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## Dairy Value Chain In Vietnam: Evidences from Bavi Area

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### Abstract

Dairy farming, in Vietnam, existed in the early twentieth century thanks to the favorable natural advantage. During many difficult periods, the Vietnam's dairy industry has developed constantly and contributed significantly to the food needs ensuring. However, Vietnam's dairy industry still could not satisfy the domestic milk demand. Retail milk prices in Vietnam are very high, whereas the price of milk sold by the dairy farmers is very low. The cause stems from the control of dairy companies in the quantity and quality of milk. Moreover, that control caused an imbalance in the profits and benefits of each actor in the dairy value chain. This study, hence, finds out the distribution of benefits, costs, value-added among the actors, and problems in the practical management in dairy milk value chain with specific focus on Bavi as the case study.

**Keywords:** dairy value chain, Vietnam dairy products, Vietnam value chain, upgrading value chain, Bavi Vietnam dairy

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### 1. Introduction

For each different research, the value chain will be interpreted in many different ways. According to Khoi [1, 2], "Chain" emphasizes vertical order of the activities leading to the distribution, consumption, and maintenance of goods and services. The chain contains dynamic characters in the sense that repeated in an order.

The value chain concept was introduced in 1985 by Porter [3] in "Competitive Advantage: Creating and Sustaining Superior Performance." In his research, the definition of the value chain is understood as "the idea of the value chain is based on the process view of organizations, the

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idea of seeing a manufacturing (or service) organization as a system, made up of subsystems each with inputs, transformation processes and outputs. Inputs, transformation processes and outputs involve the acquisition and consumption of resources—money, labor, materials, equipment, buildings, land, administration and management. How value chain activities are carried out determines costs and affects profits.” According to Porter, a basic value chain consists of nine stages and is divided into the main activities in the chain and the complementary activities. The first major activity in the inputs supply is the operation reception and storage of raw materials for an industry or a certain field. Next, the production activity directly relates to the process of creating the greatest value-added of products such as processing of raw materials into the final product. Logistics activity will be responsible for receiving the final products, storing them in warehouse, and distributing them to dealers, stores. Marketing activity and promotional media promote the product to consumers. Finally, service or after-sales activity relates to the customer care in order to maintain customers or enhance the value of the product. The complementary activities, while not directly, create the value-added of products, but they are important activities to support main activities to create value for products and for every link in the chain.

Approaching the theory about the value chain in the dairy milk sector, the value chain of dairy milk could be understood as a combination of several activities from the producers to the final consumers. The combination contains the farmer (growing dairy cows and collecting milk), the processors and the seller. These actors directly participate in the value chain; their relationships depend on the flow of good, the flow of information and the cash flow. Besides, activities of this value chain were influenced by many factors such as supply chain system, marketing, legal system, and supply and demand of goods. Therefore, a typical value chain of dairy milk contains production, transport, chilling and bulking, processing, transport or distribution and retail.

As an agriculture country, dairy farming in Vietnam existed in the early twentieth century due to many favorable natural advantages. Since then, Vietnam’s dairy industry has developed constantly and contributed significantly to the food needs ensuring. The demand for milk in Vietnam increased gradually in general, and the demand for raw milk increased by 61% in particular. Fresh milk production has increased by 15.6% compared with 2010 from 306.7 to 732.2 thousand tons. However, Vietnam’s dairy industry still could not satisfy the domestic milk demand. And the milk retail prices in Vietnam are very high, whereas the prices of fresh milk provided by the dairy farmers are very low. This paradox stems from the overwhelming control of dairy companies in both the quantity and quality of the milk input. That mechanism caused an imbalance in the profits and benefits among every actor in the dairy value chain. Hence, this chapter will find out the distribution of benefits, costs and value-added among the actors, and point out the problems in management system of this dairy value chain in Vietnam.

## **2. Dairy value chain in Vietnam: evidences from the case of Bavi**

### **2.1. Literature review**

The literature is abundant with the works that address the value chain of dairy milk. These researches pointed out the important results in developing the value chain of dairy milk in

general and each actor in chain. Thanks to Porter [3] and Kaplinsky and Morris [4], the concept of “value chain” and the method to calculate value-added and profit of actors in the dairy value chain are created. Lowe and Giraffe (2009) showed a good view of the dairy value chain in the USA—an advanced country in milk production. The value chain includes four main actors: inputs, production, process and distribution, and marketing. In the USA, high technology is applied in most parts. There are concentrated steps in nurturing, harvesting, collecting and processing milk. Every step is carefully controlled and managed. The special thing in the US dairy industry lies in the veterinary system. The result of the study is that the companies downstream from the dairy producer category, milk and dairy processors, include large, diversified companies despite being diversified well beyond milk and dairy products, nonetheless include companies that have higher shares of the dairy market than the largest producer cooperative. In the “*dairy value chain in Kenya*” (August 2008), a report by Techno Serve Kenya, East Africa Dairy Development mentioned each of the actor’s situation in the dairy value chain in that country. In addition, the study also referred to the logistics operations in parallel in the series. By means of descriptive statistics, the study showed the limitations and the dominant presence of the value chain. Research also offered solutions and proposals to overcome the difficulties. Achchuthan and Kajanathan (2012) found out the main factors that have influence on the dairy sector of Sri Lanka. This study also discovered the strengths and weaknesses of each actor in the dairy value chain; discovered the strong, weakness, opportunities and even threats of each actor; to suggest actors in the dairy value chain to strengthening the dairy sector. About the strengths, the author pointed out that the farmers are being provided the financial assistance by some local companies to widen their farms and increase the scale of dairy milk production. The farmers are also trained about how to use modern equipment to test the quality of milk and educated about marketing strategy to develop their milk brand. Also, in Sri Lanka’s agriculture sector, there is always abundant labors with low labor cost to expand their business. On the other side, the dairy farmers also have many difficulties in their business such as they do not have the educational background to plan the dairy farming in the large scale; further cooperative society in the Karachi division has not enough technological facilities to preserve the pure milk. And they also do not have the value-added strategies like milk toffee, ice cream, yoghurt in the large scale, etc.

