The Analysis of Thai Shrimp Supply Chain and Competitiveness in the U.S. Market

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Abstract

This research analyzed the supply chain of the Thai shrimp industry and examined its competitiveness in the United States of America (U.S.A.) market in comparison to the three majors exporting countries, namely Ecuador, Indonesia, and India. Secondary research and in-depth interviews were conducted with key informants in the shrimp industry in Thailand and the U.S.A. during 2013-2015.

It was found that, from the perspectives of the U.S.A., shrimp importers, Thai shrimp was superior in quality; however, its price was slightly higher than its key competitors due to higher costs. The key competitive advantage of Thai shrimp not only comes from the quality of the shrimp itself, but also comes from the quality of service offering to importers. Still, the key challenge for Thai exporters lies in the fact that American consumers are price sensitive and are not aware of the differences of shrimp from different sources. Hence, the purchase can be easily switched to any suppliers that offer the most competitive price. Finally, Thai shrimp exporters are recommended to emphasize the necessity to take more rigorous measures in reducing costs,

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upstream supply chain management improvements, and diversification of their markets and product forms to mitigate their disadvantages.

Keywords: Shrimp / Supply Chain Management / Competitiveness / Thailand / United States

บทคัดย่อ

งานวิจัยชิ้นนี้มีวัตถุประสงค์เพื่อศึกษาห่วงโซ่อุปทานอุตสาหกรรมกุ้งไทยและความสามารถในการแข่งขันในตลาดสหรัฐอเมริกา โดยเปรียบเทียบกับสามประเทศผู้ส่งออกกุ้งรายใหญ่ของโลก ได้แก่ เอควาดอร์ อินโดนีเซีย และอินเดีย โดยการรวบรวมข้อมูลทุติยภูมิ และการสัมภาษณ์เชิงลึกกับบริษัทผู้ผลิตและส่งออกกุ้งของไทยและผู้นำเข้ากุ้งรายใหญ่ในสหรัฐอเมริกาในช่วงปี พ.ศ.2556-2558

ผลการศึกษาพบว่า ผู้นำเข้ากุ้งรายใหญ่ในสหรัฐอเมริกาเห็นว่ากุ้งจากประเทศไทยมีคุณภาพสูงกว่าจากกุ้งจากแหล่งผลิตอื่น แต่มีราคาสูงกว่าผู้แข่งขันรายอื่นเล็กน้อยเนื่องจากมีต้นทุนการผลิตที่สูงกว่า ข้อได้เปรียบหลักของกุ้งไทยนอกจากจะมาจากคุณภาพของกุ้งแล้ว ยังมาจากคุณภาพของบริการที่ผู้ส่งออกกุ้งไทยให้แก่ลูกค้า อย่างไรก็ดี ความท้าทายของผู้ส่งออกกุ้งไทยคือผู้บริโภคอเมริกันมีความอ่อนไหวต่อราคาสินค้ากุ้ง และไม่มีความตระหนักถึงความแตกต่างของกุ้งจากแหล่งต่างๆ ดังนั้นจึงอาจเปลี่ยนไปซื้อกุ้งจากแหล่งอื่นที่มีราคาต่ำกว่าได้ งานวิจัยชิ้นนี้มีข้อเสนอว่าผู้ส่งออกกุ้งของไทยควรให้ความสำคัญกับการลดต้นทุนการผลิต การปรับปรุงกลยุทธ์การผลิต และการเพิ่มรูปแบบของผลิตภัณฑ์และขยายตลาดให้หลากหลายยิ่งขึ้นเพื่อลดข้อเสียเปรียบดังกล่าว

คำสำคัญ: กุ้ง / การจัดการห่วงโซ่อุปทาน / ความสามารถในการแข่งขัน / ประเทศไทย / ประเทศสหรัฐอเมริกา

Introduction

Thailand is one of the world's leading shrimp exporters. Shrimp farming in Thailand has developed into a very important industry in the country and achieved its title as the number one shrimp producer in the world (Sriboonchitta, 2001).

On average, Thailand's shrimp production stands around 500,000 to 600,000 metric tons per year, 90 percent of which are exported. The U.S.A. has long been the key market for Thailand (TFFA, 2014). This facts indicate two critical issues. Firstly, Thai shrimp industry relies heavily on the demand from international market, especially from the U.S.A. Secondly, such dependency on international market demands Thai shrimp industry to continue improve its competitiveness overtime.

This research attempts to explore two key issues. First, it aims to explore the key stages and stakeholders in the supply chain of Thai shrimp industry from farming until it reaches international consumers. Second, it aims to explore the competitiveness of Thai shrimps in the U.S.A. market through quality and price assessment which were found to be key drivers. The comparison of competitiveness in this context is made between Thailand and its three key competitors - Ecuador, Indonesia, and India.

Literature Review

Shrimp Industry in Thailand

Shrimp farming in Thailand started in year 1935 and developed into a very important industry in Thailand and achieved its title as the number one shrimp producer in 1991 (Sriboonchitta, 2001). In its introduction stage, shrimp

farming began in the east coast of the Gulf of Thailand for domestic market, then expanded to export market after the continuing growth in global demand from North America, Japan and Europe provided a strong commercial rationale for turning shrimp aquaculture into a major industry (Lebel, 2002). By 1994, 80 percent of shrimp farms in Thailand were intensive type (Dierberg, 1996), a production system characterized by a low fallow ratio and the high use of inputs such as capital and labor (Britannica Encyclopedia, 2013) and was dominated by Black Tiger shrimp species called Penaeus Monodon (DOF, 1997).

