Factors Affecting the Decision to Raise Beef Cattle of Farmers in Thailand

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Currently, the trend of beef cattle raising in Thailand is decreasing dramatically, resulting from the insufficiency of supply for demand in meat markets. This study aimed to examine some characteristics of beef cattle raising farmers and investigate key factors affecting the decision of farmers to raise beef cattle in Thailand. A purposive sample was applied to gathering data from 325 farmers who raised five or more beef cows within 25 provinces of Thailand. Questionnaires, comprising of two parts: 1) farmers characteristics, and 2) factors affecting to decision-making by four factors: physical, economic, social culture, and promotion, were used to gather data in the study. Data then were analysed by using descriptive statistics. Moreover, an independent t-test was applied to investigate the factors affecting farmers making a decision. The results revealed that, on average, the farmers were 52 years old, graduated from grade six, had 21 years of cattle raising experience, and owned 112 Rai of land size. In terms of factors, the result demonstrated that farmers paid less attention to physical factors. In contrast, they focused on economic factors, and promotion factors in moderate levels, and high level in socio-cultural factor. Regarding the investigation on factors affecting the decision of beef cattle farmers in Thailand, the result exposed that education, economic, and social-cultural factors significantly affected farmers' decision on beef cattle raising in Thailand. This study provides information to support that the government should implement a policy to encourage farmers, particularly, factors concerning with age, education, economic and social culture of beef cattle raising farmers in order to raise beef cattle in order to meet market demand.

Keywords: factors affecting, farmers' decision, beef cattle, Thailand

Introduction

Beef cattle markets in the world have increased demand for beef at 0.10 percent per year. The countries with the highest demand for beef are the United States, followed by Brazil and the European Union. The demand for beef consumption in 2015 was 56.47 million ton,decreasing from 57.71 million ton in 2014 and India was the highest export volume of beef cattle, followed by

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Brazil and Australia. In 2015, an export volume of beef cattle was 9.60 million ton decreasing at 3.89% from the previous year (Office of agricultural economics, 2015), compared to the volume of consumption, the production volume was different. There is still a large demand for beef in world markets. The overall situation of beef production in the world declined by 0.7% (Global meat market outlook, 2015) resulting in inadequate beef production.

In the past of Thailand, cattle were used in an agricultural sector. Since 1992, farmers had begun to use machinery instead of labour from cattle. For this reason, the number of cattle decreased and began to feed cattle for sale and consumers. The demand for beef cattle is growing in markets and the prices are also increasing. Farmers were able to obtain higher economic returns as an incentive for a farmer to feed cattle for meat as a main goal. (Kasetsart University Research and Development Institute, 2015). At present, cattle farming is becoming a major occupation of farmers. There are 764,668 beef cattle farmers in Thailand, with 21,919, and a total of 4,407,108 cattle, accounting for 1.09 million cattle. However, when considering statistic figures, the number of cattle from 2010-2015 likely to decline continuously, which opposed to the consumption and export demands of beef.

The volume of imported beef from overseas was 8,875 ton in 2015. In addition, beef production decrease continuously to 1.06 million in 2013, to 1.04 million in 2014, and to only 0.9 million in 20152, which is not enough to meet with domestic demands. Thailand relied on beef imports. In 2013, beef was imported 6,228 tons increased to 7,000 tons in 2014 (Kasetsart University Research and Development Institute, 2015). The domestic demands for imported beef is still higher than that of domestic beef (Department of livestock development, 2015). From the situation of beef cattle in the world markets, there is still a shortage of beef cattle. In Thailand, the production of beef is not adequate to meet the domestic demands as well as the export demands. Therefore, this study aimed to investigate the factors affecting the decision of beef cattle farmers of Thailand. The results from the study were beneficial for policy makers, or relevant agencies to promote beef cattle. Moreover, this study can be applied to set up a strategy to increase the amount of beef cattle raising in order to provide adequate beef production to the meat demands for both domestic and export.

