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Dairy Development in the Household Located in Hanoi Outskirts

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Nowadays the demand for milk products in Hanoi City in particular and in Vietnam in general is significantly increasing. Meanwhile, domestic milk production has not met the need. The study, thus, was conducted to examine the underlying development of dairy industry in Hanoi outskirts, and then to identify problems and possible solution for improvement of the dairy sector. The results were based on data collected from 1994 to 2001 in Hanoi outskirts. Descriptive statistics was used as a main method for analysis. The results showed that cow population and cow herd structure significantly fluctuated, especially since 1986. Raising cows could bring social and economic efficiency to the country and the farmers. The study also found that potential for dairy production in Hanoi outskirts was large. The study suggests the government should pay attention on managing the cow herds in order to improve quality of the cow herds in the region. Formal credit organizations should consider providing farmers with long term and low interest rate credits.

INTRODUCTION

Recently, Vietnamese economy has remarkable changes. The per capita GDP trends to increase from year to year, and so living standards of Vietnamese people have significantly improved. Because of the growth, demand for high nutrient products such as eggs, milk, meat and so on has daily increased. Additionally, the products made from milk such as yogurt, milk candies, icecream, have been more diversified and attractive for consumers. In contradiction with that perspective, the quantity of fresh milk produced domestically had been limited. In 1995, it achieved only 20,925 tons (Agriculture and Rural Development Department, Hanoi, 1996). Therefore, the development of dairy industry in Viet Nam is an urgent issue concerned by the authorities at all levels. Furthermore, in the condition of unbalanced development between crops and livestock sectors, the development of dairy industry will play an important role in the process of rural economic transformation toward modernization and industrialization. In the other hand, it will be the good condition for Viet Nam to be able to take its full advantages and comparative advantage as well.

Hanoi, a capital of Viet Nam, is the second largest city in Viet Nam. It is comprised of 7 municipal districts and 5 suburb districts. This is a large market for milk consumption. With the tropical humidity climate, Hanoi is a favorable place for growing grass but not so

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favorable for raising pure cows (i.e. Holstein Friesian cows). Therefore, the crossbred and domestic cows are prevalent types of breed, and they will decide the development of this industry. At present, with the population of two billion people, the average allotted agricultural land per capita in Hanoi is 500 square meters (In future, this number will decrease because of urbanization process). According to Hanoi Department of Agricultural and Rural Development, it is estimated that in 2005 agricultural land will decline by 20.7%. As a result, Hanoi is facing with the issue of increasing unemployment. The development of dairy production is considered as one of measures to solve this problem.

In the latest years, being aware of the importance of dairy production in Hanoi, the Hanoi authorities have applied many measures to stimulate the development of dairy production at the zones located around Hanoi City. However, the development of cow herds in Hanoi has still been slow and not stable. Thus, exact evaluation of the present dairy production in Hanoi to reveal causes of the above-mentioned issues, and then to propose appropriate solutions to improve the dairy production is very essential and significant.

Due to limited time, in this paper, the study focused only on dairy development in farm households and on milk collection activities of collection stations in Hanoi outskirts.

OBJECTIVES OF THE STUDY

The overall objective of the study is to promote the development of dairy production in the farm households of Hanoi outskirts

The specific objectives are as follows:

- To evaluate the situation of dairy development and to find out factors affecting to the development in the households of Hanoi outskirts.
- To propose the main solutions to improve the dairy production
- To evaluate the status of raw milk selling in the households and milk collection activities of collection stations in the Hanoi outskirts.

RESEARCH SITE AND METHODOLOGY

Research sites

The outskirts of Hanoi City include five districts, namely Gia Lam, Dong Anh, Thanh Tri, Soc Son, Tu Liem. In this research, I have been making inquiries about five districts, but regarding the sample for research, three typical districts named Gia Lam, Dong Anh and Thanh Tri were selected as the research sites, based on its contribution to the total milk output of the Hanoi city.

Data collection

1. Secondary data

We used various sources; some of them could be listed as follows:

The Statistical Yearbook;

Report of Hanoi Dairy Project (Collaboration Vietnam-Belgium);

Statistics Department at districts and Hanoi city;
Reports of Ministry of Planning and Investment;
Reports of Ministry of Agriculture and Rural Development.

