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Factors Aff ecting the Trend in the Number of Chicken Eggs Produced in South Sulawesi

Artikel Dosen 04102024

Jurnal Dosen UMI

Universitas Muslim Indonesia

Document Details

Submission ID
trn:oid:::1:3031609416

Submission Date
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REDVET - Revista electrónica de Veterinaria - ISSN 1695-7504
Vol 25, No. 1 (2024)
http://www.veterinaria.org
Article Received: 10 October 2023; Revised: 22 November 2023; Accepted: 16 December 2023

Factors Affecting the Trend in the Number of Chicken Eggs Produced in South Sulawesi

Nurliani[1*], Ida Rosada[2], Sitti Nurani Sirajuddin[3], Nurhapsa[4], Abdel Razzaq Al Tawaha [6], Abdel Rahman Mohammad Said Al- Tawaha[7], Arun Karnwal[8]

[1]Agribusiness Study Program, Faculty of Agriculture, Universitas Muslim Indonesia
E-mail: nurliani.karman@umi.ac.id

[2]Agribusiness Study Program, Faculty of Agriculture, Universitas Muslim Indonesia
E-mail: ida.rosada@umi.ac.id

[3] Department of Socio-Economic, Faculty of Animal Science, Universitas Hasanuddin
E-mail:sitti.nurani@unhas.ac.id

[4]Faculty of Agriculture, Universitas Muhammadiyah Pare-pare
E-mail: hapsa_faktan@yahoo.co.id

[6] Horticulture Research Directorate, National Agricultural Research Center (NARC), Baq'a 19381, Jordan
E-mail: abdelrazzaqaltawaha@gmail.com

[7]Department of Biological Sciences, Al Hussein Bin Talal University, P.O. Box 20, Maan, Jordan

[8]Department of Microbiology, School of Bioengineering and BioSciences, Lovely Professional University, Phagwara, India

Corresponding author:: nurliani.karman@umi.ac.id

Abstract

Purebred chicken eggs are highly consumed in Indonesia, making them a significant component of the country's diet. As the population grows and educational levels increase, there is a greater awareness among the public about the importance of nutrition and food, particularly the role of protein in everyday life. The demand for egg products in the Indonesian market remains consistently high due to their versatility in various food applications. Objective: This study examined the factors influencing trends in purebred chicken egg production. A comprehensive literature review was conducted, utilizing data from the Central Statistics Agency and reputable sources such as academic journals and authorized print and digital media. The collected data were analyzed using descriptive methods. Results: Purebred chicken egg yield has fluctuated over the past five years. Between 2018 and 2019, there was a significant increase of 27 % in egg production. However, there was a subsequent decline in both 2020 and 2021. The number of eggs produced experienced a modest growth of 6% from 2021 to 2022. Notably, this increase coincided with a surge in demand for purebred chicken eggs, suggesting that individuals rely on them to fulfill their animal protein requirements. Conclusions: The quantity of purebred chicken eggs produced in South Sulawesi is influenced by various factors such as fluctuations in egg prices, producer income, costs of raw materials (e.g., feed and seeds), market demand, and the occurrence of disease outbreaks. These elements collectively shape the region's production trends of purebred chicken eggs.

Keywords*:* Trends in Production Numbers, Chicken Eggs

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Introduction

South Sulawesi is the seventh most significant contributor to chicken egg production in Indonesia. The production of chicken eggs in this area has experienced a consistent increase over the past decade. It is worth noting that chicken egg production in South Sulawesi plays a crucial role in ensuring a sustainable food supply for the local population while also serving as a significant source of income for the community. Moreover, chicken egg production is vital in meeting the population's nutritional needs. Poultry eggs are known for their high nutritional content, including essential vitamins such as A, D, E, B6, B12, and minerals. These nutrients are crucial for human growth and overall health (Amar, 2021; Asnawi et al., 2023; Bakrie et al., 2021; Coyne et al., 2020; Relawati et al., 2023; Sandiah et al., 2021). Regarding local economic development, chicken egg production contributes significantly to employment opportunities for the local community. It is estimated that approximately 40,000 people directly participate in the industry in South Sulawesi. Among these individuals, 80% are farmers, while the remaining work in production-related roles. The poultry industry, therefore, represents a substantial source of income and serves as an effective means of poverty alleviation in the region (Hartono et al., 2021; Maulana et al., 2023; Asnawi et al., 2023; Wantasen et al.,2022; Nismalasari et al., 2023; Ilham et al., 2021; Mappigau & Amar, 2020).

