

International Logistic

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## **Abstract**

The business case subject of this project is the international trade of a Canadian product in a way to reduce the cost of the logistic system. The goal of the paper is to provide the highest profit per unit of investment. This project consists of an investment which results in spending money either by paying to the suppliers or the cost of the logistic system (Transportation – Inventories). That being said, the analysis should be based on a strategy to control the risk. Creating the logistic system and analyzing it from suppliers to customers in addition to choosing the product and the locations either for the manufactures or the target market are important deliverables of the project.

This paper can be used as a guide for international trade. It studies the entire steps necessary to trade a product internationally, from the selection of the product to the assembling of the logistic system and from the Supply/demand concept to the logistic cost calculation. The paper shows how to calculate the cost per item including transportation cost. Also, it shows how to predict the quantity demanded to see if the project breakeven.

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## **Chapter I: Introduction**

A strategy using Porter's model is used to choose the product. The market has thousands of products and the competition is very high. The model provides the tools to choose the right product to succeed internationally. Moreover, it provides the criteria to take competitive advantage from innovation and cost reduction perspectives.

There are different types of logistic systems. The analysis was based on reducing the cost per item. The paper explained the optimal logistic system to use which is: Manufacture - Warehouse – Distributors. Moreover, it analyzes every single component of the system such as the order processing and the inventory management to see where the money consumption is in order to reduce the processing time and cost. In addition, it provides the optimal transportation system which count for two-thirds of the total logistic system.

Since the project is about to trade overseas, it is very important to specify the demand for the target market. Not doing so would mistake the quantity demanded thus increase the cost significantly from the transportation and inventory point of view. Also, it risks the whole business to fail in case the turnover is slow and products have expiring date.

The paper also emphasizes on the role of a manager for planning in advance. He is responsible for choosing the accurate product and the right market. Also, he has to put together the logistic system that is suitable for the project. In addition, a manager should

control the risk by predicting the demand and the startup cost of the project. A manager should also do analysis to the industry to answer the questions of the model used.

## **Chapter II: State of Art (literature Review)**

### **Part I**

#### **1-International Logistic: An Overview**

##### **1.1 How Logistic Systems Work**

According to Ghiani, Laporte and Musmanno (2004), Logistic systems are made up of three main activities: order processing, inventory management and freight transportation.

Order processing is strictly related to information flows in the logistic systems and includes a number of operations. Traditionally, order processing has been a very time-consuming activity (up to 70% of the total order-cycle time). However, in recent years it has benefited greatly from advances in electronics and information technology. Bar code scanning allows retailers to rapidly identify the required products and update inventory level records. Laptop computers and modems allow salespeople to check in real time whether a product is available in stock and to enter orders instantaneously. EDI allows companies to enter orders for industrial goods directly in the seller's computer without any paperwork. .

Inventory management is a key issue in logistic systems planning and operations.

Inventories are stockpiles of goods waiting to be manufactured, transported or sold.

There are several reasons why a logistician may wish to hold inventories in some facilities of the supply chain.

- Coping with randomness in customer demand and lead times: Inventories of finished goods helps satisfy customer demand even if an unexpected peak of demand or delivery delays occurs.
- Making seasonal items available throughout the year: Seasonal products can be stored in warehouses at production time and sold in subsequent months.
- Overcoming inefficiencies in managing the logistics system: Inventories may be used to overcome inefficiencies in managing the logistics system.

The aim of inventory management is to determine stock levels in order to minimize total operating cost while satisfying customer service requirements.

Freight transportation often accounts for even two-thirds of the total logistics cost and has a major impact on the level of customer service. It is therefore not surprising that transportation planning plays a key role in logistics system management.

## **1.2 Inventory and transportation strategies**

Ghiani, Laporte and Musmanno (2004) states that a distribution channel is a path followed by a product from the manufacturer to the end-user. Inventory and

transportation policies are linked. When distributing a product, three main strategies can be used: direct shipment, warehousing, cross docking.

