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Leonal Rabins S

Subject Matter Specialist
(Animal Science), ICAR KVK,
Tirunelveli, Tenkasi, Tamil
Nadu, India

Joan Jose

Animal House Veterinarian,
IIBAT, Padappai, Tamil Nadu,
India

S Sethupathi

Programme Assistant, ICAR
KVK, Tenkasi, Tamil Nadu,
India

Economic traits of TANUVAS Aseel on backyard rearing at Tenkasi district of Tamil Nadu

Leonal Rabins S, Joan Jose and S Sethupathi

Abstract

ICAR KVK, Tirunelveli (Tenkasi) conducted a study to evaluate the economic traits of TANUVAS Aseel in Tenkasi district of Tamil Nadu. TANUVAS Aseel chicks of 15 days old were procured from TANUVAS, Tirunelveli and distributed to selected farmers in various blocks. Body weight and egg productions were documented at farmer's field on weekly interval up to 40 weeks. Economic traits investigated included, 16th week body weight of male and female, Age at sexual maturity, Livability, Egg weight, Egg production up to 40 weeks and Feed conversion ratio. The mean values of 16th week body weight of male and female, Age at sexual maturity and Egg productions (up to 40 weeks) were, 1.03±0.09 Kg, 0.86±0.06 Kg, and 185±4.1 days and 142±1.6 eggs respectively. Since it has better growth, egg production capability and disease resistance character, this dual-purpose bird is well received by farmers of Tenkasi districts of Tamil Nadu.

Keywords: Economic traits, TANUVAS Aseel, livability, egg production and age at sexual maturity

1. Introduction

Over the past years, consumption rate of meat and meat products are increased at Tenkasi district of Tamil Nadu. The demand for the desi chicken meat reared under backyard method often increased among the rural farmers and consumers. Desi chicken rearing will provide economic support to the farmers' community while also producing high-quality meat and eggs (Premavalli *et al.*, 2020) [8]. On the other hand, the awareness on native breeds of chicken and new improved varieties on production basis were lacking among the farmers.

Even though, native chicken breeds have low production performance and a high incidence of seasonal disease outbreaks, they are raised as backyard poultry to meet the family's meat and egg needs, providing income to rural unemployed youths and women (Gnanaraj *et al.*, 2020) [4]. This native poultry rearing can be enhanced with improved strains such as Gramapriya, Srinidhi, Swarnathara, Giriraja, Vanaraja, and TANUVAS Aseel, etc.

TANUVAS Aseel as per latest studies, could be a good egg producer with maximum disease resistant (Vinothraj *et al.*, 2020) [12]. It is a superior variety of native chicken developed at Poultry Research Station, TANUVAS using Aseel strain from Central Poultry Development Organization (CPDO), Bhubaneswar (Base population), Directorate of Poultry Research (DPR), Hyderabad. Individual selection of male for body weight, family selection of female for egg production, and continuous breeding for 20 generations resulted in TANUVAS Aseel, a dual-purpose native breed (Thangadurai *et al.*, 2019) [11].

On these parameters ICAR KVK, Tirunelveli (Tenkasi) introduced this breed among the farmers of Tenkasi district for meat and egg production purpose. At Tenkasi district the field level reports on TANUVAS Aseel are scanty. This present study may help the women entrepreneur to improve their livelihood and economic status at village level.

2. Materials and Methods

2.1 Farmers selection and Training

The present study was structured by ICAR, Krishi Vigyan Kendra, Tenkasi district of Tamil Nadu through Front Line Demonstration (FLD) to study the economic traits of TANUVAS Aseel chicken under backyard rearing. Initially, farmers from different blocks were selected as per eligibility procedure. A scientific training was given on native chicken rearing to the

Corresponding Author:

Leonal Rabins S

Subject Matter Specialist
(Animal Science), ICAR KVK,
Tirunelveli, Tenkasi,
Tamil Nadu, India

selected farmers. TANUVAS Aseel chicks of 15 days old were procured from TANUVAS, Tirunelveli and acclimatized with electrolytes powder and vitamin supplements.

2.2 Method demonstration

Next day, the chicks, feed bags, brooding equipments were distributed to the selected farmers from different blocks of Tenkasi district. A total of 100 chicks were supplied to the selected 10 farmers. The feed bags of various age group formulated rations were procured from Feed formulation unit, TANUVAS, Kattupakkam. The brooding was continued for a period of 21 days (3 weeks) using electric bulbs as sources of heat and illumination at farmer's field. The chicks were supplied with good quality food, water, and temperature (35 °C) for 24 hours during brooding to avoid early chick mortality.