Materials and methods

Sample size
The population used in this study was farmers who had five cattle or more in the cattle cropland area of Thailand by collecting data from 25 provinces. To

determine the sample size, Taro Yamane's formula was employed as presented below (Yamane, 1970).

$$n = \frac{N}{1+Ne^2}$$

n   =   Calculated Sample Size
N   =   Population known
e   =   Sampling error at statistical significance level 0.05.
n   =   325 Famers

In Figure 1, in 2015, there were totally 764,668 households of beef farmers, staying mostly in Zone 3, around 266,071 households (34.80%). This was followed by Zone 4, around 214,774 households (28.09%) and Zone 8 approximately 74,306 households (9.72%). Regarding the number of cattle, the total cattle was around 4,407,108. In the Zone 3, was the highest number of beef cattle at 1,204,880 (27.34%), followed by zone 4 900,061 (20.42%), respectively.
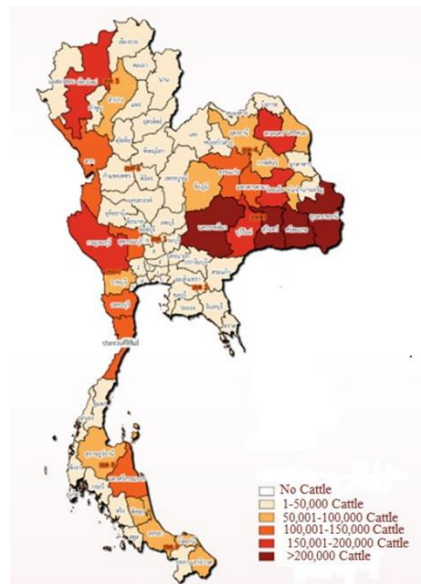

Data collection and data analysis

Personal factors of farmers in this study consisted of age, education, experience, training, culture pattern, and farming areas. Pearson's chi-square ($\chi2$) was used to investigate the relation among physical, economic, society and culture, and promotion factors. Samples were collected from four regions of Thailand consisted of five provinces from the northern region, eleven provinces

from the central region, six provinces from the north-eastern region, and three provinces from the southern region.

Finally, the total of 325 beef cattle farmers from 25 provinces in Thailand was chosen. Questionnaires including five parts; 1) personal factors 2) physical factors 3) economic factors 4) social and cultural factors and 5) promotion factors, were used as research instrument. The alpha coefficients were analyzed reliability of the questionnaire (Cronbach, 1970 in Jantasuwan S. and Buatuan S., 1994). The alpha value of 0.559 was acceptable. Interviews were conducted with 30 cattle farmers who were not in the sample group.

Data were analyzed by using descriptive statistics, namely frequency, percentage, arithmetic mean, standard deviation, and t-test at 95% confidence level ($p < 0.05$). In regard to independent variable of farmer's decision, farmers answered 1 if they want to raise beef cattle continuously, and answered 0 if they do not want to raise beef cattle. Figure 2 shows the conceptual framework of this study.
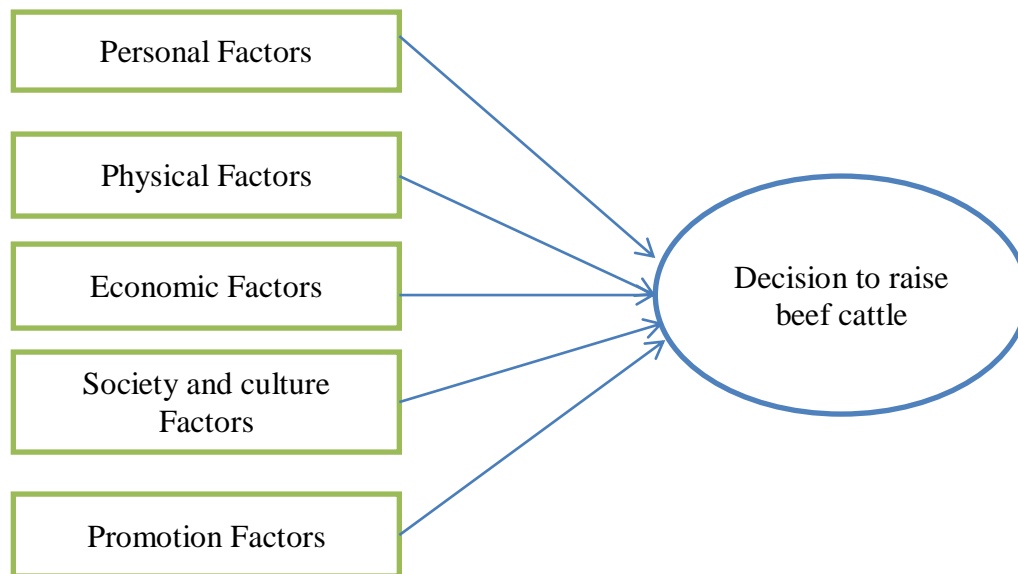
Fig. 2 Conceptual framework

Results

Characteristics of farmers raising beef cattle

Table 1 shows the characteristics and general characteristics of 325 sample farmers. The majority of the sample farmers were 50 years old and over (55.4%), graduated from primary level (75.4%), had average cattle experience

less than 10 years (73.8%), have participated in beef cattle training programs (62.5%), worked as beef cattle farmers from the beginning (90.2%), and occupied areas of 20 hectares or more (79.4%).

