Analysis of the Dairy Milk Supply Chain at Sapi Juara Farm, Bogor Regency

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Abstract: *Pamijahan District in Bogor Regency, West Java, is known as one of the main sources of milk supply for dairy cows in the region. Dairy cow's milk is a product that has high and stable demand and selling value. Supply Chain Management (SCM) at Sapi Juara Farm in Pamijahan District involves the distribution of dairy cow's milk which includes product flow, information and finance. This study aims to understand the SCM of dairy milk at Sapi Juara Farm, including product flow, information and finance, as well as efficiency as measured through marketing margin and farmer's share. This research uses quantitative descriptive methods with primary data obtained from interviews. The results of the analysis show that there is a flow of dairy milk products, a flow of information from farmers to various actors in the supply chain, and a flow of funds that includes costs and profits from nine distribution channels that influence the performance of the supply chain based on the payment system. From the analysis of the profit share value, it can be seen that the SCM for dairy cow milk in Pamijahan District is running efficiently. It is hoped that SCM in Pamijahan District can be more efficient to avoid losses at each stage or link in the chain and stabilize milk prices in the market, while improving the welfare of farmers, especially at Sapi Juara Farm.*

Keywords: *Dairy Milk, Farmer Share, Marketing Margin, Supply Chain*

INTRODUCTION

The livestock sub-sector makes a positive contribution to the national economy and experienced growth of 0.34% with a contribution of 1.58% to GDP (Kemenko Perekonomian, 2022). The livestock sub-sector has great prospects for progress and continues to grow every year. In order to support the progress of Indonesia's livestock prospects, several approaches are needed, such as choosing the right area, developing productivity, adopting the latest technology, efficient marketing strategies, and innovation in derivative products as added value. This aspect plays a crucial role in raising the standard of living of livestock farmers, meeting market demand, increasing the number of job opportunities, and strengthening the country's economy by developing agribusiness, especially in the livestock sector.

The element in the livestock subsector that has great potential for development is the dairy farming business. The potential for developing dairy cattle can be increased by ensuring the availability of feed, farmer knowledge, milk demand, farmer income, market infrastructure, the role of credit institutions and government policy (Elida, 2016). This is still in contrast to the current situation, most Indonesian dairy farms are family businesses in rural areas that operate on a small scale and often still use traditional tools, with fewer than 4 cows owned. (Anindyasari et al., 2016).

Dairy milk production in Indonesia currently does not meet demand. Domestic dairy cow milk production is only able to cover under 20 percent and the other 80 percent comes

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from imports. The growth in dairy cow milk production from year to year has averaged 1 percent over the last six years, while the growth in raw material requirements for the milk processing industry has been 5.3 percent (Antara.com, 2023). In 2023, Indonesia will import dairy cow's milk with a value of US$ 921,425,519 or the equivalent of IDR 14.324 trillion (exchange rate IDR 15,546). This figure is equivalent to an import volume of 287 thousand tons (BPS, 2023). The source of imported supplies which is greater than domestic production indicates that dairy farming in Indonesia has not developed optimally and evenly. The number of dairy farms in Indonesia is still relatively rare, where the majority, namely more than 97%, of the dairy cow population is on the island of Java. The Java region is very strategic and suitable for dairy farming which is supported by good and appropriate climate and environmental factors (Setjen Kementan, 2022).

Data from the Animal Husbandry and Fisheries Service shows that in 2017-2018, Bogor Regency was in fourth position in dairy cow milk production in West Java with total production reaching around 24.7 million kg and had a dairy cow population of 8,269 in 2018. In In the 2000-2007 period, dairy milk production in West Java reached 1.6 million liters, of which five districts contributed 86.66 percent of total production, with Bandung Regency contributing the most 50.16 percent and Bogor Regency at least 5.37 percent. compared to four other districts (Departemen Pertanian, 2008).

Bogor Regency consists of 40 sub-districts, Pamijahan Sub-district is a dairy milk production area and has the second highest population after Ciawi Sub-district in Bogor Regency. The dairy cow population in Pamijahan District in 2019 reached 1,370 heads with dairy cow milk production reaching 5,500,550 liters (BPS, 2019).

The large milk production of dairy cows and the population of dairy cows in Pamijahan District does not rule out the possibility that dairy farmers will experience problems in various aspects carried out by cattle breeders, in addition to the pressure from dairy farmers who have to increase the productivity of milk production. Dairy milk farmers face various challenges, including: weak negotiating power in the supply chain, access to financing, availability of land for forage, procurement of additional concentrate feed, procurement of production materials, evaluation of production results both in terms of quality and quantity, and determination of product prices (Setiyowati, 2020).

