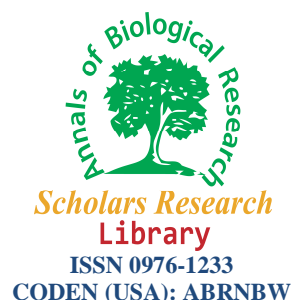




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# Effect of Herbal oil on performance, carcass quality, blood parameters and Immune System in female broiler chicken

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## ABSTRACT

*This study was investigation effect of dietary senna and anise oil medicinal plant on performance, blood biochemical and immunity parameters of broiler chickens. A total of 180 female chickens were divided into 4 groups and 3 repetitions with 15 chicken each. H1, First group as control group did not receive any herbal plant oil, H2, 200 ppm of senna oil, H3, 200 ppm of anise, H4, 200 ppm of both herbal plants oil. The highest amount of daily feed intake was observed in the group 4 and the lowest group was observed in control group also the lowest percent of abdominal fat was observed in experimental group 3, the highest percent of breast was in experimental group 4. The results showed that using these medicinal plant oil in their diet had significant effects on performance, carcass traits ( $p > 0.05$ ) but there is no effect on blood biochemical parameters and immune system of broiler chickens ( $p > 0.05$ ).*

**Keywords:** Broilers, Carcass traits, Senna, Anise, Blood biochemical.

## INTRODUCTION

The antimicrobial activity of essential oils derived from spices and herbs [1-2] is of interest as these oils could be used as feed additives alternative to antibiotics [3]. The positive effect of herbal plants on broilers have been reported by many studies. Their antibacterial potential, hypocholesterolemic effects, growth promoting and availability are the most beneficial part of herbs, which have drawn the scientists attention themselves [4]. Organic poultry is a relatively new expression in western countries which is going to expand in other countries. In this kind of poultry method, farmers do not use chemical compounds at all or in a very low level for sake of costumers, instead they use alternatives like organic acids, probiotics, and medicinal plants, and despite of higher prize of this method, these products have more fans in the costumers [5]. There are a lot of reports indicating the positive effects of herbs like anti-coccidial, anti-oxidant, anti-fungi and etc. Some of medical effects of herbs are related to their secondary metabolites such as phenols, necessary oils, saponins and etc [5]. Herbs have been used for some disease since long time ago because of availability, easy usage, non side effects. A recent study involving live birds showed that blends of the primary components of the essential oils could be used to control

*Clostridium perfringens*, the bacterium that causes necrotic enteritis in broilers [6]. Ground thyme has been shown to inhibit the growth of *S. typhimurium* when added to media [7]. The essential oil of the thyme has been shown to inhibit the growth of the *E. coli* in media [8]. Reported that feeding male broilers a 0.375% level of oligofructose improved per cent hot carcass weight and per cent breast weight while per cent fat pad was lowered [9]. Present experiment was planned to study the effects of senna and anise oil on performance, carcass quality, blood biochemical parameters and immunity parameters of female broiler chickens.

## MATERIALS AND METHODS

For this experiment, 180 one-day-old broiler chicks (Ross 308) were used. Chicks were assigned to H1, First group as control group did not receive any herbal plant oil, H2, 200 ppm of senna, H3 200 ppm of anise, H4 200 ppm of both herbal plant.

During days 0-42, unbound water and dietary was in poultries' access. Dietary and chick weight were going on weekly. Feed consumed was recorded daily, the uneaten discarded, and feed conversion ratio (FCR) was calculated (total feed : total gain). At the end of experiment, some analyses were done via SAS (Statistical Analyses Software) in the statistical level of 5% according to data gathered from dietary, weight improvement, average of FCR, weight of rearing period and carcass yield. At 42 days of age, four birds per replicate were randomly chosen, slaughtered and carcass percent to live weight and percent of carcass parts to carcass weight were calculated.

**Table 1. Ingredients and chemical analyses composition of the starter and grower diets**

Ingredients (g/kg)	1-2829-42	
Maize	557	300
Wheat	--	330
Soybean meal	370	300
Soybean oil	30	40
Fish meal	20	--
Limestone	10	--
Oyster shell	--	12
Dicalcium phosphate	5	15
Vitamin-mineral mix <sup>2</sup>	5	5
dl-methionine	1	1
Sodium chloride	2	2
Vitamin E (mg/kg)	--	100
Zn	--	50
<b>Analyzed chemical composition (g/kg)</b>		
Dry matter	892.2	893.5
Crude protein	222.3	200.7
Fat	62.4	62.9
Fiber	36.1	35.6
Ash	61.7	57.0
Calcium	8.22	8.15
Phosphorus	5.48	5.57
Selenium (mg/kg)	0.53	0.58
ME by calculation (MJ/kg)	12.78	12.91

<sup>1</sup> starter diet fed to birds from 0 to 21 days. <sup>2</sup> Provides per kilogram of diet: vitamin A, 9,000 IU; vitamin D3, 2,000, IU; vitamin E, 18 IU; vitamin B1, 1.8 mg; vitamin B2, 6.6 mg B2.; vitamin B3, 10 mg; vitamin B5, 30 mg; vitamin B6, 3.0 mg; vitamin B9, 1 mg; vitamin B12, 1.5 mg; vitamin K3, 2 mg; vitamin H2, 0.01 mg; folic acid, 0.21 mg; nicotinic acid, 0.65 mg; biotin, 0.14 mg; choline chloride, 500 mg; Fe, 50 mg; Mn, 100 mg; Cu, 10 mg; Zn, 85 mg; I, 1 mg; Se, 0.2 mg.

