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Influence of Caraway on improve performance and blood parameters of Japanese quails

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ABSTRACT

The research was conducted to examine the effects of supplementation dietary using different levels of caraway of medicinal plant on performance, carcass characteristics, and blood biochemical were studied in Japanese quails. At first 360, 7 days old quails were divided to 4 groups and 3 replicates of 30 birds in each group. Experimental groups included B1, control group with no caraway supplementation, B2, B3, and B4 received, 1%, 1.5%, and 2% caraway powder respectively. The results showed that using caraway in their diet had significant effects on performance, carcass traits and blood biochemical parameters of quails ($p < 0.05$). The highest amount of average daily gain and the best result for FCR was observed in the group 4 and the highest level of daily feed intake was in B3 also the highest percent of breast was observed in experimental group 4. The results showed that serum total cholesterol and triglycerides concentration were significantly reduced in groups of 3 and 4 compared to the control group ($P < 0.05$).

Keywords: Caraway, Blood parameter, Japanese quails, Performance.

INTRODUCTION

It is conceivable that herbal agents could serve as safe alternatives to antibiotic growth promoters due to their suitability and preference of the bird meet consumers, reduced risks and minimal health hazards. 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 [1-2]. Nowadays, there are a lot of concerns to finding non-synthetic alternatives for antibiotics among the scientists. The positive effect of herbal plants on broilers have been reported by many studies [2,3].

It was suggested that terpenoids and phenyl propanoids can penetrate the membranes of the bacteria and reach the inner part of the cell because of their lipophilicity[4]. Moreover, structural properties, such as the presence of the functional groups [5] and aromaticity[6] are also responsible for the antibacterial activity of essential oils.

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 [7]. Some authors state significant positive effects on performance [8-10], whereas another group of authors established no influence on gain, feed intake or feed conversion [10-11]. Today's, the concern of scientists is reducing the abdominal fat and instead increase the valuable parts of carcass [12-13]. One of the sources which positively affects these characteristics is medicinal plants [14-15]. Abd El-Latif et al, [16] found that, Thyme in diet of quail can improve the carcass and percentage of internal organs compared to control group; Abdel-Malak et al, [17] reported the same results by Biotonic on broilers. There are a lot of reports indicating the positive effects of herbs like anti-coccidal, 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 [19]. Herbs have been used for some disease since long time ago because of availability, easy usage, non side effects. They also exert certain immunological consequences in bird's body kong et al,[20]. According to the aforementioned details, this study was conducted in order to evaluate the effect of on performance, and blood chemistry of Japanese quails.

Table 1. Ingredients and chemical analyses composition of diets

Ingredients (%)	
Com flour	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
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 D₃ - 1.000 IU; vitamin E - 42 g; vitamin K₃ - 4 g; vitamin B₁ - 3.6 mg; vitamin B₂ - 7 g; vitamin B₆ - 8 mg; vitamin B₁₂ - 0.02 mg; niacin - 24 mg; folic acid - 12 mg; biotin - 0.05 mg; cal-D-pentotenat (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

MATERIALS AND METHODS

At first 360, 7 days old quails were divided to 4 groups and 3 replicates of 30 birds in each group. Experimental groups included B1, control group with no caraway supplementation, B2, B3, and B4 received, 1%, 1.5%, and 2% caraway powder respectively. 6 weeks 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 analyses was 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 barchial vein and centrifuged in order to getting serum, after 12 hours of fasting in the 42th day of experiment.

RESULTS AND DISCUSSION

The effects of different dietary levels of caraway on performance are presented in Table 2. The highest amount of average daily gain and the best result for FCR was observed in the group 4 and the highest level of daily feed intake was in B3. 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. pharmacologically active substances (phenolic compounds and alkamides) that are supposed to enhance feed digestion and absorption by stimulating secretion of digestive enzymes leading to better feed utilization and assimilation [20]. herbal planet could stimulate the digestion system in poultry, improve the function of liver and increase the pancreatic digestive enzymes. The positive effect of dietary herbal planet on body weight gain and the feed conversion ratio could be related to the increased efficiency of feed utilization and/or altered carcass composition. Similarly, Ather[21] reported an improved performance in broilers when a poly-herbal premix which contained five herbs was used. In agreement with these results, similar results were observed in recent studies where it was reported that essential oils had blocking effects on pathogens in the digestive system [22], and improved feed intakes, feed conversion ratios and carcass yields [23].

The data which obtained from carcass characters of Japanese quails fed by caraway are shown in Table 3 ($p < 0.05$). The highest percent of breast and liver was observed in experimental group 4. Stimulation of bile secretion, stimulation of small intestine, antibacterial effect on intestine, the nature of essential oils of herbs in preventing of fatty tissue formation and etc. Better digestion of nutrition like amino acids cause storage of them in carcass and decrease of fat in it. The mean values of serum constituents in broiler chicken fed different supplemented diets are shown in table 4. The results showed that serum total cholesterol and triglycerides concentration were significantly reduced in groups of 3 and 4 compared to the control group ($P < 0.05$). The main reason of decrease in level of cholesterol and triglycerids in blood of quails is substances like carvacrol and tymol which are present in herbs. These substances have effect on cholesterol and triglyceride and decrease these harmful parameters in blood [29].

Table 2: Effect of different level of caraway on performance of Japanese quails.

