

Effect of adding *Salvia officinalis* leaves powder to the ration on some blood traits of broiler Ross 308

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Abstract

This study was conducted at the Poultry Farm -Department of Animal Science, College of Agriculture, AL-Qasim Green University to investigate the effect of adding *Salvia officinalis* leaves powder to the ration on blood traits of broiler (Ross 308). 90 unsexed broiler chicks one day-old were used and randomly assigned to three treatments with 3 replicates per treatment and 10 chicks per replicate. The treatments were as follows: (first treatment is the control) without adding *Salvia officinalis* leaves powder to the diet, adding *Salvia officinalis* leaves powder by 1% (second treatment), and adding *Salvia officinalis* leaves powder by 2% (third treatment). The experiment included a study of the following characteristics: Red blood cell count, hematocrit (PCV), and hemoglobin concentration. The results indicated that adding *Salvia officinalis* leaves powder by 1 and 2 % to broiler diet led to a significant improve ($P<0.05$) in red blood cell counts, PCV and Hemoglobin concentration. It concluded from this experiment that adding 1 and 2% of *Salvia officinalis* leaves powder to the ration can lead to improve some blood traits of broilers.

Key words : *Salvia officinalis* leaves powder , blood traits , broiler.

Introduction

Many medicinal plants inserted in feeding broilers and laying hens, including the fenugreek seeds (Alniami, 1999., Alqim, 1999., and Altaai, 2003), black bean (Hashim, 2002 and Alnadawi, 2003) and garlic powder (Ahmad, 2002) which showed different effects in the productive, physiological, and immunological characteristics through its contain of natural chemicals. Sage plant (*Salvia officinalis*) is one of the important medicinal plants because it contains active compounds, most importantly Thujone compound, which is attributed to the cleanser and anti-infection, and shows the medical impact in the treatment of throat and tonsils inflammation, and has a contraction impact used for light diarrhea treatment and it is also repelling intestinal gases (Zhang et al., 2005). The Latin name for the sage plant is (*Salvia*) and the literal meaning is sincere or a savior. The plant has a good reputation in prolonging ages, so there was a saying in the fourteenth century said (No body deserve to die and In his garden a sage plant). That means sage plant has the advantage of preventing various diseases and give health and wellness for those who taken it (Lee et al., 2004).

The sage is a herbaceous small plant, rise slightly from the ground up to 30 cm on average, emanated from it twigs, the leaves length was more than the width, the leave length was between (2-4cm) and the width was within a half cm, soft texture with green color which become dark red in the progress of plant age. This plant was belonged to Lamiaceae which includes basil, mint, and thyme. *Salvia officinalis* is the most famous and oldest plant used in ancient and modern medicine. It is famous in the Mediterranean basin countries. The plant was found mostly in the mountainous areas, undeveloped land, and particularly in confined areas between the mountain and the ground stone terraces, watch in places locally called (Alremeian) and called in other places Shrub (Erats, 2005). The scientist Gerrard in the seventeenth century said that sage plant strengthen the weak memory and return it in a short time. The other sage plant active compounds are ocimene, cineole, limonene, and terpinene and most of terpinene compounds mentioned work as an anti-oxidant, and it can kill many types of bacteria (Vichi et al., 2001). The sage plant contains volatile oils, flavonoids, and phenolic acids and the active ingredient caused by the volatile oils compounds. Other names for sage were: Qoaisenh, soft, Xialh, Asfaks, Alfaks, lisan alail, Aizqan (Al- Sinusy, 2005). Due to the lack of studies on the influence of the *Salvia officinalis* leaves on poultry performance, this study was conducted to determine the effect of adding *Salvia officinalis* leaves powder to broiler diet on some blood characteristics.

Materials and Methods

This study was carried out at the poultry farm- Department of Animal Science, College of Agriculture, AL-Qasim Green University from 14/3/2015 to 18/4/2015. 90 unsexed broiler chicks type Ross 308 with an average weight of 43 g were used. Chicks were reared in ground cages dimensions (1 × 1.5) m and distributed randomly into three treatments (by 3 replicates per treatment and 10 chicks per replicate), Freely feed was provided for the birds throughout the study and the birds fed the diet showed in (Table 1). *Salvia officinalis* leaves powder was added into the ration from the age of one day as follows: (first treatment was the control) without adding *Salvia officinalis* leaves powder to the ration, *Salvia officinalis* leaves powder was added by 1% (second treatment), and *Salvia officinalis* leaves powder was added by 2% (third treatment). The experiment included a study of the following characteristics: Red blood cell counts,

hematocrit (PCV), and hemoglobin concentration. The blood samples collected in the 3rd and 5th week of the study by taking 6 birds from each treatment (2 birds from each replicate) randomly. The blood was collected from brachial vein using anti clotting tubes (Potassium EDTA) and specific anti clotting capillary tubes used for measuring Hematocrit samples (Archer, 1965). Hemoglobin concentration was estimated by converted into Cyanmethemoglobin using Drabkins reagent (Varley et al., 1980). Finally, the red blood cell counts was estimated using (Natt and Herrick, 1952) method. Complete Randomized Design (CRD) was used in this study and the significant differences between treatment means were compared using polynomial test Duncan (Duncan, 1955) and the statistical software used was SAS (SAS, 2010) to analyze the data.

