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## Effect of azolla feeding on the growth performance of improved native chicken breed (Giri Raja) under intensive system of rearing

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### Abstract

The present study was conducted to see the effect of Azolla feeding on body weight gain in improved native chicken breeds under intensive system of rearing. The study was conducted on 36 chicks, which were randomly divided into four treatment groups each with 3 replicates of 9 birds. The first treatment (T<sub>1</sub>) served as a control in which basal diets was offered without Azolla supplementation while in T<sub>2</sub>, T<sub>3</sub>, and T<sub>4</sub> groups, basal diet was replaced with Azolla meal at 5%, 10%, and 15% levels, respectively. A feeding trial was conducted up to 12 weeks. Throughout the experiment, there is no significant body weight gain between Azolla fed groups and control. Cost benefit analysis on basis of net return/bird or net return/kg live weight, each of Azolla fed groups showed higher economic efficiency than the control. It was concluded that Azolla could be included in the native chicken ration up to 15% level. It leads to substantial economization of feed cost of production under intensive system of rearing.

**Keywords:** azolla feeding, growth performance, native chicken breed

### Introduction

Traditionally desi varieties are used for backyard poultry production whose production potential is very low around 60-80 eggs per year, thus making the backyard poultry less economical. The meat from the native birds is widely preferred especially because of their pigmentation, taste, leanness and suitability for special dishes and often fetches higher prices. Native birds are mainly indigenous and they are kept in small numbers. They are small in body size and poor layers. To overcome the above limitations, several numbers of improved native chicken breeds have developed in our country. These birds have similar phenotypic characters of native birds like plumage pattern, scavenging, adjusting to the adverse village environmental conditions and are better with respect to growth rate, livability and egg production than indigenous birds. Feed is the major cost for poultry production which is estimated to 65-70 % of the total recurring production cost. The cost of feed ingredients is increasing day by day. So the bird should be fed with the diet that gives maximum growth performance with the minimum cost. In addition Boyd (1968)<sup>[3]</sup>, Subudhi and Singh (1977)<sup>[10]</sup> and Maurice *et al.* (1984)<sup>[5]</sup> stated that inclusion of aquatic plants at low levels in poultry diets had shown better performance, especially when they supply part of the total protein or when they are included as a source of pigment for egg and broiler skin. The water fern Azolla is an unconventional feed ingredient. Azolla is very rich in proteins, essential amino acids, vitamins (vitamin A, B12 and  $\beta$ -Carotene), growth promoter intermediaries and minerals like calcium, phosphorous, potassium, ferrous, copper, magnesium etc. Crude Protein 26.4%, Ether extract 3.42%, Crude fiber 15.96%, Nitrogen free extract 41.06%, Total ash 14.86%. The carbohydrate and fat content of Azolla is very low. Its nutrient composition makes it a highly efficient and effective feed for livestock as per the report of Natural Resources Development Project Vivekananda Kendra, Tamil Nadu (Pillai *et al.*, 2005)<sup>[8]</sup>. The protein composition of Azolla varies from 25-35% on dry matter basis which is easily digested by poultry (Parashuramulu *et al.*, 2013)<sup>[7]</sup>. Feeding value of Azolla has been evaluated by several workers in broiler chicken with promising results in growth performance. But very few works have been taken up on the feeding potential of Azolla on the growth performance of improved native chicken breeds. Keeping these points in view, the research study was under taken to find out the potential effect of feeding of Azolla on growth performance of improved native chicken breeds under intensive system of rearing.

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## Materials and Methods

### Location and period of experiment

The experiment was conducted in the Department of Agronomy, Anbil Dharmalingam Agricultural College and Research Institute, Tiruchirappalli, Tamilnadu during the period February 2018 to April 2018. The experimental birds were reared in the Instructional Livestock Farm Complex, ADAC & RI, Tiruchirappalli and Tamil Nadu.

### Experimental program

#### Experimental design

About 36 numbers of four day-old improved native chicks (Giri raja) of either sex were purchased from private poultry farm. The chicks were allowed an adaptation period of 28 days along with brooding. All chicks were weighed and randomly distributed into four treatment groups with three replicates each and each replicate having 9 chicks maintaining uniformity in body weight. Chicks were grown in deep litter system of rearing, and the experimental diets were provided as per BIS specification.

The experimental groups were subjected to dietary treatment on completion of one week of age.

The experimental groups were as under.

