Development of Cocoa Processed Food Products to Meet Consumer Demand

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Abstract

The objectives of this study were 1) to study the level of importance of factors affecting the development of cocoa processed food products to meet the consumer demand, 2) to study the marketing strategies, financial readiness, entrepreneurship, and production management that influence the development of cocoa processed food products to meet the consumer demand, and 3) to propose guidelines for the development of cocoa processed food products to meet the consumer demand. The research findings showed that 1) the development of cocoa processed food products, production management, financial readiness, marketing strategies were very important factors, while the entrepreneurship was of moderate importance, 2) the factors influencing the development of cocoa processed food products to meet consumer demands were production management, entrepreneurship, marketing strategy, and financial readiness, respectively, and 3) the guidelines for the development of cocoa processed food products follow the DPFEM guidelines starting with the product management from building a network, building the links of entrepreneurs to strengthen marketing and develop cocoa quality to meet international standards in order to increase product value to be able to compete effectively in trade.

Keywords: Product development, Cocoa processed food, Consumer demand

Background and Significance of Problems

Regarding the situation of the world cocoa production and market during the years 2014-2019, an increase was 2.96% per year. The number 1 country producer of the world is Cote d'Ivoire, followed by Ghana, Ecuador, Nigeria, Cameroon and Indonesia. The proportion of cocoa production divided by regions of the world revealed that Asia and Oceania had the production of 75%, followed by Africa (18%) and Americas (7%). ASEAN countries that can produce cocoa after Indonesia are the Philippines and Malaysia. Europe is the large market of the world with the highest demand of cocoa beans (46%), followed by the countries in North America (25%), the countries in Asia-Oceania (15%) and the countries in South America (9%). The production is to supply the process and create the added value for the products in the chocolate confectionery industry, food, beverage, cosmetic and pharmaceutical industries, etc. (Department of Industrial Promotion (2016)).

Ministry of Agriculture and Cooperatives has the policy to promote the cultivation of other crops instead of the rubber plantation for farmers to earn more and reduce the risk of rubber planting that fluctuates and the price has dropped heavily. As a result, many parties began to accelerate growing more "cocoa". Cocoa began to have good price with higher profits, approximately 45,000 baht per rai. Currently, Thailand requires at least 40,000 tons of dried cocoa beans per year. However, as the domestic production is not more than 200 tons per year, it is necessary to import from abroad at an average price of 60-120 baht per kg. Cocoa is the crop with high market demand. It can give produce all year round making the farmers earn more. In the future, farmers tend to turn to cocoa cultivation and will expand the planting area more as well. Therefore, it is necessary to create knowledge and understanding among farmers. Before deciding to plant cocoa, the suitability of the area should be taken

into account. Choosing a breed that is suitable for the area is important because cocoa varieties suitable for Thailand are limited. The farmers must have knowledge and understanding of cocoa care methods, surveillance for diseases and pests during hot and humid weather in order to produce quality products that meet the market demands. Especially the market, the farmers must consider that there will be certain buying market. As cocoa is a plant that is marketed only in the food and beverage industry, if farmers select the breed which is not suitable, lack of knowledge of cultivation, look at the traits of the breed or not study the market well enough, it will result in the loss of opportunities and income from cocoa cultivation. The farmers may also be deceived to buy a variety to cultivate (Surapong Amphanwong. 2016).

The cocoa food processing industry in Thailand still has many limitations and obstacles that are waiting to be resolved with serious support from both the government and private sectors whether they are issues of raw materials, processing, transportation and marketing problems, etc., The government's attitude in solving such problems in the past had different characteristics because the relevant government agencies still operated at redundant, lack of sufficient linkage and coordination among one another (Coordination Failure). The different procedures and practices were defined by virtue of existing laws or regulations (Fragmented Sectoral Policies) resulting in the lack of policies and common directions for solving problems in a systematic and comprehensive manner or in the same direction. Such issues cannot be beneficial to the global competition and incur huge costs in doing business. In food trade, a matter of quality and safety is very involved. If Thailand does not adjust to keep up with the changes in the global trend, it will cause damage in trade not keeping up with competitors. In addition, regarding the consumption trends, today's people focus on health which is to reduce sugar and fat causing the expansion of natural plant food. Made from 100% cocoa, "Chocolate" has to be adjusted according to the needs of consumers.

