



## Effect of supplementation of Ashwagandha (*Withania somnifera*) and Shatavari (*Asparagus racemosus*) on growth performance of broilers

A.G. MANE, A.N. KULKARNI, R.L. KORAKE AND S.S. BHUTKAR

**ABSTRACT:** The trial was conducted for a period of six weeks on 240 day old broiler chicks, uniformly distributed into four groups, three replicates of 20 chicks in each T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> groups. The chicks were fed with standard starter mash which contained crude protein 22.01 per cent and metabolizable energy 2985 Kcal / kg (calculated value) upto three weeks of age. For next 3 weeks *i.e.* from 4 to 6 weeks of age with finisher mash which contained crude protein 19.11 per cent and metabolizable energy 3030 Kcal / kg (calculated value). Group T<sub>1</sub> (control) received standard broiler diet without any supplementation, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> received standard broiler diet with supplementation of Ashwagandha powder @ 5 kg/t, Shatavari powder @ 10 kg/t and Ashwagandha and Shatavari @ 10 kg/t of feed, respectively. The chicks were kept in floor pens, water and feed were provided *ad libitum* throughout the experimental period of 42 days. The supplementation of Shatavari powder to basal diet showed significant (P<0.05) effect on body weight, weekly gain in body weight and feed conversion ratio of broilers in group T<sub>3</sub> as compared to those in T<sub>2</sub>, T<sub>4</sub> and control T<sub>1</sub> groups. The feed intake was significantly (P<0.05) higher in group T<sub>1</sub> than in T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> groups. The net profit per bird for group T<sub>3</sub> supplementation with Ashwagandha was higher *i.e.* Rs. 34.20 as compared to those obtained from T<sub>1</sub>, T<sub>2</sub> and T<sub>4</sub> groups.

**KEY WORDS :** Broiler chicks, Ashwagandha, Shatavari, Performance

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### INTRODUCTION

The dynamic Indian poultry industry is growing at an estimated rate of 6-7 per cent for egg and 15-20 per cent for meat production per annum. India possesses second rank in egg production and sixth in broiler production in the world (Anonymous, 2011). Though Indian poultry industry recorded faster growth; it is witnessing a series of problems due to high ambient temperature in the tropics, accompanied by high relative humidity is one of the most important stressors. The adverse effects of hot weather on the growth performance of broilers are overcome by using Ayurvedic formulation containing herbs (*Withania somnifera*, *Asparagus racemosus*, *Magifera indica* and *Ocimum sanctum* etc.) and fortifying with synthetic amino

acids and vitamins. It is proved that of these, Ashwagandha (*Withania somnifera*) possesses antistress, adaptogenic, immunomodulatory and performance enhancing property. "Shatavari" is also a herbal plant known as the "Queen of herbs" in Ayurveda having properties like nutritive tonic, anti-stress (Kamat *et al.*, 2000). The root powder of *Asparagus racemosus* is used as a herbal feed additive/supplement in poultry feed. Shatavari augments the appetite and stimulates the liver. In a recent study by Sharma *et al.* (1986), Shatavari has been shown to possess anabolic properties *viz.*, growth promotion, laxative, antacid and appetizer. Considering these nutritional benefits of Ashwagandha (*Withania somnifera*) and Shatavari (*Asparagus racemosus*) herbs, effort has been made to study the effect of supplementation of *Withania somnifera* (Ashwagandha) and Shatavari (*Asparagus racemosus*) in the diet of broiler chicks.

### MATERIALS AND METHODS

The trial was conducted for a period of six weeks on 240 day old broiler chicks, uniformly distributed into four groups, three replicates of 20 chicks in each T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> groups.

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All the broiler chicks were immunized against Marek's disease in hatchery; chicks were also vaccinated against Ranikhet disease (Newcastle disease) and Gumboro disease (infectious Bursal disease) on 7th and 20th day of age, respectively. During first five days of brooding period, Terramycin – WS powder was added in drinking water @ 2.5 g/ 4.5 litres as preventive medication against coliform bacterial infections. "Vimeral" (Vit-A, D3, E, B12) was also added in drinking water @ 4 ml/ 4.5 litre during first five days.

The live body weights of all birds were recorded accurately on the electronic weighing machine replicates wise at weekly interval in morning hours by withdrawing feeding troughs.

Daily feed consumption was calculated from the amount of feed consumed by each group in a day. The average feed

consumption was calculated from the total feed offered and the feed left over on the next day morning.

Weekly feed conversion ratio was calculated by dividing the weekly feed consumption by weekly weight gain. The weekly cumulative feed conversion ratio was estimated by dividing the cumulative feed consumption or total amount of feed consumed up to that particular week by the body weight gain record upto that week.

The cost of rearing the chicks for complete experiment was calculated by taking into consideration the cost of chick, cost of total feed consumed by bird, cost of litter, vaccination and medication expenses. However, the labour cost was not considered as the experiment was conducted by student.