By late 1990's the global disease problems from environmental and management factors that had prolonged eventually took its toll on the Black Tiger shrimp, farmers responded by increasing excessive chemical use. In 2002 the industry started to turn to White shrimp (Penaeus Vannamei), which abruptly domesticated because it was more tolerant and allowed better disease management than Black Tiger shrimps. Thailand's shrimp export continued to grow. Around 90 percent of processed shrimp were exported and more than 120 processing plants were established. This helped Thailand to maintain its status as the world's top shrimp exporter for 18 consecutive years. In addition to the abundant raw material resources, Thailand also had the labor and skills required to uphold its high productivity while maintaining quality which was required by customers worldwide. Hygiene and traceability where two key aspects indicated as strict requirement by major buyers (Chuchird et al., 2006).

At the end of 2012, the Early Mortality Syndrome (EMS) had taken a big toll on the Thai (and other Asian countries) shrimp industry. It is believed to be caused by bacteria called Vibrio Parahaemolyticus. The disease was first found in China and Vietnam in 2010, Malaysia in 2011, and Thailand in 2012.

This caused shrimp production in Thailand to decrease by more than 50 percent within the first half of 2013 (Department of Fisheries, 2013). As a result of EMS, Thai farm gate shrimp prices have risen more than 60 percent from 2012's level, leaving Thailand at a significant disadvantage over other exporting countries in terms of both price and supply (TFFA, 2013).

Thai Shrimps in the U.S.A. Market

Shrimp exported to the U.S.A. have been relatively static over time. As Table 1 shows, there was no collective growth in shrimp imports from Thailand seen from 2010 to 2015. This low growth is attributed to the U.S.A. seafood market as well as economic instability resulting from the 2008 economic crash (Globefish, 2011). While figures in 2012 onwards fell sharply due to production slowdown in Thailand (Globefish, 2012) and continued in 2013 as situation worsens largely due to the acute Emergency Mortality Syndrome (EMS). This caused the productivity of Thailand to drop by 300 metric tons or over half the original output from 2011 to 2013. Thai shrimp's average price in the U.S.A. in year 2011 was at 9.47 USD per kilogram whereby in 2013 the average price rose to 11.47 USD per kilogram (TFFA, 2014). In 2013, Thailand lost its number one market share to India for the first time. Volume and market share of major exporters of shrimp to the U.S.A. between years 2010 to 2015 is demonstrated in Table 1.

Table 1 Volume and market share of major exporters of shrimp to the U.S.A., 2010-2015

Country of Origin	2010		2011		2012		2013		2014		2015	
	1000 Tonnes	%	1000 Tonnes	%	1000 Tonnes	%	1000 Tonnes	%	1000 Tonnes	%	1000 Tonnes	%
India	30.3	5%	48.2	8%	66.0	12%	94.4	19%	108.7	19%	135.7	23%
Thailand	203.4	36%	185.8	32%	136.1	25%	84.2	17%	64.4	11%	73.6	13%
Indonesia	61.1	11%	70.3	12%	74.1	18%	81.1	16%	103.3	18%	114.4	20%
Ecuador	65.0	12%	73.8	13%	81.5	14%	74.5	15%	92.3	16%	85.6	15%
Vietnam	48.5	9%	45.4	8%	41.2	8%	59.9	12%	73.2	13%	60.3	10%
Others	153.2	27%	153.6	27%	145.0	23%	114.4	21%	125.7	22%	116.7	20%
Total	561.5	100%	577.1	100%	543.9	100%	508.5	100%	567.6	100%	586.3	100%

Source Globefish (2013) and Urner Barry (2016)

Competitiveness of Shrimp Industry

In general competitiveness is assessed from price and quality from the importer's point of view. Price of a product is determined based on activities including production (cost of farm raw material production inputs and factory-level processing costs), shipping costs, marketing costs, and costs for sales and after-sales service (Porter, 2008). Price competitiveness between countries is also influenced by factors like wage rates and input costs within those countries (Hallak & Schott, 2011). A number of studies have shown that price is an element of competitiveness in agricultural industries, including seafood and shrimp production (Bui Nguyen Phuc, 2011; Islam & Habib, 2013; Jung et al., 2011; Rieple & Singh, 2010; Sangho et al., 2011; Zokaei & Simons, 2006).

While quality can be defined as the perceived fitness of the received good for the purpose the consumer intends to use it for (Hallak & Schott, 2011). At the country level, quality may be generalized into a country of origin (COO), which is a stereotypical set of assumptions about the quality and characteristics of the country's goods in general (Porter, 2011).

Several researches highlight that quality is a major concern in the shrimp export industry (Dubay et al., 2010; Freitas et al., 2009; Loc, 2003; Sangho et al., 2011). There are a number of quality measurements that are specific to the shrimp industry. Loc (2003) measured quality based on production hygiene, freshness, aesthetics, and food safety of the finished product. It is also important that firms provide strong customer services. Services can include aspects such as prompt delivery, overseas inventory management support, reliability in supply volume commitment. Since the shrimp industry is a perishable industry, quality could also be measured by how rapidly the product moves through the supply chain (Delen et al., 2011).