2. Primary data

We interviewed 100 households in three districts: Gia Lam, Thanh Tri and Dong Anh. Formal survey using structured questionnaires was conducted to gather the major part of information needed to achieve the objectives of the study. The necessary data was collected as follows:

- Household head's general characteristics such as education status, experience in dairy farming;
- Household's general characteristics such as the number of people, labourers, educational status of each person, the area of agriculture land, grass land, source of income, the area of residential land, breeding facilities, etc.;
- Dairy farm sizes and the structure of cow herds, age of milk cows, milking cycles;
- Feeding practices such as ration for each cow, price of each feed component;
- Other expenses: breeding, labor, tools and veterinary service;
- Milk yield of each milk cow in a day, a milk cycle;
- Marketing channels, price and quality of raw milk and cost of each channel.

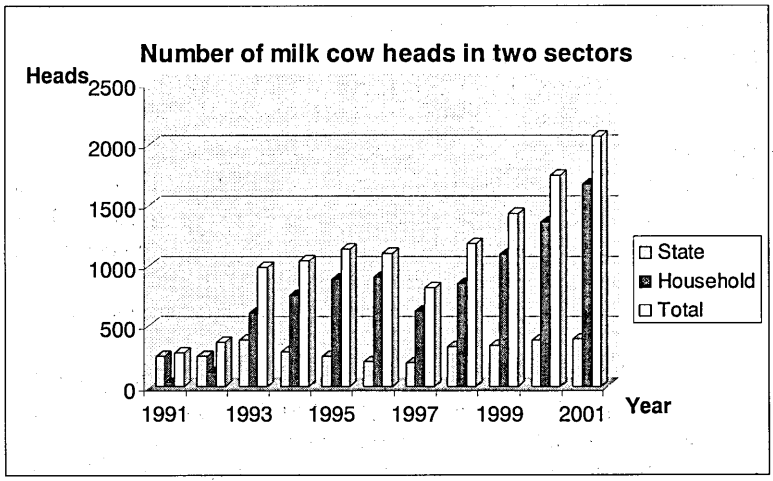
RESULTS

The development of cow herds at dairy households

Actually, dairy cows in the Hanoi outskirts have existed for many years. At the first stage, cows were raised in the state enterprises. Since Vietnam economy changed to market oriented mechanism, the dairy production has had considerable changes. Numbers of cow raised in the farm households have significantly increased. For example, from 1988 to 1991, the cow population in Hanoi outskirts concentrated mainly in state enterprises with 248 heads accounted for 90% of the total Hanoi's cow herds. In 1993, the numbers of cow increased to 984 heads, in which 604 heads belonged to farm households, accounted for 61.4%. In 1996, cow population in the households increased constantly to 1105 heads. In contrast, the numbers of cows in state enterprises has trended to decrease, accounted for only 18.2% of the total cow population or 202 heads (Figure 1).

In the period of 1988–1991, the dairy industry in Hanoi faced to many challenges, even though the open policies had been promulgated. Similar to farmers living in other localities, the Hanoi farmers were not accustomed to dairy production. The farmers had no knowledge of dairy production. Therefore, they lacked of management experience, cow raising technology and milk preservation. The persons, who participated in this industry, had spontaneous tendency and did not considerate to benefits as well as their ability in raising cow. Thus, many smallholders were un–successful because conditions of raising dairy cows were not appropriate.

Dairy production often requires large capital in the primary stage and the interval between two lactation cycles is quite long. Thus, farmers need the huge capital to constantly maintain the dairy production. Meanwhile, the farmers' income is often too low in comparison with indispensable capital of dairy production. Because of limited financial



Note: 1991-1993: Statistical Year-book, 1995
1994-2001: Survey

Fig. 1. Number of milk cow heads in two sectors.

ability, while price of a milking cow is too high, many farmers may not enjoy the benefits from this enterprise. For this reason, the farmers who want to raise a cow have to buy an in–milking–stage cow to avoid risk. That made the price of a cow become higher (sometime, the price of a F_1 milking cow went up to 20–25 million VND). In addition, price of feed also trended to increase. In the period of 1995–1996, the selling price of milk declined significantly, so some farmers sold their cows to do other activities. Thus, the cow herds trended to decrease in the late 1996 and early 1997. The number of cows was only 817 heads.

After the decrease period, both numbers of cow herds and dairy households have increased. In 2001, there were 849 households raising cows. In other words, number of dairy households in 2001 increased 2.73 times and 3 times higher than that in 1994 and in 1997, respectively. This could partially be explained by economic growth, which had caused increase in the demand for fresh milk. Another reason was that crop production achieved remarkable progress in terms of productivity, which contributed to decrease the price of feeds. In addition, Government had required the milking factories to help the dairy farmers by increasing the purchase price of milk to 3.550 VND/kg and gathering all the milk amount produced by the farmers.

