Optimization of CV Jogja Telor's Supply Chain Management with Food Supply Chain Network (FSCN) Approach

Greyuni Grace Tambunan[1,*], Dahri Tanjung[2], Warcito[3]

[a,b,c] Vocational School IPB University, Central Bogor, Bogor City and 16128
[1] tambunangreyuni@apps.ipb.ac.id*; [2] ir.da@apps.ipb.ac.id; [3] warcitow@gmail.com
*** corresponding author**

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ABSTRACT

Layer eggs are an important commodity in Indonesian agribusiness and have the potential to improve the nutrition of communities and rural economies. CV Jogja Telor is a layer egg marketing business that has a production deficit. The qualitative analysis method with FSCN consists of six elements of the supply chain, namely targets, structure, management, business processes, resources, and supply chain performance. Supply chain performance to quantitatively analyze supply chain efficiency with marketing margin, farmers share and marketing efficiency level.. The results of the study showed that the most efficient marketing channel was marketing channel 1, 100,00% farmers share and 28,00% marketing efficiency level, namely Partner Breeders → CV Jogja Telor → Bakery. The most inefficient marketing channels are marketing channel 4, farmers share 66,67% and marketing margin 33,33%, namely partner breeders → CV Jogja Telor → Modern Retail → End Consumers. Marketing efficiency is carried out to increase sales to bakeries and reduce the proportion of sales to modern retail and the use of CV Jogja Telor brand packaging to modern retail.

1. INTRODUCTION

Laying hens are an important commodity in Indonesian agribusiness and have the potential to improve community nutrition and the rural economy [1]. Layer eggs have a high nutritional content and are easy to obtain so that the number of processed food products that require eggs as a basic ingredient makes the demand for eggs increase (Febria et al., 2022). Demand for purebred chicken eggs continues to increase, but farms face various challenges such as limited capital, less strategic business locations, and constraints in supply chain management [2]. Data on layer egg consumption in Sleman Regency shows a decrease from 2,87 kg/capita/week in 2023 to 2,58 kg/capita/weak in 2024 [3] . This decline can be caused by price fluctuations and constraints in the supply chain that cause distribution instability.

Table 1. Supply-demand data for layer eggs in Java Island 2023

Province	Egg production (tons)	Egg requirements (tons)	Egg balance (tons)
Jakarta	0	289.586,30	(289.586,30)
West Java	681.233,40	779.327,21	(98.093,81)
Central Java	794.958,94	2.072.114,18	(1.277.155,24)
DI Yogyakarta	103.490,20	138.072,12	(34.581,92)
East Java	1.990.582,09	503.300,27	1.487.28,82
Banten	306.753,66	241.843,38	64.910,28
Subtotal	3.877.018,29	4.024.243,46	(147.225,17)

Source: [4].

Table 1 shows data on the availability, needs and surplus/deficit of purebred chicken eggs on the island of Java in 2023. Based on data on the supply-demand of purebred chicken eggs on the island

of Java in 2023, there was a deficit of 147.225,17 tons. with DI Yogyakarta experiencing a deficit of 34.581,92 tons. The high demand for eggs as seen from the shortage of purebred chicken eggs poses challenges for producers in the Special Region of Yogyakarta, especially CV Jogja Telor in overcoming the gap between egg production and demand.

The price of purebred chicken eggs in Yogyakarta shows fluctuations throughout the year, with a tendency to increase at the beginning of the year,experience a sharp decline in September, and return to stability towards the end of the year [5]. It is important for agricultural business people to implement sustainable concepts that include economic, social, environmental, and institutional dimensions, especially with an industry 4.0 approach to improve the efficiency and transparency of supply chain systems [6]. In the egg industry, the supply chain plays an important role because of the perishable nature of eggs and has a limited shelf life, so it requires efficiency in supply chain management, from production to distribution, to prevent losses and maintain product quality. As the main supplier of purebred chicken eggs in DI Yogyakarta, CV Jogja Telor's production is able to be marketed and sold out every day. but the challenge in the supply chain is the challenge in maintaining supply continuity and increasing production in the midst of dynamic conditions due to the instability of the national supply chain.

As a lustracy, the annual production of CV Jogja Telor in 2024 will reach 2.679.560 kg. while demand reaches 3.129.435 kg, resulting in a deficit of 449.875 kg. The demand for eggs tends to increase in certain periods such as January, April, June, and December due to seasonal factors, including religious holidays and holidays. This imbalance between production and demand shows the need to optimize supply chain management so that the supply of eggs remains stable and able to meet market needs. The concept of Supply Chain Management (SCM) includes coordination between suppliers, manufacturers, distributors, and retailers to ensure optimal product flow [7].

Research on the purebred chicken egg supply chain generally focuses on large companies and uses a descriptive approach, so there are not many who have studied medium-sized businesses such as CV Jogja Telor in depth. The Food Supply Chain Network (FSCN) approach has not been widely applied comprehensively, especially in measuring supply chain efficiency quantitatively through marketing margin, farmers share, and marketing efficiency levels. The egg market conditions in DI Yogyakarta and CV Jogja Telor also experience inequality between supply and demand after 2023, so this study will comprehensively analyze the efficiency of CV Jogja Telor's supply chain using the FSCN approach and quantitative methods. Previous research showed that the results of the analysis of the purebred chicken egg supply chain from breeders to the end consumer were all efficient marketing channels even though there was a demand deficit in one province, not in the business.