Some measures of seafood quality are environmental or social values. Dubay et al., 2010's study of shrimp fisheries in Mexico found that environmental pollution was related to quality of the finished product. Sustainability is a growing quality concern for some seafood consumers (Barclay, 2012). Sustainability as a quality measure refers to the extent to which present fishery exploitation (or farming, catch, and processing) influences future fisheries stocks (Barclay, 2012; Dubay et al., 2010).

Research Framework and Methodology

This research attempts to explore two key issues. First, it will explore the supply chain of Thai shrimp industry by looking at it from first stage of farming until it reaches international consumers. Second, it will explore the competitiveness of Thai shrimps in the U.S.A. market through quality and cost & price assessments. The comparison of competitiveness is made with Thailand's

three key competitors - India, Ecuador, and Indonesia. Research framework for assessing competitiveness is shown in Figure 1.

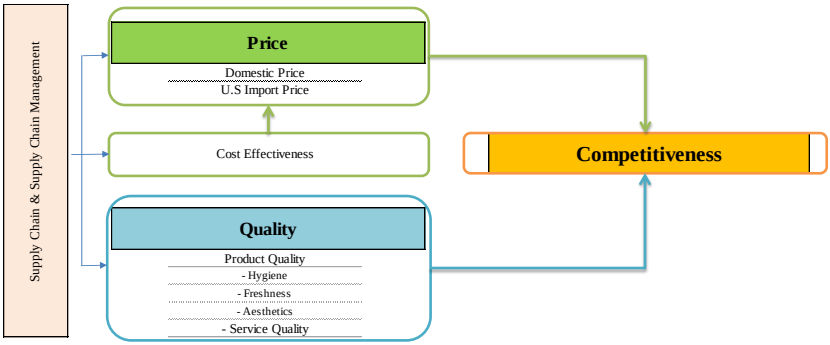


Figure 1 Research Framework for Competitiveness Assessment

This research employed a qualitative research doctrine. Qualitative research relies on collection, analysis, and interpretation of non-statistical data (Hennink, Hutter, & Bailey, 2010). This data can include data from documents, interviews, observations or others. Analysis is conducted through various methods such as thematic or narrative analysis. Qualitative analysis has a number of strengths (Tracy, 2012). These include understanding complex situations and describing context and historical situations which allows deeper analysis of a particular situation than quantitative research (Hennink et al., 2010; Tracy, 2012). Data for the research will include primary and secondary data. Primary data is data the researcher newly collects for the research (Rugg & Petre, 2006). Purposive convenient sampling method was applied with the following judgment. For Thai companies – selection was made based on firms being producer of raw materials, processor and seller of finished products, representing the widest value chain in the industry with exporting destination to

the U.S.A. Size-based selection was used. Firms were selected from those having a listed value in the Stock Exchange of Thailand (SET) of 1 billion Baht or higher to ensure that the largest firms were selected. This resulted in the selection of the final three companies, which were amongst the two largest within the industry accessible to participate in the research. For U.S.A. importers, they are the prominent importers and sellers of shrimps in the U.S.A. In-depth interviews were conducted during 2013 to 2015 with nine key informants involved in the production, sales and purchases of Thai shrimps. Reliability of the interview question was tested using expert review or pre-testing. In this method, subject matter experts look over the questions and ensure they are likely to provide reliable information (Tracy, 2012). The interview was recorded with the permission of the interviewees and conducted at the interviewee's companies, as well as through VDO conference and phone calls.

Profiles of the key informants are shown in Table 2.

Table 2 Summary of Key Informants' Profiles

Interviewee	Company	Position
Shrimp companies in Thailand	T1	General Manager, Shrimp Business Unit
Shrimp companies in Thailand	T1	Managing Director, Shrimp Business Unit
Shrimp companies in Thailand	T1	Procurement Head, Shrimp Business Unit
Shrimp companies in Thailand	T2	Procurement Head, Shrimp Plant
Shrimp companies in Thailand	T2	Production Process Development Manager
Shrimp companies in Thailand	T2	General Manager, Process Development
US shrimp firm	US.1	Senior Vice President
US shrimp firm	US.2	Senior Director
US shrimp firm	US.3	Founder & President

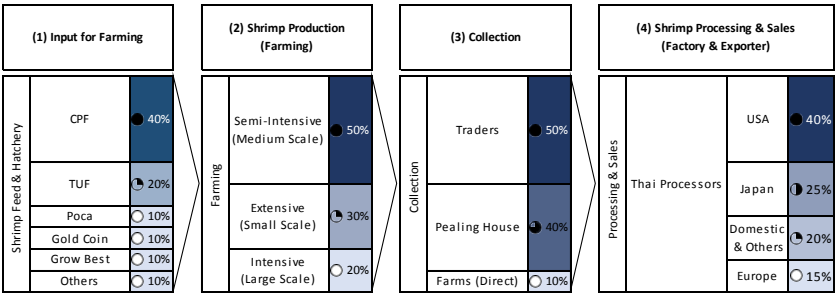
Source Author

Findings

Findings and analysis of the first two objectives (1) Thai shrimp supply chain from producer to consumer and (2) competitiveness of Thai shrimp in the US market through analysis of price and quality competitiveness between Thailand and its main rivals; India, Ecuador, and Indonesia from the perspective of Thai processors and U.S.A. importers.

1. Thai Shrimp Supply Chain

From the interviews, it is found that shrimp industry supply chain can be segregated into four key stages – (1) input for farming, (2) farming, (3) collection, and (4) processing and sales. The industry is dominated by large processors which supply seeds, feeds and laboratory services to farms, then buy harvested crops from those farms, process, manage the export, and imports to the destination markets. Thai shrimp supply chain can be drawn out according to Figure 2 below.



