

## CHAPTER 3

### METHODOLOGY

This research issues “Dairy Cooperative’s Management Process Contributing to Occupation Development of Dairy Farmers in Upper Northern Thailand” was Mix Method research by using Quantitative research and Qualitative research are as follow

#### **3.1. Research Methodology**

Research method has 3 phases as follow

**Phase 1**, Study to factors influences dairy cooperative’s management process that collecting data from 2 levels including:

1.1. From members: key Informant from 2 sampling member including farmers who continue doing dairy farming and farmers who quit dairy farming by using questionnaire for collecting data. Moreover, the research used Focus Group Discussion Technique from 2 groups of dairy farmers representative who continue doing dairy farming from dairy cooperative which passed standard of milk collecting center from Department of Livestock Development (DLD) and dairy cooperative which weren’t passed standard of milk collecting center from Department of Livestock Development (DLD). Because of participants provide complete data as well opinion about factors influence dairy cooperative’s management process which they are a member of dairy cooperative.

1.2. From organization: key Informant from the representative of dairy cooperatives and milk factories in upper northern Thailand by using SWOT Analysis.

**Phase 2**, Build up the dairy cooperative’s management process contributing to occupation development of dairy farmers in upper northern Thailand by the researcher using data from phase 1 and data from in-depth interview with whom relevant the dairy cooperative’s management process in upper northern Thailand.

**Phase 3**, Conclusion the dairy cooperative's management process contributing to occupation development of dairy farmers in upper northern Thailand. For any organization concerned such as Department of Livestock Development (DLD), The Dairy Farming Promotion Organization of Thailand (DPO), and The Dairy Cooperative Federation of Thailand Limited able to take the analysis to determine the policies on dairy farming extension and management process of all system of raw milk produced in the upper northern Thailand effectively.

### **3.2. Population and Sampling**

Unit of analysis in this research were dairy cooperatives in upper northern Thailand such as Chiang Mai, Chiang Rai, Lamphun, Lampang and Phrae for 18 Dairy Cooperatives total 1,046 dairy farmers with sampling methods as

**1. In phase 1**, (To study the factors influencing to dairy cooperative's management process in upper northern Thailand) The researcher divided the dairy farmers 2 level as follow:

#### **1.1. Member level**

The researcher used quantitative research and qualitative research for study the factors influencing to dairy cooperative's management process in upper northern Thailand in member level. The researcher determined the sampling and key informant as

**1.1.1. Quantitative research:** The researcher divided the dairy farmers 2 group as follow:

**Group 1:** Farmers who continue doing dairy farming and are member of dairy cooperative in upper northern Thailand total 1,046 persons.

**Group 2:** Farmers who quit dairy farming and used to be member of dairy cooperative in upper northern Thailand total 161 persons.

Sampling method and regulation to provide data consisting:

**1.1.1.1. Sampling of group 1** (farmers who continue doing dairy farming). The researcher used Multi – Stage Stratified Random Sampling.

**1.1.1.1.1. Classification** from size of dairy farmers who continue doing dairy farming and are member of dairy cooperatives in upper northern divided into 3 classes upon the standard regulation of dairy farming

and raw milk produced from Bureau of Livestock and Standards and Certification (DLD) including:

“Small dairy farming” means dairy farm has dairy less than 20 dairy

“Medium dairy farming” means dairy farm has dairy between 20 to 100 dairy

“Large dairy farming” means dairy farm has dairy more than 100 dairy

Notice: dairy means dairy ever give calf

1.1.1.1.2. Sampling by Proportional allocation from numbers of 1,046 dairy farmers. Population calculated the size sampling used Taro Yamane incorrect level at 0.05

$$n = N / 1 + Ne^2$$

if  $n$  = substitute sampling size

$N$  = substitute population number

$E$  = substitute acceptable error (incorrect)

Substitution as:

$$\begin{aligned} n &= 1,046 / 1 + 1,046 (0.05)^2 \\ &= 1,046 / 3.615 \\ &= 289 \end{aligned}$$

Therefore sampling size is 289 dairy farmers (farmers who doing dairy farming)

Then researcher used Proportional allocation to calculate sampling size in each dairy cooperative

$$n_i = n \times N_i / N$$

if  $n_i$  = substitute sampling size group i

$n$  = substitute the whole sampling

$N_i$  = substitute number of population group i

$N$  = substitute whole population

Result of using Proportional allocation to calculate sampling size in each dairy cooperative in upper northern Thailand shown in table 3.1

Table 3.1 Summarizes of sampling of dairy farmers who continue doing dairy farming from dairy farming size in upper northern Thailand.