Choosing effective distribution channels and managing processed products that have added value can be the answer to the challenges faced by farmers, as well as help them increase their income to overcome the high costs of dairy farming. Rusdiana (2013) highlighted that

low expertise in cultivation, processing and marketing is an obstacle in developing the agricultural sector.

The importance of choosing the right distribution channel in the dairy milk business cannot be ignored. Farmers need to determine the path that provides maximum profits to increase income and cover large operational costs, as well as potentially reducing the selling price of milk at the consumer level (Alamsyah et al., 2015).

Fluctuations in dairy milk prices caused by an imbalance between supply and demand require efficient supply chain management to ensure availability and price stability in the market. Actors in the supply chain must work together to manage and monitor product distribution (Saputro and Sediyono, 2019). This study aims to evaluate the efficiency of supply chain management at Sapi Juara Farm, Pamijahan District, Bogor Regency, which involves the flow of products, information and finances. It is hoped that the research results will provide insight into supply chain management and help increase efficiency in the management of dairy cow milk in the region.

RESEARCH METHODS

The data analysis method used in this research is qualitative descriptive analysis, which describes the actual situation of the study object according to what is happening in the field (Budiman, 2013:34). The main objective is to accurately and systematically describe the events that occur in the supply chain management (SCM) of dairy cow milk commodities at Sapi Juara Farm, Bogor Regency. According to Miles and Huberman (1992), there are three steps in the qualitative research process: data reduction, data presentation, and conclusion drawing or verification. In this research, the data used came from two types of sources. First, primary data, which is information obtained directly from informants involved in the dairy milk supply chain, especially through interviews. Second, secondary data, which is obtained from documents or information available at related institutions.

The initial analysis method applied in this study is the evaluation of the supply chain. A supply chain, also known as a supply chain, is a network of businesses that work together to produce and deliver a product into the hands of end customers. According to Heizer and Render (2004), the term "supply chain" also refers to all interactions that occur between suppliers, producers, distributors and customers. These interactions involve the exchange of raw materials, information, money, and transportation between supply chain participants.
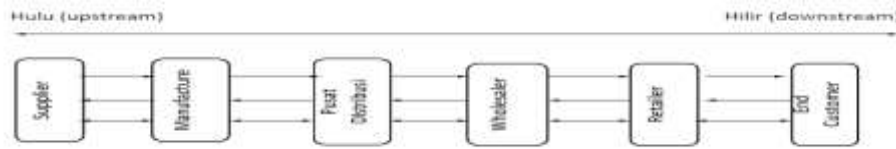
Figure 1. Supply Chain Network
Source: Anwar, 2011

Information :

⟶ = Product Flow

⟵ = Financial Flow

⟷ = Information Flow

This study involves a second evaluation, namely marketing margin and farmer's share. Marketing margin is defined as the difference in price obtained by producers and the price paid by consumers, or it can also be considered as the price gap between the retail level and the farmer level. This evaluation was carried out using quantitative methods. In the context of this research, the producer refers to the Sapi Juara Farm, Bogor Regency. Marketing margin calculations depend on subtracting the purchase price from the selling price (Khaswarina et al., 2019). The following formula is used to calculate the marketing margin for dairy milk:

$$MP = Pr - Pf \text{.. ....(1)}$$

Information:

MP = Marketing margin for dairy cow's milk (Rupiah/Kg)

Pr = Price of dairy cow's milk at the final consumer level (Rupiah/Kg)

Pf = Price of dairy cow's milk at farmer level (Rupiah/Kg)

By comparing the price paid by final consumers with the price obtained by producers, farmer's share is used to determine marketing effectiveness (Sumarni, 2021). The farmer's share formula is as follows:

$$FS = \frac{Pf}{Pr} \text{.. ....(2)}$$

Information :

Fs = Farmer's share of dairy farming (%)

Pr = Price of dairy cow's milk at the final consumer level (Rp/Kg)

Pf = Price of dairy cow's milk at farmer level (Rp/Kg)

RESULTS AND DISCUSSION

Sapi Juara Farm is a dairy farm that has been established since 1994. The location of this farm is in Bogor Regency with the owner named Mr. H. Oman. Currently the Sapi Juara Farm dairy farming business already has 5 plots with an average land area of 4,250m^2 (including buildings, pens and land). The total number of cattle currently at Sapi Juara Farm is