Besides, in Vietnam, *Tran Huy Cuong and Bui Thi Nga* (2012) analyzed the actors in the value chain of the fresh milk in Vietnam. This research used not only quantitative but also qualitative approaches in the case of fresh milk products in the northern area of Vietnam. The research illustrated the four main actors in the dairy milk value chain in Vietnam: (1) the farmer; (2) collector; (3) processing firms and (4) distribution. The dairy plants play an important role and have right to make decisions. In other word, the dairy plants (processing firms) become the main actor, which receives most of the profit. The farmers who invest lots of capital and time to raise cow only receive a small proportion of the profit. This research gives a deeper vision on what is going on in the fresh milk production and distribution in Vietnam. This is one of the very few researches in Vietnam on the value chain of the dairy industry. Agreeing with the approach of some study, the study by Khoi [5] has provided quite detailed analysis on comprehensive value chain of Vietnam dairy industry to produce the value-added level in the value chain actors of Vietnam’s dairy. This is a reference to help

paper to get different perspectives on the development of value chains in different sectors in Vietnam. In another study of Vietnam by Khoi [6], the author gave the merger may occur in the dairy sector in Vietnam due to differences in value-added in the value chain of this sector.

## 2.2. Methodology

A survey was carried out in Bavi, Hanoi, where a large amount of fresh milk is produced annually. The content of the survey was built before conducting in Bavi with 160 questions. The questionnaires were based on the criteria which reflect the main objectives of the paper such as the actor's profits and costs, the relationship among these actors, and the advantages and disadvantages in the dairy milk's value chain. Some part of results of the paper should be evaluated (by interview) of the relevant target groups in the value chain of dairy milk.

Data collected were aggregated and analyzed by SPSS20, Excel. The calculation of cost and profit margin of each actor in the chain will also be presented by a quantitative tool for value chain analysis.

## 2.3. Overview of the dairy sector in Vietnam

In the last 10 year, Vietnam has witnessed the gradual growth of the milk consumption. Vietnam is not the country with long history of milk production; however, in the last few years, Vietnamese people have realized the importance of milk products and spend more on this nutria drink. The growth rate is quite high on average; nevertheless, Vietnam is still in the low milk consumption area (<30 kg/capita/year). This might be a big chance for milk producer in the near future.

Most milk products in Vietnam are designed for under 3-year-old babies and the elder. There is a huge market for daily milk consumption and mature specialized milk. According to Khoi [1, 2] 10% of Vietnamese population in the two big cities, namely Ho Chi Minh City and Hanoi, has been consuming 78% of dairy products. These data show an inequality in the consumption of milk products.

### 2.3.1. Dairy milk consumption

Gerosa and Skoet (2012) investigated 144 countries about the consumption of goods. They released an elasticity to show the range of demand. The income elasticity of expenditure estimates the percentage increase in expenditure on the food category resulting from a 1% increase in income. According to **Table 1**, we have the elasticity of the dairy milk product.

The income elasticity of expenditure estimates the percentage increase in expenditure on the food category resulting from a 1% increase in income. The numbers reported are simple unweighted averages of estimates for the individual countries included in each income group. Vietnam—a lower middle-income countries have the relatively high dairy elasticity 0.79, which might be a reason for the fast growth of the milk industry in Vietnam.

The practical situation in dairy milk industry in Vietnam was unacceptable with Gerosa and Skoet's research (2012). Along with the increase in the living standard, the amount of annual

	Low-income countries N = 28	Lower middle-income countries N = 36	Middle-income countries N = 36	High-income countries N = 44
Food beverages and tobacco	0.81	0.77	0.70	0.54
Beverages and tobacco	1.73	1.13	0.92	0.67
Cereals	0.59	0.49	0.34	0.08
Meat	0.80	0.76	0.69	0.53
Dairy	0.83	0.79	0.72	0.55
Fish	0.69	0.64	0.56	0.42
Fats, oils	0.60	0.50	0.37	0.15
Fruits	0.66	0.60	0.51	0.36
Other foods	1.82	1.23	0.98	0.70

**Table 1.** The elasticity of consuming products.

consumption of fresh milk in Vietnam increased over the years, especially in the period from 2010 to 2015. In the 10 years since 2000, the number of annual milk consumption in Vietnam increased only 2.8 kg. However, in the period 2010–2015, the annual milk consumption is 5.8 kg, which is more than double amount of 2010. In the period from 2010 to 2013, the amount of milk consumed per capita per year increased only slightly due to the affecting of the melamine crisis in 2010. After recovering, from 2013 to 2015, Vietnam has witnessed the significant increase from 4.0 to 9.3 kg/capita/year (**Figure 1**).

### 2.3.2. The dairy milk production

The number of dairy cow and quantity of milk production in Vietnam is increased rapidly from 2000 to 2010. From 2000 to 2004, the number of dairy cow increases steadily from 35 thousand to nearly 100 thousand heads. The reason for that is the increase in the demand of milk and the implementation of resolution 09 and decision 167, which created condition and opportunity for Vietnam’s development by stimulating Vietnamese farmers to raise cows (the resolution contributed to increase the dairy herd to 100,000 milking cows and production of 300,000 tons fresh milk yearly). The decision built a production and development strategy for dairy cattle for the period 2002–2010. This strategy aimed to raise dairy cow in Vietnam including 10 provinces in the North, 5 provinces in the Central Coastal region, 4 provinces in the Central Highlands and 7 provinces in the South. In 2005 and 2006, the growth rate of the dairy cow number was only 8.7% per year; which resulted from the inefficient milk production due to the low technology. However, with the restructure of dairy program, accompany with the increasing quickly in milk demand. The number of dairy cow recovered in raised 14.9% per year from 2008 to 2010. From 2010 to 2015, the number of dairy cows increased gradually with the average of 11.73%. In 2014, Vietnam has 200,400 dairy cows. As a result, total dairy milk production in Vietnam in 2010 was 306,620 tons; it was six times higher than



Figure 1. Total fresh milk consumption in Vietnam from 2000 to 2015. Source: General statistic office of Vietnam.

the dairy milk production in 2000. From 2010 to now, the quantity of milk production has continuously increased. In 2015, Vietnam has witnessed an increase in fresh milk production by 15.6% compared with 2010. The quantity of fresh milk in Vietnam in 2015 was 723.2 thousand tons (Figure 2).