Source Author

Figure 2 Thai Shrimp Supply Chain

Shrimp farming can be classified into three categories; extensive, semi-intensive, and intensive. The classification is generally categorized by the number of ponds each farm has, that is, intensive (approximately over 50 ponds), semi-intensive (approximately 10-50 ponds) and extensive (approximately 1-10 ponds). Intensive farming are typically large-scale company-run operations while extensive farming are merely small family businesses. Thai key informants estimated that majority of shrimp farms in Thailand are semi-intensive farming at over 50%, while intensive farming was at 20%, and extensive farming 30%.

Initial upstream operation stages include feed mills, hatcheries and farms that consist of both company-owned and independent operators. It is interesting to note that at the processing stage, some companies have their own feed and hatchery operations, however, the shrimps they ultimately purchase into their factories derive from hatcheries and feed mills of numerous suppliers and not limited to only their own. There are two reasons for this. First, there is insufficient supply if only selective purchases are made. In the second stage, farms tend to be experimental of factors influencing their crop's growth rate, that is, farmers want to compare the strengths and weaknesses of baby shrimps from different sources with regard to how well they survive, how fast they grow, and the ultimate yield they generate per investment. Same goes to the feed and its impact on the growth rate of shrimp.

The proportion of sources of hatcheries and fries of the industry was estimated by key informants that 60% would come from top two major market players, Charoen Pokphand Foods (40%), Thai Union Frozen (20%), while the remaining 40% are from various fragmented small scale companies.

In the next stage, shrimp raw materials harvested from farms then flow through the supply chain to the factory processing stage through three main channels consisting of traders, pealing houses, and selling direct to the factories. Pealing houses are small-scale operators which do the initial processing of shrimp that are typically not carried-out at larger processor level due to its labor intensiveness. Pealing houses buy raw materials from farms, pre-process it, and then sell it to larger processors for further processing through traders. There are also direct sales from farms to larger processing plants or factories. For the overall industry proportions, key informants who are responsible for raw material purchasing from T1 and T2 companies estimated that 50% of shrimp are bought through traders, 40% are through partner pealing houses, and 10% are direct buys from farms.

After raw materials are purchased into factories, the production procedures starting from grading or sizing, de-heading, peeling all the way to freezing and packaging are performed. Orders are tracked through the batch production code. Then, products are loaded onto refrigerated shipping containers and exported to the markets which to includes the U.S.A. at approximately 40%, Japan approximately 25%, Europe approximately 15%, and the rest of the world for the remaining 20% of Thai shrimp output.

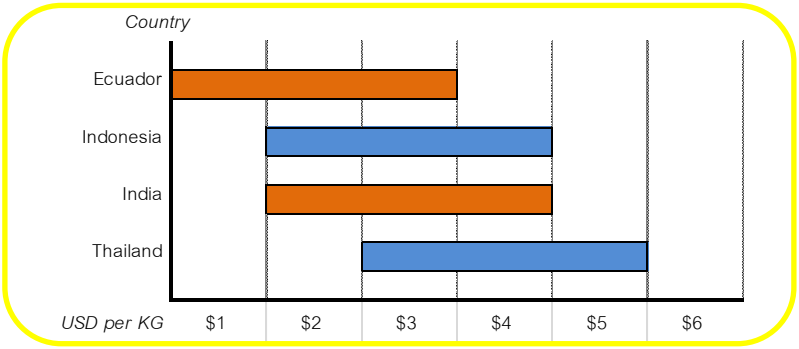
2. Competitiveness of Thai shrimp in the U.S.A. Market

Cost Competitiveness

From the interviews, it was found that here are three major types of shrimp farming: (1) Intensive, (2) Semi-intensive, and (3) Extensive systems. It was found that cost per kilogram of Thai fresh raw material shrimp from farm was at average 3-5 USD per kilogram, where farms were mostly comprised of a

blend of intensive and semi-intensive farms. Variable costs accounted for the largest share of total costs, in that, feed (shrimp food) was the most expensive variable input followed by shrimp fry (baby).

Productions in India and Indonesia has become more alike Thailand in the recent years and transitioning more from mostly extensive farming in the past to semi-intensive/intensive farming due to their increasing export to the U.S.A. and is perceived to have relative costs at approximately 2-4 USD per kilogram depending on sizes. While Ecuador which seems to have more blend of extensive farming may enjoy lower cost of product at 1-3 USD per kilogram as they are not very labor intensive and have no significant technical investment, but the trade-off is lower productivity due to the lower-density of crops in each pond and, thus, lower overall output of supply to offer. Shrimp farm production costs are indicative to the export selling price and ultimately U.S import price of frozen processed finished product because it accounts for 70% of total finish product cost. The estimated cost of production of shrimps from Ecuador, Indonesia, India, and Thailand is illustrated in Figure 3.



Source Interview with key informants

Figure 3 Cost of shrimp farming of four key shrimp exporting countries

Regarding the processing process, shrimp processors bare processing costs per the following structure:

Table 3 Typical processing cost structure of a process raw frozen shrimp product

Costs	Percentage %
Raw Material/ Shrimp	70-80%
Processing Costs	15-20%
Others	5-10%
Total	**100%**

Source Interview with key informants

The key informants explain that farming costs, or cost of raw materials lead to price differences in the international trade because they are the difference in price that processors and exporters paid on different sizes of raw material shrimps which are major determinates (approximately 70%) of their total cost. For other factors that have the impact on imported price are processing cost and additional exporting risks, such as import duties as some importing countries impose Countervailing Duties on Thai shrimps.

