

# DAIRY MILK PRODUCTION IN THE NORTH OF VIETNAM: A CASE STUDY IN MOCCHAU

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Dairy milk production in MocChau contributes to improve the welfare of farm households. It generates daily income for farmers, provides a highly nutritious food for people, create employment opportunities for the society. Although it brings a rather high income for farmers, their lives are very hard, and their living standard is quite low. This study aims to apply a monitoring system in farms to assist farmers improving their performance. Six field trips were carried out to help dairy farmersto monitor their farmsand collect economic and technical data in 2010-2012 in MocChau. The main findings are: stocking rate, milk yield and income were rather high but varied largely from this farm to others. Cost control in farm was not good thus dairy margin was not high. Purchased feed cost was too high. Homegrown feed accounted for a small part of cost but produced large amount of milk while purchased feed dominated a very large proportion of cost but produced less milk quantity. Most of the farmers followed the objective of increasing milk production but did not pay attention to the quality of herd and milk; did not make an optimal decision. Experience, land area, and herd size were the major factors that increased economic performance in farms.

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**Key words:** milk production, farm margin, dairy profit, farm monitor.

## 1. INTRODUCTION

Dairy milk production is improving the welfare for farmers. It generates daily income used for their living purposes: purchase of goods and services; pay school fees and medical expenses; or invest for the future, etc. Milk also provides them and society a high nutrition, and reduces the problem of malnutrition. Milk production and its value adding activities such as the processing, marketing and distribution of milk create employment opportunities for the society. This paper studies on the situation of dairy milk production in Moc Chau district, Sonla province in the North of Vietnam. It aims is to analyze the milk yield, milk income, operating cost, margins, and profitability of dairy farms to see how the dairy farmers operate their farms and by what way they can improve their performance.

## 2. METHODS

This research chooses MocChau as a study site because: (i) farmers in MocChau have a quite long time experience in dairy production; (ii) milk is the key economic sectors, bring the major source of income for dairy farmers in MocChau; (iii) quantity and quality of milk in MocChau are increasing quickly nowadays; (iv) milk production in MocChau has to cope with challenges in sustainable development.

The primary data was collected from 50 farms; including 10 key farms, through six field trips. The first one was carried out in July 2010 to collect overview and qualitative information of the study site. The second field trip was conducted in May 2011 to set up a plan of monitoring and help farmers to monitor their farms. The third field trip occurred in October 2011 to consult and help farmers in collecting data and transaction in farms. The fourth and the fifth trips were carried out in

November 2011 and March 2012 with the same duties in the third one. The final trip was taken place in May 2012 to collect the whole information in farms for the analysis.

### 3. RESULTS

#### 3.1. Milk production

The milking area of monitoring farms ranged from 2.1 to 4.55 hectares (ha). The largest area farm was two times higher than that of the smallest one. On the average, the milking area of the sample farms was 3.15 has per farm. In comparison to the average milking area in dairy farms in Vietnam in general, in the North of Vietnam, in particular, this area is larger. All the farms in this region followed the total mixed ration production system because of limitation in land area. Land is used to grow grass and maize for the feed of cows.

During the monitoring period, the average stocking rate was nearly 9 cows per ha, and 4 milking cow per ha. The highest stocking rate was more than 13 cows per ha, and more than 7 milking cow per ha. The lowest was around 6 cows per ha and 2 milking cow per ha. The largest herd size farm had 42 cows; of which 27 were milking cows, and 15 were heifers. The smallest size had 13 cows; of which 5 were milking cows, and 8 were heifers.

Milk production varied from this farm to the others. The highest amount of milk production, and milk sold was 140,000 kg milk belongs to whose owner has been the longest time experience in milk production, and has the largest herd and milking cows. The lowest belonged to farm whose owner has the least time experience. On the average, a dairy farm can produce 74,859 kg milk, of which 73,498 kg was sold; the rest was auto-consumed either by family members or feed the newborn calves. The collecting center will collect a sample of milk every ten days. These samples will be analyzed to record the butterfat and protein proportion. The butterfat proportion of the sample farms was quite stable around 3.5% and ranged from 3.2 to 3.7%. The protein proportion was around 3 to 3.2%. However, dairy farmers in Vietnam in general and in this region, in particular, did not pay attention to these indicators. They try their best to produce milk quantity as much as possible but not concern much on milk quality.