The Food Supply Chain Network (FSCN) is a more specific approach to managing the food supply chain, focusing on six main elements: goals, structure, management, resources, business processes, and supply chain performance [8] . The Food Supply Chain Network (FSCN) approach can be applied at CV Jogja Telor to identify supply chain management conditions and analyze the efficiency of supply chain performance at CV Jogja Telor. The implication of this study is to meet the demand for purebred chicken eggs in a certain month in the form of a recommendation model and the creation of packaging recommendations to expand the branding of the company so that the company experiences an increase in revenue.

2. THE PROPOSED METHOD

Food Supply Chain Network (FSCN)

The Food Supply Chain Network (FSCN) method was used in this study on the relevance of food products (purebred chicken eggs). Purebred chicken eggs are perishable food products and have a limited shelf life so this method is used to ensure quality, efficiency and accuracy of distribution identified with six main elements.

The approach of the Food Supply Chain Network (FSCN) framework is descriptive, namely supply chain targets, management and networking, supply chain structure, supply chain resources and supply chain business processes, then the supply chain performance will be measured. The purpose of using qualitative analysis with FSCN is to visualize the whole supply chain.

Marketing Efficiency Analysis

The analysis of supply chain performance efficiency at CV Jogja Telor was carried out a quantitative analysis through the measurement of marketing margin and farmers share. Quantitative analysis processing to streamline marketing with microsoft excel software tools.

3. RESEARCH METHOD

3.1. Qualitative Analysis

The processing of qualitative supply chain analysis data at CV Jogja Telor with the Food Supply Chain Network (FSCN) framework approach is descriptive, namely supply chain targets. management and network, supply chain structure, supply chain resources and supply chain business processes, then the supply chain performance will be measured [8]. The purpose of using qualitative analysis with FSCN is to visualize the whole supply chain.

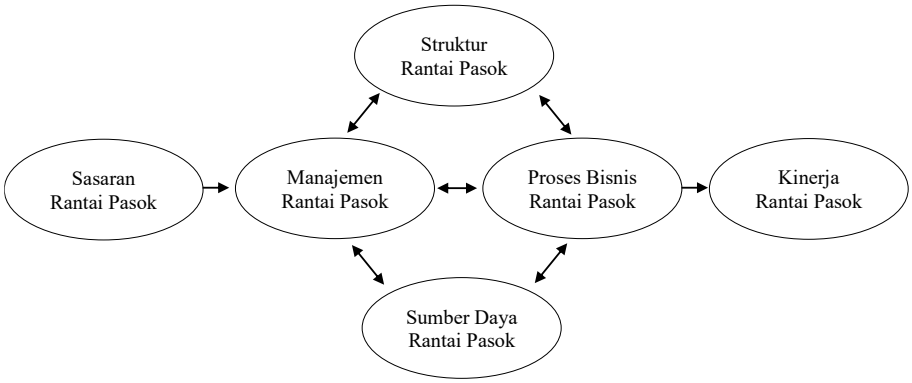

Figure 1. Kerangka Food Supply Chain Network

3.2. Quantitative Analysis

- **Marketing Margin Analysis**

  Marketing margin is usually used to determine the level of efficiency of a marketing with the result of the difference between the price obtained by farmers and the price received by consumers [9]. The criteria for assessing marketing efficiency are based on the percentage of total margin. A marketing system is categorized as efficient if the total margin is in the range of 0–33%. If the total margin is between 34–67%, then the system is considered inefficient and if the percentage reaches 68–100%, then marketing is classified as inefficient.

  MT = Pr-Pf/Pf X 100%

  Information:

  MT = Marjin Total

  Pr = Price of purebred chicken eggs at the consumer level (Rp/kg)

  Pf = Purebred chicken egg prices at the breeder/producer level (Rp/kg)

- **Farmers' Share Analysis**

  Farmers share is the sum of the percentage of the price that producers receive at the price paid by consumers which is influenced by the processing rate, transportation costs, number of products, and product sustainability. The higher the marketing margin, the lower the share received by the breeder. The criteria for assessing farmers share efficiency according to [10] If the farmers share (FS) is more than 70%, then the marketing system is categorized as efficient and if the value is less than 70%, then marketing is considered inefficient because the farmer gets a relatively small share of the price paid by the consumer.

  Fs = Pf/Pr× 100%

Information:

FS = Percentage received by producers

Pr = Purebred Chicken Egg Price at the Consumer Level (Rp/Kg)

Pf = Purebred Chicken Egg Price at the Breeder/Producer Level (Rp/Kg)

- **Marketing Efficiency Level Analysis**

According to [11], marketing efficiency can be defined as the ratio between the costs incurred to market each unit of product to the value of the market share. Marketing efficiency is used in the marketing process whose goal is to generate optimal profits by utilizing resources to a minimum. The analysis of the level of marketing efficiency is carried out by quantitative analysis. The criteria of marketing efficiency are said to be efficient when the EP has a value of 0-50% and it is said to be inefficient when the EP > 50% [12]. Analyze the marketing efficiency calculation as follows:

EP = TB/TNP× 100%

EP = Marketing efficiency

TB = Total marketing costs

NPT = Total product value

4. RESULTS AND DISCUSSIONS

4.1 Results

Descriptive Analysis of the Supply Chain of CV Jogja Telor

In analyzing the supply chain at CV Jogja Telor with the framework of Food Supply Chain Networks (FSCN) which consists of supply chain targets, supply chain management, supply chain structure, supply chain resources, supply chain business processes, and supply chain performance.

