

Fluctuations and Movement Patterns of Race Chicken Egg Prices in Bengkulu Province

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ABSTRACT

Chicken eggs are a staple food with a high enough animal protein content and the price is quite affordable for all levels of society. This causes the consumption of chicken eggs to be relatively high compared to other animal protein sources. However, currently, the amount of production and consumption by the public is not comparable; besides that, the price offered is constantly fluctuating. This study aimed to determine price fluctuations and price movement patterns of broiler chicken eggs in Bengkulu Province. The data used is secondary data. The research method used quantitative descriptive analysis. The research results show that the risk of fluctuations in the price of broiler eggs in Bengkulu Province has a slightly higher risk for prices at the producer level when compared to prices at the consumer level. The development pattern of broiler egg prices in Bengkulu Province generally shows a positive direction. Fluctuations in the price of broiler eggs occur in specific periods. These fluctuations occur because they coincide with religious holidays such as Ramadan, Eid al-Fitr, Christmas and New Year, the influence of the Russia-Ukraine war, and economic problems due to the Covid-19 pandemic.

Keywords: chicken eggs, fluctuations, price movements, race chicken egg prices

INTRODUCTION

Food is one of the most basic human needs. Fulfilment of food in quantity and quality is very important; besides that, it is also needed as the basis for Indonesia's development in the long term. Food consumption behaviour is an indicator that assesses the household economy and national economies levels. It can even become one of the indicators determining the Human Development Index. Caloric needs can be obtained from staple foods, while protein needs are obtained from the consumption of animal foods (Rorimpandey et al., 2020).

Animal food products are food ingredients needed by the people of Indonesia apart from the staple food of rice. Since ancient times, people have served staple foods with animal foods to improve nutrition. This animal protein is essential in everyday life because it contains various amino acids for human growth and intelligence. This role cannot be replaced by vegetable protein sources (Song et al., 2016).

One source of animal protein is purebred chicken eggs (Reflis et al., 2021), Where laying hens are the largest egg producers and the cheapest source of animal protein at a price the wider community can reach. As Syamsiah said (2020), chicken eggs are one of the staple foods which contain quite a high amount of animal protein but at a price that is quite affordable for all levels of society. In addition, eggs are a source of

animal protein with the highest biological value, so eggs are the easiest-to-digest protein source.

This causes the consumption of chicken eggs to be relatively high compared to other animal protein sources. The high consumption of chicken eggs is not always matched by stable production Sari et al., (2022). The egg production of free-range chickens in Bengkulu Province, based on Bengkulu Province, in figures (2022) shows an increase. The total production of chicken eggs in 2020 were 3,406.77 tons; in 2021, it increased to 3,415.85 Tons. However, according to Reflis et al. (2021), egg production in Bengkulu Province is insufficient and requires a supply of eggs from North Sumatra and West Sumatra. This is why the price of purebred chicken eggs has not fallen since the end of 2020.

Based on SUSENAS 2020-2021 data, it is known that the consumption of purebred chicken eggs per capita in 2020 is 6.682 kg/year; these eggs are the highest protein consumed by people in Bengkulu Province compared to chicken meat at 5.292 kg/year. Year and beef by 0.328 kg/year, but the consumption of chicken eggs will decrease in 2021, namely to 6.533 kg/year. A decrease in consumption equals a decrease in demand. The demand for purebred chicken eggs is closely related to the price because, at the right price people can buy them according to their income. The increase in income greatly affects the demand for eggs. If income changes, the amount of demand for eggs will also change so that it can affect egg production and trading activities.

The high price risk reflected in price fluctuations does impact not only producers but also consumers. For producers, this will lead to uncertainty regarding the acceptance of the livestock business and will further affect the willingness of farmers to continue producing. For consumers, the risk of high prices will certainly impact efforts to achieve family food security. Thus research is needed on the pattern of price movements of broiler eggs in Bengkulu Province.