From such problem condition, the researchers were interested in studying the development of processed food products from cocoa to meet the needs of consumers and to improve products to meet consumer demand as well as creating and developing new products into the market more and in order for the organizations to be able to continue the business operation sustainably.

Research Methodology

The researchers used a combination of quantitative research and qualitative research with a focus on studying and reviewing the literature on the development of cocoa processed food products to meet the consumer demand.

Regarding the quantitative research, the sample group used in the research consisted of business owners and employees of beverage shops located in Bangkok area. The sample size was calculated using multivariate statistical analysis technique and structural equation model. It was proposed that the sample should be set approximately 20 times the observed variable. According to the research conceptual framework of the researchers, 18 variables were defined. Therefore, the sample size of 360 people was calculated to be consistent with the analysis technique and the data accuracy. The data collection was based on probability theory using stratified sampling method by calculating proportionally according to the percentage of the sample group. The research tool was 5-scale questionnaire with 90 items. The tool quality was examined by finding the IOC value. It was found that the IOC value was entirely .96 and the confidence value was entirely .962. The data was analyzed by using descriptive statistics and the structural equation.

Regarding the qualitative research, the data was collected through in-depth interviews with the key informants divided into 1) group of the executives and government officials, 2) the private sector agencies, Cocoa Association of Thailand, the owners of the companies that process cocoa, and 3) the leader or president of cocoa production. All of the three groups involved in food products from cocoa processing. The basic criteria were defined as those who had knowledge and understanding of cocoa processed food products for at least 3 years and agreed to participate in the interview. Specific sample selection methods were used for 18 participants to verify the accuracy and reliability of the data obtained from in-depth interviews. The researchers used the triangulation of data to consider the consistency and difference of information from time sources, place sources, and personal sources.

From the research objectives, the researchers have studied the concepts, theories and related researches to consider constructing the model of relationship among variables, namely marketing strategies, financial readiness, entrepreneurship, production management, and the development of cocoa processed food products to meet the consumer demand. The data of the respondents was analyzed using the descriptive statistics to determine the frequency, percentage, mean, standard deviation, and coefficient of variation. The inferential statistics were used in the analysis of structural equation models to test the relationship between latent variables and observable variables and the relationship between independent variables and dependent variables.

Research findings

The comparative analysis and sequence of all latent variables from Table 1 could be sorted as follows. The development of cocoa processed food products had the mean of 3.71, ranked first, followed by production management with the mean of 3.47. The third was financial readiness with the mean of 3.40. The fourth was entrepreneurship with the mean of 3.37 while the fifth was marketing strategy with the mean of 3.30.

Table *1* Levels of significance of the factors

Total of latent variables (TOT)	Quantity	Mean	St. Dev.	Levels of significance	Rank
Marketing strategies	360	3.30	0.70	High	*5*
Financial readiness	360	3.40	0.73	High	3
Entrepreneurship	360	3.37	0.84	High	4
Production management	360	3.47	0.77	High	2
Development of cocoa processed food products	360	3.71	0.62	High	1

The correlation and influence from the collaborative data analysis were shown to examine the coherence of the model with the empirical data after the model final modification having the results as shown in Figure 1.
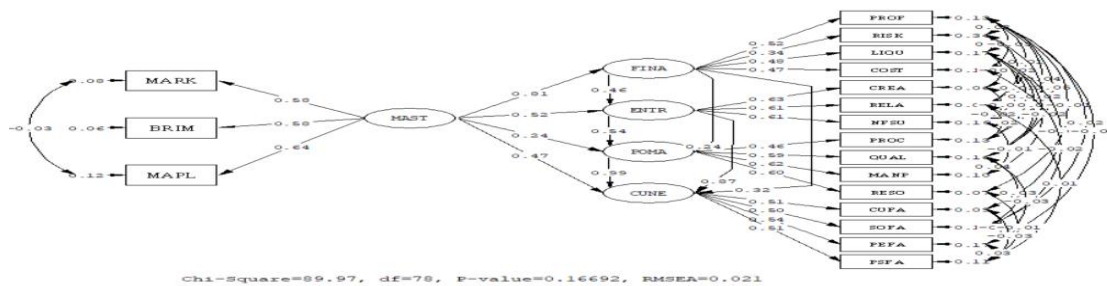