Dairy Cooperatives	Small dairy farming		Medium dairy farming		Number of Sampling
	Total	Sampling	Total	Sampling	
<b>Large dairy cooperative</b>					
1. Chiang Mai Dairy Cooperative	69	<b>18</b>	121	<b>32</b>	<b>50</b>
2. Chaiprakarn Dairy Cooperative	52	<b>14</b>	111	<b>31</b>	<b>45</b>
3. Maeon Dairy Cooperative	71	<b>19</b>	45	<b>12</b>	<b>31</b>
4. Maejo Dairy Cooperative	38	<b>11</b>	60	<b>17</b>	<b>28</b>
5. Lamphun Dairy Cooperative	41	<b>11</b>	20	<b>6</b>	<b>17</b>
<b>Total</b>	271	<b>73</b>	327	<b>98</b>	<b>171</b>
<b>Medium dairy cooperative</b>					
6. Sankampang dairy farmers groups	59	<b>17</b>	14	<b>5</b>	<b>22</b>
7. Banpatueg-hoymor Dairy Cooperative	44	<b>12</b>	16	<b>4</b>	<b>16</b>
8. Chiang Rai Dairy Cooperative	34	<b>9</b>	26	<b>7</b>	<b>16</b>
9. Phatat Doi Pa Tang Dairy Cooperative	45	<b>12</b>	10	<b>3</b>	<b>15</b>
10. Banta Dairy Cooperative	43	<b>12</b>	4	<b>1</b>	<b>13</b>
11. Maelao Dairy Cooperative	17	<b>5</b>	12	<b>3</b>	<b>8</b>
12. Banhong samphan 1 Dairy Cooperative	8	<b>2</b>	15	<b>4</b>	<b>6</b>
13. Maewang Dairy Cooperative	6	<b>2</b>	16	<b>4</b>	<b>6</b>
<b>Total</b>	256	<b>71</b>	113	<b>31</b>	<b>102</b>
<b>Small dairy cooperative</b>					
14. Maetha Dairy Cooperative	12	<b>3</b>	4	<b>2</b>	<b>5</b>
15. Hariphunchai Dairy Cooperative	12	<b>3</b>	2	<b>1</b>	<b>4</b>
16. Phrae Dairy Cooperative	6	<b>2</b>	2	<b>1</b>	<b>3</b>
17. Fang Dairy Cooperative	3	<b>1</b>	2	<b>1</b>	<b>2</b>
18. Long Dairy Cooperative	6	<b>2</b>	-	-	<b>2</b>
<b>Total</b>	39	<b>11</b>	10	<b>5</b>	<b>16</b>
<b>All Total</b>	566	<b>156</b>	480	<b>133</b>	<b>289</b>

Source: The Education and Development of Livestock

Regional Bureau of Animal Health and Sanitation 5<sup>th</sup>, 2008

1.1.1.2. Sampling of group 2 (farmer who quit dairy farming). The researcher used Multi – Stage Stratified Random Sampling.

1.1.1.2.1. Sampling by Proportional allocation from numbers of 161 dairy farmers who quit dairy farming. Population calculated the size sampling used Taro Yamane incorrect level at 0.05

$$n = N / 1 + Ne^2$$

if  $n$  = substitute sampling size

$N$  = substitute population number

$E$  = substitute acceptable error (incorrect)

Substitution as:

$$\begin{aligned} n &= 161 / 1 + 161 (0.05)^2 \\ &= 161 / 1.4025 \\ &= 115 \end{aligned}$$

Therefore sampling size is 115 dairy farmers (dairy farmers who quit dairy farming)

Then researcher used Proportional allocation to calculate sampling size in each dairy cooperative

$$n_i = n \times N_i / N$$

if  $n_i$  = substitute sampling size group i

$n$  = substitute the whole sampling

$N_i$  = substitute number of population group i

$N$  = substitute whole population

Result of using Proportional allocation to calculate sampling size in each dairy cooperative in upper northern Thailand shown in table 3.2

Table 3.2 Summarizes of sampling of dairy farmers who quit dairy farming in upper northern Thailand.

Dairy Cooperative	Dairy farmers who quit dairy farming	
	Number of dairy farmer	Number of sampling
<b>Large dairy cooperative</b>		
1. Chiang Mai Dairy Cooperative	26	<b>19</b>
2. Maeon Dairy Cooperative	10	<b>7</b>
3. Maejo Dairy Cooperative	14	<b>10</b>
<b>Total</b>	50	<b>36</b>
<b>Medium dairy cooperative</b>		
4. Banpatueg-hoymor Dairy Cooperative	14	<b>10</b>
5. Chiang Rai Dairy Cooperative	21	<b>15</b>
6. Phatat Doi Pa Tang Dairy Cooperative	4	<b>3</b>
7. Banta Dairy Cooperative	6	<b>4</b>
8. Maelao Dairy Cooperative	2	<b>1</b>
9. Banhong samphan 1 Dairy Cooperative	11	<b>8</b>
10. Maewang Dairy Cooperative	18	<b>13</b>
<b>Total</b>	76	<b>54</b>
<b>Small dairy cooperative</b>		
11. Maetha Dairy Cooperative	15	<b>11</b>
12. Hariphunchai Dairy Cooperative	4	<b>3</b>
13. Phrae Dairy Cooperative	7	<b>5</b>
14. Fang Dairy Cooperative	5	<b>3</b>
15. Long Dairy Cooperative	4	<b>3</b>
<b>Total</b>	35	<b>25</b>
<b>All Total</b>	161	<b>115</b>

