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## Impact of azolla supplementation on body weight and feed cost in TANUVAS Aseel chicks

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### Abstract

This study focussed the impact of azolla supplementation on body weight and economic efficiency in TANUVAS Aseel under intensive system of rearing. This study is conducted with 240 chicks having four treatments and 60 chicks each with three replicates. Control (T<sub>1</sub>) group fed with normal diet, and the treatment groups viz., T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> had 10% 20% and 30% fresh azolla in addition to the basal diet. This experiment was conducted during chick stage upto 8 weeks. Control group and azolla supplementation group showed similar body weights during 2<sup>nd</sup>, 4<sup>th</sup>, 6<sup>th</sup> and 8<sup>th</sup> weeks of age. But there is a significant variation in feed consumption in treatment group due to intake of fresh azolla in diet. Significantly less feed consumption of T<sub>4</sub> group was observed during 2<sup>nd</sup>, 4<sup>th</sup>, 6<sup>th</sup> and 8<sup>th</sup> week and the values in grams were 81.25 ± 0.18, 128.24 ± 0.22, 208.15 ± 0.07 and 376.16 ± 0.23 respectively. Hence it is suggested that azolla can be included in the feed for TANUVAS Aseel to reduce the feed cost without compromising the body weight at correct age.

**Keywords:** TANUVAS Aseel, azolla, feed consumption, body weight, feed cost and FCR

### Introduction

Desi chickens are traditionally raised by rural agricultural producers for their meat and eggs, as well as for economic support. Though India stands in 3<sup>rd</sup> position in egg production and 5<sup>th</sup> in poultry meat production, still there is a wide gap between the supply and demand of egg and meat to meet out the ICMR recommendation. Native chicken is contributing around 33 percentage of total poultry production in India (Nair *et al.*, 2021) [4]. Desi chicken egg and meat have high consumer preference (Thomas *et al.*, 2023) [8]. There are some drawbacks in backyard poultry farming such as high cost of feed, low productivity due to poor germplasm and mortality due to diseases and predator attack. Increasing the production of chicken is the need of the hour and the cost of production must be reduced with alternate feeds to the chicken.

TANUVAS Aseel is a dual-purpose native variety of Aseel with all the characteristic features of the breed which was evolved for table purpose with continuous selection and breeding at TANUVAS. Now it is mainly used for backyard poultry farming and farmer gets good return from Aseel rearing since it attains the weight @1.2 kg by 4 months of age. Germplasm of TANUVAS Aseel is available at farms and centres of Tamil Nadu Veterinary and Animal Sciences University for the benefit of farming community.

Veterinary University Training and Research Centre, Tiruchirappalli is offering on campus and off campus training programmes for desi chicken rearing and supplying TANUVAS Aseel which are procured from Regional Research Centre, Pudukkottai and Veterinary College and Research Institute, Orathanadu. The Desi chicken unit of this centre, is supplying 4-6 week old TANUVAS Aseel to the farming community. Feed cost is the major problem of poultry rearers and hence this study focusses the impact of weight gain in TANUVAS Aseel by azolla supplementation in addition to the basal diet.

Water fern Azolla is having high proteins, essential amino acids, vitamin A, B12 and β-Carotene and minerals (Subramaniam, V, 2021) [6]. Fresh azolla can be given as a feed supplement in backyard poultry farming to reduce the cost of production and increase the benefit cost ratio.

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There are several works related with efficiency of azolla in growth performance of broilers. But very few works are done to study the impact of azolla on the production performance in desi chicken and TANUVAS Aseel birds.

### Materials and Methods

Day old Aseel chicks were purchased from Livestock Farm Complex, Veterinary College and Research Institute, Orathanadu and standard brooding with pre starter crumbles was given upto 7 days. The brooding was carried out using 60 watt electric bulbs for heat. Pre-starter feeding and *ad libitum* water is given. The birds were divided into four treatment groups after first week of age and randomly allotted with 60 chicks with 3 replicates and the details of the treatment are as follows

- T1- control- (basal diet),
- T2- Basal diet(90%) + fresh Azolla (10% to basal diet)
- T3 -Basal diet (80%)+ fresh Azolla (20% to basal diet)
- T4- Basal diet (70%)+ fresh Azolla (30% to basal diet)

TANUVAS pre-starter feed was purchased from Department of Animal Nutrition, Veterinary College and Research Institute, Orathanadu. Approximately 100 chicks require 9 kg fresh azolla per day, which can be grown in a pond size of 60 sq.m. (Swain *et al.*, 2022) [7]. Fresh azolla was harvested from the Azolla unit maintained at VUTRC, Tiruchirappalli on daily basis and washed twice before feeding to the chicks.

