



Future of Functional Foods and Nutraceutical Products: The Challenge and Potential of Thailand to ASEAN

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Abstract— This research purposes to explore the potential and challenges of Thailand about the leadership of the functional foods and nutraceutical products in ASEAN, especially developing marketing strategies of these products. This research was collected the data and confirmatory with data triangulation which contains primary and secondary data. The primary data collected from informants and secondary data conducted from access to online while the exhibition of the Australian Trade Commission presented the biggest of functional foods and nutraceutical products market of Southeast Asia is Thailand country. Although, researchers studied the factors which have influence for consumption acceptance in functional foods and nutraceutical products, some factor as price has not seen yet. Thus, when these products have the same ingredients and quality, the price of product is become to necessary factor. Therefore, Thai's government has to have the policy for supporting to produce the functional foods and nutraceutical products which have high quality from rice products.

Keywords— Functional Foods, Nutraceutical Products, Thailand, ASEAN.

1. INTRODUCTION

In present, people's life has changed while people are more take care of health than the past. It might be because of the knowledge and the social have changed. The current world, many people have a rush time and too hurry because their life style changed more competitive than a past. So everything in their life was designed to easy and very comfortable [3], [10], and [23]. Beside, people use technology to improve their connection, eating style has changed also. While people have more knowledge, they have more awareness in their health [10].

Many people are interested in everything that can improve the healthy [13]. As food that intake to their body, many people avoid the fat food and eat more healthy food instead [24] and [63]. Not only the healthy food which calls functional food but the supplement food or vitamins and minerals in tablet form that call nutraceutical products are increasing the sale volume also [74] and [76]. People have more cognitive and acceptant in functional foods and nutraceutical products than the past [1]. Hence, the functional foods and nutraceutical products seem to more important in daily life of present world [9], [69] and [70].

Currently, consumer's behavior and purchasing healthy product depend on personality and cognitive style that always chose healthy food brand product [31] and [69]. Otherwise, this group of people is a segment of initial market for new food product [33] and [57]. Thereby, these claim that lifestyle have influence and effect on functional food products consumption [5]. So a

consumption behavior is an influence factor on functional food and nutraceutical products [12].

In 1998, Health Canada has defined a functional food is similar in appearance to conventional food which is consumed as a part of a normal diet and has demonstrated physiological benefits and/or reduces the risk of chronic disease beyond basic nutritional function [4]. Some of definition of a functional food is a product which contains specific nutrients, minerals, vitamins, fatty acids, or dietary fiber, foods with added biological active substances such as phytochemicals or other antioxidants and probiotics that have live benefit [67]. Otherwise, health authorities in Japan calls FOSHU (Food for Specified Health User) pointed an improved quality of life must accompany increasing life expectancy [2]. Thus, the concept of functional food products that were developed specifically to promote health or reduce the risk of disease.

AS a function food definition, Health Canada has defined the nutraceutical products is a product isolated from foods but sold in powders, pills and other medicinal forms not generally associated with food and is demonstrated to have physiological benefits or provide protection against chronic diseases such as vitamin pills, mineral pills, herbal pill or supplement, oil gel caps, phytochemicals, and zoochemicals [4] and [7].

From research revealed the data about global functional food market which has found the ASEAN countries as a niche market and the most rapid expansion area for these industries [75]. Moreover, from The Australian Trade Commission Expo where exhibit at Hong Kong in the topic "The complementary healthcare to Asia" is revealed by the Australian government's export and international business facilitation agency. The result showed about the value sales vitamins and dietary supplements market in each country that Thailand is the biggest market of South-East Asia [50].

In addition, some researchers studied about the factor

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of consumer acceptance [9], [32], and [56]. They found consumer characteristics are a first factor. The consumer characteristics can separate personality of consumer whom always taken functional food products concerning about health status. The secondary factor is purchasing situation that consumers are advised from health professionals and they are familiar with brand of products. So the distribution channels for functional food products imply to three main ways: pharmacy, drug store, and supermarket. Finally, factor for consumer acceptance is product characteristic. The three of factors have similarly to 4Ps of marketing but lack of the P as price [9], [62], and [63]. Thus, when the functional food products have the same ingredients and quality, the price of product is become to necessary factor. Although, Many research studied about the effect and advantage of functional foods and nutraceutical products as food science technology and pharmaceutical side but in marketing side is rarely research about consumer's behavior.