Supply Chain Targets. CV Jogja Telor's supply chain targets consist of market targets and development targets. The target market sees that a supply chain model takes place for the product being marketed in the sense that a product will be channeled with the purpose of marketing is the domestic market or the regional market in the region itself [13]. In an effort to market purebred chicken eggs, partner breeders do not Grading It's just packaging in a crate. CV Jogja Telor has transportation that is specialized as a distribution of delivery from partners to CV Jogja Telor as a marketing of purebred chicken eggs. CV Jogja Telor does not have a deep classification Grading Specifically, however, eggs will be classified by weight to determine the number of eggs according to consumer needs.

Table 2. Classification of eggs in CV Jogja Telor by weight

Grade	Egg weight (g)	Number of eggs (grains)
A	> 68	14
B	60-68	15
C	< 60	16-17

Source : CV Jogja Telor (2024)

Based on Table 2. the classification of purebred chicken eggs based on weight is divided into three, namely grade A with an egg weight above 68 g with a total of 14 eggs, grade B with an egg weight between 60-68 g with a total of 15 eggs and grade C with an egg weight below 60 g with a total of 16-17 eggs. The goal is to meet the wishes of its customers based on the quantity of orders that have been made. Purebred chicken eggs are perishable products (easily perishable) and fresh eggs have a short shelf life so that if left in the open air (room temperature) they only last 10-14 days so that their handling is very important in every supply chain so that the quality is maintained until it reaches consumption. The development goal is an effort to develop an aspect that includes coordination. collaboration and application of technology in the supply chain [14]. CV Jogja Telor

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focuses on improving the quality and quantity of partner production as well as service to consumers. Partner farms are expected to produce eggs according to SNI 3926:2023. with a smooth, shiny, dirt-free, and non-cracked shell. High-quality eggs are preferred by consumers, especially Bakery which requires a strong shell. Good service is also key in increasing customer satisfaction, encouraging repurchases, and building long-term relationships with consumers.

Supply Chain Structure

Supply chain structures are interdependent networks of organizations to collaborate in improving the flow of materials and information from suppliers to end users [15]. Based on the results of interviews and field observations. the supply chain structure at CV Jogja Telor can be seen in Figure 1.

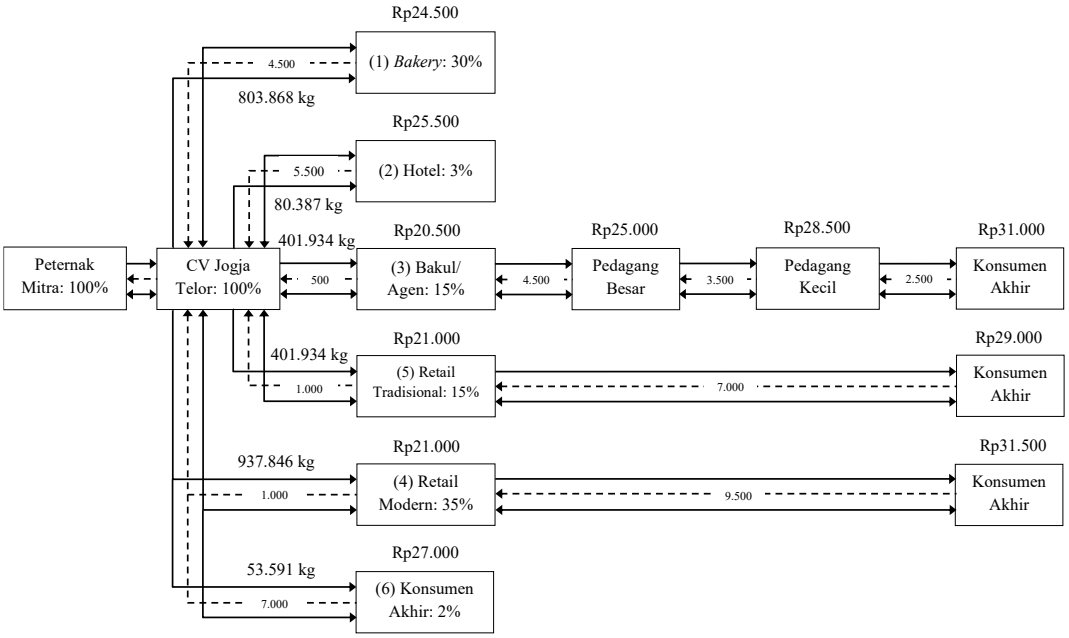

Figure 1. Structure of purebred chicken egg supply chain in CV Jogja Telor

Information:

% : Proportion of Sales

: Product Flow

: Financial Flow

: Information Flow

The supplier of purebred chicken eggs at CV Jogja Telor is a surodadi farm. a blessing of the dalem and build a farm village. The production of partner farms at CV Jogja Telor. namely Surodadi. Berkah Dalem. and Bangun Desa Farm for one year from January to December produces a total of 2.679.560 kg of eggs per year. Bangun Desa Farm recorded the highest production of 1.030.520 kg. Berkah Dalem 1.006.950 kg. while Surodadi contributed 24% with 642.090 kg. The production of all three farms was stable throughout the year. with an increase between October–December. The peak of production occurred in December. Surodadi Farm reached 57.270 kg and the lowest in June was 52.050 kg. Production differences are influenced by feed management. chicken numbers. environmental conditions. and operational effectiveness.

