Available online at www.scholarsresearchlibrary.com

Scholars Research Library

Scholars Research Library

Annals of Biological Research, 2011, 2 (6):389-393
(http://scholarsresearchlibrary.com/archive.html)

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

Black pepper improve performance, characteristics and effect on some blood parameters of Japanese quails

[1]Mahmoud Pooryousef Myandoab* and [2]Navid Hosseini Mansoub

[1]Department of Agronomy, Mahabad Branch, Islamic Azad University, Mahabad, Iran
[2]Mahabad Branch, Islamic Azad University, Mahabad, Iran

ABSTRACT

Four feeding trials were conducted to investigate the effects of using different levels of black pepper of medicinal plant on performance, carcass characteristics and blood biochemical were studiedinJapanese quails. A total of 500 Japanese quails were divided into 4 groups and 5 repetitions with 25 quails each.G1), First group as control group did not receive any black pepper, G2) 1% of black pepper, G3) 1.5% of black pepper, G4) 2% of black pepper.The results showed that using black pepper in their diet had significant effects on performance, carcass traits and blood biochemical parameters of quails ($p<0.05$). The highest amount of daily feed intake andbody weight gain was observed in the group 4also the highest percent of breast was observed in experimental group4.The results showed that serum total cholesterol and triglycerides concentration were significantly reduced in groups of 3 and 4 compared to the control group ($P<0.05$). But there is no effect on total protein and albumin.

Keywords: Carcass, Blood parameter, Japanese quails, Performance, Black pepper.

INTRODUCTION

Today's, the concern of scientists is reducing the abdominal fat and instead increase the valuable parts of carcass [1-2]. One of the sources which positively affects these characteristics is medicinal plants [3-4]. Abd El-Latif*et al*, [5] found that, Thyme in diet of quail can improve the carcass and percentage of internal organs compared to control group; Abdel-Malak*et al*, [6] reported the same results by Biotonic on broilers. Alcicek *et al*, [7] used 48 mg essential oil of herbs per 1Kg of diet, and found out that it can enhance the carcass characteristics. There are anti-bacterial and anti-oxidant effects in medicinal plants [8-9]. The antibacterial components of medicinal plants affects by changing in the permeability of bacteria's membrane to Na^+ and Ka^+ ions [10]. It was suggested that terpenoids and phenylpropanoids can penetrate the membranes of

the bacteria and reach the inner part of the cell because of their lipophilicity[11]. Moreover, structural properties, such as the presence of the functional groups [12] and aromaticity[13] are also responsible for the antibacterial activity of essential oils.

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 birds diets has produced inconsistent results [14]. Some authors state significant positive effects on performance [15-17], whereas another group of authors established no influence on gain, feed intake or feed conversion [16,18]. 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]. There is need to find more efficient alternatives or combinations of different alternatives for maintaining health and improving performance of poultry and other livestock species. 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.In this experiment we tried to investigate effects of different level of black pepper on performance, and blood chemistry of Japanese quails.

Table 1. Ingredients and chemical analyses composition of diets

Ingredients (%)	
Corn 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 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-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

A total of 500 Japanese quails were divided into 4 groups and 5 repetitions with 25 quails each.G1), First group as control group did not receive any black pepper, G2) 1% of black pepper, G3) 1.5% of black pepper, G4) 2% of black pepper. 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 quils 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

For the period of 7-42 days,the effects of different levels of black pepper on performance of Japanese quails s are showed in Table 2. The highest amount of daily feed intake andbody weight gain was observed in the group 4 but the best result of FCR was in group 3.This result is in agreement with the finding of and Azadegan-meher*et. al*.[21] who reported decreasing in liver weight due to supplemental protexin. But these results are not consistent with work of Yazdankish*et. al*., [22].Langhout [23], who showed that 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 [24-25].Al-Kassie [26] who found that herbal planet effect on the live weight gain and the improvement of the health of birds, in addition to other performance traits, feed conversion ratio and feed intake.

Table 3 shows the effect of black pepper on carcass and it's parameters. According to the data, there are significant differences in the carcass characters ($p<0.05$).the highestpercent of breastand gizzard were observed in experimental group 4.The present of antioxidants and phenolic substance in herbal plant may be the main cause of improvement in breast percent of carcass. The presence of harmful bacterial populations in the gastrointestinal tract may cause breakdown of amino acids and thereby reduce their absorption as antimicrobial substances are present in herbal plant can reduce the harmful bacterial populations in the gastrointestinal tract and improve the levels of absorbed amino acids [27-28]. There is a possibility of gathering these to antimicrobial herbs made a remarkable decrease in the amount of intestine microbal colony and this prevented from lysis of amino acids and they used in formation of proteinic tissues and increased the breast percentage. *Lee et al* [27].

The concentration of serum glucose,total protein and albuminwere not significantly effects in compared to the control group(table 4). But 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]. *Al-Kassie* [30] reported a big statistically difference in blood cholestrol

level compar to control group. According to *Akiba* and *Matsumoto* [31] high level of fibers can increase the excretion of bile and this can decrease the cholesterol level of blood.