While in current market consumers are increasingly interested in the health benefits of foods and they awareness of the basic benefits nutritional of functional food products as to reduce the disease or disease prevention and health enhancing compounds contained in many foods [6], [9]. So the innovative product as functional foods and nutraceutical are more opportunities to still stay in the market [34] and [62] and the trending of customers are increasing and expanding the volume of need [16], [48], and [60]. For consumers acceptance have three of factors have similarly to 4Ps of marketing so that the marketing strategy is an important things to driven functional foods and nutraceutical products for consumer acceptance and willingness to pay [11], [32].

Thereby, Thailand is the land of agricultural which has many kinds of raw material of functional food and nutraceutical products. The Thai farmers have more experience for growing plants than others countries in ASEAN, so that this has the research question as Can Thailand the challenge and has a potential to leadership on functional food products in ASEAN? Indeed, the objective of this research is studying the opportunity and potential of Thailand to leader positioning in functional food products in ASEAN. The order of paper after introduction has review literature, methodology, result, conclusion, discussion, and study limitation and future research.

2. LITERATURE REVIEW

2.1 Functional food and Nutraceutical Definitions

Firstly, the functional food was born in Japan in the 1980s'. However, the term of "functional food" not really clarify a definition from legislation in Europe or any universal [59]. Not only functional food definition not clear but nutraceutical definition also. Many definitions of functional food and nutraceutical are existed which have an amount more than a hundred definitions [14], [15], [25], [27]-[28], [46], [53], and [59]. The functional food can define from many ways such as ingredient, potential of function, a traceability, resources, and so on [25], [52]-[59], and [68]-[70].

Although, food law is designed to provide for the food safety of food stuffs, many of functional foods cannot label the suitable dose for each person. So the EC Commission has to have a particular rule for covering every kind of functional foods [17]. Consumer interest in the relationship between diet and health has increased substantially in Europe and the U.S. There is much greater recognition today that people can help themselves and their families to reduce the risk of illness and disease and to maintain their state of health and well being through a healthy lifestyle, including the diet [12] and [59]. Today, Asia people have trend as Europe. So trends of population change to need for foods with added health benefits. For example, consumer needs functional foods and nutraceutical products that have the potential to improve health and well-being, reduce the risk from or delay the onset of major diseases such as cardiovascular disease (CVD), cancer and osteoporosis [12], [27]-[28], [43], [47] and [72]. Combined with a healthy lifestyle, functional foods and nutraceutical products can make a positive contribution to health and well being [59] and [61]. Thus, functional foods and nutraceutical products are great potential products to help and improve healthy lifestyle [5], [23], and [53].

According to, many researchers have to define the functional food's definition. In this paper can be define a functional food definition as a functional food is a similar in appearance to conventional foods which contain nutrients as vitamins and minerals. This has physiological benefits and/or reduces the risk of chronic disease. For example of functional food is bran, oats, wheat, fiber, modified oil such as bran oil, soy protein, grains, lentils, chickpea, peas, beans, and so on [28], [36], [38], [43], and [59]. As a functional food definition, the nutraceutical in this paper is a product which is isolated from foods but sold in medicinal forms such as powders, pills and others, however, these are comprised of physiological benefits or provide protection against chronic diseases. For instance, nutraceutical products are vitamin pills, mineral pills, herbal pill or supplement, oil gel caps, phytochemicals, and zoochemicals [16], [19]-[21], and [27].

2.2 Functional foods and nutraceutical products from rice

The definition of functional food and nutraceutical that made from rice can be refers to germ rice and rice bran. These are developed and added value from general grain rice by using food technology [65]. Furthermore, many healthy consumers are favor in functional foods, and nutraceutical products which made from rice. Meanwhile, rice is a conventional food of people in many countries, so it is easy to promote these products [15], and [53]-[55]. and zoochemicals [16], [19]-[21], and [27].