MATERIALS AND METHODS

The location of this research was chosen purposively with the consideration that in Bengkulu Province, the commodity of eggs is one of the basic needs of the people whose consumption needs are relatively high. The type of data used is secondary data, namely data on the development of broiler egg prices in a daily time series (time series) starting from the first day of August 2021 – the last day of December 2022; there are 519 daily data points (series). The data in this study were sourced from the Bengkulu Province Animal Husbandry Service and the Bengkulu Province Central Bureau of Statistics.

Price fluctuation analysis

In this study, fluctuations in broiler egg prices in Bengkulu Province were analyzed using the analysis of covariance and coefficient of variation (CV). Covariance analysis in this study was used to determine the most effective unit period of broiler egg price fluctuations for analysis. Analysis with the coefficient of variation is used to determine how high the level of risk is directly proportional to the level of fluctuation; that is, the higher the fluctuation, the higher the risk. Revenue risk analysis is carried out using the Coefficient Variance CV (%) by dividing the standard deviation (SD) by the average production/month (\bar{x}). From the analysis results, a comparison of the risk of broiler egg prices was then carried out. The magnitude of the coefficient

of variation indicates the relative price risk (Ekaria and Muhammad, 2018).

Price fluctuation movement pattern

The analysis used in this research is descriptive statistical analysis. Descriptive statistical analysis is an analysis that processes data through tabulations and graphs so that the development pattern of broiler egg prices in Bengkulu Province can be identified.

Measurement criteria (Makridakis, 1999):

1. Horizontal (Constant) if: Data fluctuates around its average. The data for each commodity has its minimum and maximum figures, and the data fluctuate in that range.
2. Seasonal (Seasonal) if: Data is formed from movements that repeat regularly over a certain period and are influenced by seasonal factors (for example certain quarters in a year, months or days in a specific week).
3. Cycle (Cyclical) if: Data that occurs as a result of long-term economic fluctuations such as those related to business cycles (usually seen in annual data patterns)
4. Trend if: Data formed because there is a continuous increase or decrease in a certain period

RESULTS AND DISCUSSION

Fluctuations in the price of race chicken eggs

This study will be determined based on covariance analysis tests to determine the most effective time unit period for measuring fluctuations in broiler egg prices in Bengkulu Province. After obtaining the period from the results of the covariance analysis, it is continued with risk analysis using the Coefficient Variance CV (%) to determine the level of fluctuation in egg prices by dividing the standard deviation (SD) value by the average production/month (\bar{x}). Here are the result values and their covariances:

Table 1. Price fluctuation analysis of race chicken based on unit of time.

No.	Period	Covariance Values
1.	Daily	6617860.670
2.	Weekly	4970447.774
3.	Monthly	7127742.557

Source: Processed secondary data, 2022

Based on the covariance analysis that has been carried out on the price of purebred chicken eggs in Bengkulu Province, it can be seen that

prices at the producer level and the consumer level both for daily, weekly and monthly measurements have a positive covariance value, which means

that the linear relationship is positive. This means that if the price of eggs at the producer level increases, the consumer level will also increase. The most considerable covariance value in the three time periods is 7127742.557, contained in the monthly data. This means that the analysis of patterns and trends of broiler eggs has a more effective fluctuation relationship when analyzed in units of monthly periods. These price fluctuations will have several impacts, as obtained by Yuhuan and Fu (2018) who state that the price of chicken eggs continues to fluctuate in China, affecting farmers' income and people's welfare.

Price fluctuation risk assessment uses the coefficient of variation. The greater the value of the coefficient of variation, the greater the risks faced (Ilham & Saptana, 2019). Table 2 below shows the value of the price variance coefficient, which indicates the level of risk in the price of broiler chicken eggs.

The data above shows that the risk of broiler egg prices at the producer price level is 12.39%, and at the consumer, the level is 11.35%. The risk of fluctuations in broiler egg prices has a slightly higher value of 1.04% compared to the price of broiler chicken eggs at the consumer level. This result is more excellent than Ilham and Saptana (2019), who found a coefficient of variance at the producer and consumer levels of 10.6% and 7.1%. It can be concluded that the risk of fluctuations in the price of purebred chicken eggs at the producer level during the period August 2021 – December 2022 tends to affect prices at the consumer level.