Figure 1 Analysis to verify the coherence of the model with the empirical data

Table 2 Results of model comparison based on the research hypothesis

item	statistical value	hypothetical model	alternative model
1. Chi-square (χ^2)	*Low to 0	497.65	89.97
	*equal to df	125	78
Relative Chi-square	division $(\chi^2/df) < 2.00$	3.98	1.15
2. GFI	> 0.90	0.87	0.97
3. agfi	> 0.90	0.82	0.94
4. rmr	near 0.00	0.017	0.007
5. rmsea	< 0.05	0.091	0.021
6. cfi	*0.00-1.00	0.98	1.00
7. cn	> 200	114.48	437.54

Table 3 Analysis Result of Total Influence (direct-indirect) and statistical significance presentation

Dependent variables	Relation	Independent variables				
		MAST	FINA	ENTR	POMA	CUNE
FINA	DE	0.81**	N/A	N/A	N/A	N/A
	IE	N/A	N/A	N/A	N/A	N/A
	TE	0.81**	N/A	N/A	N/A	N/A
ENTR	DE	0.52**	0.46**	N/A	N/A	N/A
	IE	0.38**	N/A	N/A	N/A	N/A
	TE	0.90**	0.46**	N/A	N/A	N/A
POMA	DE	0.24**	0.24**	0.54**	N/A	N/A
	IE	0.68**	0.25**	N/A	N/A	N/A
	TE	0.92**	0.46**	0.54**	N/A	N/A
CUNE	DE	0.47*	0.32*	0.87*	0.99**	N/A
	IE	0.39**	0.08	0.13*	N/A	N/A
	TE	0.86**	0.40**	1.00*	0.99**	N/A

Chi-Square= 89.97, df=78, p-value = 0.167, GFI=0.97, AGFI=0.94, RMR=0.007, RMSEA=0.021, CFI=1.00, CN=437.54

From Table 3, the relationship path can be described as Marketing Strategy (MAST) directly affecting the financial readiness (FINA) the most for 0.81. This was followed by directly affecting Entrepreneurship (ENTR), Development of cocoa processed food products (CUNE) and Production Management (POMA) equaling to 0.52, 0.47 and 0.24, respectively. It indirectly influenced Production Management (POMA), Development of cocoa processed food products (CUNE) and Entrepreneurship (ENTR) equaling to 0.68, 0.39 and 0.38, respectively.

Financial readiness (FINA) directly affected entrepreneurship (ENTR) the most at 0.46, followed by directly affecting the development of cocoa processed food products (CUNE) and production management (POMA) for 0.32 and 0.24, respectively. It indirectly affected Production Management (POMA) for 0.25 but did not indirectly affect development of cocoa processed food products (CUNE) for 0.08.

Entrepreneurship (ENTR) directly affected the development of cocoa processed food products (CUNE) the most for 0.87. This was followed by directly affecting Production Management (POMA) equaling to 0.54. It indirectly influenced the development of cocoa processed food products (CUNE) for 0.13. It was also found that Production Management (POMA) directly affected the development of cocoa processed food products (CUNE) for 0.99.

It was also found that structural equation model of financial readiness, entrepreneurship, production management, and the development of cocoa processed food products had R^2 values of 0.66, 0.88, 0.96 and 0.84, respectively. It meant the structural equation model which was the model based on the hypotheses could describe the vitality of the financial readiness, entrepreneurship, production management, and the development of cocoa processed food products by 66%, 88, 96 and 84 percent, respectively.

The overall image analysis revealed that the harmonization index was more consistent with the empirical data. It met the benchmarks demonstrating very good level of conformity of the standardized models and empirical data.

