

Proposed Business Model of Dairy Cooperative to Empower Dairy Supply Chain of Dairy Cooperative

Rizka Tauria Nuryadi* and Nur Budi Mulyono

School of Business and Management, Institut Teknologi Bandung, Indonesia

Abstract. *Huge number of small dairy farmers dispersed in wide are of West Java Indonesia had become a major contributor of fresh-milk production. Dairy-cooperative plays important role in collecting fresh-milk from dairy farmer, conduct pre-processing, and sell fresh milk to large industry and end customers. Some dairy cooperative further process fresh milk into dairy products. The role of dairy cooperative is central to improve the competitiveness of the dairy farmers against others fresh milk producer. This research aims to understand in dairy supply chain especially situation faced by dairy farmer and dairy-cooperative, and to provide recommendation on the new business model for dairy cooperative to empower themselves and improve competitiveness of the dairy farmers. We employ secondary data analysis to understand the situation in the upstream of the dairy supply chain and conjoint analysis to get customer preference as a basis for new business model development for dairy cooperative. Our result suggests that dairy cooperative must proactively collaborate with the owner of an abandon land for seeding forage pasture for the upstream strategy, and focusing value proposition in packaging, local brand, and dairy farmers assistance.*

Keywords: *Dairy cooperative, empowerment, policy, small dairy farmers, supply chain*

1. Introduction

Fresh milk can be categorized as perishable goods that need cooling at least two hours after milking to prohibit spoilage by the accumulation of microbes (Sugiwaka, 2004). However, small dairy farmers, which has only less than four cows, usually do not have adequate facilities and equipment for an ideal dairy farm. To overcome this resource constraints, small dairy farmers usually join dairy cooperatives in order to better utilize resources, reduce wastage and gain higher economic of scale, thus reducing the total cost of production and marketing (Uotila and Dhanapala, 1994). Dairy cooperatives facilitate production infrastructure, outbound logistics, and marketing in dairy supply chain activities (Uotila and Dhanapala, 1994). In terms of production and operations, dairy cooperatives provide the necessary assistance in cow

procurement, credit to purchase cows, equipment for milk collection and chilling and vehicles for transport (Uotila and Dhanapala, 1994). In outbound logistics, dairy cooperatives handle the collection, chilling, and distribution of milk to milk processing plants (Uotila and Dhanapala, 1994). In marketing, dairy cooperatives do collective marketing to give fair prices for dairy farmers. Dairy cooperatives usually market their products to private-sector milk processing industries (Uotila and Dhanapala, 1994). Local fresh milk production in terms of quantity meet 25% overall milk demand in 2007 until 2011 and 20% overall milk demand in 2012 (Meylinah, 2007; Meylinah, 2008; Meylinah and Slette, 2009; Meylinah and Slette, 2010; Meylinah and Slette, 2011; Meylinah and Slette, 2012). Local fresh milk production in terms of quantity can be seen in Figure 1.

*Corresponding author. Email: rizka.tauria@sbm-itb.ac.id

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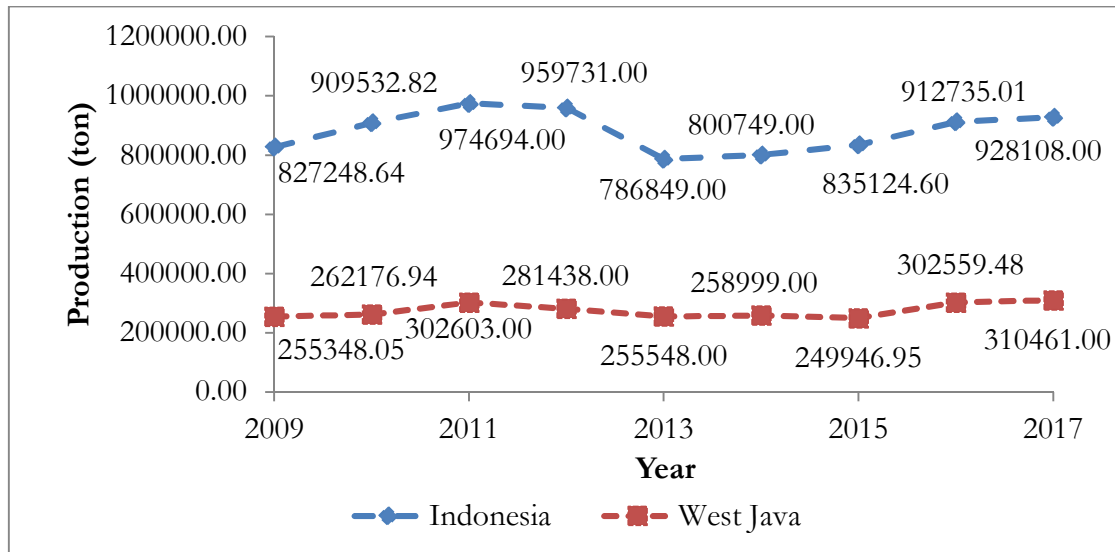


Figure 1.

