



Performance Evaluation of Janapriya Chicken as an Alternative Backyard Poultry Variety under Dry land Farming Conditions of Tamil Nadu

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Abstract— Backyard poultry farming contributes to rural livelihoods by providing supplementary income and enhancing nutritional security for small and marginal farmers. However, indigenous breeds often exhibit low productivity and high mortality, particularly under changing climatic conditions. This study, conducted from October 2023 to June 2024 in Pulutheri and Chinnareddipatti villages, Thogamalai Block, Karur district, Tamil Nadu, India, evaluated the performance of improved backyard poultry strains under dry land farming conditions. Two improved varieties—Janapriya and TANUVAS Star Chicken—were compared with local non-descript birds under field conditions. Results showed that Janapriya birds attained a higher body weight (1.60 kg at five months), produced more eggs annually (120 eggs), and demonstrated better hatchability (75%) than TANUVAS Star Chicken and local birds. Mortality was considerably lower in improved varieties (5%) compared to local birds (20%). Economic analysis revealed that Janapriya generated the highest net income (INR 8635 per batch) with a benefit–cost ratio of 3.98. These findings suggest that improved backyard varieties, such as Janapriya, can significantly enhance productivity and profitability in rural poultry systems, thereby strengthening livelihood opportunities for smallholder farmers in dryland areas.



Keywords— Backyard poultry, Janapriya chicken, rural livelihood, egg production, improved poultry varieties, dry land farming

I. INTRODUCTION

Backyard poultry farming is an integral component of rural production systems in India, contributing significantly to household income, employment, and nutritional security for small and marginal farmers (Chatterjee & Rajkumar, 2015; Kumar *et al.*, 2022). It provides an affordable source of high-quality animal protein and empowers rural women, enhancing livelihood resilience in resource-poor settings (Padhi, 2016; FAO, 2020).

Traditional backyard systems rely on indigenous birds, which are well-adapted to local conditions but exhibit slow growth, delayed maturity, and low egg production (60–80 eggs per year) (Ayyagari, 2001; Singh *et al.*, 2017). To

address these limitations, improved varieties such as Janapriya and TANUVAS Star Chicken have been developed, combining local adaptability with enhanced growth and egg production (Padhi, 2016; Rajkumar *et al.*, 2019; Kumar *et al.*, 2022).

In dry land regions such as Karur district, Tamil Nadu, backyard poultry farming offers a viable supplementary livelihood option. This study evaluates the growth performance, egg production, survivability, and economic viability of Janapriya chicken under backyard farming conditions, comparing it with TANUVAS Star Chicken and local non-descript birds. The findings aim to support the promotion of improved poultry varieties and management practices to enhance rural livelihoods and food security in dry land areas.

II. MATERIALS AND METHODS

Study Area

The field study was carried out in Pulutheri and Chinnareddipatti villages located in Thogamalai Block of Karur district, Tamil Nadu. The region is characterized by a semi-arid climate with relatively low rainfall and high temperatures during most of the year. Agriculture in this area mainly depends on seasonal rainfall and groundwater resources. Farmers typically cultivate crops such as millets, pulses, and oilseeds under dry land conditions. Livestock rearing is an important component of the local farming system. Backyard poultry farming is widely practiced in the villages, where birds are raised in small flocks and allowed to scavenge freely around the household premises. However, most farmers traditionally maintain local non-descriptive birds with relatively low productivity. The present study was conducted between October 2023 and June 2024 under field conditions to evaluate the performance of improved backyard poultry varieties in this region.

Selection of Farmers

Farmers involved in traditional backyard poultry farming were selected for the study with the assistance of local extension personnel. Priority was given to small and marginal farmers who had experience in maintaining backyard poultry. Selected farmers were provided with improved poultry chicks along with training on scientific poultry management practices.