2.3 Consumer Acceptance Factor

In general, 4Ps marketing mix is contained product, price, place, and promotion while from reference [9] reveals that consumer acceptance contains product characteristics, purchasing situation, and consumer characteristics. So consumer characteristics have to have

culture's influence and cognitive consumption behavior [11].

Culture's influence consumption

Hofstede is a person who studied in a culture and economy. From Hofstede's seminal typology of cultural dimensions debuted in 1980 and continues to dominate in studies of management and marketing scholars. For Hofstede's culture definition refers to the dynamic process that can drive human social belief, create attitude, perception, thoughts, and responses actions [51].

Reference [51] results that difference culture always vary behavior and decision making. The research has compare two different cultures; a Western culture (Australia) and an Eastern culture (Singapore). Beside, the culture has influence to consumption's behavior, it also has influence for the marketing strategy [51]. Therefore, many research found that culture is an importance factor which has effect to consumption of customer in the market [71].

Cognitive consumption behavior

Food consumption behavior is different from a base of person. From many research found that not only gender and age, but lifestyle and consumer perception are effect to healthy [23] and [31]. Reference [63] concluded healthy and health-related consumer terms are link to product and traditional food components. This explains about different opinion and perception of consumption which connect to healthy. Moreover, women are take more information than men about how to get well of healthy which affect to seeking behavior and help they having good healthy [3].

For people who have awareness of healthy consumer are serving food in a limitation quantity and usual exercise [10] and [23]. The consumer's behavior whose has purchasing healthy product have personal and cognitive style always chose healthy food brand product [31] and [49]. Otherwise, this group of people is a segment of initial market for new food product. Thereby, these result that lifestyle have influence and effect on food consumption so that a consumption behavior is an influence factor on functional foods and nutraceutical products [31]-[34]. Thereby, before customer decision buying these products, they also have the knowledge in benefits from these products and acceptance in advantages that they are recieved [5], [62], and [69].

2.4 Functional foods and nutraceutical products market in ASEAN

ASEAN Economic Community (AEC) is the realization of the end-goal of economic integration as outlined in the ASEAN vision 2020. AEC create a stable, prosperous and highly competitive ASEAN economic region in which there is a free flow of goods, services, and investment [22] and [41]. From the AEC priority area has functional foods and nutraceutical products in a part of food technology. So the functional foods, nutraceutical products, and ASEAN are pertained [29]. The priority area will address the current need to provide the scientific basis for sustainable development of the

rich sources of functional foods in ASEAN countries; and, in so doing promote health and regional economic integration ASEAN implement many plans which have short-term and long-term vision [35], [64].

Meanwhile, AEC has others part of plan, the AEC has plan of action on science and technology, especially food security and food safety. This is a point of this research about studying in the functional food products that it is a part of product in the science site. Otherwise, Singapore is a member national in ASEAN is interested in this products market because functional food products can increase the value of products and make more benefit than original product [37] and [75]. Thailand is a country for food resources which has a gigantic potential for ASEAN's market because Thailand is the land of agricultural products. Therefore, Thai farmers have more experience than others countries in ASEAN for growing the high quality of rice so that Thailand should be to leadership positioning in functional foods and nutraceutical products from rice in ASEAN [39].

2.5 Content analysis

Although, the content analysis is old principle, it is still a classic method. Beside, using cognition and word analysis, the content analysis has a lot of advantages [44] and [45]. For example, the content analysis allows rendering the rich meaning participated with mainly documents and combines with quantitative analysis [26]. and suitable for research which has limit in the way because of save time, cost and well known in researchers [40], [42].

3. METHODOLOGY

3.1 Key informant

This research design using dept interview from person who related the functional foods and nutraceutical products. For informants include three of each brand retailer of functional foods and nutraceutical products and one of the owner of a pharmacy shop at Nongkai province.

3.2 Research design and data sources

The research design for semi-structural is collected the primary data by interview follow the questionnaire and access to online for collecting secondary data. The sources of content analysis are from literatures review 54 papers which is divided the class into four groups: book sections, dissertation or theses, newspaper or magazine online, and scholarly journals.