However, the number of households participated in this industry has distributed mainly in Gia Lam–the district with more suitable condition for dairy production. The history of dairy production in Gia Lam is the longest, which implies that Gia Lam farmers have more experience in dairy farm. Moreover, there are two State dairy enterprises located in this district. Although, the number of dairy households increased in 2000 and 2001, its growth rate decreased in comparison with that of several previous years. The growth rate of dairy households in 2000 was 22.6% compared with 1999 and the figure in

2001 was 24.6% compared with 2000, while the growth rates in the previous years were 40–70% (except for that of 1996–1997). However, Gia Lam was relatively accounted for stable structure of 70–80% the total dairy households in Hanoi. Number of dairy households in Thanh Tri is very low. It was only 26 households in 2001. Different from Thanh Tri, number of dairy households in Dong Anh has increased rapidly since 1999. It reached 174 households in 2001, increased about 40% in comparison to 2000. Particularly, in Soc Son the number has strongly fluctuated. There were 45 households raising cows in 1998, but they gave up dairy production in 1999 due to careless preparation. Then, it was recovered with 49 households in 2001. (Table 1)

The fluctuation of dairy households has made number of milking cows go

Table 1. The number of dairy households in Hanoi outskirts

Unit: household

District	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*
Gia Lam	231	394	262	197	279	393	482	601
Thanh Tri	37	41	20	18	22	20	26	25
Dong Anh	15	14	32	59	44	79	113	174
Soc Son	0	2	1	1	45	0	8	49
Other	17	40	7	6	2	0	0	0
Total	310	491	322	281	392	492	629	849

Source: Survey, 1994–2001

up–and–down. This is illustrated in *Table 2*.

The total milking cow herds increased from 888 heads in 1995 to 1,672 heads in 2001; in which Gia Lam has always occupied a large share, accounting from 72% in 1997 to 81.93% of the total milking cows of Hanoi City in 1999. Because number of dairy households was quite stable, the number of milking cows in Thanh Tri constituted from 13.4% in 1995 to 14.4% the total milking cows of Hanoi City in 1997. However, it reduced to 6.1% in 2001. On the contrary, the number of milking cows in Dong Anh increased significantly from 1.91% in 1995 to 14.1% of the total milking cows of Hanoi City in 2001.

Together with an increase in number of herds, the structure of cow herds also changed. The number of milking cows increased from 55.8% to 57.78% of the total cow herds. These cows generate main and regular source of income for farm households, so they receive the households' special concern. This can be clearly seen in dairy newly–developing districts. The number of milking cows increased more rapidly because households trended to buy milking cows in order to immediately obtain cash flow. The districts, which had relatively stabilized in number of cows, often developed dairy production by using their own breed, thus, the ratio of milking cows trended to go down. In Gia Lam, this ratio declined from 56.12% in 1995 to 55.58% and in Thanh Tri from 64.71% to 54.9%, while in Dong Anh the ratio increased from 64.71% to 69.07% of the total cow herds.

The crossing formula of some cow breeds in Hanoi outskirts were described in *Table 3*. Because the artificial insemination is improved, cross breed cows are popularly raised in the outskirts. The F_3 5/8 blood of HF cows was more prevalent than the F_3 3/8 of HF

Table 2. The development of cow herds in dairy households

Year	Total		Gia Lam		Dong Anh		Thanh Tri		Soc Son		The edge of town	
	H	%	H	%	H	%	H	%	H	%	H	%
1995	*888*		*686*	*77.25*	*17*	*1.91*	*119*	*13.40*	*18*	*2.03*	*48*	*5.41*
Milking cows	496	55.86	385	56.12	11	64.71	77	64.71	4	22.22	19	39.58
Heifers and Heifer calves	392		301	43.88	6	35.29	42	35.29	14	77.78	29	60.42
1996	*903*		*738*	*81.73*	*51*	*5.65*	*103*	*11.41*	*3*	*0.33*	*8*	*0.89*
Milking cows	512	56.7	402	54.47	34	66.67	66	64.08	3	100.0	7	87.50
Heifers and Heifer calves	391		336	45.53	17	33.33	37	35.92	0		1	12.50
1997	*625*		*450*	*72.00*	*75*	*12.00*	*90*	*14.40*	*3*	*0.48*	*7*	*1.12*
Milking cows	398	63.68	292	64.89	27	36	71	78.89	1	33.33	7	100
Heifers and Heifer calves	227		158	35.11	48	64	19	21.11	2	66.67	0	–
1998	*856*		*627*	*73.25*	*56*	*6.54*	*95*	*11.10*	*76*	*8.88*	*2*	*0.23*
Milking cows	487	56.89	390	62.20	29	51.79	66	69.47	0	–	2	100
Heifers and Heifer calves	369		237	37.80	27	48.21 4	29	30.53	76	100	0	–
1999	*1096*		*898*	*81.93*	*98*	*8.94*	*100*	*9.12*	*0*	–	*0*	–
Milking cows	623	56.84	509	56.68	50	51.02	64	64	0		0	–
Heifers and Heifer calves	473		389	43.32	48	48.98	36	36	0	–	0	–
2000	*1364*		*1093*	*80.13*	*153*	*11.22*	*110*	*8.06*	*8*	*0.59*	*0*	–
Milking cows	730	53.51	589	53.89	72	47.06	63	57.27	6	75	0	–
Heifers and Heifer calves	634		504	46.11	81	52.94	47	42.73	2	25	0	–
2001	*1672*		*1281*	*76.61*	*236*	*14.11*	*102*	*6.10*	*53*	*3.17*	*0*	–
Milking cows	966	57.77	712	55.58	163	69.07	56	54.90	35	66.04	0	–
Heifers and Heifer calves	706		569	44.42	73	30.93	46	45.10	18	33.96	0	–

