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Research Article

EFFECT OF USING ALOE VERA AND PROTEXIN PROBIOTIC ON PERFORMANCE, CARCASS CHARACTERISTICS AND SOME BLOOD BIOCHEMICAL IN JAPANESE QUAILS

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ABSTRACT
To determine the effect of using *Aloe vera* and protexin probiotic on performance, carcass characteristics and some blood biochemical in Japanese quails, a total 300 ten days old Japanese quails quail chicks with an average weight of 19.5±5 g were divided into 8 treatments with 3 replicates as factorial randomized design experiment. The quails were fed by basal diet as control diet, (0 and 1 g.kg protexin probiotic) and (0.1 and 0.2 percentage *Aloe vera* powder). For performance evaluation feed consumption, body weight gain and feed conversion ratio were measured. At the end of trial 2 quails form each group was slaughtered then separated and some edible organs percentage were measured and compared together. Protexin and *Aloe vera* increased feed intake (g) compared to control. Body weight (g) was higher significantly ($p \leq 0.05$) when the birds fed by them. There were no significant differences for feed conversion ratio (FCR) between treatments. Carcass percentage had increased by using *Aloe vera* and protexin probiotic. The breast and drumstick weight was changed no significantly by using experimental diets. Glucose levels tended to increase by using Aloe vera. There were significant differences for cholesterol, triglyceride and HDL levels between treatments ($p \leq 0.05$). Data showed that cholesterol and triglyceride were decreased by using *Aloe vera* and protexin but HDL was increased where quails fed by *Aloe vera* and protexin probiotic. We determine significant differences between male and female quails about some blood biochemical. As result relevant from this study using of *Aloe vera* and protexin in quails diet may be useful and have significantly effects on performance, carcass characteristics, some blood biochemical on Japanese quails.

Keywords: *Aloe Vera, Blood Biochemical, Performance, Protexin, Japanese Quails*

INTRODUCTION
Herbal medicines have always been a form of therapy for livestock among resource poor smallholder farmers (Grindlay and Reynolds, 1986). There is, however, little documentation of the use of ethno veterinary medicines, as many researchers and health practitioners view these practices as backward (Croom, 1995). Documentation of herbal plants is necessary because they are likely to be more important in the future, especially given the escalating costs of drugs and the focus on organic products in most developing countries (Wenk, 2002). In addition, with the development of resistance of pathogens to drugs, ethno veterinary medicine might be the route to take since herbs tend to be broad spectrum (Darabighane *et al.*, 2010). Aloe vera is also widely used for the external treatment of minor wounds, skin irritations including burns, bruises and abrasions, and general inflammatory skin disorders (Atherton, 1998; Croom, 1995). It has anti-allergy and anti inflammatory properties because of glycoproteins and anthraquinones, which block the regeneration of thromboxanes and bradykinin, and also inhibit and break down bradykinin (Mmereole, 2011). Previous studies discovered different properties of Aloe vera gel, including wound healing, anti-parasitic, anti-viral, antifungal and anti-bacterial properties (Boudreau and Beland, 2006; Reynolds and Dweck, 1999). Studies revealed that properties of Aloe vera, including wound healing, immunomodulatory, and antibacterial properties, may stem from acemannan (Heggers *et al.*, 1993; Mascolo *et al.*, 2004). Zhang and Tizard (1996) reported improved intestinal microflora in broilers as a result of acemannan treatment. Tariq *et al.*, (2015) showed that higher values of dressing percentage with and without giblet and breast weight in the Aloe vera group as compared to the control