Financial flows show price and money movements on marketing channels. The selling price of CV Jogja Telor to various marketing channels varies, starting from IDR 20.500,00 to IDR 27.000,00 with different margins in each marketing channel. The marketing margin on various marketing channels ranging from CV Jogja Telor to Bakery is IDR 4.500,00. CV Jogja Telor to Hotel is IDR 5.500,00, CV Jogja Telor to Baskets/Agents, Wholesalers, Small Traders and Final Consumers of IDR 500,00, IDR 4.500,00, IDR 3.500,00, and IDR 2.000,00, respectively. The flow of information supports the smooth flow of two-way information from CV Jogja Telor to the end consumer. This shows that there

is coordination and communication that supports operational efficiency. The flow of information shows the selling price of purebred chicken eggs and the availability of eggs from CV Jogja Telor. The total production of CV Jogja Telor in 2024 from 3 partner breeders is 2.679.560,00 kg with a selling price of eggs to Bakeries of IDR 24.500,00, Hotels of IDR 25.500,00, Baskets/Agents of IDR 20.500,00, Modern Retail and Traditional Retail of IDR 21.000,00, and Final Consumers of IDR 27.000,00.

CV Jogja Telor

CV Jogja Telor is a business that markets purebred chicken eggs which plays a role in collecting purebred chicken eggs,sorting and distributing eggs to various marketing channels. The market share of CV Jogja Telor is Bakery hotels., Baskets/Agents, traditional retail, modern retail and end consumers. In 2024, the selling price of CV Jogja Telor varies with prices between IDR 20.500 to IDR 27.500/kg. Eggs that are distributed directly to the end consumer, namely company Bakery have become customers of CV Jogja Eggs are Alif, Amanda, Larizo Bika Ambon and large hotels in the DI Yogyakarta area as well as end consumers.

Baskets/agents in the CV Jogja Telor supply chain act as intermediaries who buy eggs in large quantities for resale. As part of the supply chain. the basket helps to expand the distribution of eggs, ensure that supplies remain available in various sales channels, and support the smooth circulation of products in the market. Traditional retail in this case is a traditional stall or market that sells directly to the end consumer. Traditional retail in this case is described as selling in warehouses around traditional markets and modern retail in the CV Jogja Telor supply chain. such as Indogrosir.

Supply Chain Management

CV Jogja Telor works with good breeders in chicken maintenance management. In choosing distributor and retailer partners. CV Jogja Telor prioritizes parties with a wide marketing network and timely distribution to maintain the freshness of eggs. Periodic evaluations of partner performance are also carried out to maintain supply chain stability and increase competitiveness in the market. Contractual agreements in the supply chain of CV Jogja Telor involve formal and informal cooperation, generally done orally without a written agreement. This deal includes the price, retrieval schedule, and number of egg sales. Partner farmers agreed to sell purebred chicken production to CV Jogja Telor twice a day in a fresh state. In addition, the agreement with the bakery is also done informally. emphasizing the price, quality, and quantity of eggs that are whole without white shells.

The transaction system of CV Jogja Telor follows a common mechanism in trading. The partner farms are carried out on cash on delivery (COD), eggs are sent from the cage to the warehouse according to the order, then egg production is grouped based on the condition of the eggs and payments are made to the partner. For end consumers, traditional retailers, and agents, payment uses cash and carry with a deposit to CV Jogja Telor via transfer (80%) or cash (20%). Modern retail, bakeries, and hotels use tempo payment systems. ranging from 7 to 60 days as agreed at the time of booking. Supporting parties outside the supply chain provide support for the smooth supply flow of CV Jogja Telor. The main suppliers include PT Glori Indah Farm for Lohman Brown strain pullets. medicines. vitamins. and vaccines. as well as PT Siba Prima Utama Feed Mill and PT New Hope Indonesia for feed supply. The government also plays a role in monitoring prices during major holidays and providing corn assistance to partner farmers. Government support is also important in monitoring prices and stock availability.

Supply Chain Resources

Physical resources in the marketing of purebred chicken eggs at CV Jogja Telor include well-maintained cages. harvesting equipment, and storage systems at the partner farmer level to maintain egg quality. CV Jogja Telor sorts and packs using digital sorting machines and scales, as well as storing eggs in warehouses before distribution. Transport vehicles are used to deliver eggs to modern baskets/agents and retailers.

Partner farmers still use simple technology with the cultivation and harvesting process carried out manually. Retailers and baskets/agents only use digital scales in their operations. Partner breeders have 25 to 32 workers, including foremen, admins, and operational staff. CV Jogja Telor itself employs 25 employees for transportation, sorting, packaging, delivery, and sales recording. Partner development is carried out through training for foremen and admins related to feed, vaccines, and

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medicines, but it is not routine every year. Retail has a small workforce, while a basket/agent usually involves a family of only 3 people.