The U.S.A. Import Price

The recent emergence of EMS was seen as a significant problem for the industry. All key informants identified it as the main issue in Thailand causing the country to fall from first to third position in U.S.A. market. The reduction in its export derived from two intertwined causes. First lack of supply, and second, higher price. With regards to the higher price, one key informant emphasized that the U.S.A. market is very price sensitive. He explained:

"The U.S.A. market is a very price sensitive market. To a large extent there is not much loyalty with the end customers. Price is the most important factor for us. Quality is number two. We have our own specifications. We buy from 17 countries. We can change from one country to another depending on seasonality, price and demand. Also support, reliability and relationship matter." (U.S.A.1, 2014)

Moreover, India's rapid increase in production by over 400% from 2009 to 2013 significantly threatens Thailand's dominant position in the U.S.A. market. While Ecuador has sometimes had price advantage, the production scale is small and product varieties are limited.

Another worth noting key issue that impacts competitiveness factored into the pricing aspect is the anti-dumping duty that was imposed on shrimps imported from certain countries. Per interview with informant U.S.A. 3, average anti-dumping duties being charged in 2013 to subject-merchandize shrimps from Thailand, Vietnam, and India were 1.10%, 6.37%, and 1.97% respectively. However, no duties were charged to Indonesian, and Ecuador shrimps.

All U.S.A. key informants agreed that overall supplies of shrimps in India, Indonesia, and Ecuador have all improved over the recent years by more than 50% increase in output while Thailand was on a downward trend. Key informant U.S.A.3 stated the rising status of Indonesian shrimp in the U.S.A. with an increasing quality, production and supplies. China also has the potential but high demand in local consumption prevents them from exporting too much. However, China now purchases shrimps from Vietnam which were commonly imported from Ecuador for reprocessing.

From the interviews, it is found that U.S.A. buyers purchase more from Indonesian companies, while Indian companies are dominating the market with its most competitive export prices, volume, and product sizes unmatched by elsewhere. Ecuador has its presence, but would be considered the least concern as a major part of their products goes to Asian countries such as Vietnam and China rather than the U.S.A.

However, key informant U.S.A.1 summarizes that *"Price of shrimp changes year to year depending on demand. There were times in India, supply exceeded demand, and they were extremely competitive then. Ecuador expanded quite rapidly, there were times when Ecuador had the lowest price.... India opened even more markets. The shrimp industry would switch each year between being the seller's market and buyer's market."* (U.S.A.1, 2013)

Interestingly, the research finds that changes in shrimp export price impact the U.S.A. market shrimp price index directly but not as extremely and simultaneously to the end customers. This is because of large margin gaps (30-40 percent) between U.S.A. imported price and U.S.A. retail price to supermarkets and food services. This high margins act as a demand buffer as retail prices would only gradually change to lessen the impact to price sensitive end consumers which, if in the case of end prices do increase, may result in their switching to purchase substituted products.

Overall, all three U.S.A. key informants stated that Thai shrimp has the lowest price competitiveness. Ecuador seems to have the best position in terms of price (two out of three US key informants mentioned that in comparison to other three countries, Ecuador has the best price competitiveness). For India,

there was no consensus among the key informants. Whereas two out of three U.S.A. key informants put Indonesia at the third rank. Figure 4 presents the summary of a perceived price competitiveness (derived and aligns with cost competitiveness) between Thailand, Indonesia, India, and Ecuador ranked by the three key U.S.A. shrimp importers.

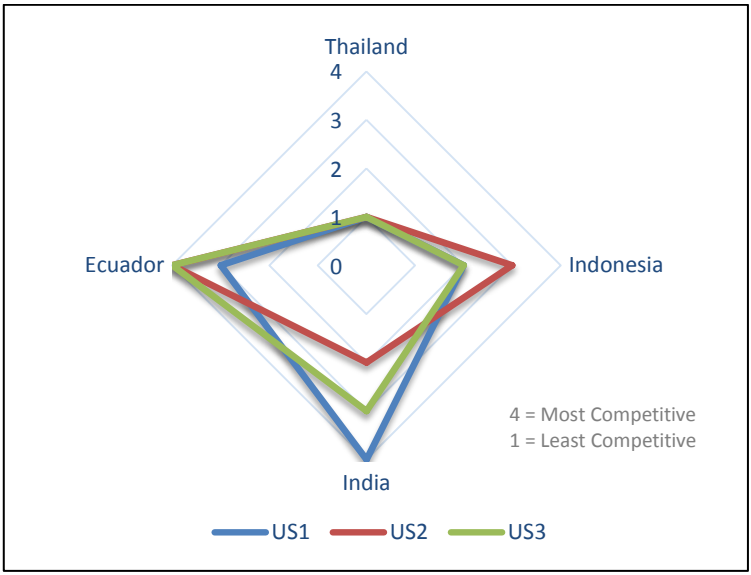


Figure 4 The comparison of the perceived price competitiveness of shrimps from key exporting countries

Product Quality

Product quality as discussed earlier includes aspects covering food safety, hygienic practices, freshness, and aesthetics. In terms of food safety, it is found that the quality has to comply with product specifications and safety standards set forth by customers. This includes a minimum safe handling and storage temperatures, sanitation, and timing.