Table 4 Results of hypothesis test

Research hypothesis	Path coefficient	t statistics	Results
1st hypothesis: Marketing Strategy (MAST), Financial Readiness (FINA), Entrepreneurship (ENTR), and Production Management (POMA) affected the development of cocoa processed food products (CUNE).			
1.1 MAST --> CUNE	0.47**	3.41	Supportive
1.2 FINA --> CUNE	0.32*	2.23	Supportive
1.3 ENTR --> CUNE	0.87**	2.88	Supportive
1.4 POMA --> CUNE	0.99**	2.56	Supportive
2nd hypothesis: Marketing Strategy (MAST), Financial Readiness (FINA), and Entrepreneurship (ENTR) affected Production Management (POMA).			
2.1 MAST --> POMA	0.24**	3.45	Supportive
2.2 FINA --> POMA	0.24**	3.01	Supportive
2.3 ENTR --> POMA	0.54**	5.11	Supportive
3rd hypothesis: Marketing Strategy (MAST) and Financial Readiness (FINA) affected Entrepreneurship (ENTR).			

3.1 MAST --> ENTR	0.52**	8.08	Supportive
3.2 FINA --> ENTR	0.46**	6.75	Supportive
4th hypothesis: Marketing Strategy (MAST) affected Financial Readiness (FINA)			
4.1 MAST --> FINA	0.81**	14.60	Supportive

From Table *4*, it could be explained based on the results of research hypothesis test as follows:

1st hypothesis: Marketing Strategy (MAST), Financial Readiness (FINA), Entrepreneurship (ENTR), and Production Management (POMA) affected the development of cocoa processed food products (CUNE). It was found that the Marketing Strategy directly affected the Financial Readiness with the path coefficient equaling to 0.47. The t statistics was 3.41 supporting the hypothesis with the statistical significance at 0.01 level. It could be interpreted that the studied variables had the relationship in the same direction. When Marketing Strategy increased, the development of cocoa processed food products increased as well.

The Financial Readiness directly affected the development of cocoa processed food products with the path coefficient equaling to 0.32. The t statistics was 2.23 supporting the hypothesis with the statistical significance at 0.05 level. It could be interpreted that the studied variables had the relationship in the same direction. When Financial Readiness increased, the development of cocoa processed food products increased as well.

The Entrepreneurship directly affected the development of cocoa processed food products with the path coefficient equaling to 0.87. The t statistics was 2.88 supporting the hypothesis with the statistical significance at 0.01 level. It could be interpreted that the studied variables had the relationship in the same direction. When Entrepreneurship increased, the development of cocoa processed food products increased as well. The Production Management directly affected the development of cocoa processed food products with the path coefficient equaling to 0.99. The t statistics was 2.56 supporting the hypothesis with the statistical significance at 0.01 level. It could be interpreted that the studied variables had the relationship in the same direction. When Production Management increased, the development of cocoa processed food products increased as well.

2nd hypothesis: Marketing Strategy (MAST), Financial Readiness (FINA), and Entrepreneurship (ENTR) affected Production Management (POMA) affected the Production Management (POMA). From the results of hypothesis test, it was found that Marketing Strategy directly affected the Production Management with the path coefficient equaling to 0.24. The t statistics was 3.45 supporting the hypothesis with the statistical significance at 0.01 level. It could be interpreted that the studied variables had the relationship in the same direction. When Marketing Strategy increased, the Production Management increased as well.

Financial Readiness directly affected the Production Management with the path coefficient equaling to 0.24. The t statistics was 3.01 supporting the hypothesis with the statistical significance at 0.01 level. It could be interpreted that the studied variables had the relationship in the same direction. When Financial Readiness increased, the Production Management increased as well. The Entrepreneurship directly affected the Production Management with the path coefficient equaling to 0.54. The t statistics was 5.11 supporting the hypothesis with the statistical significance at 0.01 level. It could be interpreted that the studied variables had the relationship in the same direction. When Entrepreneurship increased, the Production Management increased as well.

3rd hypothesis: Marketing Strategy (MAST) and Financial Readiness (FINA) affected the Entrepreneurship (ENTR). From the results of hypothesis test, it was found that Marketing Strategy directly affected the Entrepreneurship with the path coefficient equaling to 0.52. The t statistics was 8.08 supporting the hypothesis with the statistical significance at 0.01 level. It could be interpreted that the studied variables had the relationship in the same direction. When Marketing Strategy increased, the Entrepreneurship increased as well. Financial Readiness directly affected the Entrepreneurship with the path coefficient equaling to 0.46. The t statistics was 6.75 supporting the hypothesis with the statistical significance at 0.01 level. It could be interpreted that the studied variables had the relationship in the same direction. When Financial Readiness increased, the Entrepreneurship increased as well.