The capital in running the business of CV Jogja Telor and partner breeders comes from its own capital and loans from banks of IDR 2.000.000.000 and IDR 2.000.000.000 from bank loans. Running a business in a basket/agent using borrowed capital from the bank. Loans from this bank are used as cash flow circulation flows by the basket/agent initially amounting to IDR 50.000.000 then increasing by IDR 250.000.000.

Supply Chain Business Process

The relationship between the supply chain business process and the push-pull concept at CV Jogja Telor plays an important role in the distribution and fulfillment of demand for purebred chicken eggs. The push process is carried out by producing and delivering eggs based on estimated demand to agents. modern retailers, and baskets without waiting for direct orders. Meanwhile, the pull process occurs when demand from consumers or modern retailers pushes the supply of eggs as needed. The integration of these two processes ensures product availability. quality. and customer satisfaction.

CV Jogja Telor's supply chain starts from partner farmers who cultivate pullets to egg harvesting. The eggs are then packaged, sorted by weight and quality, and then distributed to baskets/agents, modern retailers, and wholesalers. Same-day delivery is done to keep the product fresh. Sellers/agents buy in bulk and resell to wholesalers or small markets, while modern retailers like Indogrosir sell directly to the end consumer.

The production of purebred chicken eggs requires various inputs such as feed, medicine, and vitamins. Partner farmers support each other in the procurement of these needs to ensure production continuity and an efficient supply chain. CV Jogja Telor's partner breeder supplier is the same supplier as can be seen in Table 3.

Table 3. Supplier of raw materials for the cultivation of partner breeders and CV Jogja Telor

Yes	Raw Materials	Supplier
1	Pullet strain Lohman Brown	PT Glori Indah Farm
2	Medicines. vitamins. and vaccines	PT Glori Indah Farm
3	Feed L-208	PT. Siba Prima Utama Feed Mill
4	New Hope Feed	PT. New Hope Indonesia

CV Jogja Telor seeks to increase production to meet high market demand by expanding partnerships, increasing the number of cages, and increasing the population and productivity of purebred chickens. Collaboration with partner breeders is focused on improving egg quality through testing of different types of feed and standardization of feeding. In addition, cooperation with bakeries continues to be developed to ensure smooth distribution. The company is also committed to quality and service by accommodating customer complaints and maintaining the freshness of eggs through efficient distribution. Eggs are not stored for long in the warehouse, and in case of damage, the company compensates with the replacement of new products. Orders can be processed and shipped on the same day. including for sameday requests of at least 10 kg.

The challenges faced include the risk of chicken diseases, the quality of thin eggshells, and the accumulation of feces that can increase ammonia levels and reduce chicken health. Diseases in chickens have an impact on decreased production and quality, which has the potential to reduce customer satisfaction and company competitiveness. This will have an impact on decreasing the demand for purebred chicken eggs at CV Jogja Telor and then losing the competition for purebred chicken eggs with other business actors.

The risk aspect faced by CV Jogja Telor is the process of distributing eggs from partner breeders to CV Jogja Telor. during the journey. egg damage is 3% using crates and 2% using egg-trays Supply Chain Performance Efficiency.

Marketing Channels

Marketing channels are all elements in the marketing system that include institutions or intermediaries that function to distribute goods or services from producers to end consumers [11] . CV Jogja Telor's supply chain in carrying out its activities is formed based on six marketing channels.

Marketing channels through 3-6 agencies within the marketing channel. The marketing channels in the supply chain of CV Jogja Telor are:

1. Farmer Partner → CV Jogja Telor → Bakery
2. Farmer Partners → CV Jogja Telor → Hotel
3. Breeders Partners → CV Jogja Telor → Baskets/Agents → Wholesalers → Small Traders → End Consumers
4. Farmers Partners → CV Jogja Telor → Modern Retail → End Consumers
5. Farmers Partners → CV Jogja Telor → Traditional Retail → End Consumers
6. Farmers Partners → CV Jogja Eggs → End Consumers

The average monthly production of CV Jogja Telor purebred chicken eggs is 223.297 kg from 3 partner breeders as suppliers at CV Jogja Telor which are distributed to various marketing institutions.

Marketing Margins

Marketing margin is usually used to determine the level of efficiency of a marketing by the result of the difference between the price obtained by the farmer and the price received by the consumer in the [9]. Marketing margin calculation can be seen in Table 4. Marketing margin is used to determine the level of efficiency of a marketing by the result of the difference between the price obtained by farmers and the price received by consumers in [9]. The longer the distribution chain, the greater the marketing margin, which means the final price at consumers is much higher than the starting price at farmers.

Table 4. Marketing Margin Calculation

Marketing channel patterns	Price at the producer level (Rp)	Price at the consumer level (Rp)	Marketing margin (Rp)	Marketing margin (%)
Marketing Channel 1	24.500	24.500	0	0,00
Marketing Channel 2	25.500	25.500	0	0,00
Marketing Channel 3	20.500	31.000	10.500	33,87
Marketing Channel 4	21.000	31.500	10.500	33,33
Marketing Channel 5	21.000	29.000	8.000	27,59
Marketing Channel 6	27.000	27.000	0	0,00

Source: Data processed (2024)

Table 4. shows the marketing margins in each marketing channel. The longer the distribution chain. the greater the marketing margin, which means the final price at the consumer is much higher than the initial price produced. Marketing Margin indicates that longer marketing channels have higher marketing margins.

