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# Influence of two herbal plants extract on performance and certain blood Parameters of Japanese quails

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## ABSTRACT

*In this study we tried to investigate the effect of Melissa officinalis and Tanacetum balsamita extract on performance and serum composition of Japanese quails. One week old of 400 Japanese quails were divided into 4 groups and 5 repetitions with 20 quails each. First group, TG1, control group did not receive any herbal plant extract, second group, TG2, fed 200 ppm of melissa officinalis extract, third group, TG3, fed 200 ppm of tanacetum balsamita extract, and group of 4, TG4, fed 2% of both herbal plants. The results showed that using these two medicinal plants in their diet had significant effects on performance, carcass traits and blood biochemical parameters of Japanese quails ( $p < 0.05$ ). The best result for FCR was in group 2 and the highest amount of daily feed intake and average daily gain were observed in the TG4 and the highest percent of breast and gizzard were observed in group of 4 but the highest percent of spleen was in TG3. Also the serum total cholesterol and triglycerides concentration were significantly reduced in groups of 4 compared to the control group ( $P < 0.05$ ) but there is not any significant effects on other blood parameters.*

**Keywords:** Melissa officinalis, Tanacetum balsamita, Japanese quails, Carcass, Blood, Performance.

## INTRODUCTION

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 [1]. Herbs have been used for some disease since long time ago because of availability, easy usage, non side effects. Herbs have been used for some disease since long time ago because of availability, easy usage, non side effects. Many herbs have a long history of use even prehistoric use, in preventing or treating human and animal

diseases. Aromatic plants have been used traditionally in therapy of some diseases worldwide for a long time. Research on the use of herbal mixtures in diets has produced inconsistent results [2]. Some authors state significant positive effects on performance [3-5], whereas another group of authors established no influence on gain, feed intake or feed conversion [4-6].

Recent studies have shown that they have a stimulating effect on the digestive systems of animals, through the increasing production of digestive enzymes and by improving the utilization of digestive products through enhanced liver function [7-8]. Furthermore, limited research has suggested that some aromatic plants and their components could improve feed intake, feed conversion ratio and carcass yield [9-11]. There are a large number of feed additives available for inclusion in animal and poultry diets to improve their performance. However, the use of chemical products especially (hormones and antibiotics), may cause unfavorable side effects. Moreover, there is evidence indicating that these products could be considered as pollutants for human and threaten the health on the long-run. Attempts to use the natural materials such as medicinal plants could be widely accepted as feed additives to improve the efficiency of feed utilization and productive performance [12].

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## MATERIALS AND METHODS

One week old of 400 Japanese quails were divided into 4 groups and 5 repetitions with 20 quails each. First group, TG1, control group did not receive any herbal plant extract, second group, TG2, fed 200 ppm of *Melissa officinalis* extract, third group, TG3, fed 200 ppm of *Tanacetumbalsamita* extract, and group of 4, TG4, fed 2% of both herbal plant. During days 0-42, unbound water and dietary was in poultries' access. Dietary, chick and weigh 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 analyzes 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 6 weeks of age, five quails per replicate were randomly chosen, slaughtered and carcass percent to live weight and percent of carcass parts to carcass weight were calculated. Blood samples were obtained from branchial vein and centrifugated in order to getting serum, after 12 hours of fasting in the 42<sup>th</sup> day of experiment.

**Table 1. Ingredients and chemical analyses composition of diets**

<b>Ingredients (g/kg)</b>	
Com	48.8
Soybean oil	2.2
Soybean meal	40
Fish meal	6
Dicalcium	1.6
Vitamin premix*	0.25
Mineral premix**	0.25
Methionine	0.25
<b>Analyzed chemical composition (g/kg)</b>	
Dry matter	92.2
Crude protein	23.9
Fat	3.46
Fiber	4.13
Ash	6.7
Calcium	1.22
Phosphorus	0.41
ME by calculation (MJ/kg)	12.21

\* Vitamin premix (/kg diet): Vitamin A - 1.000 IU; vitamin D<sub>3</sub> - 1.000 IU; vitamin E - 42 g; vitamin K<sub>3</sub> - 4 g; vitamin B<sub>1</sub> - 3.6 mg; vitamin B<sub>2</sub> - 7 g; vitamin B<sub>6</sub> - 8 mg; vitamin B<sub>12</sub> - 0.02 mg; niacin - 24 mg; folic acid - 12 mg; biotin - 0.05 mg; cal-D-pentothemat (pantothenic acid) - 12 mg; cholin chloride - 150 mg; vitamin C - 60 mg