Scientific management and vaccination practices as per protocol were demonstrated and applied throughout the experimental period. As per Tamil Nadu Animal Husbandry department reports Tenkasi district is an endemic for Ranikhet disease outbreaks, throughout the study the birds were vaccinated against the disease and the details were recorded. Seasonal deworming was also practiced using selected need based antihelminth. Chick starter ration was provided to the chicks up to 4 weeks of age. Subsequently, the grower ration during growing periods and layer ration for the layers were provided. Since it is a backyard rearing household wastes were also provided by the farmers under free ranging systems. The demonstrated fields were regularly visited for scientific assistance and observation recorded. The mortality of birds was observed, fertility and hatchability percentage were also

recorded for a period of one and half year. For study of fertility and hatchability percentage, every week, each 200 numbers of eggs from TANUVAS Aseel chicken were collected and set in a small-scale incubator. The economic traits of Body weight for male and female, Feed Conversion ratio, Liveability Percentage, Age at First Egg, Egg Production (20-40 Weeks), Egg Weight (grams) and Hatchability Percentage were collected for individual birds and recorded at weekly intervals. The mean value and standard deviation of these parameters were documented.

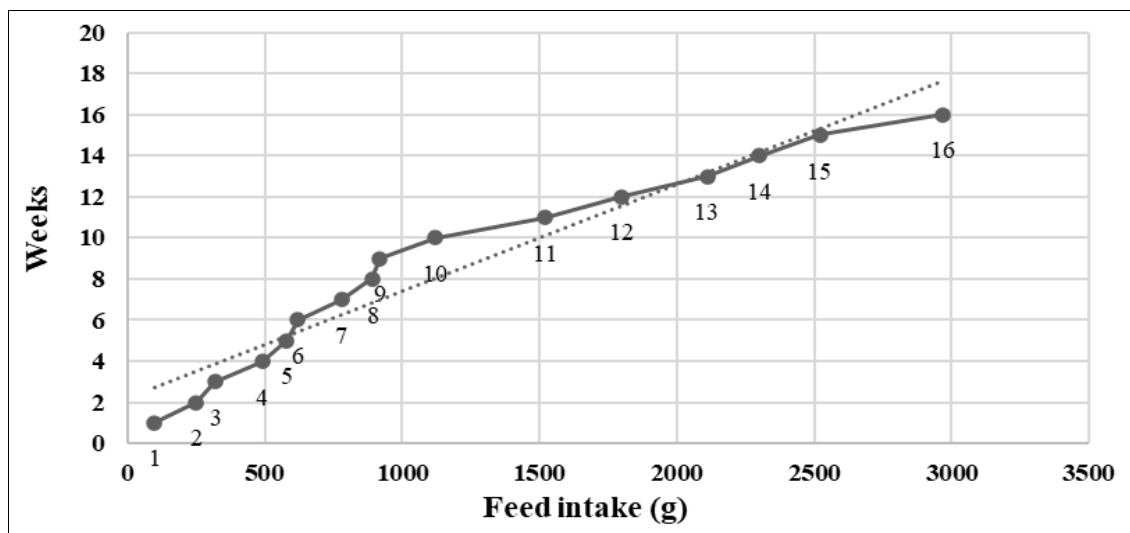
3. Results

The marketing body weight of 16-week-old male and female were 1.03±0.09 Kg and 0.86±0.06 Kg respectively. The present study revealed that the average age at sexual maturity of TANUVAS Aseel is 185±4.1 days. Comparable percentage of Liveability (0-12 weeks) was recorded in our study as 95.75±0.67%. The consolidated estimate of egg production (40 Weeks) revealed that the number of egg production for TANUVAS Aseel chicken is 142±1.6 eggs. In present study the average egg weight of TANUVAS Aseel chicken 51.9±0.37 gms. An average fertility and hatchability percentage of TANUVAS Aseel chicken recorded as 88.2±0.31% and 82.7±0.24 %, respectively.