A relevant marketing decision is to select an appropriate combination of distribution channels for each product. The strategy used in this project is Warehousing. It is a traditional approach in which goods are received by warehouses and stored in pallet racks or on shelves. When an order arrives, items are retrieved, packed and shipped to the customer. Warehousing consists of four major functions: reception of the incoming goods, storage, order picking and shipping. Out of these four functions, storage and order picking are the most expensive because of inventory holding costs and labor costs, respectively.

In centralized warehousing, a single warehouse serves the whole market, while in decentralized warehousing the market is divided into different zones, each of which is served by a different (smaller) warehouse. On the other hand, centralized warehousing is characterized by lower facility costs because of larger economies of scale. Finally, inbound transportation costs (the costs of shipping the goods from manufacturing plants to warehouses) are lower in a centralized system. According to recent surveys, transportation by truck is approximately seven times more expensive than by train, which is four times more costly than by ship.

Supply chains are often classified as push or pull systems. In a pull (or make-to-order (MTO)) system, finished products are manufactured only when customers require them. Hence, in principle, no inventories are needed at the manufacturer. In a push (or make-to-



stock (MTS)) system, production and distribution decisions are based on forecasts. This is the case of this project. As a result, production anticipates effective demand, and inventories are held in warehouses and at the retailers.

## **2- What affect logistics Cost?**

### **2.1 Logistic system management:**

Logistics management seen as an iterative process that seeks to optimize the flow of materials and supplies through the organization to the customer (Christopher, 1999).

The concept of integrated logistics extends functional management to include customers, suppliers and manufacturers. Companies can no longer afford to focus on supply-side efficiency alone; they need to use their business strategy to drive them towards integration of their demand and supply sides to build a platform for achieving a competitive advantage. Enterprises extend their internal supply chain process both upstream with suppliers of raw materials and downstream to final consumers. In this way, all companies in the supply chain are integrating their activities with those of other companies to achieve economies of joint operation. The market channel now becomes a virtual enterprise with common goals, systems, organizations, facilities and shared management. Firms at this level are working in project organization with suppliers and customers, and investments are made jointly. Companies achieving this level of integration have the potential to realize superior levels of performance.

The progressive integration of logistics across supply chains has had profound effects on business practices. These include the following trends, noted by Scary (1999):

- Higher interdependency between firms interlinked within the business network, which has become the new reality of industry. Performance by an individual firm affects the performance of all, and determines the ultimate performance of the network as a whole.
- It places a premium on inter-organizational relationships through formal and informal contact, as well as on data and information systems across organizational boundaries.
- Changing the concept of corporate enterprise. Organizations have shed peripheral activities to concentrate on core competencies that offer the promise of unique value. Greater external dependence therefore forces attention to inter-organizational relationships for coordinating activities and processes. In some cases, the shift towards core business has led to the creation of “virtual” organizations, where the majority of business operations have been outsourced to external parties, including third and fourth party logistics.

## **2.2 Use of modern communication and Information Technology**

According to The Organization for Economic Co-Operation and Development (2002), the strategic use of Information and Communication Technology (ICT) is critical for

realizing low cost logistic systems. The advantages of these ICT supported information exchange systems include:

- Increased speed and reliability, increased storage capacity, increased transparency, reduced transaction costs and increased worldwide coverage.  
Thanks to goods and vehicle tracking as well as real-time vehicle routing and scheduling systems, cargo can now be identified, tracked and scheduled in real-time almost anywhere in the world.
- Lead-time has been reduced by the introduction of EDI (Electronic Data Interchange), mechanization, automation and optimal vehicle routing systems, leading to potentially lower levels of stock surplus.

The application of ICT to transportation has also led to the emergence of Intelligent Transport Systems (ITS). ITS links individual transportation elements and combines them into a single system through the use of advanced information technologies. It offers the potential to improve the efficiency of use of transportation systems by generating additional capacity from existing physical infrastructure.