3.3 Research theme

From content analysis can sort the article in various divisions that depends on interesting group. In this paper divide the topic interesting to pertain a culture, a cognitive consumption behavior, functional foods, nutraceutical products, marketing strategy, and ASEAN. Thus, this paper is divided three catagories type of data, period of time, and type of journal follow [26], [39], and [43]-[45]:

3.3.1. Type of data

- Book sections (BS)
- Dissertations and Theses (DS)
- Scholarly journals (SJ)
- Newspaper and magazines (NM)

3.3.2. Period of time

- Before 1985 (1)
- 1986 – 1990 (2)
- 1991 – 1995 (3)
- 1996 – 2000 (4)
- 2001 – 2005 (5)
- 2005 – 2011 (6)

Reference [28] has longitudinal design of content analysis that it is used in this research.

3.3.3. Type of journal

- Research paper (RP)
- Conceptual research (CR)

A content analysis technique has follow based on the features of frequency counts from the basis of content analysis [26], [42], [44]-[45].

4. FINDINGS

4.1 The dept interview data

An informant 1 is person who is a selling person at Tasadej Nongkai province said that “most of the nutraceutical and functional food are consume by suggestion from a seller. Not only Thai people but Laos who travel into Thailand also. When they take it and feel better, they always comeback to buy it again and again” The volume of selling the nutraceutical and functional food product depend on person. Otherwise, Thai people buy these product more than Laos because Laos who is rich is not too much. The informant sell this product as a package so that the sale volume per each different from another seller.

An informant 2 is a direct selling person who work with the big direct selling company. She said “almost the customer is woman and the age around 26 – 38 because they have salary enough for buy these products which are not conventional food”.

An informant 3 is an employee in a shop at Tasadej, Nongkai. She said “the consumer who travels in this place has more Thai people than Laos. So they buy only the same product as they use to and in a small volume. Sometimes, she hasLaos customer. Laos always read the codex before they buy it even though the seller suggest and give the detail of product already.”

An informant 4 is an owner of pharmaceutical retailer at Nongkai. The name of this retailer is wel known, Thai and Laos people are always buy and order the medicine and nutraceutical and functional food product. She said “Laos who come to Thailand is richer than others so that they have enough money for buy a lot in each time. Sometimes, if Laos does not have a kind of medicine or nutraceutical, they always come to her shop for ordering or buy it.”

4.2 Content analysis

From content analysis data can plot the graph trending of functional food reseach in ASEAN’s market follow figure1 and nutraceutical products research in ASEAN’s market follow figure2:

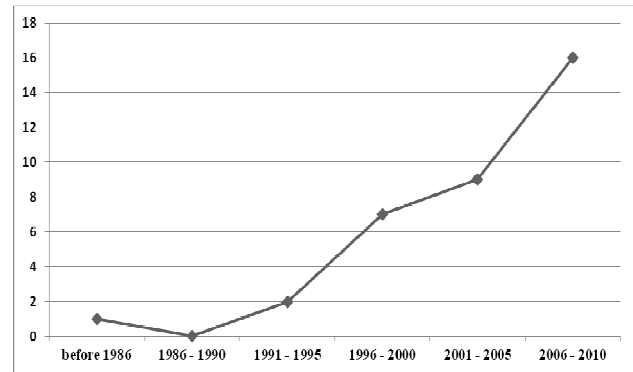


Fig. 1. Trend of Functional foods in ASEAN market from content analysis: axis Y = frequency and axis X = year.

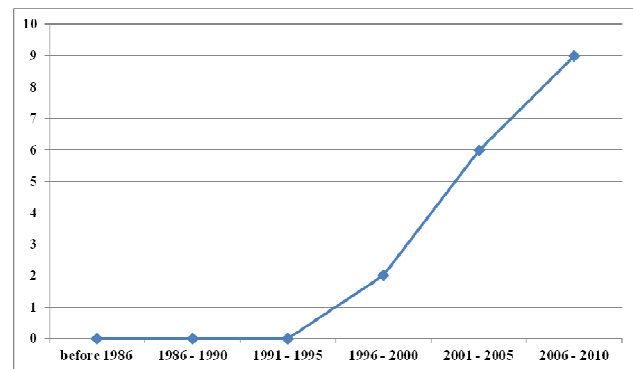


Fig. 2. Trend of Nutraceutical in ASEAN market from content analysis: axis Y = frequency and axis X = year.