Body weight of chicks was recorded weekly and body weight gain was calculated. Feed consumption was also recorded on weekly basis. Feed cost was worked out for the different groups.

The statistical analysis of data was done with two-way ANOVA (Steel *et al.*, 1997) [12] under randomised complete block design. Results were expressed as Mean with their Standard Errors (Mean  $\pm$  SE).

### Results and Discussion

#### Body weight

The mean body weight (g) of TANUVAS Aseel chicks at zero day and 7<sup>th</sup> day before treatment were 31.25 $\pm$  0.21 and 43.51 $\pm$  0.10 respectively. After that chicks were randomly allotted to four different groups with 3 replicates each. Body weight of Aseel in all groups was recorded during 2<sup>nd</sup> 4<sup>th</sup> 6<sup>th</sup> and 8<sup>th</sup> week. Body weight of different group of birds at different age is given in the table. 1. There is no significant difference in body weight between the different treatments during 2<sup>nd</sup> 4<sup>th</sup> 6<sup>th</sup> and 8<sup>th</sup> week. Valavan *et al.*, (2016) [9] reported the body weight in day old Aseel birds was 33.18 $\pm$  0.91 g which is accorded with the present study. Shanmathy *et al.*, 2018 [5] reported that body weight of Aseel birds during 8<sup>th</sup> week was 392.09 $\pm$ 4.16 g which is lower value than the present findings. Chitra, 2021 reported that body weight was 570 g and Devaki and Nisha, 2023 [2] reported 448 g at 8<sup>th</sup> week under field trial of TANUVAS Aseel. The variations in body weight may be due to diet and grazing nature of the field.

#### Feed consumption

Feed consumption (g) of control group during 2<sup>nd</sup>, 4<sup>th</sup> 6<sup>th</sup> and 8<sup>th</sup> week were 91.25 $\pm$  0.08, 138.12 $\pm$  0.1, 223.32 $\pm$  0.21 and 392.31 $\pm$  0.51 respectively (Table.2). This is in agreement with the findings of Shanmathy *et al.*, 2018 [5] who reported that feed consumption (g) of Aseel birds during 2<sup>nd</sup>, 4<sup>th</sup>, 6<sup>th</sup> and 8<sup>th</sup> week were recorded as 90.75 $\pm$ 3.16, 132.99 $\pm$ 6.24, 219.12 $\pm$ 5.45 and 381.10 $\pm$ 25.61 respectively. Feed intake of T<sub>2</sub> and T<sub>3</sub> groups was significantly less when compared with control and T<sub>1</sub> group. Low feed consumption in treatment group compared with control group might be due to the intake

of fresh azolla.

#### Feed conversion ratio (FCR)

FCR indicates that amount of feed consumed by birds for gaining one kg in body weight. In this study, FCR of control birds during 2<sup>nd</sup> 4<sup>th</sup>, 6<sup>th</sup> and 8<sup>th</sup> week were 3.65  $\pm$  0.21, 3.85  $\pm$  0.24, 3.80  $\pm$  0.18 and 3.91 $\pm$  0.26 respectively. Whereas T<sub>4</sub>, 30% Azolla fed groups showed significantly lower FCR viz., 3.35  $\pm$  0.21, 3.65  $\pm$  0.24, 3.72  $\pm$  0.25 and 3.65  $\pm$  0.21. Since fresh azolla fed into treatment group, feed conversion ratio was observed as less value when compared to control group. According to Shanmathy *et al.*, 2018 [5] FCR for Aseel during the 2<sup>nd</sup>, 4<sup>th</sup>, 6<sup>th</sup> and 8<sup>th</sup> week were 3.09 $\pm$ 0.21 3.62 $\pm$ 0.17, 3.24 $\pm$ 0.18 and 7.56 $\pm$ 0.30 respectively. Din *et al.*, 2020 [10] reported that FCR of Aseel during 6<sup>th</sup> week of Aseel was 5.46 $\pm$ 0.32. Whereas Zia *et al.*, 2016 [11] reported low FCR of Aseel during 4-6 weeks and the values were around 3.11 $\pm$ 0.023. Variation in FCR of different studies might be due to diet formulation, variety of Aseel, climatic condition, growth phase etc.

#### Feed cost

Feed cost contributes the major cost of production in poultry and it is around 70 percentage. A significant difference was observed among the feed cost per kg weight gain of control and azolla supplementation group. 30 per cent azolla fed group (T<sub>4</sub>) had minimum feed cost (Rs.33.14) compared with control (Rs.37.12) and T<sub>1</sub> (Rs.36.25). The feed rate used during this trial is Rs.45 per kg chick starter, whereas Anjum and Khan, 2008 reported the feed cost of rearing chicken from 9-20 weeks was Rs.60 per bird @ feed rate Rs.12 per kg.