group. They mentioned that no significant ($p>0.05$) differences were observed in giblet weight, other cut up parts and composition of the breast, thigh, and drumstick muscles in all the treatment groups.
An alternative approach to sub-therapeutic antibiotics in livestock is the use of probiotic microorganisms, prebiotic substrates that enrich certain bacterial populations, or synbiotic combinations of prebiotics and probiotics (Crawford, 1979; Bai *et al.*, 2013). In broiler nutrition, probiotic species belonging to Lactobacillus, Streptococcus, Bacillus, Bifidobacterium, Enterococcus, Aspergillus, Candida, and Saccharomyces have a beneficial effect on broiler performance, modulation of intestinal microflora and pathogen inhibition (Jeropme, 1962). Protexin is a one of the probiotics used in poultry feed stuffs, it is a one of the multi strain probiotic containing live microbes to establish, enhance or re establish essential microflora in the gut (Vali, 2009; Fatma *et al.*, 2013). Protexin can be used in a wide range of circumstances, either to improve the general health of animals, address specific problems or to maximize poultries performance (Vali *et al.*, 2013). Based on the results obtained in previous studies regarding the positive effects of *Aloe vera* on immune system and intestinal microflora of broilers, the purpose of this study was to effect of using *Aloe vera* and protexin probiotic on performance, carcass characteristics and some blood biochemical in Japanese quails.

MATERIALS AND METHODS

Birds and Diets

This experiment was carried out at the aviculture farm of Shahrekord, Iran. To determine the effect of using Aloe vera and protexin probiotic on performance, carcass characteristics and some blood biochemical in Japanese quails, a total 300 ten days old Japanese quails quail chicks with an average weight of 19.5 ±5 g were divided into 8 treatments with 3 replicates as factorial randomized design experiment. The quails were fed by basal diet as control diet, (0 and 1 g.kg protexin probiotic) and (0.1 and 0.2 percentage Aloe vera powder). Aloe Vera was purchased from spicery shop keeper in Shahrekord-Iran. 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 basal diet was balanced on the basis of corn and soybean meal as recommended by nutrition research council for birds (NRC, 1994). The compositions of basal diet are shown in Table 1. Diets and fresh water were provided adlibitum during the experiment.

Table 1: The Compositions of Experimental Diets *

Ingredients	Control	A	B	C	D	E	F	J
Corn	57.09	57.09	57.09	57.09	57.09	57.09	57.09	57.09
Soybean meal	34.20	34.20	34.20	33.20	34.20	33.20	34.20	33.20
Fish meal	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
Oil	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Methionine	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
DCP	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Oyster shell	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Edible Salt	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
Vitamin premix**	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Mineral premix	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Filler	0.91	0.81	0.71	0.71	0.51	0.51	0.31	0.31
Aloe vera	0	0	0.2	0.2	0.4	0.4	0.6	0.6
Protexin	0	1	0	1	0	1	0	1

Calculated values of Nutrient composition for Ingredients as (NRC, 1994). Supplied per kilogram of feed: 7.500 IU of vitamin A, 2000IU vitamin D3, 30 Mg vitamin E,1.5 µg vitamin B12,2Mg B6,5 Mg Vitamin K,5 Mg vitamin B2,1 Mg vitamin B1,40 Mg nicotinic acide,160µg vitamin Biothine,12 Mg Calcium pantothenate,1MgFolic acid 20 Mg Fe,71 Mg Mn,100µg Se,37Mg Zn,6 Mg Cu,1.14 Mg I,400 µg Cu.*

Collection of Data

Data on body weight, feed consumption were recorded at weekly intervals and mortality was recorded at occurrence. From the above data, body weight gain, feed efficiency and livability were calculated. At the end of experimental, 2 birds form each replicates were slaughtered for determination of carcass traits. Also dressing percentage was calculated free from giblets and some organs were weighed separately as percentage of carcass weight.

Evaluation of 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$^{\circ C}$. Individual serum samples were analyzed for glucose, cholesterol, triglyceride and HDL by an automatic biochemical analyzer following the instructions of the corresponding reagent kit (Pars Azmoon Co., Teheran, Iran).

Statically Model

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

Yijk = average effect observed, μ = total average, άi= effect of Aloe vera powder, ßj = effect of protexin probiotic, (ά +ß) ij = interactions (*Aloe vera* × protexin), eijk = effect of errors.

Data Analysis

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 (1995) multiple range tests.

