

FEEDING POTENTIAL OF FRESH AZOLLA (*Azolla pinnata*) ON DRESSING AND MORTALITY PERCENTAGE AND COST: BENEFIT RATIO OF KAVERI POULTRY BIRD

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ABSTRACT

The experiment was carried out at Animal Husbandry and Dairy Science section, College of Agriculture, Nagpur during 2023 to study the effect of feeding fresh Azolla on dressing percentage, mortality percentage, morbidity and cost structure. 120-day-old, Kaveri chicks were procured from Government Hatchery, Seminary Hills, Nagpur, Maharashtra. They were randomly distributed into five groups. The experimental chicks were reared in well-ventilated shed from 0-8 weeks (56 days). The Azolla was added in experimental diet at the rate of 0, 5, 10, and 15 per cent for T₁, T₂, T₃ and T₄, respectively. The control group (T₁) was without Azolla. The experimental ration was proteinous. The experiment was continued up to 8 weeks. Average dressing percentage of Kaveri Poultry bird was recorded as 64.11%, 66.14%, 67.12% and 68.62% under treatment groups T₁, T₂, T₃ and T₄, respectively. Mortality was observed in initial weeks of experiment. Mortality percentage recorded during experimental period was highest in 0 per cent azolla added i.e. T₁ (8.50%) followed by 5 per cent i.e. T₂ (8.33%), 10 per cent i.e. T₃ (6.66%) and 15 per cent i.e. T₄ (3.33%). As far as morbidity is concerned there was no incidence of disease, all birds were healthy throughout the research. Cost: Benefit analysis showed higher economic efficiency than the control. C: B was highest in 15 per cent (T₄) Azolla diet i.e. 1.6.

The net profit bird⁻¹ was highest in T₄ (Rs. 128.61) followed by T₃ (Rs. 115.77), T₂ (Rs. 103.34) and T₁ (Rs. 84.03). Thus, feeding of fresh Azolla up to 15% level of commercial diet could safely be used in terms of its economic production and performance and it didn't have any adverse effect on the birds.

(Key words: FreshAzolla, dressing percentage, mortality, morbidity, cost structure)

INTRODUCTION

The poultry industry in India has benefited from scientific advances in poultry breeding and disease control but an additional factor has been the accessibility of low-priced, high-quality feed (Ravindran, 2013). Feed is the largest single input cost for broiler production (Davis *et al.*, 2013) and can constitute up to 70% of the total cost. Feed proteins that are generally used in poultry, most are of plant origin and economically cheaper than protein of animal origin. Though, very limited work has been done in our country, on the use of unconventional feed ingredients in poultry diet. Thus, poultry nutritionist's world over are exploiting the use of various un-conventional feed ingredients in poultry feeding to enhance the consumer demand for eggs and meat.

The water fern Azolla is an unconventional feed ingredient. Azolla is very rich in proteins, essential amino acids, vitamins (vitamin A, B12 and β -Carotene), growth promoter intermediaries and minerals like calcium, phosphorus, potassium, ferrous, copper, magnesium etc.

Azolla is having crude protein 26.4%, ether extract 3.42%, crude fiber 15.96%, nitrogen free extract 41.06% and 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). The protein composition of Azolla varies from 25-35% on dry matter basis which is easily digested by poultry (Parashuramulu *et al.*, 2013). 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 studies 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. 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 studies on the feeding potential of Azolla on the dressing and mortality percentage of improved Kaveri poultry birds.

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Keeping these in view, present paper focused on the “Rearing of Kaveri Poultry bird fed with fresh Azolla (*Azolla pinnata*)”.

MATERIALS AND METHODS

In the present study the Azolla was cultivated in poultry pits of, section of Animal Husbandry and Dairy Science, College of Agriculture, Nagpur during 2023. Azolla, required for the preparation of experimental diets was collected from the Azolla pits. After harvesting, the Azolla was rinsed with fresh water for 3-4 times. It was spread over a moisture absorbing paper for half an hour to remove excess water.

120-day-old chicks of Kaveri poultry bird were procured from government hatchery, Seminary Hills, Nagpur. These 120 chicks were divided into five groups and allotted to four treatment groups viz., T₁ (basal diet or control), T₂ (5% Azolla + Basal diet), T₃ (10% Azolla + Basal diet) and T₄ (15% Azolla + Basal diet). All the Kaveri chicks were fed with chick crumb initially, followed by experimental ration. The experimental birds were managed properly including housing environment, providing floor space, feeder and waterer space, litter management, lighting management, sanitation, immunization and medication. During managemental period dressing percentage, morbidity, mortality percentage and cost contributing factors were recorded. The data observed during the experimental period was statistically analyzed according to the method described by RBD given by Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

Chemical composition

Data regarding chemical composition of starter, finisher and fresh azolla are presented in Table 1.