Gross profit per bird was calculated by subtracting the cost of production per bird from the price fetched per bird after selling it in the local market on live weight basis.

The chemical analysis of the experimental broiler rations were carried out as per A.O.A.C. (1995) for all the proximate principles.

The data collected during this investigation were subjected to statistical analysis by Complete Randomized Design (CRD) method with week and treatment as two factors as per Snedecor and Cochran (1994).

## RESULTS AND DISCUSSION

The experimental findings of the present study have been presented in the following sub heads:

**Table 1 : Growth parameters**

Sr. No.	Particulars	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
1.	Weekly live body weight	357.94	361.63	376.98	363.32
2.	Weekly gain in body weight	361.92	356.41	381.38	368.13
3.	Weekly feed consumption	714.23	687.34	673.60	698.91
4.	Feed conversion	1.794	1.741	1.649	1.722

Significant at (P=0.05) level

**Table 2 : Economics of broiler production**

Sr. No.	Particulars	T <sub>0</sub> (Control)	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
1.	Cost of day old chick (Rs.)	25	25	25	25
2.	Cost of feed (Rs./kg)	18.5	18.5	18.5	18.5
3.	Cost of Shatawari and Aswagandha(Rs.)	0	2.1	2.7	2.3
4.	Total cost of feed (Rs./kg)	18.5	20.6	21.2	20.8
5.	Average total feed consumed per bird (g)	4285.42	4124.09	4041.62	4193.49
6.	Cost of feed consumed per bird (Rs.)	79.27	84.95	85.67	87.22
7.	Average body weight at the end of 6 <sup>th</sup> week (g)	2194.3	2216.1	2308.8	2226.5
8.	Feed consumption per kg live weight gain (g)	1.952	1.86	1.75	1.883
9.	Cost of feed per kg live weight gain (Rs.)	36.11	38.31	37.1	39.16
10.	Cost of medicine, vaccines, litter material etc. per bird (Rs.)	5	5	5	5
11.	Total cost of production (Rs.) (1+6+10)	109.27	114.95	115.87	117.22
12.	Average price realized @ Rs.65 per kg live weight (Rs.)	142.62	144.04	150.07	144.72
13.	Net profit per bird (Rs.) (12-11)	33.35	29.09	34.20	27.50

**Growth performance:**

The average means of weekly live body weight, weekly gain in body weight, weekly feed consumption and weekly feed conversion ratio are presented in Table 1. The supplementation of Shatavari powder to basal diet showed significant ( $P < 0.05$ ) effect on average mean of body weight, weekly gain in body weight and feed conversion ratio of broilers in group ( $T_3$ ) as compared to those in ( $T_2$ ), ( $T_4$ ) and control ( $T_1$ ) groups. The feed intake was significantly ( $P < 0.05$ ) higher in group ( $T_1$ ) than in ( $T_2$ ), ( $T_3$ ) and ( $T_4$ ) groups.

The beneficial effect of supplementation of Shatavari in diet ( $T_3$ ) was recorded in the present study in respect of growth performance is in agreement with Rekhate *et al.* (2004) and Pedulwar *et al.* (2007). However, non-significant difference was seen among the groups supplemented with Ashwagandha, combination of Ashwagandha and Shatavari and diet without supplementation ( $T_1$ ). The feed intake was significantly ( $P < 0.05$ ) higher in group ( $T_1$ ) than in ( $T_2$ ), ( $T_3$ ) and ( $T_4$ ) groups.

**Economics:**

The results of economics of broiler production are given in Table 2. The present study revealed that net cost of production per bird was maximum for  $T_3$  (Rs. 87.22) followed by  $T_2$  (Rs. 85.67),  $T_1$  (Rs. 84.95), and  $T_4$  (Rs. 79.27). The net profit per bird for groups  $T_1$ ,  $T_2$ ,  $T_3$  and  $T_4$  was Rs. 33.35, 29.09, 34.20 and 27.50, respectively. The group supplemented with Shatavari ( $T_3$ ) have more net profit than control ( $T_1$ ), ( $T_2$ ) and ( $T_4$ ) group. The results of the present study are in agreement with the findings of Pedulwar *et al.* (2007).

**Conclusion:**

Inclusion of Aswaganda (0.5%), Shatavari (1%) and Aswaganda + Shatavari (0.5+0.5%) root powder in broiler ration as feed supplement was beneficial in improving the average weekly gain in body weight and lowering down average weekly feed consumption and improving feed consumption ratio.

The inclusion of Shatavari root powder at 1 per cent in broiler ration as a herbal feed supplement was found to be better in terms of overall performance of broiler as compared to Ashwagandha, both herbs mix inclusion and control group. Inclusion of Shatavari root powder at 1 per cent is beneficial in terms of net profit as compared to Ashwagandha, both herbs mix inclusion and control group.

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