

Original Research Article

Use of Fresh Azolla as Dietary Supplementation in Backyard Poultry

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ABSTRACT

Keywords

Backyard poultry, Azolla, Egg production, Body weight gain

This study was conducted as the farmers participatory on farm trial in the Sheikhpura district of Bihar during the year 2013-14 and 2014-15. A total of 6 farmers as replication with 30 birds (age 25-40 weeks) each, under a total of 3 treatments were included in the study. The feeding of fresh azolla was done @ 100 g per day per bird in backyard poultry for 16 weeks. The result of trial indicated that the feeding of azolla resulted into the mean average change in the body weight of 446.95 gram which is 161.85 gram more than the farmer's traditional practice i.e. foraging. Similarly the average number of egg production was 53.2 per bird which is also 6.2 more than the farmer's practice. Both of the factors caused the highest net return of Rs. 151 and Benefit: Cost ratio as 1.94. Hence it can be concluded that feeding of Azolla to poultry birds under backyard condition @ 100 g per day per bird may be highly effective method to get more profit.

Introduction

Backyard poultry is common in Bihar but high feed cost is a major constraint to poultry farming in this state. Feed cost alone accounts for 70% of the total cost of production in poultry (Parthasarathy *et al.*, 2002). Providing commercial poultry feeds all-round the period is just not financially feasible, hence there is need to reduce the cost of poultry production by replacing the costly commercial feed with some comparatively cheaper feed resources. Azolla is one of the plant resources with high biomass and protein content. It is an abundantly available aquatic fern in ponds, ditches, and paddy fields in tropical and subtropical regions of the world. It was grown at the farmer's field in Sheikhpura district of Bihar to confirm the adaptability of this fern to the local ecosystem. It has

been recommended as a good feed resource, due to its high nutrient contents (Pillai *et al.*, 2002; Alalade and Iyayi, 2006). Incorporation of Azolla as a feed ingredient in poultry ration up to 5% has shown better growth, feed conversion, protein and energy utilization efficiency, along with promising economic returns (Parthasarathy *et al.*, 2001) as compared to the birds reared on normal ration, and had no deleterious health effect (Basak *et al.*, 2002). Subudhi and Singh (1978) recommended that 9 kg of fresh Azolla each day could replace about 20% of commercial feed in the diet of 100 young chickens and the amount could be produced in a shallow pond of 60 m² area. Little information is available on levels of inclusion of Azolla in the diets of backyard poultry and for this reason a farmer's

participatory on farm trial was conducted for consecutive two years in 2014 and 2015 with the objective of the assessment of the effect of fresh Azolla as dietary supplementation on egg production and growth rate in backyard poultry.

Materials and Methods

This study was conducted at the farmers field in the operational area of Krishi Vigyan Kendra, Sheikhpura, Bihar on 30 backyard chicken (24 weeks old) divided into three groups of 10 birds each for the duration of 16 weeks (25-40 weeks age) under Farmers' participatory On Farm Trial.

Harvesting and Feeding of Azolla

Azolla, introduced from Bihar Agricultural University (BAU), Sabour, was multiplied at Krishi Vigyan Kendra (KVK), Sheikhpura and was distributed to 6 farmers where it was grown, harvested, and thoroughly washed to get rid of cow dung smell. Dry matter content of the Azolla has been estimated as 8%. The control group of backyard poultry under farmer's traditional practice was maintained on foraging only while the experimental group as Technology Option 1 (TO 1) and Technology Option 2 (TO 2) were given additionally at the rate of 50 g of concentrate mixture and 100 g of fresh Azolla per day per bird, respectively. Both the groups were maintained under similar management conditions. Water was provided *ad libitum* and 16-hour photoperiod was provided.

Estimation of production parameters

The data on body weight and egg production were recorded. The benefit: cost ratio was estimated in terms of gain in body weight and number of egg produced during the trial period. The data were statistically analysed as per Snedecor and Cochran (1994).

Results and Discussion

Average change in body weight

Our study revealed that the mean average change in the body weight during 16 weeks of trial period (Birds Age 25-40 weeks) was 446.95 g in Azolla fed group which is significantly higher than the farmers practice with only foraging as well as concentrate mixture fed group (Table 1). Supplementation of the diet with fresh Azolla also enhanced the gain in body weight in backyard poultry birds. Similar results of gain in the body weight was found in the Azolla supplemented group of backyard poultry bird (Sujatha *et al.*, 2013). Gain in the body weight may be due to its rich nutrient contents, particularly protein, vitamins, and minerals (Pillai *et al.*, 2002). However, our results were not in corroborated with the findings of Shamna *et al.*, 2013, who did not find significant differences in feed intake in quails on normal ration from the quails on ration supplemented with 5% Azolla, as they used sun dried Azolla powder in the ration.

