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Research Article

THE EFFECT OF USE CONE FLOWER AND PROTEXIN ON PERFORMANCE AND SOME BLOODPARAMETERS IN JAPANESE QUAIL

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ABSTRACT
The present study was conducted to evaluate the effects of feeding coneflower and protexin on performance and some blood parameters of Japanese quail. A total of 192 one day old quail chicks with an average weight of 18.50 g were divided into 8 treatments with 3 replicates as factorial experimental design. The treatments were divided as basal diet with no protexin and coneflower kept as control and for others 10g/kg coneflower with (10g/kg) or without protexin (T1), 50 g/kg coneflower with (10g/kg) or without protexin, 100g/kg coneflower with (10g/kg) or without protexin were used respectively. The live body weight gains and feed consumption of birds were measured individually feed conversion efficiency were calculated weekly. At the end of the trial for investigating the effect of using tomato powder supplementation on performance of quails, 2 birds form each replicates were slaughtered and some blood samples were taken for blood parameters determination. Data showed that use of coneflower and protexin had decreased feed intake feed intake significantly ($p<0.05$) in comparison to control. Data from this study indicated that using cumulative levels of coneflower with protexin didn't significant change on feed conversion ratio. The cholesterol concentration $_{(mg/dl)}$ was induced when quails fed with coneflower and protexin. Triglyceride concentration $_{(mg/dl)}$ had decreased significantly ($p<0.05$) by using coneflower and protexin supplementation. Carcass percentage had increased by using coneflower and protexin respectively and the interaction between coneflower and protexin lead to significant differences ($p<0.05$) between treatments. As result was relevant from this study there were no significant differences between treatments about intestine weight. There were no significant effects about breasts weight between treatments. In conclusion coneflower and protexin may be used as ingredient in quails ration without harmful effect on performance of the birds

***Keywords**: Coneflower, Protexin, Performance, Blood parameters, Japanese Quail*

INTRODUCTION
Now days Japanese quail had gained attention as they are resistant to pathogens and a good producer of meat for healthy nutrition in human and also they are being used as beneficial animal model in researches (Bishop, 2009). Increased awareness of the potential problems associated with the use of antibiotics on quails has stimulated research efforts to identify alternatives to their use as feed additives (Landy *et al.*, 2011; Vahdatpour *et al.*, 2011). Probiotics are live microorganisms which, when they administered in sufficient amounts, confer a health benefit on the host. There is increasing interest in using alternatives to antibiotics for poultry husbandry and using probiotics is an approach that has potential to reduce enteric disease in poultry and subsequent contamination of poultry products (Kavyani *et al.*, 2012; Vahdatpour *et al.*, 2011; Sarica *et al.*, 2005).Also it is possible to promote growth of broiler chickens and achieving both enhanced performance and good health by using alternatives such as probiotics and probiotics. Protexin is a live microbial feed supplement (kind of probiotic). It improves intestinal microbial balance by maintaining the digestive system, optimizing digestion of feed and naturally enhancing health. Protexin can be used for the treatment and control of scouring and diarrhea; exclusion and suppression of pathogens; following antibiotic therapy in all animals to re-establish gut microflora, improving weight gain and intestinal balance by maintaining the digestive system and optimizing digestion of feed, periods of stress, naturally enhancing health, non toxic and residue free. Unlike many other Probiotics that consist

primarily of a single strain of bacteria, Protexin consists of seven different naturally occurring bacteria. The effectiveness and synergy of these strains has been proven in years of trials and production application. Some of the benefits of using protexin include: a) improved growth in farm animals, b) improved utilization of food, c) reduced intestinal dysfunction, d) improved health and e) establishment or re-establishment of microflora (Sarica *et al.*,2005; Ayasan *et al.*, 2006). Many previous studies showed that good reasons for protexin impact on broiler growth and health status of them. Phytogenic feed additives are plant derived products that used in animal feeding to improve performance of animals through amelioration of feed properties, promotion of production performance, and improving the quality of their food (Windich *et al.*, 2008). Also vegetal feed additives are more often used, and showing favorable influence in diminishing the negative impact of numerous agents or in increasing the nonspecific or specific resistance of the body to infections. *Echinacea purpurea* is belong to the group of phytogenic immune stimulants that help in establishment and strengthening of para immunity and are reported to possess a number of pharmacologically active substances. *Echinacea purpurea* contain a variety of active substances like alkamides, glycoproteins, polysaccharides, phenolic compounds, cichoric acid, cinnamic acids, essential oils and flavonoids. *Echinacea purpurea* was effective treatment in human acute respiratory infection (Narimaniana *et al.*, 2005). Some study on animal showed that *Echinacea purpurea*'s ability to enhance cellular immunity in leukemia (Hayashi *et al.*, 2001). The objective of this study was conducted to evaluate the effects the effects of feeding coneflower and protexin on performance and some blood parameters in Japanese quails.