Note: H: heads
Source: Survey, 1994–2001

Table 3. Crossing formula of some cow breeds reared in the Hanoi outskirts

Formula	*Type of breeds*	*Crossing formula*
1	HF	Holstein Friesian female × Holstein Friesian bull
2	CS (Crossbred Sindhi)	Domestic female cow × Red Sindhi bull
3	F_1 (1/2 blood of HF)	Crossbred Sindhi female cow × HF bull
4	F_2 (3/4 blood of HF)	$F_1^{1/2}$ blood of HF female cow × HF bull
5	F_3 (5/8 blood of HF)	$F_1^{1/2}$ blood of HF female cow × $F_2^{3/4}$ blood of HF bull
6	F_3 (3/8 blood of HF)	$F_2^{3/4}$ blood of HF female cow × Red Sindhi bull

Source: Nguyen Van Thuong, 1995

blood cows. In our sample, only F_3 5/8 of HF blood cows are mentioned.

HF cows are imported from either Australia or Netherlands by Livestock Breeding Institute and Hanoi Breed Company. Except for crossbred Sindhi cows crossbred between Domestic cow and Red Sindhi cow (50% blood of Domestic; 50% blood of Red Sindhi), most of HF crossbred cows are the results of crossing among domestic blood, Red Sindhi blood and HF blood. In the formula 3, F_1 cows have 50% blood of HF, 25% blood of Red Sindhi and 25% blood of Domestic. In the formula 4, F_2 cows have 75% blood of HF and 25% rest blood among domestic blood and Red Sindhi blood. In the formula 5, F_3 cows have over 60% blood of HF.

The Crossbred Sindhi cows do not require a large level of investment, and have high resistance with the external environment. However, its milk yield is quite low. Raising the crossbreed Sindhi cow is said to be more suitable to the condition of limited capital and dairy knowledge, so number of the crossbred Sindhi cows recently increases.

The structure of cow breeds has changed positively for the past few years as shown in *Table 4*.

At the beginning, the selection of cow breed was spontaneous, affected by financial condition and predicted efficiency. Therefore, the households with strong financial background often bought high-yield breeds. The households with limited financial condition often bought crossbred Sindhi cows or supplied themselves based on their own ox herds.

Table 4 showed that the total number of cows rapidly increased from 888 heads in 1995 to 1672 heads in 2001; in which $F_2^{3/4}$ blood of HF cows constituted from 16.13% in 1995 to 51.66% the total milking cows in 2001, F_3 5/8 blood of HF cows occupied from 0% in 1995 to 7.76% in 2001. In contrast, CS cows decreased from 36.71% to 6.21% of the total milking cows. In the near future, these changes are favorable for households, but in terms of management, it is a danger because there will be no heifer to make F1 cows. In the fact, the farmers continue crossing from $F_2^{3/4}$ blood of HF female and HF bull. The rapid increase in quantity of the high blood of HF cows in Hanoi also needs to be paid attention. If we do not adjust in time, crossbred process will produce cow breeds with the very high ratio of HF blood, which is not suitable to the conditions of Hanoi. According to Mr. Thuong (Thuong, 1995), the cows with the ratio of 50–75% blood of HF are suitable for Hanoi.