The starter contained 91.24 per cent dry matter, 21.28 per cent crude protein, 4.56 per cent crude fat, 65.65 per cent NFE and 1.92 per cent total ash, respectively. The finisher contained 88.96 per cent dry matter, 19.34 per cent crude protein, 68.55 per cent NFE, 5.63 per cent crude fiber and 1.75 per cent total ash, respectively. Fresh azolla contained, dry matter (DM) 94.40%, organic matter (OM) 80.67%, crude protein (CP) 21.67%, ether extract (EE) 3.27%, crude fiber (CF) 12.38%, nitrogen free extract (NFE) 43.35%, total ash (TA) 19.33%, calcium 0.98% and phosphorus 0.59% respectively. It is observed that fresh Azolla (*Azolla pinnata*) is a rich source of crude protein, trace minerals and vitamins (Akhud *et al.*, 2017 and Adake *et al.*, 2016).

Dressing percentage

The dressing percentage were recorded as 64.11%, 66.14%, 67.12% and 68.62% under treatments T₁ (basal diet or control), T₂ (5% Azolla + Basal diet), T₃ (10% Azolla + Basal diet) and T₄ (15% Azolla + Basal diet), respectively. Dressing percentage is based on the relationship between

the dressed carcass weight and the live weight after the things like the hide and internal organs have been removed. The average dressing percentage of different treatment groups are presented in Table 2. Significantly higher percentage was observed in treatment group T₄ (15% azolla + basal diet).

The findings of present study are in accordance with results of Chatterjee (2014). He studied on growth and meat performance of commercial broiler chickens fed with Azolla. The carcass percentage was significantly higher in T₂ (66.2%) and T₃ (68.4%) treatments containing 7.5% and 15% azolla content along with the basal diet which was mere similar to the findings of present study.

The results of the present study showed that inclusion of Azolla at 15% of basal diet in Kaveri Poultry ration as rich protein source found to be better in terms of overall improvement in dressing percentage followed by 10% and 5% inclusion of Azolla.

Morbidity and Mortality Percentage

There was no incidence of disease, all birds were healthy throughout the research. Mortality occurred in the experiment is considered as negligible as the death of birds occurred at initial weeks of treatment i.e., 1st and 2nd week. It might be due to the inability of chicks to sustain the external environment and feed. The data regarding mortality (%) are presented in Table 3. The overall mortality in Kaveri Poultry birds during experimental period was noticed as 8.50%, 8.33%, 6.66% and 3.33% under treatment groups T₁ (basal diet or control), T₂ (5% Azolla + Basal diet), T₃ (10% Azolla + Basal diet) and T₄ (15% Azolla + Basal diet), respectively. The mortality percentage was recorded highest in T₁ followed by T₂, T₃ and T₄.

Similar findings were recorded by Shinde (2015). He studied the effect of dietary levels of Azolla (*Azolla pinnata*) in broilers. He reported the mortality percentage as 3.3, 0.0, 3.3, and 3.3 per cent under treatment groups T₀ (Basal diet or Control), T₁ (5% Azolla + Basal diet), T₂ (10% Azolla + Basal diet) and T₃ (15% Azolla + Basal diet), respectively fed with Azolla meal.

Cost structure

The cost of production of Kaveri Poultry birds mainly dependent upon the cost of chicks, feed consumed by rearing of experimental birds, medicines and miscellaneous charges. The data regarding cost of Kaveri Poultry bird production are presented in Table 4.

It indicated the cost of production bird⁻¹ as Rs. 217.47, Rs. 222.16, Rs. 232.23, Rs. 228.39 under treatments T₁ (Basal diet or Control), T₂ (5% Azolla + Basal diet), T₃ (10% Azolla + Basal diet) and T₄ (15% Azolla + Basal diet), respectively. The cost of production was higher in T₃ followed by T₄, T₂ and T₁, respectively. This might be due to more consumption of Azolla (fresh) as per the body requirement. The net profit bird⁻¹ was Rs.84.03, Rs.103.34, Rs.115.77 and Rs. 128.61 and kg⁻¹ profit was 8(5% Azolla + Basal diet) 3.61, 95.24, 99.80 and

108.07 for T₁, T₂, T₃ and T₄ treatments, respectively. The total net profit was higher in T₄ (Basal diet + 15% Azolla) as Rs. 128.61 than other treatments. Therefore, T₄ experimental birds exhibited net profit of Rs. 44.58 bird⁻¹ than control (T₁). Net profit was increased with increase in level of Azolla, this might be due to higher body weight gain because of incorporation of fresh Azolla.