MATERIALS AND METHODS

This experiment was carried out at the Aviculture farm of Najafabad, Isfahan, Iran. A total of 180 ten day old quail chicks with an average weight of 97.36 g were divided into 5 treatments and were further subdivided into 3 replicates with 12 birds on each. Coneflower powder was purchased from local market and protexin was purchased from veterinary drug store. Corn, soybean meal and coneflower samples were analyzed in the lab for determine amount of crude protein, calcium and its phosphorus with Association of Official Analytical Chemists (AOAC, 2000) methods as shown on Table 1. The basal diet was balanced on the basis of corn and soybean meal as recommended by National Research council (NRC, 1994). The treatments were divided as basal diet with no protexin and coneflower kept as control and for others 10g/kg coneflower with (10g/kg) or without protexin, 50 g/kg coneflower with (10g/kg) or without protexin, 100g/kg coneflower with (10g/kg) or without protexin were used respectively. Diets and fresh water were provided adlibitum during this experiment. The live body weight gains and feed consumption of quails were measured individually, feed conversion efficiency were calculated weekly. At the end of experimental period, 2 birds form each replicates were slaughtered for determination of other parameters. Also dressing percentage was calculated free from giblets and some organs were weighed separately as percentage of carcass weight.

Table 1: Chemical Composition and proximate analysis of the tested diets (DM)

Samples	Crude fiber %	Ash %	Crude fat %	Crude protein %	Ca %	P %
Corn	2.2	1.12	5.9	8.8	0.02	0.10
Soybean meal	3.9	7.62	3.45	48.5	0.27	0.24
Coneflower	2.1	11.83	1.12	17.06	1.98	0.23

Evaluation of Some Blood Parameters

After 12 h of fasting, blood samples were taken from the brachial vein from four birds per replicate and stored at refrigerator at 4°C. Individual serum samples were analyzed for cholesterol, triglyceride, Zn and Fe by an automatic biochemical analyzer following the instructions of the corresponding reagent kit (Pars Azmoon Co., Teheran, Iran).

Data Analysis

The statically model was: Yijk = μ+ ά i+ ßj+ (ά +ß)ij+ eijk

Yijk = average effect observed, μ = total average, άi= effect of coneflower, ßj = effect of protexin, (ά +ß) ij = interactions (coneflower × protexin), eijk = effect of errors.

At last the GLM procedure of SAS software (SAS, 2001) was used for data analysis of variance as completely randomized design. In addition the significant difference among the mean were calculated by Duncan's multiple range tests (Duncan, 1995).

RESULT AND DISCUSSION

Results

Data showed that use of coneflower and protexin had decreased feed intake (FI) significantly ($p<0.05$) in comparison to control (Table 2). We found that body weight BW (kg) was higher none significantly when the birds were used coneflower and protexin in comparison to control. Although feed conversion ratio (FCR) were lesser in CF (1) and CF (2) than control but also that was significantly higher ($p<0.05$) on CF (3) that compared to the control. Data showed that using cumulative levels of coneflower with protexin didn't significant change on FCR.

Table 2: The effects of coneflower and protexin on performance of Japanese quails

Treatments*	**FI (Kg)****	**BW(Kg)**	**FCR (%)**
(Coneflower)			
Control	20.58^{b***}	7.07	2.95^{ab}
CF (1)	20.45^{b}	7.29	2.82^{b}
CF (2)	20.04^{b}	6.96	2.88^{b}
CF (3)	22.19^{a}	6.99	3.20^{a}
(Protexin)			
P (0)	20.35	7.68	3.04
P (1)	20.28	7.98	2.88
(Coneflower ×Protexin)			
Control × P (0)	20.35^{b}	7.10	2.91^{b}
Control × P (1)	20.81^{b}	7.43	2.99^{b}
CF (1) × P (0)	20.27^{b}	7.20	2.82^{b}
CF (1) × P (1)	20.63^{b}	7.39	2.82^{b}
CF (2) × P (0)	20.00^{b}	6.87	2.90^{b}
CF (2) × P (1)	20.07^{b}	7.06	2.85^{b}
CF (3) × P (0)	20.76^{b}	7.22	2.88^{b}
CF (3) × P (1)	23.63^{a}	6.77	3.51^{a}
MSE	0.683	0.331	0.129
P Value	0.029	0.909	0.025