Although the dairy production in Hanoi is evaluated to be a small status and scatters, the size of cow herds in household has significantly increased, from the average of

Table 4. The structure of milking cow breeds in households

Item	1995		1996		1997		1998		1999		2000		2001	
	H	%	H	%	H	%	H	%	H	%	H	%	H	%
Total	888	100	903	100	625		856		1096		1364		1672	
1. Milking cows	496	55.86	512	56.70	398	63.68	487	56.89	623	56.84	730	53.52	966	57.78
– HF	3	0.60	6	1.17	6	1.51	6	1.23	6	0.96	7	0.96	9	0.93
– F_1	221	44.56	259	50.59	139	34.92	241	49.49	298	47.83	301	41.23	323	33.44
– F_2 3/4	80	16.13	107	20.90	128	32.16	181	37.17	237	38.04	325	44.52	499	51.66
– F_3 5/8			18	3.52	77	19.35	32	6.57	45	7.22	52	7.12	75	7.76
– CS	192	38.71	122	23.83	48	12.06	27	5.54	37	5.94	45	6.16	60	6.21
2. Heifers and heifer calves	392	44.14	391	43.30	227	36.32	369	43.11	473	43.16	643	47.14	706	42.22

Note: H: heads
Source: survey, 1994–2001

Table 5. The cow size of farm households in the years of 1995–2001
Unit: heads per household

Year	Gia Lam	Dong Anh	Thanh Tri	Soc Son	Total
1995	1.74	1.21	2.9	9	1.81
1996	2.81	1.59	5.15	3	2.8
1997	2.28	1.27	5	3	2.22
1998	2.24	1.27	4.32	1.69	2.18
1999	2.28	1.24	5		2.23
2000	2.26	1.35	4.23	1	2.17
2001	2.13	1.35	4.08	1.08	1.97
Average	2.21	1.33	4.78	1.52	2.14

Source: survey, 1994–2001

1.81 heads per household in 1995, up to 2.14 heads per household in 2001 (Table 5). This number in each district reached the peak in 1996. Among districts, Thanh Tri has the biggest average number of cows per household (an average of 4.78 heads per household in the period of 1995–2001). Dong Anh has the most stable number of cows per household (it ranged from 1.21 to 1.59 heads per households).

However, there were still a few of the farms with large dairy size, which were from 15 to 26 heads. For example, the farm of Mr. Tran Van Hac in Long Bien (Gia lam) had 26 heads, and the farm of Ms. Tran Thi Lien Hoa in Yen So (Thanh Tri) owned 18 heads. The big farms could produce enough feed for their cows. These households experienced the process of stable production in the past few years.

Some assets used in dairy production

Barn and tools

According to the survey in 1994, 85% of the interviewed households utilized old

barns, which used to raise other livestock, to raise their cows. As a result, the area of barn was not large (average from 4.5 to 5 square meters per head) and so, was not met requirement of cow production. 80% of the interviewed households had barns with the concrete floors and tile roofs, 15% of the households had cow the barns with brick walls and floors located in favorable condition; 5% of the households had temporary facilities with terrace floor, thatch roof. In general, drainage systems were not good for raising and environment hygiene.

In 2001, although the barn had not completely upgraded, temporary facilities replaced. Nearly 80% of the households had semi–permanent barns. The remaining barns had brick walls and floors, tile roofs.

Although the average area of barn per cow remained the same, drainage system had been improved, so the environmental pollution had been reduced. In 2001, 89 households undertook bowel movement treatment by using the Biogas method. Nowadays, more and more households trend to apply this method. Besides, the application of enzyme called EM as a deodorizer made the environment cleaner.

Apart from those, other tools for cleaning up such as pail, basin, shovel, hoe, etc. were available in all of the surveyed households. 10% of the households had machine for crushing feed; 20% of the households used electric fan for dairy production. So far 100% of the households used water pumps in raising dairy.

Another difficulty in dairy production is the irrational location of breeding facilities. This problem is difficult to solve because there is no specific area for dairy production in Hanoi. The residential houses and the barns are located side by side, so environment was effected seriously. The limited area and the irrational location of barn partly prevent the expansion of dairy production.

The milk marketing of the dairy households in Hanoi outskirts

Before 1996

Before 1996, the Hanoi Dairy Development project had not been approved yet. Before the establishment of Hanoi Milk Processing Factory (in 1995), the dairy households sold their milk through the following channels:

– ***Channel 1:*** *The direct channel*

Several dairy households who had their own shops in Hanoi city sold their products via this channel. The milk price was 5,000–7,000 VND per kg. However, the demand for milk through this channel was not much, so the dairy households still had to sell their milk through other channels.

– ***Channel 2:*** *The indirect channel with one middle trader*

The dairy households sold their products to the restaurant and beverage shops in Hanoi. The prices were often mutually negotiated between sellers and traders, and depended on the season. The average price was 4000–4500 VND/kg. In the summer, because of high demand for types of beverage, the milk price was often higher than that in the winter, which reached 4500–5000 VND/kg. The price of milk was the lowest in winter with 3000–4000 VND/kg, even in some cold days it was only 2500–2800 VND/kg. Nevertheless, the amount of milk sold through this channel was not stable. In the condition of bad weather such as long and heavy rain or typhoon, the shops' owners often forced the milk price down. If the supplier did not reduce the price, they could not buy

all of milk amount. That was the biggest problem of dairy farmers.