RESULTS AND DISCUSSION

This study was carried out to envisaged effect of Aloe vera and protexin on productive performance, carcass characteristics and some blood biochemical in Japanese quail. The results of experiment were showed as followed:

A. Performance

Data showed that use of protexin and Aloe vera increased feed intake (g) compared to control. Body weight (g) was higher significantly ($p \leq 0.05$) when the birds fed by protexin and *Aloe vera* compared to control. Also feed conversion ratio (FCR) was lesser in protexin group and there were no significant differences compared to the control (Table 2).

Table 2: The Effects of Aloe Vera and Protexin on Performance of Japanese Quails

Treatments		**FI***	**BW**	**FCR**
Aloe vera **%**	**Protexin g.Kg**	**g.day**	**g.day**	**--**
0	0	23.38±0.55	6.03±0.15^{ab**}	3.90±0.17
0	1	22.55±0.55	6.20±0.15^{ab}	3.75±0.17
0.2	0	22.71±0.55	6.15±0.15^{ab}	3.63±0.17
0.2	1	22.44±0.55	5.95±0.15^{ab}	3.73±0.17
0.4	0	23.57±0.55	6.47±0.15^{a}	3.69±0.17
0.4	1	23.71±0.55	6.46±0.15^{a}	3.84±0.17
0.6	0	22.32±0.55	5.90±0.15^{b}	3.94±0.17
0.6	1	23.36±0.55	6.15±0.15^{ab}	3.85±0.17
P value	--	ns	**	ns

**Feed intake (FI), body weight (BW), feed conversion ratio (FCR). **Means within row with no common on letter are significantly different (p<0.05).*

Olupona *et al.,* (2010) reported increased feed intake in groups which were treated by Aloe vera gel solved in water (15, 20, 25 and 30 cm3/dm3) as body weight gain. Similarly, the present study shows increased feed intake in the Aloe vera group with raised level of body weight gain. Wenk (2002) argued that herbs can stimulate appetite and endogenous secretions which, in turn, improve performance.

Darbigane *et al.,* (2011) concluded that no significant difference among the 1.5% and 2% Aloe vera gel groups, the antibiotic and the control groups can be seen. Among all groups, the 2.5% Aloe vera gel group had the greatest feed conversion ratio. The results are in accordance with (Chinnah *et al.,* 1992) and (Valle-paraso *et al.,* 2005) who reported that Aloe vera gel and polysaccharide in Aloe vera (acemannan) could improve the performance response in broilers.

B. Some Organs Percentage

According to the table 2, the carcass percentage had increased by using Aloe vera and protexin probiotic. The breast weight percentage was changed no significantly by using experimental diets. Also drumstick weights percentage also were increases by using Aloe vera and protexin and they were at the lowest in control.

As result was relevant from Table 3 there were no significant differences between treatments about intestine, Liver and gizzard percentage.

Singh *et al.,* (2013) showed that the dressing percentage of the Aloe vera group was numerically higher as compared to other groups. Also Ojewola and Ewa (2005) reported no significant differences in dressing percentage amongst the birds fed with pigeon pea seed meal, groundnut cake cashewnut meal and cotton seed meal.

Darbigane *et al.,* (2011) showed that the heavier dressing percentage was observed in the antibiotic group showing significant difference than other groups except for the 2% Aloe vera gel group ($P<0.05$). Among the groups treated by Aloe vera gel, the 2% Aloe vera gel group had the heavier dressing percentage with significant difference than the 1.5% Aloe vera gel group as well as the control group ($P<0.05$). Furthermore, the lightest dressing percentage was that of the control group.

Tarigh *et al.,* (2015) showed significantly ($p<0.05$) higher values of dressing percentage with and without giblet and breast weight in the T2-T4 group as compared to the T1 group. No significant ($p>0.05$) differences were observed in giblet weight, other cut up parts and composition of the breast, thigh, and drumstick muscles in all the treatment groups.

They noted that *Aloe vera* and clove supplementation improved the dressing percentage and breast weight without adversely affecting the meat composition and serum enzymes. Thus, these can be used as a growth promoter in Japanese quails.