The results of the analysis are in line with Utomo (2022), which states that the price of chicken eggs fluctuates, where in general, the fluctuations that occur are caused by several factors, including the amount of available food stocks, weather and season, the amount of demand and the price of raw materials in the food procurement itself. This means that if there is a change in the amount of food stock, weather and season, the amount of demand and the price of raw

materials will cause a price change. Food, either increased or decreased. There is an increase or price fluctuation in contrast to Putri and Wulandari (2022) which states that fluctuations in the price of purebred chicken eggs tend to be stable. However, price fluctuations are still caused by rising food prices and people's purchasing power.

Price development pattern of purebred chicken eggs

The price pattern for purebred chicken eggs can be obtained from daily time series data from the first day of August 2021 – the last day of December 2022 in Bengkulu Province. Based on the correlation and covariance analysis results above, to analyze the price pattern of broiler eggs in Bengkulu Province at the most effective producer and consumer level in this study, daily data were converted in monthly periods. Following are the results of the analysis of the pattern of development of broiler egg prices in Bengkulu Province.

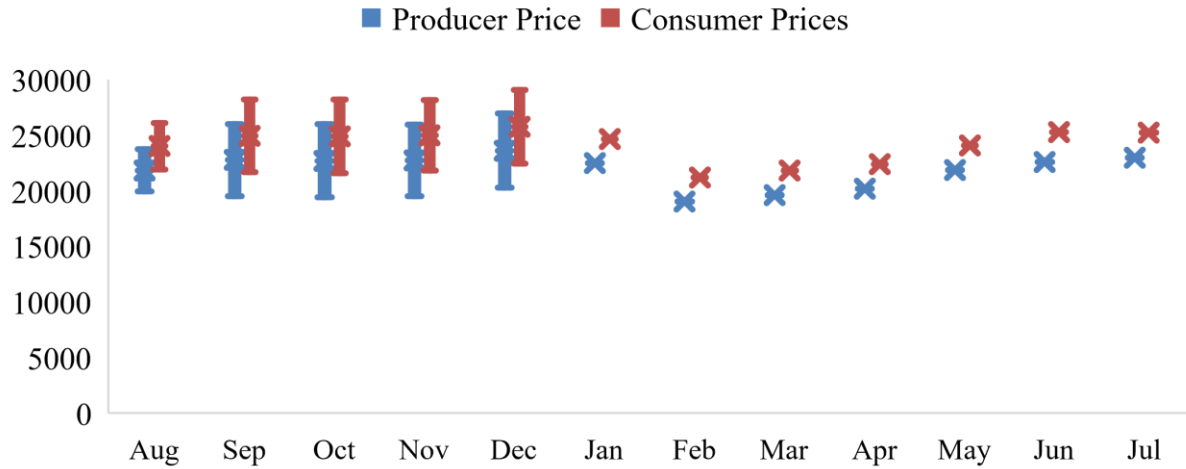
The figure 1 under shows that the graphical results of data patterns on the development of broiler egg prices in Bengkulu Province show a pattern. Graph of a pattern of price development for purebred chicken eggs in Bengkulu Province with an average price converted in monthly units during the first quarter, namely August 2021 - October 2021, of IDR 19,641 per egg at the producer level and IDR 21,744 at the consumer level price. Prices at the consumer level are higher when compared to the producer level because the price at the producer level is the original first-hand price of production, in this case, broiler chicken eggs. The price at the consumer level is the market price paid by the consumer after the distributor or marketer takes advantage or profits from selling the product. However, in the broiler egg price chart in Bengkulu Province, there have been consistent developments and changes at the producer and consumer levels.