The demand for eggs of animal origin continues to increase. This is consistent with increasing population size, education levels, public knowledge about the value of nutrition and food, especially proteins, in everyday life, and society's increasing ability to consume animal products. Increasing livestock areas not only benefits social and nutritional outcomes but also significantly impacts participants in the livestock industry, particularly on welfare (Ningsih, 2017; Paly, 2019).

The Indonesian market's interest in egg products seems constant. The reason for this is apparent: these products can be used for different purposes, especially in preparing different types of meals. Against this background, the laying hen business in Indonesia appears to be very promising. It is not unlikely that breeding this type of chicken will still provide the owner with long-term returns (Ramadhon et al., 2021).

Eggs are a source of animal protein that is good for human life. One of the eggs most consumed by Indonesian people is purebred chicken eggs. Chicken eggs contain many types of high-quality protein, including essential amino acids for human needs. One egg can contain 7 grams of protein. The protein content of egg yolk is 16.5%, and egg white is 10.9%, while the fat content of egg yolk reaches 32%, and the amount in egg white is small. It also contains various vitamins and minerals, including vitamin A, riboflavin, folic acid, vitamin B6, vitamin B12, choline, iron, calcium, phosphorus, and potassium (Elpawati et al, 2022)

According to Agustina et al. (2021), consuming diverse and nutritionally balanced foods can improve immunity and health. Balanced nutrition refers to the composition of food that contains complete nutrition that the body needs, both macronutrients (carbohydrates, proteins, and fats) and micronutrients (vitamins and minerals), which are very important to support growth and

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development as well as to maintain and improve body health. The existence of chicken eggs is enough to help lower middle-class people meet their nutritional needs as a daily diet, and it is important to know that eggs are a food source that has quite dense nutritional content, which is suitable for use as growth and replacement for damaged body cells (Zaresta et al., 2022; Juli Supriyanti, 2021).

Purebred chicken eggs are expected to gain popularity year after year due to their lower cost when compared to other types of eggs. Chicken eggs are rich in protein and minerals. Consumer taste and preference for purebred chicken eggs for consumption contribute to increased sales of purebred chicken eggs (Zaresta et al., 2022). South Sulawesi is one of the few places in Indonesia with a relatively stable laying hen population that can keep pace with population growth. This aligns with growing public awareness of the benefits of consuming eggs as an animal protein source, which are affordable for all segments of society. Egg consumption will continue to rise year after year due to the qualities of purebred chicken eggs, which are inexpensive to all levels of society, have a high nutritional value as an animal protein source, and are popular with people of all ages. This provides context for writing about the factors impacting the trajectory of chicken egg consumption in South Sulawesi.

Research Methods

This study uses the literature review method. A literature review provides a detailed summary of research on a particular issue. It informs readers about what is known and unknown about the topic, provides the rationale for the study, and suggests ideas for future research (Denney & Tewksbury, 2013).This research relies on data from the Central Statistics Agency—also, scientific publications, academic papers and other reliable information from print and digital media. The present study presents statistical data on broiler chicken meat production trajectory in South Sulawesi between 2018 and 2022. Multiple literature reviews have been conducted to discern the factors influencing chicken egg production in the same region. The data analysis methodology employed in this research is a descriptive study that systematically elucidates the patterns observed in broiler meat output.

Results And Discussion

Figure 1 illustrates the temporal variation in egg production from purebred chickens in South Sulawesi over five years. The quantity of eggs produced in 2018 amounted to 9,725,837, which then experienced an increase to 13,779,226 in 2019. However, a decline in production occurred in 2020, reaching 12,112,190. Subsequently, in 2021, a rebound was observed, with the production of eggs rising to 13,237,827. Notably, the highest level of egg production from purebred chickens was recorded in 2019.