Fresh Milk Production from 2009 until 2017 (BPS, 2018)

Local fresh milk production in terms of quality is portrayed by dairy processing industries as solid constituent content and a number of microbes. Those quality parameters are used as a payment base by dairy processing industries to dairy cooperatives. Local fresh milk average number of microbes reported in “Indonesia Dairy and Products Annual Reports” from 2007 to 2012 have average between 0,5 until 1 million per ml (Meylinah, 2007; Meylinah, 2008; Slette and Meylinah, 2009; Slette and Meylinah, 2010; Slette and Meylinah, 2011; Slette and

Meylinah, 2012). Solid constituent content required by dairy processing industries minimum have value at 12.0% based on price assessment at a number of microbes or Total Plate Count (TPC) and solid constituent content or % Total Solid (% TS) that was published in “Indonesia Dairy and Products Annual Reports” from 2007 to 2012 shown in Table 1 (Meylinah, 2007; Meylinah, 2008; Slette and Meylinah, 2009; Slette and Meylinah, 2010; Slette and Meylinah, 2011; Slette and Meylinah, 2012).

Table 1.

Fresh Milk Price from 2007 to 2012

Product	Unit	Price (per kg)					
		2007	2008	2009	2010	2011	2012
Local fresh milk Grade 1 (farm gate:12% TS, 0 - 0.25 million per ml TPC)	IDR	3,047	2,700	3,400	3,500	3,850	4,000
	USD	0.336	0.282	0.282	0.392	0.433	0.417
Local fresh milk Grade 2 (farm gate:12% TS, 0.25 - 0.5 million per ml TPC)	IDR	2,947	2,500	3,200	3,300	3,750	3,800
	USD	0.325	0.261	0.261	0.37	0.422	0.396
Local fresh milk Grade 3 (farm gate:12% TS, 0.5 - 1.0 million per ml TPC)	IDR	2,847	2,400	3,000	3,200	3,650	3,600
	USD	0.314	0.25	0.25	0.358	0.411	0.376

Reference: Indonesia Dairy and Products Annual Reports

Main problem of dairy supply chain based on two previous paragraphs is quantity and quality of local fresh milk produced. Upstream problem that become the cause of main problem is less availability of good fodder (Morey, 2011). Downstream problem that become the effect of main problem is increasing dependence of dairy processing industries on milk powder imports such as non-fat dry milk (NFDM) and whole milk powder (WMP) as a substitute (Wright & Darmawan, 2016).

Upstream problem is best portrayed by dairy cooperative in West Java Province. Dairy cooperative in West Java Province is 2nd best high quantity local fresh milk production area by dairy cooperative after dairy cooperative in East Java Province (Darmawan, 2017). Dairy cooperative in West Java Province suffer dairy cow population drop in 2013 that resulted in conversion of dairy farm into non-dairy farm (Wright & Darmawan, 2016). Those conditions likely to be one of the causes that land for dairy cow fodder cultivation was decreasing in West Java because business people think dairy cow fodder cultivation was not profitable anymore.

Downstream problem is happening because dairy cooperative depending on dairy processing industries to market local fresh milk and local fresh milk production cannot meet dairy processing industries quantities quota and quality requirement. Dairy cooperatives market 95% of the fresh milk collected from smallholder dairy farmers to dairy processing industries and process 5% by themselves to be their own products (McDonald & Darmawan, 2018).

This production must be supported with enough forage rather than concentrate to feed cow since natural forage have 1.2 productivity in producing fresh milk and has better quality

compared with fresh milk produced from concentrate feeding. On the other hand, the prosperity of the small dairy farmer is still not improving since they rely on the selling of fresh milk through dairy cooperative to dairy processing industries. Both problems can be solved by empowering dairy cooperative. In order to empowering dairy cooperative, new business model that portray new competitiveness of dairy supply chain is needed to tackle the challenges at current era.

This research aims to understand the situation in the upstream and downstream dairy supply chain and find out appropriate solution centered on the dairy cooperative. Dairy cooperative is chosen as an agent of change since their central role in bridging small dairy farmer with customer. In order to understand the situation in the upstream and downstream dairy supply chain, secondary data analysis and conjoint analysis is employed.

The rest of sections in are organized as follows: In Section 2, studies about recent literature are presented. Literatures being reviewed are related with dairy supply chain in Indonesia that related with dairy cooperative, dairy supply chain research that related with dairy cooperative problem in Indonesia, and consumer preference of dairy products in Indonesia. Methodology of this research is explained in Section 3. In Section 4, we explain about upstream and downstream condition and propose solution to empower dairy-cooperative. In Section 5, the conclusion of this research and possible future direction are presented.

2. Literature Study

Since 1978, dairy cooperatives have faced fierce competition from low-cost imported milk powder to market their product to private-sector milk processing industries

(Uotila and Dhanapala, 1994). The low-cost milk powder originates from dairy cooperatives in Europe and Oceania (Uotila and Dhanapala, 1994). The dairy cooperatives in Europe and Oceania are made up of mostly medium to large size dairy farmers in relatively concentrated regions, e.g. hills. On the other hand, dairy cooperatives in Indonesia constitute small dairy farmers in a rather dispersed area, making it less competitive in price. As a countermeasure to this competition, the dairy cooperatives union of Indonesia has negotiated with the private-sector milk-processing industries for a fairer quota and price of milk supplied by dairy cooperatives, which is reviewed every six-months (Uotila and Dhanapala, 1994). Nevertheless, the price of milk set by the private-sector milk processing industries through the dairy cooperatives for small dairy farmers is considered to be of low value. This is thought to be due to the break-even point, which, according to GKSI, is about Rp 3.500 per liter, but large milk processors pay only Rp 3.600 per liter on average (Morey, 2011).

