

## Azolla - An Economical and Accessible Feed for Poultry

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### ABSTRACT

A study was conducted to evaluate the effectiveness of azolla as an economical and accessible feed for poultry. The feed cost and unavailability of feed ingredients being the major deterrent in taking up poultry rearing as an enterprise in rural areas made us to take up the study at rural areas to find out the cost effectiveness and body weight gain in relation with the birds that are fed with 0.5-1 kg grains along with grazing. The poultry birds that were fed with ad libitum azolla had showed 15% weight gain when compared with birds that were solely fed on grains. The cost spent on grains was also reduced to 70%.

**Keywords:** Azolla, Feed cost reduction, Body weight gain

### INTRODUCTION

The poultry population is increasing day by day but the production seems to be declining as the enterprises are unable to bear the cost of feed and there is unavailability of feed ingredients, mainly maize which is a key ingredient (fall army pest effect in maize) in commercial feed. In recent days, azolla is very much used as a sustainable feed substitute for livestock especially dairy cattle, poultry, piggery and fish. Azolla is very rich in proteins, essential amino acids, vitamins (vitamin A, vitamin B-12, beta carotene), growth promoter intermediaries and minerals including calcium, phosphorous, potassium, ferrous, copper and magnesium. On a dry weight basis, azolla has 25-35% protein content, 10-15% mineral content and 7-10% comprising a combination of amino acids, bio-active substances and biopolymers [1]. For sustainability, it is necessary to make resources available locally and competition with human food should be minimal [2]. Thus, the rare combination of high nutritive value and rapid biomass production make azolla a potential and effective feed substitute for livestock, particularly poultry birds [3]. Keeping this in view, a study was taken up to include azolla, as feed to poultry birds, which is economical at production level.

### MATERIALS & METHODS

Azolla beds and culture of azolla was provided to the farmers holding poultry at Prakasam district, Andhra Pradesh. Portable high quality HDPE azolla beds (12' x 4' x 1') were provided one each to ten farmers. The birds considered for the study are of non-descriptive breed/local breeds of Prakasam district and are of 2 months of age, apparently healthy and vaccinated against Mareks and New

castle disease. The weight of the birds on day zero of introducing azolla was recorded. The cost spent on grains was also recorded. Fresh azolla was provided to birds' ad libitum along with grazing in the premises of the farmers' house. The existing situations of non-availability of commercial feed and feed ingredients locally, azolla as sole feed resource was evaluated.

### Azolla cultivation

Azolla was cultivated in the given azolla beds. About 2 kg fresh cow dung and 50g single super phosphate was mixed in a bucket of water and poured in the pit. The pits were filled with fresh water and about 500g of fresh azolla was inoculated in the pit by spreading on the surface. The pits were made near the farmer's house. The water was replaced monthly once or based on the need.

Two groups were taken for the study, i.e., group I: Grazing in backyard + 0.5-1 kg grains per 50 birds per day and group II: Azolla pinnata (ad lib.) was provided to the birds and it was the main feed during grazing. The data collected were statistically analyzed by employing t-test as per the methods described [4].

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## RESULTS AND DISCUSSION

The body weight gain was recorded fortnightly. The average body weight gain was calculated compared to birds that were fed with grains and grazing. The average body weight gain was shown in Table 1. The birds from group I showed an increase in average body weight gain of 15% on day 84 of the study. The body weight differed significantly ( $P < 0.05$ ) from day 70 of the study. However, there is no significant difference in body weight gain during the initial study period. Studeis have reported a 14 percent increase in growth in birds that were fed with azolla as main feed ingredient and also stated that the smaller leaf size of *Azolla pinnata* is suitable for intake by the chicks as well as

grower/adults [2]. The higher growth rate, was also reported by many workers [5,6] which is due to higher crude protein content (above 22%), minerals and vitamins available in the fern, which were able to meet the major requirement of the body and grazing in the backyard supplemented with other amino acids and nutrients [7] stated that azolla strains have a well-balanced array of essential amino acids and constitute high quality protein if cultivated in good conditions. 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 [8]. The non azolla fed group showed reduction in weight gain. Thus, positive trend in the body weight gain in azolla fed group shows that, it can be used as a feed to enhance productivity.

**Table 1.** Body weight gain (g) birds fed azolla+grazing vs grazing+grains.

Day of study	Birds fed azolla+grazing	Birds fed grains+grazing
0 day	252.05 ± 0.22	253.03 ± 0.09
14 <sup>th</sup> day	478.10 ± 0.56	469.40 ± 0.02
28 <sup>th</sup> day	734.23 ± 0.45	721.00 ± 0.21
42 <sup>nd</sup> day	819.14 ± 0.14	811.01 ± 0.32
56 <sup>th</sup> day	1013.02 ± 0.11	1007.31 ± 0.13
70 <sup>th</sup> day	1386.00 ± 0.24*	1290.11 ± 0.42
84 <sup>th</sup> day	1591.33 ± 0.66*	1379.13 ± 0.21

\*Significant at ( $P < 0.05$ )

Note: Average body weight of birds of 10 farmers. The number of birds in each treatment and flock were considered equal,  $n = 50$

In the present study, feeding of birds with azolla under semi-range saved the feed cost by 70%. The average cost spent on grains in group II was Rs.1500.35, whereas the cost of cultivation of azolla is negligible and thus the expenditure towards grains and competition with human food is saved by resource poor farmers. This is similar with other findings [2,9] which stated that azolla meal is an unconventional feed at low price and may be used as poultry feed to reduce feed cost. However, researchers have concluded that only 20% of commercial feed could be replaced by supplementing fresh azolla in the diet will reduce the cost of feed and weight gain increases [10].

The horizontal spread of this technology to the neighboring villages helped the farmers to step towards establishing poultry micro enterprises locally.

In conclusion, azolla is a good source of protein that has resulted in body weight gain, reduction in feed cost and easily available resource (azolla) from azolla beds make it an important low-cost feed to poultry. However, further studies using large number of birds with similar objectives is needed

before giving final recommendation to use azolla as main feed.

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