109, including lactating, pregnant lactating, dry lactating, heifers, pregnant heifers, calves and adult males. Sapi Juara Farm buys feed in the form of tofu dregs at a price of IDR 22,000/sack and concentrate at a price of IDR 160,000/sack from partners in Parung, Cibanteng, Bandung and Sentul. Feeding is carried out twice a day at specified times and type of feed and the average volume of water consumed is 40 liters/day. Sapi Juara Farm cows can produce 270 liters of pure milk every day.
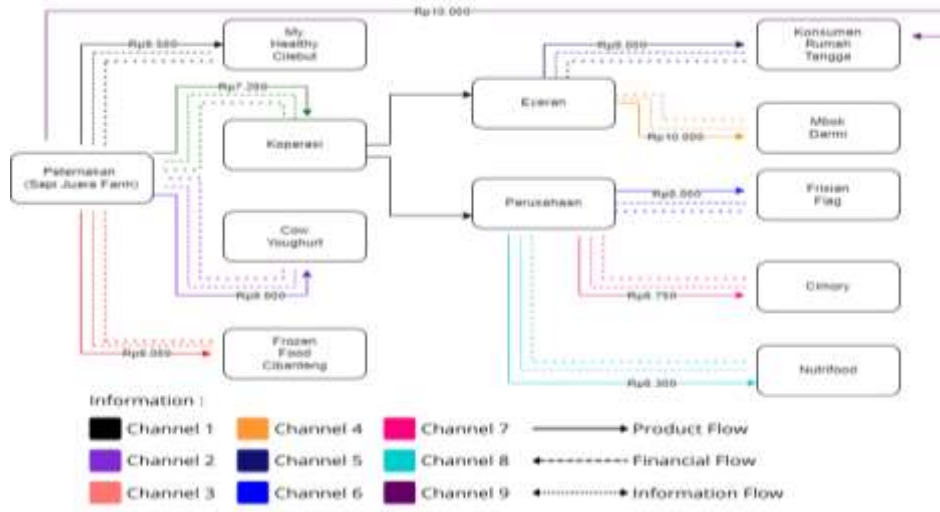

Figure 2 . Milk Supply Chain Pattern 2024
Source: Primary Data Analysis, 2024

Pure milk products are distributed to several places such as My Healthy Cilebut, Cow Yoghurt Ciampea, Frozen Food Ciampea, KPS Bogor, and household consumers at different selling prices. Milk distributed to the cooperative will be collected together with milk obtained from other dairy farms in the Bogor area. Currently, the KPS Bogor storage capacity is 20 tons per day, but the average milk intake from farmers is only 3.6 tons per day. The cooperative will distribute milk to various partners who have collaborated, such as Frisian Flag, Cimory, Nutrifood, Mbok Darmi, as well as household consumers. The selling price set by the KPS Bogor for each partner is of course different according to the agreement between the two parties. In companies such as Frisian Flag and Cimory, the minimum volume of milk ordered is one ton, whereas Nutrifood, Mbok Darmi, My Healthy do not use a minimum maximum limit or in other words request by order. Milk delivery to the Frisian Flag and Cimory companies will be borne by KPS Bogor which includes transportation and driver costs. Payment times include net eom 30, net 10 days, and cod with transfer payment form.

From Figure 2, we can conclude that there are nine paths in the supply chain starting from the farm, namely the Sapi Juara Farm, leading to the company and final consumers. These nine supply chain paths are divided into three types of flow: (1) product flow, (2) information flow, and (3) financial flow. A particular product flow is the distribution of fresh milk to various

business entities. Meanwhile, information flow is a flow that supports the smooth distribution of products and finances, which includes data regarding the price of fresh milk, stock, demand and milk quality. Financial flow is the flow of money which includes payment systems, payment instruments, etc. Carried out by fellow actors in the supply chain flow.

Marketing margin analysis of dairy milk shows the profits and costs associated with marketing. These marketing costs include all expenses incurred at every stage of the supply chain at Sapi Juara Farm. Each stage has marketing costs that vary according to their respective functions. For example, in the first channel of the supply chain, farmers sell milk to My Healthy Cilebut at a price of IDR 9,500 per liter and incur marketing costs of IDR 333,-, which results in a total marketing margin of IDR 0,- and a farmer share of 100%. In the second channel, farmers sell to Cow Yoghurt Ciampea with the same marketing costs, IDR 333,-, and a selling price of IDR 9,000 per liter, which also results in a total marketing margin of IDR 0,- and a farmer share of 100%.

For the third supply chain channel, farmers market milk to Frozen Food Cibanteng at a rate of IDR 9,000 per liter and incur marketing costs of IDR 333,-, so the total marketing margin is IDR 0,- with the farmer's share reaching 100%. In the fourth channel, farmers transact with KPS Bogor for IDR 7,200 per liter with marketing costs of IDR 166.-. The KPS Bogor then sells to Susu Mbok Darmi for IDR 10,000 and marketing costs of IDR 350, which results in a total margin of IDR 2,800 and a farmer's share of 72%. Meanwhile, in the fifth channel, breeders sell to KPS Bogor at the same price, IDR 7,200 per liter and marketing costs of IDR 166,-, and KPS Bogor sell directly to household consumers at IDR 9,000 per liter without marketing costs, resulting in a total margin of IDR 1,800,- and the farmer's share is 80%.