Most major producers in Thailand have held at least the quality standards including GMP, HAACP, BRC, BAP (ACC), ISO9001, ISO14001, and OSHAS18001 at the processing plant level which U.S.A. customers require. Key informants stated that their quality was controlled by tracking systems that stayed in place during the shipping process. Purchasing order numbers and container numbers are used to track the product to its destination. Transformation Temperature Range (TTR) temperature recording devices are installed in each container, which are inspected at the destination ports. Key informants pointed out, *"After finishing production and packaging, products are loaded into refrigerated containers and hauled out. It takes from a few days for domestic customers, and up to 40 days for export customers. We use our status report and web based system which we communicate with our freight forwarder and importer." (T1, 2014)*

"Processes are in place to control production so that products are manufactured as required. Timing of production is controlled very precisely. There can be no delays as the temperature of raw materials must be within the specified range throughout the whole production process from start to finish." (T2, 2014)

As for hygienic practices (biological and chemical), it starts from the farm level in this past year due to the EMS disease. Key informants have shown increased effort in maintaining more consistent quality at this stage of the supply chain in order to close any gap of possible causes of the disease, including controlling genetics, improving brood stock quality, and reducing V. Parahaemolyticus bacteria exposure. A few methods mentioned by the Thai companies were by means of relationship building with upstream industry such

as feed, farm and hatchery operators and transfer technology and knowledge for quality control. Without proper control and training, individual farmers may, under misconceptions, turn to illegal antibiotics that are not permitted by the U.S.A.

In terms of aesthetics, retail and restaurant chains in the U.S.A. demand more than just good price. Thai shrimp is still perceived by all U.S.A. key informants as the highest quality shrimp and reserved for more premium products and end-customers. While India produces larger, harder to peel shrimp that are not as often demanded in the U.S.A. market. India does not receive good product quality perception, has inferior logistic supply chain, and lacks infrastructure over which Thailand has some advantage. China, Vietnam, India, and Ecuador all have advantages in terms of the size of production, but do not have the aesthetic quality or government support at the same level as Thailand. The following are perspectives from U.S.A. companies interviewed,

"Right now India is the number one position which exceeded Thailand in volume this year (2014). Thailand is number two but still has advantage in terms of capacity and value-added, cooked, easy peel. India's difficultly is the sizes that are usually on the larger end, and lower production capacity." (U.S.A.1, 2014)

One of the key informants added in favor of Thailand that, *"American consumers are not conscious of where the raw materials came from. Importer and distributor buy from Thailand due to quality, consistencies, and large volume… Consistency and aesthetic quality is really the key, so they want to buy from Thailand…. Ecuador is a great place to buy shrimp if you do not*

need value-added shrimp, they do not have a good industry for processing." (U.S.A.3, 2014)

Services

Beside product quality as the core aspect of competitiveness, it is found that the quality of services provided by the processors and exporters also have an impact on buyer's buying decisions and cannot be left unattended. U.S.A. importers demand high quality of service, reliability, and full traceability. This is something that Thailand has higher quality in comparison to the other three key competitor.

It is interesting to note that from the U.S.A. buyers' perspective, they perceived that India has poor infrastructure, which made it unappealing to commute to for business meetings and on-site visits for product verification and auditing in comparison with Thailand in which plants are located less than an hour's drive from metropolitan Bangkok. Thailand was viewed by key informants as more capable of managing on time deliveries, overseas inventory management, reliability in supply and product quality. It also offers a wide variety of value-added products. By and large, it is conclusive from the interviews that Thai shrimp has the highest quality competitiveness as shown in Figure 5.

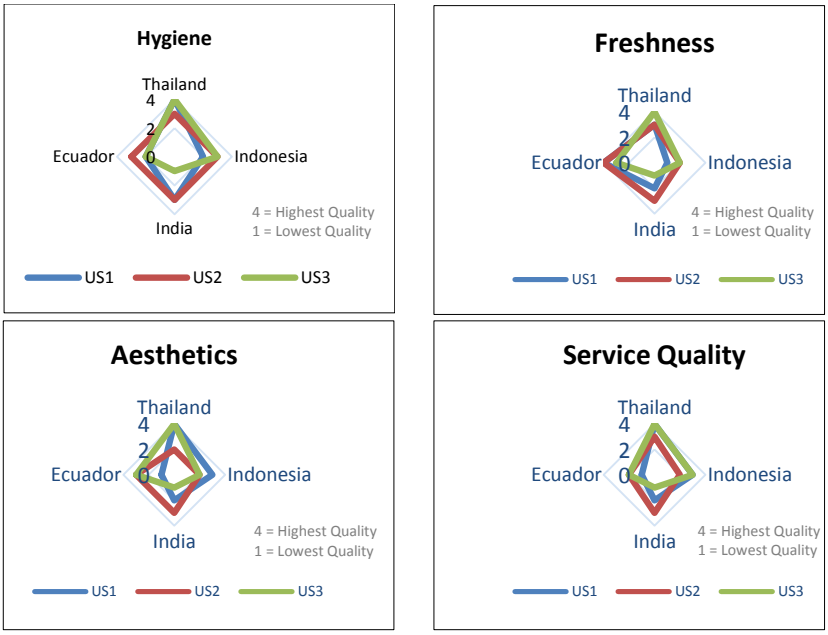


Figure 5 The comparison of the perceived product quality of shrimps from key exporting countries

To sum up, the comparative quality and price between Thailand, Indonesia, India, and Ecuador ranked by the three key U.S.A. shrimp importers can be summarized per Figure 6.