Experimental Birds

The study included two improved backyard poultry varieties: Janapriya chicken and TANUVAS Star Chicken. The performance of these improved varieties was compared with local non-descriptive poultry birds commonly maintained by farmers. Janapriya birds are known for their dual-purpose characteristics, providing both eggs and meat. They exhibit good adaptability under backyard conditions and possess multi-coloured plumage that resembles indigenous birds, which improves their acceptance among farmers and consumers. TANUVAS Star Chicken is another improved backyard poultry variety developed for rural production systems. It is characterized by moderate growth rate, good egg production, and adaptability to village conditions.

Management Practices

Improved poultry chicks were distributed to farmers with basic inputs, and they were advised to construct simple shelters using local materials. Birds were reared semi-scavenging, roaming freely for food, with supplemental feed provided early on. Vaccinations against Ranikhet, IBD, and Newcastle diseases were done, and basic biosecurity measures like shelter cleanliness and health monitoring were followed.

Data Collection

Data were collected from participating farmers throughout the study period, including body weight at day-old stage and five months of age, mortality percentage, number of eggs produced per bird per year, hatchability percentage, and cost of production along with economic returns. Body weight was measured using digital weighing scales, while egg production was recorded based on farmer records and periodic field observations. Mortality data were collected to assess survivability under backyard conditions.

Economic Analysis

The economic performance of different poultry varieties was evaluated using standard cost-benefit analysis methods, calculating indicators such as gross cost of production, gross income from sale of eggs and birds, net profit, and benefit-cost ratio (BCR). This analysis helped determine the economic feasibility of introducing improved poultry varieties under backyard farming systems.

III. RESULTS

Growth Performance

Growth performance differed significantly among the poultry varieties evaluated in the study. Improved poultry strains exhibited higher body weight compared to local birds. Janapriya birds attained an average body weight of 1.60 kg at five months of age, whereas TANUVAS Star Chicken reached 1.52 kg. In contrast, the body weight of local birds was considerably lower, averaging 1.12 kg. The superior growth performance observed in Janapriya birds indicates their better genetic potential for meat production under backyard farming conditions. Faster growth and higher body weight contribute to increased market value and improved economic returns for farmers.

Table 1: Body weight, Mortality, Egg production and Hatchability parameters.

Technology opted	BW Day old (g)	BW 5 th month (g)	Mortality (Percentage)	Egg production (No's)	Hatchability (Percentage)
Farmer practice - Unrecognized breed	30	1.12	20	70	60
Technology 1 – Janapriya	40	1.6	5	120	75
Technology 2- TANUVAS Star Chicken	41	1.52	5	110	70

Table 2: Cost Benefit ratio

Technology	Gross cost (Rs/batch)	Gross income (Rs/batch)	Net return (Rs)	BC ratio
Janapriya	2165	10800	8635	3.98
TANUVAS Star chicken	2175	10260	8086	3.72
Farmers practice	2165	7560	5394	2.49

Egg Production

Egg production varied significantly among the poultry varieties. Janapriya birds produced an average of 120 eggs annually, which was higher than TANUVAS Star Chicken (110 eggs per year). Local birds produced only around 70 eggs annually. The improved egg production observed in Janapriya birds can be attributed to their genetic improvement and better adaptability to scavenging conditions. Higher egg production directly contributes to increased household nutrition as well as additional income through egg sales.

Mortality

Mortality rate was considerably higher among local poultry birds compared to improved varieties. Local birds recorded a mortality rate of approximately 20%, whereas both Janapriya and TANUVAS Star Chicken showed significantly lower mortality rates of around 5%. Lower mortality among improved poultry varieties indicates better disease resistance and adaptability under village conditions. Proper vaccination and improved management practices also contributed to reduced mortality.

Hatchability

Hatchability percentage is an important parameter for evaluating the reproductive performance of poultry birds. In the present study, hatchability was highest in Janapriya birds (75%), followed by TANUVAS Star Chicken (70%) and local birds (60%). Higher hatchability improves the sustainability of backyard poultry systems as farmers can increase their flock size through natural hatching.