**Table 1:** Mean body weight (g) of TANUVAS Aseel in different azolla supplementation

| Weekly interval      | Mean body weight (g)     |                   |                   |                   |
|----------------------|--------------------------|-------------------|-------------------|-------------------|
|                      | T <sub>1</sub> (Control) | T <sub>2</sub>    | T <sub>3</sub>    | T <sub>4</sub>    |
| 2 <sup>nd</sup> week | 65.25 $\pm$ 0.10         | 64.18 $\pm$ 0.10  | 63.23 $\pm$ 0.10  | 64.25 $\pm$ 0.10  |
| 4 <sup>th</sup> week | 251.14 $\pm$ 0.16        | 259.27 $\pm$ 0.17 | 257.20 $\pm$ 0.18 | 256.24 $\pm$ 0.26 |
| 6 <sup>th</sup> week | 316.25 $\pm$ 0.15        | 317.14 $\pm$ 0.26 | 317.12 $\pm$ 0.35 | 314.25 $\pm$ 0.27 |
| 8 <sup>th</sup> week | 435.28 $\pm$ 0.50        | 440.16 $\pm$ 0.51 | 437.24 $\pm$ 0.26 | 434.15 $\pm$ 0.27 |

**Table 2:** Mean feed consumption (g) of TANUVAS Aseel in different azolla supplementation

| Weekly interval      | Feed consumption (g)     |                   |                   |                   |
|----------------------|--------------------------|-------------------|-------------------|-------------------|
|                      | T <sub>1</sub> (Control) | T <sub>2</sub>    | T <sub>3</sub>    | T <sub>4</sub>    |
| 2 <sup>nd</sup> week | 91.25 $\pm$ 0.08         | 90.10 $\pm$ 0.11  | 86.13 $\pm$ 0.18  | 81.25 $\pm$ 0.18  |
| 4 <sup>th</sup> week | 138.12 $\pm$ 0.11        | 135.15 $\pm$ 0.14 | 131.20 $\pm$ 0.15 | 128.24 $\pm$ 0.22 |
| 6 <sup>th</sup> week | 223.32 $\pm$ 0.21        | 219.17 $\pm$ 0.14 | 210.25 $\pm$ 0.13 | 208.15 $\pm$ 0.07 |
| 8 <sup>th</sup> week | 392.31 $\pm$ 0.51        | 385.26 $\pm$ 0.14 | 381.18 $\pm$ 0.17 | 376.16 $\pm$ 0.23 |

**Table 3:** Mean feed conversion ratio of TANUVAS Aseel in different azolla supplementation

| Weekly interval      | Feed conversion ratio    |                 |                 |                 |
|----------------------|--------------------------|-----------------|-----------------|-----------------|
|                      | T <sub>1</sub> (Control) | T <sub>2</sub>  | T <sub>3</sub>  | T <sub>4</sub>  |
| 2 <sup>nd</sup> week | 3.65 $\pm$ 0.21          | 3.58 $\pm$ 0.15 | 3.51 $\pm$ 0.19 | 3.35 $\pm$ 0.21 |
| 4 <sup>th</sup> week | 3.85 $\pm$ 0.24          | 3.75 $\pm$ 0.11 | 3.68 $\pm$ 0.24 | 3.65 $\pm$ 0.24 |
| 6 <sup>th</sup> week | 3.80 $\pm$ 0.18          | 3.80 $\pm$ 0.28 | 3.76 $\pm$ 0.18 | 3.72 $\pm$ 0.25 |
| 8 <sup>th</sup> week | 3.91 $\pm$ 0.26          | 3.81 $\pm$ 0.14 | 3.74 $\pm$ 0.20 | 3.65 $\pm$ 0.21 |

**Table 4:** Feed cost per TANUVAS Aseel bird in different azolla supplementation

| Treatment                | Feed cost per bird (Rs.) |
|--------------------------|--------------------------|
| T <sub>1</sub> (Control) | 37.12                    |
| T <sub>2</sub>           | 36.25                    |
| T <sub>3</sub>           | 35.05                    |
| T <sub>4</sub>           | 33.14                    |

## Conclusion

Backyard poultry farming with TANUVAS Aseel is giving good returns to the farmers. In this study, it is concluded that, azolla supplementation around 30 per cent of the basal diet improves the economic efficiency of the farmer by reducing the feed cost per bird and gives good body weight in TANUVAS Aseel at the age of 8 weeks, so that farmers can minimise the cost of production and increase their income.

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## Conflict of Interest

Not available

## Financial Support

Not available

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