Table 1. Statistical frequency of personal factors (N = 325)

Item	Test	Frequency	Percentage
Age	50 years and upper	180	55.4
	50 years and lower	145	44.6
Education	Upper primary school	80	24.6
	primary school	245	75.4
Experience	10 years and upper	85	82.8
	10 years and lower	240	17.8
Training	never	122	37.5
	pass training	203	62.5
Type of feed	Feed since begin	293	90.2
	Cancel feed but comeback new feed	32	9.8
Land size	20 Rai and upper	258	79.4
	Lower than 20 Rai	67	20.6

The importance of physical, economic, society-culture factors influenced farmer's to raise beef cattle.

Figure 3. shows the average of four factors: physical, economic, social, cultural, and promotion influenced farmers to raise beef cattle. Society-cultural factors is most important factors for farmer to raise beef cattle such as passion for e farm beef cattle, followed by economic factors such as price of beef cattle, promotion factors such as housing fund and the physical factors such as farm system.
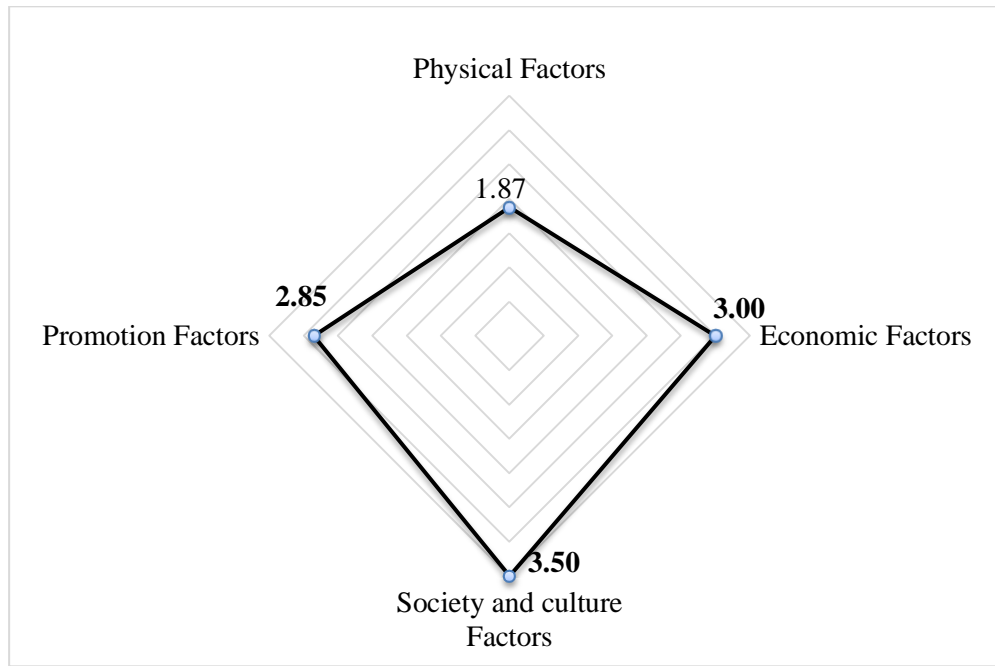
Figure. **3**. The importance of physical, economic, social and cultural factors influenced farmers to raise beef cattle.

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Table 2. presents the average age of the two farmers groups that decided to raise and not decide to raise beef cattle. The result shows that education, raising experience, economic factors, and society and culture factors were significant between the two groups.

An average experience of the two groups was decided not to continue to raise beef cattle. The experience of cattle farming was conducted at 16 years and 22 years, respectively. While the study of Haitook *et al*. (2013) pointed out that the sustainability of beef cattle farming was caused by the community as a basis. Average farming area of the decided not to raise group, and the decision to raise cattle group was 81 Rai, and 117 Rai, respectively. Based on the statistical significance, the physical factors did not affect the decision to raise beef. Economic factors and society-cultural factors also influenced beef cattle decision making.

