

Vinamilk's Supply Chain and the Small Farmers' Involvement

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Abstract: Supply chain management is the critical success factor in the food processing industries in general and in dairy firms in particular. This article tries to analyze the current state of the supply chain of Vietnam Dairy Products Joint Stock Company (Vinamilk), the leading player in the country's dairy industry. Along with the supply chain's description and analysis, this article also illustrates the challenges of fresh milk procurement activities for the multiple small farmers in the country. The article ends up with some solutions for improving the effectiveness and efficiency of Vinamilk's supply chain as well as for the higher participation and benefits for the small farmers.

Keywords: Vinamilk, dairy industry, small farmers, supply chain.

1. Introduction

Dairy production is becoming one of the most important solutions to achieve sustainable development for agriculture in Vietnam. Despite the high growth rate in recent years, milk production and marketing in the country have been facing many difficulties. Production is compromised by a decreasing farm-gate price, severe competition from imported milk, and the sharply increasing price of input factors. The situation is even worse for small farmers as they have lower productivity as well as lack of the market power to negotiate with the more experienced downstream market actors. The weak market power may result from small-scale production, non-homogenous product quality, poor market information, high transaction costs per unit of marketed product, cash shortage, and

the perishability of product etc. In contrast to the small scale of dairy farming, the dairy processing industry comprises some major, big local companies and multinational companies [1, 2].

From this perspective, the paper tries to analyze the current state of the supply chain of Vinamilk, the leading player in the country's dairy industry, with more focus on the milk procurement activities from the multiple small farmers for the higher participation and benefits for these small participants in the chain.

In order to investigate the contemporary dynamic phenomenon within its real-life context of the supply chain, a case study method was employed for an empirical inquiry. The primary data was mainly obtained through in-depth interviews with the Vinamilk's procurement director as well as with some dairy households who had farming contracts with the company in Bavi, Hanoi. The secondary data was collected from Vinamilk's annual reports.

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2. Literature review

The important role of small farmers in the dairy industry in Asian countries has been highlighted in many researches [1, 3, 4, 5]. Over 80% of dairy animals in the region are raised by backyard or small-scale farmers who are a critical ingredient in the region's dairy landscape.

Despite their significant role as the primary producers in the dairy supply chain, these rural members of the sector only receive a small share of the value of the final agro-product. These small-scale farmers, who are a unique ingredient in the country's dairy landscape, are in need of more support from other big players in the chain as well as from the government. The existence of a vibrant smallholder-managed dairy sector combined with a favorable medium term market outlook is a necessity for poverty alleviation and sustainable growth of Vietnam's dairy industry [5, 6].

In Vietnam, much like in other countries of Asia, milk is produced mainly on specialized small-scale farms and the entire milk output is usually sold to one dairy processor. Formal outside options are very limited. Hence, small-scale dairy farmers who have undertaken relationship-specific investment have little bargaining power compared to large dairy processors [1, 7].

Currently, Vinamilk, the formerly state-owned enterprise, has contracted more than 8,000 farmers with 95,000 cows. This dairy processor collects the major share of milk produced in Vietnam and is also a main importer of powdered milk. It is essential to discover the opportunities and challenges of Vinamilk's fresh milk procurement activities from the multiple smallholders for the long term development of the country's dairy sector.

3. Methodology

The dairy industry in Vietnam is a dynamic field that has shown continuous growth during

the past ten years and has become one of the fastest growing sectors in the packaged food industry of the country. According to the market research group Euromonitor International, in 2014, milk sales in Vietnam reached VND 75,000 billion, up 20% compared to 2013. It increased to VND 92,000 billion in 2015, up 23% compared to 2014 (Figure 1).

Demand for milk and milk products in Vietnam is growing rapidly due to rising incomes, population growth, urbanization and the young population supported by a shift in consumer habits, including more focus on health and nutrition. The sales growth comes mainly from milk powder and liquid segments. These two groups combined account for 74% of the total market value of milk and related products.

Milk consumption per capita in Vietnam has doubled in the period from 2000-2009 from 12 kg/year, to 15 kg per/year in 2011 and eventually reached 18 kg/capita last year (2015). However, milk consumption per capita in Vietnam (18 kg) is still relatively lower than most regional peers such as China (23 kg), Thailand (28 kg), Myanmar (30 kg), Malaysia (51 kg), South Korea (55 kg) and India (69 kg). It is also very far from the world average milk consumption of 108 kg per person per year at the end of the year 2015. It is expected that the dairy volumes in Vietnam will grow 5-6% annually over the medium to long term.