The farmers participated in this channel often alternately delivered the milk to the shops to reduce the transportation cost. Normally, one group was organized by 2 or 3 dairy households, thus they had just delivered the milk once in every 2 or 3 days. The average price in this channel was 4.000–5.000 VND/kg.

– ***Channel 3:*** *the indirect channel with two middle traders*

The dairy households without transportation normally had to participate in this channel. In one village, there were two or three milk collectors. They bought the milk from dairy households and sold to the shops in urban areas. The selling price per kg was 300–500 VND lower than that of channel 2. In the condition of bad weather, the collectors also forced the price down. Otherwise, they could not buy the milk. In 1995, Vinamilk factory was established in Hanoi, so the situation changed. In general, milk was still delivered through the above–mentioned channels, but in the condition of bad weather or over–demand for milk, it will be sold to the factory. The standard price determined by the factory was 3.000 VND/kg, but the average selling price of farmers was only 2.600–2.800 VND/kg. Therefore, when farmers were not able to sell all of their milk amounts via channel 1 and channel 2, they sold the remaining milk amount to the factory. Sometimes, the farmers were not worry about their unmarketable products because there were different places absorbing their cow milk.

Since 1996 up to now

Since the middle of 1996, the milk collection systems have been settled in Cau Dien (Tu Liem), Vinh Ngoc (Dong Anh) and Phu Duc (Gia Lam). So far, in total there are 9 collection stations in the essential communes of four districts. Except for Cau Dien station being in charge of collecting milk from Hanoi Cattle Breed Company, all stations are located in essential communes of dairy production to collect milk from households living there. All expenditures on construction and establishment of collection stations were granted by Hanoi Dairy Development Project; only a small expense on milk preservation was calculated into the milk selling price.

Since the milk collecting stations came into operation, the milk selling activities have significantly changed in terms of price levels and selling amounts through channel 3. Intermediary agents are now collectors and the collecting stations. Thus the dairy households can choose buyers to sell their own products. Because of this competition, the collectors have to raise the milk price from 100 to 150 VND higher than that of the stations. Additionally, the dairy households can also sell the milk to both collectors and collecting stations. In the favorable condition, they sold their products to middle collectors with high price. In contrast, when facing to the disadvantageous condition, they sold their products to collecting stations to avoid the situation of deteriorated milk. Therefore, the collecting stations were only able to gather the remaining amount of milk from dairy farmers and the un–saleable milk from middle collectors. This is a reason for the fact that collecting stations are usually under their capacities, which increases preservation cost per unit. The collecting stations must change their strategies of milk collection. For example, they encouraged farmers who registered to sell their milk to the station. These farmers enjoyed all benefits from the projects such as exemption from artificial insemination fee, inoculation fee, and cow checking and treatment fees. The

unregistered farmers can sell their product to collecting stations but not able to enjoy the above benefit. This policy has effected so significantly that the number of households selling their products to these stations has increased constantly. The amount of collected milk in the stations is on increase. At present, all 9 collecting stations in Hanoi are in good operation. The milk amounts collected by the stations from 1998 to Sept. 2001 was illustrated in Table 6.

Table 6. The milk amount collected by the stations

Unit: ton

Collection stations	*1998*	*1999*	*2000*	*2001*
Cau Dien (6/1998)	51.4	65.2	85.58	108.73
Vinh Ngoc (7/1998)	23.89	111.38	144.23	183.07
Phu Duc (9/1998))	62.15	240.15	122.97	107.59
Trung Mau (2/1999)		157	310.1	280.18
Duong Ha (4/2000)			51.97	107.73
Tua (1/2000)			355.77	302.27
Tran Phu (4/2001)				36.6
Hoi Xa (7/2001)				11.97
Dong Hoi (7/2001)				15.01
Total milk amount collected in the year	137.44	573.73	1070.62	1153.15
Total milk amount produced in the year	1821	2569.71	3120.3	3003.92
			34.31	38.39
Ratio of milk collected and total milk produced (%)	7.55	22.33		

Source: Annual Financial Report of Hanoi Dairy Project No. VIE/00/001

In general, the increase in amount of milk collection can be explained by two reasons. First, the number of cow went up which resulted in increase in the milk amount. Second, preferential conditions given by Hanoi Dairy Development Project encouraged households to sell their products to the collecting stations.