Group 1: Basal diet (T1)

Group 2: Basal diet + 5% fresh Azolla of basal diet (T2)

Group 3: Basal diet + 10% fresh Azolla of basal diet (T3)

Group 4: Basal diet + 15% fresh Azolla of basal diet (T4)

### Feeding of Azolla

Azolla, required for the preparation of experimental diets was collected from the local water bodies present in the premises of College. After harvesting, the Azolla was rinsed with fresh water for 3-4 times. To remove excess water, it was spread over a moisture absorbing paper for half an hour. Calculated amount of fresh Azolla was offered to birds in separate containers twice daily.

### Growth performances

#### Body weight gain

At the end of each week, the chicks were weighed individually. Then replicate wise weekly average body weights were calculated. Absolute gains were calculated by subtracting the initial body weight (2nd week) from final body weights of successive weeks.

### Economics of production

The cost of each diet prepared during a feeding trial was arrived at by considering the prevailing prices of the

constituent feed ingredients, minerals, salts and other additives. Further, by considering the expenditure on chicks, labour, medicine etc. to be similar for each treatment, the net profit for each treatment was calculated separately for chicks under different treatments taking into account the sale price of birds. The relative cost effectiveness of each diet was assessed.

### Statistical analysis

Data obtained from the experiment were subjected to statistical analysis wherever required. The effects of treatments were determined by analyzing the data using one-way ANOVA.

## Results and Discussion

### Body weight gain

The weekly average body weight gain for four groups of improved native chicken breeds is presented in Table-1. No significant difference was observed between the groups at the end of the 12<sup>th</sup> weeks. Average weekly Body weight gain, for each group, increased progressively in successive weeks till the end of the experiment (12<sup>th</sup> week). But there was no significant difference between the four treatment groups. This implies that feeding of fresh Azolla had beneficial effect on the body weight of improved native chicken without any detrimental effect and a comparable gain in body weight.

### Economics of production

The production costs were calculated on the basis of feed cost only. On the basis of profit/bird or profit/kg live weight, each of the Azolla-fed group showed higher economic efficiency than the control. Between the Azolla-fed groups, group T4 (15%) showed a higher efficiency than group T3 (10%) and T2 (5%). This result was on par with Seth *et al* (2014)<sup>[9]</sup> recorded lowest feed cost for the 15% Azolla by incorporating 0,5,10 or 15% Azolla in the diet of vanaraja birds. Economization of feed cost in poultry by dietary inclusion of Azolla at different levels has been reported by several authors, namely, Basak *et al* (2002)<sup>[1]</sup>, Seth *et al* (2013)<sup>[9]</sup>, Chichilichi *et al* (2013)<sup>[4]</sup> and Naghshi *et al* (2014)<sup>[6]</sup>.

The fresh Azolla is a good feed supplement for reducing the feed cost and highest Benefit Cost ratio in backyard poultry. Usually 100 gram per bird per day may be fed for the better body weight gain as well as more number of egg production thereby for more profit was reported by Bidya Shankar Sinha *et al* (2015)<sup>[2]</sup>. Subudhi and Singh (1978)<sup>[10]</sup> reported that feed cost could be economized by replacing 20-25% of commercial feed by fresh Azolla.

**Table 1:** Average Body Weight Gain (g)

No of Weeks	Date	Control(g)	T1(g) 5% Azolla	T2 (g) 10% Azolla	T3 (g) 15% Azolla
1 <sup>st</sup> week	5.2.2018	29.1	28.5	31	31.6
2 <sup>nd</sup> week	12.2.2018	78.6	61.1	70.7	78.1
3 <sup>rd</sup> week	19.2.2018	134.2	117.1	128.2	147.8
4 <sup>th</sup> week	26.2.2018	183.1	167	170	191.3
5 <sup>th</sup> week	5.3.2018	263.7	220.4	245.1	270
6 <sup>th</sup> week	13.3.2018	334.7	310	323	339.9
7 <sup>th</sup> week	19.3.2018	429.9	400.5	414.8	430.9
8 <sup>th</sup> week	26.3.2018	510.3	492.9	465.3	520.3
9 <sup>th</sup> week	2.4.2018	629.3	598.4	620.3	632.6
10 <sup>th</sup> week	9.4.2018	740.5	708.6	727.6	755.7
11 <sup>th</sup> week	16.4.2018	869.9	810.4	833.7	877.6
12 <sup>th</sup> week	24.4.2018	1091.3	1011.2	1034.5	1114.9

## Conclusion

From the experiment, it was concluded that, inclusion of Azolla at 5% or 10% or 15% level in the diet improved body weight, which was at par with standard basal diet. Feed cost of production was substantially minimized by inclusion of Azolla at either level. Inclusion of Azolla at 15% level showed the maximum economic benefit.

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