Mixed Integer Linear Programming (MILP) model has been used by Pooley (1994), Wouda et.al. (2002), and Eksioglu and Jin (2006). Both Pooley (1994) and Wouda et.al. (2002) explored location-allocation cases from the dairy industry, but Wouda et.al. (2002) developed a complex model that integrated by-products movement such as cream and whey. Eksioglu and Jin (2006) developed a network planning of perishable products.

Dairy supply chain model related to milk quality is seen in research by Dooley et.al (2005) who investigated the different types of milk collection. In this transport logistics problem, they maintained the separation of different types of milk along the transportation routes. Marquez and Ramirez (2009), Schimith et.al. (2015), Lie and Rich (2016), Suryani et.al. (2017), Lie et.al. (2017), and Lie et.al. (2018), all applied system

dynamics in the dairy supply chain modelling. Marquez and Ramirez (2009) observed the matured cheese production; Schimith et.al. (2015) focused on the genetic improvement technology in milk production; Lie and Rich (2016) developed a value chain of small producers focusing on the feeding systems improvement that relate to effective land usage for fodder cultivation to increase quantity of fresh milk production; Suryani et.al. (2017) determined the national fulfilment ratio of milk based on cow's milk supply and demand; Lie et.al. (2017) emphasized on the importance of the participatory model building process; and finally, Lie et.al. (2018) identified the linkages between policies and feeding system improvements.

Feed as an input to produce fresh milk is important in terms of quantity and quality. Required quantity and acceptable quality of produced fresh milk are very important in continuity of dairy supply chain. Fulfillment of daily protein intake from feed for dairy cows is the main key to the quantity of produced fresh milk (Lie, Rich, van der Hoek, & Dizyee, 2018). Low supply of feed in terms of forage can lower the quality of produced fresh milk (McDonald & Darmawan, 2018).

Consumer preference is individual needs at the current time that will be bought at the right time without any delay (Anojan & Subaskaran, 2015). Kotler (1999) defined consumer preference as an assessment of someone that consume a product with a choice like or dislike. The likeliness over another product from the choice among alternatives is the definition of consumer preference by Oliver and Swan (1989). Kotler and Keller (2012) refers consumer preference as consumers who give a rank of subjective taste in their mind about various products.

Dairy products, as a final product, production must be related to consumer preference of the target market to gain demand sustainability.

Other than that, to gain demand sustainability, the price of dairy products must be in line with the financial conditions of the target market. Consumer preference usually follows the current trend in the environment.

Nowadays, 56 percent of milk consumption is in the form of liquid fresh milk, UHT milk, flavored /fermented milk, evaporated /condensed milk, and cream thus the remaining 44 percent of milk consumption is in the form of powdered milk, cheese and bakery uses (butter) (McDonald & Darmawan, 2018). Previously, 26 percent of milk consumption is in the form of fluid UHT milk, 35 percent of milk consumption is in the form of sweetened condensed milk, and 39 percent of milk consumption is in the form of powdered milk (Wright & Meylinah, 2015). The emergence of fermented milk, cheese, and butter in most of the milk consumed open market opportunities in that product production.

Nowadays, the production of fermented milk, butter, or cheese began to be done by some dairy cooperatives and start-up companies (McDonald & Darmawan, 2018). Local production of salted and unsalted butter was still in limited amount (McDonald & Darmawan, 2018). Locally produced butter has a competition with imported butter that majority come from New Zealand and Netherlands (McDonald & Darmawan, 2018). Local production of cheese is already common in many varieties such as mozzarella, ricotta, parmesan and cheddar (McDonald & Darmawan, 2018). First types of cheese that introduced in the Indonesian market and the most popular cheese for both local producers and imports is cheddar (McDonald & Darmawan, 2018). New Zealand, Australia and the United States are major importers of cheddar type cheese (McDonald & Darmawan, 2018).

3. Methodology

This research utilizes qualitative and quantitative method. Qualitative method in this research utilizes secondary data analysis, interview, and observation. Quantitative method in this research utilizes surveys through questionnaire. Surveys result in this research analyzed with conjoint analysis. Conjoint analysis in this research has a purpose in exploratory studies because in this research, consumer preference will be matched with the strategy of dairy cooperatives.

Qualitative method in this research is used to map capability of dairy cooperative in West Java. Secondary data analysis about the history and origins of dairy cooperatives (Uotila & Dhanapala, 1994) and the latest report about development of Indonesia dairy supply and market chain (Morey, 2011) is used to construct initial capability of dairy cooperative in West Java and basis of question in interview. Semi-structured interview and observation is used to validate and expand conception of the initial capability. The interview was carried out to dairy cooperatives management, extension agent, veterinarian, the quality assessor (tester and quality control), and public relations. The observation was carried out to dairy cooperatives, milk collection point, dairy farms, and dairy industries.