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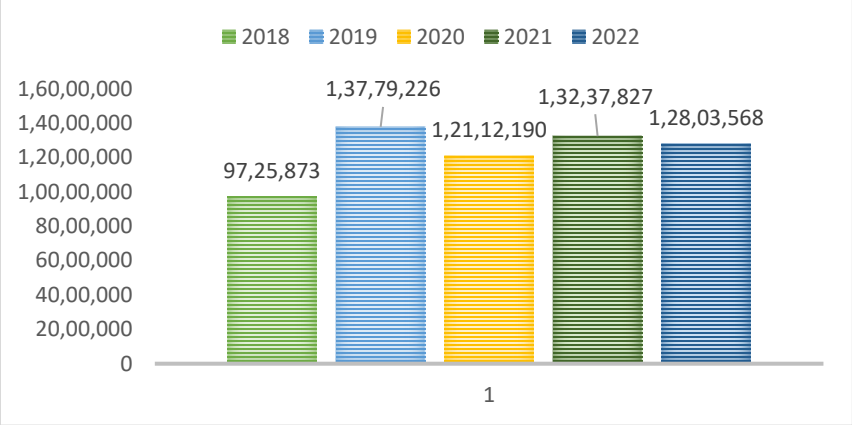
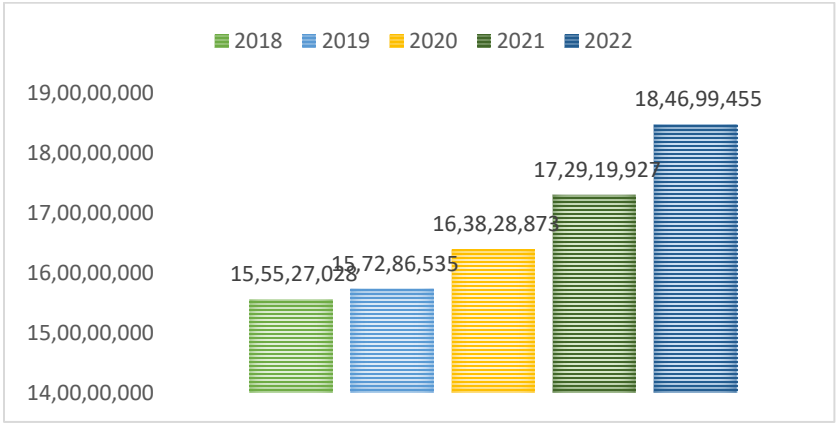
Figure 1. Population of Laying Breed Chickens in South Sulawesi from 2018 to 2022:



Source: Livestock and Animal Health Statistics, 2022

Figure 2 shows purebred chicken egg consumption data from 2018 to 2022. Between 2018 and 2022, the demand for purebred chicken eggs increased sharply, reflecting population growth in South Sulawesi and greater public awareness of the importance of sufficient animal proteins. The larger the population, the greater the need for food to survive.

Figure 2. The amount of purebred chicken eggs that were consumed in South Sulawesi between the years 2018 and 2022



Source: Livestock and Animal Health Statistics, 2022

Figure 3 shows the Egg production for purebred chickens for five years (2018-2022). The eggs produced increased by 27% between 2018 and 2019 but decreased in 2020. In 2021 increased by 6% from 2021 to 2022.

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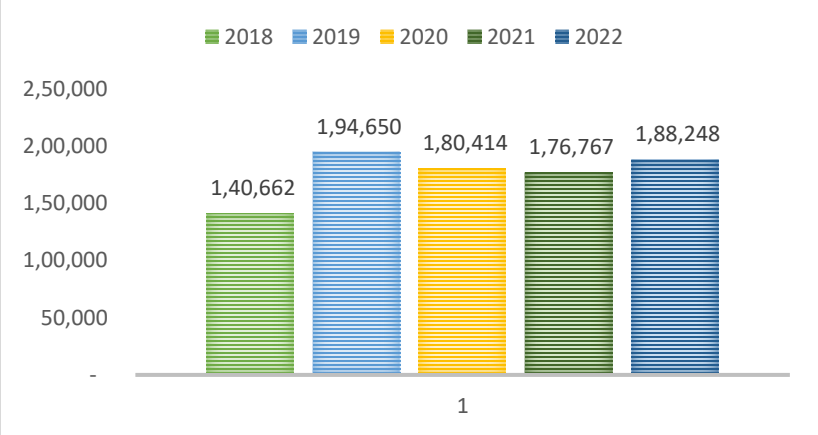
Figure 3. Producing Eggs from Purebred Chickens in South Sulawesi Between the Years 2018 and 2022.Source: Livestock and Animal Health Statistics, 2022