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

Treatments	G1	G2	G3	G4	SEM
Feed conversion ratio	3.44[a]	3.20[a]	3.05[a]	3.07[ab]	0.11
Feed intake (g/day)	12.20[a]	12.23[a]	12.24[a]	12.39[ab]	1.10
Average daily gain (g/day)	3.90[a]	3.98[b]	4.22[ab]	4.30[ab]	0.52

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

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

Characters (%)	G1	G2	G3	G4	SEM
Carcass percentage	[a]77.82	78.01[a]	78.42[a]	[ab]78.90	1/99
Spleen	2.17	2.19	2.20	2.26	0.15
Liver	2.32[a]	2.35[a]	2.39[a]	2.69[ab]	0.19
Gizzard	7.22[a]	7.33[a]	7.51[ab]	7.86[ab]	0.23
Brest	21.35[a]	22.40[a]	22.42[ab]	22.48[ab]	1.87

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	G1	G2	G3	G4	G5	SEM
Glucose (mmol/L)	121.93	122.02	122.01	121.98	122.53	3.92
Cholesterol (mg/dl)	114.31[a]	114.02 [a]	112.21 [a]	109.86[ab]	109.09[ab]	3.11
Triglyceride (mmol/L)	116.88[a]	116.23[a]	114.35[a]	113.61[ab]	113.51[ab]	3.64
Total protein(g/l)	123.52	123.59	123.68	124.02	123.98	2.98
Albumin(g/l)	122.12	123.52	123.56	123.96	124.01	3.09

a-bMeans with different subscripts in the same column differ significantly

REFERENCES

[1] Guler, T., Dalkilic, B. Ertas, ON. andCiftci, M. **2006**. *Asianian-Austeralian Journal of Animal Science.* 19 (3): 425-430.
[2] Al- Kassie, G. A. M. **2009**. *Pakistan Veterinary Journal*. 29 (4): 169-173.
[3] Hassan, I. I., Askar, A. A. and El-Shourbagy, G. A. **2004**. *Egyptian Poultry Science.*24 :247-266.
[4] Pernakova, D., Mate, D. Rozanska, H. and Kovac, G. **2007**. *Bulltan Veterinary Industry Pulawy*. 51: 585-589.
[5] Abd El-Latif, S.A., Faten, A. Ahmed. and El-Kaiaty, A.M. **2002**. *Egyptian Poultry Science*. 22(1):109-125.
[6] Abdel-Malak, N.Y. Abdel-Malak, M.S. ; El-Gendi, G.M. and Naguib, E. F. **1995**. *Egyptian Poultry Science.* 15:111-139.
[7] Alcicek, A., Bozkurt, M. and Cabuk, M. **2004**. *South African Journal of Animal Science*. 34 (4): 217-222.

[8] Azaz, D., Demirci, F. Satıl, F. Kürkçüoğlu, M. and Başer, K. H. C. **2002**. Antimicrobial activity of some Satureja oils. 57:817-821.
[9] Botsoglou, N.A., Florou-Paneri, P. Christaki, E. Fletouris, D.J. Spais, A.B. **2002**. *British Poultry Science.* 43: 223-230.
[10] Kamel, C. **2001**. Tracing modes of action and the roles of plant extracts in non-ruminants. In: Garnsworthy PC, and Wiseman J. (Editors). Recent advances in animal nutrition. Nottingham: Nottingham University Press.pp 135-150.
[11] 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.
[12] Farag, R. S., Z. Y. Daw, F. M. Hewed and G. S. A. El- Baroty, **1989c**. *J. Food Prot*., 52: 665-667.
[13] Bowles, B. L. and Miller A. J., **1993**. *J. Food Prod*., 56: 788-794.
[14] Fritz Z, Schleicher A, Kinal S .**1993**. *J. Anim. Feed Sci*. 2: 189–195.
[15] Ertas O.N, Guler T, Çiftci M, Dalkilic B, Simsek Ü.G .**2005**. *In. J. Poult. Sci.* 4: 879-884.
[16] Cross D.E, Mcdevitt R. M, Hillman K, Acamovic T .**2007**. *Br. Poult. Sci.* 48: 496-506.
[17] 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.
[18] Ocak N, Erenter G, Burak A.K.F, Sungue M, Altop A, Ozmen A .**2008**. *Czech. J. Anim. Sci*. 53: 169-175.
[19] Fritz Z, Schleicher A, Kinal S .**1993**. *J. Anim. Feed Sci.* 2: 189–195.
[20] Kong XF, Hu YL, Yin YL, Wu GY, Rui R, Wang DY, Yang CB **2006**. *Poult. Sci*., 85: 2169-2175.
[21] Azaz, D., Demirci, F. Satıl, F. Kürkçüoğlu, M. and Başer, K. H. C. **2002**. Antimicrobial activity of some Satureja oils. 57:817-821.
[22] Botsoglou, N.A., Florou-Paneri, P. Christaki, E. Fletouris, D.J. Spais, A.B. **2002**. *British Poultry Science*. 43: 223-230.
[23] Kamel, C. **2001**. Tracing modes of action and the roles of plant extracts in non-ruminants. In: Garnsworthy PC, and Wiseman J. (Editors). Recent advances in animal nutrition. Nottingham: Nottingham University Press.pp 135-150.
[24] Simsek, UG.,Ciftci, M. Dalkilic, B. Guler, T. and Ertas, ON. **2007**. *Revue de Medecine*. 158 (10): 514-518.
[25] Hernández, F., Madrid, J. García, V. **2004**. *Poultry Science*. 83: 169-174.
[26] Cowan, M. M. **1999**. *Clinical Microbiology. Review*. 12: 564-582.
[27] Lee, K.W., Everts, H. and Beyen, A.C. **2003**. *Journal of Applied Poultry Research*. 12:394-399.
[28] Gülçin I, Küfrevioğlu K, Oktay M, Büyükokuroğlu M.E (**2004**). *J. Ethnopharacology* . 90: 205-215.
[29] Zargari, 2001. Medical plants.Second edition.Tehran University Press.pp: 25-36.
[30] AL-Kassie G. A. M.**2009**. *Pakistan Vet. J*, 29(4): 169-173.
[31] Akiba A, Matsumoto T.1982. *Journal of Nutrition*.**1982**, 112:1577-1585.

.