**Coneflower 10g/kg diet Cf (1), Coneflower 50g/kg diet Cf (2), Coneflower 100g/kg diet Cf (3), Protexin 0g/kg diet P (0), Protexin 10g/kg diet P (1). **Feed intake (FI), body weight (BW), feed coefficient (FCR) ***Means within row with no common on letter are significantly different (p<0.05).*

Data from Table 3 showed that the cholesterol concentration $_{(mg/dl)}$ was induced when quails fed with coneflower and protexin. Also triglyceride concentration $_{(mg/dl)}$ had decreased significantly ($p<0.05$) by using coneflower and protexin supplementation. The concentration of Fe and Zn had decreased significantly ($p<0.05$) compared to the control.

Table 3: The effects of coneflower and protexin on some blood parameters of Japanese quails

Treatments*	Cholesterol (mg/dl)	Triglyceride (mg/dl)	Fe (mg/dl)	Zn (mg/dl)
(Coneflower)				
Control	209.7	211.8	211.8^{a**}	255.0
CF (1)	205.4	194.5	194.5^{ab}	251.8
CF (2)	202.3	171.8	171.8^{bc}	264.3
CF (3)	188.1	154.5	154.5^{c}	265.6
(Protexin)				
P (0)	195.3	163.2	163.2^{b}	252.7
P (1)	207.4	203.1	203.1^{a}	265.6
(Coneflower ×Protexin)				
Control × P (0)	198.3	124.1^{abc}	203.6^{ab}	253^{b}
Control × P (1)	206.3	152^{a}	220^{a}	257.1^{b}
CF (1) × P (0)	213.8	142.6^{b}	133.1^{d}	268.8^{ab}
CF (1) × P (1)	205.6	113.6^{abc}	210.5^{a}	259.8^{ab}
CF (2) × P (0)	205.8	125.3^{abc}	173^{bc}	253.3^{c}
CF (2) × P (1)	205	125.6^{abc}	216^{a}	250.3^{b}
CF (3) × P (0)	163.5	98.8^{d}	143.1^{cd}	287.6^{a}
CF (3) × P (1)	212.8	140.8^{ab}	166^{cd}	243.6^{b}
MSE	29.61	19.34	17.31	15.35
P Value	0.74	0.158	0.0001	0.152

**Coneflower 10g/kg diet Cf (1), Coneflower 50g/kg diet Cf (2), Coneflower 100g/kg diet Cf (3), Protexin 0g/kg diet P (0), Protexin 10g/kg diet P (1). **Means within row with no common on letter are significantly different (p<0.05).*

According to Table 4, the carcass percentage had increased by using coneflower and protexin respectively and the interaction between coneflower and protexin lead to significant differences ($p<0.05$) between treatments. As result was relevant from Table 4 there were no significant differences between treatments about intestine weight.

The weight of breast was higher in the treatments and even it was at the lowest on CF (2) × P (1) in comparison to others and there were significant effects ($p<0.05$) about breasts weight between treatments. Drumstick weight was at the lowest on Control × P (1) and at the highest on CF (2). There were no significant differences ($p>0.05$) for drumstick weight between treatments.

Table 4: The effects of coneflower and protexin on some carcass characteristics of Japanese quails

Treatments*	Carcass (%)	Intestine (g)	Breast (g)	Drumstick (g)
(Coneflower)				
Control	82.99	3.63	36.70	26.63
CF (1)	89.15	3.05	36.89	25.91
CF (2)	84.52	3.85	37.29	27.25
CF (3)	83.44	3.76	37.68	26.53
(Protexin)				
P (0)	84.24	3.83	37.08	26.74
P (1)	85.80	3.81	37.20	25.92
(Coneflower ×Protexin)				
Control × P (0)	84.17^{ab**}	3.25	36.90^{ab}	26.22
Control × P (1)	81.81^{b}	3.00	36.51^{ab}	25.02
CF (1) × P (0)	83.53^{b}	4.04	36.53^{ab}	26.14
CF (1) × P (1)	94.77^{a}	3.06	37.25^{ab}	25.67
CF (2) × P (0)	85.99^{ab}	4.45	38.40^{a}	28.09
CF (2) × P (1)	83.04^{b}	3.26	36.17^{ab}	26.41
CF (3) × P (0)	83.30^{b}	3.64	36.88^{ab}	26.49
CF (3) × P (1)	83.57^{b}	3.91	36.38^{ab}	26.57
MSE	4.96	0.648	2.06	1.87
P Value	0.222	0.55	0.928	0.86

