



OVERCOMING BARRIERS OF FOOD SUPPLY CHAIN IN MALAYSIA BY JAPANESE FOOD COMPANIES

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Keywords

food industry, supply chain, Japanese food companies, Malaysia, Japan

ABSTRACT

The food manufacturing industry in Malaysia plays a significant role in the economy. Since the industry is dominated by small and medium-sized enterprises, the local food manufacturing sector is not able to satisfy increasing demand. Malaysia has experienced a persistent food trade imbalance as the demand for food items has risen faster than their supply. In helping Malaysia become more self-sufficient in its food requirements, improvements in the supply chain are important. Given that Japan is a supply chain superpower and for years has been an important trading partner for Malaysia and contributes capital, technology and management expertise to it, its supply chain management practices need to be closely studied. Supply chain management was studied using a qualitative survey involving several Japanese food companies operating in Malaysia. The main aim of this paper is to explore the underlying problems concerning supply chain management that Japanese food companies in Malaysia experience. The approaches with which Japanese food companies overcome these problems are examined.

JEL Classification

M10, M11, M19

1. INTRODUCTION

The food and beverages industry is one of the most important sectors in Malaysia's manufacturing industry. The food-processing sector accounts for about 10% of Malaysia's manufacturing output and is considered one of the backbones of the Malaysian economy. Although exports from this sector have doubled in the last ten years, Malaysia continues to be a net importer of food products. Food manufacturing is largely domestic and small and medium-sized in scale. For this reason the local food processing sector is not able to cater for the rising demand for food. The need to have a well integrated supply chain in the food manufacturing companies has been articulated in the Malaysian Third Industrial Master Plan (2006–2020). Therefore, it is the aspiration of the Malaysian government to position the country as a prime food producer and trader in the Asian region by encouraging supply chain integration.

As a developing country, Malaysia was dramatically transformed from an agrarian economy at independence in 1957 through a rapid process of industrialization. Japanese trade linkages with Malaysia has grown along with the structural transformation. Since The Look East Policy was launched in 1981, Malaysia aimed to emulate and learn from Japan and other countries, the technological know-how, work ethic and management system that have been the ingredients for economic success. Accounting for Japan is a

supply chain superpower – albeit one facing a host of unique challenges (Inagaki & Kuroda 2007), its supply chain management practices should be learnt by countries such as Malaysia. The complexities of food supply chain impose enormous challenges to food processors. The unique features of the food industry such as the perishable nature of food products differentiate it from other sectors of the economy, and have intensified the need for an efficient supply chain. Therefore, it is aim of this paper to explore the barriers in implementing food supply chain integration by Japanese food companies in Malaysia and the approaches with which Japanese food companies overcome these problems.

The following sections will, in order, provide a literature review. It is then followed by an overview of the food industry in Malaysia and outline of the methodology used in this study. Finally, barriers in supply chain integration faced by Japanese food companies and how they address the problem will be discussed. This analysis will help domestic food companies improve and manage their food supply chain and provide data to Japanese food companies and other companies around the world about their investment strategy in Malaysia's food industry.

2. LITERATURE SURVEY

A supply chain refers to a network consisting of a series of companies involved in the manufacturing and delivering products or services to end customers (Mentzer et al. 2001; Wisner, Leong & Tan 2005). In short, the supply chain encompasses steps taken in order to get the good or services from the supplier to the customers. The primary objective of a supply chain is to create value in terms of quality, cost, speed and flexibility to the end customers as well as companies in the chain (Chow et al. 2008; Walters & Lancaster 1999; Wisner, Leong & Tan 2005). The various benefits of integrated supply chain management have been suggested in previous studies. Integrated supply chain management will enhance the ability to design products faster (Ajmera & Cook 2009), lead to reduced costs (Management Accounting Committee 1999), stock-outs and lead-time (Talib, Rahman & Qureshi 2011), improvements in service effectiveness and cost efficiency (Richey et al. 2010) and better forecasting accuracy and reduced cash-to-cash cycle time (Katunzi 2011). While the strategic importance of integrating operations is widely accepted, in reality such integration faces several impediments. Several studies have addressed various issues that need to be considered when accomplishing integrated supply chain management (see Table 1). Furthermore, there is evidence to suggest that various industries may have different practices and expectations when implementing supply chain management and this makes the whole process incredibly complex. Following Li et al. (2006, p.119) supply chain management practices may be influenced by contextual factors, such as type of industry, firm size, a firm's position in the supply chain, supply chain length, and the type of supply chain. Larger firms may have more sophisticated supply chain management practices since they usually have more complex supply chain networks necessitating the need for more effective processes. In other study, Mollenkopf and Dapiran (2005) demonstrated that the motor or transport and the chemicals/petroleum sectors function the best. Conversely the food processing and distribution sectors as well as the clothing and textile sectors are weak in their logistics and supply chain competencies. This research uses the Supply Chain 2000 Framework to analyze logistics/supply chain capabilities and competencies of Australian and New Zealand firms. Further, Jharkharia and Shankar

(2006) investigated the supply chain practices in four sectors of the Indian manufacturing industry: Auto, Engineering, Process and FMCG (Fast Moving Consumer Goods) sector. Their findings revealed that different sectors had adopted supply chain management practices based on their own constraints and working environments. This is due to the fact that different economic sectors have different operational and working techniques.