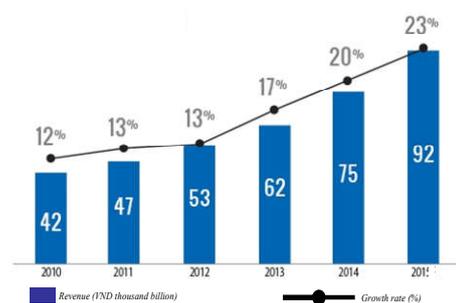


Figure 1. Vietnam's dairy market size and growth rate, 2010-2015.

Sources: FAO, 2015 and Euromonitor International, 2015 [8].

However, the retail price of milk in Vietnam is one of the highest in the world, especially in the powdered milk segment. The reason is simple as Vietnam mainly depends on imports to meet domestic demand for dairy products. The country is the 20th most important importer of dairy products in the world. The local raw milk production is able to provide only 30% of the domestic demand. This implies that Vietnam's dairy products' market has a high potential for future growth, both through increased domestic production and imports. High demand for milk and milk products in Vietnam creates incentives for different actors in the dairy supply chain to take advantage of the emerging opportunities.

Currently, the segment "liquid milk" still occupies the largest market share in Vietnamese dairy consumption demand thanks to its high nutritional value and easy usage. However, due to high consumption demand and limited local supply source, producers mainly import powdered milk from abroad and turn it into "fresh" milk. Meanwhile, the market information is not clear among various milks (real, fresh, or reconstituted), leading to the indifference in price of these totally different kinds of milk. This negatively affects the benefits of consumers and the dairy farmers as well.

4. Vinamilk's Business Description and its supply chain

Vinamilk has been the largest dairy company in Vietnam for the past 40 consecutive years. It is also the largest company in the private sector in 2015 on the Vietnam Stock market [9]. The company was founded in 1976 as the state-owned Southern Coffee-Dairy Company. In 2003, following its IPO to the HCMC Stock Exchange, the company legally changed its name to Vietnam Dairy Products JSC (Vinamilk). The principal activities of Vinamilk are to produce and distribute condensed milk, powdered milk, liquid milk, soya milk, yogurts, ice-cream, cheese, fruit juice, coffee and other products derived from milk. The company's business performance is presented in Table 1.

The company's average growth rate of total revenue, gross profit and profit after tax in the two nearest years are 14.3%, 42.8% and 28.1% respectively. The gross profit margin had widened from 32.3% in 2014 to 40.4% in 2015, a big leap for just one year thanks to a downturn of world milk prices. Export sales contribute about 13% of the total revenue. At the end of 2015, Vinamilk has exported to more than 40 nations with its traditional markets being in the Middle East and South East Asia. With impressive development, Vinamilk aims to achieve a total revenue of VND billion 44,560 in 2016 and to be ranked in the Top 50 biggest dairy companies in the world by the year 2017.

Table 1. Vinamilk business performance

Indicators	2013	2014	2015	Growth vs. 2014	2016 (expected)
Total revenue (VND billion)	31,586	35,187	40,223	14.3%	44,560
Gross profit (VND billion)	11,183	11,392	16,262	42.8%	18,493
Gross margin (%)	35.4	32.3	40.4	-	41.5
Net profit after tax (VND billion)	6,534	6,068	7,770	28.1%	8,266
Net margin (%)	21.1	17.2	19.2	-	18.6
Total assets (VND billion)	22,875	25,770	27,470	6.5%	28,978
Employees (people)	5,570	5,738	6002	4.6%	-

Source: Synthesized from Vinamilk annual reports, www.vinamilk.com.vn.

Vinamilk’s current market share occupies over 50% of the dairy industry. It is now fighting fiercely in four key segments: condensed milk, liquid milk, powdered milk, and yogurt. It was recently reported that Vinamilk now accounts for 90% of the market share in condensed milk, 48% in liquid milk, 24.6% in powdered milk, and 68% in yogurt. It can be seen that the key to Vinamilk’s faster growth in the coming years will lie in its ability to expand its market share in the segments of liquid milk and powdered milk, in which it will face tough challenges. In powdered milk, for instance, especially the children’s segment, the habit of Vietnamese people to prefer foreign products is a major barrier for Vinamilk to overcome in order to improve its market share. Its main competitors in this segment are strong

foreign brands such as Abbott, Friesland Campina, and Mead Johnson. In liquid milk, Vinamilk faces a similar situation, fighting against Friesland Campina and even smaller players such as TH True Milk, Moc Chau, Long Thanh, and IDP.