2.3.3. The imported quantity of milk

Due to the melamine milk crisis in the Asia region in 2008 and 2009, the number of imported milk of Vietnam had decreased suddenly in early 2010. From then to now, the quantity of milk that Vietnam imported has recovered gradually. Currently, in the end of February 2016, Vietnam’s import reached to 168 items, 8 million of dairy products and increased 17.99% with last year. Vietnam imported raw milk and other milk products from 16 countries around the world, mainly from New Zealand, accounting for 35.1% of total turnover, reaching 59.3 million,

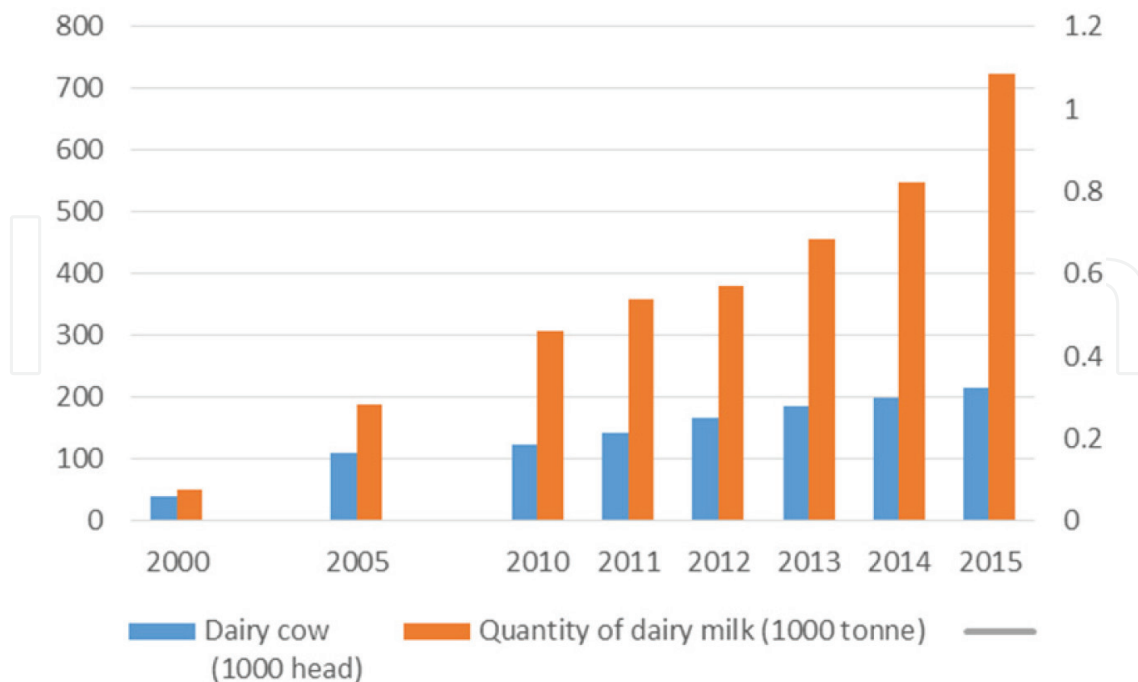


Figure 2. Quantity of dairy cow and milk production in Vietnam from 2000 to 2015. Source: General Statistics Office of Vietnam.

and raised 41.58%. The second largest supplier is Singapore reaching 22.4 million, and increased 8.4%; followed by Australia, reached 16.7 million (data 2016)

Generally, in the first 2 months of 2016, the amount of imported milk from other markets had positive growth rates such as Denmark, France, the USA, Korea, Philippine, etc.

#### 2.4. The dairy value chain in Vietnam

The value chain of dairy milk in Vietnam includes a lot of activities such as input supply; farming, production; bulk and cooling processing; packaging; transportation and distribution, which divided in five stages. There are many actors in the chain: A, feed, heifers machines; B, dairy men (dairy farmers); C, milk collectors; D, dairy plant; E, wholesaler, shop agents, showroom-market; F, Retailers; G, middle men (small shop, milk care shop); and H, Consumers (domestic consumers and international companies). Besides, the value chain of dairy milk was supported by other organization through projects and policies (Figure 3).