**Coneflower 10g/kg diet Cf (1), Coneflower 50g/kg diet Cf (2), Coneflower 100g/kg diet Cf (3), Protexin 0g/kg diet P (0), Protexin 10g/kg diet P (1). **Means within row with no common on letter are significantly different (p<0.05).*

Discussion

In the present study, coneflower and protexin supplementation had significant effects (P<0.05) on the measured values in growing Japanese quails. The usage of the coneflower and protexin wasn't significant influences on feed intake and feed conversion ratio in Japanese quails. Lee *et al.,* (2012) showed that the body weight gain and feed intake of the broilers were not significantly different by treatment in the starter or grower period. In the grower period, the feed conversion of the coneflower groups was significantly decreased compared with that of the control group. These results are in agreement with the (Vahdatpour *et al.,* 2011) who indicated that consumption of synbiotic (Protexin+ Fermacto) were more effective than other groups in BW, FI and FCR of Japanese quails. Many scientists showed that beneficial effects of herbal or active substances in animal nutrition may include the stimulation of appetite and feed intake, the improvement of endogenous digestive enzyme secretion, activation of immune response and antibacterial, antiviral, antioxidant and antihelminthic actions (Janssen, 1989; Manzanilla *et al.,* 2001; Jamroz *et al.,* 2003). The herb coneflower is commonly known as an immune stimulating substance, so the application of immune stimulating substances to increase the immune status can result in increased performance (Iren, 2000). Landy *et al.,* (2011) showed that the body weight obtained in broilers fed diet containing 5g/kg diet coneflower continuously was highest than all treatments in the 14 and 28 days, but the height was not significant. The result of their study showed that the use of 10 g/kg diet dried aerial part powder of coneflower intermittently had significant effect on daily weight gain and feed conversion ratio. Parreira (1998) has showed that dietary supplementation of protexin increased growth performance and decreased mortality in broilers. Rajmane *et al.,* (1998) showed a significant improvement in body weight, improved feed conversion efficiency and reduction in mortality with the use of protexin as a growth promoter such as coneflower in broilers. Also Shabani *et al.,* (2012) showed that the chicken broilers feed with protexin have the lowest feed conversion ratio and was the most favorable. These results are similar to the findings of Ayasan and Okan (2001) who reported that growth performance parameters and carcass characteristics

of Japanese quails was not affected by protexin supplementation. Result of this study aren't in agreement with (Roth-Maier *et al.*, 2005) who concluded that coneflower cannot be considered as a suitable alternative for antibiotics as a growth promoter in the animals' feed. In the present study a positive effect of coneflower and protexin on cholesterol concentration in the blood plasma of Japanese quails was observed. Similar results were reported by Ghalamkari *et al.*, (2011) who demonstrated that inclusion in the diet of coneflower powder from the dried aerial part (10 g/kg) could improve the total antioxidant activity in the serum of broiler chicks. Sarica *et al.*, (2009) showed that use of essential oils in combination with the enzyme complex, a probiotic and a mannan oligosaccharide with or without the enzyme complex in the wheat based diet significantly reduced the intestinal viscosity compared to the control diet, these treatments negatively decreased plasma total cholesterol and triglyceride on quails. Data from this study showed that carcass percentage had increased significantly ($P<0.05$) by using coneflower and protexin. This result is agree with (Kavyani *et al.*, 2012) who indicated that carcass yield increased in broilers fed diets containing probiotic ($P<0.05$). As result was relevant from this study there were no significant differences between treatments about intestine weight. Landy *et al.*, (2011) showed that the significant difference in the intestine relative weight between the control and the intermittent groups ($P<0.05$).they showed that the birds fed the control diet presented significantly heavier intestine as compared to the coneflower groups ($P<0.05$).

Conclusion

It can be concluded that the supplementation of quail diets with the coneflower had beneficial effect on growth performance. Also the use of coneflower and protexin in quail rations during the period from 10 to end may manipulate weight gain and decrease feed conversion ratio. Coneflower and protexin supplementation may be used as ingredient in quails ration up to level of (0.01 % - 0.1%) with or without protexin (0- 0.01%) without harming feed intake, weight gain and feed conversion ratio of birds. As mentioned above it has become clear that there is a quite bite of benefits coneflower and protexin as source of a medical and nutritional resource to be used for birds respectively. However further studies are needed for more explanations.

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