In addition to its existing competitors, Vinamilk may also have to face major dairy enterprises in the region as the ASEAN Economic Community (AEC) is enacting now and from the TPP countries as well. A large market of nearly 92 million people such as that of Vietnam is certain to catch the eye of regional players. The supply chain of Vinamilk consists of five activities, namely: input ingredients, raw milk production, processing, distribution and consumption (Figure 2).

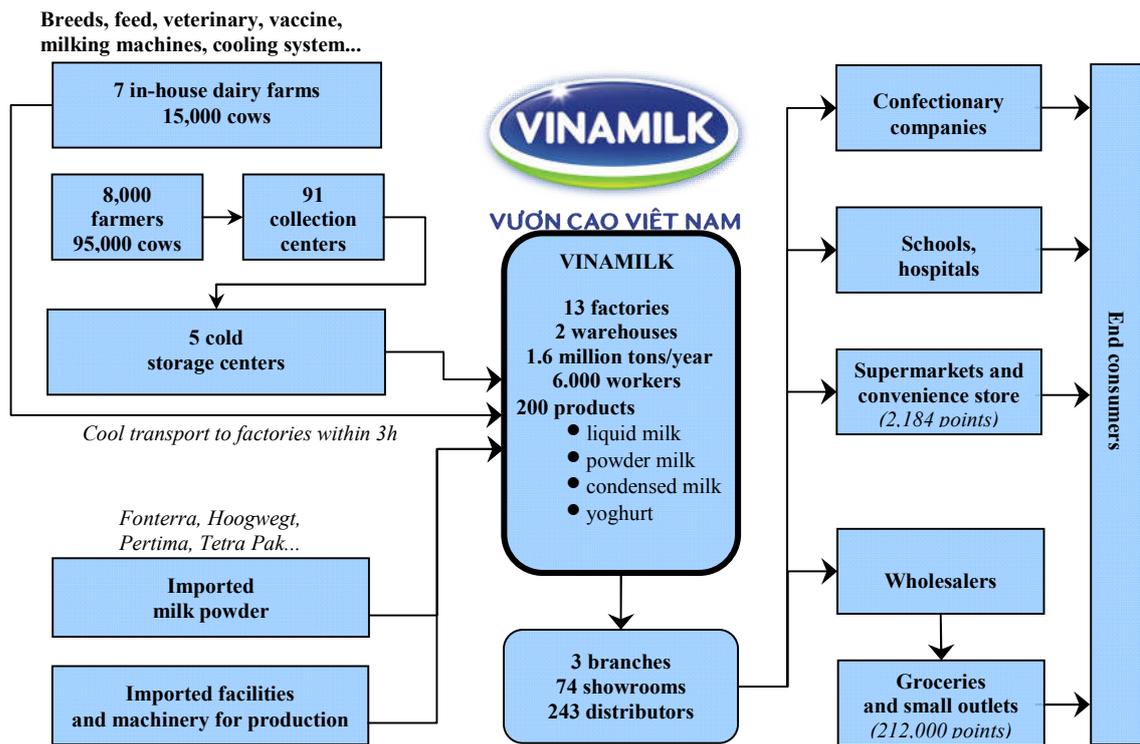


Figure 2. Vinamilk’s supply chain in the domestic market.
 Source: Developed by author with Vinamilk’s data up to March 2016.

Activity 1: Input ingredients

Inputs include the import of dairy breeds for husbandry and the purchasing of raw milk powder ingredients for processing activities. Cow raising requires high technique and investment which are not available in Vietnam. To set up a standard dairy farming system, Vinamilk must import technology, materials and equipment. Currently, dairy cattle for the local herds are mainly imported from Australia and New Zealand.

The imported milk powder comes mostly from New Zealand, Australia and USA which includes Whole milk Powder (WMP) and Skim milk powder (SMP). It is estimated that the imported milk powder materials account for 63% of the demand for the final milk products of the company. Dependence on imported raw material sources is one of the company's weaknesses which strongly affects the sustainable development and the gross profit of Vinamilk.