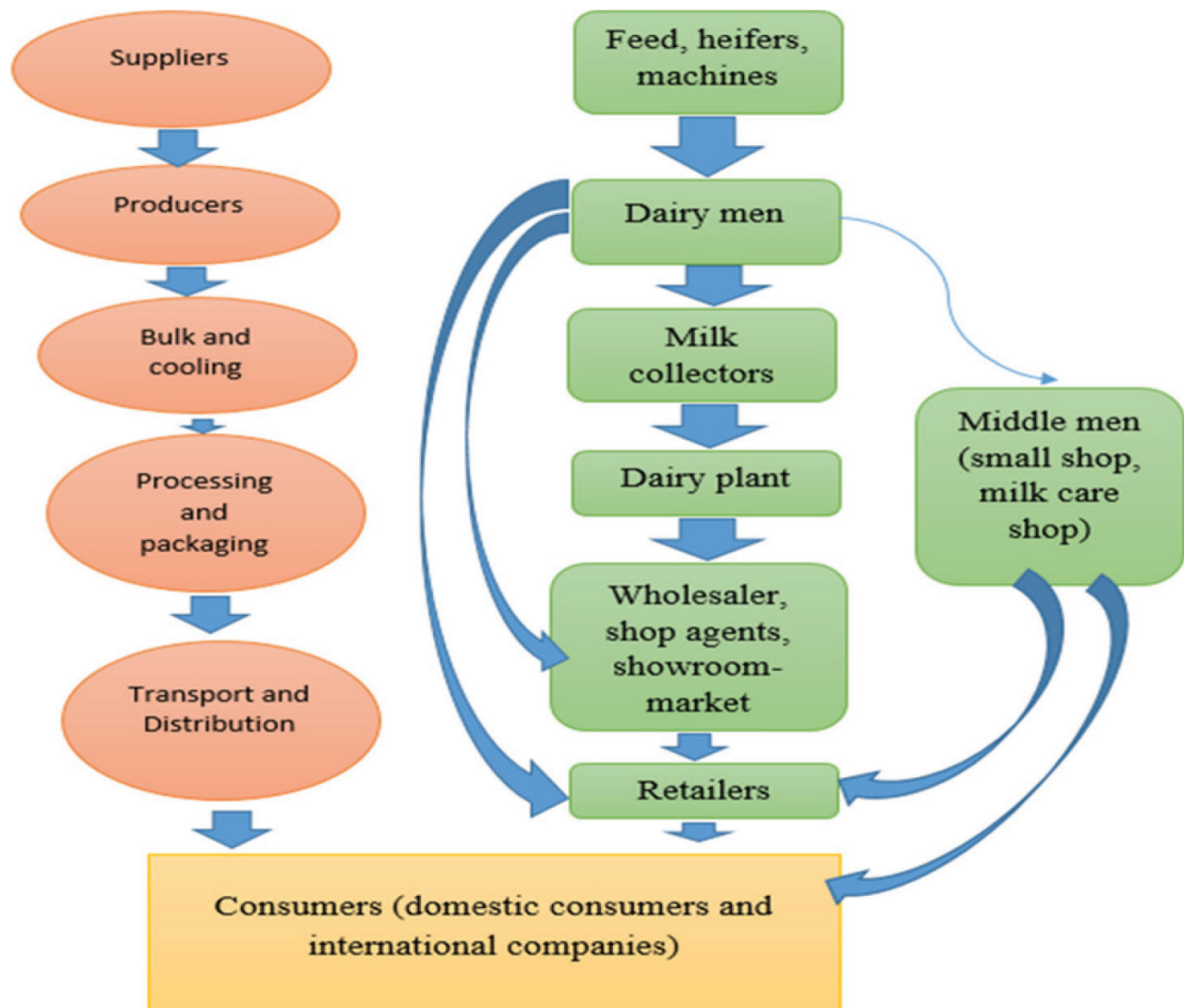


Figure 3. The value chain of dairy milk in Vietnam—the function and actors.



#### *2.4.1. First stage: input supply*

Dairy cows and industrial food for agriculture sector derive from domestic market and importing from the foreign. However, the importing dairy cows and food accounted for a relatively large amount. The dependence on this importing source may effect on the stability of Vietnam dairy milk. Therefore, in stage of input materials, one of the most essential tasks of Vietnam dairy milk is being prior to choose the best dairy cows.

#### *2.4.2. Second stage: production and farming*

This stage plays the most important role in the whole value chain of Vietnam dairy milk and it also the stage, which Vietnam still, have the huge gap with other countries. There are several reasons why Vietnam is not good at this stage. Firstly, it comes from the lack of animal food, infrastructure, technology and the support from Vietnam government. Secondly, the famers in the Vietnam's dairy value chain also lack the necessary knowledge and skills of livestock sector (dairy farming). As a result, the dairy breeding sector only meets 25% of domestic demand.

#### *2.4.3. Third stage: processing*

This stage is the combination of milk collecting, processing and packing. Presently, there are three major participants taking part in milk collecting: milk procurement companies, cooperatives and privates. Although the milk collecting companies have increased the level of milk procurement through their collecting points, however, with the participation of private in collecting dairy milk makes the price of milk is not stable. Additionally, there is still above 20% of the milk that does not meet the quality standards.

#### *2.4.4. Fourth stage: distribution*

Recently, in Vietnam, the dairy milk is distributed in two main trends: traditional channel (distributors account for over 10% profit – wholesale agents – stores – consumers) and modern channel (supermarket – consumers)

#### *2.4.5. Fifth stage: consumption*

The large of milk consumption in Vietnam shows a positive picture when the milk is one of the most important goods and it accounts for the largest market. In recently, the level of milk consumption in Vietnam market increased significantly. Only 10% of the country's population consumes 78% of dairy products. This promotes Vietnam dairy branches to develop more and more to meet different consumer needs.

In the case of Bavi, the dairy farmers buy animal feeds, cows and machines from suppliers and generate milk by their own. Dairy farmer mainly sold their raw milk to collecting centers by 97%; they keep the rest at home as food resource or provide for retailers and shops by 1 and 2%, respectively. There are many retailers and milk shops situated near highway from

