

Capstone Project

Business Proposal



Rice Trading Innovation

20th March 2017

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Executive Summary

This is a project about rice innovation. Considering that rice in these days becomes less popular than before, this is the time to create new innovation to promote rice up to the same level with other grain products. This problem is not only affecting the farmers' income but also causing a drop in economy of agricultural countries, especially, Thailand. Thailand has been world's top rice exporter, but since the price has declined due to the decreasing number of rice consumer, Thailand gains less profits. According to the research, rice has been developed throughout the world. Thailand has developed clearly outstanding products and willing to create more innovative rice idea in the future. As it has several types and forms, more possible variation can be created. This project researches how rice can be innovated through global innovation. It accumulates ideas in general and analyzes the rice market throughout the world. From the research, this project concludes the operational plan. It is resulted that Rice Flour Bread and Rice Facial Soap are the products that can suit the gap in the world market perfectly. This project analyzes benefits, possibilities, and plans of these innovation.

Objective

In the present, there are less people consuming rice, while the number of people consuming bread keeps increasing every day. Amount of people consuming wheat-based products such as noodles and bread has been rising significantly over 10 years. Rabobank consumer foods analyst, Haris Rahmanto stated that, "The growing middle class and changing lifestyles provide a big opportunity for bakery companies, as these consumers have strong buying power, while they embrace modern, Western lifestyles." Moreover, according to the Boston Consulting Group, more than 9 million people enter the middle class every year (1). Since 2008, wheat demand has increased to approximately twice the rate of rice consumption in Asia. Kim Geon-Hui, South Korean working mother told that, "I am very busy in the morning because I have to drop my children off at kindergarten. So, I have bread for breakfast. And I often meet up with my friends at a cafe and enjoy bread with coffee over the weekends" (2) This demonstrates how wheat-products become popular throughout the world instead of rice.

Global economic slowdown also being another factor leads to a lower purchasing power of Thailand's main rice buyers. This reduced the export price of Thai rice to the lowest in ten years. Mr Charoen Laothammathat, president of Thai Rice Exporters Association suggested that this situation caused the domestic prices of Hom Mali rice dropping to 8,000 baht/tonne. While the FOB export prices of Hom Mali rice and parboiled rice are dropped to US\$700-720/tonne and US\$350/tonne respectively. Thai rice stock is loaded with 4-5 million tonnes of rice this year (3).

In 2012, there was a sharp drop in the amount of Thai rice exported. Exports dropped from 10,671.19 tonnes in 2011 down to 6,704.3 tonnes. This can be considered the biggest drop in Thai rice export since 1961, actually the biggest drop in the history (4).

Background

Background of the product

Rice is a grain that contains helpful nutrients. It lowers risks of developing several diseases, such as Parkinson's and Alzheimer's disease (5).

Types of rice

1. Long Grain Rice

Long-grain rice is four or five times as long as its wide which varies between 7 to 9 millimeters.

It is fluffy and separates after cooking. The grains have a firm and dry texture.

2. Medium Grain Rice

Medium-grain rice is three times as long as its wide, about two millimeters. It has moist, tender, chewy textures and stick together after being cooked.

3. Short Grain Rice

Short-grain rice has less than twice of length compared to its wide. It has fat, round grains with high starch (6). After it is cooked, it will be soft and tender, and sticks together.

Forms of rice

1. Brown Rice

It is a rice with husk removed from the grain. It has only bran and germ layers. This grain is nutritious with a nutty and mild flavor.

2. Regular Milled White Rice

Regular-milled white rice has its husk, bran, and germ removed. This prevents it from being spoiled. At the result it can be stored long.

3. Parboiled Rice

Using steam pressure process to force the inner and outer starches to create a less sticky, separate kernel. This process helps keeping vitamins. Nutrients are absorbed into the rice kernels before the outer layers are removed. Parboiled Rice has light golden or amber color (6).

Background of the market

Producing more rice is not enough. The quality is essential. After the food crisis in 2007, Canada's Department of Foreign Affairs, Trade and Development (DFATD), AfricaRice, and McGill University created a project to develop new rice-based products, innovative uses of husks and straw, improve the policy environment, and build the capacity of rice stakeholders to improve African farmer's income. The project has promoted the development of equipment for parboiling. Their new products from rice include cereal grain for slow-digesting Type II diabetes consumers. For low-value broken rice, they transformed it into noodles, biscuits, and porridge for children. "Tasty and innovative uses of rice can catalyze rural enterprises and raise income, especially for women farmers and processors in our region," said Ms. Lynda Hagan, scientist at the Food Research Institute (FRI) in Ghana (7).

In Nasarawa State, it is a fact that "neither the farmers nor the processors have adequate knowledge, equipment and technique to process the rice after harvest" (8).

