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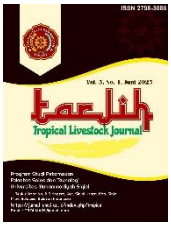

Growth Performance of SenSi Native Chickens Under an Intensive Rearing System

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ABSTRACT

This study aims to analyze the growth pattern of body weight of superior SenSi native chickens in an intensive maintenance system and to evaluate the effectiveness of the system in supporting production performance. This study was conducted for 75 days, covering three maintenance phases: starter (1–21 days), grower (22–42 days), and finisher (43–75 days), with a sample of 20 chickens from a population of 275 DOCs observed individually. The method used was a field experiment in a closed cage with ad libitum feeding. Data collected included initial body weight, weekly weight, daily weight gain (DWG), feed conversion (FCR), and mortality. The results showed a sigmoid growth pattern, where body weight increased consistently from 28.25 g in DOC to 1080 g on the 75th day. The highest DWG was recorded at 75 days of age at 14.02 g/head/day. The FCR value of 2.31 indicates good feed efficiency for native chickens, with a very low mortality rate of 0.88%. The conclusion of this study is that SenSi native chickens have high potential to be cultivated in an intensive system, both in terms of growth, feed efficiency, and resistance to mortality. These results can be a reference for breeders, researchers, and policy makers in developing superior native chicken cultivation strategies based on scientific data and production efficiency.

INTRODUCTION

The poultry farming sector is one of the backbones of providing animal protein for the Indonesian people. Among the types of poultry that play an important role, native chickens occupy a special position because they have long been part of Indonesia's agrarian culture and have high economic and social value. Consumers in Indonesia have a special preference for native chickens because of their distinctive meat taste, are more chewy, and are considered healthier (Junaedi *et al*., 2024). Market demand for native chickens is relatively stable, and even tends to increase along with the growing public awareness of the consumption of natural and traditional foods. Unfortunately, the productivity of

native chickens is still a major challenge in developing efficient and sustainable livestock businesses.

Local native chickens are generally raised traditionally with extensive or semi-intensive systems (Jamili, 2022). This system is indeed suitable for the character of native chickens which are adaptive to open environments, but at the same time has many limitations (Junaedi & Husnaeni, 2020). The growth rate of native chickens is slow, the harvest weight is not uniform, and the mortality rate is high due to minimal environmental and disease control. As a result, the production cycle becomes long and inefficient in terms of time and cost (Junaedi, 2024). To answer these challenges, an intensive maintenance system is a potential alternative, especially in optimizing the growth of native chickens in a measurable manner.

The intensive maintenance system refers to a cultivation model that prioritizes closed cage management, controlling temperature, humidity, lighting, sanitation, and providing regular and balanced feed (Tamalluddin *et al*., 2012). This system has been proven to increase production efficiency in broiler chickens, and has also begun to be applied to native chickens to encourage faster and more uniform growth. However, the application of this system to local native chickens sometimes encounters obstacles, especially because the genetics of traditional native chickens tend to grow slowly and are less responsive to intensive management. Seeing these conditions, several poultry research and breeding institutions in Indonesia have developed superior native chickens from selection that have better performance. One of the results of this selection is the SenSi native chicken. The SenSi native chicken was developed to combine the genetic advantages of local native chickens with the characteristics of fast growth like meat chickens (Karimah, 2022). The result is a native meat chicken that has better growth potential, high feed conversion efficiency, and still maintains the distinctive taste characteristics of native chicken. With improved genetic performance, SenSi chicken is a prime candidate for commercial development through an intensive rearing system.

The SenSi native chicken exhibits several key advantages, including high adaptability, relatively rapid growth, and superior feed efficiency compared to conventional local native chickens. Under optimal management conditions, SenSi chickens are capable of achieving marketable body weight within a shorter production cycle, typically around 10–12 weeks. Furthermore, this strain demonstrates a relatively strong resistance to disease, making it well-suited for application in small- to medium-scale intensive production systems (Saleh *et al*., 2024). These attributes position the SenSi native chicken as a strategic commodity for enhancing national food security while simultaneously improving the livelihoods of smallholder poultry farmers. Despite its significant potential, comprehensive scientific studies on the growth patterns of SenSi chickens under intensive management systems remain limited. Existing research has predominantly addressed genetic characteristics and environmental adaptability, with limited focus on detailed analysis of body weight development in controlled environments. However, data on body weight growth are essential for determining optimal slaughter age, estimating feed conversion ratios, and assessing economic viability at commercial scale. This underscores the need for more specific, targeted, and application-oriented research on the growth performance of SenSi native chickens in intensive production settings.