Education level of farmers of the both groups significantly affected cattle decision making. The farmers decided to raise cattle. The level of education

was higher than the non-culture group at 0.05 level Mendis I.U. and Udomsade J. (2005), cultivation. While this result was consistent with the studies of Manyseng and Sirisunyaluck (2011), Egge *et.al.* (2012). The study revealed that the group that studied for 5 years of education decided not to raise, while the group that studied for 6 years decision to raise cattle.

Regarding experience in farming, the both groups significantly affected cattle decision making. The farmers decided to raise cattle. There was no significant difference at the 0.05 level. This finding was consistent with the studies of Prapatigul *et.al.* (2011), Haitook *et.al.* (2013), Krajangchom *et.al.* (2015), Varma (2017). The group that had 16 years of farming experience decided not to raise their cattle, but the group with 22 years farming experience decision to raise cattle.

In terms of economic factors, farmers of the both groups significantly affected cattle decision making. Economic factors revealed at a high level. The farmers decided to raise, and not to rear at 0.05 level which consistent with the research of Kongthawee and Kiatsuranont (2016), Prapatigul *et al.* (2011). Economic factors were of great importance to the whole group.

For society and culture factors, farmers of the both groups significantly influenced beef cattle production. The society-cultural factors were at the highest level. The farmers decided to raise and high level for the group that decided not to raise at 0.05 level of significant. This finding agreed with the studies of Varma (2017), Kongthawee and Kiatsuranont (2016). Social factor culture was most important factor to the group that decides to raise and a very high level for the group that decided not to raise.

Table 2. Factors affecting farmer's decision to raise beef cattle

Item	Test	N	Mean	SD	t	Sig.
Age	Decision not to raise	45	51.04	11.364	-	0.481
		280	52.25	10.519	0.706	
	Decision to raise					
Education	Decision not to raise	45	5.40	2.189	-	0.023*
		280	6.27	3.218	1.751	
	Decision to raise					
Experience	Decision not to raise	45	16.09	11.123	-	0.035*
		280	21.55	12.612	2.740	
	Decision to raise					
Training	Decision not to raise	45	1.24	0.435	-	0.051
		280	1.40	0.490	1.960	
	Decision to raise					

Table 2. (Continued)

Item	Test	N	Mean	SD	t	Sig.
Type of feed	Decision not to raise	45	1.11	0.318	0.355	0.723
		280	1.09	0.239		
	Decision to raise					
Land of feed	Decision not to raise	45	80.83	112.018	-	0.118
		280	116.85	147.312	1.568	
	Decision to raise					
Physical Factors	Decision not to raise	45	1.80	0.529	-	0.40
		280	1.88	0.630	0.843	
	Decision to raise					
Economic Factors	Decision not to raise	45	2.78	0.717	-	0.024*
		280	3.04	0.714	2.269	
	Decision to raise					
Society and culture Factors	Decision not to raise	45	2.97	1.012	-	0.001**
		280	3.58	1.205	3.245	
	Decision to raise					
Promotion Factors	Decision not to raise	45	2.62	0.930	1.736	0.084
		280	2.89	0.956		
	Decision to raise					

*$p < 0.05$

Conclusion

Beef cattle raising continued to attract the attention of farmers, while, the demand for beef in the market was likely to increase. Most of the farmers were graduated from elementary level which is a limitation in the perception of new knowledge and technology related to beef cattle raising. The study aimed to investigate factor influencing farmer's decision to raise beef cattle. The results of the study were as follows: influence of receiving information on hybrid cattle breeding and the level of crossbreeding problems. In terms of experience, most farmers had experience less than 10 years in beef cattle. Experience is vital to the success of beef cattle raising. The results also revealed that the age of cattle raising farmers, and economic factors is related to the decision of professional development of beef cattle farmers. Society-culture contexts were also important; especially the farmers had passion for beef cattle profession and the succession of beef cattle from their ancestors. Therefore, the current generation of farmers should create a positive attitude towards the beef business to maintain the beef cattle business and increase the potential of cattle production in Thailand.

The results of the study exhibited that four factors influenced the decision of beef cattle in Thailand, namely farmers; education, experience in beef cattle, economy, as well as society-culture, which the government should launch a

policy to support all aforementioned aspects of the farmers to gain confidence of farmers and investors. In order to increase the potential of beef production in Thailand, markets must be effectively competed.

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