The ratio between the milk amount collected and the total milk amount produced has increased rapidly from 7.55% in 1998 to 22.33% in 1999, 34.41% in 2000 and 38.39% in early 9 months of 2001. However, it was still low. Over 60% of the milk amount produced was sold to private collectors and other channels. Therefore, in order to improve the efficiency of collecting stations, necessary measures are needed to reduce preservation cost per kg of milk. Only by this way, the buying price of collecting station can increase and encourage households to sell more their products to the collecting stations.

To examine efficiency of milk collection activities, we chose the Phu Duc (Gia Lam) and Vinh Ngoc (Dong Anh) stations. The two stations started operating in 1998. Based on the project's stages, the research was divided into two periods: First one was from 1998 to 2000 and second one was from 2001 to 2005 (the data used in the research was from 1998 to Oct 1st, 2001). One thing should be noted that there were no differences between the two stations and no more investment in the stations in this period. The financial statements of these two stations have been shown in Table 7.

From *Table 7*, we could realize that the amount of milk collected significantly impact-

Table 7. Financial statement of the two stations

Items	Unit	Phu duc			Phu duc		
		Period 1	Period 2	Compared	Period 1	Period 2	Compared
Total milk collected	kg/month	15187.61	11954.67	-3232.9	9316.45	20342	11025. 55
Expenses	1000 VND/ month						
Milk		48188.71	36977.94		29029	64234.61	
Electricity cost for reservation		311.09	278.05		227.88	306.56	
Transportation cost		1623.75	1516.67		1150.27	600	
Labor cost		900	900		898.33	1194.44	
Other expenses		179.16	112.5		135.33	198.44	
Total cost		**51202.72**	**39785.17**		***31440.8***	**66534.05**	
Average cost	VND/kg	3371.35	3328		3374.76	3270.77	
Average electricity cost	VND/kg	20.48	23.26	2.78	24.46	15.07	-9.39
Average transportation cost	VND/kg	106.91	126.87	19.96	123.46	29.49	-93.97
Average labor cost	VND/kg	59.26	75.28	16.02	96.42	58.72	-37.7
Other expenses	VND/kg	11.8	9.41	-2.39	14.53	9.75	-4.78
Revenue	**1000 VND**	**52369.46**	**40300.06**		**30285.9**	**69378.57**	
Profit	**1000 VND**	**1166.74**	**514.9**		**-1154.9**	**2844.51**	
Profit per kg	VND/kg	76.82	43.07		-123.96	139.83	

Source: Annual Financial Report of Hanoi Dairy Project No. VIE/00/001

ed on the average cost per kg of milk. Excluding other expenses (i.e. hygiene tools, detergents, etc.) being quite constant, the costs of electricity, transportation decreased when the amount of collected milk increased. The change in transportation cost is the largest, and followed by labor cost.

In Phu Duc station, transportation costs and labor costs increased 19.96% and 16.02%, respectively when the milk amount decreased from 15187.61 kg to 11954.67 kg. This decline is sharply because another new station was established, named Tua station. This station attracted households living nearby to sell their products to it. Therefore, we should carefully take into consideration on establishing new collecting stations.

In Vinh Ngoc, transportation and labor costs decreased by 93.97 VND/kg and (equal to) 37.7% when the amount of milk increased from 9316.45 kg to 20342 kg. The transportation and labor costs in Vinh Ngoc decreased more than those in Phu Duc. This can be justified by the longer distance between Vinh Ngoc and Ha Noi Milk Factory (Vinh Ngoc and Phu Duc are about 20 and 12 km far from Ha Noi Milk Factory, respectively). The longer distance is, the higher transportation cost will be.

The advantages for dairy development in Hanoi outskirt

1. The benefits of dairy production

The dairy production is evaluated to be a new but beneficial industry. According to the study conducted by Ms. Loan (2000), the net returns of various crossbred cows reached the levels of 505.8 thousand VND to 754 thousand VND/cow/year. In addition, the research implemented by author, except for CS crossbred cows, on average, each cow in

the lactation cycle can generate profit levels from 863,6 thousand VND to 1468.9 thousand VND/cow/year (2000). Raising cows not only generates cash flows for the farmers but also creates the employment opportunities for rural labors, and utilizes efficiently the households' resources.

2. The assistance from the Authorities

The strategies and policies issued by Government and Hanoi People's Committee was the important starting point to develop the dairy production. However, if only depending on the support policies, the dairy production will not develop with high tempo. The specific activities of the organizations and local authorities combined with the Government's policies have virtually promoted the development of dairy production. The establishment of the collecting stations has assisted farmers to be able to sell their products more easily. That was an important link in the reproduction of dairy production.