The application of ICT in supply chains enables information on transport orders and shipments to be made available at an early stage. This means that transit times of transport operations can be better managed, thus creating new transport opportunities, including reduced processing time and cost intermodal transport, which were not feasible before.

Improvements in intermodal transportation through the application of ICT and ITS have promoted the concept of just-in-time inventory management and delivery. These improvements all increase the efficiency of intermodal transport.

## **2.6 Inventory Management**

Freight transportation is characterized by economies of scale because of high fixed costs. As a result, rather than frequently delivering small orders over long distances, a company may find it more convenient to satisfy customer demand from local warehouses. (Ghani, Laporte and Musmanno, 2004)

Traditionally, customers or retailers have been in charge of monitoring their inventory levels and place purchase orders to vendors. In recent years, there has been a growth in vendor-managed systems, in which vendors monitor customer sales and inventories through electronic data interchange (EDI), and decide when and how to replenish their customers. Vendors are thus able to achieve cost savings through a better coordination of customer deliveries while customers do not need to allocate costly resources to inventory management. (OECD, 2002)

## 2.7 Governments role

The Organization for Economic Co-Operation and Development (2002) points out that in order to achieve efficient global logistics systems, extensive co-operation and collaboration among private corporations, governments and international organizations is essential. Choose the trade to be between countries with harmonized regulations and standardization of frameworks surrounding the use of technologies and infrastructures. Also, government financial support of intermodal transport differs considerably from country to country. Customs formalities are one of the main barriers to achieving seamless changes across modes. The advantages of standardized, automated and ICT based interfaces are well understood. However, it is not clear how rapidly or how extensively ICT will be adopted by authorities in different countries for the smooth operation of custom formalities. Developments in Asian logistics have not kept pace with its rapid growth and lag far behind those of North America and Europe. There is an imbalance in the amount of transport infrastructure and institutional measures between different countries in Asia, which leads to gaps and inefficiencies in the logistics system.

This following is what should be done to enhance international logistics:

- Logistics and ICT developments necessitate changes in the demand for skills. Improved training and qualification systems are needed to respond to these developments. Human resource development in support of the freight industry should be considered both a public and a private sector responsibility. Since the

level of skills differs across countries, developing countries may need assistance in establishing training courses.

- Governments need to prepare for the framework for the development of advanced global logistics systems, where important cross-border issues such as custom clearance processes, deregulation and development and maintenance of intermodal systems should be addressed. Therefore, governments are advised to co-operate and integrate their policies at a global level by, for example, harmonizing regulations, streamlining ICT-based operations in custom clearance systems, standardizing new technologies in order to promote seamless operations, compatible training and qualification systems and promoting extensive information exchange among all affected stakeholders

## **Part II**

### **Strategy to choose the product**

Michael Porter, the well-known Harvard business professor, believes that a firm's international competitiveness is a function of how effectively its industry operates in the firm's home country.

Porter found that firms facing intense home-country pressures who respond by investing continuously in order to upgrade their competitive advantage will prosper internationally. Having sophisticated local buyers causes a firm to make investments to make its product better than anywhere else. For example, Japanese car buyers have been so demanding of

perfection that Japanese car manufacturers have had to produce superior products to satisfy their local buyers. As a result, Japanese car manufacturers made huge inroads into the American market beginning in the 1970s, because the cars they produced were superior in important areas such as reliability, fit and finish. Serving the needs of demanding local buyers were nine car companies in Japan. This large number of companies produced intense local rivalry in a small market far more than existed among the big three car manufacturers in the larger U.S. market.