The urgency of this research is reinforced by the livestock industry's growing need for comprehensive data on the growth performance of superior native chickens, which serves as a critical foundation for designing effective management systems. In

an increasingly competitive economic environment marked by rising production costs, poultry farmers are required to optimize all aspects of production, including body weight gain efficiency. Without clear scientific data, management decisions are often based on assumptions or subjective experiences that may not be accurate or reliable. Therefore, the findings of this study are expected to be valuable not only to the academic community but also to practitioners and policymakers in the livestock sector. Beyond its urgency, the novelty of this research lies in its analytical approach to the growth performance of the SenSi native chicken, which has not yet been systematically explored. This study specifically investigates the body weight growth pattern of SenSi chickens under intensive rearing systems, encompassing the starter, grower, and finisher phases. This approach is essential to understanding growth dynamics over time and identifying critical phases that can be leveraged to enhance production efficiency.

Measuring average daily body weight gain, feed conversion ratio (FCR), and mortality rate in poultry is essential for evaluating growth performance, feed efficiency, and overall flock health. Average daily gain reflects the rate of growth, FCR indicates the efficiency with which feed is converted into body mass, and mortality rate serves as a critical indicator of health management and environmental conditions. These parameters are interrelated and directly influence the productivity, sustainability, and profitability of poultry production systems. Furthermore, the study contributes to the development of a growth profile for superior native chickens, which can serve as a basis for formulating national native chicken farming strategies. The objectives of this study are to analyze the body weight growth patterns of SenSi native chickens across different rearing phases under intensive management, assess the effectiveness of intensive systems in supporting the growth performance of this superior strain, and provide quantitative data to inform decisions regarding optimal harvesting age, feeding strategies, and the economic feasibility of intensive native chicken production. Through this research, it is anticipated that scientifically grounded information will be generated to guide the development of native chicken farming enterprises based on intensive systems. With a data-driven and measurable approach, the potential of SenSi native chickens as a national superior commodity can be maximized, contributing to increased income for local farmers and addressing future demands for animal protein in Indonesia. This study aims to analyze the growth pattern of body weight of superior SenSi native chickens in an intensive maintenance system and to evaluate the effectiveness of the system in supporting production performance.

METHODS

Research Methodology

The research sample consisted of 20 SenSi native chickens selected for data collection. The chickens were housed in a representative colony cage under uniform rearing conditions, and individual body weights were monitored at regular intervals. Data were collected through direct field measurements using a digital scale (accuracy: 0.01 g), daily recording forms, and photographic documentation to support observational data.

This study used a quantitative approach with direct data collection in the field. The research sample consisted of 20 SenSi native chickens taken from a total population of 275 Day Old Chicks (DOC). Sample selection was carried out non-randomly without using stratification or random methods, but rather using a purposive sampling technique. The selection was carried out based on the criteria of uniformity of age (one day), healthy physical condition, active, and showing no symptoms of disease. This purposive sampling

technique aims to obtain individual chickens that are visually and physiologically considered to represent the normal conditions of the population, as well as to minimize the influence of disturbance variables from health factors and age differences. The sample chickens were then placed in representative colony cages with a uniform maintenance system, including the provision of feed and drinking water, environmental temperature control, lighting, and optimal sanitation. This is done to ensure that environmental conditions do not become external variables that can affect the results of research related to the growth and development of SenSi native chickens.

This study was a field-based experimental research aimed at evaluating the body weight growth of SenSi native chickens under an intensive rearing system. All husbandry activities were conducted in a controlled environment using intensive management practices, including the provision of feed and drinking water on an ad libitum basis. The research was conducted over a period of 75 days and encompassed three main rearing phases: Starter phase (day 1–21), grower phase (day 22–42), and finisher phase (day 43–75).

Research Procedure

The chicken house was cleaned and sterilized prior to the placement of SenSi native day-old chicks (DOC). Equipment such as feeders, drinkers, and weighing scales were prepared in advance.

Chick Placement

SenSi native DOCs were introduced into the housing on Day 0 and individually identified using coded markers.

Feeding and Drinking

Feed was provided ad libitum using commercial feed formulated according to the respective rearing phase. Drinking water was supplied continuously.

Body Weight Monitoring

Body weight measurements were conducted using a digital scale. Individual weights of all sampled chickens were recorded at scheduled intervals.

Research Parameters

Initial Body Weight (g)

The body weight of individual SenSi native day-old chicks (DOC) when first placed in the housing.

Weekly Body Weight (g)

The body weight of the chickens recorded at weekly intervals.

Daily Weight Gain (g)

Calculated based on the difference in weight between weeks, divided by the number of days.

Final Total Body Weight (g)

The body weight of the chickens at harvest age on Day 75.