Interviews and observations are based on national dairy cooperatives union management visit and scale of fresh milk production of dairy cooperatives. Scale of fresh milk production divided into large scale, medium scale, and low scale. Scale of fresh milk production is based population of smallholder dairy farmers. To not face ethical issue and request of secrecy, categorization of scale of

fresh milk production for dairy cooperatives is not stated.

Interview used is based on semi-structured interview. Interviews are done at national dairy cooperatives union of West Java, one large scale dairy cooperative, and three medium scale dairy cooperative. Short interview coupled with observation is done to one small scale dairy cooperative. Interview duration is starting from one hour duration and more because the interview is not done with time keeping. The interview is done only to dairy cooperative because the smallholder dairy farmers are represented by their dairy cooperative that they joined in.

In national dairy cooperatives union, interviews are done to head management of national dairy cooperatives union of West Java and five managements at national dairy cooperatives union of West Java. Interview in national dairy cooperatives union of West Java is done in informal way, so the content are not listed on appendix because overall it is used to verified analyzed data from secondary data analysis. Short interview in small scale dairy cooperative is done to one quality assessor. Interviews in medium scale dairy cooperative are done to head management of dairy cooperative. Interviews in large scale dairy are done to extension agent, veterinarian, the quality assessor (tester and quality control), and public relations.

Observations are done at national dairy cooperatives union of West Java, one large scale dairy cooperative, three medium scale dairy cooperative, one small scale dairy cooperative, one smallholder dairy farm, and one dairy processing industry. Observation is took place for more than one hour in dairy cooperatives and smallholder dairy farms, more than a days in national dairy cooperatives union of West Java, and ten months in dairy processing industries. Hygienic of milking tools and hygiene of

milking practices are observed in smallholder dairy farm such as full-hand milking technique, usage of milk pail, and usage of milk can. Flow of milk collection activities, hygienic of fresh milk collection equipment, quality test used, and cooling system are observed in dairy cooperatives. Dairy cooperatives data is observed in national dairy cooperatives union of West Java. The data of dairy cooperative data also connected to quantitative data collection. Flow of process and all equipment used in processing fresh milk are observed in dairy processing industry.

Quantitative method in this research is used to map consumer preference of dairy products that related with dairy cooperative in West Java. Population of data collected through questionnaire is throughout Indonesia. This research population is so wide because dairy products originally come from milk production that 97% of all dairy cows are located on the island of Java in the provinces of East Java, Central Java, and West Java (Morey, 2011). Even though dairy cows concentrated on the island of Java, dairy products that manufactured by 30 companies as milk processor in Indonesia distributed spread throughout Indonesia in forms of liquid milk, sweet condensed milk, powdered milk, ice cream, and yoghurt (Morey, 2011).

Data collection of this research was through online questionnaire that randomly spread throughout Indonesia. One condition that must be fulfilled in the questionnaire is the sample must like the dairy products (such as: milk, yoghurt, or cheese). It means the sample know the types of dairy products, quality of the dairy products, and price of the dairy products. For example, high quality cheese have characteristics will melt in mouth when being eaten and sold at high price, then, for standard quality cheese have characteristics rather hard when eaten and sold at low price. The minimum sample size for this research are 200, following the recommended sample

size based on rule of thumb of conjoint analysis and consider large target market involved (Hair, Black, Babin, Anderson, & Tatham, 2010).

The construct of factors for combination of this research illustrates three distinct perceived values for consumer of dairy products that is type of dairy products, quality of dairy products, and price of dairy products. These three factors come from concepts of customers need in the dimensions of cost, quality, and features/innovativeness (Beckman & Rosenfield, 2008). The factors also correlate with current conditions of dairy cooperatives that must have fresh milk from dairy farmers with quality as high as possible to be paid at more amount of price by milk processor to be made into different types of dairy products (Morey, 2011).

The capability and the consumer preference resulted in this research were formulated into business model canvas to portray current dairy supply chain competitiveness. New business model canvas was formulated to tackle challenges in upstream and downstream and adapt to the current era.

4. Finding and Discussion

4.1. Dairy Supply Chain Strategy

4.1.1. Upstream Strategy

Cumulative forage pasture is a strategy in upstream to procure feed supply in order to minimize feed expense. In order to develop cumulative forage pasture, there is a need to know capacity of cumulative forage pasture

needed to be built. In order to know capacity of cumulative forage pasture needed to be built, there is a need to analysis daily feed needs based on dairy cow weight and dairy cow population. Based on estimation in one dairy cooperative, lactation dairy cow population is 12,164 head and average dairy cow weight is 320 kg. Standard daily feed supply is 10 percent of dairy cow weight, so daily feed supply for one dairy cow is 32 kg. Feed supply needed to procure by dairy cooperative is 389,248 kg. If king grass productivity is 60 ton per hectare and harvest time is 40 days, then land needed is 259.50 hectare. Based on “*Buku Statistik Data Laban Tahun 2012-2016 oleh Pusat Data dan Sistem Informasi Pertanian Sekretariat Jendral Kementerian Pertanian Tahun 2017*” at page 181 shown in Table 2, available potential land in district or municipality in 2015 can fulfill land capacity needed to do cumulative forage pasture for that dairy cooperative. Land to do cumulative forage is leased from land owner with contract over ten years and farm workers are outsourced from local residents.