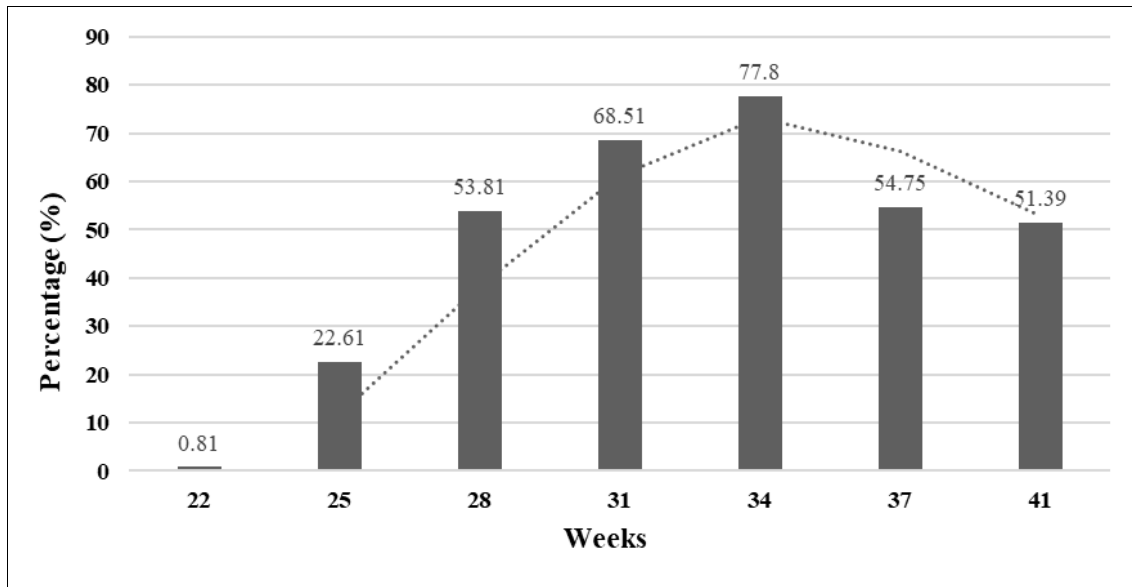
Feed conversion ratio of TANUVAS Aseel in our study was 2.82±0.28 with the overall consumption of 2.97 kg. Maximum of 5% mortality rate was recorded in the present study. The maximum egg production was reported at 34th week of the study. The mean values and their standard deviation of the economic traits of TANUVAS Aseel is shown in Table 1.

Table 1: Economic traits of TANUVAS Aseel chicken

S. No	Parameters	Results	
1.	Body weight (Kg) 16 th week	Male	1.03±0.09
		Female	0.86±0.06
2.	Livability (0-12 week) %	95.7±0.67	
3.	Age at sexual maturity (days)	185±4.1	
4.	Egg weight (gms)	51.9±0.37	
5.	Egg production (40 weeks)	142±1.6	
6.	Feed conversion ratio (Kg)	2.82±0.28	
7.	Hatchability (%)	82.7±0.24	
8.	Fertility (%)	88.2±0.31	
9.	Mortality % up to 72 weeks	5	
10.	Average feed intake up to 16 th weeks (kg)	2.97 Kg	
11.	Maximum egg productions	34 th week	



Graph 1: Consolidated weekly body weight of TANUVAS Aseel



Graph 2: Percentage (Weekly) of Hen-day eggs production of TANUVAS Aseel

4. Discussions

The present study reported that the average 16th week significant body weight of male and female was 1.03 ± 0.09 Kg and 0.86 ± 0.06 Kg. Male birds attained expected body weight faster than female birds. These results were comparable with Chitra, 2021, which highlights the average body weight of Aseel chicken at 16th week of age as 1.41 ± 0.26 kg. Even though all birds were maintained under similar general management conditions, the abrupt changes in the environment and a fluctuating microenvironment which are outside of human control had a substantial impact on variations in body weight gain. Environmental factor may have an impact on body weight of birds which is one of the important factors that draws consumers to buy live birds.

In general, it takes longer for a native chicken to reach its marketing body weight; if it attains earlier, consumers are more likely to purchase a live bird at ground level. Temperature and humidity variations were reported frequently in our district, which may have contributed to the slight differences in weight gain. This study also reported on the different ranges of body weight gain in birds of the selected block in the district. Sankarankoil in Tenkasi district had registered a lower body weight gain than the other blocks in the district.