Protein and choline make chicken eggs a healthy option for beef or chicken, according to the USDA Food Pyramid (Ramadhon et al., 2021). Eggs from purebred chickens are a source of protein that is easy to find and has an affordable price (Lumenta et al, 2022)

Factors influencing the demand and supply of chicken eggs in South Sulawesi are as follows.:
1. Fluctuating Egg Prices

The prices of purebred chicken eggs in South Sulawesi have experienced fluctuations between 2018 and 2022. These fluctuations in price have had an impact on egg production. Specifically, during holidays such as Idul Fitri, the prices of chicken eggs tend to increase, leading farmers and suppliers to ramp up their production to meet the demand. Conversely, when egg prices fall, companies reduce their production to avoid financial losses. However, it is essential to note that the prices of purebred chicken eggs have continued to fluctuate due to the declining purchasing power of consumers. For instance, prices slightly increased during the Eid Al Fitr and Christmas celebrations 2020. The Chinese New Year also tends to drive up the price of chicken eggs. This study suggests that the pandemic has impacted the prices of chicken eggs, which is consistent with the findings of Agustin, et al (2020), who also observed changes in the prices of purebred chicken eggs. Despite some positive developments, the prices of purebred chicken eggs experienced a decline in May 2020, likely due to the effects of the pandemic.

The price is positively related to the offer. This is consistent with Djojodipuro's (1991) idea that the number of goods/services produced by producers can be changed by increasing or decreasing their price—quantity increases when price increases and quantity demanded decreases when price decreases. The price, therefore, has a positive relationship with the production quantity. It is essential to critically analyze the demand-supply pricing model and the price-cost-profit-volume model to determine the impact of price fluctuations on the demand for chicken eggs in the market. According to economic theory, if the price of a product increases, the quantity demanded by consumers will decrease (Meng et al., 2021; Van et al., 2020; Loxton et al., 2020; Sarkar et al., 2022). The term used to describe this relationship is a “negative” or “inverse” relationship. In other

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words, consumer demand for a product decreases as the price of the product increases. Knowing the relationship between demand and supply quantity with price, the price trend and fluctuation of market demand leads to potential price shifts and movements along the demand curve (Sana, 2020; Meng et al., 2021). If one of the determinants of the quantity demanded changes, a demand shift occurs in addition to the product price. During a period of price fluctuation, demand in the market shifts, creating a new price and quantity equilibrium. Market factors influencing egg demand and consumption patterns in South Sulawesi are essential considerations for all farmers. First, it is essential to note that eggs are a popular and relatively cheap source of protein in Indonesia (Cempaka et al., 2023). In recent years, demand for eggs has increased as the population has grown and become increasingly urbanized. As a result, many small chicken farmers take advantage of readily available markets for their products, including eggs. This, in turn, has led to an overall increasing trend in egg production. Price fluctuations can affect the profitability of egg production. The egg supply strongly influences egg prices in Indonesia in the country (Khoiriyah et al., 2023; Maulana et al., 2023; Nuriliani et al., 2022; Putri et al., 2021; Relawati et al., 2023).

2. Manufacturer's Advantage

Poultry farming for laying hens is promising. Egg farms are incentivized to provide products. The extensive range of items available for purchase impacts the financial bottom line. Higher forecast profits lead to an increased supply of goods. According to the supply rule, an increase in profits leads to an increase in the quantity of goods offered. Profit is the primary goal of all businesses, even those with chickens. Indonesian manufacturers choose to start a business venture comparable to farmers aiming for quick profits, regardless of scale. Price has a significant impact on farmers' income and includes both selling price and production costs. The product's price is determined by the company's revenue from selling chicken eggs, sorted birds, and chicken manure and production costs such as cage, seeds, labor, feed, medicines, vaccines, and electrical infrastructure costs. To effectively manage production costs in the competitive egg market, the manager should focus on efficient control rather than increasing prices (Martinez, Stephen, 2002).

3. Raw Materials (Feed and Seeds)

Production factors such as feed and seeds significantly influence the livestock industry, particularly the laying hen sector. Rising input costs, including feed and seeds, can lead to financial losses for farmers and halt production. An increase in feed prices, the primary production source, could lead to declining egg production. Farmers, especially livestock farmers, often face challenges in supplying feed. Concrete measures are required to ensure the availability of this feed. One possible option is to utilize local feed production by setting up a feed production facility. Establishing this feed mill can help ensure the constant availability of economical feed while maintaining a steady supply. Using local feed sources can increase efficiency and maximize the potential of layer manufacturing processes. In addition, using local feed sources can increase productivity in livestock farms, thereby increasing market competitiveness (Rohani et al., 2019).