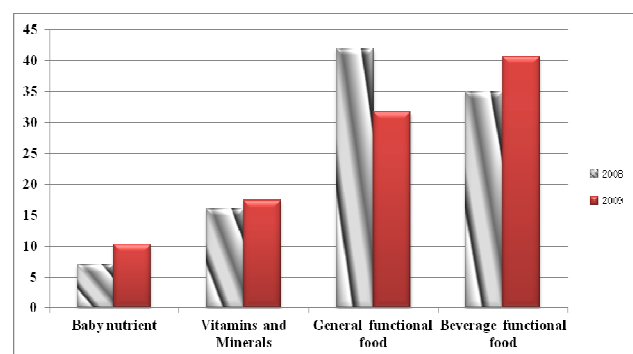


Fig.3. Trend of functional foods and Nutraceutical products in Thailand market From : KTB research, axis Y = Growth rate of product (%: Percent) and axis X = Type of product.

5. DISCUSSION AND CONCLUSION

From figure 1 and 2 found trend of functional foods and nutraceutical products research are increasing, especially, in 2006 – 2010 the researcher more interested in this topic than the past. While in the United States of

America's market is still growing up even though the rate of increasing is not high. Furthermore, the exhibition that Australian government invests for the investor found the ASEAN country market overview responding to the nutraceutical and functional food product.

Figure 3 is shown the trend of functional foods and nutraceutical products in Thailand's market that found every kind of functional food and nutraceutical product as baby nutrient, vitamins and minerals, beverage functional food are increasing except general functional food.

Besides, the data from the informants, the data's finding, and literature reviewing found the education related to cognitive consumption behavior, knowledge and country development [31] and [49]. Laos is a best example country because people of Laos awareness in their health more than in the past [58]. The result from the informant said that "the rich people of Laos increase consumption of the nutraceutical and functional food."

In 2008-2009, however, trend of functional food and nutraceutical product in ASEAN and Thailand has increasing. Furthermore, the data from informants and the Australian Trade Commission present an important the functional foods and nutraceutical products market of Southeast Asia is Thailand country.

In summary, trend of nutraceutical and functional food in ASEAN market is growing up and expand into the poor countries in ASEAN because those countries are opening and giving many the benefits for investment in their country [73] and [74]. Hence, the advantages of this research have:

- 5.1 Forecasting and knowing the trend of nutraceutical and functional food in ASEAN for the future.
- 5.2 Thai government will develop the policy in each part for relating with the AEC, especially science, technology, and management.
- 5.3 For increasing a potential of Thailand in production and development for nutraceutical and functional foods.
- 5.4 For direct respond consumer's need and reduce the volume of raw material which use in the nutraceutical and functional food production.

6 STUDY LIMITATIONS AND FUTURE RESEARCH

This research model is derived from existing literatures and concept has not been tested empirically, so that in the future research has to have the deductive method that can use quantitative analysis for confirming and forecast the right way of the government's policy.

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APPENDIX

From The Australian Trade Commission Expo where exhibit at Hong Kong in the topic "The complementary healthcare to Asia" is exhibited by the Australian Government's export and international business facilitation agency. The consequences of exhibition of this follow [50]:

Market Overview –Hong Kong

1. Vitamins and dietary supplement market is valued at approximate HK\$ 1billion (A\$173 million) in 2005 (account for nearly 50% of OTC Healthcare)
2. Increased health consciousness (especially after SARS)

