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Annals of Biological Research, 2011, 2 (6):657-661
(http://scholarsresearchlibrary.com/archive.html)

Annals of Biological Research
Scholars Research Library
ISSN 0976-1233
CODEN (USA): ABRNBW

Evaluation of two medicinal plants extract in diets of Japanese quails

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ABSTRACT

A study was conducted to determine the performance, carcass and blood parameters ofJapanese quails diets supplemented withofmenthapiperitaand watercress extract.This study was carried out with 360 of 8 days Japanese quails in 4 treatment groups, 3 repetitions and 30 birds for each group. First group (A) as control group did not receive any herbal planets, second group (B) fed 200 ppm of menthapiperitaextract, third group (C) fed 200 of watercress extract and fourth group (D) fed 200 of bothmenthapiperitaand watercress extract herbal planet. There were significant effects of dietary treatments on body weight gain, feed intake and FCR ($p<0.05$). The highest amount of daily feed intake andaverage daily gain was observed in the D.The highest percent of carcass percentage and spleenwere observed in group 4, and the highest percent of liver was observed in group 3.The amount of cholesterol and triglyceride were significantly reduce in groups B and Dcompare with control group($P<0.05$).

Keywords: *menthapiperita*, *watercress*, Japanese quails, Carcass.

INTRODUCTION

Several compounds like, enzymes, organic acids, probiotics, prebiotics and phytogenics are used to improve the performance [1]. Recently, aromatic plants, and their associated essential oils or extracts are being concerned as potentially growth promoters. At present the scientists are working to improve feed efficiency and growth rate of livestock using useful herbs [2].Phytogenic compounds are the groups of feed additives that have been reported to possess a potential for growth enhancement of livestock species due to presence of a number of pharmacologically active substances. They are supposed to enhance feed intake, activate digestive enzymes and stimulate immune function [3].

The use of antibiotics in poultry diets has been curtailed and scientists have been searching for alternatives to antibiotics. In view of this, aromatic plants and herbal extracted from plants have become more important due to their potential antimicrobial and stimulating effects in the animal digestive system. Aromatic plants have been used traditionally as antiparasitic, anthelmintic, analgesic, expectorant, sedative, antiseptic and anti-diabetic substances in many parts of the world [4].Various dietary herbs, plant extracts have been studied for their antimicrobial and

growth promoter abilities [5-6]. Nevertheless, it has been indicated that the outcome of a test can be affected by factors such as the method used to extract the essential oil from herb [7], Furthermore, limited research has suggested that some aromatic plants and their components could improve feed intake, feed conversion ratio and carcass yield [8-9]. 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 [10].

There is an increasing trend in the prevalence level of disease, by industrialization of poultry science and breeding chickens in a large scale. To cope with this problem and improve the biological and nutritional characters of chickens, chemical compounds like antibiotic have been used highly in poultry industry [11]. After many years, the long term side effects of these products like microbial resistance and increase of the blood cholesterol level in the livestock lead to the ban of these commercial antibiotics[12-13].

The results showed that using of *menthapiperita*and *watercress* extract in Japanese quails have significantly effects on performance, carcass quality and blood biochemical parameters.

MATERIALS AND METHODS

Table 1. Ingredients and chemical analyses composition of diets

Ingredients	**(g/kg)**
Corn	47.5
Soybean oil	2.8
Soybean meal	41
Fish meal	5
Dicalcium	1.8
Vitamin premix*	0.25
Mineral premix**	0.25
Methionine	0.25
Analyzed chemical composition (g/kg)	
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_3 – 1.000 IU; vitamin E - 42 g; vitamin K_3 - 4 g; vitamin B_1 – 3.6 mg; vitamin B_2 - 7 g; vitamin B_6 - 8 mg; vitamin B_{12} – 0.02 mg; niasin - 24 mg; folic acid - 12 mg; biotin – 0.05 mg; cal-D-pentothenat (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*

