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Demonstration of backyard rearing of TANUVAS Aseel x Nandanam chicken-4 chicks among rural youth for improved income

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Abstract

Backyard poultry farming plays a pivotal role in enhancing rural livelihood, improving nutritional security and generating supplementary income for small and marginal farmers. Despite its potential, traditional desi bird rearing suffers from poor egg production, low body weight, high mortality and limited access to improved germplasm. To address these constraints, a frontline demonstration (FLD) was conducted by Krishi Vigyan Kendra (KVK), Kattupakkam, to popularize TANUVAS Aseel × Nandanam Chicken-4 (ANC4), a superior synthetic native chicken strain evolved for dual-purpose performance. Five rural youth from Erumbulicheri village, Chengalpattu and Kancheepuram districts, were selected, and each was provided with 20 day-old ANC4 chicks along with feed and equipment. The study assessed key productive and economic parameters, including body weight, livability, feed efficiency, age at first lay, egg production and benefit-cost ratio (BCR). Results showed significant improvement in all assessed traits compared with local desi birds. ANC4 demonstrated higher livability (94%), better body weight (518 g at 8 weeks; 1.16 kg at 12 weeks), improved feed efficiency (3.642) and reduced age at first lay (157 days). Monthly egg production increased from 130 in local birds to 390 in ANC4 birds from the given birds to farmers. Economic analysis revealed a BCR of 1.89 compared with 1.09 in desi birds, indicating substantial profitability. Farmers reported increased income, household egg consumption and high market demand. The demonstration created awareness, motivated horizontal spread and enhanced entrepreneurship among rural youth. The findings confirm ANC4 backyard rearing as a viable livelihood intervention for rural households.

Keywords: Backyard poultry, TANUVAS ANC4 chicks, Rural youth, Livelihood improvement, Egg production, Benefit-cost ratio, Native chicken.

Introduction

Backyard poultry rearing is a traditional livelihood activity among rural households in India, providing a reliable source of nutrition and supplementary income (Ahuja & Pratap, 2020) ^[1]. Native chicken varieties, although hardy and well adapted, suffer from low productivity, poor egg output, and high broodiness (Padhi, 2016) ^[6], ultimately limiting farmer income and nutritional security.

India ranks as the 3rd largest egg producer globally, yet per capita egg consumption still falls short of ICMR recommendations, indicating the need for enhanced productivity in rural poultry systems (Chatterjee *et al.*, 2016) ^[3]. Improved backyard poultry strains have demonstrated significantly higher growth and egg production compared with desi birds (Haunshi *et al.*, 2018; Islam *et al.*, 2014) ^[4, 5].

TANUVAS has developed several improved native strains, including Aseel and Nandanam Chicken-4, both known for superior growth and egg-laying ability (Peethambaran *et al.*, 2019) ^[7]. Their three-way synthetic cross, TANUVAS Aseel × Nandanam Chicken-4 (ANC4), exhibits better livability, attractive plumage, enhanced body weight, and high egg yield suitable for backyard systems (Padhi, 2016; Chatterjee

et al., 2016) ^[6, 3].

However, rural youth often lack access to improved germplasm, training and scientific management practices, as reported in multiple field studies on rural poultry adoption (Singh & Kumar, 2020; Wong *et al.*, 2017) ^[9, 10]. Therefore, the present frontline demonstration aimed to evaluate the productive and economic performance of ANC4 birds in real farm settings and assess their livelihood-enhancing potential.

Materials and Methods

Study Area and Beneficiaries

The FLD was conducted in Erumbulicheri village of Chengalpattu district. Five rural youth farmers were purposively selected based on interest, willingness to adopt improved poultry strains and previous experience with desi bird rearing.

Inputs and Interventions

- Each beneficiary received:
- 20 day-old TANUVAS ANC4 chicks
- 20 kg chick brooder feed

- One chick feeder and drinker

A total of 100 ANC4 chicks and 100 kg feed were procured from TANUVAS Poultry Research Station and CFTU, Kattupakkam respectively.

Training

Participants underwent training on scientific poultry rearing, feeding, brooding, disease prevention and record maintenance.

Parameters Assessed

- Livability (%)
- Body weight at 8 weeks (g) and 12 weeks (kg)
- Feed efficiency (FCR)
- Age at first egg laying (days)
- Egg production per month (Nos.)
- Economic parameters: Gross cost, Gross return, Net return and BCR

Data Analysis

Data were compiled from farmer records and analyzed using simple descriptive statistics (mean and percentage comparisons).

Results

Performance of ANC4 Birds

ANC4 birds demonstrated superior growth, egg production and economic returns across all farmers. The average performance indicators are summarized in Table 1.

Table 1: Growth and Economic Parameters of ANC4 Backyard Rearing

S. No.	Parameters	Local desi Birds (Check)	ANC4 Birds (Demo)
1	Body weight at 8 weeks (g)	316	518
2	Livability (%)	59	94
3	Body weight at 12 weeks (kg)	0.832	1.16
4	Feed efficiency	6.034	3.642
5	Age at egg production (days)	210	157
6	Egg production (per month)	130	390
7	Gross cost (Rs.)	2367	2486
8	Gross return (Rs.)	2595	4700
9	Net return (Rs.)	228	2214
10	Benefit-Cost Ratio	1.09	1.89

The substantial improvement in livability (from 59% to 94%) and weight gain (increased by 38% at 12 weeks compared to desi birds) observed in ANC4 birds is consistent with previous reports on improved native chicken performance under backyard conditions (Reddy *et al.*, 2017; Haunshi *et al.*, 2018) ^[3, 4]. Similarly the feed efficiency nearly doubled, the age at first lay reduced by 53 days, monthly egg production increased threefold and net returns increased from Rs.228 to Rs.2214.

Discussion

The results of the demonstration showed that ANC4 birds substantially outperformed local desi varieties in growth, reproductive performance and economic returns. These findings align with earlier studies that reported improved native chicken strains achieving 30-50% higher productivity

under field conditions (Chatterjee *et al.*, 2016; Haunshi *et al.*, 2018) ^[3, 4].

The higher body weight and better feed efficiency observed in ANC4 are consistent with the performance characteristics reported in improved Aseel crosses and synthetic native strains (Peethambaran *et al.*, 2019; Barua & Yoshimura, 2021) ^[7, 2]. Improved livability in the current study may be attributed to better adaptability and enhanced genetics, which have been previously documented in similar backyard production systems (Islam *et al.*, 2014; Padhi, 2016) ^[5, 6].

Early sexual maturity (157 days) and enhanced monthly egg production (390 eggs/month per farmer) mirror the improved reproductive traits reported in other dual-purpose native chicken lines evaluated under rural conditions (Reddy *et al.*, 2017; Singh & Kumar, 2020) ^[8, 9].

The economic benefits, particularly the high BCR (1.89), reinforce findings from other livelihood-based poultry interventions, which reported notable income gains among rural youth and women upon adoption of improved poultry technologies (Wong *et al.*, 2017; Ahuja & Pratap, 2020) ^[10, 1].

Overall, the study confirms that ANC4 has strong potential as a livelihood-enhancing intervention for rural poultry keepers, consistent with global evidence emphasizing the socio-economic value of improved backyard poultry systems.

Conclusion

The frontline demonstration successfully established TANUVAS ANC4 as a superior backyard poultry option for rural youth. The strain's enhanced productivity, resilience and market demand significantly increased farmer income and improved household nutritional security. Adoption of ANC4 can therefore serve as a scalable and sustainable livelihood model. Awareness creation, regular training and continued technical support will further promote widespread adoption and long-term economic benefits.

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