Average age at sexual maturity of TANUVAS Aseel in present study was 185 ± 4.1 days. In contrary to present finding, age at first egg was lower in the study of Haunshi *et al.*, (2011) [5], Thangadurai and Shanmugam (2019) [11] and Vinothraj *et al.*, 2020 [12]. It is reported that the age at first egg in the Aseel flock ranged between 154 and 214 days (Ezhilvalavan *et al.* 2016) [3]. It was noticed that the onset of sexual maturity in hen was comparatively longer than the other reports. Dorji *et al.*, 2015 [2], suggested that sexual maturity of the hen may also be associated with live body weight. In our study, a significant body weight of around 900 gms was achieved at 112 days, started laying eggs at the age of 185 days. Percentage of Livability (0-12 weeks) recorded in our study was 95.75 ± 0.67 . However, Ezhilvalavan *et al.*, (2016) [3] observed that Livability of Aseel was 94.29. The variation in Livability is mostly due to environmental factors especially the study locations. Age at sexual maturity is one of the factors considered when live hens are procured for rearing purpose from other farmers. The variation of the

sexual maturity could give indirect loss to the eggs marketing farmers.

Motsepe *et al.* (2016) [6] argue that the unorganized sector of backyard poultry production of eggs and meat is critical to doubling income and family nutrition to the poorest of the poor egg production is the utmost factors for selection and adaption of new breeds at backyard rearing is egg production. Growth in the poultry segment is expected to remain strong due to egg production. Village or backyard production can make a useful contribution to dietary protein intake and incomes of resource poor households (Rajkumar *et al.*, 2010) [9]. Farmers' transitions from organic to natural farming have recently increased among Tenkasi district farmers.

The comparative estimate of egg production (40 Weeks) revealed that the TANUVAS Aseel chicken produced 142 ± 1.6 eggs. This value is higher than the previous report of Aseel chicken with a range of 18 to 64 eggs (Vij *et al.* 2006; Rajkumar *et al.* 2017) [13, 10]. Ezhilvalavan *et al.* (2016) [3] reported that an average egg production at 20 to 72 weeks of age as 159 eggs per bird. Our study's maximum egg production was reported at 34th week. There is a decrease in continuous egg production after reaching maximum production. (Graph. 2). The prominent broodiness character of Aseel is the primary reason for differences in eggs production. In present study the average egg weight of TANUVAS Aseel chicken was 51.9 ± 0.37 gms. This result agreed with the findings of Chitra *et al.*, 2021. According to those reports, the egg size of TANUVAS Aseel is nearly identical in many reports and is not influenced by micro and macro environmental factors.

Attaining a maximum fertility and hatchability rate in native chicken was always a difficult task for farmers. The timely placement of eggs for incubation is regarded as a critical factor in achieving a high hatchability percentage. The TANUVAS Aseel chicken's average fertility and hatchability percentages were 88.2 ± 0.31 and 82.7 ± 0.24 , respectively. Rajkumar *et al.* (2017) [10], on the other hand, found a low fertility rate of 67.18%, hatchability of 44.71% on total eggs set, and 80.87% on fertile eggs set in Aseel chicken. Overall fertility was influenced by a variety of factors, including breed, nutrition, age, and native chicken management practices. The variation in fertility and hatchability may be due to age differences in the birds as well as variable environmental conditions.

At the field level, the feed conversion factor was also very important. The rising cost of feed bags and other raw materials is another important factor for farmers when choosing a poultry breed. This is the most important economic parameter, and a ratio of 1:1 appears to be the most efficient (Nicol, 2013). According to our findings, the average feed intake of TANUVAS Aseel at 16 weeks of age was 2.97 Kg (Graph.1). In our study, the feed conversion ratio of TANUVAS Aseel was 2.82 ± 0.28 . Vinothraj *et al.*, 2020^[12] reported similar findings. Farmers can also formulate feed from locally available raw materials, lowering feed costs. Any factor that is likely to cause discomfort, such as difficulty accessing feed, could result in heterogeneous growth and health issues. This will eventually result in significant reductions in feed intake in native chicken.

5. Conclusions

The native breeds play a major role in providing subsidiary income and nutritional security to the small-scale farmers of India. At present, the Indian native chicken population is 37.2% of the total population, which contribute around 17.8% of the total egg production in the country. Low mortality and high egg productions are the expected quality for farmers to adopt the newly introduced improved breeds. The present study revealed that the average body weight at 16th week of age, body weight at first egg laying, age at the point of lay, egg weight and egg production up to 20 and 40 weeks of age, fertility, and hatchability percentage of TANUVAS Aseel was satisfactory among the farmers of Tenkasi district. It is well accepted strain by rural areas and improved the socio-economic status of rural people and rural women empowerment. Besides income generation, TANUVAS Aseel reared under backyard helps to alleviate the malnutrition of the rural people through production of valuable animal protein.

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