Table 1. 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%)	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⁾ (%)			
ME, Kcal / Kg feed	3079		3102.6
Crude protein	22.06		19.37
Lysine	1.21		1.03
Methionine	0.53		0.48
Calcium	1.2		0.95
Available phosphorus	0.44		0.42

⁽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% methionine + cystine.

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

Results and Discussion

Table (2) showed that using *Salvia officinalis* leaves powder in broilers diet led to significant ($P < 0.05$) increase in the red blood cells counts. That's happened with the increase of *Salvia officinalis* leaves powder concentration in the diet for the 3rd and 5th weeks of the study. Third treatment was recorded the highest level which was (2.37 Million cells / mm³ of blood) in the third week and (2.42 Million cells / mm³ of blood) in week five followed by second treatment when recorded (2.31 and 2.34 Million cells / mm³ of blood) for the 3rd and 5th weeks respectively. However, the first treatment recorded the lowest level of red blood cells counts, which was (2.14 Million cells / mm³ of blood) in the 3rd week and (2.25 Million cells / mm³ of blood) in the 5th week of the study. The reason behind the increase of red blood cells counts was because of the body needs for transporting nutrients and oxygen to cells when the metabolism rate increase for birds eat *Salvia officinalis* leaves powder when added to the diet. Or probably because of that *Salvia officinalis* leaves powder working as antioxidant which helps protect red blood cells from damage that may occur as a result of oxidation (Vichi et al., 2001).

Table (2): Effect of adding *Salvia officinalis* leaves powder to the diet on the red blood cells counts (mil/mlm³)

Age (wk)	3	5
First treatment	2.14± 0.25 ^b	2.25± 0.12 ^c
Second treatment	2.31± 0.16 ^a	2.34± 0.15 ^b
Third treatment	2.37± 0.14 ^a	2.42± 0.17 ^a
Level of significance	*	*

* : $P < 0.05$

Table (3) clarified that PCV values taken almost identical trend to changes happened in the numbers of red blood cells in the 3rd and 5th weeks. PCV associated with the numbers of red blood cells, where the greater number of red blood cells lead to an increase in the PCV (Sturkie, 1986). The concentration of *Salvia officinalis* leaves powder had significant impact on the PCV values, where noticed from table (3) that increasing the concentration of *Salvia officinalis* leaves powder in the diet led to an increase in the PCV values. Third treatment was recorded the highest level of PCV which was 29.31% in the 3rd week and 31.33% in the 5th week with a significant differences of (P<0.05) compare to the first and second treatments. PCV level recorded for the second treatment was 26.24% in the 3rd week and 27.82% in the 5th week which was significantly increased (P<0.05) compared to the first treatment. Finally, first treatment had a PCV values that significantly lower (P<0.05) than second and third treatments which were 23.62% and 24.27% for the 3rd and 5th weeks respectively.

Table (3): Effect of adding *Salvia officinalis* leaves powder to the diet on PCV values.

Treatments \ Age (wk)	3	5
First treatment	23.62± 0.18 ^c	24.27± 0.15 ^c
Second treatment	26.24± 0.21 ^b	27.82± 0.37 ^b
Third treatment	29.31± 0.23 ^a	31.33± 0.51 ^a
Level of significance	*	*

* : P<0.05

The increase occurred in hemoglobin concentration showed in table (4) was similar to that happened for the red blood cell counts, whereas hemoglobin concentration directly linked to the number of red blood cells (Al-hasny, 2000). Therefore, the nature of this increase in the concentration of hemoglobin was associated with strong links to a concentration of *Salvia officinalis* leaves powder in the diet for the 3rd and 5th weeks of age. Moreover, third treatment was outperformed significantly (P<0.05) when recorded 8.51 and 8.46 (gm/100 ml) for the 3rd and 5th weeks respectively compared to the first and second treatments. However, the first treatment was significantly lower than second and third treatments when the hemoglobin concentration was recorded to be 7.21 and 8.19 (gm/100 ml) for the 3rd and 5th weeks respectively. In addition, hemoglobin concentration in the 5th week was lower than that in the 3rd week for the third treatment, but it still not significantly different (table 4). It turned out from this study that increasing *Salvia officinalis* leaves powder concentration in the diet had an important role for increasing the concentration of hemoglobin.

Table (4): Effect of adding *Salvia officinalis* leaves powder to the diet on hemoglobin concentration (gm/100 ml).

Treatments \ Age (wk)	3	5
First treatment	7.21± 0.42 ^c	8.19± 0.37 ^c
Second treatment	7.86± 0.31 ^b	8.38± 0.55 ^b
Third treatment	8.51± 0.15 ^a	8.46± 0.34 ^a
Level of significance	*	*

* : P<0.05

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