Channel 3 has the highest marketing margin of 33,87%. this shows that prices at the consumer level have increased significantly due to the presence of many intermediaries so that the price of eggs increases significantly before reaching the end consumer and becomes less efficient for producers in terms of revenue.

Farmers Share

Farmers share It is an analysis to find out the level of marketing efficiency measured by the comparison of the price received by the farmer with the price received by the consumer or in the

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sense of knowing the share of the price received by the farmer from the price of the consumer level [9].

Table 5. Results of farmers share analysis

Marketing Channel Patterns	Price at the Manufacturer level (Rp)	Price at Consumer level (Rp)	Farmers Share (%)
Marketing Channel 1	24.500	24.500	100,00
Marketing Channel 2	25.500	25.500	100,00
Marketing Channel 3	20.500	31.000	66,13
Marketing Channel 4	21.000	31.500	66,67
Marketing Channel 5	21.000	29.000	72,41
Marketing Channel 6	27.000	27.000	100,00

Source: Data processed (2024)

Based on table 5. farmers share shows the percentage of price received by farmers compared to the final price at consumers. The higher the farmers share, the greater the proportion of profits received by the producer. Channel 1, channel 2, channel 3 have the highest farmers share of 100%, indicating that producers get almost the entire selling price. In contrast, channel 4 has the lowest farmers share of 66,67%.

Table 6. Comparison of production volume between marketing channels at CV Jogja Telor

Marketing Channel Patterns	Production Volume (kg)	Farmers Share (%)	Admission (Rp)
Marketing Channel 1	803.868	100,00	19.694.766.000
Marketing Channel 2	80.387	100,00	2.049.863.400
Marketing Channel 3	401.934	66,13	8.239.647.000
Marketing Channel 4	937.846	66,67	20.163.689.000
Marketing Channel 5	401.934	72,41	8.440.614.000
Marketing Channel 6	53.591	100,00	1.125.415.200

Source: Data processed (2024)

Table 6 shows a comparison of production volumes in CV Jogja Telor's marketing channels, most of which are distributed to modern retailers and bakeries. This shows that marketing channel 1 and marketing channel 2 have higher marketing efficiency than the other channels. **Farmers share** is used as an indicator of the efficiency of profit distribution, where the higher the value, the greater the proportion of the price received directly by the farmer. Marketing Channels 1, 2 and 3 have a *farmers share* of 100,00%, indicating that the entire value of sales is received directly by the producer without an intermediary.

In contrast, Marketing Channel 4 had *the lowest farmers share* at 66,13%, which shows a reduction in farmer revenue due to distribution through third parties. Production volumes also vary between channels. Marketing Channel 4 absorbed the highest production volume (937.846 kg), but gave a *low farmers share*.

Marketing Efficiency Level Analysis

The level of marketing efficiency is a comparison between the marketing costs incurred and the value of the product received by the producer at the end consumer level. Marketing efficiency is used to measure how effective and efficient a marketing channel is in getting products from the manufacturer to the end consumer at the lowest possible cost.

Table 7. The level of efficiency of the marketing channel at CV Jogja Telor

Marketing Channel Patterns	Total marketing costs (Rp/kg)	Total product value (Rp/kg)	Marketing efficiency rate (%)
Marketing Channel 1	6.950	24.500	28
Marketing Channel 2	8.217	25.500	32
Marketing Channel 3	15.017	31.000	48
Marketing Channel 4	15.970	31.500	51
Marketing Channel 5	12.650	29.000	44
Marketing Channel 6	7.000	27.000	26

Source: Data processed (2024)

Table 7 shows that the level of marketing efficiency in the various distribution channels used by CV Jogja Telor uses the Marketing Efficiency Level (EP) indicator as the main measuring tool. Based on the criteria set, a marketing channel is categorized as efficient if the EP value is in the range of 0% to 50%. while the EP value exceeds 50% indicates inefficient conditions [12].

The marketing channel that has the most efficient level of marketing efficiency is 6 marketing channels with a value of 26% according to the criteria of marketing efficiency is said to be efficient when EP has a value of 0-50%. Marketing channel 1 has an EP value of 28%. marketing channel 2 of 32%, marketing channel 3 of 48%, marketing channel 5 of 44%, and marketing channel 6 of 26%. All indicators of the level of efficiency analysis are in the efficient range, which means that the marketing process in each channel runs with relatively efficient cost allocation and the achievement of optimal marketing objectives with the distribution of products from producers to consumers on those channels has taken place effectively and does not overburden marketing costs.

The level of inefficient marketing efficiency is that 4 marketing channels with a value of 51% are said to be inefficient when EP > 50%. This inefficiency leads to wasted costs or ineffectiveness of distribution strategies, so a thorough evaluation of the structure and mechanism of the channel is needed, especially in packaging costs. Optimization in efficiency is carried out by adjusting strategies, such as reducing the number of intermediaries, logistics efficiency, or increasing coordination between marketers which can be potential solutions to increase the efficiency of these channels.