Activity 2: Raw milk production

This activity includes dairy cattle husbandry, milking and milk maintenance. The source of raw material is one of the important issues of the dairy company but this activity is still the weakest one in the company's supply chain as it is now facing many difficulties. Vinamilk collects raw milk from dairy farms, both from small farmers and from its in-house industrial farms.

For Vietnamese farmers, dairy cattle are not traditional animals and rather new on their farms. Smallholders have dominated the dairy industry with up to 95% of dairy farming households (with fewer than 10 cows per family). Small dairy herds have low outputs per animal and produce inconsistent quality milk. Furthermore, animal-keeping smallholders are associated with increased production costs and the spread of animal diseases. The lack of grass in Vietnam and the huge capex outlay necessary are also major challenges for dairy farming. The amount of natural and grown grass only satisfies about 30% of the forage needs of the dairy cattle. Still, dairy production in Vietnam

has grown significantly over the last years. This growth has been the result of increased milk demand and government's policies to promote efforts to develop the domestic dairy industry.

But the situation is changing now. In early 2016, prices of milk sourced from cow farmers in Vietnam were about VND 12,000-14,000 (US\$ 0.54-0.63) per kilo, nearly double that of milk shipped from the U.S., Australia, New Zealand, and European countries, which sold for about VND 7,000-9,000 (\$0.3-0.4) per kilo. Therefore, priority is given to buying milk powder from these countries over fresh milk from local farmers. As the global milk prices have dropped significantly in recent times, cow farmers are finding it difficult to sell their products.

By the end of March 2016, Vinamilk was operating 7 cow farms with a combined herd of 15,000 cattle. Vinamilk's cow herd, including the owned farms and that of contracted farmers, now totals over 110,000 head and has the ability to supply nearly 600 tons of raw milk each day. With the plan to develop new farms, the company intends to raise the number of cows in their herd as well as from farmers to about 140,000 cows by 2017 and 180,000-200,000 by 2020. This means that the planned volume of raw milk in 2020 will be doubled, equivalent to 1,000-1,200 tons per day. Vinamilk is still the leader among dairy producers in terms of herd size, outnumbering Friesland Campina by 32,000 cows from contracted farmers, TH True Milk by 45,000 head of in-house farms, and IDP by 58,000 head in outsourcing schemes with the farmers.

Activity 3: Processing

In this part, Vinamilk collects raw milk from dairy farms and buys powdered milk from foreign partners (Fonterra, Hoogwegt...), then processes and packages for the various final products. The company now operates 13 factories across the country including two mega factories. The company's production infrastructure is capable of processing 1.6 million tons of milk per year to meet the rising market demand. It also has 2 logistics

enterprises in HCMC and in Hanoi to operate the warehouses and transportation of raw materials and finished goods.

Activity 4: Distribution

Vinamilk has a strong and nationwide distribution network. The traditional channel of Vinamilk totals 243 exclusive distributors, that cover over 212,000 outlets in all cities and rural areas, which generated about 80% of domestic revenue in 2015. The rest was from the modern trade through direct deals with 1,609 small and big supermarkets, as well as with 575 convenience stores across the country. The strong channel development is partly attributable to its information technology tool ERP which has helped switch the firm from wholesaler to retailer, manage its inventory more precisely and improve its sale teams' efficiency. The firm is now trying to expand its channel to acquire more market share, especially in rural areas and small urban areas.

Activity 5: Dairy consumption

Milk is a vital and essential good for health and nutrition thus consumers' decisions are influenced much by product quality and safety. Another important factor that impacts the Vietnamese customers' behavior is retail price, and the high price of dairy products deprives many Vietnamese of the opportunity to use them. Spending for milk in cities is much higher compared to rural areas, but it is getting saturated. Meanwhile the milk consumption in rural areas is continuously growing at a double digit rate. Vinamilk is well serving the domestic market in all four key segments.

- In the condensed milk segment, Vinamilk has been dominating the market with two well-known brands "Sua Ong Tho" and "Ngoi Sao Phuong Nam" which make up to 90% of the local market share. This category used to be the core product of Vinamilk long ago, however the market is becoming saturated and it accounted for only 13% of the total revenue in 2015.

- In the liquid milk segment, local consumers tend to prefer fresh milk to reconstituted milk, thus Vinamilk is investing

heavily in upstream development to expand its cow herd as a key factor to survive the intensifying market. Though other local liquid milk manufacturers such as FCV, TH Milk, Moc Chau Milk and IDP are also increasing their herds of dairy cattle, Vinamilk still occupies the leading position in this segment with a market share of 48%.