The training courses on feeding practice, artificial insemination, feed processing, and grass cultivation have played an important role in dairy production. The farmers have now more chances to get access to knowledge in dairy production.

In addition, establishing the dairy associations in each commune took advantages to the dairy households to borrow money from banks and other organizations.

3. The broad application of new technologies

The approaches on wastes treatment such as biogas have broadly been applied in the dairy households. The construction of wastes tank, in one hand, supplies the fuel that is lacking because of competition with dairy production, in the other hand, contributes to environment protection.

Additionally, the application of EM products to dispose the odors has purified the atmosphere (Thach 2000). Therefore, dairy farmers feel freely to extend their size of production.

The constraints in dairy production

After examining the dairy development in outskirts of Hanoi over the past few years, we realized that the main reasons affected the development as following:

a. The dairy households have the limited capital. This obstacle has strongly influenced on the selection of cow breeds and investment in feeding, instruments, environmental treatment, etc. In the study areas, 100% dairy households needed to borrow money to operate their farms, because they could not afford the high capital investment during establishment of the farms. The farmers could borrow money from formal sources (as Agricultural Banks, Women's Associations...) and informal sources (as Friends, Village Lender, Relatives...), but it was not easy for the farmers to borrow money from formal sources. In the study areas, 15% of the total interviewed farmers accepted to borrow money from village lenders at the interest rate of 1.5–1.7% per month. The rest accepted interest rate of 0.6–1% per month. In addition, 65% of the non–dairy households wanted to raise milk cows but they do not have capital. Only 15% of them did not want and the remaining numbers (20% of them) were not sure. Therefore, if the problem of capital is solved, there are more households joining the dairy production.

b. The milk price is said to be low compared with prices of feed. This is the main rea-

son for restriction of dairy development. 78% of the households produced enough concentrates for their milk cows, the rest accepted to buy ready–made concentrates. Commonly, the costs of concentrates made by themselves were about 10–15% lower than those of factories, depending on each household. When households expanded their dairy sizes, they had difficulty in supplying enough concentrates. These are the reason madding the farmers hesitate to expand their sizes.

c. Lack of good cow breeds for expansion of herd size

It is impossible to extend immediately the size of herds, because this relates to the number of heifers, the artificial insemination service and so on. At present, the cow breeds in Hanoi Outskirt are not managed well, so they are in the unregulated and unqualified condition. Many dairy households have bought the unqualified crossbred cows. Hence, Government and other specialized organizations should pay attention on the management of cow breeds. Although a number of cows were imported to Vietnam in 2000 and 2001, they did not meet the demand of households. The imported cows could not be adaptive with Vietnam conditions in a short time, some of them died.

d. The location and the area for dairy production

The small land size of the dairy households is another obstacle for development of dairy production in Hanoi outskirts. This not only affected the expansion of the cow herd size in the households but also the application of waste treatment methods. Generally speaking, quantity of gas will be enough for one household to use, when Biogas application requires bowel movement from 2–3 cows/year. Thus, the households with 1–2 cows did not apply this technology, resulting in polluted environment.

In conclusion, the dairy production in outskirts of Hanoi in recent years has changed significantly. Nevertheless, to improve the development of dairy production, we need to resolve the following issues:

1. Government should rationalize the price systems

As analyzed above, dairy households receive very small profit from dairy production when they buy concentrated feed from factories. The authorities should control the relationship between concentrated feed price and milk price so that dairy households buying concentrates can get higher profit. According the study conducted by author in 2000, the price of 1 kg raw milk should be over than that of 3 kg concentrates.

2. Providing a reasonable credit system (i.e. longer term and larger amount of loan) so that the households will be able to liquidate their debits.

In the first 1–3 years of dairy production, households spend their money to buy and feed their cows but the cows have not give milk yet. Therefore, loan duration of 12–24 months at present is not long enough for farmers to feed the cows.

Moreover, it is not necessary for farmer to borrow in cash. They can receive cows or concentrated feed from Breeding Company or factories, and then banks will transfer money to the company or factories depending on a number of feeds/cows they bought. Applying this measure, the dairy households can use money in the right purpose of dairy production and the company or factories can implement well the services function.

3. Paying attention on the management of cow breeds to improve quality of cow herds. Every cow has to be recorded and marked on her ear. When one dairy household transfers his/her cows to another, he/she must be approved by veterinary centers located in the commune and to hand the record of the transferring cows over new dairy household.

4. Broadening the service systems such as feed service, breed service, veterinary service, etc.
5. Improving the knowledge in dairy production for farmers.
6. Providing the existing collection stations with equipments (i.e. tanker truck) and other tools.

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