Source: The Education and Development of Livestock

Regional Bureau of Animal Health and Sanitation 5<sup>th</sup>, 2008

1.1.2. Qualitative research: The researcher used Focus Group Discussion in 6 dairy cooperatives in upper northern and selected participants 6-7 farmers per 1 dairy cooperative that collecting complete data. Moreover, opinion of



factors influence dairy cooperative's management process from dairy farmer's experience and used this data for check data in phase 1 too. The researcher classified the sampling of dairy farmers as

1.1.2.1. The researcher classified from Standard of milk collecting center (GMP) of Department of Livestock Development (DLD) which divided into 2 groups as follow:

1.1.2.1.1. Group 1: Dairy cooperative which passed standard of milk collecting center from Department of Livestock Development total 5 dairy cooperatives such as Chaiprakarn Dairy Cooperative, Maeon Dairy Cooperative, Maejo Dairy Cooperative, Lamphun Dairy Cooperative and Banpatueg-hoymor Dairy Cooperative.

1.1.2.1.2. Group 2: Dairy cooperative which weren't pass standard of milk collecting center from Department of Livestock Development total 13 dairy cooperative.

The researcher used simple random sampling by drawing lots, selected 3 dairy cooperative per group for focus group discussion total 6 dairy cooperative including

Table 3.3 Summarizes of sampling dairy cooperative for focus group discussion

Dairy Cooperative	standard of milk collecting center from Department of Livestock Development (GMP)
1. Chaiparkarn Dairy Cooperative	GMP passed from DLD
2. Maeon Dairy Cooperative	GMP passed from DLD
3. Maejo Dairy Cooperative	GMP passed from DLD
4. Banta Dairy Cooperative	GMP wasn't pass from DLD
5. Maetha Dairy Cooperative	GMP wasn't pass from DLD
6. Phrae Dairy Cooperative	GMP wasn't pass from DLD

Source: The Education and Development of Livestock

Regional Bureau of Animal Health and Sanitation 5<sup>th</sup>, 2007

The researcher selected dairy farmers from 6 dairy cooperative and participants 6-7 dairy farmers per 1 dairy cooperative for focus group discussion which sampling dairy farmers have similar character such as dairy cooperative position, similar in dairy farming experience and voluntary participation.

### 1.2. Organization level

The researcher used qualitative research for study the factors influencing to dairy cooperative's management process in upper northern Thailand in organization level by analysis of dairy cooperative and milk factory status by SWOT Analysis. The researcher divided into 2 groups as follow:

1.2.1. Sampling of group 1: The representatives from dairy cooperative in upper northern Thailand total 18 dairy cooperative (2 dairy farmers per 1 dairy cooperative) total 36 dairy farmers. Moreover, the researcher classified dairy farmers into 3 sub groups such as:

- The representative from large dairy cooperative total 5 dairy cooperative (2 dairy farmers per 1 dairy cooperative) total 10 dairy farmers.

- The representative from medium dairy cooperative total 8 dairy cooperative (2 dairy farmers per 1 dairy cooperative) total 16 dairy farmers.

- The representative from small dairy cooperative total 5 dairy cooperative (2 dairy farmers per 1 dairy cooperative) total 10 dairy farmers.

1.2.2. Sampling of group 2: The representative from 3 milk factory in upper northern Thailand total 6 persons (2 persons per 1 milk factory)

Data from this method brought to analysis of dairy cooperative and milk factory status (Strengths, Weaknesses, Opportunity, and Threat) concerning Managerial Resources (Man, Material, Money and Management) and used in next phase.

**2. In phase 2,** (Build up the dairy cooperative's management process contributing to occupation development of dairy farmers in upper northern Thailand) The researcher used data from phase 1 and data from in-depth interviewed with who relevant the dairy cooperative's management process in upper northern Thailand as follow:



2.1. Persons who determined a dairy planning and policies concern dairy cooperative in upper northern Thailand total 18 persons such as: President or committee dairy cooperative in upper northern Thailand total 18 persons.

2.2. Persons who responsible of dairy farming extension project in upper northern Thailand total 6 persons such as: The authority from Department of Livestock Development (DLD) to be work in 5 provinces and livestock extension expert from Department of Livestock Development (DLD).