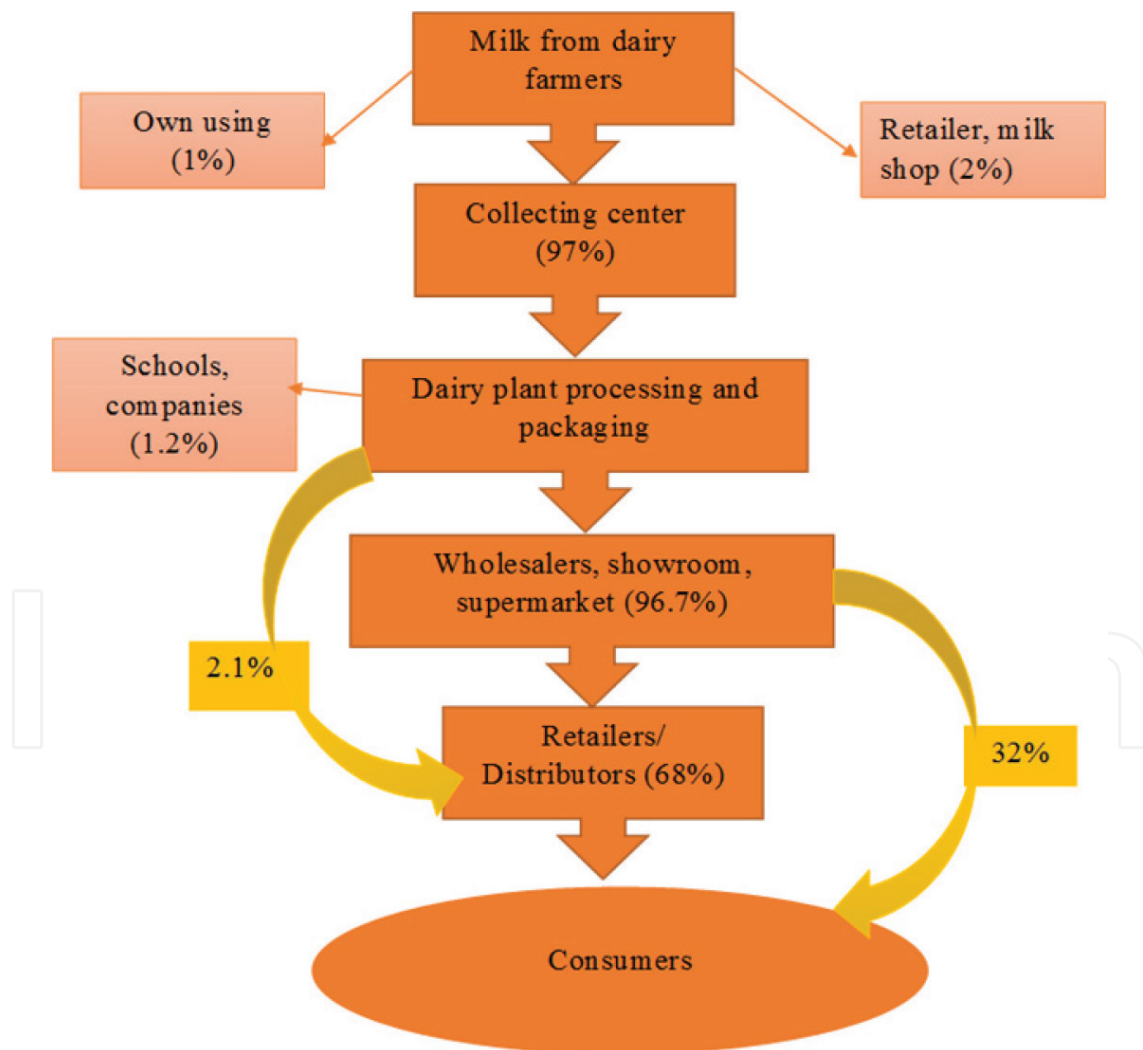
Hanoi to Phu Tho and Vinh Phuc, where it is convenient for anyone to buy milk. The reason why there are still a considered amount of milk that was provided to retailers (**Figure 4**).

From dairy plant, most of milk products (96.7%) were distributed to the wholesaler, shop agents, showrooms, only 1.2% of those products to schools and companies and 2.1% of them to the retailers. From wholesaler, shop agents and showroom-market, these products were distributed to retailer (68%) before being sold to consumers and 32% of those products are shared out directly to the consumers.

## 2.5. The cost, profit and value-added

### 2.5.1. Economic analysis of dairy farmers

The survey was carried out in Bavi district with the aim to examine the production cost of dairy farmers in Bavi. With the including of family worker in the cost production, the total



**Figure 4.** The distribution in the value chain of dairy milk in Bavi. Source: Calculated by data collected, 2016.

	Items	Detail	Unit	A-Quantity	A-Price	A-Costs	A-Share
A	Cost						
	Food	Produce (grass, others)	VND/cow/month	6 cows	79,100	474,600	3.45
		Purchase	Kg	6 cows	1,300,000	7,800,000	56.72
	Vaccine		VND/cow/month	6 cows	20,000	120,000	0.87
	Electricity		VND/cow/month	6 cows	36,000	216,000	1.57
	Water		VND/cow/month	6 cows	50,000	300,000	2.18
	Labor	Family worker	Man month	2	2,000,000	4,000,000	29.09
		Hired worker (cutting grass)	Man month	4	160,000	640,000	4.65
	Transportation		VND/month			200,000	1.45
	IC (Income)		VND/month			9,110,600	
	Total cost		VND			13,750,600	100
	<b>Total unit cost</b>		<b>VND/KG</b>			<b>9793.87</b>	
B	<b>Sale price</b>		<b>VND/kg</b>	<b>1</b>		<b>11,100</b>	
	Revenue		VND/month	6 cows	2,574,000	15,444,000	
C	Profit		VND/cow/month	6 cows	175,500	1,693,400	
	<b>Unit profit</b>		<b>VND/kg</b>	<b>1</b>		<b>1206.125</b>	
D	<b>Value-added</b>		<b>VND/kg</b>			<b>4510.97</b>	

Source: Calculated by data collected, 2016.