4.1.2. Downstream Strategy

Development of advanced dairy product production is a strategy to adding value to fresh milk production by smallholder dairy farmers in order to gain more revenue. In order to develop advanced dairy product production, there is a need to know readiness dairy cooperative to produce advanced dairy product, specification needed to produce advanced dairy product, business model needed to produce advanced dairy product, and steps needs to be taken to develop production of advanced dairy product.

Table 2.

Available unused potential land in West Java in 2015

No	District/Municipality	Area (Ha)
1	Kabupaten Bogor	1,822.00
2	Kabupaten Sukabumi	276.00
3	Kabupaten Cianjur	1,317.00
4	Kabupaten Bandung	307.00
5	Kabupaten Garut	511.00
6	Kabupaten Tasikmalaya	2,448.00
7	Kabupaten Ciamis	26.00
8	Kabupaten Kuningan	26.00
9	Kabupaten Cirebon	57.00
10	Kabupaten Majalengka	-
11	Kabupaten Sumedang	5.00
12	Kabupaten Indramayu	1,040.00
13	Kabupaten Subang	245.00
14	Kabupaten Purwakarta	117.00
15	Kabupaten Karawang	290.00
16	Kabupaten Bekasi	404.00
17	Kabupaten Bandung Barat	639.00
18	Kabupaten Pangandaran	2.00
19	Kota Bogor	124.00
20	Kota Sukabumi	-
21	Kota Bandung	37.00
22	Kota Cirebon	20.00
23	Kota Bekasi	-
24	Kota Depok	303.00
25	Kota Cimahi	-
26	Kota Tasikmalaya	77.00
27	Kota Banjar	-
West Java		10,093.00

Reference: (Abdurachman, Wiratno, Hakim, & Suvandi, 2017)

In order to know readiness of dairy cooperative to produce advanced dairy products, there is a need to analyze dairy cooperative production of dairy product. Dairy cooperative as smallholder dairy farmers representative have produced dairy products such as milk candy, yoghurt, pasteurization milk, butter, and mozzarella cheese besides supplying fresh milk to dairy processing industries. Production of its own brand by dairy cooperatives is done to reduce handling

cost of fresh milk collection activity. Handling cost consists of cost and spare part of milk truck tank, artificial insemination and dairy cow health assistance, quality assessment in lab and cooling unit cost, maintenance of milk collection point and equipment in dairy cooperative, *pajak*, and dairy cooperative office operational cost and dairy cooperative officers *gaji*. More high quantity of fresh milk produced in one dairy cooperative, more less handling cost per liter of fresh milk.

Maximum of handling cost nowadays is 1,000 rupiah per liter for fresh milk sold at dairy processing industries at 6,000 rupiah per liter or depend on quality of fresh milk. It means smallholder dairy farmers will get 5,000 rupiah per liter or depend on quality of fresh milk. In conclusion, readiness dairy cooperative to produce advanced dairy products only for reducing handling cost so it is not overlap 1,000 rupiah per liter.

Each dairy cooperative in West Java have its own brand. List of dairy product produced by

dairy cooperative in West Java listed in Table 3. Dairy processing plants that shareholder is owned by national dairy cooperative union in West Java have experience in producing flavored milk, UHT milk, fermented milk, whole milk powder for pregnant women, sweet condensed milk, and yoghurt. Nowadays, dairy processing plants that shareholder is owned by national dairy cooperative union in West Java mostly producing contract manufacturing product for other dairy processing industries.

Table 3.

List of Dairy Product Produced by Dairy Cooperative in West Java

No	Dairy Cooperative	Dairy Product
1	KSU Tandangsari	Yoghurt, Edam Cheese, and Butter
2	KPSP Saluyu	-
3	KPGS Cikajang	Pasteurization Milk and Yoghurt
4	KUD Sinar Jaya Ujung Berung	-
5	KPS Cianjur Utara	Yoghurt (Bottle, Cup, and Stick)
6	KSU Mitra Jaya Mandiri Ciwidey	-
7	KUD Giri Tani	Yoghurt
8	KPSBU Lembang	Yoghurt and Pasteurization Milk
9	KUD Sarwa Mukti Cisarua	Pasteurization Milk and Yoghurt
10	KUD Gemah Ripah	Yoghurt and Flavored Milk
11	KPS Bogor	Pasteurization Milk
12	KUD Mandiri Bayongbong	-
13	KSU Karya Nugraha Jaya	-
14	KUD Puspa Mekar	-
15	KPBS Pangalengan	Butter, Mozzarella Cheese, Ice Cream, Cream Cheese, Yoghurt, and Pasteurization Milk

Reference: Finding (Interview)

Fresh milk is meant to be processed further into cheese based on the research. Fresh milk to be processed further into cheese need to consider nutritional content in fresh milk such as fat, protein, and calcium; fresh milk pH; free of chemical taints and free fatty acids; and low in number of microbes because microbes will contaminate cheese curd and cause

defects (Fox, Guinee, Cogan, & McSweeney, 2017).

Fresh milk composition will be standardized with pre-treatments as necessary before processing it into cheese with a list below (Fox, Guinee, Cogan, & McSweeney, 2017):

- Removing some fat by natural creaming
- Adding skim milk

- Adding cream
- Adding micellar casein (prepared by ultrafiltration)
- Adding milk powder, evaporated milk or ultrafiltration retentate.