2.3. Persons who determined a planning and policies of milk factory concern milk production in upper northern Thailand total 3 persons such as: The representative from Chiang Mai Fresh milk Limited, Gold milk Limited and UM. Food Product Limited.

**3. In phase 3,** (Conclusion the dairy cooperative's management process contributing to occupation development of dairy farmers in upper northern Thailand). The researcher analyzed and synthesized data in phase 1 and 2 for conclusion the dairy cooperative's management process contributing to occupation development of dairy farmers in upper northern Thailand. For any organization concerned such as Department of Livestock Development (DLD), The Dairy Farming Promotion Organization of Thailand (DPO), and The Dairy Cooperative Federation of Thailand Limited able to take the analysis to determine the policies on dairy farming extension and management process of all system of raw milk produced in the upper northern Thailand effectively.

### **3.3. Variable and Measurement**

The researcher determined the variables, measurement and principle of variable calculation such as

#### **1. Independent Variable**

##### **1.1. Inner Factors including**

1.1.1. Personal basic factors such as gender (male-female), age (year), level of education (qualification), experience in dairy farming (year), period on membership of dairy cooperative (year), knowledge in dairy farming (correct – incorrect) and practice in dairy farming (every time, sometimes, never)

1.1.1.2. Economic factors such as number of family members (person), number of labour for dairy farming (person) and total outstanding debts (bath)

1.1.1.3. Social factors such as occupy in dairy cooperative position, occupy in social position, participation in activities of dairy cooperative (every time, sometimes, never), acquire information about dairy farming from various medias (number of time per 1 month) and communication with officer concerning dairy farming (number of time per 1 month)

## 1.2. Outer Factors including

1.2.1. Dairy farming operation factors such as size of dairy cooperative (small, medium, large), style of dairy farming (tying, leasing in cote or courtyard, leasing in pasture), dairy farming standard recognized from DLD (recognized already, not recognized), number of dairy replacement (dairies), number of dairy (dairies), capability on milk production of dairy (kg/dairy/day), purchase price of raw milk (baht/kg), farm land owning for dairy farming (rai), size of area for pasture (rai), cognizance in operating of dairy cooperatives (correct – incorrect), satisfaction with dairy cooperative operation, government and dairy farming (very satisfied, somewhat satisfied, somewhat dissatisfied, very dissatisfied), opinion of the dairy farmer in career succession of their child (take succession, not take), problem and obstacle in dairy farming (physical, economic, social and farm operating) (highest, high, medium, low, lowest, non-problem)

Dependent Variable was factors influencing to dairy cooperative's management process in upper northern Thailand form member that the researcher will consider about factor influencing to dairy farmers' decision to continue doing dairy farming occupation.

The researcher determined the rating score as follow

### 1. Independent Variable

#### 1.1) Gender

Male = 1 score

Female = 0 score

#### 1.2) Age is determined to be an actual age.

## 1.3) Level of education

Uneducated	= 1 score
Elementary school grade 4	= 2 score
Primary education	= 3 score
Secondary school grade 3	= 4 score
Secondary school grade 6 or	
Vocational certificate	= 5 score
High vocational certificate or diploma	= 6 score
Bachelor degree	= 7 score
Above bachelor degree	= 8 score

1.4) Experience in dairy farming is determined to be an actual experience in dairy farming.

1.5) Period on membership of dairy cooperative is determined to be an actual period on membership of dairy cooperative.

1.6) Knowledge in dairy farming: The researcher use true score from dairy farmer answered total 24 questions. (Correct = 1, Incorrect = 0)

1.7) Practice in Dairy farming: The researcher use true score from dairy farmer answered total 20 questions. (Never = 0, Sometime = 1, Every time = 2)

1.8) Number of family members: The actual number of family members.

1.9) Number of labours for dairy farming: The actual number of labour for dairy farming.

1.10) Total outstanding debts: The actual number of total outstanding debts.

## 1.11) Occupy in dairy cooperative position

The researcher determines the rating score such as

Do not have dairy cooperative position	= 0 score
Have dairy cooperative position	= 1 score

## 1.12) Occupy in social position

The researcher determines the rating score such as

Do not have social position	= 0 score
Have social position	= 1 score

1.13) Participation in various activities of dairy cooperative: The researcher use true score from dairy farmer answered total 10 questions. (Never = 0, Sometime = 1, Every time = 2)

1.14) Acquire information about dairy farming from medias: The number gained is times of receiving dairy information from various media.

1.15) Communication with officer concerning dairy farming: The number gained is times of communicating with officer concerning dairy farming.

1.16) Size of dairy cooperative

Small dairy cooperative = 1 score

Medium dairy cooperative = 2 score

Large dairy cooperative = 3 score

1.17) Style of dairy farming

Tying = 1 score

Leasing in cote or courtyard = 2 score

Leasing in pasture = 3 score

1.18) Dairy farming standard recognized from DLD

Recognized already = 1 score

Not recognize = 0 score

1.19) Number of dairy replacement (calf, growing cattle and heifer):

The actual number of dairy replacement.