In the sixth supply chain channel, farmers supply milk to the KPS Bogor at a rate of IDR 7,200 per liter and marketing costs of IDR 166. Then, the KPS Bogor sells it to Frisian Flag at a rate of IDR 8,800 per liter and marketing costs of IDR 350. From this process, the marketing margin is obtained was IDR 1,600, with a farmer's share percentage of 81.81%. In the seventh supply chain channel, farmers sell milk to the KPS Bogor at the same price, but the KPS Bogor sells it to Cimory at a price of IDR 8,750 per liter and the same marketing costs. The marketing margin is IDR 1,550, and the farmer gets a farmer's share of 82.28%. For the eighth supply chain channel, farmers again sell milk at the same price to the KPS Bogor, which then sells it to Nutrifood at a price of IDR 8,300 per liter. Marketing costs are fixed, and the marketing margin is IDR 1,100, with a farmer's share of 86.74%.

In the ninth supply chain scheme, farmers market milk directly to household consumers without marketing costs, with a sales rate of IDR 10,000 per liter. As a result, no marketing

margin is created, so the farmer gets all the profits, namely 100%. Further information is available in table 1.

Table 1. Summary of Marketing Margin and Farmer's Share Proportion for Each Marketing Channel.

Channel Pattern	Marketing Margin	Farmer's Share (%)
1	0	100%
2	0	100%
3	0	100%
4	2,800	72%
5	1,800	80%
6	1,600	81.81%
7	1,550	82.28%
8	1,100	86.74%
9	0	100%

Source: Primary Data Analysis, 2024

Knowing the efficiency of each distribution channel is key to assessing the effectiveness of the dairy milk supply chain. The efficiency of marketing actors participating in this process will increase profits for all parties. Marketing margin and farmer's share calculation methods can be applied to evaluate efficiency in the supply chain (Ardillah and Hasan, 2020).

The most dominant marketing channels for dairy milk products (Sapi Juara Farm) are channels 4, 5, 6, 7, 8. These channels are level 1 marketing channels which involve 1 additional marketing actor, namely KPS Bogor, the reason behind these channels can be dominant is that there is a regulation that requires farmers to deposit 80% of their dairy cow's milk production to the KPS Bogor even though the average farmer's share in this channel is only in the range of 72-86%. Farmers who are members of the Bogor Milk Production Cooperative have advantages such as easier access to capital and getting supplies of feed or medicine when needed.

The marketing strategy for dairy milk on the Sapi Juara Farm farm is very good as evidenced by the fact that farmers can create level 0 marketing channels with farmer's share reaching 100% with various types of target markets, namely business to business channels 1, 2, 3 and business to consumers channels 9. A farmer's share value of 100% is a very good value and gives farmers very optimal profits (Nugroho et al., 2023).

CONCLUSION

Based on the research results and discussion described above, the researcher concludes that in supply chain analysis, there are several actors involved. The actors in this supply chain include the Sapi Juara Farm, the Bogor milk production cooperative (KPS Bogor), and final consumers consisting of household consumers, processing consumers, and processing companies.

Most of the quantity of milk produced by Sapi Juara Farm farmers is sold to the Bogor milk production cooperative at a price of idr 7,200. There are nine channel patterns in milk sales, namely: supply channel 1: Sapi Juara Farm – My Healthy Cilebut. Supply channel 2: Sapi Juara Farm – Cow Yoghurt Ciampea. Supply channel 3: Sapi Juara Farm – Frozen Food Cibanteng. Supply channel 4: Sapi Juara Farm – KPS Bogor - Mbok Darmi. Supply channel 5: Sapi Juara Farm – KPS Bogor – Household Consumers. Supply channel 6: Sapi Juara Farm – KPS Bogor – Frisian Flag. Supply channel 7: Sapi Juara Farm - KPS Bogor - Cimory. Supply channel 8: Sapi Juara Farm - KPS Bogor - Nutrifood. Supply channel 9: Sapi Juara Farm - Household Consumers.

All of these channels are quite efficient. In supply chain channels 4, 5, 6, 7, and 8, the level of efficiency lies in the quantity of product sales. Meanwhile, in supply chain channels 1, 2, 3, and 9, the level of efficiency lies in the selling price of the product and farmer's share from the Sapi Juara Farm.

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