#### 3.2. Farm income

The average farm income per kg of milk was 10,554 Vietnam dong (VND)<sup>11</sup>. In which, income from milk is the major source of farm income on the dairy farms. On the average, it accounted for 94.6% total farm income. Other incomes included stock sales of dairy, stock sales of others and other farm income. Because most of the farms are on the way of accumulation, dairy farmers keep the entire milking cows they have; even some cows brought them a few amounts of milk (5 to 10 kg milk per day). They sell them only in some very special cases, for example, when milking cows die, or got seriously diseases, or could not be pregnant, did not have milk.

Stock sales of others in farms mainly come from the sales of cull cows. Dairy farmers do not raise other animals due to the regulation of the dairy plan<sup>12</sup>; the limitation of land and very hard working in farms. Some of them keep one or two dogs as a guard, or raised some chickens, ducks for their self-feeding. Other incomes of farm could be income from external sources such as: share dividend, salary of the employed family members.

<sup>11</sup> Approximately 0.5 USD

<sup>12</sup> According to the *Regulation book* of the dairy plant, dairy farmers are not allowed to raise other animals in order to protect the diseases from external factors.

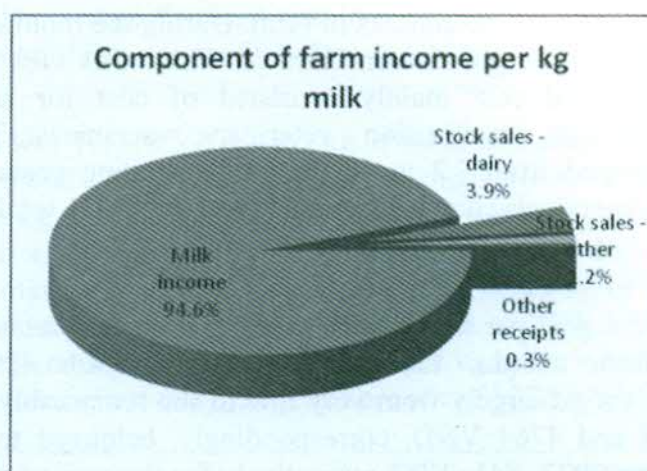


Figure 1. Farm income

Source: Monitoring results

### 3.3. Farm operating costs

The operating cost to produce a kg of milk was 6,795 VND on average. Feed-related cost included expenses for purchased feed and homegrown feed, accounted for 87% total operating cost. Proportion of feed-related cost was the highest at 90% total operating cost.

Purchasing feed consisted of concentrates and imported alpha grass from United States. Purchasing feed is the major component in the production cost of milk. On the average, purchased feed dominated and accounted for 70% total operating costs. The highest proportion feed cost was 82% total operating cost, and the lowest was 68%.

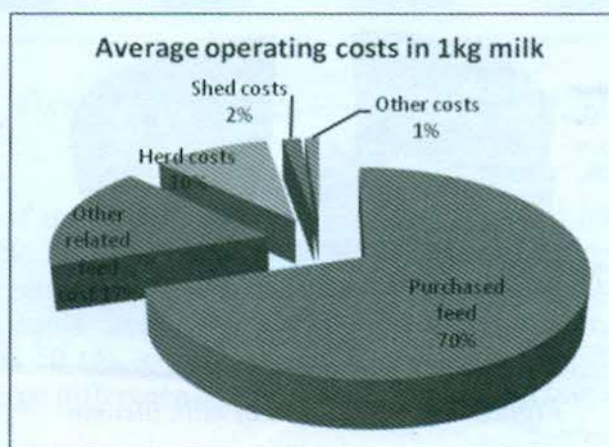


Figure 2 Average operating costs proportion in one kg of milk.

Source: Monitoring results

These implied that the dairy farmers spend too much on purchasing the feed for their animals. This situation makes them to depend on the feed market. It also means that they are easy to be vulnerable. In case the market is shocked or fluctuated, the price of feed increases, for example, they still have to buy the feed for their cows. The input of production will increase while the output price is very difficult to rise<sup>13</sup> and their margin, profit will reduce.

