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Efeito do uso de probiótico protexina e suplementação de pó fúnebre de efedrina sobre o desempenho e algumas características de carcaça de frangos de corte

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A B S T R A C T

This experiment was conducted to evaluate the effects of feeding protexin and Ephedra funereal on performance and some carcass traits on broiler chicks. A total of 240 seven days old broiler chickens with an average weight of 39 g were divided into 8treatmentswith 3 replicates. The treatments were divided as basal diet with no protexin and Ephedra funereal kept as control, and for others 100 mg/kg (T1), 200 mg/kg (T2) and300 mg/kg(T3) Ephedra funereal with or without protexin (0-100 g/kg)were used respectively. The live body weight gains and feed consumption of birds were measured individually feed conversion efficiency were calculated. At the end of the trial for investigating the effect of using protexin and Ephedra funereal supplementation on performance of birds, 2 birds form each replicates were slaughtered and some blood samples were taken for carcass determination. Data showed that using of protexin and Ephedra funereal increased feed intake (FI) in treatments compared to control. Also body weight (BW) (g/d) and Pre-slaughter weigh (g) were higher in protexin and Ephedra funereal groups compared to the control. There were significant differences ($p<0.05$) for feed conversation ratio (FCR) among treatments. Data showed that using of protexin and Ephedra funereal could increase carcass yield (g), breast and drumstick meat percentage none significantly. Data showed that gizzard and intestine weight also increased by using protexin and Ephedra funereal. Data from this study showed that protexin and Ephedra funereal may be used as ingredient in broilers diet without harming effects on performance and carcass quality of birds.

Key words: *Ephedra funereal, Protexin, Performance, Carcass traits. Broilers.*

Introduction

Probiotics are live microbial feed supplements, which improve the intestinal microbalance (Salminen et al., 1999).The use of probiotics in poultry was pioneered by Tortuero (1973), who reported an increase in growth rate in chicks given a Lactobacillus acidophilus culture in drinking water for 11 days from hatching. Similar results on the beneficial effects of Lactobacillus cultures on the growth of chickens were also reported by several researchers (Kalbane et al., 1992; Jin et al., 1997). One of the probiotics used in poultry feed is Protexin. Protexin is a multi-strain probiotic containing live microbes to establish, enhance or re-establish essential microflora in the gut. Protexin is a highly concentrated pre-mix containing seven strains of bacteria and two yeasts (Lactobacillus plantarum 1.89×10^{10}cfu/kg (colony forming unit per kilo gram), Lactobacillus delbrueckii subsp. Bulgaricus 3.09×10^{10}cfu/kg, Lactobacillus acidophilus 3.09×10^{10}cfu/kg, Lactobacillus rhamnosus 3.09×10^{10}cfu/kg, Bifidobacteriumbifidum 3.00×10^{10}cfu/kg, Streptococcus salivarius subsp.Thermophilus 6.15×10^{10}cfu/kg, Enterococcus faecium 8.85×10^{10}cfu/kg, Aspergillusoryza 7.98×10^{9}cfu/kg, Candida pintolopesii 7.98×10^{9}cfu/kg). All the microorganisms in the protexin are naturally occurring and have been isolated from a wide range of feed, plant, animal, bird and human sources (Ayasan et al., 2006).Protexin can be used in a wide range of circumstances, either to improve the general health of animals, address specific problems or to maximize animal's performance. Under general conditions Protexin has been promoted to: improve health

