2006. Chemical study of *Salvia fructicosa* volatile oil grown in green amount of Libya. *J. Adv. Agric. Res*. 11(1): 209-220.
6. Duncan, B.D. 1955. Multiple range and multiple f-test. Biometrics, International Biometric Society, 11: 1-42.
7. Lenuta, F. and Leonte, D. 2005. The effect of Sage (*Salvia offcinalia*) Essential oil on Broiler performance. Faculty of Animal Science. Romania.
8. Franey, R. J. and Elias, A. 1968. Serum cholesterol measurement based on ethanol extraction and ferric chloride - sulfuric acid. *Clin. Chem. Acta*, 2: 255-263.
9. Henry, R. J., Cannon, D. C. and Winkelman, J. W. 1974. Clinical Chemistry, Principles and Techniques. 2nd Ed. Harper & Row.
10. Hernandez, F., Madrid, J., Garcia, V., Orengo, J. and Megias, M. D. 2004. Influence of two plant extracts on broilers performance, digestibility and digestive organ size. Department of Animal Production, University of Murcia, *Campus de Espinardo 30071,*

Murcia, Spain.
11. Jamroz, D. and Kamel, C. 2002. Plant extracts enhance broiler performance. *J. Anim. Sci*., 80: 41.
12. Lee, K.W., Everts, H., Kappert, H.J., Frechner, M., Losa R., Beynen, A.C. 2003. Effect of dietary essential oil components on growth performance, digestive enzymes and lipid metabolism in female broiler chickens. *Br. Poult. Sci*., 44(3): 450-457.
13. Marcus, Donald, M. 2002. Education about complementary and alternative medicine focus on Alternative and Complementary Therapies. 7(1), Pharmaceutical press, 1SSN 1465-3753: 1-2. (Article).
14. National Research Council (NRC). 1994. Nutrient requirement of poultry then. National Academy press. Washington. D. C. USA.
15. Ninomiya, K., Matsuda, H., Shimoda, H., Nishida, N., Kasajima, N., Yoshino, T., Morikawa, T. and Yoshikawa, M. 2004. Carnosic acid, a new class of lipid absorption inhibitor from sage. Bioorganic and Medicinal Chemistry Letters. 14: 1943–1946.
16. Pitarevic, I., Kuftinec, J., Blazevic, N. and Kustrak, D. 1984. Seasonal variation of essential oil yield and composition of Dalmatian sage, *Salvia officinalis*. *J. Nat. Prod.* 47: 409-412.
17. SAS, 2010. SAS/ STAT Users Guide for Personal Computers Release 9.1 SAS. Institute, Inc. Cary and N.C USA. Siegal, H. S. 1980. Physiological stress in birds. *Bio. Sci*. 30: 529-534.
18. Toro, G. and Ackermann P. G. 1975. Practical clinical chemistry. Little Brown Company. Boston. pp.354.
19. Vichi, S., Zitterl, K., Jugl, M. and Franz, C. 2001. Determination of the presence of antioxidants deriving from sage and oregano extract added to animal fat by means of assessment of the radical scavenging capacity by photo chemiluminescence analysis. *Nahrung*, 45(2): 101- 104.
20. Williams, P. and Losa, R. 2001. The use of essential oils and their compounds in poultry nutrition. *World Poultry*, 17: 14-15.
21. Zhang, K.Y., Yan, F., Keen, C.A. Waldroup, P.W. 2005. Evaluation of Microencapsulated Essential Oils and Organic Acids in Diets for Broiler Chickens. I. *Journal of Poultry Science*, 4(9): 612-619.