Home grown feed cost fluctuated from the minimum proportion of 7.5 to the maximum level of 23% total operating costs. On the average, it accounted for 17%. These costs consisted of cost used

<sup>13</sup> As discussed in previous part, dairy farmers do not have power in price setting.

for growing forages or homegrown concentrates in farm. During the monitoring period, none of the dairy farmers produce their home grown concentrates. Thus, this cost is used to indicate the homegrown forages only. Herd cost mainly consisted of cost for animal health and herd improvement such as artificial insemination, veterinary, vaccines. The average herd cost accounted for 10% and ranged from 7.2 to 13.1% total operating costs. The shed cost mainly included electricity, water, chemicals cost. It accounted for 0.9 to 3.1% total operating costs.

### 3.4. Farm margin

There are three kinds of margins per kg of milk: margin over feed-related cost, margin of milk production and whole farm margin. The average margins were 4096, 3214, 3759 VND, respectively. The margins varied largely from very low to the remarkably high level. The highest margins were 5455, 4558 and 4764 VND, correspondingly, belonged to the highest experience farmer. The lowest one was 2077, 841, 1782 respectively for the newest milk production farmers. Some farms performed quite well as their margin results were rather high. Some other farms did not operate properly. They achieved low margin amount.

Generally, total feed cost occupied 59% whole milk income, in which purchased feed accounted for 48%. The proportion of feed cost was the least at 46%, of which 37% was purchased feed cost. The highest proportion of feed cost was 75% milk income, of which 69% was purchased feed cost.

On the average, gross margin of milk in farms was 32% milk income. In the most successful farm, gross milk margin accounted for 45% milk margin. However, in the unsuccessful farm, this proportion accounted for only 16%.

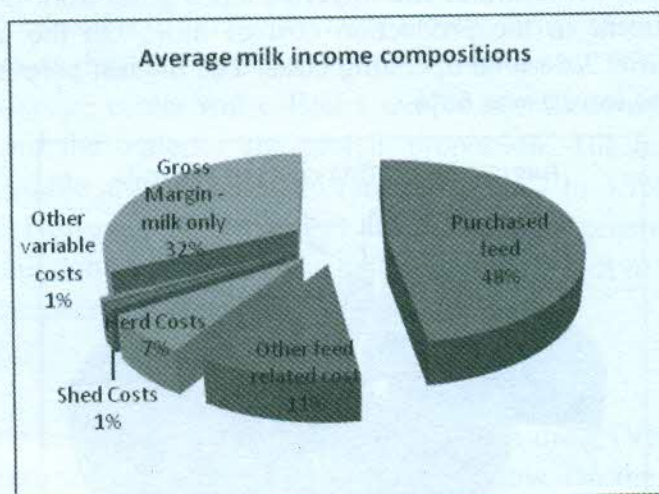


Figure 3. Composition of milk income

Source: Monitoring results

### 3.5. Dairy profit

On the average, total dairy income of a kg of milk on the sample monitoring farms was 12,009 VND. Of which, there was 10,009 VND that came from milk and other dairy income, 1,755 VND came from cattle trading profits and the rest 245 VND came from inventory changes. Generally, operating cost used to create one kg milk was 7793 VND. Hence, after subtracting this cost, farms got 4215 VND dairy operating profit per kg of milk.

In Vietnam, it is quite difficult for farmers in general and dairy farmers, in particular, to access the financial loan. Almost dairy farmers in the study site have to reinvest from their previous profit. Some farms borrowed from some financial institutions for their investment. Other had to borrow from relative or neighboring farmers. Thus, although the interest rate in Vietnam was rather high

over the last three year, the average financial cost in these farms was very small, only 31 VND per kg of milk. Thus, the mean dairy net profit before tax of the investigated dairy farms was 4184 VND per kg of milk.

The lowest profit in farm was 12,010.5 VND per kg of milk, including: 9979.7 VND milk incomes, 1895 cattle trading profits and 135.8 VND inventory changes. However, due to too high operating cost at 11,433.5 VND per kg of milk, dairy operating profit per kg was 577 VND. After subtracting 109.6 VND for financial cost, dairy net profit pre tax was only 467.4 VND per kg of milk. Meanwhile, the highest total dairy income was 14,274.1 VND per kg of milk. Thanks to this high dairy income with good cost control with the operating cost of 7988 VND per kg milk, this farm gained the highest dairy operating profit of 6286 VND per kg milk. After subtracting financial cost of 49.2 VND, she earned the highest dairy net profit pre tax of 6236.9 VND per kg of milk.