Economic Performance

Economic analysis revealed significant differences in profitability among the poultry varieties. Janapriya birds generated the highest net income of Rs. 8635 per batch with a benefit–cost ratio of 3.98. TANUVAS Star Chicken recorded a net return of Rs. 8085 with a benefit–cost ratio of 3.71. In comparison, local poultry birds generated a lower net return of Rs. 5395 with a benefit–cost ratio of 2.49. The higher economic returns obtained from improved poultry varieties demonstrate their potential for enhancing the income of rural farmers.

IV. DISCUSSION

The results of the present study clearly indicate that improved backyard poultry varieties can significantly enhance productivity compared with traditional local birds. Janapriya birds exhibited superior growth performance, higher egg production, better hatchability, and lower mortality under rural backyard conditions. These findings are consistent with earlier studies that reported improved performance of genetically developed backyard poultry strains under village production systems (Raj Kumar *et al.*, 2019; Kumar *et al.*, 2022). The higher body weight observed in Janapriya birds compared with local birds may be attributed to their improved genetic potential for growth and better feed utilization. Similar observations were reported by Singh *et al.* (2017) and Thakur *et al.* (2018), who found that improved backyard poultry varieties showed better growth rate and body weight than indigenous birds when reared under scavenging or semi-scavenging conditions. Egg production is one of the most important economic traits in backyard poultry systems. In the present study, Janapriya birds produced significantly more eggs than TANUVAS Star Chicken and local birds.

Higher egg production in improved backyard poultry varieties has also been reported by Padhi (2016) and Raj Kumar *et al.* (2017), who emphasized that genetic improvement programs have significantly enhanced the laying capacity of rural poultry strains. Increased egg production contributes not only to farmer income but also improves household nutritional security by providing a readily available source of animal protein.

The lower mortality observed in improved poultry varieties indicates their better adaptability and disease resistance under backyard farming conditions. Similar results were reported by Kumaresan *et al.* (2008), who observed higher survivability of improved dual-purpose chickens compared to local birds in rural farming systems. Proper vaccination and basic health care practices also play an important role in reducing poultry mortality in village conditions (FAO, 2020). Hatchability percentage recorded in the present study was also higher in Janapriya birds compared to other poultry varieties. Higher hatchability ensures better flock sustainability and enables farmers to expand their poultry population through natural incubation. Earlier studies have also reported improved reproductive performance in genetically improved backyard poultry strains (Raj Kumar *et al.*, 2019). Economic analysis further demonstrated the advantages of improved poultry varieties in rural production systems. The higher net returns and benefit–cost ratio obtained from Janapriya birds highlight their potential for improving the economic status of rural households. Similar findings were reported by Kumar *et al.* (2022) and Murali and Vimalarani (2025), who reported that improved backyard poultry varieties, generated higher income compared with traditional indigenous birds.

Despite the advantages of improved poultry varieties, several constraints still limit their large-scale adoption in rural areas. Consumer preference for indigenous birds with multi-coloured plumage and traditional taste remains an important factor influencing market demand (Padhi, 2016). In addition, the limited availability of improved chicks in rural areas restricts the expansion of backyard poultry farming. Strengthening the supply chain for improved poultry chicks, providing farmer training programmes, and improving rural marketing systems can significantly enhance the adoption of improved backyard poultry technologies. Overall, the results of the present study confirm that improved backyard poultry varieties such as Janapriya have considerable potential to enhance productivity, profitability, and livelihood security of smallholder farmers in dry land regions.

V. CONCLUSION

Janapriya chicken outperformed other varieties in backyard farming in Tamil Nadu's dry lands, showing higher body weight, egg production, and lower mortality. Economic analysis revealed higher net income and benefit–cost ratio, making it suitable for improving rural livelihoods. Promoting such varieties can boost rural poultry farming productivity and profitability.

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