Following Kauffman, Crimi and Stading (2006) countries and their industries vary in supply chain management practices. Therefore managing supply chain demands additional information on subjects that include: international logistics, laws, customs, culture, ethics, language, politics, governments, and currency. In a study by Chow et al. (2008), the authors used different constructs for different countries. This is due to the fact that organization, management culture, etc., will differ from place to place. Similarly, Halldórsson, Larson and Poist (2008) argued that the different results for Scandinavian and American perspectives on supply chain management are due to countries having a different management styles. Further, Jharkharia and Shankar (2006) found that business environments in the United States, Australia and New Zealand firms are very different with reference to managerial competency.

Table 1: Previous Studies on the Overriding Obstacles that Impede Supply Chain Integration

Authors	Identified barriers to supply chain integration
Chopra and Meindl (2001, 2012)	Requires proper training and preparedness; willing and competent trading partners; and, potentially a change in one or more organizational cultures.
Walker, Di Sisto and McBain (2008)	Cost and lack of legitimacy, poor supplier commitment and industry - specific barriers.
Gou, Ma and Li (2008)	Shared information between supply chain partners can only be fully leveraged through process integration.
Brown (1998)	Continuous information flow is very important in operating an integrated supply chain, and optimizing the product flows cannot be accomplished without implementing a process approach to the business.
Omain et.al (2010)	Lack of trust and senior management support, incompatible information technology system and functional silos.
Management Accounting Committee (1999).	A decision must be made on the nature of the linkages, either physical or virtual as in complete integration; the partners must share all relevant information.
IBM (2009)	Lack of visibility due to data silos, lack of predictability and an inability to identify changes necessary to get processes back on track; incomplete information due to incomplete reporting systems and optimization at the local level.

Lambert (2008)	Trading partners must concentrate on sharing sales and forecast information in order to maximize profits for the entire supply chain membership, not just for themselves.
Cachon (1999)	Balancing retailer order intervals and a flexible quantity strategy must be considered to reduce the supplier's demand variance, however, this strategy is only effective when there are few retailers and consumer demand variability is low.
Cachon and Fisher (2000)	Lack of information visibility along the supply chain is a common supply chain process integration problem.
Wisner, Leong and Tan (2005)	Requires an ongoing training regime. When education and training are curtailed, innovation cannot occur, and innovation fuels supply chain competitiveness.
Katunzi (2011)	<i>silo mentality</i> , lack of supply chain visibility, lack of trust, lack of knowledge and activities causing the bullwhip effect.

Over the past decade consensus has grown concerning the strategic importance of integrating suppliers, manufacturers and customers. Most previous studies on supply chain management practices were conducted in developed nations such as the United States, European countries, Australia, and New Zealand (Kemppainen & Vepsäläinen 2003; Mollenkopf & Dapiran 2005; Olhager & Selldin 2004; Sohal, Power & Terziovski 2002; Tan 2002; Wong, Arlbjørn & Johansen 2005). Less attention has been paid to developing countries and specifically those in Asia (Chow et al. 2008; Xu, Zhu & Gibbs 2004; Zailani & Rajagopal 2005). According to Xu, Zhu and Gibbs (2004) firms in developing nations may react differently due to distinct economic settings such as market imperfections, information asymmetries, less supportive regulatory frameworks, immature technology infrastructure and less developed supply chain networks. Therefore, to further investigate supply chain integration, a focus on specific constructs that suit a particular country is required. For this reason the present study intends to contribute to deepening our understanding of the barriers to implementing supply chain integration in Malaysia.

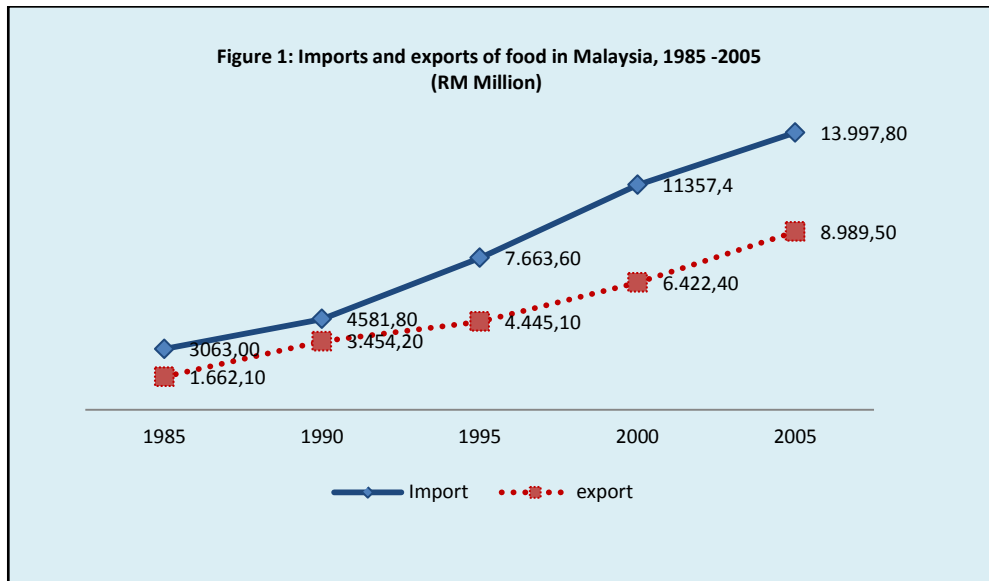
3. AN OVERVIEW OF THE FOOD INDUSTRY IN MALAYSIA

The manufacturing sector in Malaysia developed significantly when the government created the First Industrial Master Plan for 1986-1995 with an export-oriented industrialization strategy (Karim & Ahmad 2012). During the early 1980s, Malaysia's economy was about to shift from a dependence on the export of primary commodities to the development of a heavy manufacturing industry. Food and agricultural policies at that time were merely aimed at increasing the production of export commodities such as cocoa and oil palm. After the 1985-1987 recessions the government realized the need to focus on the production of final food products to diversify the economy (Radam, Yacob & Shah 2008). Therefore, starting in 1985, several government policies were established,

namely the First Industrial Master Plan 1986–1995, Second Industrial Master Plan 1996–2005 and Third Industrial Master Plan 2006–2020.