The presence of several rivals in a market also leads to a local build-up of specialized human resources and infrastructure. This phenomenon has been seen in many industries worldwide including the U.S. movie business, Dutch cut flowers, Italian footwear, German printing presses, Japanese video cameras, and Canadian telecommunications equipment. (Martin 1999)

### **The Model**

Porter's Diamond is the right application that is going to be used to choose the product in this project. According to Porter, there are inherent reasons why some nations, and industries within nations, are more competitive than others on a global scale. The argument is that the national home base of an organization provides organizations with specific factors, which will potentially create competitive advantage on global scale. It suggests that the national home base of an organization plays an important role in shaping

the extent to which it is likely to achieve advantage on a global scale. (Businessmate 2009)

The Method developed by Porter analyzes four different dynamics of a nation. It is within these determinants of a nation that companies are created and learn to compete. Each of the determinants has a contribution to the success of a company or industry within the national context. However, achieving success is not dependent on understanding or leveraging one or two of the determinants while ignoring the rest. It is the system that is created by these that creates an environment and it is within that environment that companies come into existence. (Industry Canada, n.d)

Porter states: “The sophistication with which companies compete in a particular location, however, is strongly influenced by the quality of the local business environment. Companies cannot employ advanced logistical techniques, for example, without a high quality transportation infrastructure. Nor can companies effectively compete on sophisticated service without well-educated employees. Businesses cannot operate efficiently under onerous regulatory red tape or under a court system that fails to resolve disputes quickly and fairly. Some aspects of the business environment, such as the legal system, for example, or corporate tax rates, affect all industries. In advanced economies, however, the more decisive aspects of the business environment are often cluster specific; these constitute some of the most important microeconomic foundations for competition.”



## **Factor Conditions**

This describe the situation in a country in terms of production factors like, infrastructure, natural resources, capital ,land and skill labor which are important for competition in particular industries. Factors are essentially inputs and the standard theory of trade has been based upon these factors of production. The theory is that a nation will make use of its factor assets and it will trade that which it has in excess. Porter stresses that this is far too simple a theory for the evolving globe of international trade.

These national factors often provide initial advantages, which are subsequently built upon. Each country has its own particular set of factor conditions; hence, each country will develop those industries for which the particular set of factor conditions is optimal.

This explains the existence of so-called low-cost-countries (low costs of labor), agricultural countries (large countries with fertile soil), or the start-up culture in the United States (well developed venture capital market). (Recklies 2001)

Porter points out that these factors are not necessarily nature-made or inherited. They may develop and change. Political initiatives, technological progress or socio-cultural changes, for instance, may shape national factor conditions. Thus, the existence number of factors in a nation is less important than the ability to create new ones and how fast they are able to be developed. (Industry Canada, n.d)

## **Home Demand Conditions**

This describes how the people in a country demand for products and services produced in that country. Home demand conditions influence the shaping of particular factor conditions. They have impact on the pace and direction of innovation and product development. According to Porter, home demand is determined by three major characteristics: their mixture (the mix of customers' needs and wants), their scope and growth rate, and the mechanisms that transmit domestic preferences to foreign markets. (Grant 2002)

The customer base can provide the firm with a better vision of what the needs are and can enable them to be better positioned against foreign competitors. When the home market applies pressure for the firm to innovate and increase sophistication, this also provides benefits to competing in global markets. Normally, home markets have a much higher influence on an organization's ability to recognize customers' needs than foreign markets do.

Home Demands also contribute to internationalization of domestic demand, essentially how a nation's products and services are pulled into the international arena. One aspect is if the buyers are multinational or mobile. Buyers who are abroad or travel can create opportunity and aid in establishing international presence quite quickly. Another aspect is the influence on foreign needs. This means refers to transfer of domestic needs to foreign buyers. One of the most common aspects is when training occurs for foreigners in the home nation. They return to their nation and carry with them the values and processes

they were taught. This aids in creating a foreign pull for services and products. (Industry Canada, n.d)

### **Related and Supporting Industries**

This third determinant deals with the ability of an industry to work with its required suppliers. A base of suppliers in the home market can offer some potential advantages for a company.

When supplier industries are strong and co-located, they can contribute to efficiencies, speed and cost effective contributions. Porter indicates: "The most important benefit of home-based suppliers however, is in the *process of innovation and upgrading*."