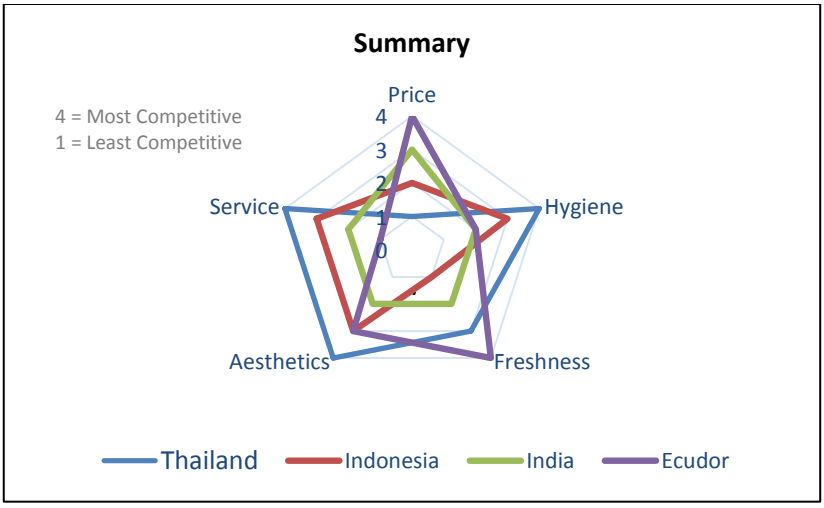


Figure 6 The comparison of the perceived competitiveness of shrimps from key exporting countries

In general, the competitive nature of the industry is that of cost leadership. This means that the company that can produce the cheapest product (while still meeting minimum quality standards) will be able to compete best in the market (Porter, 2008). This suggests that price would be one of the main competitive advantages that a country's production system could offer. This can be seen both in statements about origin and brand being unimportant to US consumers and about the dominance of price concerns. Thus, in theory, in order to compete successfully in the US market, it will be necessary for countries to be highly cost-efficient at shrimp production. However, recent events such as the outbreak of EMS in Southeast Asia have created market pressures that have increased the price of shrimp past the price of production around the world (Stewart, 2014). Thus, under conditions of strained supply, the

price advantage of countries may be obscured by generally high prices. It also obscures the problem that price leadership means that quality and other factors cannot be ignored (McWilliams & Siegel, 2011). As the primary analysis showed, this is a significant problem for some competitors, especially India and Indonesia. There is also the problem of international commodity markets as well as factors like import duties and tariffs (Porter, 2011). In general, the countries examined all have low wage rates, one of the key factors in the production cost (Hallak & Schott, 2011). However, differences in cost structures (such as the difference between low-density and high-density farming) mean that it can be difficult to understand how production costs actually influence competitive advantage in the US market. This is generally consistent with the literature, which suggests that price competitiveness is in theory a significant advantage, but in practice difficult to both measure and sustain.

The second basis of competitive advantage considered for the US shrimp market was quality. Production quality determinants included time, temperature, and sanitation, as well as farming quality (which can involve issues like disease or chemical or antibiotic contamination). Production quality was one of the main factors that companies selected their suppliers for, but it was not generally considered a major factor for the end market, which was mainly focused on cost. There is evidence to support the importance of quality in the literature with quality concerns like freshness and hygiene (Loc, 2003) and speed at which the product moves through the supply chain (Delen et al., 2011) being relevant. In general, these findings supported an operational understanding of quality in a technical sense, rather than a vaguer emotional or social status sense as can be understood in some products (Hallak & Schott,

2011). In general, quality can be assumed to be a significant competitive advantage in the US market. However, the quality that is important includes consistency, production quality, and freshness rather than branding efforts.

Conclusion and Managerial Implications

Through the examination of supply chain, this research found that Thai shrimp industry is dominated by large processors which supply seeds, feeds and laboratory services to farms, then buy shrimp from those farms, process, manage the export, and U.S.A. importers which imports to the destination markets. Sixty percent of hatcheries and fries in the industry come from two major market players, Charoen Pokphand Foods (40%), Thai Union Frozen (20%), while the remaining 40% are from various fragmented small scale companies.

The relationships between processors, suppliers, and farmers in Thailand are easily recognizable. A great deal of evidence from this research show the sign of strategic supplier relationships, knowledge and technology transfer that help to ensure the supply of raw materials meet their supply, cost, sustainability and quality that are required of by the U.S.A. market.

The dynamics and changes of the business environment of the industry have to be carefully monitored as they effects the competitiveness of the industry. For example, while India's production capacity has increased rapidly its current problem lies in the inability to process the shrimp effectively. Indian shrimp is often identified by the U.S.A. importer as being below quality, in particular being prone to disease and antibiotic and chemical contamination.

Indonesia used to have problems on production quality. However, this research finds that Indonesia has improved its quality and now can keep up with international quality demands and standards. Ecuador uses low-density shrimp farming practices. Low-density shrimp farming reduces the potential for disease contagion, though it also reduces production per hectare. This has allowed Ecuador to take a leading role in global shrimp production, including direct exports to the U.S.A. as well as exports to countries like Vietnam. Combining each country's advantages and disadvantages from the primary research into consideration, this puts Thailand in a tough position as illustrated in the below figure.