**Table 2.** Cost, profit and value-added of dairy farmers (including family workers).

average cost per 1 kg of milk is almost 9793.9 Vietnam dong (VND). This cost contains the cost of food, vaccine, electricity, water, labor and transportation as shown in **Table 2**. Farmers plant nappies grass, corn in their field and harvest for cows to diminish the cost of food. Despite of that saving, they still have to pay 1,300,000 VND per cow for industrial food, which accounts for 56.72% of total cost. However, the average price of 1 kg fresh milk is only 11,000 VND. It is clear that the profit of farmers is only 1206 VND/ kg milk while they generate almost 4511 VND value-added.

But in fact, when calculating the cost production of farmers, the labor cost of family members were not calculated. Thus, the intermediate cost was maintained, whereas the total cost decreased to 6987.6/kg milk. So that, with the price of 11,000 VND/kg milk, they believe that they could earn the profit at 4012 VND/kg of milk.

### 2.5.2. Economic analysis of dairy plants

Firstly, this chapter will not calculate the cost, profit and value-added of the collectors in Bavi. The reason is that the dairy milk chain in Bavi is different from other value chain. In this value chain, the collectors belong to dairy plant; they are not households or traders so the economic analysis is added into the dairy plant's economic analysis (**Table 3**).

In general, 1 kg of fresh milk is 24,000 VND. Dairy companies usually have high intermediate cost, which accounts for 46.01% of milk price with 16,102 VND. Intermediate cost contains input material, which is imported from other countries, the input milk from dairy farmers, electricity to operate dairy plant, water and other materials. The average total cost of dairy plant is 18,423 VND (78.53%). Thus, dairy companies gain the average profit of 5577 VND, which account for over 23% of total revenue. Besides, they generate the amount of value-added at 7898 VND.

### 2.5.3. Economic analysis of wholesalers

Wholesalers at level 1, who buy milk product directly for dairy companies; they are hired to sell product for companies. The advantage is that they do not need to buy facilities and the input products were not calculated in the intermediate cost. So that, all the input cost they have to pay is electricity and renting. The other cost is labor cost; the average wage of a worker or seller in the shop is 2,500,000 VND. In the end of month, the companies will assess the revenue of wholesaler and pay the commission for them. The commission is based on the level of revenue (revenue 10 million VND, get 10% commission; revenue 30 million VND, get 20% commission; and revenue over 50 million VND, get 30% commission). This method encourages the wholesalers trying to sell more and more.

On the other hand, the wholesalers at levels 2 and 3 (smaller scale) buy milk products of dairy companies in the low price and sell it to retailers and consumers with higher price to get profits. In this way, wholesalers have more independence in their businesses. They also were equipped facilities by companies (this is advertising and the taking market share of companies) (**Tables 4 and 5**).

Items	Unit	Costs	Share (%)
GO/TR (Revenue)	VND/kg	24,000	
TC (Total cost)	VND/kg	18,423	52.64
IC (Income)	VND/kg	16,102	46.01
VA (Value-added)	VND/kg	7898	22.57
NPr (Net profit)	VND/kg	5,577	15.93

Source: Calculated by data collected, 2016.

**Table 3.** Cost, profit and value-added in 1 kg milk of dairy companies.

<b>Wholesaler 1</b>				
<b>Items</b>	<b>Unit</b>	<b>A-Quantity</b>	<b>A-Price</b>	<b>A-Cost</b>
Cost				
Electricity	VND/month			2,100,000
Rent	VND/month			2,000,000
Labor	Man month	2	2,500,000	5,000,000
<b>IC (Income)</b>	<b>VND/month</b>			<b>4,100,000</b>
<b>TC (Total cost)</b>	<b>VND/month</b>			<b>9,100,000</b>
<b>GO/TR (Total revenue)</b>	<b>VND/month</b>			<b>55,000,000</b>
<b>Get</b>	<b>VND/month</b>			<b>16,500,000</b>
<b>NPr (Net profit)</b>	<b>VND/month</b>			<b>6900,000</b>
<b>VA (Value-added)</b>	<b>VND/kg</b>			<b>2800</b>

Source: Calculated by data collected, 2016.

**Table 4.** Cost, profit and value-added of wholesaler at level 1.

<b>Wholesalers 2 and 3</b>				
<b>Items</b>	<b>Unit</b>	<b>A-Quantity</b>	<b>A-Price</b>	<b>A-Cost</b>
Cost				
Input	kg/month	1000	24,000	24,000,000
Electricity	VND/month			2,000,000
Rent and transportation	VND/month			2,000,000
Labor	Man month	1	400,000	400,000
<b>IC (Income)</b>	<b>VND/month</b>			<b>28,000,000</b>
<b>TC (Total cost)</b>	<b>VND/month</b>			<b>28,400,000</b>
<b>GO/TR (Total revenue)</b>	<b>VND/month</b>	<b>1000</b>	<b>32,200</b>	<b>32,200,000</b>
<b>NPr (Net profit)</b>	<b>VND/month</b>	<b>900</b>	<b>4222.2</b>	<b>3,800,000</b>
<b>VA (Value-added)</b>	<b>VND/kg</b>			<b>3755.6</b>

Source: Calculated by data collected, 2016.

**Table 5.** Cost, profit and value-added of dairy farmers of wholesaler at level 2.

Finally, wholesalers could get an average profit at 6,900,000 VND and generate the value-added per milk product at 2800 VND. With wholesalers at levels 2 and 3, the average total revenue is 32,200,000 VND per month and get about 3800 VND/kg milk. They create the average value-added at 3755.6 VND, which is higher than that in wholesaler level 1.

#### 2.5.4. Economic analysis of retailers

The retailers in the value chain of dairy milk in Bavi have the same business method with wholesalers at levels 2 and 3, but they have much smaller scale than wholesalers. Most retailers buy milk products at wholesaler and distribute to consumers. The average labor hired is smaller than one because they usually use their own labor force. The input price of retailers is 32,200 VND/kg milk and sale price is 35,000 VND. The average quantity milk sold per month is 200 kg. They could earn 1050 VND/kg milk and generate 1800 VND value-added (**Table 6**).