Marketing Efficiency Indicators

Table 8. Indicators of the efficiency of marketing channels at CV Jogja Telor

Marketing Channel Patterns	Marketing margin (%)	Farmers Share (%)	Marketing efficiency rate (%)
Marketing Channel 1	0.00	100.00	28
Marketing Channel 2	0.00	100.00	32
Marketing Channel 3	33.87	66.13	48
Marketing Channel 4	33.33	66.67	51
Marketing Channel 5	27.59	72.41	44
Marketing Channel 6	0.00	100.00	26

Source: Data processed (2024)

Table 8 is the result of the analysis of the efficiency of the marketing channel at CV Jogja Telor and refers to the efficiency criteria according to the total margin (MT) and *farmers share*. adjustments are made to the efficiency position of each channel. It is known that Marketing Channel 5 has a *farmers share* of 72,41%. which means it is above the efficiency threshold (> 70%) and can be categorized as efficient in terms of distributing value to producers. Although its marketing margin of 37,93% is in the category of less efficient (34–67%), the success of this channel in providing a large portion of price revenue to farmers puts it in the category of medium efficiency or quite efficient.

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This shows that the level of marketing efficiency depends not only on the amount of margin. but also on the extent to which the value of the product is enjoyed by the manufacturer.

If all marketing channels are sorted by overall efficiency level, then Marketing Channels 1, 2, and 6 occupy the top positions as the most efficient channels. All three show optimal performance with a 0% marketing margin and 100% *farmers share*, which means that all sales proceeds are received directly by the breeder without any reduction by the intermediary. Furthermore, Marketing Channel 5 occupies the fourth position with a moderate level of efficiency, because even though there is a considerable margin, *the farmers share* remains high. Marketing Channel 3 is in fifth position with a marketing margin of 31% (efficient category), but its *farmers share* is only 66,13%, so it does not meet the efficiency requirements based on revenue distribution indicators.

Finally, Marketing Channel 4 showed the lowest efficiency with *a farmers share* of 66,67% and a marketing margin at the upper limit of efficiency. which was 33,33%. This combination puts the channel in the category of less efficient because the value that producers receive is relatively small compared to the final price at the consumer level.

Supply Chain Efficiency Model CV Jogja Telor

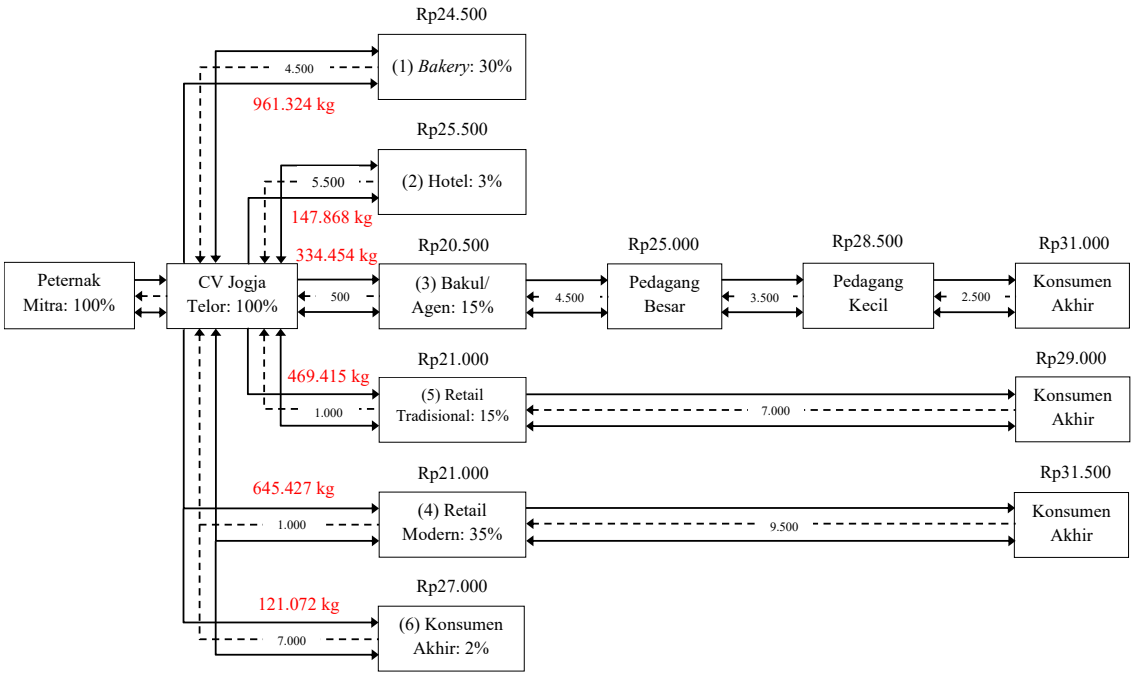

Figure 2. Efficiency model of purebred chicken egg supply chain at CV Jogja Telor

Information:

%	: Proportion of Sales
⟶	: Product Flow
⟵	: Financial Flow
⟷	: Information Flow

Figure 3 shows the efficiency model of the purebred chicken egg supply chain at CV Jogja Telor. which illustrates the product distribution flow from upstream to downstream. The purebred chicken eggs that are marketed are entirely sourced from partner breeders (100%) and then entirely managed by CV Jogja Telor as the main distribution center. From here, the product is distributed through several channels of varying proportions. depending on the type of consumer and the marketing channel. Each marketing agency is distributed according to the demand from consumers.