4.2. Analysis and Discussion

4.2.1. Business Model Needed to Produce Advanced Dairy Product

It is known that cheddar cheese price is higher than fresh milk price. 454.8 kg fresh milk can be processed into 46.98 kg cheddar cheese (Fox, Guinee, Cogan, & McSweeney, 2017). Based on that information, different between fresh milk sales and cheddar cheese sales is shown in Figure 2 if cheddar cheese price is 5,000 rupiah per 35 gram based on craft cheddar 35 gram price.

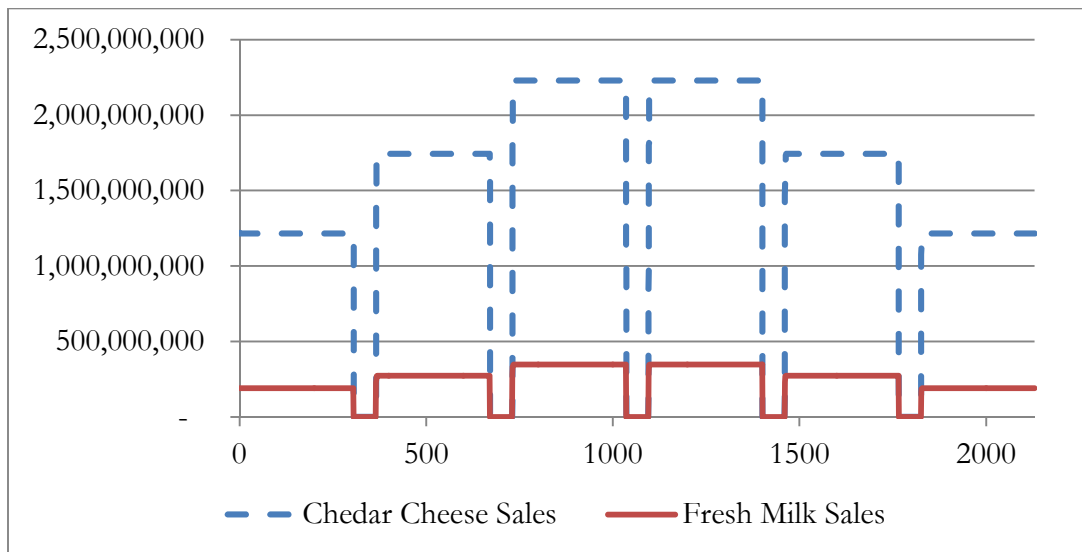


Figure 2.

Fresh milk sales vs cheddar cheese sales (Finding [Observation & Calculation])

Cheddar cheese is used as standard of advanced dairy product to be processed based on research on consumer preference that giving cheese as preferred dairy product type rather than fresh milk, pasteurization milk, and yoghurt

Consumer preference is based on quantitative method. Total data collected on the online questionnaire are 224 samples consist of 203 data used, 20 data invalid, and 1 data not used because respondents don't like dairy products. 20 data invalid because the respondents fill the questionnaire in the same choice for every question. This means the respondents decide to look at the questionnaire but do not take

part in the questionnaire seriously (Melles, Laumann, & Holling, 1999).

Collected data analyzed using R-programs for conjoint analysis (Bak & Bartlomie, 2012). The results shows the most preferable dairy products for the respondents are a standard quality cheese with high price based on the highest utility for each categories. The average importance of levels in the factors by turns: quality concern (41,47%), price concern (35,22%), and product type concern (23,31%). The multicollinearity among the factors is measured as the goodness of fit with simple Pearson correlation for rating scale (metric) type of conjoint analysis (Hair, Black, Babin,

Anderson, & Tatham, 2010). The value resulted in a simple Pearson correlation is 0.497 with significance 0.011. Based on the significance of simple Pearson correlation which is below 0.05, the correlation between the estimates part-worth and the actual is strong.

Quality with average important of level with value at 41,47% become the main concern at consumer preference. Standard quality with estimated part-worth at (+) 0.649 is preferred rather than premium quality with estimated part-worth at (-) 0.649 that is not preferred. This might be caused by consumer in Indonesia precept quality based on brand and packaging (Viaene, Verbeke, & Sufiati, 2000). Usually the dairy products which offer premium quality are come from not well known producer. The more famous the brand of dairy product, the more preferred to be chosen by consumer.

Price with average important of level with value at 35,22% become the concern after quality. High price with estimated part-worth at (+) 0.5665 is preferred rather than low price with estimated part-worth at (-) 0.5665 that is not preferred. Consumer is preferred to pay higher price for their dairy product because consumer often relate price with product quality (Vikarman & Ganesan, 2011). Consumer in Indonesia refer low price product as low quality product. Misleading conception of higher quality product as higher price is come from concept of freshness product often related with high price (Lefèvre, 2014). It seems dairy products consumer in Indonesia are aware of reconstituted milk.

Dairy products using reconstituted milk usually have price lower than dairy product using fresh milk (Lefèvre, 2014). It seems labeling in dairy products ingredients need to be fixed which state only milk in there, so it should be stated specific ingredients in there such as fresh milk, SMP, or etc.