4ᵗʰ hypothesis: Marketing Strategy (MAST) affected the Financial Readiness (FINA). From the results of hypothesis test, it was found that Marketing Strategy directly affected the Financial Readiness with the statistical significance at 0.81 level. The t statistics was 14.60 supporting the hypothesis with the statistical significance at 0.01 level. It could be interpreted that the studied variables had the relationship in the same direction. When Marketing Strategy increased, the Financial Readiness increased as well.

Furthermore, the research results revealed that the cocoa cultivation should be promoted from seeds suitable for the Thai landscape. It should be made in contract farming form. The government should support to develop the quality of cocoa varieties. As the products are the core of business operation, they must meet quality and standards to promote the sales of cocoa products at reasonable prices. The emphasis should be put on being unique in developing new things to always respond the consumer demand.

Figure 2 Approaches for the development of cocoa processed food products to meet the consumer demand

Conclusion and Discussion of Results

Marketing strategy has positive influence on the development of cocoa processed food products to meet the consumer demand. As marketing is the demand to sell and to increase the sales volume, the planning process and practice based on concepts, pricing, promotion, and distribution are required. This is consistent with Drucker, Peter (*2006)* and services to create an exchange that can meet individual needs and achieve organizational objectives. According to Oliver (*201)5*, marketing is the result of activities related to an organization's efforts to achieve its objectives based on anticipation customer demand including bringing products or services from the manufacturer to the customer. It is consistent with Kotler, Lane, Brady, Goodman, & Hansen (*2019)* stating that marketing is human activity that is undertaken in order to meet various satisfactions and needs through the exchange process. Marketing planning for cocoa processed food products can be a framework for implementing the organization's objectives and direction under the constraints of the external environment. The information technology is applied to create, maintain, develop, increase capacity and competitive advantages in the business of cocoa processed food products.

Financial Readiness has positive influence on the development of cocoa processed food products to meet the consumer demand. The business operation requires the planning and decision on investment in current assets as well as providing the sources of funds to invest in current assets. This causes the management to understand about working capital. It is consistent with Pannupa Thuwanimitkul (2015) stating that Profitability is a measure of the efficiency in the management of the executives on the profits and losses. This corresponds to Seru, 2014, reflecting the efficiency of cost control and profitability from sales. Determining the meaning of profits could reasonably be anticipated over a period of time in the future. Because they cannot tell the future in advance, the past profits and current profits are often used as the guidelines. These figures will be used as the base for rational forecasting of future profits.

Entrepreneurship has positive influence on the development of cocoa processed food products to meet the consumer demand. Because the entrepreneurs are the ones who cause various activities to make the most of the available resources, the existing inputs will be taken and transformed into products or services. This is in accordance with Henrekson, Magnus, and Tino (2018) defining what to produce, how to produce, for whom to produce, who to produce and control. It is responsible for planning, decision making, and controlling the business to run efficiently and earning returns as profits corresponding to Block, Joern, Christian, and Mirjam (2017). Entrepreneurs are individuals who start new businesses from the pursuit of opportunities and

possibilities. Various resources are used for profits and economic growth by being willing to face risks and uncertainties. It is in accordance with Dvouletý, 2018, the company's founder is the owner and partner of the business to accept the risks that may arise in the hope of making profits, being committed to success, planning, dealing, managing people, organizations and resources, determining visions, policies, strategies to drive business development to achieve success as expected appropriate to the environment and society.

Production Management has positive influence on the development of cocoa processed food products to meet the consumer demand. It is an activity related to the production of goods and services through the transformation process from inputs to convert to outputs or into operational design and production system improvements. In other words, it is management using quantitative techniques to improve productivity and optimize the production of goods or services. Many organizations, especially manufacturers, use operational management techniques. This is in line with Vathoopan, Brandenbourder& Zoitl (2016) discussing the production management. It is something that the production executives have to decide. It agreed with (Tortorella & Fogliatto, 2013) production management methods and the use of appropriate tools to control and manage To assist management in the management of various information so that production management meets its intended objectives, this control and management may mean: Monitoring of resources, costs, quality of output, budget expenditure and including receiving errors and correcting them in order to adjust the plan accordingly.

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