\*\* Mineral premix (mg/kg diet): Fe - 72; Zn - 72; Cu - 6; I - 1.2; Co - 0.24; Se - 0.18; Mn - 96

## RESULTS AND DISCUSSION

The effects of melissaofficinalis and tanacetumbalsamita extract on different parameters of performance are shown in table 2. The best result for FCR was in group 2 and The highest amount of daily feed intake and average daily gain were observed in the G4 ( $P > 0.05$ ). Improve in the feed conversion ratio in the treated groups with the these herbal plant could have been due to their antibacterial and antifungal effects which can lead to decrease in the amount harmful microbes of digestive system, improve their immunity and performance. The improvement of body weight gain is due to the active materials found in herbal, causing greater efficiency in the utilization of feed, resulting in enhanced growth. There is an evidence to suggest that herbs, spices and various plant extracts have appetite and digestion stimulating factors, in addition to their antimicrobial activity against bacteria found in the intestine [14-15]. Table 3 shows the effect of plants and their different combinations on carcass and its parameters. The highest percent of breast and gizzard were observed in group of 4 but the highest percent of spleen was in TG3. There is a possibility of gathering these to antimicrobial herbs made a remarkable decrease in the amount of intestine microbial colony and this prevented from lysis of amino acids and they used in the formation of proteinic tissues and increased the breast percentage [16]. However, effects of phytogetic compounds and their active ingredients are not always observed in terms of performance parameters, as they also affect different metabolic pathways and activity of different body systems.

The effects of melissaofficinalis and tanacetumbalsamita extract on blood biochemical of quails are summarized in Table 4. Serum total cholesterol and triglycerides concentration were significantly reduced in groups of 4 compared to the control group ( $P < 0.05$ ) but there is not any

significantly effects on other blood parameters. The main reason of cholesterol and triglycerid decrease in blood of chicks is substances like carvacrol and tymol which are present in herbs such as of melissaofficinalis and tanacetumbalsamita. These substances have effect on cholesterol and triglyceride and decrease these harmful parameters in blood [17].

**Table 2: Effect of different combinations of herbal plants on performance of Japanese quails**

Treatments	TG1	TG2	TG3	TG4	SEM
<b>Feed conversion ratio</b>	3.50 <sup>a</sup>	3.08 <sup>ab</sup>	3.35 <sup>a</sup>	3.17 <sup>ab</sup>	0.13
<b>Feed intake (g/day)</b>	12.15 <sup>a</sup>	12.23 <sup>a</sup>	12.76 <sup>ab</sup>	12.98 <sup>ab</sup>	0.97
<b>Average daily gain (g/day)</b>	3.79 <sup>a</sup>	4.22 <sup>ab</sup>	4.28 <sup>ab</sup>	4.33 <sup>ab</sup>	0.09

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

**Table3: Effect of different combinations on carcass of Japanese quails**

Characters (%)	TG1	TG2	TG3	TG4	SEM
<b>Carcass percentage</b>	78.25 <sup>a</sup>	79.32 <sup>ab</sup>	79.50 <sup>ab</sup>	79.62 <sup>ab</sup>	3.23
<b>Spleen</b>	2.30 <sup>a</sup>	2.23 <sup>ab</sup>	2.91 <sup>ab</sup>	2.82 <sup>ab</sup>	0.32
<b>Liver</b>	2.20 <sup>a</sup>	2.80 <sup>ab</sup>	2.82 <sup>ab</sup>	2.91 <sup>ab</sup>	0.09
<b>Gizzard</b>	7.32 <sup>a</sup>	7.61 <sup>ab</sup>	7.41 <sup>ab</sup>	7.95 <sup>ab</sup>	0.11
<b>Brest</b>	21.13 <sup>a</sup>	22.31 <sup>a</sup>	22.51 <sup>ab</sup>	22.78 <sup>ab</sup>	1.29

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

**Table4. The effect of different level of treatment on blood biochemical of Japanese quails**

Blood Parameter	Treatments				SEM
	TG1	TG2	TG3	TG4	
<b>Glucose (mmol/L)</b>	121.12	122.40	124.38	123.64	0.89
<b>Cholesterol (mg/dl)</b>	117.46 <sup>a</sup>	115.06 <sup>a</sup>	114.32 <sup>ab</sup>	113.63 <sup>ab</sup>	3.75
<b>Triglyceride (mmol/L)</b>	118.36 <sup>a</sup>	109.61 <sup>ab</sup>	116.09 <sup>a</sup>	112.45 <sup>ab</sup>	2.32
<b>Total protein(g/l)</b>	123.12	123.20	123.61	123.97	1.77
<b>Albumin(g/l)</b>	123.36	123.63	123.33	123.12	2.36

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

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