This relationship, which can develop out of close geographic proximity, can help a company gain access to information, insight and supplier innovations. Likewise, suppliers gain access to information about markets and products that enable them to innovate around their inputs and processes. (Industry Canada, n.d)

This describes how a country can gain competitive advantage when the local supporting industries are competitive. This goes a long way to help firms enjoy more cost effective and innovative inputs. This effect is further strengthened when the suppliers themselves are strong competitors on the global market. A typical example is the shoe and leather industry in Italy. Italy is not only successful with shoes and leather, but with related products and services such as leather working machinery, design ... (Grant 2002)

## **Firm Strategy, Structure, and Rivalry**

This describes the conditions in a country that determine how companies are established, organized and managed. And this determines the characteristics of domestic competition.

Cultural aspects play an important role. In different nations, factors like management structures, working morale, or interactions between companies are shaped differently.

This will provide advantages and disadvantages for particular industries.

Such strategy and structure helps to determine in which types of industries a nation's firms will excel. Porter argues that domestic rivalry and the search for competitive advantage within a nation can help provide organizations with bases for achieving such advantage on a more global scale.(Recklies 2001,under"Porter's Diamond")

## **Location of production**

when locating a production, a firm should be located where it can be most productive, and yield the highest revenues per unit of investment. A highly productive firm is one that is near to the market, so that the demand for production is high and relative to costs of making that input.

It should also be close to a skilled labor force so that it makes it easier for the firm to attract labor with appropriate skills and the more likely it is to produce high value outputs and low costs per unit of output. Also a firm should be located at a place where it is close to high value raw materials because the further materials have to travel the lower the productivity of the plant will be.

Basically an ideal location for production should include some or all of the following:

- Closeness to point of sale. The higher the sales revenue, the higher the productivity will be.
- Closeness to raw materials.
- Away from centers of population: for noisy, environmentally unfriendly plant.
- Near to skilled labor source.
- Have room for expansion.
- Have good communication links.(The Times 100,under"Operations theory")

### **Entering Markets**

Before a company enters a market, it has to decide which markets to enter since not all the countries are attractive. However, there are specific entry determinants about market attractions that need to be considered when entering an international market. Some basic points to consider before one enters a market are:

- Is the product tradable and what are the barriers to trade? If the product is not tradable because of transportation constraints or import restrictions, then accessing that market requires entry either in overseas production facilities or by licensing the use of key resources to local companies within the overseas market.
- Legal: every country has got its legal regime. So by determining the extent to which businesses can enforce contracts, protect property or avoid corruption is very important.

- Social factors will be clearly important, for example the availability of a well trained workforce or the size of the market is relevant to the strategy of the company. Also culture differences need to be considered, for instance in determining tastes in the marketplace.
- Economic factors such as the size of the market or the gross domestic product which help in estimating the potential size of the market need to be considered. It is obvious that fast growing economies provide more opportunities, an example being China. However, companies should also be aware of the stability of a country's currency which may affect its income stream.

### **Chapter III: Major Issues and Discussion**

In order to justify the convenient of the product according to the model, to cover the logistic system from suppliers to customers passing by manufactures, and to anticipate the demand expectation and logistic cost, a series of questions is answered to focus on the progress that lead to the steps necessary to illustrate the strategy used in this project.

**Which manufacture is chosen? Why? What are the advantages? What are the disadvantages?**

Omega-3 market is a multi-Billion dollar market with annual sale of \$ 8.2 Billion. The reason behind the high demand for Omega-3 is the media attention and customer awareness, scientifically proven health benefits, and production innovations. Globally, the Omega-3 category is growing at approximately 30% annually with the number of Omega-3 global food launches increasing notably .Moreover, More than 14,000 scientific studies and reports support the health benefits of Omega-3 EPA and DHA from fish oil. Omega-3 is also one of the top five dietary supplements .The components of Omega-3 which are EPA/DHA are lately prescript by doctors as a treatment to circulatory, heart, brain and mental health conditions. Despite ALA is present in the Flax, it is poorly converted into EPA and DHA. However, Algae has only DHA; Fish Oil represents more than 80 % of the Omega-3 EPA/DHA market. That is because the Omega-3 found in fish oil is the only body's preferred, most balanced and readily absorbed Omega-3 EPA/DHA source.