#### 2.5.5. The benefit and value-added comparison among actors

Base on the method that Kaplinsky and Morris [4] has launched, the costs and profits are divided among the actors could be determined and thereby determine who may benefit from the chain.

In **Table 7**, it takes the cost A for the dairy farmers when they produce one unit of milk product; they sell milk product with price G. Follow the alongside of chain, H, I, J, K are price of one unit milk product of each actors. B, C, D, E are added cost when milk products transfer to the next steps including collectors, dairy plants, wholesalers and retailers. Hence, the total costs to produce one unit of milk product of each actor are:  $G + B$ ,  $H + C$  and  $J + E$ .  $F = A + B + C + D + E$  is the total cost to produce one unit of milk product from the beginning stage (farmers) to the final stage of the value chain (consumers). So, the total profit that the chain get from producing one unit of milk product is  $F - K$ . From that, percentage of added cost, percentage of added-profit and percentage of retailer price of each actor in the dairy value chain will be calculated clearly. Based on **Table 7** and the data about unit total cost and price of each actor mentioned above, the relative financial position of actors in value chain was showed in **Table 8**.

Items	Unit	A-Quantity	A-Price	A-Cost
Cost				
Input	kg/month	200	32,200	6440,000
Electricity	VND/month			200,000
Labor	Man month	0-1	150,000	150,000
<b>IC (Income)</b>	<b>VND/month</b>			<b>6,640,000</b>
<b>TC (Total cost)</b>	<b>VND/month</b>			<b>6,790,000</b>
<b>GO/TR (Total revenue)</b>	<b>VND/month</b>	<b>200</b>	<b>35,000</b>	<b>7,000,000</b>
<b>NPr (Net profit)</b>	<b>VND/month</b>	<b>200</b>	<b>1050</b>	<b>210,000</b>
<b>VA (Value-added)</b>	<b>VND/kg</b>			<b>1800</b>

Source: Calculated by data collected, 2016.

**Table 6.** Cost, profit and value-added of dairy farmers of retailers.

Chain actors	Costs			Revenue	Profit	Margin		
	Unit total cost	Added unit cost	% Added cost	Unit price	Unit profit	% Total profit	Unit margin	% Retail price
Farmer	A	–	A/F	G	G–A	(G–A)/(K–F)	G	G/K
Collectors	G + B	B	B/F	H	H–B–G	(H–B–G)/(K–F)	H–G	(H–G)/K
Dairy plant	H + C	C	C/F	I	I–C–H	(I–C–H)/(K–F)	I–H	(I–H)/K
Wholesaler	I + D	D	D/F	J	J–D–I	(J–D–I)/(K–F)	J–I	(J–I)/K
Retailer	J + E	E	E/F	K	K–E–J	(K–E–J)/(K–F)	K–J	(K–J)/K
Total		F = A + B + C + D + E	100		K–F	100	K	100

Source: Kaplinsky and Morris [4].

**Table 7.** Relative financial position of actors in value chain.

Chain actor	Costs			Revenue	Profit	Margin		
	Unit total cost	Added unit cost	% Added cost	Unit price	Unit profit	% Total profit	Unit margin	% Retail price
Farmers	9793.9	–	41.91	11,000	1206.1	10.37	11,000	31.43
Dairy plant	18,423	7423	31.77	24,000	5577	47.94	13,000	37.14
Wholesalers	284,000	4400	18.83	32,200	3800	32.67	8200	23.43
Retailers	33,950	1750	7.49	35,000	1050	9.03	2800	8
Total		23,366.9	100.00		11,633.1		35,000	100

Source: Calculated by data collected, 2016.

**Table 8.** Cost and margin for actors in Bavi in 2016.

As presented on the data, it is evident that farmers incur high cost (41.91% of the total) and has very little profit (only account for 10.37%), whereas the wholesalers have little costs and relatively high profit with 32.67%. For the case of dairy plants (dairy companies), they added 31.77% of total cost—the second highest cost, however, it should be noted that, they get a remarkable profit with 47.95%. Overall, the financial position of actors indicated that the costs and margins are shared unequally in the chain. Specifically, for every 35,000 VND that a consumer pays for a 1 kg of milk product, 11,000 VND goes to farmers, 13,000 VND goes to dairy plant, 8200 VND goes to wholesaler and 2800 VND belong to retailers.

In the term of profit, the profit seems to be distributed unequally among actors along the chain of dairy milk. Farmers who invest most in their facilities, technology and food received

only about 10% profit of the value chain. The profit receiving is inclined to the dairy companies, which get the highest profit with 5577 VND per one unit of milk product. Going to the end of the dairy milk chain, the profit decreases gradually with 32.67% for wholesalers and about 9% for retailers (Figure 5).

## 2.6. The dairy chain management

Management activities of the dairy value chain in Bavi have many advantages such as:

- The value chain is concerned and encouraged as much as possible. Typically, farmers are supported in all aspects by the establishment of Bavi Cattle and Forage Research Center (BCFRC). To stimulate farmer in the increasing the number of dairy cows of the district, the BCAFRC collaborated with IDP companies (International Dairy Joint Stock Company established since 2004) to provide loans for farmers with 0% interest rate. With these loans, they could buy breeds and build cow house.

Up to 93% of farmers buy cows from the center and 7% of farmers buy cows from other household (small cow). Hundred percent of them implemented fully **vaccinated** policy and 100% of cow health managed by authorities.

- Control of the company's commitment: The implementation of milk consumption of dairy companies registered trademark. Bavi milk is always under the control, which ensures the fairness in trade by farmers.
- Milk quality management: At collecting stations of mainstream companies, there are always strict testing processes to ensure the hygiene and quality of milk.
- Facilitating for wholesale and retail shops along the road and around the Bavi national eco-park.