Product type with average important of level with value at 23,31% become the concern after price. Cheese product with estimated part-worth at (+) 0.0486 is preferred rather than fresh milk, yoghurt, and processed fluid milk with estimated part-worth at (-) 0.0068, (-) 0.0203, and (-) 0.0216 that is not preferred. Cheese as preferred dairy product for consumer as a result in this research is contrary with the result by Ngoulma (2015). Ngoulma (2015), stated that consumer are less preferred to pay for cheese product because willingness to pay result is in negative. In this research, cheese have higher price than other dairy products being compared, so it makes sense that consumer in this research are preferring cheese rather than other dairy products.

The consumer preference resulted in this research give a hint that quality is more important than price and dairy product types. Brief result about this research in consumer preference of dairy products is shown in Figure 3. Quality perceived by consumer is in the form of brand and packaging. On the other words, well-known brand from dairy processing industries is more in demand rather than dairy product that excel in price and nutrient content from not well-known brand.

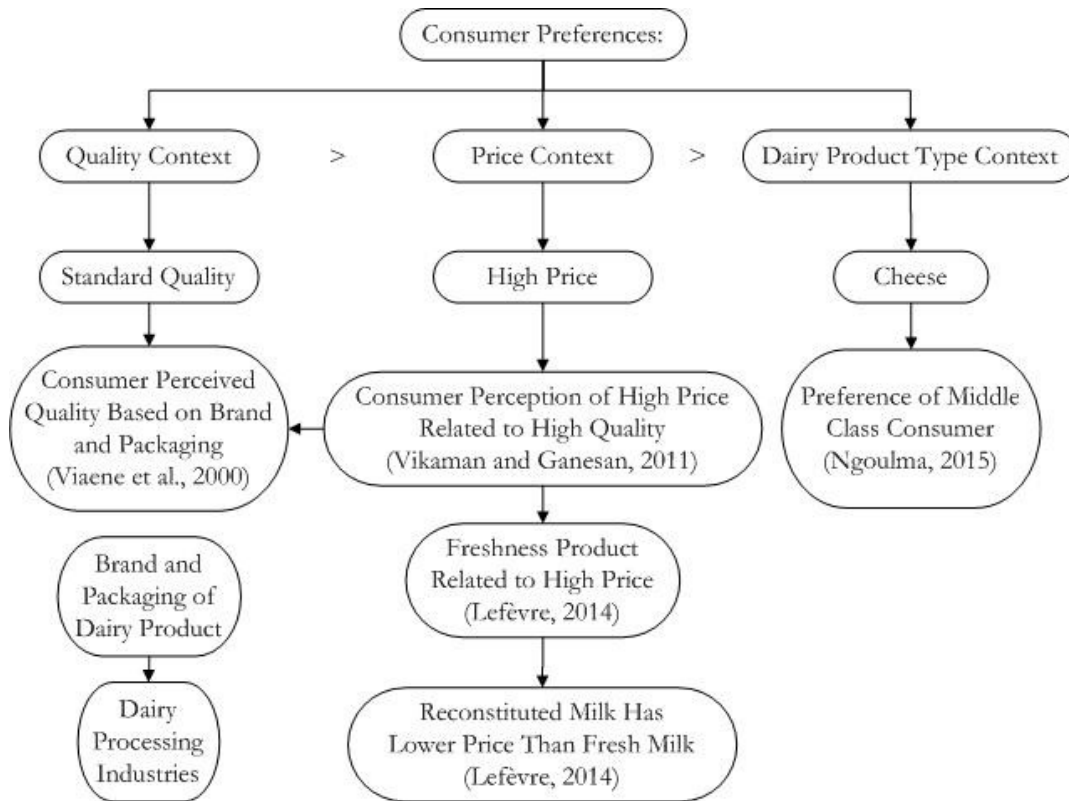


Figure 3.

Dairy Products Consumer Preference Result in the Research (Finding [Surveys & Analysis])

Dairy cooperative, as positioning in this research, doesn't focus on value proposition in brand and packaging. Value propositions focus of dairy cooperative is giving plentiful supply of fresh milk to dairy processing industries. Business model canvas of dairy cooperative is shown in Figure 4. It is known that 95 percent of fresh milk is processed by dairy processing industries and 5 percent of fresh milk is processed by dairy cooperatives or farmers (McDonald & Darmawan, 2018). In the other words, dairy cooperative only produce the collected fresh milk to be its own brand at only 5 percent of total fresh milk that is marketed to local consumer and mostly supply the collected fresh milk to dairy processing industries at 95 percent of total fresh milk.

Quantity as value propositions of dairy cooperatives to dairy processing industries caused by dairy processing see collected fresh milk economic value is lower than imported powdered milk. This condition verified with comparison of fresh milk with powdered milk nutrient content is shown in Table 4 and product price comparison for same protein composition content is shown in Table 5. Even though fresh milk has lower price in terms of values per ton, but in nutritional content and quality stability powdered is considered better. Comparison between fresh milk and WMP based on protein content because WMP is used to fortify protein content of fresh milk in making dairy product (Wright & Meylinah, 2015).

