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Research Article

EFFECT OF SHATAVARI (*ASPARAGUS RACEMOSUS*) ON THE GROWTH PERFORMANCE OF BROILER CHICKEN

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ABSTRACT

The present study was attempted to analyze the effect of supplementation of Shatavari (*Asparagus racemosus*) on the growth performance of broilers. Two hundred and twenty-five, day old unsexed broiler chicks were used on a completely randomized design in 5 treatments with 3 replicates, each consisting of 15 broilers. The treatments included the control group (basal diet) and four groups with basal diet mixed with Shatavari powder @ 0.5%, 1%, 1.5% and @ 2% in feed, respectively. Chicks were weighed individually at the start of experiment and later at weekly interval to calculate gain in weight. Standard feeding and all other management practices were followed during the experimental period. The results obtained regarding growth performance of the broilers showed that statistically ($P<0.05$) significant effect of supplementation of Shatavari was observed from 21st day onwards on weekly body weight and cumulative body weight. The average weight gain/bird/week and daily weight gain of broilers showed statistically significant ($P<0.05$) differences among various treatments from 5th week onwards. The highest body weight and weight gain values were recorded in treatment fed 1% Shatavari in feed and lowest in treatment fed 2% Shatavari at sixth week of age respectively. It is concluded that 1% Shatavari inclusion in feed can act as efficient and effective growth promoter for broilers.

Keywords: Broiler chicks, Cumulative body weight, Growth performance, Shatavari

Phytobiotics are derived from herbs, spices or aromatic plants and have shown antimicrobial, antifungal, antiviral, antioxidant or sedative properties. Many studies have shown antimicrobial properties of herb extracts (Cowan, 1999) which can improve intestinal microflora population and enhance health in bird's digestive system through reduction in number of disease making bacteria (Mitsch *et al.*, 2004). In addition, modified harmful microbial population in intestines will change intestinal morphology. Intestinal health is of great importance in poultry for improved performance and reduced feed conversion ratio (Montagne *et al.*, 2003). Shatavari (*Asparagus racemosus*) is the one of most commonly used herb in traditional medicine due to presence of steroidal saponins and sapogenins in various parts of plant (Krishana *et al.*, 2005).The tuberous root of Shatavari (*Asparagus racemosus*) is well known for its galactogogue and anabolic activity (Chopra *et al.*, 1956) and it appears in many Ayurvedic preparations as growth promoter and immune stimulant. The present work was undertaken to study the effect of supplementation of Shatavari on the growth performance of broiler chicken.

MATERIALS AND METHODS

The present study was attempted to analyze the effect of supplementation of Shatavari (*Asparagus racemosus*) on the growth performance of broilers from day old to 6th weeks of age, starting from Sep 06, 2017 at the Poultry section of the Department of Livestock Production Management, College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary and Animal Sciences (LUVAS), Hisar. The experiment was approved by the Institutional Animal Ethics Committee held on Feb. 6, 2017.

Two hundred and twenty-five, day old unsexed broiler chicks of Ven-Cobb strain-400 were used on a completely randomized design in five treatments groups each having 45 chicks and each group was further divided into three replicates of 15 chicks each. The treatments included the control group (T_1-basal diet as per BIS, 2007 specifications) and four groups with basal diet mixed with Shatavari powder @ 0.5% (T_2), 1% (T_3), 1.5% (T_4) and @ 2% (T_5) in feed, respectively. Before formulation of broiler rations, the feed ingredients were analyzed (AOAC, 2005) for proximate composition (Table 1). Based upon the proximate composition of feed ingredients, the broiler pre-starter ration for 1 to 7 days, starter ration for 8 to 21 days and finisher rations for 22 to 42 days of experiment, were formulated. The composition of the experimental diet is presented in Table 2. For the first three days, feed was offered on newspapers in addition to linear chick feeders used for the chicks. Grower feeders were used during the experimental period according to growth and size of birds. The feeders were kept at shoulder height of birds to prevent feed wastage. The birds were offered clean and fresh water *ad libitum* using chick waterers up to two weeks of age and bell type waterers during rest of the experimental period.