In the 35<sup>th</sup> day of experiment, three chicks were chosen from each group and inoculated from brachial vein by 0.1 ml (5 %). Heterophils to Lymphocytes ratio were determined which had been obtained from brachial vein of three randomly chosen chicks from each group in the 42<sup>th</sup> day of experiment. Blood samples were obtained from brachial vein and centrifuged in order to getting serum, after 12 hours of fasting in the 42<sup>th</sup> day of experiment.

**Table 2: Effect of different combinations of herbal plants on performance of broiler chickens.**

Treatment	Feed conversion ratio (g:g)	food Intake (g)	Body weight gain (g)
H1	1/89±0/52 <sup>b</sup>	79/40±2/17 <sup>b</sup>	44/92±1/23 <sup>b</sup>
H2	1/62±0/42 <sup>ab</sup>	82/23±2/16 <sup>ab</sup>	45/64±1/22 <sup>b</sup>
H3	1/65±0/13 <sup>ab</sup>	82/02±1/02 <sup>ab</sup>	45/19±1/93 <sup>b</sup>
H4	1/57±0/23 <sup>ab</sup>	82/31±2/4 <sup>ab</sup>	47/92±1/84 <sup>ab</sup>

a-b: in each column the numbers which have different letters have significant differences ( $p < 0.05$ ).

**Table 3: Effect of different combinations of Treatments on quality of broiler chicken's carcass**

H4	H3	H2	H1	Characters (%)
3/02±0/35 <sup>ab</sup>	3/02±0/21 <sup>ab</sup>	3/10±0/15 <sup>a</sup>	3/98±0/21 <sup>a</sup>	Abdominal Fat
2/31±0/13 <sup>a</sup>	2/31±0/21 <sup>a</sup>	2/43±0/31 <sup>a</sup>	2/29±0/42 <sup>a</sup>	Gizzard
32/31±0/31 <sup>ab</sup>	31/76±0/41 <sup>a</sup>	32/12±0/31 <sup>ab</sup>	30/36±0/36 <sup>a</sup>	Breast
27/56±0/45 <sup>a</sup>	27/22±0/04 <sup>a</sup>	27/30±0/41 <sup>a</sup>	27/13±0/14 <sup>a</sup>	Lap
3/05±0/07 <sup>a</sup>	3/56±0/41 <sup>a</sup>	3/62±0/32 <sup>a</sup>	3/71±0/31 <sup>a</sup>	Liver

a-b: in each column the numbers which have different letters have significant differences ( $p < 0.05$ ).

**Table 4: Effect of different combinations of herbal plants on blood biochemical and immune system parameters of broiler chickens.**

Parameters	H1	H2	H3	H4	SEM
Heterophils to Lymphocytes ratio	0.23	0.21	0.22	0.24	0.02
Globulin	1.43	1.40	1.46	1.49	0.20
Albumin	1.48	1.54	1.43	1.50	0.15

<sup>a-c</sup>Means with different subscripts in the same row differ significantly ( $P < 0.05$ )

**Table 5. The effect of different levels of herbal plants on blood biochemical of hens**

Blood Parameter	Treatments				SEM
	H1	H2	H3	H4	
Glucose (mg/dl)	171.20	173.36	172.40	174.36	3.52
Cholesterol (mg/dl)	136.66	135.02	135.12	134.92	4.54
Triglyceride (mg/dl)	42.65 <sup>a</sup>	42.01 <sup>a</sup>	40.69	41.10	2.87
LDL	34.11	33.26	33.15	32.57	1.51
HDL	83.20	82.64	83.06	83.28	0.56

Means with different subscripts in the same column differ significantly ( $P < 0.05$ )

## RESULTS AND DISCUSSION

The results obtain on the performance of broiler chicken under different levels of both herbal oil exudate are shown in table 2. There were a significant effect on FCR, food intake and body

weight gain of treated chicks ( $p < 0.05$ ). The highest amount of food intake and body weight gain was in group 4 but the least one was in the control group which was not affected by plants.

Table 3 shows the effect of plants and their different combinations on carcass and its parameters. According to the data, there are significant differences in the carcass characters ( $p < 0.05$ ). The lowest percentage of abdominal fat was in the 3 group and the highest percentage of breast was in the 4 group. Aromatic plants and essential oil extracted from these plants have been used as alternatives to antibiotics. For this reason, these plants are becoming more important due to their antimicrobial effects and the stimulating effect on animal digestive system [10]. The carvacrol in nettle has stimulatory effects on pancreatic secretions by increasing the secretions of digestive enzymes more amounts of nutrients like amino acids can be digested and absorbed from the digestive tract and thereby improve carcass traits [4]. Phytochemical compounds have a number of active ingredients and pharmacologically active substances that are beneficial for maintaining health and improving performance of poultry and other livestock species. They are reported to stimulate secretion of digestive enzymes (lipase and amylase) and intestinal mucous in broilers, to stimulate feed digestion, to impair adhesion of pathogens and to stabilize microbial balance in the gut (Lee et al., 2003). The effects of experimental plants on blood biochemical parameters are presented in Table 4. There is no effect on blood biochemical parameters and immune system of broiler chickens.

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