Under the Industrial Master Plan 1986-1995, the food processing industry was identified as a top priority for development. This was determined on the basis of its potential contribution to manufacturing, particularly with respect to more employment, better foreign exchange and value-adding. The rationale for developing this sector lies with the fact that the industry is strongly linked to other sectors of the Malaysian economy (Ahmed 2012). During this period, local production of food rose to approximately 4.2% per annum. This increment, however, has not been able to match domestic demand and resulted in rising imports especially during 1990–1995 (see Figure 1). Malaysia has experienced a persistent food trade imbalance because the demand for food items has risen faster than their supply (Ismail, Sidique & Radam 2008). This trend remained during the Second Industrial Master Plan 1996-2005. Despite the contribution of the food processing industry to the country’s total manufacturing output increasing from 6.1% in 1996 to 9.9% in 2000, Malaysia remained a net importer during this period. The rising imports of food items were mainly due to increased demand from downstream processing of primary and intermediate food products (MITI 1996).

During the Third Industrial Master Plan 2006 –2020, the food industry expected to expand its capacities and enhance its competitiveness to meet domestic demand and increase exports. It is expected that the food processing industry will continue to be one of the major contributors of export earnings during the Third Industrial Master 2006 – 2020. The production of food commodities is expected to grow at an average rate of 7.6% per year through upgrading human resources and technology, enhancing R&D, producing and exporting high value-added and niche products, and implementing quality standards (MITI 2006).



Sources: Ministry of International Trade And Industry Report, various years

The food-processing sector account for about 10% of Malaysia's manufacturing output. Processed foods are exported to more than 200 countries, with an annual export value of more than RM13 billion, which amounts to two-thirds of the total food exports of over RM20 billion in 2012. Advances in processing technology have broadened the usage of local raw materials, expanding the range of products and increasing the investment absorbing capacity in the food industry. Although the export performance of this sector has doubled over the few past decades, at this stage Malaysia continues to be a net importer of food products with annual imports of more than RM36 billion in 2012 (MIDA 2012). Major imports were edible products and preparations, dairy products, sugar and sugar confectionery, cocoa and cocoa preparations and vegetables and fruits. The major items exported were edible products and preparations, cocoa and cocoa preparations, prepared cereal and flour preparations, dairy products and margarine and shortening (MIDA 2015).

The food manufacturing industry in Malaysia plays a significant role in the economy, however the industry is dominated by small and medium-sized enterprises. Food industries in Malaysia are experiencing several problems such as traditional technologies, sub-standard grades of raw materials and low product innovation (Senik 2010). Due to its small scale nature, the local food processing sector is not able to cater for increasing demand and therefore Malaysia currently has a negative trade balance for edible products and preparations (ETP 2010). Therefore the government wanted to see growth in the local food-processing sector, especially through the utilization of local raw materials. Malaysia's government has always encouraged supply chain integration in business operations and this was spelled out in the Third Industrial Master Plan (2006–2020) where one of the main objectives is to improve the country's global competitiveness (MITI 2006). Improvements in the supply chain are important in helping Malaysia moving move towards greater self-sufficiency in food.

4. JAPANESE-MALAYSIA TRADE LINKAGES IN BRIEF

The relationship between Japan and Malaysia is beyond that of trade which dominated the early stages of Malaysia's economic development. Japan not only provides additional capital to help speed up Malaysia's industrial development, but also helps provide job opportunities, training and technology transfer. Japanese investment also assists in promoting the relationship between the people of both countries. Considering the Japanese – Malaysia relationship, reference must be made to The Look East Policy and Malaysia's New Economic Policy (NEP) (1971-1990). While the Look East Policy sought to have Malaysians emulate the Japanese work ethic and business management techniques and to acquire Japanese expertise and capital, through aid, investment and trade cooperation (Som 2012), Japanese foreign direct investment was a key ingredient in the success of Malaysia's New Economic Policy (NEP) (1971-1990)(Smith 2003). Japanese investment provided capital, technology and management expertise for the rapid-oriented industrialization policy which was central to these reforms. Consequently, Japanese investment in Malaysia, based on paid up capital, increased from US\$32.6 million in 1980 to US\$69.1 million in 1981 and then to US\$139.9 million in 1982 (which by then constituted 26.5% in total foreign direct investment in Malaysia) (Lim 1999).

Continuing the trends that began in the 1980s, Japan continued to be the major investors in Malaysia throughout the 1990s. Since then, Japan remained a major source of foreign investment. In 2013 Japan, the United States, South Korea, Singapore and China jointly accounted for 75.1% of total foreign investments approved during the period (MITI 2013). Various foreign direct investments by Japanese companies in Malaysia's manufacturing sector since the 1980s include electronic and electrical products, non-metallic metals, basic metals, petroleum products, chemicals, and automobile industries and food beverages. While the number of Japanese companies that have been active in the food and beverage production industry is still fairly small, the food sector showed encouraging developments as the number of Japanese companies participating in this field has increased to 20 with the establishment of another Japanese company in Malaysia (Akhir et al. 2012).