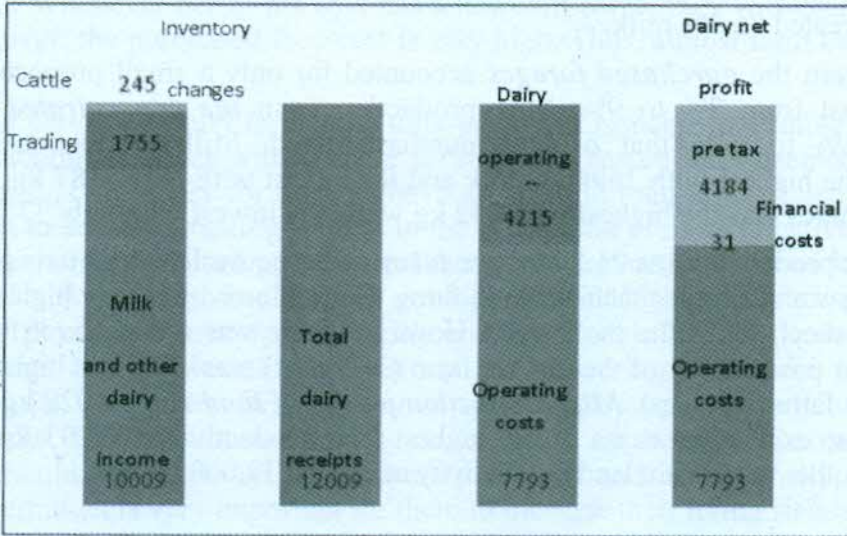


Figure 4. Farm Profit (count on a kg of milk)

Source: Monitoring results

The average equity ratio of the monitoring farms was 96.8%. The lowest equity ratio was 88% while the highest was 100%. The returns of dairy operating on assets in monitoring farm were quite high. On the average, this ratio was 35.7%; that means each 100 VND of the operating asset after one-year dairy production could create 35.7 VND of return. However, it ranged widely from the highest return on assets was 50.1%, to the lowest ratio was only 3.8%. The average return on assets was 36.2%. There was a large difference among farms. The highest one was 50.1% while the lowest was only 3.5%.

### 3.6. Technical indicators

In general, *milk yield* did not vary much among farms. The average amount of milk production per cow in the monitoring farms was 5801 kg milk per annum, or 4848 kg per lactation of 305 days. The highest milk yield was 6471 kg or 5407 kg per lactation of 305 days while the lowest was 4485 kg milk per cow per annum or 3748 kg milk per lactation of 305 days. Milk from feed

Milk production of the monitoring farms came from *concentrated feed* less than from *forages*. On the average, the forages could create 57% of milk (3298 kg milk per cow) while concentrated feed created 43% (2548 kg per cow). There are some farms that milk from concentrates was higher than that from forages. The highest proportion of milk from concentrates was 60%. These farms normally could not control cost well. The highest proportion of milk from forages was 79%. The farms with higher proportion of milk from forages always controlled cost well and achieved higher results.

On the overall, milk production from *homegrown feed* tended to be higher than that of *purchased feed*. The average amount of milk production by homegrown feed was 3105 kg, accounted for 53.5%, in comparison with 2743 kg milk produced by purchased feed (46.5%). Milk production from forages achieved the highest proportion at 76.7% with 4254 kg. The farms with higher milk produced from homegrown were more independent in the market and less vulnerable than other farms.

On the average, *homegrown feed cost* was equal to one fourth of purchased feed cost while the milk production from homegrown feed was 7% higher than that of purchased feed. The largest distance came from a farm with 82% purchased feed cost feed that created only 65.1% amount of milk while only 18 % expense on homegrown feed created 34.9% milk. The distance was the least in a farm with only 16% expense on homegrown feed cost and gained 53.4% milk while 68% spent to purchase feed cost that created only 46.6% milk. However, farm 3 seemed to save the most as her homegrown feed created 76.7% milk.