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In addition to providing nutrients, seeds are also crucial for egg production. Seed is crucial for the optimal performance of laying hens. Producers need to understand the concepts of chicken selection, including seed selection, depending on the production capacity of the laying hen breed (Afandi et al., 2020). Breeders usually purchase day-old chicks (DOC) from breeding companies.
In addition to providing nutrients, seeds are also crucial for egg production. Seed is crucial for the optimal performance of laying hens. Producers need to understand the concepts of chicken selection, including seed selection, depending on the production capacity of the laying hen breed (Afandi et al., 2020). Breeders usually purchase day-old chicks (DOC) from breeding companies.

4. Consumer Demand

Consumer demand or desires are strongly tied to the production quantity delivered by suppliers. The increasing demand for chicken eggs leads to an increase in supply or production. This encourages farmers to expand their production in response to the growing demand for chicken eggs. Growers increase production levels to meet market demand. The demand for purebred chicken eggs in South Sulawesi is increasing yearly. The decision is influenced by consumers' per capita income, the number of dependents, their demand for pure-bred chicken eggs, and the government's BPNT program. Manufacturers increased the amount of purebred chicken egg producers to meet the growing demand (Ilham and Saptana, 2019). The expected growth in egg production is expected to meet increasing consumer demand. Farmers need data on market variables that influence consumer egg demand to manage production and sales effectively. If this information is not provided, the production and distribution plan will fail or not function as intended. It is crucial to predict future egg demand to organize production and sales effectively, ensure demand is met, and help local governments manage egg supplies.

5. Environmental Factors

Several environmental factors significantly influence the development of the number of chicken eggs produced in South Sulawesi. The first is climate, which includes temperature, humidity, and precipitation. In general, it is extreme temperatures that can have adverse effects on the productivity of laying hens (Gicheha, 2021; Vandana et al., 2021; Biswal et al., 2022; Kim et al., 2020; Wasti et al., 2020). In hot weather, chickens eat less and drink more water, reducing egg production.

5. Disease Outbreak

In March 2020, several regions were affected by the Covid-19 epidemic. In Indonesia, it significantly impacted various sectors, especially the economy. The affected sector is the poultry industry, particularly egg production. This situation increases the demand for animal goods such as eggs. The decline in egg production from laying hens is a consequence of changes in consumer demand (Sarlan & Murah, 2022). The egg-laying chicken sector is significantly affected by disease outbreaks such as the COVID-19 pandemic. In 2019, laying hens in South Sulawesi produced

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194,650 chicken eggs, which decreased to 180,414 in 2020, as shown in Figure 1. This is the impact of the Covid-19 pandemic. Animal disease outbreaks can lead to reduced production. This disease affects the reproductive system of the chicken. Young laying hens can regenerate up to 80% of their egg production, but older birds suffer irreversible damage, leading to a significant decline in egg production.

Conclusion

The egg production of purebred chickens in South Sulawesi has varied over the past five years. Specifically, there was a notable increase of 38% from 2018 to 2019, followed by declines in 2020 and 2021. However, a modest increase of 6.49% was observed from 2021 to 2022. This positive trend can be attributed to consumers' growing demand for purebred chicken eggs. Consequently, the local community necessitates an adequate supply of purebred chicken eggs to meet the increasing demand for animal protein sources. Several factors have been identified as influential in expanding purebred chicken egg production in South Sulawesi: fluctuating egg prices, producer income, raw inputs, demand, and disease outbreaks.

Author Contributions: Conceptualization and review writing, Nurliani, Ida Rosada ; Supervision, review and editing the draft, Sitti Nurani Sirajuddin, Nurhapsa; Writing—review & editing and original draft preparation, Nurliani, Ida Rosada; Writing—review and editing, Abdel Razzaq Al Tawaha, Abdel Rahman Mohammad Said Al- Tawaha, Arun Karnwal

Conflicts of Interest: The authors declare no conflict of interest

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Article Received: 10 October 2023; Revised: 22 November 2023; Accepted: 16 December 2023

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