1.20) Number of dairy (milking dairy and dry dairy): The actual

number of dairy cattle.

1.21) Capability on milk production of dairy: The actual number of

capability on milk production of dairy.

1.22) Purchase price of raw milk: The actual number of purchase price

of raw milk.

1.23) Farm land owning for dairy farming: The actual number of farm

land for dairy farming.

1.24) Size of area for pasture: The actual number of size of area for

pasture.

1.25) Cognizance in operating of dairy cooperative: The researcher use

true score from dairy farmer answered total 24 questions. (Correct = 1, Incorrect = 0)

1.26) Satisfaction to dairy cooperative operation: The researcher use true score from dairy farmer answered total 15 questions. (Very dissatisfied = 1, Somewhat dissatisfied = 2, Somewhat satisfied = 3, Very satisfied = 4)

1.27) Satisfaction in operation of government officers: The researcher use true score from dairy farmer answered total 14 questions. (Very dissatisfied = 1, Somewhat dissatisfied = 2, Somewhat satisfied = 3, Very satisfied = 4)

1.28) Satisfaction in earn a living by dairy farming: The researcher use true score from dairy farmer answered total 10 questions. (Very dissatisfied = 1, Somewhat dissatisfied = 2, Somewhat satisfied = 3, Very satisfied = 4)

1.29) Opinion of the dairy farmer in career succession of their child:

Not take = 0 score

Take succession = 1 score

1.30) Problems and obstacle in dairy farming (physical aspect): The researcher use true score from dairy farmer answered total 7 questions. (Non-problem = 5, Lowest = 4, Low = 3, Medium = 2, High = 1, Highest = 0)

1.31) Problems and obstacle in dairy farming (economic aspect): The researcher use true score from dairy farmer answered total 6 questions. (Non-problem = 5, Lowest = 4, Low = 3, Medium = 2, High = 1, Highest = 0)

1.32) Problems and obstacle in dairy farming (social aspect): The researcher use true score from dairy farmer answered total 6 questions. (Non-problem = 5, Lowest = 4, Low = 3, Medium = 2, High = 1, Highest = 0)

1.33) Problems and obstacle in dairy farming (farm operating aspect): The researcher use true score from dairy farmer answered total 9 questions. (Non-problem = 5, Lowest = 4, Low = 3, Medium = 2, High = 1, Highest = 0)

## 2. Dependent Variable

Factors influencing to dairy cooperative's management process in upper northern Thailand form member that the researcher will consider about factor influencing to dairy farmers' decision to continue doing dairy farming. The researcher determined the rating score such as

Decided to continue doing dairy farming = 1 score

Decided to quit dairy farming = 0 score



### 3.3.1. Rating score of variables and action with data

The researcher determined to rating score of variables such as

1. Dairy farmers' knowledge in dairy farming in upper northern Thailand: The researcher use true score from dairy farmer answered total 24 questions and determine the rating score such as

Correct answer = 1 score

Incorrect answer = 0 score

And manage the level of dairy farmers' knowledge in dairy farming in upper northern Thailand total 3 levels as formula follow such as

$$\text{Class Interval} = \frac{\text{Maximum score} - \text{Minimum score}}{\text{Number of class}}$$

The result when substitute in formula

$$\text{Class Interval} = \frac{24 - 0}{3} = 8.00$$

Divide level of dairy farmers' knowledge in dairy farming in upper northern Thailand total 3 levels including

0.00 – 8.00 score means knowledge in dairy farming in low level.

9.00 – 16.00 score means knowledge in dairy farming in medium level.

17.00- 24.00 score means knowledge in dairy farming in high level.

2. Dairy farmers' practice in dairy farming in upper northern Thailand: total 20 questions and measure by Likert Scale. Divide practice score total 3 levels and determine the rating score of practice such as

Never = 0 score

Sometimes = 1 score

Every time = 2 score

And manage the level of dairy farmers' practice in dairy farming in upper northern Thailand total 3 levels as formula follow such as

$$\text{Class Interval} = \frac{\text{Maximum score} - \text{Minimum score}}{\text{Number of class}}$$



The result when substitute in formula

$$\text{Class Interval} = \frac{2 - 0}{3} = 0.66$$

Divide level of dairy farmers' practice in dairy farming in upper northern Thailand total 3 levels including

0.00 – 0.66 score means practice in dairy farming in low level.

0.67 – 1.33 score means practice in dairy farming in medium level.

1.34 – 2.00 score means practice in dairy farming in high level.