naturally,stimulate appetite, aid in establishment of gut flora inimmature animals like day old chicks, calves, lambs, kids, kittens, re-establish gut microflora after antibiotictreatment, optimize digestion of feed and reduce stress(Rajmane, 1998; Cyberhorse, 1999; Panda et al., 2000, Vali.,2009).Many studies have been conducted to test the efficacy of protexin on animal growth and performance. Balevi et al, (2000) indicated that supplementation of diets with protexin at 500 gr/tone quality was shown to cause some improvement in feed intake. Ayasan and Okan (2001) investigated the effect of four different levels of protexin on fattening performance and carcass characteristics of Japanese quails. Ephedra (*Ephedra funereal*) is a genus of gymnosperm shrubs, the only genus in its family, Ephedraceae, and order, Ephedrales. The various species of Ephedra are widespread in many lands, native to southwestern North America, southern Europe, northern Africa, and southwest and central Asia, northern China, and western South America. Plants of the genus *Ephedra* have traditionally been used by indigenous people for a variety of medicinal purposes, including treatment of asthma, hay fever, and the common cold (Abourashed, 2003).The alkaloids ephedrine and pseudoephedrine are active constituents of Ephedra and other members of the genus. These compounds are sympathomimetics with stimulant and decongestant qualities and are related chemically to the amphetamines. Pollen of Ephedra spp. was found in the Shanidar IV burial site in Iraq, suggesting its use as a medicinal plant dates to over 60,000 years ago(Anon,1996). It has been suggested that *Ephedra* may be the Soma plant of indo Iranian religion (Solecki, 1975). Herbal *Ephedra* has been used in China to treat respiratory conditions for over 5,000 years; however, the herb is not used for weight loss or physical performance enhancement in eastern medicine. Ephedrine and its isomers were already isolated in 1881 from Ephedra dystachia and characterized by the Japanese organic chemist Nagai Nagayoshi of the19th century. Its active alkaloid, ephedrine, was first used in western medicine as an asthma treatment in the 1930s. Since then, ephedrine (2-methylamino-1-phenyl-1-propanol) and other sympathomimetic alkaloids have been used in many over the counter decongestants and cold medicines (Cui, 1991). These alkaloids are structurally similar to amphetamines and have direct alpha- and beta agonistic properties and catecholamine releasing actions (Hoffman, 1996). It was not until the 3 early 1990s that herbal Ephedra and other products containing ephedrine began to be promoted as weight loss aids in the United States (Abourashed et al., 2003). The objective of this study was conducted to evaluate the effects of protexin and Ephedra funereal supplementation table on performance and some hematological parameters in broiler chickens

Materials and Methods

This experiment was carried out at the Aviculture farm of Shahrekord, Iran. A total of 240 seven days old broiler chicks with an average weight of 38.50 g were divided into 8 treatments and were further subdivided into3 replicates with 10 birds on each. Ephedra funereal was purchased from local market in Shahrekord, Iran. The basal diet was balanced on the basis of corn and soybean meal as recommended by (NRC, 1994). Corn, soybean meal and were analyzed in the lab for determine amount of dry matter, crude protein, calcium, phosphorus and its crude fiber with association of official analytical chemists (AOAC, 2000).

The treatments were divided as basal diet with no protexin and Ephedra funereal kept as control, and for others 100 mg/kg (T1), 200 mg/kg (T2) and300 mg/kg (T3) Ephedra funereal without (P0) or with (P1) (0-100 g/kg) protexin were used respectively. The compositions of basal diet are shown in Table 2. Additionally 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, 2birds form each replicates (totally 48 birds) 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.

Statically model and data analysis

The statically model was: $Yijk = \mu + \acute{\alpha} i + \beta j + (\acute{\alpha} + \beta)ij + eijk$

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

The GLM procedure of SAS software (SAS, 2001) was used for data analysis of variance as completely randomized design. The significant difference among the mean were calculated by

Duncan's multiple range tests (1995).

Result

Data showed that use of protexin and Ephedra funereal had decrease feed intake (FI) significantly ($p<0.05$) in comparison to control (Table 1). We found that body weight BW (kg) was lower significantly when the birds fed by protexin and Ephedra funereal compared to control. Although feed conversion ratio (FCR) was lesser in protexin and Ephedra funereal group but there were no significant differences in (Ephedra funereal × Protexin) compared to the control.

According to table 2, the carcass percentage had increased by using Ephedra funereal and protexin. The breast weight percentage was changed no significantly by using experimental diets. Drumstick weights percentage also were tended to increase by using Ephedra funereal and protexin and they were at the lowest on control and at the highest on T (3) × P (1). As result was relevant from Table 2 there were no significant differences between treatments about intestine and gizzard percentage.