Table 1. Chemical composition of overall experimental feed (% DM)

Sr. No.	Proximate Principle	Starter	Finisher	Fresh Azolla
1	DM	91.24	88.96	94.40
2	CP	21.28	19.34	21.67
3	CF	6.59	5.63	12.38
4	NFE	65.65	68.55	43.35
5	Total Ash	1.92	1.75	19.33

(Source: Agrofab Pvt. Ltd. M.I.D.C. Hingna, Nagpur)

The findings of present study are comparable with results of Shinde (2015). He recorded the net profit bird⁻¹ was 47.09, 61.91, 49.58 and 51.54 and kg⁻¹ profit as 20.12, 24.66, 21.65 and 23.00 for T₀, T₁, T₂ and T₃, respectively.

Table 2. Average dressing percentage of Kaveri Poultry bird (%)

Treatments	Dressing percentage (%)
T ₁	64.11
T ₂	66.14
T ₃	67.12
T ₄	68.62
SE(m)±	0.94
CD @ 5%	2.82

Table 3. Mortality percentage of Kaveri Poultry birds during experimental period

Treatments	Total no. of birds	No. of birds died	Mortality percentage (%)
T ₁	30	4	8.50 ^a
T ₂	30	3	8.33 ^a
T ₃	30	2	6.66 ^b
T ₄	30	1	3.33 ^c
SE(m)±			3.04
CD @ 5%			9.12

Table 4. Cost structure of Kaveri Poultry bird

Sr. No.	Particulars	T ₁	T ₂	T ₃	T ₄
1.	Cost of day-old chick (Rs.)	25	25	25	25
2.	Total feed consumption bird ⁻¹ (kg)	3.47	3.32	3.21	2.91
3.	Cost of feed (Rs. kg ⁻¹)	165.27	158.68	154.35	141.31
4.	Total Azolla consumed (kg)	-	0.166	0.321	0.436
5.	Cost of Azolla (Rs kg ⁻¹) Azolla @ Rs. 80 kg ⁻¹	-	13.28	25.68	34.88
6.	Total cost of consumption (Feed + Azolla) bird ⁻¹ (Rs.) (3+5)	165.27	169.96	180.03	176.19
7.	Average body weight at the end of 8 th week bird ⁻¹ (kg)	1.005	1.085	1.160	1.190
8.	Rearing cost bird ⁻¹ (Rs.)	27.2	27.2	27.2	27.2
9.	Total cost of production (Rs.) (1+6+8)	217.47	222.16	232.23	228.39
10.	Average price realized @ Rs. 300 kg ⁻¹ weight (Rs.)	301.5	325.5	348	357
11.	Net Profit bird ⁻¹ (Rs.) (10-9)	84.03	103.34	115.77	128.61
12.	Profit kg ⁻¹ (Rs.)	83.61	95.24	99.80	108.07
13.	Cost Benefit Ratio (C:B ratio)	1.3	1.4	1.5	1.6

REFERENCES

- Adake, Jyoti, A. S. Ingole, V. G. Atkare, Rohini Darade and A. A. Patil, 2016. Effect of *Azolla pinnata* feeding on growth performance of Osmanabadi goat kids. *J. Soils and Crops*. **26** (1): 162-165.
- Akhud, M. W., A. S. Ingole, V. G. Atkare, S. M. Khupse and S. V. Deshmukh, 2017. Effect of feeding different levels of concentrate replacement with azolla on Nagpuri buffalo calves. *J. Soils and Crops*, **27** (2): 105-108.
- Chatterjee, S. 2014. Studies on Assessment of Feeding azolla on the growth and meat performance of commercial Broiler Chickens. West Bengal University of Animal and Fishery Sciences, Kolkata, West Bengal.
- Davis, C. G., D. Harvey, S. Zahniser, F. Gale and W. Liefert, 2013. Assessing the growth of U.S. broiler and poultry meat exports, USDA-ERS (November): 1-33. <http://www.ers.usda.gov/media/1217411/Idpm-231-01>.
- Parashuramulu, S., P. S. Swain and D. Nagalakshmi, 2013. Protein fractionation and in vitro digestibility of *Azolla* in ruminants. *Online J. Anim. Feed Res.* **3** (3):129-132.
- Pillai, K., S. Premalatha and S. Rajamony, 2005. *Azolla*: A sustainable feed for livestock. *Leisa India*. **21** (3): 15-17.
- Ravindran, V. 2013. Poultry feed availability and nutrition in developing countries. *Poult. Develop. Rev.* pp. 60-63.
- Shinde, P. N. 2015. Effect of Dietary levels of *Azolla pinnata* in Broilers. Unpublished M.Sc. thesis submitted to Dr. B.S.K.K.V., Dapoli.
- Snedecor, G. W. and W. G. Cochran, 1994. *Statistical methods*, 8thedn. IOWA State University Press, Ames, IOWA, USA.

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