3. Dairy farmers' participation in various activities of dairy cooperative in upper northern Thailand: total 10 questions and measure by Likert Scale. Divide participation score total 3 levels and determine the rating score of participation such as

Never to participate = 0 score

Sometimes to participate = 1 score

Every time to participate = 2 score

And manage the level of dairy farmers' participation in various activities of dairy cooperative in upper northern Thailand total 3 levels as formula follow such as

$$\text{Class Interval} = \frac{\text{Maximum score} - \text{Minimum score}}{\text{Number of class}}$$

The result when substitute in formula

$$\text{Class Interval} = \frac{2 - 1}{3} = 0.66$$

Divide level of dairy farmers' participation in various activities of dairy cooperative in upper northern Thailand total 3 levels including

0.00 – 0.66 score means Participation in the activities of dairy cooperative in low level.

0.67 – 1.33 score means Participation in the activities of dairy cooperative in medium level.

1.34 – 2.00 score means Participation in the activities of dairy cooperative in high level.

4. Dairy farmers' cognizance in operating of dairy cooperative in upper northern Thailand: The researcher use true score from dairy farmer answered total 10 questions and determine the rating score such as

Correct answer = 1 score

Incorrect answer = 0 score

And manage the level cognizance in operating of dairy cooperative in upper northern Thailand total 3 levels as formula follow such as

$$\text{Class Interval} = \frac{\text{Maximum score} - \text{Minimum score}}{\text{Number of class}}$$

The result when substitute in formula

$$\text{Class Interval} = \frac{10 - 0}{3} = 3.33$$

Divide level of dairy farmers' cognizance in operating of dairy cooperative in upper northern Thailand total 3 levels including

0.00 – 3.33 score means cognizance in operating of dairy cooperative in low level.

3.34 – 6.67 score means cognizance in operating of dairy cooperative in medium level.

6.68- 10.00 score means cognizance in operating of dairy cooperative in high level.

5. Dairy farmers' satisfaction with dairy cooperative operation, government and earn a living by dairy farming in upper northern Thailand: total 15 questions, 14 questions and 10 questions respectively and measure by Likert Scale. Divide satisfaction score total 4 levels and determine the rating score of satisfaction such as

The very dissatisfaction = 1 score

The somewhat dissatisfaction = 2 score

The somewhat satisfaction = 3 score

The very satisfaction = 4 score

And manage the level of dairy farmers' satisfaction with dairy cooperative operation, government and earn a living by dairy farming in upper northern Thailand total 4 levels as formula follow such as

$$\text{Class Interval} = \frac{\text{Maximum score} - \text{Minimum score}}{\text{Number of class}}$$

The result when substitute in formula

$$\text{Class Interval} = \frac{4 - 1}{4} = 0.75$$

Divide level of dairy farmers' satisfaction with dairy cooperative operation, government and earn a living by dairy farming in upper northern Thailand total 4 levels including

1.00 – 1.75 score means satisfaction with dairy cooperative operation, government and dairy farming in lowest level.

1.76 – 2.51 score means satisfaction with dairy cooperative operation, government and dairy farming in low level.

2.52 – 3.27 score means satisfaction with dairy cooperative operation, government and dairy farming in high level.

3.28 – 4.00 score means satisfaction with dairy cooperative operation, government and dairy farming in the highest level.

6. Dairy farmers' problems and obstacle on dairy farming in upper northern Thailand such as: Physical problems, Economic problems, Social problems and farm operating total 7 questions, 6 questions, 6 questions and 9 questions respectively measure by Likert Scale. Divide problems and threats score total 5 levels and determine the rating score of problems and obstacle such as

The lowest problems and obstacle = 1 score

The low problems and obstacle = 2 score

The medium problems and obstacle = 3 score

The high problems and obstacle = 4 score

The highest problems and obstacle = 5 score

Divide level of dairy farmers' problems and obstacle on dairy farming in upper northern Thailand such as: Physical problems, Economic problems, Social problems and farm operating problems total 5 levels as formula follow such as

$$\text{Class Interval} = \frac{\text{Maximum score} - \text{Minimum score}}{\text{Number of class}}$$

The result when substitute in formula

$$\text{Class Interval} = \frac{5 - 1}{5} = 0.80$$

Divide level of dairy farmers' problems and obstacle on dairy farming in upper northern Thailand such as: Physical problems, Economic problems, Social problems and farm operating problems in upper northern Thailand total 6 levels including

1.00 – 1.80 score means Dairy farmers' problems and obstacle in lowest level.

1.81 – 2.61 score means Dairy farmers' problems and obstacle in low level.

2.62 – 3.42 score means Dairy farmers' problems and obstacle in medium level.

3.43 – 4.23 score means Dairy farmers' problems and obstacle in high level.

4.24 – 5.00 score means Dairy farmers' problems and obstacle in the highest level.