Table 1.The effects of Ephedra funereal and protexin on performance of broiler chicks

Treatments*	FI (Kg)**	BW(Kg)	FCR
(Ephedra funereal)			
Control	78.14a	38.21a	2.01a
T (1)	75.20b	37.64b	1.94b
T (2)	74.61b	37.12b	1.95b
T (3)	73.00c	36.96c	1.90c
P Value	0.013	0.011	0.012
(Protexin)			
P (0)	74.00	37.20	2.02a
P (1)	73.52	36.56	1.95b
P Value	0.02	0.20	0.001
(Ephedra funereal × Protexin)			
Control× P (0)	75.45a	37.67a	2.00
T (1) × P (0)	73.34b	36.90b	2.01
T (2) × P (0)	72.10ab	36.43ab	1.98
T (3) × P (0)	70.56c	35.14c	1.96
Control× P (1)	75.65a	37.35a	1.95
T (1) × P (1)	74.54a	37.12a	1.96
T (2) × P (1)	73.21b	36.23b	1.94
T (3) × P (1)	72.15c	35.67c	1.95
P Value	0.71	0.21	0.30
SEM	0.001	0.001	0.09

*no protexin and Ephedra funereal kept as control, and for others 100 mg/kg (T1), 200 mg/kg (T2) and 300 mg/kg (T3) Ephedra funereal without (P0) or with (P1) (0-100 g/kg) protexin.**Feed intake (FI), body weight (BW), feed coefficient (FCR).***Means within row with no common on letter are significantly different ($p<0.05$).

Table 2.The effects of Ephedra funereal and protexin on some organs percentage

Treatments*	Carcass %	Breast %	Drumstick %	Gizzard %	Intestine %
(Ephedra funereal)					
Control	81.19	36.00	24.40	2.34	3.60
T (1)	82.08	36.20	25.22	2.35	3.65
T (2)	82.45	37.00	26.14	2.59	3.84
T (3)	83.02	37.17	26.25	2.80	3.97
P Value	0.114	.0116	0.320	0.105	0.116
(Protexin)					
P (0)	81.64	36.64	25.46	2.55	3.65
P (1)	82.45	37.01	26.50	2.50	3.78
P Value	0.101	0.110	0.222	0.312	0.413
(Ephedra funereal × Protexin)					
Control× P (0)	81.78	36.10	25.06	2.24	3.24
T (1) × P (0)	82.11	36.15	26.09	2.23	3.34
T (2) × P (0)	82.12	36.53	27.04	2.40	3.54
T (3) × P (0)	82.53	36.54	27.14	2.54	3.65
Control× P (1)	82.41	36.65	26.65	2.32	4.21
T (1) × P (1)	82.45	37.03	27.76	2.32	4.11
T (2) × P (1)	83.12	37.34	27.87	2.54	4.21
T (3) × P (1)	84.14	37.54	28.00	2.61	4.34
P Value	0.94	0.278	0.626	0.224	0.221
SEM	4.32	2.56	2.14	1.64	0.646

*no protexin and Ephedra funereal kept as control, and for others 100 mg/kg (T1), 200 mg/kg (T2) and 300 mg/kg (T3) Ephedra funereal without (P0) or with (P1) (0-100 g/kg) protexin.**Feed intake (FI), body weight (BW), feed coefficient (FCR).***Means within row with no common on letter are significantly different ($p<0.05$).

Discussion

In the present study, protexin and Ephedra funereal supplementation had significant effects on the measured values in growing broiler chickens. The usage of protexin and Ephedra funereal was significant influences on FI, BW, FCR and carcass yield. These results are in agreement with the (Vahdatpour et al, 2011) who indicated that consumption of synbiotic (Protexin+ Fermacto) was more effective than other groups in BW, FI and FCR of Japanese quails. Balevi et al, (2001) showed that diet supplementation with probiotic could improve FI and FCR. 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).
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.

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 Ephedra funereal and protexin. This result is agree with (Kavyani et al., 2012) who indicated that carcass yield increased in broilers fed diets containing probiotic ($P<0.05$).

Conclusion

We could conclude that the Ephedra funereal supplementation in broilers diets with protexin had beneficial effect on their growth performance. As mentioned above it has become clear that there is a quite bite of benefits Ephedra funereal 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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