5. METHODOLOGY

This research employs a constructivist ontology using qualitative methodology. Following Leung (1999) constructivism attempts to investigate the roots of social phenomena, each investigation being unique and its findings not able to generalizable to another similar phenomenon. Brand (2009) emphasizes the value of qualitative methodology in obtaining a better understanding of the "how" and "why" of respondents' perceptions which cannot be elicited easily from large-scale questionnaires. The research design chosen is in line with literature findings in that different countries have different practices in implementing supply chain management. By using qualitative methodology through semi-structured interviews this study is able to document the obstructions to internal supply chain integration and how Japanese food and beverage manufacturers in Malaysia address the issues.

Semi-structured interviews forms (guides) were designed after an extensive literature review on many aspects of the supply chain and its performance. The guide essentially captures the obstacles that food companies experience when attempting supply chain integration and how they deal with the challenge. As a means to assess validity, the semi-structured interview guide was reviewed by two experts based on their experience in supply chain integration in Malaysia: an academic from Malaysia's public university and someone who works in the industry. The reviewers were requested to uncover any flaws in the survey form design and provide comments on the suitability and clarity of the questions. Feedback from the reviewing process was incorporated into a revised survey form. This validity procedure is considered sufficient to establish the survey's clarity and reliability. According to Stenbacka (2001) the concept of reliability is irrelevant when judging the quality of qualitative research. If a qualitative study is discussed with reliability as a criterion, the outcome is that a study is substandard. In other study, Lincoln and Guba (1985) stated that demonstrating validity in a qualitative approach is sufficient to establish the study's reliability.

Respondents for the survey consisted of senior or middle managers with direct responsibility for supply chain management logistics in the business. Following Chow et al. (2008) in order to capture the issues concerning supply chain practices, perceptions from middle-line managers are important because they deal directly with supply chain processes and network structures, and the technical/ behavior components of

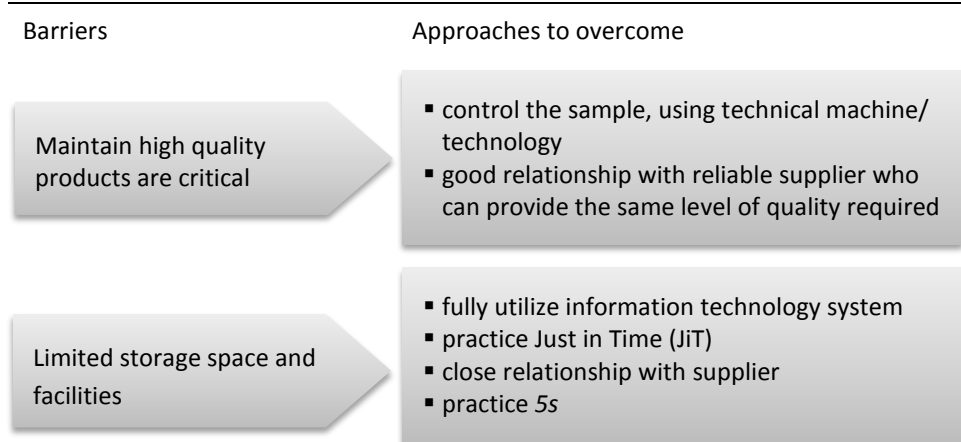
management systems. Based on the listing of Japan External Trade Organizations (JETRO), there are currently 18 Japanese food and beverage manufacturers operating in Malaysia. In recruiting respondents, the general managers of 18 Japanese food companies were contacted by email. Five Japanese food companies agreed to participate and 10 managers from various departments such as supply chain, logistics and production were involved in the semi-structured interview data collection. The number of interviews is deemed appropriate because they will be conducted with people who are considered to be experts in the field (Glesne, 1999). In addition, Williams and Webb (1994) and Zolingen and Klaassen (2003) state that there is no precise mechanism for identifying the ideal number of individuals or the number of panels for inclusion in any individual study. It has been suggested that the size of the participating panel may vary according to the topic being covered, the nature of different viewpoints included, and the time and resources available.

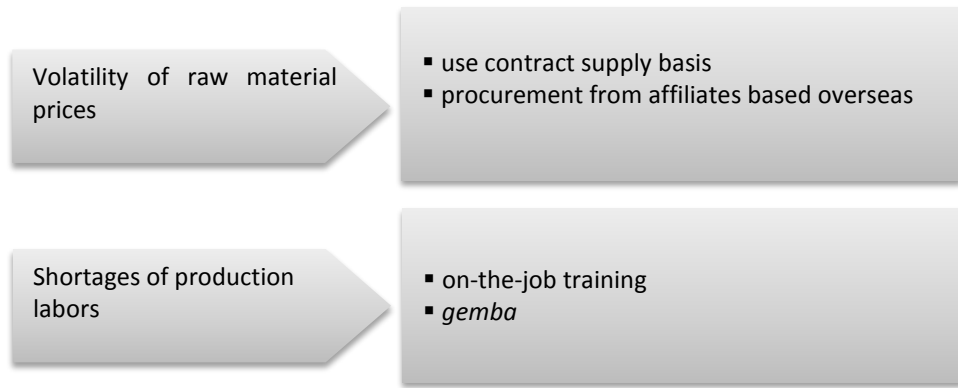
All interviews were taped and transcribed for analysis. Following standard practice for qualitative data analysis, the data were systematically analyzed by inductively developing and iteratively refining a coding scheme.

6. FINDINGS

Based on rich data obtained from semi-structured interviews, various problems were identified. These problems could then be aggregated into several main obstacles, specifically maintaining quality products, limited storage space and facilities, price volatility and labor shortage. The ways of how Japanese food companies cope with these problems are summarized in Figure 2 below.