The birds belonging to all the experimental groups were closely observed throughout the experiment, starting from day old till the end of experiment i.e. 42 days, for health status. Chicks were weighed individually at the start of experiment and later on weekly to calculate gain in weight. Initial and weekly body weight of individual bird

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Table 1

Chemical composition (% DM basis) and metabolizable energy of feed ingredients used for formulating the experimental rations

S.No.	Name of Ingredient	Moisture (%)	Total Ash (%)	Ether Extract (%)	Crude Protein (%)	Crude Fiber (%)	Nitrogen free extract (%)	Methionine* (%)	Lysine* (%)	Metabol-izable Energy* (Kcal/Kg)
1.	Maize	11.92	2.83	3.44	9.13	2.52	70.16	0.17	0.27	3300
2.	Soyabean Meal	10.52	7.34	2.98	46.07	4.67	28.42	0.64	2.75	2250
3.	Ground nut cake	6.53	8.90	9.05	40.23	9.43	25.86	0.42	1.07	2400
4.	Fish Meal	10.03	27.07	11.40	45.80	1.81	3.89	0.84	2.50	2180
5.	Vegetable fat	-	-	99.40*	-	-	-	-	-	8800

*Calculated values- BIS (2007)

Table 2

Quantity of ingredients (kg/100 kg feed) and chemical composition (%) of experimental diet

Name of Ingredients	Quantity		
	Pre-starter (0-1 week)	Starter (2-3 weeks)	Finisher (4-6 weeks)
Maize	55.0	55.5	60.0
Soyabean meal	20.0	17.0	15.0
Ground nut cake	12.5	13.5	10.0
Fish meal	8.0	8.0	8.0
Mineral mixture	2.0	2.0	2.0
Vegetable oil	2.5	4.0	5.0
Feed additives (g/100kg of ration)			
Spectromix	10	10	10
Spectro BE	20	20	20
Cocciwin	50	50	50
Choline chloride	50	50	50
Lysine	50	50	50
DL - methionine	80	80	80
Chemical composition			
Moisture %	10.33	10.83	10.87
Crude protein %	23.28	21.96	19.76
Crude fibre %	3.64	3.61	3.32
Ether extract %	6.99	8.39	8.99
Total ash %	6.30	6.18	5.86
Nitrogen free extract %	49.53	48.97	50.88
Methionine %	0.45	0.40	0.35
Lysine %	1.26	1.15	0.94
Metabolizable energy (Kcal/Kg)	2960	3050	3162

of each group was taken up to 6 weeks of age in the morning using single pan balance. Weekly gain in body weight was calculated.

Statistical Analysis

Data obtained were subjected to statistical analysis as per Snedecor and Cochran (1994) using Completely Randomized Design (CRD). All the data were subjected to ANOVA using the General Linear Models procedure of SAS software (SAS Institute, 2003). The mean differences among different treatments were separated by Duncan's multiple range tests. Consequently, a significance level of 5% ($P<0.05$) was used as the criterion for statistical significance (Duncan, 1955).

RESULTS AND DISCUSSION

Growth performance

The data of mean body weight and mean cumulative weight gain of broilers is presented in Table 3 and 4, respectively. The initial body weights of chicks were nearly the same in all dietary treatments indicating that the treatment groups were homogenous in nature. The statistically significant ($P<0.05$) differences among various treatments found from 21st day onwards. The same trend of significantly better growth was recorded in T_3 treatment group on 35th and 42nd day. The mean weight gain/bird/week and mean daily weight gain of broilers is presented in Table 5 and 6, respectively. The results showed statistically significant ($P<0.05$) differences among various treatments from 5th week onwards. Weight gain in T_3 treatment group was higher than other treatment groups. This indicates beneficial effect of feeding Shatavari at 1% level compared to other groups. Findings of Rekhate *et al.* (2004); Pedulwar *et al.* (2007); Karadkar *et al.* (2009); Kumari *et at.* (2012) and Dwivedi (2013) reveal similar results for body weight and body weight gains in broilers.

Results indicated that inclusion of Shatavari can be effective up to 1% level in the ration of broilers in respect of growth parameters which are in agreement with the properties of Shatavari. The possible reason may be improved nutrient absorption, efficient gut micro-flora and better digestibility in 1% Shatavari supplemented group while its supplementation at higher level may cause activation of anti-nutritional factor (saponins) of Shatavari in broiler ration which results in reduction of growth of broilers.

CONCLUSION

It can be concluded that the supplementation of Shatavari at 1% level is quite safe and viable for lucrative rearing of broilers for meat production.