- In the powdered milk segment, consumers tend to have higher brand loyalty on products that satisfy their children's appetite and nutrition and they are willing to pay a premium price for the strong foreign brands such as Abbott, Mead Johnson and Nestle. This segment is a most profitable market that is dominated by the foreign enterprises which have up to 75% of the market share. Vinamilk is still lagging behind its foreign competitors and is still competing in the low-end and mid-end products with brands Dielac and RiDielac.

- In the yogurt segment, Vinamilk has a huge advantage due to its nine yogurt factories across the country combined with an extensive distribution channel and large system of cool storage. Thus the firm claims to own up to 68% of the market share in 2015.

5. Assessing the challenges of fresh milk procurement activities at Vinamilk

Vinamilk's main strategy for the development of raw milk supply is "Establishing a network high-technology dairy farms in order to meet the demand for safe, quality raw milk as the main input for the company's diversified products; refining the purchasing system to ensure raw milk sales for farmers across the country on the top of the development of industrial milk farms".

The Vietnam Dairy Cow Co. Ltd. was established in 2006, as a subsidiary enterprise of Vinamilk, in order to fulfill this ambitious strategy, both in terms of quantity and quality of the raw milk input. Since then, Vinamilk has begun its investment into cow breeding directly

through building their own industrial dairy farms with a total capital of more than VND 500 billion at that time. The figure increased to VND 1,700 billion in 2015 with 7 big cow farms of 15,000 head that successfully apply a quality control system in accordance with ISO 9001:2008. The in-house farms supplied 37,595 tons in 2015, up 27.56% from the previous year (29,472 tons).

For the purpose of increasing the local source of raw material from the current rate of 37% up to 50% in 2020, Vinamilk has made big investments in dairy cow development in all areas, from planting grass, building breeding facilities, preparing feed for cows to preparing veterinary medicine and monitoring surrounding environment.

Vinamilk continues moving forward to develop large-scale input sources. Vinamilk has

been actively working with cattle companies to invest in facilities as large as 100-200 cows with modern shed design and advanced technologies. These partnerships are set to play a strategic role in securing the company's material supply. Moreover, in the beginning of September 2014, Vinamilk officially cooperated with Duc Long Gia Lai Group to invest VND 11,000 billion into farms with 80,000 dairy cows that are expected to be taken for milk in 2017.

Along with its in-house industrial dairy farms and the partnership with cattle companies, Vinamilk still relies on a large supply network of smallholder farmers which often supplies more than 82% of its raw milk source (Table 2). In 2015, Vinamilk purchased 178,890 tons of raw milk from farming households, an increase of 15.83% from 2014.

Table 2. Local raw fresh milk supply

<i>(Unit: tones)</i>	2013	2014	2015	Ratio in 2015	Growth vs. 2014
Vinamilk's in-house farms	23,952	29,472	37,595	17.37%	27.56%
Collection from farmers	132,610	154,440	178,890	82.63%	15.83%
Total raw fresh milk supply	156,562	183,912	216,485	100.00%	17.71%

Source: Synthesized from Vinamilk annual reports, www.vinamilk.com.vn.

Vinamilk has 91 collection centers throughout the country which are often located near its factories. The collection centers belong to 3rd party companies which require significant investment in a collection grid, cooling facilities and transportation trucks for the deliveries to Vinamilk factories. Roughly 90 farmers supply an average collection center which carries out the following tasks: collection and handling of the milk twice a day, sampling of the milk, initial testing of quality (through external staff employed by Vinamilk) and cool delivery of the raw milk to Vinamilk's nearest factory within 3 hours. There are two types of contracts in the Vinamilk procurement system: Farmers contract directly with the processing factories of Vinamilk to sell their raw milk; and

milk collectors' contract with farmers to collect and sell milk to Vinamilk (Figure 3).

However, the quality testing system is considered as a major constraint in the Vinamilk procurement system. On a daily basis, external Vinamilk staff deployed at the collection centers take milk samples individually for each farmer. One sample per week is randomly selected and analyzed in the dairy plant employing sophisticated laboratory methods. Payment is made directly to farmers based on the result of the quality test (fat, protein, total solids, bacterial count and absence of antibiotics etc.) by Vinamilk. The system tests and pays each farmer for the quality and quantity of milk delivered. Milk prices are set by Vinamilk according to milk quality and for a given period (twice per month).