Table 3: The Effects of Aloe Vera and Protexin on Some Organs Percentage

Treatments		**Carcass**	**Liver**	**Gizzard**	**Drumstick**	**Breast**	**Intestine**
***Aloe vera* %**	**Protexin g.Kg**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**
0	0	81.02	1.89	2.21	23.72	31.20	3.21
0	1	83.01	1.91	2.22	73.80	31.80	3.20
0.2	0	82.11	1.91	2.31	24.10	32.10	3.14
0.2	1	83.26	1.96	2.34	24.21	32.26	3.26
0.4	0	84.12	2.00	2.30	24.36	33.10	3.32
0.4	1	84.20	2.01	2.30	24.45	33.00	3.24
0.6	0	85.23	2.14	2.31	24.50	33.65	3.35
0.6	1	86.42	2.20	2.32	25.10	33.70	3.50
P value	--	ns	ns	ns	ns	ns	ns

**Means within row with no common on letter are significantly different ($p<0.05$).*

Data from Table 4 showed that glucose levels tended to increase by using Aloe vera and protexin none significantly. There were significant differences between treatments for cholesterol, triglyceride and HDL levels ($p\leq0.05$).

Data showed that cholesterol and triglyceride were decreased by using Aloe vera and protexin but HDL were tended to increase were quails fed by Aloe vera and protexin probiotic.

C. Blood Biochemical

Table 4: The Effects of Aloe Vera and Protexin on Some Blood Biochemical

Treatments		HDL	Triglyceride	Cholesterol	Glucose	Uric acid	Total Protein
Aloe Vera %	Protexin g.Kg	(Mg.dl)	(Mg.dl)	(Mg.dl)	(Mg.dl)	(Mg.dl)	(Mg.dl)
0	0	0.182^{ab}	0.123^{c}	0.170^{c}	1.300	0.261^{bcd}	0.191
0	1	0.169^{b}	0.188^{bc}	0.233^{bc}	1.117	0.280^{d}	0.183
0.2	0	0.208^{ab}	0.211^{b}	0.288^{ab}	1.238	0.245^{cd}	0.206
0.2	1	0.216^{ab}	0.236^{ab}	0.335^{a}	1.304	0.325^{ab}	0.190
0.4	0	0.225^{a}	0.245^{ab}	0.371^{a}	1.391	0.290^{bc}	0.200
0.4	1	0.214^{ab}	0.235^{ab}	0.326^{a}	1.317	0.235^{cd}	0.203
0.6	0	0.165^{b}	0.251^{ab}	0.331^{a}	1.338	0.331^{ab}	0.210
0.6	1	0.211^{ab}	0.306^{a}	0.356^{a}	1.326	0.388^{a}	0.216
P value	--	**	**	**	ns	**	ns

**Means within row with no common on letter are significantly different (p<0.05).*

The present findings for blood biochemical results are in agreement with the report of Mmereole (2011) reported increase in above parameters in the group having Aloe vera as compared to control and group having antibiotics. Singh *et al.*, (2013) study showed no significant differences in the levels of blood plasma glucose, total protein, albumin, globulin, uric acid, creatinine and phosphorus amongst all the groups.

Table 5: The Effects of Aloe Vera and Protexin on Male and Female Quail's Blood Biochemical

Aloe Vera	HDL	Triglyceride	Cholesterol	Glucose	Uric Acid	Total Protein
%	(Mg.dl)	(Mg.dl)	(Mg.dl)	(Mg.dl)	(Mg.dl)	(Mg.dl)
0	0.182^{ab}	0.123^{c}	0.170^{c}	1.300	0.261^{bcd}	0.191
0.2	0.169^{b}	0.188^{bc}	0.233^{bc}	1.117	0.280^{d}	0.183
0.4	0.208^{ab}	0.211^{b}	0.288^{ab}	1.238	0.245^{cd}	0.206
0.6	0.216^{ab}	0.236^{ab}	0.335^{a}	1.304	0.325^{ab}	0.190
P value	**	**	**	ns	**	ns

**Means within row with no common on letter are significantly different (p<0.05).*

Tarigh *et al.*, (2014) concluded that *Aloe vera* and clove supplementation through feed improved immune status of Japanese quails without affecting haematological and serum biochemical parameters.

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