Table 3

Effect of Shatavari on mean body weight (g) of broilers (Mean ± S.E.)

Age (days)	Treatments				
	T_1	T_2	T_3	T_4	T_5
0	44.67 ± 0.07	44.67 ± 0.04	44.69 ± 0.04	44.67 ± 0.00	44.67 ± 0.00
7	114.96 ± 2.05	115.29 ± 0.48	115.96 ± 0.06	114.16 ± 0.79	113.76 ± 0.49
14	210.60 ± 4.44	212.29 ± 1.01	215.87 ± 3.43	209.42 ± 0.99	206.55 ± 4.59
21	$450.53^{ab} \pm 1.32$	$452.73^{ab} \pm 1.52$	$456.52^{a} \pm 3.21$	$447.74^{b} \pm 1.74$	$444.75^{b} \pm 3.42$
28	$879.40^{ab} \pm 2.40$	$883.01^{ab} \pm 2.96$	$889.46^{a} \pm 7.61$	$874.78^{ab} \pm 2.88$	$871.50^{b} \pm 5.44$
35	$1372.43^{b} \pm 5.54$	$1378.81^{ab} \pm 2.46$	$1394.72^{a} \pm 4.61$	$1363.48^{b} \pm 6.04$	$1359.07^{b} \pm 9.79$
42	$1874.48^{bc} \pm 9.45$	$1883.33^{b} \pm 6.41$	$1906.64^{a} \pm 5.95$	$1861.04^{c} \pm 5.71$	$1855.99^{c} \pm 3.46$

Means bearing different superscripts differ significantly ($P<0.05$) row wise.

Table 4

Effect of Shatavari on mean cumulative weight gain (g) of broilers (Mean ± S.E.)

Age (days)	Treatments				
	T_1	T_2	T_3	T_4	T_5
7	70.29 ± 2.03	70.62 ± 0.45	71.27 ± 0.04	69.49 ± 0.79	69.09 ± 0.49
14	165.93 ± 4.39	167.62 ± 0.97	171.18 ± 3.43	164.76 ± 0.99	161.89 ± 4.59
21	$405.86^{ab} \pm 1.32$	$408.07^{ab} \pm 1.48$	$411.83^{a} \pm 3.21$	$403.07^{b} \pm 1.74$	$400.08^{b} \pm 3.42$
28	$834.74^{ab} \pm 2.39$	$838.34^{ab} \pm 2.92$	$844.77^{a} \pm 7.57$	$830.11^{ab} \pm 2.88$	$826.83^{b} \pm 5.45$
35	$1327.76^{b} \pm 5.55$	$1334.14^{ab} \pm 2.42$	$1350.03^{a} \pm 4.62$	$1318.82^{b} \pm 6.04$	$1314.40^{b} \pm 9.79$
42	$1829.81^{bc} \pm 9.46$	$1838.66^{b} \pm 6.38$	$1861.95^{a} \pm 5.97$	$1816.37^{c} \pm 5.71$	$1811.33^{c} \pm 3.46$

Means bearing different superscripts differ significantly ($P<0.05$) row wise.

Table 5

Effect of Shatavari on mean weight gain/bird/week (g) of broilers (Mean ± S.E.)

Age (days)	Treatments				
	T_1	T_2	T_3	T_4	T_5
1	70.29 ± 2.03	70.62 ± 0.45	71.27 ± 0.04	69.49 ± 0.79	69.09 ± 0.49
2	95.64 ± 2.96	97.00 ± 0.58	99.92 ± 3.47	95.27 ± 1.60	92.80 ± 4.66
3	239.93 ± 5.35	240.45 ± 0.53	240.65 ± 6.63	238.31 ± 0.92	238.19 ± 1.44
4	428.88 ± 1.08	430.28 ± 1.64	432.94 ± 6.11	427.04 ± 1.71	426.75 ± 2.12
5	493.02^{ab} ± 3.24	495.80^{ab} ± 1.04	505.26^{a} ± 7.97	488.71^{b} ± 3.22	487.58^{b} ± 4.36
6	502.05^{ab} ± 3.98	504.52^{ab} ± 3.96	511.92^{a} ± 1.36	497.56^{b} ± 0.57	496.93^{b} ± 6.36

Means bearing different superscripts differ significantly (P<0.05) row wise.