### 3.4. Research Instrument

#### 1. Quantitative Instrument

1.1. Questionnaire for find the factors influencing to dairy cooperative's management process in upper northern Thailand from member and ask data and measure the sampling dairy farmers' characteristic including Close – ended Question and Open – ended Question that the questionnaire divided 3 part such as

Part 1: Questionnaire including inner factor such as Personal basic factors, Economic factors and Social factors.

Part 2: Questionnaire including dairy farming operation factors such as size of dairy cooperative, style of dairy farming, dairy farming standard recognized from DLD, number of dairy replacement, number of dairy, capability on milk production of dairy, purchase price of raw milk, farm land owning for dairy

farming, size of area for pasture, cognizance in operating of dairy cooperatives, satisfaction with dairy cooperative operation, government and dairy farming and opinion of the dairy farmer in career succession of their child

Part 3: Questionnaire including problems and obstacles in dairy farming (physical, economic, social, farm operating) and requirement from dairy farmers.

## 2. Qualitative Instruments

2.1. Questionnaire for ask data and measure characteristic the sampling dairy farmers which participate in focus group discussion by Open – ended Question that the questionnaire including Personal basic factors, Economic factors , Social factors, dairy farming operation factors and problems and obstacles in dairy farming (physical, economic, social, farm operating) and requirement from dairy farmers.

2.2. In-depth Interview for ask about dairy cooperative's management process in considering to who concerning promotion of dairy farming in upper northern Thailand that the question for interview including dairy cooperative's management process (Planning, Organizing, Directing, Controlling) and suggestion problem and obstacles in occupation development of dairy farmer and dairy cooperative's management process.

2.3. Researcher has duty to moderator in focus group discussion for leading the participants comment as issues that determined.

2.4. Tape recorder has duty to record in participants' conversation during focus group discussion.

## 3.5. Collecting Data

### 1. Collecting Quantitative Data

1.1. Questionnaire: collecting data from member that farmers who continue doing dairy farming which are member of dairy cooperative and farmer who quit dairy farming which used to member of dairy cooperative.

## 2. Collecting Qualitative Data

2.1. Focus Group Discussion: collecting data from member that farmers who continue doing dairy farming which are member of Dairy Cooperative. The researcher observed participates' behavior and using tape-recorder and take note.

2.2. SWOT Analysis: collecting data from organization for analyze the strengths, weakness, opportunity and threat of dairy cooperatives and milk factories in upper northern Thailand.

2.3. In-depth Interview: collecting data from organization for collecting data including dairy cooperative's management process such as planning, organizing, directing and controlling.

### 3.6. Validity and Reliability of instruments

The researcher checked quality of instrument in this study consists of content validity and Reliability such as:

#### 1. Questionnaire

Content Validity: the instrument was given to experts of dairy farming in upper northern Thailand consist of 5 experts such as: dissertation committee total 3 persons, the representative from President of dairy cooperative in upper northern Thailand total 1 person and the representative from Regional Bureau of Animal Health and Sanitation 5<sup>th</sup> total 1 person.

Reliability: The questionnaire checked by Pre - Test with 20 dairy farmers who weren't member of dairy cooperative in upper northern Thailand and calculate by SPSS for window. The researcher estimated this internal consistency for determine the reliability of questionnaire through consider to Cronbach's Alpha Coefficient.

#### 2. Focus Group Discussion

Content Validity: the conversation topic checked by give to experts of dairy farming in upper northern Thailand consist of 5 experts such as: dissertation committee total 3 persons, the representative from President of dairy cooperative in upper northern Thailand total 1 person and the representative from Regional Bureau of Animal Health and Sanitation 5<sup>th</sup> total 1 person.



Content Validity: the researcher check content validity when group discussing and to follow the conversation topic that the researcher determined the objectives of this research.

In Participation Process by using focus group discussion. The researcher focus to researcher ethics such as before the activity starting, the researcher ask for permission to use record instruments such as voice recorder, camera and video recorder with participate in this activity and avoid to using sad question or dangerous question with participate. Moreover, the researcher will not refer to participates' names. (Creswell, 2001)

### **3.7. Data Analysis**

#### **1. Analyzing Quantitative Data**

Analyze the collecting data on computer program: Statistical Package for Social Science, SPSS for window. Statistic analysis consist of

1.1. Descriptive Statistics: Describe the aspects of data as Frequency, Percentage, Mean, Maximum, Minimum and Standard Deviation to describe the personal basic factors, economic factors, social factors and dairy farming operation factors of farmers who continue doing dairy farming in upper northern Thailand.

1.2. Inferential Statistics: finding relations between independent variables and dependent variable by Logistic Regression Analysis.

For logistic regression analysis, it is one technique that dependent variable is a qualitative variable which are dichotomy and binary variables that are represented as 1 and 0. And the independent variables might be either all quantitative or qualitative variables or combination between both variables. In a case of qualitative variables, there must be dummy or indicator variables.