A supplementary source of vitamins and minerals was not included in the diets of the groups that received Azolla and yet there were no obvious health problems or deficiency symptoms indicating that these essential nutrients might have supplied through the Azolla. This apparent capacity of Azolla to supply vitamins and minerals is an important advantage in rural areas where premixes may not be available or are expensive. Azolla strains have a well-balanced array of essential amino acids and constitute high quality protein if cultivated in good conditions (Van Hove; 1989).

There are few references to feeding trials that have been carried out with Azolla for poultry. In an experiment in India, White Leghorn females were fed a commercial

poultry feed and fresh Azolla at levels of 5, 12.5, or 16% on a dry matter basis. The birds receiving the diet with 5% Azolla grew faster than the control group and those given

the diet with 12.5% Azolla grew only slightly slower, although at 16% inclusion growth rates were significantly reduced (Singh and Subudhi 1978).

Table.1 Effect of dietary supplementation of Azolla (*Azolla pinnata*) on the egg production, growth rate and economics in backyard poultry during 2013-14 and 2014-15

Management Practices	Avg. body weight gain (g)			Avg. No. of eggs per bird			Gross Cost (Rs)	Gross return (Rs)	Net return (Rs)	B:C Ratio
	2013-14	2014-15	Mean	2013-14	2014-15	Mean				
Control*	280	290.2	285.1	46	48	47	140	263	123	1.88
TO 1 [#]	392	398.6	395.3	47.9	49.9	48.9	196	282	86	1.44
TO 2 ^s	440	453.9	446.95	53.2	53.2	53.2	160	311	151	1.94
CD at 5 %	2.028	5.045		1.827	4.211					
CV	0.582	1.409		3.915	1.966					

* Control: Farmer's traditional practice with foraging only

[#]TO 1: FP + Addition of 50 g concentrate mixture (Maize 75%+ Rice polish 25%) per day per bird

^sTO 2: FP + 100 g Azolla per day per bird

Note: The price was considered for Egg @ Rs. 5/- and Body weight @Rs. 100/- per Kg

Egg production

The hen housed egg production in during the trial revealed that the mean egg production of Azolla fed group (53.2) was significantly higher than the control (47.0) as well as concentrate fed group (49.9).

Net profit and B:C ratio

Results indicated that Azolla fed group gave highest net profit (Rs.151) in comparison to concentrate fed group (Rs 83) and control group (Rs.123) as well as B:C ratio as 1.94, 1.44 and 1.88 respectively.

It can be concluded that 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.

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References

- Alalade, O. A. and Iyayi, E. A. (2006). Chemical composition and the feeding value of Azolla (*Azolla pinnata*) meal for egg-type chicks. International Journal of Poultry Science 5 (2): 137-141.
- Basak, B., Pramanik, M. A. H., Rahman, M.

- S., Tarafdar, S. U. and Roy, B. C. (2002). Azolla (*Azolla Pinnata*) as a feed ingredient in broiler ration. *International Journal of Poultry Science* 1(1): 29-34
- Parathasarathy, R., Kadirvel, R. and Kathaperumal, V. (2001). Studies on economics of utilizing Azolla in broiler ration. *Cheiron* 30(1-2): 24-26.
- Parathasarathy, R., Kadirvel, R. and Kathaperumal, V. (2002). Azolla as a partial replacement for fish meal in broiler ration. *Indian veterinary journal* 79 (2): 144-146.
- Pillai, P. K., Premlatha, S. and Rajamony, S. (2002). Azolla – A sustainable feed substitute for livestock *LEISA India* 4 (1): 15-16.
- Shamna, T. P., Peethambaran, P. A., Jalaludeen, A., Joseph, Leo and Muhammad, A. M. K. (2013). Broiler characteristics of Japanese quails (*Coturnixcoturnix japonica*) at different levels of diet substitution with *Azolla pinnata*. *Animal Science Reporter* 7 (2): 75-80.
- Snedecor, G. W. and Cochran, W. G. (1994). *Statistical Methods*, 8th edition; Oxford and IBH Publishing Company, New Delhi, India.
- Singh, P. K. and Subhudhi, B. P. R. (1978). Utilize Azolla in poultry feed. *Indian Farming* 27:37-38
- Subhudhi, B. P. R. and Singh, P. K. (1978). Nutritive value of the water fern *Azolla pinnata* for chicks. *Poultry Science* 57 (2): 378-380
- Sujatha, T., Udhayakumari, D., Kundu, A., Jeyakumar, S., Sundar, Jai and Kundu, M. S. (2013). Utilization of raw azolla as a natural feed additive for sustainable production in Nicobari fowl. *Animal Science Reporter* 7 (4): 146-152.
- Van Hove, C. (1989). Azolla and its multiple uses with emphasis on Africa. *FAO, Rome*, FAO : 53