Table 2. Price fluctuation risk analysis of chicken eggs

No	Coefficient of Variations	Price of race chicken eggs producer level	Price of race chicken eggs consumer level
1.	Means	IDR 22,143	IDR 24,363
2.	stdev	2742.522	2765.118
3.	KV	IDR 0.12	IDR 0.11
4.	KV %	12.39%	11.35%

Source: Processed secondary data, 2022.

Price Pattern of Race Chicken Eggs in Bengkulu Province (IDR/Kg)



Source: Processed secondary data, 2022

Figure 1. Price development pattern of race chicken eggs

In the second quarter, the average conversion price in monthly units in November 2021 - January 2022 is IDR. 20,797 for the producer level and IDR. 23,008 for consumer-level prices. In that period, there was an increase in the price of purebred chicken eggs in Bengkulu Province from IDR 1,156 – IDR 1,264. The reason is, during this period the demand for purebred chicken eggs increased ahead of the Christmas and New Year celebrations. Meanwhile, the availability of purebred chicken eggs has not been able to cover the high demand. This period was also followed by the Covid-19 pandemic that hit Indonesia, making it difficult for the people's economy.

In the third quarter, the average conversion price in monthly units for February - April 2022 was IDR 19,652 for the producer level and IDR 21,831 for the consumer level. When compared to the previous quarter, during this period, there was a decrease in prices both at the producer and consumer levels, namely a decrease of IDR 1,145 – IDR 1,177. During this period, the price of purebred chicken eggs in Bengkulu Province tended to return to normal.

In the fourth quarter, namely May – July 2022, the average conversion price data in monthly units of broiler eggs in Bengkulu Province is IDR 23,000 for the producer level and IDR 25,080 for the consumer level. The price of broiler eggs in this period again experienced an increase both at the producer and consumer levels, namely IDR 3,249 – IDR 3,348. During this

period, religious holidays allowed the public to increase consumption so that the level of demand was high. This is under Ilham & Saptana (2019) who argues that the price increase was due to the increased demand for purebred chicken eggs during Ramadan and before the Eid al-Fitr holiday. In addition to the commodity of purebred chicken eggs, based on Maulana and Safarida (2021) it is stated that ahead of religious holidays it also causes an increase in demand for other animal feed ingredients, namely chicken pieces and Firmansyah et al. (2021) which states that there is a tremendous change in beef prices ahead of Ramadan. These results are inversely proportional to the law of demand as obtained by Astaman et al. (2020) where the price harms the demand for chicken eggs so that a price increase will reduce the quantity demanded.

Likewise when compared to August 2021 and August 2022. The average conversion price in monthly units of purebred chicken eggs during August 2021 for the producer level is IDR. 19,970, and for the consumer level is IDR. 21,946. The average daily price for purebred chicken eggs in August 2022 was IDR 23,749 at the producer level and IDR 26,115 at the consumer level. Compared with that, in one year, there was a significant price increase, namely IDR 3,779 – IDR 4,169. This is supported by data published by the Ministry of Trade on prices of staple goods in Bengkulu Province comparing two time periods.

Based on data from the market and the primary food monitoring system of the Kemendag

(2022), when compared to the same month in one year, it can be seen that the commodity of purebred chicken eggs fluctuates relatively high. Fluctuations experienced by broiler egg commodities in this period increased by 20%.

Based on the presentation of market monitoring by the Ministry of Trade, the commodity of purebred chicken eggs occupies the fourth position with the highest market price fluctuations out of a total of 14 commodities.

Table 3. Comparison of prices on Bengkulu staple goods.