This study was carried out with 360 of 8 days Japanese quails in 4 treatment groups, 3 repetitions and 30 birds for each group. First group (A) as control group did not receive any herbal planets, second group (B) fed 200 ppm of *menthapiperita* extract, third group (C) fed 200 of *watercress extract* and fourth group (D) fed 200 of both*menthapiperita*and *watercress* extract herbal planet. During days 8-42, 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. For the experimental period of 42 days the quails were kept in cages (20x 22 x 25 cm), four quails per cage. some analyzes were done via SAS in the statistical level of 5% according to data gathered from dietary, weight improvement, average of FCR, weight of rearing period and carcass yield.After 9-12 h of keeping hungry to defecate the digestive system contents, the quails were weighted and then slaughtered in order to determine the carcass total weight and carcass characters percent At 6 weeks of age, three quails per replicate were randomly chosen, slaughtered and carcass percent to live weight and percent of carcass parts to carcass weight were calculated. On 42 day of experimental period, 3 ml of blood was collected from brachial vein from one bird of each pen (from four birds of eachtreatment). Serum was isolated by centrifugation at 3,000×g for 10 min.The serum concentrations of total triglyceride, cholesteroland level of glucose were analyzedby an automatic biochemical analyzer.

RESULTS AND DISCUSSION

The effect of both of *menthapiperita*and *watercress* extract on body weight, daily weight gain, and feed intake are shown in Table 2.There were significant effects of dietary treatments on body weight gain, feed intake and FCR (p<0.05). The highest amount of daily feed intake andaverage daily gain was observed in the D.

The addition of a mixture of herbal essential oils to the diet increased (P < 0.05) body weight gain of the quails at 42 days of age. The improvement in body weight gain in this study agreed with results reported by Hertrampt[9], McCartney [14], These results suggest that the improved digestibility of the nutrients leads to a more balanced gut flora with the potential to reduce the proportion of pathogenic bacteria. The benefits of the use of essential oils in broiler nutrition may be due to the greater efficiency in the utilization of feed, resulting in enhanced growth.

The improvement of body weight gain and feed conversion are 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 [6,15]. Table 3 shows the effect of *menthapiperita*and *watercress* extract on carcass parameters. According to the data, there are significant differences in the carcass characters (p<0.05). The highest percent of carcass percentage and spleen were observed in group 4, and the highest percent of liver was observed in group 3. The carvacrol in these herbal plants have 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 [16]. Herbal planet could stimulate the digestion system in poultry, improve the function of liver and increase the pancreatic digestive enzymes. Enhancement of the metabolism of herbal planet, carbohydrates and proteins in the major organs would increase growth rate of these organs [17-18].According to *Akiba* and *Matsumoto* high level of fibers can increase the excretion of bile and this can decrease the cholesterol level of blood (.Akiba and Matsumoto, 1982). The effects of *menthapiperita*and *watercress* extract in starter and grower feeds on blood biochemical is summarized in Table 4.The amount of

cholesterol and triglyceride were significantly reduce in groups B and D compare with control group (P<0.05).

Table 2: Effect of *menthapiperita*and *watercress* extract on performance of Japanese quails.

Treatments	A	B	C	D	SEM
Feed conversion ratio	3.41[a]	3.12[ab]	3.36[a]	3.10[ab]	0.23
Feed intake (g/day)	12.13[a]	12.20[a]	12.75[ab]	13.01[ab]	1.21
Average daily gain (g/day)	3.89[a]	4.02[a]	3.99[a]	4.31[ab]	0.36

a-bMeans with different subscripts in the same column differ significantly (P < 0.05)

Table3: Effect of *menthapiperita*and *watercress* extract on carcass of Japanese quails

Characters (%)	A	B	C	D	SEM
Carcass percentage	78.19[a]	78.59[a]	78.36[a]	[ab]79.32	2.65
Spleen	2.22[a]	2.36 [a]	2.32 [a]	2.69[ab]	3.86
Liver	2.24[a]	2.36[a]	2.94[ab]	2.45[a]	0.23
Gizzard	7.21	7.26	7.31	7.30	0.26

a-bMeans with different subscripts in the same column differ significantly (P < 0.05)

Table4. The effect of *menthe piperita*and *watercress* extract on blood biochemical of Japanese quails

	Treatments				
Blood Parameter	G1	G2	G3	G4	SEM
Glucose (mmol/L)	123.32	123.98	124.03	123.96	2.09
Cholesterol (mg/dl)	118.23[a]	115.36[ab]	117.63 [a]	115.87[ab]	2.38
Triglyceride (mmol/L)	117.30[a]	114.65[ab]	116.78[a]	115.01[ab]	2.97

a-bMeans with different subscripts in the same column differ significantly (P < 0.05)

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