4.2 Discussion

CV Jogja Telor experienced deficits in January, April, June and December. Based on the efficiency model, the adjustment of the proportion of sales is carried out in 2 ways, namely reducing

the proportion of sellers to retail so that the demand for bakeries and hotels is met. Meanwhile, in addition to the high months, sales can be made by using packaging with branding from CV Jogja Telor, which is a package containing 15 eggs with a weight of 1 kg. The proportion of egg sales on CV Jogja Telor is that some eggs (12%) are distributed through baskets or agents who then distribute them to several advanced channels, such as wholesalers, small traders, traditional retail (18%), and modern retail (32%). This line reflects a longer distribution structure owning and involving multiple intermediaries. Meanwhile, direct distribution is also carried out to consumers involved in marketing channels such as bakeries (36%), hotels (6%), and direct to end consumers (5%) which overall shows that around (47%) of eggs are distributed directly without intermediaries from CV Jogja Telor to large customers.

Table 9. Comparison of purebred chicken egg supply chain efficiency model at CV Jogja Telor

Selling Price (Rp)	Supply chain efficiency recommendation model		Supply chain models that have already been implemented	
	Sales Volume (kg)	Admission (Rp)	Sales Volume (kg)	Admission (Rp)
24.500	961.324	23.552.444.125	803.868	19.694.766.000
25.500	147.868	3.770.635.275	80.387	2.049.863.400
20.500	334.453	6.856.281.375	401.934	8.239.647.000
21.000	645.427	13.553.972.250	937.846	19.694.766.000
21.000	469.415	9.857.720.250	401.934	8.440.614.000
27.000	121.072	3.268.956.150	53.591	1.446.962.400
Total		60.860.009.425	**Total**	59.566.618.800

Source: Data processed (2024)

Table 9 shows the comparison of sales and revenue volumes on marketing channels. The supply chain efficiency recommendation model increased revenue by IDR 1.293.390.625 in a year compared to the supply chain model that has been implemented. In the recommended model, the total sales volume reached 961.324 Kg with a revenue of IDR 60.860.009.425. This is higher than the model that has been implemented which only reached a total sales volume of 803.868 Kg with a revenue of IDR 59.566.618.800. This increase is consistent across various selling prices. showing that the recommendation model has the potential to improve the operational efficiency and sales capabilities of CV Jogja Telor and can result in higher revenue receipts.

CV Jogja Telor can also increase sales by using its own packaging for wider improvement and branding . The price comparison of each package can be seen in Table 10. there is a difference in the price of packaging used by modern retailers with packaging recommendations and packaging design. The price of the packaging is converted to the number of eggs 15 eggs/kg. The packaging recommendation made is eggs with plastic packaging containing 15 eggs/kg. Based on the price comparison. it is recommended to pack 15 mica and stickers at a price of IDR 1.500,00. This price is IDR 500,00 lower than the other two packages.

Table 10. Comparison of purebred chicken egg packaging prices

Packaging type	Packaging price (Rp)	Packing capacity (kg)	Packaging Cost (Rp)
Mica containing 10 grains and stickers	1200	0.67	2000
Mica contains 15 grains and stickers	1400	1	1500
Carton tray containing 30 grains	1000	2	2000

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5. CONCLUSION

The overview of the condition of the supply chain of CV Jogja Telor has run smoothly in general. CV Jogja Telor has a clear target even though it is still limited in the fulfillment of eggs in the Special Region of Yogyakarta. The supply chain structure of CV Jogja Telor involves partner breeders as the main supplier and six marketing channels. namely surodadi's farm. build a village farm and blessing dalem. In particular. the flow of information plays a crucial role in ensuring the smooth running of business processes. encouraging collaborative planning. and building trust among all members of the CV Jogja Telor supply chain. Support for this performance also comes from the availability of adequate supply chain resources. including physical. technological. and capital resources.

The performance of the CV Jogja Telor supply chain that was studied has 6 marketing channel patterns. The most efficient marketing channel pattern is channel 1 which has a marketing margin percentage of 00.00% and farmers share of 100.00% with the marketing channel pattern being Farmer Partners → CV Jogja Telor → Bakery. The most inefficient supply chain structure is channel 4 with a marketing margin percentage of 33.33% and farmers share of 66.67% with the supply chain structure being Mitra Farmers → CV Jogja Telor → Modern Retail → End Consumers.

The suggestions are provided for CV Jogja Telor to enhance its business operations: First, CV Jogja Telor could optimize its distribution channels by reducing reliance on intermediaries, who often take significant marketing margins. This could help improve the overall profitability of the distribution process. Second, the company has the opportunity to increase direct distribution to end consumers. By establishing stronger partnerships with bakeries and hotels, CV Jogja Telor can ensure that its products are absorbed more efficiently by the market. Lastly, CV Jogja Telor could consider developing distinctive packaging for its products. This would not only contribute to brand identity but also facilitate a partnership model with modern retailers, potentially leading to an increase in revenue

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