Figure 2: Supply Chain Management Barriers and Approaches to Overcome by Japanese Food Companies in Malaysia





Sources: based on survey

6.1 Supply Chain Management and Quality of Products

Generally, in any industry supply chain integration is often defined as a network consisting of a series of companies involved in the manufacturing and delivery of products or services to end customers. It includes managing supply and demand, sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, and delivery to the customer (see Cooper, Lambert & Pagh 1997; Lambert, Cooper & Pagh 1998). Since supply chain deals with various and extensive stages, in general, most managers of Japanese food companies view the production stage or processing of raw materials as the most difficult to deal with given that maintaining good quality of products is essential.

“raw material foods...which are sensitive to temperature and deteriorate easily, require a time-efficient supply chain and continuous monitoring...hardest stage to handle”.....Japanese food company 1

“Because we are dealing with food, it’s a something very sensitive. Need to take care of the quality of raw material. The material has short shelf life...probably 3-6 months”.....Japanese food company 3

“Basically I think raw material.....processing raw material... Because our raw material come from natural grow product. Because sometimes weather climate may affect the quality”.....Japanese Company 5

Various reasons lead to critical managing in the production stage and these are identified as maintaining processed food that retains high quality, is safe and of assured provenance. These criteria rely on other things, in particular the standard of the raw materials used and abilities of all supply chain partners to provide required level of quality consistently. Since raw materials for food industries are the products of agriculture, the quality of these raw materials will ultimately influence the total quality of processed foods. Given the nature of agriculture and farming practices in any particular location are strongly influenced by the long-term mean climate state, in certain cases it influence the quality raw material supply by suppliers. The quality of raw materials is complex as it includes nutritional, sensory, hygienic-toxicological and technological aspects. In this regard, managing the food supply chain becomes more complex due to the perishable nature of

food products. Several approaches have been practiced by Japanese food companies in managing the quality products issues and these are described in more detail below.

6.1.1 Control Product Quality Using Technology

Most managers in Japanese food companies believe that high quality products can be produced only from high quality raw materials. Most importantly, the quality of products is further influenced by the technological procedures used.

“Yes we have a control, I mean, DQC they have a control sample. We have reference sample to be compare. So every time we have new sample we make checking this sample then colour wise we have a system. We have colour spectrometer machine to check the colour. By numeric database, so...yeah. Not only by visual, but we have to use some machine to scan that, if the result is within the range then we consider this is within the specification”Japanese food company 5

“The IT system, I mean the technical machine and the software use to make sure we get all the right specification and help us to inspect the material, the taste, the colour”Japanese food companies 4

“We have the control machine. For our raw material, we have periodically checking on the quality, I mean, we after one year, two year, so we check with quality if out of quality and out of the control then we have to write off. We have to throw away. And the hygiene aspect also importance sine we are handling foods”.....Japanese food companies 3

The highly sophisticated technology has enabled Japanese food companies in Malaysia to check products and materials against the required quality standards. This allows them to capture the inherent heterogeneity in quality of product batches. This is of particular importance in the food industry because the natural input materials vary strongly in quality, which may result in batches of uneven quality or standard, even at the initial levels of the distribution network. Sorting out substandard materials before money is spent processing them is therefore one of the most cost effective methods of ensuring a uniformly high quality final product. Quality depends not only on the technological procedure itself, but also on the hygienic level of machinery used, and on the total hygienic situation of the manufacturing environment.

6.1.2. Same Supplier for the Same Quality of Raw Material

Manufactured foods usually contain ingredients from different origins and production systems. Although some may be derived from simple supply chains and others may involve many transactions between farmers and manufacturers, it is probable that the total number of the transactions involved in any one product is high. Some ingredients (e.g. herbs, spices, dried fruit) may make up only a tiny proportion of the finished product or may be required only for short product life of a particular variety of product (e.g. bakery product, sauce, meal). Major ingredients may be derived from dynamic international supply networks that overlap with those of business competitors; vegetable oils, for example, are often mixed or substituted to compensate for seasonal unavailability or variation in quality and price. Mixing and substitution along complicated dynamic supply networks may limit not only traceability but also the flow of information and influence along the chain (Smith, BG 2008). However, this is not the case for Japanese

food companies since mixing or substitution of raw material is a somewhat uncommon practice. For them, replacing raw materials will not be simply done, if, for example out-of-stock on the supplier side can change the original taste. It is not possible to improve the quality of raw materials by processing them. Finally, poor quality raw materials will lead to the manufacture of poor quality final products.

“Same for Japanese-based customer if you start work with them for the first day, it can last for maybe never ending one. They won’t change. ...We can’t simply change the ingredient. Even if we can simply source but we can’t get the right material. Because they are many things need to check before we use the material”.....Japanese food company 5

“If we can control supplier, we can control quality....we use the same supplier so that we can ensure the coming in raw material. Sometimes a bit difficult...this is how Japanese companies take care quality of food”..... Japanese food company 4

One of the main values that were identified as being practiced by Japanese food companies is that preserving food quality is vital to ensuring that food products or processed food will always look and taste the same. Japanese food companies will try to retain as much as possible the ingredients used in processing food from the same suppliers. In fact, the managers stated they already have an ongoing relationship with a reliable supplier who has provided the same good quality required over many years. ‘Maintain food quality overriding more than anything else even if losing sale’ is considered to be a very important principle conducted by Japanese food companies, according the following statements:

“Some company in Malaysia like Yamazaki...they owning some strong qualities that means their motto is quality first then quantity meaning that if I can mention, if you don’t get raisins you don’t sell raisin bread at all. I don’t mind getting zero sales for that day for that week for that month. I do not replace raisins with sultana”...Japanese food company 1

“So actually our relationship with the supplier is very... I can say it’s very close; we can’t simply change the supplier. Because of the nature of the product that we want, so sometimes also we have a problem but we try to solve with our supplier, to communicate again, and try to solve, to get the right material”.....Japanese food company 5

In general, managers in Japanese food companies believe that preserving quality products will help to maintain customers’ satisfaction and loyalty and reduce the risk and cost of replacing faulty goods or products. By extending the responsibility for product quality into social and environmental contexts, this will promote food safety and ultimately lead to long-term revenues and lifelong relationships with customers.