Treatments	B1	B2	B3	B4	SEM
Feed conversion ratio	3.51 ^a	3.39 ^a	3.11 ^a	3.04 ^{ab}	0.08
Feed intake (g/day)	12.18 ^a	12.26 ^a	12.99 ^{ab}	12.45 ^{ab}	0.15
Average daily gain (g/day)	3.78 ^a	3.81 ^a	4.24 ^{ab}	4.29 ^{ab}	0.74

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

Table3: Effect of different level of caraway on carcass of Japanese quails

Characters (%)	B1	B2	B3	B4	SEM
Carcass percentage	77.97	77.96	78.02	78.12	1.11
Spleen	2.11	2.25	2.19	2.30	0.09
Liver	2.29 ^a	2.30 ^a	2.52 ^a	2.81 ^{ab}	0.41
Gizzard	7.19 ^a	7.24 ^a	7.72 ^{ab}	7.79 ^{ab}	0.23
Brest	21.35 ^a	22.40 ^a	22.42 ^{ab}	22.48 ^{ab}	2.12

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

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

Blood Parameter	B1	B2	B3	B4	SEM
Glucose (mmol/L)	122.48	122.52	122.61	122.30	2.48
Cholesterol (mg/dl)	112.59 ^a	111.97 ^a	110.06 ^a	109.99 ^{ab}	2.61
Triglyceride (mmol/L)	115.67 ^a	115.35 ^a	114.21 ^{ab}	114.01 ^{ab}	2.23
Total protein(g/l)	122.62	122.02	122.55	123.42	2.98

a-b Means with different subscripts in the same column differ significantly

REFERENCES

- [1] Tekeli A., L.Çelik, H.R. Kutlu. and M. Gorgulu, **2006** Effect of dietary supplemental plant extracts on performance, carcass characteristics, digestive system development, intestinal microflora and some blood parameters of broiler chicks; XII European Poultry Conference, Italy, 10 – 14 Sept.
- [2] Mansoub, N.H. **2011**. *Annals of Biological Research*. 2 (4) :315-320
- [3] Osman N.E.,GTalat .,C Mehmet.,DBestami .and UG Simsek, **2005**. *Int. J. Poult. Sci.* 4: 879-884.
- [4] Helander, I. M., H. L. Alakomi K. Latva-Kala, T. Mattila-Sandholm, I. Pol, E. J. Smid, L. G. M. Gorris and A. Von-Wright, **1998**. *J. Agri. Food Chem.*, 46: 3590-3595.
- [5] Farag, R. S., Z. Y. Daw, F. M. Hewed and G. S. A. El- Baroty, **1989c**. *J. Food Prot.*, 52: 665-667.
- [6] Bowles, B. L. and Miller A. J., **1993**. *J. Food Prod.*, 56: 788-794.
- [7] Aboul-fotouh, G.E., Allam, S.M.; Shehat, E. and Abdel-Azeem, S.N. **1999**. *Egypt. J.Nutr. and Feeds*, 2 : 79-87.

- [8] Ertas O.N, Guler T, Çiftci M, Dalkilic B, Simsek Ü.G .**2005**. *In. J. Poult. Sci.* 4: 879-884.
- [9] Cross D.E, Mcdevitt R. M, Hillman K, Acamovic T .**2007**. *Br. Poult. Sci.* 48: 496-506.
- [10] Peric L, Milosvic N, Đukic-Stojcic M, Bledov S .**2008**. Effect of phytogenic products on performance of broiler chicken, World Nutrition Forum, Mayrhofen, Austria: Nottingham University Press, 18-20, 325.
- [11] Ocak N, Ereter G, Burak A.K.F, Sungue M, Altop A, Ozmen A .**2008**. *Czech. J. Anim. Sci.* 53: 169-175.
- [12] Guler, T., Dalkilic, B. Ertas, ON. andCiftci, M. **2006**. *Asianian-Austeralian Journal of Animal Science.* 19 (3): 425-430.
- [13] Al- Kassie, G. A. M. **2009**. *Pakistan Veterinary Journal.* 29 (4): 169-173.
- [14] Alcicek, A., Bozkurt, M. and Cabuk, M. **2004**. The [6] Hassan, I. I., Askar, A. A. and El-Shourbagy, G. A. **2004**. *Egyptian Poultry Science.*24 :247-266.
- [15] Pernakova, D., Mate, D. Rozanska, H. and Kovac, G. **2007**. *Bulltan Veterinary Industry Pulawy.* 51: 585-589.
- [16] Abd El-Latif, S.A., Faten, A. Ahmed. and El-Kaiaty, A.M. **2002**. *Egyptian Poultry Science.* 22(1):109-125.
- [17] Abdel-Malak, N.Y. Abdel-Malak, M.S. ; El-Gendi, G.M. and Naguib, E. F. **1995**. *Egyptian Poultry Science.* 15:111-139.
- [18] Fritz Z, Schleicher A, Kinal S . **1993**. *J. Anim. Feed Sci.* 2: 189–195.
- [19] Kong XF, Hu YL, Yin YL, Wu GY, Rui R, Wang DY, Yang CB **2006**. *Poult. Sci.*, 85: 2169-2175.
- [20] Durrani F.R., Chand N., Zaka K., Sultan A., Khattak F.M., Durrani Z., **2007**. *Pakistan J. Biol. Sci.* 10, 4164-4167
- [21] Ather, M.A.M., **2000**. Polyherbal additive proves effective against vertical transmission of IBD. *World Poultry-Elsevier* 16, 50-52.
- [22] Alçiçek, A., Bozkurt, M. &Çabuk, M., **2003**. *Afr. J. Anim. Sci.* 33, 89-94.
- [23] Zargari, **2001**. Medical plants.Second edition.Tehran University Press.pp: 25-36.