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RESEARCH ARTICLE

EFFECT OF ADDING *SALVIA OFFICINALIS* LEAVES POWDER TO THE RATION ON PRODUCTIVITY CHARACTERISTICS OF BROILER TYPE ROSS 308

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ABSTRACT

This study was conducted at the Poultry Farm -Dept. of Animal Science, College of Agriculture, AL-Qasim Green University to investigate the effect of adding *Salvia officinalis* leaves powder to the ration on productivity characteristics of broiler type 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: control group without adding *Salvia officinalis* leaves powder to the diet, adding *Salvia officinalis* leaves powder by 1% (first treatment), and adding *Salvia officinalis* leaves powder by 2% (second treatment). The experiment included a study of the following characteristics: live body weight, weight gain, feed consumption, feed conversion ratio, and mortality rate. The results indicated that, the addition of *Salvia officinalis* leaves powder by 1% and 2% to broiler diet led to significant improvement in the live body weight ،weight gain, and significant decrease in the mortality rate. No significant differences were found between all treatments in the rest of productivity characteristics. This experiment concluded that adding *Salvia officinalis* leaves powder to the ration can lead to improve production performance of broilers.

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INTRODUCTION

Many medicinal plants inserted in feeding broilers and laying hens, including the fenugreek seeds, black bean and garlic powder 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 Thujonecompound, which is attributed to the cleanser impact 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, in the undeveloped land, 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, the 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. Another names for sage were: Qoaisenh, soft, Xialh, Asfaks, Alfaks, lilisanalail, Aizqan (Al- Sinusy, 2005) and due to the lack of studies on the influence of the *Salvia officinalis* leaves on the performance of poultry. Therefore, this study was conducted to determine the effect of adding *Salvia officinalis* leaves powder to broiler diet on the productive performance.

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MATERIALS AND METHODS

This study was carried out at the poultry farm- Dept. of Animal Science, College of Agriculture, AL-Qasim Green University from14/3/2015 to 18/4/2015. 90 unsexed broiler chicks type Ross 308 with an average weight of 43 g were used. Chicks were raised 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: control group without adding *Salvia officinalis* leaves powder to the ration, as well as *Salvia officinalis* leaves powder was added by 1% (first treatment), and then *Salvia officinalis* leaves powder was added by 2% (second treatment). The following parameters were measured weekly: live body weight, weight gain, average daily feed intake, feed conversion ratio and mortality rate. Completely 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% methioinine + cystine.
[2] Chemical structure was calculated according to the analysis of diet material found in NRC (1994).

RESULTS AND DISCUSSION

The results of the experiment showed no significant effect in the treatments of *Salvia officinalis* leaves powder on the rate of live body weight in the first and second week of the study (Table 2), while in the third week, the first and second treatments were superior significantly (P>0.05) compare to the control group, which recorded the highest live body weight (682.61 and 673.57 g / bird) respectively, while the control group was recorded a live body weight of (615.21 g / bird).The results of the fourth and fifth week showed continuous superiority of the first and second treatments significantly (P>0.05) in the rate of live body weight compared to the control group where the rate of the live body weight recorded was (1132.14 and 1128.18 g) respectively, and (1542.26 and 1523.37 g), respectively, while the control group recorded the following values (1020.53 and 1410.34 g) for the fourth and fifth week respectively.

The results in (Table 3) did not show statistically significant differences in the rate of weight gain during the first and second week of the experiment for all treatments. While significant superiority (P>0.05) was found in the third week of the study, where the first and second treatments recorded significant superiority compare to the control group, which recorded the highest weight gain rate of (331.20 and 316.47 g / bird) respectively, while the control group recorded a weight gain rate of (252.54 g / bird). On the fourth week of the study, the first and second treatments continued recording the highest weight gain rate as compared to the control group which recorded the following values (449.53 and 454.61 g / bird) respectively, while the control group recorded this value (405.32 g / bird). However, in the last week of the study (fifth week) no significant differences were recorded between all treatments.

From (Table 4) no significant differences was noted in feed consumption rate for all treatments during the experiment period (35 Days).

No significant differences was found in weekly feed conversion ratio for all treatments in the first and second week (Table 5). However, in the third week, the control group significantly (P>0.05) recorded the highest feed conversion ratio of (2.81 g) compared to the first and second treatments with the following values (2.12 and 2.18 g weight / g feed) respectively.

Table 2. Effect of adding *Salvia officinalis* leaves powder to the ration on the average body weight (gm/bird)

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
7.41±1542.26a	5.17±1132.14a	9.31±682.61a	6.11±351.41a	6.16±146.15a	first treatment
6.12±1523.37a	6.44±1128.18a	6.13±673.57a	3.18±357.10a	8.62±150.11a	second treatment
*	*	*	N.S	N.S	Level of significance

NS : No significant.* : P<0.05

Table 3. Effect of adding *Salvia officinalis* leaves powder to the ration on the weekly weight gain (gm/bird)

Age (week)

5	4	3	2	1	Treatments
4.05±389.81ab	405.32 8.42±b	22.01±252.54b	9.22±221.01a	6.52±98.56a	control group
410.12 13.17±a	6.08±449.53a	5.04±331.20a	7.08±205.26a	7.24±103.08a	first treatment
395.19 9.53±a	2.11±454.61a	3.25±316.47a	9.62±206.99a	6.35±107.13a	second treatment
N.S	*	*	N.S	N.S	Level of significance

NS : No significant.* : P<0.05

Table 4. Effect of adding *Salvia officinalis* leaves powder to the ration on weekly feed intake (gm/bird)

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
6.53±879.12a	763.664.31± a	9.11±702.43a	4.11±395.10a	2.31±190.33a	first treatment
8.41±883.64a	8.56 ± 741.73a	7.51±691.31a	5.18±392.62a	3.42±195.21a	second treatment
N.S	N.S	N.S	N.S	N.S	Level of significance

NS : No significant.

Table 5. Effect of adding *Salvia officinalis* leaves powder to the ration on the feed conversion ratio (gm feed/ gm weight)

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±2.14a	1.690.09±b	0.08±2.12b	0.05±1.92a	1.84±0.05a	first treatment
2.23±0.05a	1.63±0.03b	0.04±2.18b	0.07±1.89a	0.06±1.82a	second treatment
N.S	*	*	N.S	N.S	Level of significance

NS : No significant.* : P<0.05

Table 6. Effect of adding *Salvia officinalis* leaves powder to the ration on mortality rate

1-5 weeks	Treatments
a **0.04**2.26	control group
b **0.20**±1.50	first treatment
b **0.41**±1.00	second treatment
*	Level of significance

* : P<0.05

The control group continued recording the highest feed conversion ratio in the fourth week of the study which was (1.86 g weight / g feed) compared to the first and second treatments with values of (1.69 and 1.63 g weight/ g feed) respectively. However, no significant differences were recorded between all treatments in the fifth week of the experiment.

Table 6 is showing the effect of adding *Salvia officinalis* leaves powder to the ration in the mortality rate for broiler during the duration of the experiment (35 days). The highest mortality rate in the control group was noted significantly (P>0.05) which was (2.26%) compared to the first and second treatments mortality rate with the values of (1.50 and1.00%) respectively.

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