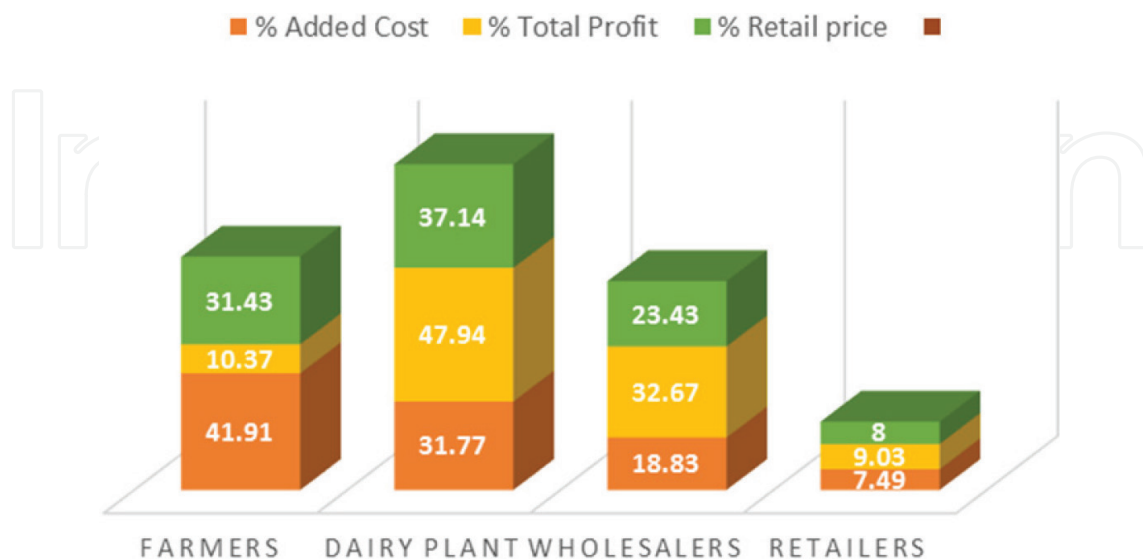


Figure 5. The comparison among actors in added cost, total profit and retail price-1. Source: Calculated by data collected, 2016.



Besides, there are the inevitable weak points at which express the lack of authority's control. Bavi milk brand so far was given right to only two companies. However, there are a lot of companies taking advantage of the lax management, they set up the companies with the same name to cheat consumers. They purchase milk from dairy farmers having under and poor standard milk; which affects the consumer health. Here, the list of the companies who were not allowed to use the brand of Bavi milk but still sell a huge amount of milk everyday (Table 9).

## 2.7. Conclusion and recommendation

In conclusion, the value of income in the chain is distributed unequally. The benefits that farmers receive are inadequate with the costs they have to pay. This is a particular chain in which the main factors boosting the chain are factories and the revenue increasing also reflects the benefit of them. The result is that the value-added in the chain is also biased toward the dairy plant. This chapter pointed out the shortcomings in the cost calculation of farmers. All the expenses such as wages and the opportunity are calculated in the total cost of dairy plant, whereas dairy farmers do not mention about these cost. Thus, in terms of benefits, farmers suffer more and face with more disadvantages, even though they should have received more incentives. In terms of management, Bavi's authorities could not manage the output of milk in the perfect way. It is the lax management has led to a series of counterfeit goods appear on the market today. These low quality products were sold right on the highway and the Bavi's tourist destinations, which affect negatively on Bavi's brand, tourism and even consumer health.

Thus, firstly, it is necessary to make measures in order to obtain the balance among actors, especially dairy farmers.

- In the whole value chain, the dairy plants play the most important role. Farmers could not have enough power to negotiate with dairy companies about prices of raw milk. As a

	Name
1	Bavi Yogurt LTD company
2	Bavi milk investment JSC company
3	Vietnam Dairy—Bavi JSC
4	Fresh milk JSC company
5	Bavi fresh milk JSC company
6	Bavi milk and cake production JSC company
7	Bavi milk and cake JSC company

Source: Calculated by data collected, 2016.

**Table 9.** Name of company illegally using Bavi milk brand.

result, dairy companies could use many methods to buy raw milk of farmers at a low price. Thus, to increase the profits received of dairy farmers, it is indispensable to increase the role of farmers.

- To ensure the criteria in strict quality of milk, farmers should choose the good breeding cows that have ability to avoid disease and get high productivity.
- The small-scale milk collection of dairy companies, in fact, is a costly method. Moreover, the gap in the education level of each factors spark difficulties for the implementation of contracts. Therefore, companies should combine small milk collection stations into the largest milk collection stations. The commune should establish some organizations to represent farmers to sign contracts with the companies.
- Building waste-treatment system: In Bavi, it is clear to the cattle waste in front of farmer's house (farmers aim to use it to grow grass). However, it not only pollutes the human living environment but also affect the cleanliness of cows and milk. Thus, it is necessary for government to build a waste-treatment system.

The above measures could not only solve the problem of distribution but also enhance the connection between actors. Management is also the problem that the thesis wants to give recommendations that improve the value chain of dairy products in Bavi.

- To be able to manage the value chain of Bavi milk, policymakers and milk entrepreneur should encourage factors to be aware of the value chain of dairy milk and the need and benefit when they participate deeply in the chain.
- Policymakers should check and review all enterprises using Bavi Milk brand for developing their business. This activity could prevent other companies from using the Bavi milk brand for developing business illegally by taking advantage of the Bavi brand.
- Checking the quality of raw milk and milk products frequently. In serious problem, authorities should deprive the license registration of companies.
- Provide adequate information to dairy farmers about the companies operating illegally to avoid the milk supplying from farmers to those companies.
- Do not allow the distributors to sell the unclear brand product.

With these measures, the Bavi milk brand would becoming stronger, reaching farther and each actor in the value chain will be received benefits that they deserve.

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