In Thailand, Permanent secretary Chutima Boonyapraphasara suggested that "Thai rice can be developed as a value-added 'super food' in the form of various products. The commercial rice institute would contribute to adding value to Thai rice so that farmers would receive more income." It could be transformed into various kinds of food for babies, children, senior persons, and those watching their weight. Furthermore, rice could also be transformed as cosmetics and other products (9).

Dr. N. Shoba Rani stated about rice quality breeding that it should be improved in terms of color, texture, and aroma by using biotechnology. Dr. K. Alagusundaram suggested on developing dryers and bulk storage of grains (10).

Director of the National Innovation Agency Pun-Arj Chairatana said Thai rice needs to be improve for its higher cost. This can be acheieved by creative, scientific, and technological marketing for rice products, especially health food. Thai rice can be made into noodles, crackers, flour, health drinks, cooking oil, and other goods. Gaba rice, which has many health benefits, is considered an innovation, as well (11).

2015, May 20, Thai Prime Minister, Prayut Chan-o-cha stated in "Thailand's Strategy on Rice Trade Policy" that Thai rice needs to be improved in several ways. In the second part

of his speech: Trend, demand, and supply of Thai rice, he said that modern behavior, taste, health, and organic, environmental friendly products are considered as new types of products that consumers are willing to pay extra. This includes higher quality and nutrition. Another factor is the world's and rice importing countries' economic condition. The global economy is still fragile and needs to recover. This affects trade and prices of agricultural products. On the other hand, quantity and prices of other carbohydrate products such as wheat can substitute for rice and meet market demand, especially when the prices of rice is high. He gave the government's 7 strategies on rice as follows:

- 1) Sustainable and stable rice development plan
- 2) Creation of fairness in rice trade system
- 3) Promotion and implementation of rice production and trade at a standard level
- 4) Capacity enhancement of rice trade system
- 5) Promote rice consumption value
- 6) Creation of innovation
- 7) Capacity enhancement of logistics management (12).

Market Analysis

Product Analysis

1.) Rice Straw

Rice straw is produced when harvesting paddy. Rice straw is separated from the grains after the plants are threshed. It is commonly used to feed farm animals and mushroom growing.

2.) Rice Bran

Rice bran is produced from the outer layer of the brown rice grain. It is used in cereals such as Kellogg and Cheerios, because of its high nutritive value, such as vitamin B6, iron, phosphorus, magnesium, potassium, thiamin, and fiber.

In modern rice mills, several different kinds of bran are produced: coarse bran, fine bran and polish. Rice bran contains 10–23% bran oil. Rice bran can be used as an ingredient for animal food (13).

3.) Rice Bran Oil

It is a high quality, delicate tasting cooking oil that made from the outer layer on the brown rice kernel. It helps in lowering blood cholesterol levels. It can also be used as a wax for cosmetic products. Rice bran and germ oil are also used as a nutritional supplement. Rice bran forms 5–8% of grain weight, and is also used for flours, concentrates, and dietary fiber, as well as for other non-human-food purposes. The main producers of rice bran oil are India, Japan, China and Taiwan.

4.) Rice Husks (Hulls)

The outer layer of husk which contains many uses as fuel. It can also be used as a packing material to pad fragile cargo during shipping.

5.) Ash from Husks (Hulls)

Ash from hulls can be used to clean teeth and turned into cellulose products. For example, a sweetener or syrup which produced through hydrolysis.

6.) Rice Flour

It is a gluten free product produced from either white or brown ground rice. Used to produce rice pasta, crisps, cereals and snacks.

6.1.) Rice noodles: Flat rice noodles and extruded round noodles are made from wet-milled rice flour.

6.2.) Egg-roll wrappers and edible rice paper: These are made from wet-milled high-amylose rice batter in East and South East Asia. Edible rice paper is translucent and is used as edible candy wrappers.

6.3.) Rice-flour cakes and dumplings: Across Asia, a wide range of sweet and savoury rice-flour-based cakes and dumplings are generally available for purchase as snack-foods from traditional markets, supermarkets, and road-side stalls. Glutinous rice flour is commonly used to make many of these products, including Japanese mochi and Indonesian layered rice cakes, which require a stickier texture.

7.) Rice Starch

It is produced from the endosperm of the grain, used as a thickener in sauces and desserts such as steamed rice cake. Also used in the manufacture of Rice Syrup.

8.) Brewers Rice

An ingredient used in brewing, such as processing in beer and other ferment products. The mash left at the bottom of the container is often prized. It is popular in Philippines and Myanmar. Sake is widely consumed in Japan, and also increasingly around the world. These rice-based wine-like beverages are served warm and featured at ceremonial festival.

9.) Other

9.1.) Puffed rice: Puffed rice is made by heating rice grains under high pressure in the presence of steam. 'Rice Krispies' are one type of popular breakfast cereal made from puffed rice, and puffed rice cakes are a common snack food.