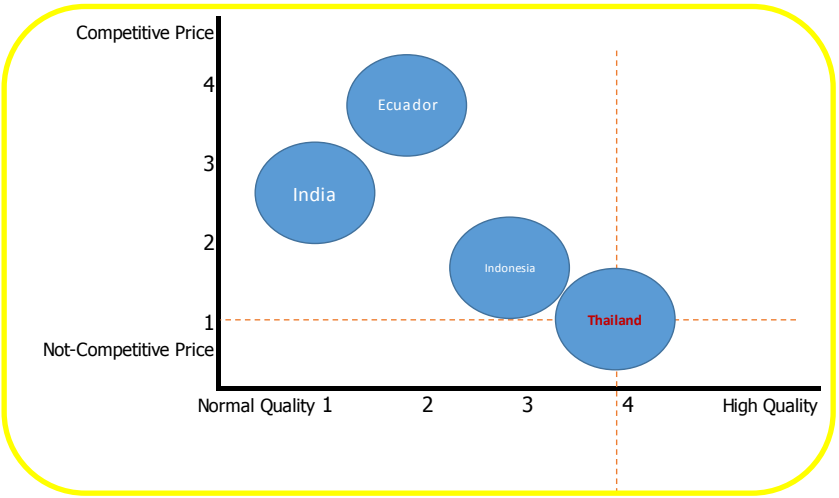


Figure 6 Thailand's competitiveness in comparison to other countries

Thailand is a strong player in the U.S.A., based on production practices, density, quality, and sizes produced as well as the volume Thai producers can handle. For managerial implications, at firm level, the most vital

recommendation is that control on production costs must be pursued. Senior members of US companies' informants were asked about these questions, and the recommendations from primary research can conclude that the U.S.A. market is highly price-sensitive and the consumers do not particularly care about the country of origin of their shrimps. American buyers are determined to incur only lowest possible costs and there is no end-customer brand loyalty. However, standard quality has to be maintained as U.S.A. market has high requirement of the quality control. Therefore, Thai shrimp producers need to control costs without sacrificing the quality of the end product in order to remain competitive.

Cost control is attainable through (1) increased level of raw material supply, as per the aforementioned cost structure, raw material cost is 70-80% of total costs, Thai informants are aware and are working on improvements in the areas of breeding and farming practices are. The biggest issue is shrimp genetics, which are at the heart of the EMS outbreak currently impacting supplies. However, there are also other problems, like chemical and antibiotic contamination, that can enter the supply chain at this stage. Thus, Thai producers should work closely with their suppliers in order to control production quality at the upstream hatchery and farm level. This could involve technological and knowledge transfers, and could even involve encouraging smallholding shrimp farmers to band together into cooperatives to facilitate better production practices. In the long run, Thai shrimp producers need to advance their production technologies in order to better control disease without antibiotics, to ultimately increase supply and attain lower raw material costs. (2) Efficient supply chain management which starts from distribution channel

integration, management of the sourcing, flow and control of materials using a total systems perspective across multiple functions and multiple tiers of suppliers and functions including buying and selling, auctioning, transportation, grading, packaging, storaging, financing, market information and pricing all are essential for lowering costs (Islam & Habib, 2013). From Table 1, Thailand figures for 2015 imports have already begun to show positive signs of improvements.

Last but not least, for Thai shrimp export markets, the U.S.A. is the main export destination at approximately 40% of total country's shrimp output, followed by Japan (25%), Europe (15%), and others (20%). Diversification to mitigate existing overflowing competition in the same current area, channels, and products that other competitors are needed. Market diversification to other markets outside the U.S.A. such as the Middle East, Latin America, and East Asia can help lessen the dependency and competition while competitors are focused on the U.S market. Moreover, firms should consider diversifying their product varieties by expanding the number of value-added shrimps to reduce direct commodity competition and leverage Thailand's higher level of technological advances in production capabilities.

At country level, the government policy can play a critical role in improving the competitiveness of shrimp industry. Research and development is one key area that the government can help private sector to improve the quality and price competitiveness. Moreover, many barriers such as anti-dumping regulation, Generalized System of Preferences tariff, human rights and Illegal, Unreported, and Unregulated (IUU) workers in fisheries industry, and sustainability and environmental management including how to prevent

decease of EMS have become key emphasis of importers in developed countries. Private sector cannot resolve these issues alone. Education and regulations have to be put in place to help with the adaptation to the higher requirements of the market in the near future.

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Appendix

Ranking of five aspects of competitiveness in imported shrimp by U.S.A. key informants

Aspects of Competitiveness of Imported Shrimp	Country	US1				US2				US3			
		Best			Worst	Best			Worst	Best			Worst
		4	3	2	1	4	3	2	1	4	3	2	1
Price	Thailand				1				1				1
	Indonesia			1			1					1	
	India	1						1			1		
	Ecuador		1			1				1			
Hygiene	Thailand	1					1			1			
	Indonesia			1			1				1		
	India		1				1						1
	Ecuador			1			1					1	
Freshness	Thailand		1				1			1			
	Indonesia				1			1				1	
	India			1			1						1
	Ecuador	1				1					1		
Aesthetics	Thailand	1						1		1			
	Indonesia		1					1				1	
	India			1			1						1
	Ecuador				1		1				1		
Packer's Service Quality	Thailand	1					1			1			
	Indonesia		1					1			1		
	India			1			1						1
	Ecuador				1			1				1	

Source Interview with key informant