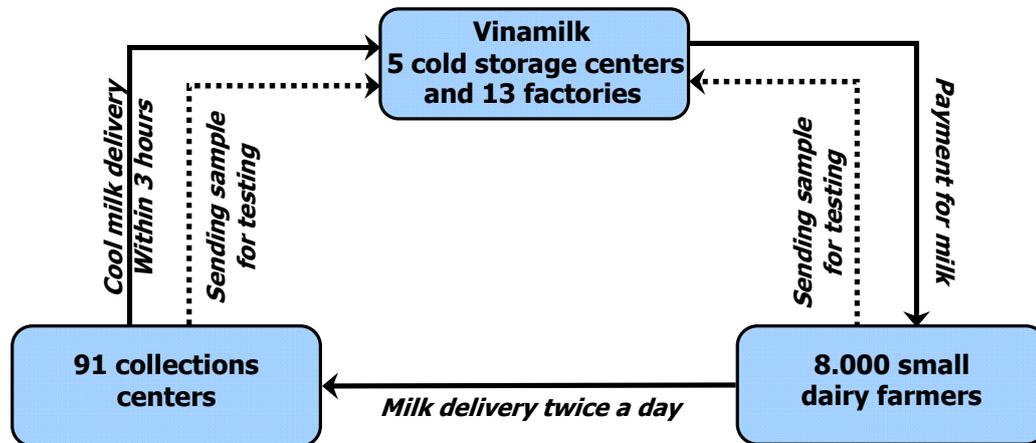


Figure 3. Vinamilk procurement system from small dairy farmers.

Milk prices are adjustable depending on the market price. The collection centers receive only a collection fee who centralize the production of a large milk basin into tanks where the milk from various farmers is mixed. The centers are not highly trained in quality control which sometimes results in a large spoilage of milk in the supply chain as dairy materials are very sensitive to food hygiene and safety issues.

This process is beneficial to Vinamilk by reducing investment in collecting points. However, farmers and owners of the milk collection centers think that the system is unfair because the testing of milk quality is done at the dairy plants and not at the collection points. The farmers are therefore unable to follow and check the testing process and results, but have to accept the decisions and prices metered out by Vinamilk. In fact, as reported by the farmers, the unclear quality testing system of the company sometimes degrades the quality of their milk, which reduces income from milk significantly.

In the general sourcing scheme, Vinamilk does not depend much on fresh milk (37%) but on imported milk powder (63%), while the dairy farmers depend on the company. Hence, the small-scale dairy farmers have little bargaining power compared to this large dairy processor. And with the milk procurement price

set by Vinamilk, not by the farmers, the dairy farmers bear all the risk of production.

6. Conclusions and implications for Vinamilk and small farmers

It is obvious that there are some barriers which Vinamilk has to overcome to competitively supply growing markets in the future and to be always the No.1 dairy company in Vietnam. Dependence on imported raw material sources is one of the company's biggest weaknesses and challenges. Therefore a prerequisite for success is to be completely self-controlled in managing input sources, especially in the liquid milk segment.

Small dairy farmers play an important role in Vinamilk's raw milk supply system. Thus the company should focus more resources and capability to nurture the development of family-run cow farms. Vinamilk should elaborate its contract farming relations with smallholders so that it shows the credible signal of long-term commitment to the selling farmers. In order to increase the number of farmers signing contracts and supplying quality fresh milk, the Vinamilk company needs to continue its supporting system, transferring technical training and providing information to farmers.

Since milk quality is considered a major bottleneck in the absence of the standardized

milk-quality testing scheme, it is suggested that Vinamilk should employ an independent quality control agency who will carry out regular checks at farms, collection centers and processing factories. This solution will ensure the selling farmers of the more clear and transparent quality testing results. Third-party quality control contract enforcement can be a useful way to mitigate the adverse effects of asymmetry of information between the big buying processor and the small selling farmers. To give more incentives for the smallholder dairy farmers, a new pricing system should be set up based on a basic milk quality as the higher the quality the higher the price [1, 5].

The higher participation of the small dairy farmers with quality fresh milk can be a good supporting pillar for Vinamilk to fulfill the dream of reaching and being among the world's Top 50 biggest dairy companies in the world in the near future.

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