The logistic regression analysis is aimed to; study relations between dependent and independent variables; and to study level of relation of both variables that one of them influences the dependent variables. In this study, the researcher chose the method of Forward: LR which is back stepwise analysis. Independent variables used in this study consist of 28 factors i.e. personal basic factors, economic factors, social factors and dairy farming operation factors. Dependent variable was dairy farmers' decision to continue doing dairy farming.

### Logistic Regression Analysis

The logistic regression model satisfies the constraint ( $0 \leq E \{Y\} \leq 1$ )

$$P(\text{occurrence}) = P(Y = 1) = \frac{1}{1 + e^{-(B_0 + B_1 X_1 + \dots + B_{28} X_{28})}}$$

$$P(Y = 1) = \frac{1}{1 + e^{-w}}$$

$$W = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_{28} X_{28}$$

$$\beta_0, \beta_1, \dots, \beta_{28} = \text{Coefficient of logistic regression}$$

$$\text{Dependent variable (Y)} = \begin{cases} 1 = \text{Farmer's group who decided to continue doing dairy farming.} \\ 0 = \text{Farmer's group who decided to quit dairy farming.} \end{cases}$$

Independent variables

$$X_1 = \text{Age}$$

$$X_2 = \text{Level of education}$$

$$X_3 = \text{Experience of dairy farming}$$

$$X_4 = \text{Knowledge in dairy farming}$$

$$X_5 = \text{Practice in dairy farming}$$

$$X_6 = \text{Number of family members}$$

$$X_7 = \text{Number of labours for dairy farming}$$

$$X_8 = \text{Total outstanding debts}$$

$$X_9 = \text{Occupy in dairy cooperative}$$

$$X_{10} = \text{Occupy in social position}$$

$$X_{11} = \text{Participation in various activities of dairy cooperative}$$

$$X_{12} = \text{Acquire information about dairy farming from various medias}$$

$$X_{13} = \text{Communication with officer concerning dairy farming}$$

$$X_{14} = \text{Dairy farming standard recognized from Livestock Department}$$

$$X_{15} = \text{Number of dairy replacement (calf, growing cattle, heifer)}$$

$X_{16}$	=	Number of dairy (milking dairy and dry dairy)
$X_{17}$	=	Capability on milk production of dairy
$X_{18}$	=	Purchase price of raw milk
$X_{19}$	=	Farm land owning for dairy farming
$X_{20}$	=	Cognizance in operating of dairy cooperative
$X_{21}$	=	Satisfaction to dairy cooperative operation
$X_{22}$	=	Satisfaction in operation of government agency
$X_{23}$	=	Satisfaction in earn a living by dairy farming
$X_{24}$	=	Opinion of the dairy farmer in career succession of their child
$X_{25}$	=	Problems and obstacle in dairy farming (physical aspect)
$X_{26}$	=	Problems and obstacle in dairy farming (economic aspect)
$X_{27}$	=	Problems and obstacle in dairy farming (social aspect)
$X_{28}$	=	Problems and obstacle in dairy farming (farm operating aspect)

Remark: independent variables that are not applied to the assumption test are as follows:

- 1) Age: because most of farmer sample group are male (85.50%)
- 2) Period on membership of dairy cooperative: due to multicollinearity problem
- 3) Size of dairy cooperative: because most of farmer sample group who are members of large dairy cooperatives. (59.20%)
- 4) Style of dairy farming: because most of farmer sample group have tying style of dairy farming (64.00%)
- 5) Size of pasture: due to multicollinearity problem.

Criteria for level of correlation (Bupha, No date: 148) levels of relationships as follows:

$R_{XY}$	Mean
+ 0.70 or more	Relationship in positive and higher ways
+ 0.50 – 0.69	Relationship in positive and high ways
+ 0.30 – 0.49	Relationship in positive and moderate ways
+ 0.10 – 0.29	Relationship in positive and low ways
+ 0.01 – 0.09	Relationship in positive and rare occurrences
0.00	No Relationship
- 0.01 – 0.09	Relationship in negative and rare occurrences

- 0.10 – 0.29 Relationship in negative and low ways
- 0.30 – 0.49 Relationship in negative and moderate ways
- 0.50 – 0.69 Relationship in negative and high ways
- 0.70 or more Relationship in negative and higher ways

The relationship in negative ( - ) indicates a relationship in the opposite direction.

## 2. Analyzing Qualitative Data

The researcher used the content analysis by classifying of focus group discussion data and in-depth interview data for link with concept, theory and associate research, for explain to factors influences dairy cooperative's management process, for build up and develop the dairy cooperative's management process contributing to occupation development of dairy farmers in upper northern Thailand from stakeholders' participation. Moreover, explain the problem and obstacle in various aspect of dairy farmers and dairy cooperatives in upper northern Thailand.