6.2. Limited Storage Space and Facilities

Ensuring product quality of food or agricultural raw materials for a long time requires well designed storage facilities that many firms cannot afford to buy and install. Much of the activity involved in managing relationships in the supply chain is based on the purchase, transfer, or management of inventory (Waller & Esper 2014). While inventory movement and storage is considered essential to supply chain relationships, most managers working for Japanese food companies in Malaysia contend that inventory management is somewhat critical as they have limited storage areas and facilities:

".....We store within our production area. So, when we come to a serious situation, I will have to discuss ok, excuse me, I need to borrow a space to keep 40 bags of flour because in my store room area I cannot keep 100 bags, I could only keep 70 bags so the balance 30 bags, 40 bags I need to store here. But since the consumption is 10 bags per day so over 5 days there should be able to consume, so, we understand this matter".....Japanese food company 1

"For example we imported mushroom from China, this must be keep at very low temperature, to maintain the freshness is challenge as we have many type of raw material. We have to frequent check on the temperature of the cold room, cleanliness of the warehouse".....Japanese food company 4

".....Need to have proper plan-ordering, delivery and distribution because need to meet shelf life of the products. If cannot meet, need to dispose products-lost to company".....Japanese food company 3

Having only limited storage and facilities creates problems in maintaining product perishability which leads to uncertainty for the buyer with respect to product quality, safety and reliability (i.e. quantity) of supply. It creates uncertainty for them because perishable products must be moved promptly to the marketplace to avoid deterioration, as sellers are unable to store products and simply await more favorable market conditions. Frequent deliveries are urgently required through dedicated modes of transportation (e.g. refrigerators). It also creates negotiations costs, as procedures are required for establishing which party (buyer or seller) is responsible for product quality at different stages of the transaction. For example, does the processor take ownership of the product upon collection from the farm, upon delivery to processing plant or during storage, etc.

Food products usually exhibit high seasonality in raw materials availability and in end-products demand, and therefore they need well designed storage facilities to further guarantee their quality. With reference to perishable raw materials, their microbiological quality plays an important role and has to be controlled. Food safety issues have profound implications for the design of the supply chain. For instance, proper monitoring and response to food safety problems requires the ability to trace back small lots, from retailer to processor or even back to the supplying farm. Another feature of food chains is that only a few products are transformed from commodity to differentiated branded foods, while others undergo different packaging but remain essentially intact in character. All these characteristics along with the dynamically evolving legislative framework further hinder the task of efficiently managing food supply chains.

Managing inventories become a significant part of the supply chain and they include everything from raw materials to work in process to finished goods that are held by the manufacturers, distributors, and retailers in a supply chain. Here, the managers state that they must decide where they want to position themselves in the trade-off between responsiveness and efficiency. Holding large inventories or stock allows a company or an entire supply chain to be very responsive to fluctuations in customer demand. However, the creation and storage of inventory is a cost and to achieve high levels of efficiency, the cost of inventory should be kept as low as possible. Due to limited storage facilities,

Japanese food companies have implemented several strategies for a proper inventory management system.

6.2.1. Computerized System for Inventory Management

Determining the optimal inventory allocation in a supply chain is a challenging problem that requires appropriate decision support and planning systems. This challenge is multiplied for Japanese food companies due to limited storage space and facilities. Therefore, Japanese food companies developed computerized systems to set up reorder systems for raw products and for each item:

“We have a monitoring on stock and then we are checking this data, we also have like internal database. Beside the ERP, we also have our own Excel database....that is we create by our own”.....Japanese food company 5

‘All computerized system...very highly integrated in ordering raw material in helping us to determine the required quantity’.....Japanese food company 4

‘We have annual projection quarter projection we have monthly plan and we have weekly plan. So, all those is actually fluctuating because of the market requirement so, when we actually go to the material we base on annual projection...with the help of computer system.....Japanese food company 2

To the extent that any forecast is inevitably inaccurate, inventory and sales databases for all relevant departments will be interconnected. Due to variability in the pattern of demand and supply, each raw material or product will be coded and indicate its batch number data, such as description of the item and its location in the store. The activities of inflow and outflow of raw materials and finished goods are recorded in the computer system in order to facilitate tracking inventory levels, orders, sales and deliveries. With all the required data in hand, at the operational level, the process team executes the forecasting and synchronization that was designed at the strategic level. At the same time, the team liaises with the marketing functional silo as well as the order filling and customer service management processes. These sources are close to the customer and provide critical information on sales projections and anticipated demand. This effective system will provide them a guide for matching demand with supply. This can be translated into the required optimal level of raw materials that is consistent with their weekly, monthly and yearly manufacturing plan.