Milk production from the *purchased forages* accounted for only a small proportion of milk from purchased feed, just from 2% to 9%. Milk production from *the concentrated purchased feed* occupied from 91% to 98% that of total purchased feed. Milk production from purchased concentrates was the highest with 3698 kg milk and the lowest with only 1187 kg. Milk production from purchased forages was the highest with 342 kg while the lowest with only 37 kg.

On the whole, milk production was 21.8 tons *per labor units*; equivalent 14.7 tons per *imputed labor unit*. With only a few and simple machineries in farm, this productivity is very high. It proved that the farmers had effort much to do the farm work. However, there was a distance in labor productivity among farms. Labor productivity of the highest farm (31.7 tons) was 4.7 times higher than that of the lowest productivity farm (6.8 tons). *Milk production per ha of land* was 12,029 kg and did not vary much among farms; except the cases of the highest land productivity (20,293 kg) and the lowest (6692 kg). Almost other farms gain land productivity of around 12,000 kg milk.

#### 4. DISCUSSION

Land area in this region was larger than the average land area of other region in Vietnam (Tran H.C and Bui T.N, 2010). It is a good condition to grow forages for cow and reduce the purchased feed. In spite of this favorable condition, the stocking rate of farms was quite high because of the large herd size. The high stocking rate led to a shortage of feed, thus the farmers have to buy feed for cow. The high purchased feed cost pushed up their operating cost. Although they spent a lot on purchased feed, the milk from homegrown was higher than that from purchased feed. Cost control was not good.

Thanks to the larger herd size compared to other region in Vietnam (Bui T.N and Tran H.C, 2011), farms produced a rather high quantity of milk. This is the main factor that pushed the income of the farms. The farms also increased their total income through the other sources of income; however, they still depend too much on milk income and will be easy to be vulnerable if there is any shock in the market. Farm income varied from farms to farms, thus there was a large distance in milk margin among farms.

It is the fact that the low education level, qualification have a negative impact on the farmers' operating results. Meanwhile experience and land area impose positive impacts on their performance. Most of dairy farmers perform their farms by experience. The higher milk margins and profit mainly come from the longer time experience the farmers have and the larger land area. The longer experience farmers normally know how to operate their farms better and exploit their factors of production more effectively.

Most of farmers in the region try their best to increase herd size and milk production. They started to pay attention to the herd improvement. They began to choose and buy the good breed of heifers, improve the welfare of the herd as install a cooling system for cows, establish a playground for

cows, etc. They vaccinate them scientifically. However, there were many cows got diseases. In some farms, the cows' interval is long at more than 400 days (monitor results). The proportion of protein and fat was not paid attention, thus it was low, from 3.0 to 3.5% (monitor results). The farmers did not concern about the social and environment problem. They did not treat but normally directly discharged the cows' manure and waste into their surrounding environment such as canal, fields, etc.

Although they are very hard working, many of them achieve high income and profit, their living standard was still low. Before 2008, the dairy cow in Vietnam faced many difficulties (Bui T.N and Tran H. C, 2011). It was almost a new successful and develop industry for around 4 years, It takes time and money for farmers to raise cows. Milking cows are very expensive in Vietnam. In 2011, price of one pregnant Holstein Friesian heifer in Vietnam was very high at 96 million VND (survey result). Many farmers do not have money to buy such an expensive cow. They have to buy female calves and raise it. Whenever her or his cow has a newborn calve, they will keep it for future milk production. Moreover, the purchased feed cost is very high. Thus, almost farm income has to spend on their herd.

This is a favorable period for dairy farmers as milk price is reasonable and stable. In case of market shock, their production and lives will be more difficult. To ensure the sustainability and improve their performance, it is necessary for them to have a good and long-term strategy. They had better pay more attention to decision-making process in the orientation of more effectiveness. They should choose the suitable herd size based on their real factors of production such as land, labor, capital, etc. Larger herd size does not ensure them to get higher profit if they have to spend too much on purchasing feed. They should develop their skills and knowledge of milk production. They could exchange experience and self-learning by visiting and observing successful farms. They could compare their results with other farms to know whether they operate well or not and how to improve their results. They should not concentrate too much on the herd size and quantity of milk production, but should pay attention to the quality of herd and milk. Finally, support from the scientists and government is very important for them to increase their living standard.

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