Table 6

Effect of Shatavari on mean daily weight gain (g) of broilers (Mean ± S.E.)

Age (days)	Treatments				
	T_1	T_2	T_3	T_4	T_5
1	10.04 ± 0.29	10.09 ± 0.06	10.18 ± 0.01	9.93 ± 0.11	9.87 ± 0.07
2	13.66 ± 0.42	13.86 ± 0.08	14.27 ± 0.50	13.61 ± 0.23	13.26 ± 0.67
3	34.28 ±0.76	34.35 ±0.08	34.38 ±0.95	34.05 ±0.13	34.03 ±0.21
4	61.27 ±0.15	61.47 ±0.23	61.85 ±0.87	61.00 ±0.24	60.96 ±0.30
5	70.43^{ab} ±0.46	70.83^{ab} ±0.15	72.18^{a} ±1.14	69.82^{b} ±0.46	69.65^{b} ±0.62
6	71.72^{ab} ±0.57	72.07^{ab} ±0.57	73.13^{a} ±0.20	71.08^{b} ±0.08	70.99^{b} ±0.91

Means bearing different superscripts differ significantly (P<0.05) row wise.

REFERENCES

AOAC (2005). Official methods of analysis, (18th Edn.), Association of official analytical chemists. Gaitherburg, Maryland, USA.

BIS (2007). Requirement for chicken feeds. IS: 1374-2007, Manak Bhawan, Bahadurshah Zafar Marg, New Delhi.

Chopra, R.N., Nayar, S.L., Chopra, I.C., Asolkar, L.V. and Kakkar, K.K. (1956). Glossary of Indian Medicinal Plants, CSIR, New Delhi, pp. 28, 150, 176.

Cowan, M.M. (1999). Plant products as antimicrobial agents. *Clin. Microbiol. Rev.* **12**: 564-582.

Duncan, D.B. (1955). Multiple range and multiple F tests. **11**: 1–42.

Dwivedi, A. (2013). Effect of feeding Shatavari (*Asparagus racemosus*) and Yeast (*Saccharomyces cervisiae*) alone and in combination on the performance of broiler chicks. M.V.Sc. thesis submitted to Rajasthan University of Veterinary and Animal Sciences, Bikaner (Rajasthan) India.

Karadkar, B.T., Wankhede, S.M., Deshmukh S.V. and Kanchi S.N. (2009). Effect of Shatavari (*Asparagus racemosus*) on growth performance of broilers. 13th biannual conference of ANSI held at NIANP, Bangalore on Dec. 17-19. Vol. II: pp. 207.

Krishana, L., Swarup, D. and Patra, R.C. (2005). An overview prospects of ethano-veterinary medicine in India. *Indian J. Anim. Sci.* **75(12)**: 1481-1491.

Kumari, R., Tiwari, B.K., Prasad, A. and Ganguli, S. (2012). *Asparagus racemosus* willd. Root extract as herbal nutritional supplement for poultry. *Global J. Res. Medicinl. Plants Indigen. Med.* **1(5)**: 160–163.

Mitsch, P., Zitterl-Eglseer, K., Kohler, B., Gabler, C., Losa, R. and Zimpernik, I. (2004). The effect of two different blends of essential oil components on the proliferation of *Clostridium perfringens* in the intestines of broiler chickens. *Poultry Sci.* **83**: 669-675.

Montagne, L., Pluske, J.R. and Hampson, D.J. (2003). A review of interactions between dietary fibre and the intestinal mucosa, and their consequences on digestive health in young non-ruminant animals. *Anim. Feed Sci. Tech.* **108**: 95-117.

Pedulwar, S.N., Zanzad, A.A., Choudhari, A.J., Ramteke, B.N. and Deshmukh, G.B. (2007). Effect of dietary supplementation of Shatavari (*Asparagus racemosus*) on broilers. *Indian J. Field Veter.* **3(1)**: 28-29.

Rekhate, D.H., Ukey, S. and Dhok, A.P. (2004). Performance and haemobiochemical profile of broilers fed on supplementation of Shatavari (*Asparagus racemosus* wild) root powder. *Indian J. Poultry Sci.* **39**: 182-184.

Snedecor, G.W. and Cochran, W.G. (1994). Statistical methods, (8th Edn.), Oxford and IBH Publishing Co., New Delhi, India.