Consumer awareness drives the growth of the fish oil market. As consumer knowledge and the desire for healthy lifestyles increase, the demand for products with Omega-3 EPA/DHA fish oil will continue to grow. Moreover, the media covers the latest Omega-3 EPA/DHA findings which are the best way to educate consumers about fish oil and the health benefits associated with it. (ONC, n.d)

### **It is a Need**

Our Bodies do not produce Omega-3, so we need to get it from our diet. Omega-3 is a healthy fat that is essential to our brain and heart function. Eating oily fish twice a week provides a healthy dose of Omega-3 EPA/DHA. Once that is not met, concentrated fish oil supplements are needed to ensure getting the daily dose.

EPA and DHA work as a team to help young bodies develop normally and to maintain good health at all life stages: EPA plays a physiological role, acting as building blocks for cells in the vital organs; DHA plays a structural role in cell membranes, aiding in normal growth and development. Both work together to support the normal development of the brain, eyes (Retina) and nerves; Help maintain a healthy cardiovascular system; And help maintain healthy triglyceride level.

According to health studies worldwide, a lack of Omega-3 could be contributing to a significant spike in certain diseases including heart and cardiovascular disease, metabolic syndrome type II diabetes, dementia and Alzheimer diseases, arthritis and possibly allergies. (ONC , n.d)



In addition to the product from being a need, I am going to analyze my choice for the product from the demand perspective. The factors that determine the Demand for a good are:

- Price of the good

A big advantage of this product is that it could be discounted. A good strategy to increase the quantity demanded is to put the product on sale. Since the customers know that the price of the good would increase, the natural response would be that they rush to buy the good in sequence to not buy it at higher price later.

- The number of potential costumers

If the population in a nation tends to increase, the quantity demanded is likely to increase.

The reason behind companies looking to explode new markets is that the number of potential buyers of their products rises. The birth rate in Qatar is 10.23 per thousand populations (2011 estimation) which is very high compared to other countries. Also, the number of foreign workers in Qatar is 1271000 and these people need to shop in Qatar.

- Tastes

It is meant by taste the desire for a good. As the want for a good strengthen, the clients are willing to pay more for the product. Advertising is one way to change tastes. It shows customers the advantages of a product and how it is differentiated from competitors.

- Information

By making the information about a product available to consumers, the demand rises. Companies that find a way to educate their customers enjoy highest demand for their products. Well informed consumers about the benefits of a product, especially health related once, will buy the product no matter the price is.

- Income

The income controls the demand. If the income decreases because of inflation for example, the quantity demanded falls. As income rises, consumers boost spending and have more potential to spend in the future. People in Qatar enjoy the higher income in the world (\$63000 per Capita) which is a big advantage for the retail market in Qatar.

- Government rules and regulations

Government regulations could be an important player in the demand function. Rules sometimes prevent products to enter a country whereas the local supply is low which lead to high demand. That being said, many companies adopt their products to the rules of the target country in order to enter its market. Qatar is a consumption market. Government sets laws to ease the import of international products.

## **Advantages**

As any other manufacturing, this industry has advantages and disadvantages. Fortunately, the convenient outweigh the inconvenient which increase the rate for success of this project. As advantages, the need for the product is based on strong science evidence. In June 2009 the Center for Disease Control (CDC) reported that Omega-3 deficiency may cause up to 96,000 US deaths per year. Thus, the good has health benefit opportunities to aim in the future for further growth. In addition, A survey in 2008 shows that 77 % of Americans state that Omega-3 is on the top of their nutrition deficient list: Omega-3, Calcium, and Fiber. Moreover, 95 % of American consumers are aware of Omega-3 and

90 % of consumers associate Omega-3 with fish oil (ONC, n.d.). This confirms that the product is a winner in the local market (North American) before exporting it.