Commodities	Units	August 31, 2021 (IDR.)	August 31, 2022 (IDR.)	(%)	Note
Premium Rice	kg	12,000	12,100	0.83	Stable
Medium Rice	kg	9,800	10,000	2.04	Stable
Sugar	kg	12,500	14,000	12.00	Go on
Bulk Cooking Oil	Lt	13,500	13,100	-2.96	Down
Simple Packaging Cooking Oil	Lt	14,800	14,300	-3.38	Down
Premium Packaging Cooking Oil	Lt	17,000	16,000	-5.88	Down
Imported Soybeans	kg	11,000	12,500	13.64	Go on
Flour	kg	12,000	14,500	20.83	Go on
Back Thigh Beef	kg	125,000	140,000	12.00	Go on
Race Chicken Meat	kg	29,000	29,000	0.00	Still
Race Chicken Eggs	kg	24,000	28,000	20.00	Go on
Curly Red Chili	kg	26,500	70,000	164.15	Go on
Red Cayenne Pepper	kg	35,000	60,000	71.43	Go on
Red onions	kg	31,000	33,500	8.06	Go on
Garlic Honan	kg	27,000	25,000	-7.41	Down

Source: Kemendag (2022).

The average price of purebred chicken eggs converted in monthly units in September-December 2022 shows a positive pattern of increase. Based on the data, the price of purebred chicken eggs peaked again at the year's end, coinciding with the Christmas and New Year moments. The pattern of increase in the price of purebred chicken eggs in the final period of 2022 is the same as in the final period of 2021. This means that, apart from various factors that affect fluctuations in the price of purebred chicken eggs, the celebration of Christmas and New Year has contributed to a significant increase.

Many factors affect the increase in egg prices, especially during this period. One of the reasons for this increase in prices is the availability of broiler egg stock which has not been able to cover the high demand. Another factor that underlies the increase in the price of purebred chicken eggs, besides the impact of the Covid-19 pandemic, is the Russia-Ukraine war.

This Russia-Ukraine war caused various impacts, especially on the economic sector, including the price of purebred chicken eggs. The increase in the price of chicken eggs is due to a decrease in the population of laying hens

throughout Indonesia. The decline was due to high feed prices due to the Covid-19 pandemic, supported by the Russia-Ukraine war. The increase in feed prices is one of the effects of the Russian-Ukrainian war, considering that most of the chicken feed in Indonesia is still imported from abroad. For example, corn was imported from Ukraine because the war disrupted distribution channels and the balance of the economy. Even though the price of broiler chicken eggs has increased, this has not made farmers experience a consistent increase in profits. This is because the price of chicken feed, which is still high, also makes operational costs high. Many breeders are starting to quit the business because they cannot survive. To avoid this, many breeders have to cut feed costs by selling laying hens, which reduces the laying hen population as a producer of purebred chicken eggs.

Just like in Eastern Canada, the market was fully integrated and efficient before the end of COVID-19. However, complicated travel and labour shortages due to Covid-19 impose trade barriers between provinces and will likely affect the price transmission mechanism. As a result, markets are becoming less integrated (Khedhiri,

2023). Meanwhile, in Myanmar, Covid-19 forced farmers to close and disrupt the production of chickens and chicken eggs (Fang et al., 2021).

Thus the policy of determining the selling price of broiler eggs set nationally every year must be reviewed in connection with fluctuations in the price of broiler eggs at the consumer level, which can increase beyond the price set by the government, and government policies to stabilize the price of broiler eggs on the excellent market. Policies in the upstream subsystem need to be followed in the downstream, for example, a policy on production input prices specifically for chicken farmers, especially the price of raw material for animal feed (especially corn). As well as the existence of market operations in Jambi Province, it is necessary to carry out and study its sustainability so that it can be one of the solutions to maintain the stability of broiler egg prices (Dwinata et al., 2022).

CONCLUSION

The risk of fluctuations in the price of purebred chicken eggs in Bengkulu Province has a slightly higher risk of prices at the producer level with a CV(%) value of 12.39 percent when compared to prices at the consumer level, which have a CV(%) value of 11.35 per cent. The price development pattern of purebred chicken eggs in Bengkulu Province generally forms a positive trend pattern. Fluctuations in the price of broiler eggs occur in specific periods. These fluctuations occur because they coincide with religious holidays such as the month of Ramadan, Eid al-Fitr, Christmas and New Year, the influence of the Russia-Ukraine war, and economic problems due to the Covid outbreak. -19 pandemics.

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