Feed Conversion Ratio (FCR)

The ratio of feed intake to body weight gain during the rearing period. FCR shows how much feed is needed to produce 1 kg of body weight, calculated using the formula (Djunaidi *et al.*, 2025):

$$\frac{\text{Amount of feed consumption } (kg)}{\text{Body weight (kg)}}$$

Mortality (%)

The number of chickens that died during the rearing period, expressed as a percentage of the initial population, calculated using the formula (Djunaidi *et al.*, 2025):

$$\frac{\text{Number of dead chickens}}{\text{Total number of chickens at starts}} \; x\; 100$$

Data Analysis

The data obtained from observations were analyzed using descriptive statistical methods, including the calculation of mean body weight, standard deviation, mortality rate, feed conversion ratio (FCR), and daily weight gain (DWG).

RESULT AND DISCUSSION

Daily Growth of Native SenSi Chicken

This study observed the body weight growth of SenSi free-range chickens over a 75-day period under an intensive rearing system. Based on the data presented in Table 1, there was a consistent increase in body weight from the day-old chick (DOC) stage up to 75 days of age. The initial body weight of the DOCs was recorded at 28.25 ± 1.21 g, which progressively increased to 1080 ± 22.48 g by day 75. Table 1 illustrates a sigmoid growth pattern, characterized by a slow initial phase, a rapid growth phase in the middle, and a deceleration toward the later stage. The average daily weight gain (ADG) also showed an increasing trend with age, reaching a peak of 14.02 g/day at 75 days of age. Other notable ADG peaks were observed at 64 days (13.74 g/day) and 55 days (12.89 g/day), indicating that the optimal growth phase of SenSi chickens occurred between days 36 and 75.

An increase in body weight was observed on day 6, reaching 70.4 ± 3.32 g, indicating a gain of approximately 42 g from the initial DOC weight within just six days. This early growth suggests that SenSi native chickens possess a good initial adaptability to intensive rearing systems. Following this, the growth rate increased significantly up to day 28, with the average body weight reaching 316.15 ± 30.07 g. During the grower phase (28–48 days of age), the chickens exhibited a marked surge in body weight gain, particularly between days 33 and 36, where body weight jumped from 340.75 g to 487.35 g. During this period, the average daily gain (ADG) reached 12.75 g/day, marking a distinct growth spurt phase. Afterward, the growth rate remained relatively consistent, although minor fluctuations were observed, which are typical in biological systems.

The growth pattern of SenSi native chickens in this study reflects the characteristics of local poultry breeds that have undergone genetic selection programs. Compared to conventional native chickens, SenSi chickens exhibited relatively faster, more stable, and more predictable body weight gain, supported by the intensive rearing environment (Harnanik & Masito, 2019). The observed sigmoid growth pattern is consistent with general livestock growth theory, which states that monogastric animals, including chickens, experience a slow growth phase during early life (adaptation phase), followed by a rapid growth phase (log phase), and then a deceleration approaching maturity (stationary phase) (Nurhayati, 2018). In this study, the rapid growth phase was clearly evident from day 20 to day 64, characterized by significant weight gains and high ADG values.

Table 1. Growth of native SenSi chicken

Age (day)	Body weight (g)	Body weight gain (g/day)
DOC	28.25±1.21	0.00
6	70.4±3.32	7.03
20	198.3±10.72	8.50
28	316.15±30.07	10.28
33	340.75±23.59	9.47
36	487.35±23.53	12.75
48	576.45±38.92	11.42
55	737.05±42.32	12.89
64	907.35±67.89	13.74
75	1080±22.48	14.02

One of the key factors influencing these results is the intensive rearing system applied. This system enables optimal control over feed, drinking water, temperature, ventilation, and disease prevention (Suprayogi *et al*., 2020). The availability of ad libitum feed and high-quality nutrition plays a major role in facilitating the high growth rate observed. Optimal environmental management also helps reduce thermal stress and disease risks that often hinder growth in semi-intensive or extensive systems (Junaedi & Khaeruddin, 2018). As a result, the chickens can allocate more energy toward tissue development and overall growth.

When compared to data from Demasani (2021), conventional native chickens typically reach a body weight of about 600–800 g at 10 weeks of age (70 days) under semi-intensive rearing systems. In contrast, in this study, SenSi native chickens reached 907.35 ± 67.89 g at 64 days and 1080 ± 22.48 g at 75 days. This indicates that the growth performance of SenSi chickens under intensive rearing is significantly superior to that of conventional native strains. These findings affirm that the genetics of SenSi chickens, which have undergone selective breeding and genetic improvement, possess a highly competitive growth potential. This potential is further optimized when supported by conducive environmental conditions, such as those provided in intensive systems.

The pattern of average daily gain (ADG) exhibited fluctuations that reflect the metabolic dynamics and nutrient requirements at different growth stages. The highest ADG was recorded at 75 days of age, reaching 14.02 g/day, suggesting that the chickens had not yet reached their physiological growth limit. This indicates the potential for extended rearing to achieve higher body weights if desired. A slight decrease in ADG at 33 days (9.47 g/day), following a previous increase, may be attributed to physiological adjustments such as skeletal and muscle tissue development. However, chickens with superior genetics, such as the SenSi strain, were able to quickly recover and resume their growth rate.