9.2.) Rice crackers: Many kinds of rice crackers are produced across Asia including in Japan and Indonesia.

9.3.) Fermented rice food products: These include Japanese miso, Latin American 'Sierra rice', and angkak's 'yeast rice'. Fermented rice is also eaten in many parts of Asia as

a snack or a treat, including in China, India, Cambodia, Indonesia, Malaysia, the Philippines, Singapore, Thailand and Brunei.

9.4.) Canned rice products and quick-cooking packaged rice: Sweet and savoury canned rice products are found in many countries. Various types of quick-cooking or 'instant' rice meals or side-dishes, prepared and packaged in different ways, are also available internationally. Instant rice differs from parboiled rice in that it is milled, fully cooked and then dried. There is a significant degradation in taste and texture (14).

Thai Innovation

From 2011 National Innovation Awards, the prizes were given to ground-breaking rice innovations: Rice-bran oil shortening developed by Thai Edible Oil to meet the need of commercial bakers, a fat-free salad dressing made from rice, and a rice energy drink. There was also an egg coating made from rice starch, developed by Kasetsart University. It prevents oxygen from penetrating the shell, thus keeping eggs fresh at room temperature for up to 28 days. In the past, the award also went to rice innovations such as talc-free baby powder made from rice starch and a ready-to-bake rice flour cake.

The rice-bran oil shortening can be used in baking with only a slight difference in taste and texture from conventional shortening. It has the best soft, stable texture. Rice-bran oil shortening is a good substitute for vegetarians or those with health concerns (15).

Operational Plan

According to the market analysis and research, it is shown that rice has been transformed into several products in order to develop enterprises and farmers' income. Not only food products, health products and cosmetics are also being created. Rice can be transformed into more beneficial products through innovation: rice straw, rice bran, oil, husks, flour, noodles, starch, brewers rice, puffed rice, cracker, and fermented food products. To find gaps in this market, it can be summarized in the table:

Table 1, Commonness of Rice's Retail Products.

Retails rice products	Commonness
foods	7
health products	1
energy sources	1
cosmetics	2

This project suggests two of the most possible rice products innovation. Considering the gap in the market, food products might not be the best solution for rice innovation. However, it is still considered as one of the most viable products that can be made.

1st Suggestion: Rice Flour Bread

Due to the fact that people, for instance, consume rice as a snack (for example, rice cake, puffed rice, and cracker), which also explains why grain products such as bread became so popular.

Table 2, The Comparison Between Rice and Bread

Categories	Rice	Bread
Calories (per 100grams)	low (129 kcal)	high (266 kcal)

Nutrients (per 100 grams)		
-Fats	0.28g	3.29g
-Sodium	376 mg	681 mg
-Potasium	35 mg	100 mg
-Carbohydrate	27.9g	50.61g
-Protein	2.66g	7.64g
-Calcium	1%	15%
-Iron	7%	21%
Price	higher	cheaper (wheat)
Time required to prepare	long	short
Time required to consume	long	short
Convenience	low	high

From the table, it is obvious that bread gives more energy and nutrients, as well as requiring shorter time to prepare and consume which fits with people's lifestyle nowadays. In this case, rice could be improved in order to meet people's needs and expectation by transforming it into products that require less traditional preparation. Therefore, the first suggestion or solution for rice innovation is rice flour based food product. Using the same method with wheat baking, rice flour can be transformed into several kinds of bread and pastries. Rice cake is also considered as one possible product (Thai innovation), but it is still not enough in amount. Thus, it cannot be a substitution for a meal. Due to the fact that rice contains more beneficial nutrients than wheat, rice flour bread should be an alternative for the consumer, especially for the health-care product's market.

S.W.O.T analysis for 'Rice Flour Bread'

Strengths	Weaknesses
<ul style="list-style-type: none"> - convenience - fit with modern lifestyles. 	<ul style="list-style-type: none"> - higher price comparing to other bakery products from wheat.

Opportunities	Threats
<ul style="list-style-type: none"> - ability to access the modern health-food market. 	<ul style="list-style-type: none"> - changes on the traditional consumption. - difficulty in entering senior market.

Project Planning

Project Task List for 'Rice Flour Bread'

Number	Task	Description
1	Research on a recipe	Do a research on internet, cookbooks, or library.
2	Determine and adjust the amount of product	Determine the market demand.
3	Purchase rice	Both brown and white rice are capable for this process.
4	Purchase other ingredients	Purchase respectively to the recipe.
5	Purchase equipments	Purchase respectively to the recipe.
6	Produce rice flour	Blend rice in the blender until flour texture appears.
7	Store rice flour	Store it in an air-tight container
8	Make a bread dough	<ol style="list-style-type: none"> 1. Combine the wet ingredients, milk, oil, honey, egg, water, and cider vinegar. 2. Slowly add the dry ingredients, rice flour, salt, and Xanthan Gum. 3. Mix until the dough becomes sticky (16).
9	Prove	Cover the dough and wait until it doubled in size.
10	Bake	Bake at 325 degrees for 20 to 25 minutes.
11	Store	Cut into portions.
12	Determine the price and quality check	Sum the capital and define the total price. Check the quality by an expert.
13	Introduce the product to the market	Describe the benefits and differences of the product to the market (marketing). Determine 4Ps.