6.2.2. Just-in-Time (JiT)

Considering the problem of limited storage space, most managers in Japanese food companies state that implementing the JiT inventory management is beneficial. By employing the JiT approach, they manage to reduce inventory to a minimum level as much as possible, keeping only the amount needed until the next order arrives. The factors that assist them in implementing JiT are numerous. First, by having an effective information management system coupled with proper manufacturing planning will significantly reduce stockpiles and lead time and ensure timely delivery of raw materials from the supplier and products to the customer. Second, as noted earlier, significant coordination between Japanese food companies and suppliers in the distribution channel, resulted in JiT being fairly simple to execute. Since the long-term relationships exist, suppliers are well

informed about production processes so that the supply chain remains consistent and available. In this scenario, Japanese food companies can plan time delivery packaging so as to meet their storage space requirements. Third, the logistics and communications systems in Malaysia can be considered as modern to facilitate JiT strategies.

6.2.3. Close Relationship with Suppliers

The quality of end products is influenced primarily by the raw materials used. The quality control of materials depends on many factors such as length of storage, their disposition to spoilage, the possible presence of contaminants and their ability to influence nutrition and the total sensory quality of the products, etc. Limited shelf life of some (and certainly the main) raw materials induces the need for cleaning after a certain time period but also between different recipe productions. Contamination of different products is usually seen as a large problem both from a quality and hygienic perspective. Concerning the potential for disaster here, working closely with raw materials suppliers has to be beneficial and effective. In many cases, suppliers provide much valuable guidance with reference to storage of raw materials, particularly the proper techniques to maintain raw materials' freshness and edibility.

6.2.4. Principles of *Seiri, Seiton, Seiso, Seiketsu* and *Shitsuke* (5s)

The study also identified that some Japanese companies' representatives who were interviewed implement the 5s – the Japanese acronyms of *seiri* (organisation), *seiton* (neatness), *seiso* (cleaning), *seiketsu* (standardisation) and *shitsuke* (discipline). As production speeds differ and because processing is batch oriented, coupled with many varieties of food raw materials to be managed, the foundation 5s are significant for improving food companies' physical environment. Executing the 5s contributes to improved floor space utilization that enables Just in Time (JiT) production. The 5s improve production, sales and business growth when they are implemented. In addition, operations can be performed safely and comfortably, reducing the chances of accidents occurring:

"We have been greatly benefited from 5s assistance. By implementing 5s we not only have a better working environment but we have increased our productivity. Our sales are better than before implementing 5s. It also reduces accident in workplace as all the raw materials have been arranged properly. Last accident we have in this company was in 1990, if I was not mistaken".....Japanese food company 4

6.3. Volatility of Raw Material Prices

The raw materials used by the Japanese food companies are a mixture of local and overseas. While a small percentage of raw materials are obtained from overseas, these imported materials are considered core items for their production processes. This can be understood from respondents' words:

'...the dough and confectionaries...these are in frozen form we purchase from Thai factory. Thai Yamazaki bring here in container, once every a month...as quality food is our concern we buying them from overseas... only the flour, the sugar from local supplier in Malaysia'.....Japanese food company 1

“All the purchase contract is actually done by Nestle, which means the raw material is actually supplied by Nestle. In certain cases we only perform in terms of payment transaction. So that’s a bit unique so those raw material partially majority of it is actually from local and partially about 30 percent is from import”.....Japanese food company 2

“So majorities from outside. Only 20% from Malaysia. Japan is the main, Indonesia, Vietnam, Taiwan”.....Japanese food company 3

“whatever we can get from local, we buy locally, some of main item we imported raw material from India, from Indonesia”.....Japanese food company manager 4

“We imported raw material. We have pepper from Sarawak but the quantity is not as many than what we required”.....Japanese food company manager 5

The persistence in using overseas raw materials is due to issues of quality and scarcity. In certain cases, the quality of products obtained from the domestic market may not reflect or could be limited by geographic factors. Furthermore the insufficiency of local raw materials means that they have to be sourced from overseas. The dependence on overseas suppliers and unexpected changes in the prices of imported goods can lead to price volatility. According to the managers in Japanese food companies, given the nature of the food industry, industrial production depends on trade in raw materials such as minerals, agricultural and natural resources despite the fluctuations in supply that may occur. These sources’ prices vary for many reasons such as yield variations, typically owing to weather, climate and policies in the countries that produce and export them.

Beyond extreme climate events that affect agricultural production, the prices of imported or raw materials are subject to foreign exchange rates. Because international purchasing always involves a series of purchases, companies, in certain cases usually buy the raw materials or goods in bulk, which requires larger monetary transactions. These transactions are exposed to greater risks in the form of currency fluctuations. Moreover, cross-border transactions result in complicated procedures and processes, which exposes a company to many additional risks. When requiring the outsourcing of raw materials or products, environmental factors such as political uncertainties in other countries, regulations and transportation delays will amplify or attenuate price volatility. At the same time, home nations impose tariffs or taxes that can be viewed as additional costs to the company. Instead of uncertainties of pricing material, as far as imported raw material is concerned, it is common for imports to be delayed. Home nations’ regulations on the imported goods, customs duties, and any changes in regulations for imported goods wield less logistical influence on materials needed at the production site.

Furthermore, in certain cases, producing countries including local suppliers make greater use of measures which raise export prices, limit export quantity or place conditions on the circumstances under which exports are permitted.

“price problem also happen for example the minimum order or packaging sizes sometime is too large for us, while for production site the usage for the material is low”.....Japanese food company 4

While packaging and different standards of ordering practice by producer countries do not directly result in price volatility, to some extent it brings problems to the production site

and these can be translated into higher production costs. The standard order quantity may result in excess supply of raw materials which have to be stored. This situation becomes problematic as in general raw materials for food production have a certain expiry date which is mostly very short. Accounting for perishability creates certainties within the supply chain in respect to final product quality, safety and reliability; it is not easy to recover any materials once the expiry date is due. Expired raw materials need to be disposed of which ultimately is a loss to the company, particularly if they are in excess quantity.