<u>Key Partners</u>	<u>Key Activities</u>	<u>Value Propositions</u>	<u>Customer Relationship</u>	<u>Customer Segments</u>
Smallholder Dairy Farmers	Fresh Milk Collection	Products: Plentiful acceptable fresh milk supply (Dairy Processing Industries)	Products: Price Contract Aggrement (Dairy Processing Industries)	Products: Niche Market (Dairy Processing Industries)
National Dairy Cooperative Union	Hygiene Practices	Accessability (Local Consumer)	Buyer-Seller (Local Consumer)	Segmented Area (Local Consumer)
Equipment Producers	Quality Assessment	Services: Assist smallholder dairy farmers activity at a reasonable cost (Smallholder Dairy Farmers)	Services: Dedicated Personal Assistance (Smallholder Dairy Farmers)	Services: Niche Market (Smallholder Dairy Farmers)
Car Milk Tank Producer	Concentrate Production		<u>Channels</u>	
Raw Material Producer	Dairy Products Production		Products: National Dairy Cooperative Union	
	Quality Management Assistance		Local Store Front	
	<u>Key Resources</u>		Milk Collection Point	
	Milk Collection Point Facilities		Services: Extension Agents	
	Car Milk Tank		Veterinarian	
	Production Plants		Fresh Milk Collectors	
	Assistance Agents			
<u>Cost Structure</u>		<u>Revenue Streams</u>		
Operational Costs		Products: Sales of fresh milk collected from smallholder dairy farmers (Dairy Processing Industries)		
Raw Material Costs		Sales of dairy products (Local Consumer)		
Transportation Costs		Services: Assistance, production, and sales fees (Smallholder Dairy Farmers)		
Purchasing Costs				

Figure 4.
Business Model Canvas of Dairy Cooperatives in the Research (Finding)

Table 4.

Fresh Milk and Dry Whole Milk Nutrient Content per 100g Comparison

Nutrient Content	Fresh Milk	Powdered Milk
Water(g)	88.1	2.5
Energy (kcal)	61	496
Protein (g)	3.2	26.3
Total Fat (g)	3.3	26.7
Lactose (g)	5.1	38.4

Reference: (FAO, 2013)

Table 5.

Fluid Milk Price Comparison Based on Equal Protein Content

Products	Price	Comparison
Fresh milk (from cooperatives) ^(A)	Rp 5.500/ liter	USD 5.250
Dry whole milk ^(B)	USD 3.074/ Ton	USD 4.595

Reference: Finding (Observation & Calculation)

(A) Average fresh milk price paid to smallholder dairy farmers

(B) Average whole milk powder price based on global dairy trade at event 240 in July 16th, 2019

Based on the research, value proposition of dairy cooperative must include packaging and empower local brand in the business model.

Target of business model canvas is shown in Figure 5. Target consumer is institution and campus that enforce empower local brand.

<u>Key Partners</u> Figure 4 + Distributor & Sellers	<u>Key Activities</u> Figure 4 + Package Production Cooperation with Special Sellers	<u>Value Propositions</u> Products: Packaging and Empower Local Brand (Specific Consumer) Services: Figure 4	<u>Customer Relationship</u> Products: Buyer-Seller (Specific Consumer) Services: Figure 4	<u>Customer Segments</u> Products: Niche Market (Specific Consumer) Services: Figure 4
	<u>Key Resources</u> Figure 4 + Package Production Unit		<u>Channels</u> Products: Figure 4 + Specific Sellers Services: Figure 4	
<u>Cost Structure</u> Figure 4 + Distribution Costs Special Seller Costs			<u>Revenue Streams</u> Products: Sales of dairy products (Specific Consumer) Services: Figure 4	

Figure 5.

New Business Model Canvas of Dairy Cooperatives (Finding)

Packaging as target value proposition add package production in key activities, package production unit in key resources, and package producer in key partners. Package producer is supplying raw material for package production on-site or package to be used in packaging process. Packaging adding packaging cost in operational costs, package in raw material costs, package production unit in purchasing costs in cost structure.

Empower local brand as target value proposition add cheddar cheese production in dairy products production and cooperation with specific sellers in key activities, cheddar cheese production plant in production plants and package production unit in key resources, and cheddar cheese equipment producers in equipment producers, cheddar cheese raw material producer in raw material producer,

distributor, and specific sellers in key partners. Addition of cheddar cheese production in dairy products production in key activities in order to add more values to dairy products produced by dairy cooperatives thus increase revenue. Cooperation with specific sellers is meant to cooperate with sellers that enforce empower local brand. Distributor is a third-party that transport product from dairy cooperatives to specific sellers. Empower local brand adding cheddar cheese production in operational costs, cheddar cheese production raw material in raw material costs, cheddar cheese production unit in purchasing costs, distribution costs, and specific seller costs.

5. Conclusion

Forage pasture in west java is limited and not able to fulfill the demand of forage for cows owned by dairy farmer. However, there are many abandon lands in west java that can be utilized for forage pasture. Dairy-cooperative must take a proactive role in creating mutual partnership with the land owner to provide forage for dairy farmers. Based on business model canvas target, dairy cooperative can develop brand awareness about local dairy product that is mean to increase smallholder dairy farmer revenue as the first stage. After brand awareness of dairy cooperative is developed, dairy cooperative can market the products to mass market. This also implies that the government must take an initiative to extend the capability of the dairy-cooperative and provide supportive policy to ease their business.

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