14	Sell	Sell accordingly to the determined price.
15	Promoting	Enhance the popularity of the product, make it become well known throughout the country.
16	Export	Export to other countries, make it world-wide.

Project Schedule for 'Rice Flour Bread'

Number	Task	Duration	Time scale
1	Research on a recipe	1 month	*
2	Determine and adjust the amount of product	½ month	*
3	Purchase rice	1 month	*
4	Purchase other ingredients	1 month	*
5	Purchase equipments	2 months	**
6	Produce rice flour	3 months	***
7	Store rice flour	1 month	*
8	Make a bread dough	-	
9	Proof	-	
10	Bake	2 months	**
11	Store	10 days	*
12	Determine the price and quality check	10 days	*
13	Introduce the product to the market	2 months	**
14	Sell	1 month	*

15	Promoting	up to 1 year	*****
16	Export	3 years	*****

2nd Suggestion: Rice Facial Soap

For the second innovation, this project would like to suggest the non-food product, rice facial soap. According to the research of retail rice product (Table 1, Commonness of Rice’s Retail Products), there is an enormous gap in the market for non-food product, especially for health and cosmetic categories.

Rice contains several vitamins and minerals that profits in cleansing and treatment the skin. This includes promoting cell growth, stimulating blood flow, keeping skin smooth and bright, healing acne, and soothing sunburn (17).

Table 3, Benefits of Vitamins and Minerals existing in Rice.

Vitamins and Minerals	Benefits
Vitamin B	<ul style="list-style-type: none"> - Repairing skin cells. - Preventing dryness.
Vitamin E	<ul style="list-style-type: none"> - Antioxidant - Protecting the body from damage from unstable molecules. - Preventing destruction of cell membranes and tissues.
Vitamin K	<ul style="list-style-type: none"> - Aiding blood clotting (18).

There are normal body soaps made from rice in the market already, however, based on rice’s benefits, this project considers that rice can be made into more specific and delicate soap such as facial soap. Facial soaps use milder chemical substances than body soap. For the example, milder detergent, and oils. This kind of soap is popular and suitable for child, woman, or customers with sensitive skin. Rice facial soap production is not well developed at present. Therefore, creating facial rice soap should help promoting the rice market.

S.W.O.T analysis for 'Rice Facial Soap'

Strengths	Weaknesses
<ul style="list-style-type: none"> - fit the gap in the market place. - beneficial in health care 	<ul style="list-style-type: none"> - higher price than other kinds of soap, due to the specific ingredients. - not a product that is required in everyday life, not much demand.
Opportunities	Threats
<ul style="list-style-type: none"> - satisfying a certain target market. 	<ul style="list-style-type: none"> - not well- needed in some countries.

Project Planning

Project Task List for 'Rice Facial Soap'

Number	Task	Description
1	Research on Rice	Do a research of how rice benefits facial skin care.
2	Learn	Learn how to produce soap efficiently from the expert, including techniques.
3	Determine and adjust the amount of product	Determine the market demand.
4	Purchase rice	Both brown and white rice are capable for this process.
5	Purchase other ingredients	Purchase respectively to the recipe.
6	Purchase equipments	Purchase respectively to the recipe.
7	Produce facial soap	Produce it according to the learned procedures.
8	Quality check	Check the quality by an expert and scientist. Do an experiment for quality and safety.
9	Store	Packaging
10	Determine the price	Sum the capital and define the total price.
11	Introduce the product to the market	Describe the benefits and differences of the product to the market (marketing). Determine 4Ps.

12	Sell	Sell accordingly to the determined price.
13	Promoting	Enhance the popularity of the product, make it becoming well known throughout the country.
14	Export	Export to other countries, make it world-wide.

Project Schedule for 'Rice Facial Soap'

Number	Task	Duration	Time scale
1	Research on Rice	1 month	*
2	Learn	1-2 years	*****
3	Determine and adjust the amount of product	1 month	*
4	Purchase rice	1 month	*
5	Purchase other ingredients	1 month	*
6	Purchase equipments	2 months	**
7	Produce facial soap	3 months	**
8	Quality check	6 months	****
9	Store	1 month	*
10	Determine the price	1 month	*
11	Introduce the product to the market	2 months	**
12	Sell	1 month	*
13	Promoting	up to 1 year	*****
14	Export	3 years	*****

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Appendix