6.3.1. Managing Price Volatility by Forming Close Relationship with Suppliers

Most managers in Japanese food companies state that building relationships with suppliers and having a mutual agreement is beneficial in managing the pricing problem. Since the relationship has been established for a number of years with local or overseas suppliers, supply contracts form the basis of procuring raw materials and a stable relationship with the acquainted supplier's reputation. Close relationships with suppliers will also help the Japanese company have enough time to adjust to the new price regime. The suppliers will normally inform them earlier should there be any increase in the price of raw materials. At the same time, the relationships also helpful as it can strengthen information sharing particularly with reference to ordering and logistics matters.

"we have contract...mutual contract...because it's commodity. Something like, what you buy, the garlic, the onion from the supermarket, the fresh one. Sometimes you see the price very high, sometimes very low.Japanese food company

"For the key material basically we have contract with supplier, other raw material, we obtain them from our affiliates in overseas".....Japanese food company 3

Further, there are certain tie-ups between local Japanese food companies in Malaysia and their affiliates overseas for the procurement of raw materials. In securing scarce certain local raw materials, the procurement from affiliates is beneficial. Apart from mutual contracts and affiliates, most managers state that keeping updated about cross-border transaction procedures and processes is essential when dealing with imported raw materials.

6.4. Shortages of Production Operators

Following Malaysian Employers Federation (2014) in Malaysia, companies of all sizes, from large multinationals to small and medium enterprises, rely on foreign workers. The problem of labor shortage has also been confronted by Japanese food companies operating in Malaysia:

"We used to hire the Nepalese but we have big headaches on this people. We can't communicate with them...We hire about I think about 80% in many years ago. I think 10 years back'.....Japanese food company 3

"Management level I think as long as in their management, I don't say it's perfect, but it should be ok. But for the operator part...we have to take foreign worker as difficult to get

locals to operator. Actually, these foreign workers are loyal workers, but we need to continuously provide training to them”.....Japanese food company 4.

“up to now, 10 years ago we will still have to bear high labor cost. Participation by local workforce is not very encouraging. Foreign workers fill up the vacuum as they are not opposed to working in dirtier, smell spices all the time and working longer hours’.....Japanese food company 5

Since there is a great shortage in domestic labor force in Malaysia, most managers state that they depend largely on migrant workers for their burgeoning industrial expansion plans. The demand for foreign workers is not only associated with people’s skills and capabilities but also with employees’ education levels. It has been indicated that the current workforce in the manufacturing firms mostly have a minimum qualification, and some have no qualifications beyond primary school or are illiterate, particularly in the case of shop floor employees (production operators). However, as a result of these employees’ low levels of education as they are hired for such operations, yet problems arise regarding language, communication and attitudes to learning new skills. The use (or lack of use) of the English language is identified as an immense problem to training and learning. Foreign workers found it difficult to understand workplace orders, safety rules and interpreting safety warning signs.

6.4.1. On-the -Job Training

From the interviewed, this study has identified that the scarcity of labor refers only to production operators, but not to the managerial level. In fact, most managers interviewed have worked for Japanese food companies for a long time, and some of them joined their firm since they began operating in Malaysia. In this regard, managers are generally devoted to their company. Given the communication problems that were noted earlier, several strategies were pursued to overcome widespread skill and labor shortages, for instance more investment in education and training to improve workers’ industry skills. In general, the Japanese food companies have created their own training program to improve employees’ skills and competencies. The advantage of this model is that it is easy to accomplish training programs and it costs less because the additional purchase of machines or appliances for training is not necessary.

6.4.2. Gemba

In conducting training for production operators, this study found that most Japanese food companies use and promote *gemba* activities as a way of encouraging worker participation and continuous improvement. The idea of having *gemba* or ‘manufacturing floor’ is that the managers walk around the work area to gain first-hand insight into how food processes are done or to understand the full impact of a problem that has occurred. This is followed by having meetings and exchanging information involving the manager, supervisor and production operators so that the problem is solved. There is no proper timetable in doing *gemba*; it can vary from once a week or two or three times, depending on the nature of the problem.

7. CONCLUSION

The 'farm to fork' supply chain is complex due to the perishable nature of food products, hence different organizations have various ways in implementing supply chain management practices. The challenges along the supply chain facing the Japanese food companies in Malaysia can be considered as striving to maintain the quality of finished products, overcome limited storage space and facilities, price volatility of imported raw material and shortages in production labor. Various appropriate supply chain strategies have been adopted for the circumstances prevailing in Malaysia. It is critical that the information technology system must be advanced enough to help Japanese food companies achieve greater supply chain process efficiency. Information technology enables greater coordination and collaboration among supply chain partners and their internal operations can be achieved. The effective usage of technology and forming good relationships with suppliers over a number of years means that a uniformly high quality of final product can be maintained. The concept of collaborative relationship has been considered the essence of supply chain management as it helps Japanese food companies to reduce limited storage problems and the volatility of raw materials prices. In addition, this collaboration makes information sharing possible in inventory management for complex and perishable foods. The study also shows that Japanese management principles such as JIT, 5s and *gemba* are present in companies' activities and management practices, to facilitate the successful implementation of food supply chain integration. In summary, a successful food supply chain is mainly derived from information technology, close relationships with suppliers and Japanese management principles provide some guidance for domestic food industry in Malaysia to manage their food supply chain. This input also essential for food companies around the world in considering investment of the food industry in Malaysia.

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