3. Aging population (11.4% of the population is 65 and over)
4. Highly fragmented market with local products and import products from China, USA, Australia, Canada and New Zealand.
5. Value sales of vitamins and dietary supplements dependent on advertising
6. Besides branded products, opportunities for Australian companies include OEM production
7. Registration on health supplement products in Hong Kong would depend on the product composition and nature of claims made in labels and promotion materials.
8. Pharmaceutical products would be required to be registered with Department of Health.
9. Registration process normally takes about 6-9 months.
10. Three main categories of health supplement products: Vitamins, Herbal-based products, and nutraceuticals
 - Vitamins are the most popular as it has been in the market for long time
 - Herbal-based products is a late addition to the market but customer demand is growing fast
 - Nutraceutical products are gaining popularity in recent years and has vast market potential
 - Popular products include shark liver oil capsules, shark cartilage capsules, deep sea fish oil capsules, lingzhi, herbal pills, royal jelly, pollen tablets, Omega 3, etc.
 - Protective parents drive sales of child-specific vitamins and dietary supplement
11. Major distribution outlets—pharmacy chain stores (Watsons, Rite Aid, Mannings, CRCare, etc.) and health food stores.

Market Overview -Malaysia

1. In 2005, the nutraceuticals market in Malaysia was valued at \$375.0 million and is forecast to reach \$746.1 million in 2012.
2. High growth potential encouraged by aggressive multi-level marketing.
3. Heavily reliant on imports but local production growing.
4. Most of the younger generation in Malaysia consumption nutraceutical products on a regular basis.
5. The registration of nutraceutical products with the Government and the availability of on-line registration options by the local distributor has substantially reduced the time to market.
6. Islamic country with more than 12 million Muslims. Supplements that Muslims consume must be Halal (lawful or permitted in Arabic language). eg: gelatin from bovine sources is a major ingredient in the production of soft gel and it is not Halal.

Market Overview -Singapore

1. The nutraceutical market in Singapore was valued at \$112.2 million in 2005. By 2012, the market is likely growing up.
2. Market saturated, mature, highly competitive thus high A and P costs.
3. Supply in bulk a good option.
4. Not a market in isolation –most distributors have multi-market presence.
5. Most over-the-counter vitamins and dietary supplements need not be licensed.
6. Vitamins with very high dosages of certain nutrients must be licensed with the Health Sciences Authority.
7. Labeling and advertising regulated

Market Overview -Thailand

1. In 2005, the market was valued at \$A 1,114.1m. By 2012, the market is forecast to reach \$A2,430.8 million.
2. Key growth driver is emphasis on physical appearance.
3. Brand loyalty low.
4. Current popular products: Vitamins A, C and E, coenzyme Q10, green tea, chitosan, fat burners, conjugated linoleic acid (CLA), grape seed extract, multi-vitamins, calcium, ginkgo biloba, fish oil and lecithin.
5. Main distribution channels are MLM and Pharmacy (traditional or modern drug stores).
6. Dietary supplements regulated by the Ministry of Public Health as a food product (dosage less the Thai RDI dosages) or a drug (more than the Thai RDI).
7. Supplements classified as drugs can only be sold by registered pharmacists in drug stores.
8. Advertising is also regulated by FDA

Market Overview -Philippines

1. The nutraceutical market was valued at \$118.4 million in 2005, with revenues are expected to increase to \$205.9 million by 2012.
2. Foods fortified with vitamins and minerals are considered a regular part of the diet.
3. Local manufacturing companies lead market participation, capturing majority market share on basis of price.
4. Establish a clear link between a health benefit and the product is likely to be well received by consumer.
5. The Government and the NGOs have been organizing campaigns to help increase consumer awareness and understanding of the benefits of functional foods, especially those fortified with vitamins and minerals. These campaigns are likely

to lead to an increase in the demand for nutraceutical in the country.

Market Overview - China

1. Value sales of vitamins and dietary supplements in China were worth RMB36 billion in 2005; Over 40% sales from import or international brand.
2. The outbreak of SARS in 2003 in China and 2004's avian flu outbreak resulted in Chinese consumers becoming more health conscious.
3. Multi-sales channels in China include direct selling, chain store, pharmacy...also large volume sales through "grey" channels.
4. Regulated by SFDA (www.sfda.gov.cn), and AQSIQ (www.aqsia.gov.cn).
5. Strong competition and price is more sensitive.
6. Labeling and advertising legislation applied.
7. Marketing cost high.
8. Brand loyalty low and unstable