These findings have positive implications for both productivity and economic efficiency. With a body weight exceeding 1 kg at 75 days of age, significantly faster than traditional native chickens which typically require 90–120 days. Indicates time efficiency, feed cost savings, and better space utilization. SenSi native chickens represent a competitive alternative for meat production compared to traditional native chickens, which typically require 90–120 days to reach similar weights (Rosningsih & Amin, 2017). SenSi chickens significantly shorten the production cycle, directly reducing feed costs and space requirements. This efficiency is particularly relevant for small- to medium-scale poultry operations, especially in regions with high demand for native chicken meat. Moreover, the shorter rearing period reduces the risk of losses due to disease outbreaks or market price fluctuations.

Table 2. Body weight, feed conversion ratio, and mortality of SenSi native chickens

Parameters	Mean
DOC weight (g)	28.25±1.21
Final body weight at 75 days (g)	1080±22.48
BWG (g/head/day)	14.02
FCR	2.31
Mortality (%)	0.88

Based on the data obtained (Table 2), the body weight of the Day-Old Chicks (DOC) of SenSi native chickens was recorded at 28.25 ± 1.21 g, while the body weight at harvest on day 75 reached 1080 ± 22.48 g. The average daily gain (ADG), calculated as the difference between the harvest weight and the DOC weight divided by the rearing period, was 14.02 g/head/day. The feed conversion ratio (FCR) was 2.31, while the mortality rate during the rearing period was 0.88%. One of the key aspects in evaluating poultry

performance in intensive farming systems is feed conversion (Rahmawati *et al*., 2019). The FCR value of 2.31 indicates that the chickens required 2.31 kg of feed to gain 1 kg of body weight. The FCR of 2.31 indicates good feed efficiency for SenSi native chickens raised under intensive systems.The FCR was calculated based on total feed intake and weight gain, and is superior to local native chickens, which may exceed an FCR of 3.0.This value is considered relatively good for native chickens, although it is higher than that of commercial broilers (which typically have an FCR ranging from 1.5 to 1.8). Manullang *et al.* (2025) reported that the FCR value obtained from broiler chickens ranged from 1.36 to 1.41, which is considered efficient for broiler production standards. However, in the context of native chickens, an FCR of 2.31 demonstrates better feed efficiency compared to traditional local strains, which can have FCR values as high as 3.0–4.0 or more. Harun *et al.* (2025), reported that the FCR value of SenSi chickens ranged from 3.33-3.74, while Hidayat & Sumiati (2014) reported that the FCR of Sentul chickens was 3.55-4.57.

Feed conversion efficiency is influenced by several factors, including feed formulation, raw material quality, feeding methods, and the genetic traits of the chickens themselves (Akhadiarto, 2017). The SenSi native chickens used in this study demonstrated good feed efficiency, although not as high as commercial broilers, they were still much more efficient than conventional native chickens. This provides significant economic value as feed accounts for approximately 60–70% of the total production costs in poultry farming. Feed conversion efficiency is also linked to the chickens' ability to digest and absorb nutrients from the feed, as well as the energy metabolism that occurs during the growth process. Chickens with low FCR are not only economically beneficial but also help reduce production waste because feed is utilized more efficiently.

The mortality rate during the rearing period was recorded at 0.88%, which is an excellent result for intensive farming systems. A mortality rate of only 0.88% indicates strong adaptability and effective health management under intensive rearing. Attributed to proper sanitation, consistent access to feed and water, and stress control.A low mortality rate indicates that the SenSi chickens possess strong resistance and that health management practices are being optimally implemented (Junaedi *et al*., 2024). In intensive rearing systems, a mortality rate below 2% is considered very good. Meanwhile, according to Djunaidi *et al*. (2025), the ideal mortality rate should not exceed 5% under good management practices. Several factors contribute to the low mortality rate, including timely vaccination, ideal stocking density, proper coop sanitation, and stress control due to temperature changes, noise, or overcrowding (Efendi, 2016). Additionally, the provision of clean and adequate feed and drinking water is critical for the chickens' immunity. The low mortality rate is highly important from an economic standpoint as it directly affects final productivity. The lower the mortality rate, the higher the number of chickens that can be harvested, leading to increased revenue without a significant increase in production costs.

CONCLUSION

The SenSi native chickens reared intensively for 75 days demonstrated excellent growth performance. With a final body weight of 1080 g, an average daily gain (ADG) of 14.02 g/day, a feed conversion ratio (FCR) of 2.31, and a mortality rate of only 0.88%, the SenSi chickens proved to be efficient, adaptive, and economically viable for farming. These values position SenSi native chickens as a leading candidate in the development of superior local poultry breeds that are both productive and highly competitive in the national market.

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