In the other hand, eating fish is associated with the risk of having the unwanted compounds like mercury that might risk hurting unborn babies and the young kids developing nervous system. Fish oils go through multi-processing steps that eliminate any trace of undesired compounds. That being said, having fish oil is much safer than eating fish. For these reasons, Frost and Sullivan forecasts the global Omega-3 dietary supplement and food ingredients categories will continue growing in double digits annually until 2015.

As for disadvantages, first the competition is very high. Fish oil is a multi-billion market whereas many competitors try to increase their market share. Only high potential firms are able to compete and to remain in business. Second, the market in the middle east lacks the marketing information which might add a little risk to the project.

### **What is the product? Why did u choose it?**

The product subject of this paper is Omega-3 EPA/DHA fish oil supplement. The locations play the key factors from the strategy point of view for this project. ONC is the suppliers of Omega-3 EPA/EHA ingredients is located in North America and benefits from well-educated employees, good logistic infrastructure structure and usefulness legal system which are the foundations for a successful business. In addition, the location of the company on the Atlantic Ocean and the Peruvian region on the Pacific Ocean

provides the company a sustainable source for fisheries and an easy access to export globally. The location of the fish oil supplement plant in South Africa takes advantage of low labor costs and the close distance to Qatar which provides an ideal market to the product. Qatar is a consuming market with the higher GDP per capita (\$ 85867) in the world. Moreover, one ware house in the center of Doha is able to cover the whole country with approximate 80 km radius with possibility to expand to the rest of Gulf countries. Even though Revite is the producer of the final product, ONC is the main player because it provides the ingredient whereas Revite does only the assembling. Two reasons behind choosing the product: one is related to the ingredient itself while the other is related to ONC.

### **Ocean Nutrition Canada**

ONC proved to be doing well since it started in 1997. What differentiate ONC from other competitors that it delivers expert solutions joined with high quality Omega-3 products. The reason behind choosing ONC is that it operates in North America. According to porter: “a firm’s international competitiveness is a function of how effectively its industry operates in the firm’s home country”. The North American market is one of the most competitive markets in the world. For a firm to succeed in this environment it has to be a leader in the industry and it is influenced by the culture of the country. In order to satisfy the local customers who are well educated and very good in prioritizing, a company should invest in innovation to provide products with added value in a cost effective way. The mixture of the market competition with the demanding consumers in a leading

scientific and research civilization let ONC to grow in this environment, build a solid infrastructure and extend internationally.

ONC has the structure of a successful manufacturing business. As evidence, many investors stepped in; one of them is the world's largest integrated shellfish harvester and processor. The factors that influenced my choice to choose the product are the same as for investors to make a decision to invest in a business.

- High-tech processing plants

The development of the plants went through the development of the company over the years. The company started its operation by acquiring a manufacturing facility in Cape Breton that distributes Omega-3 fish oil products to hospitals in Canada. The second plant was in Dartmouth to produce the micro-encapsulation products. Due to the increase in consumer demand for food and beverage fortified with Omega-3 EPA/DHA fish oil, the firm created a third plant. The fourth plant was a joint venture in Peru to produce fish oil. With these plants utilizing molecular distillation refinement process for the purest, most highly concentrated EPA and DHA, ONC is able to supply Omega-3 ingredients to clients all over the world. The Manufacturing, packaging, and encapsulation facilities are operated to dietary supplement CGMP (current good manufacturing practice) and HACCP (Hazard analysis and Critical control point) standards. (ONC, n.d.)

- R&D marine lab

What make a business takes a competitive advantage and sustainable position in the market is the degree of innovation that differentiates its products from competitors. ONC has the largest marine research and development facility in North America. It has 14 PhDs and 30 researchers on staff that research and develop only products supported by

strong scientific evidence. The first innovation was technology that transformed fish oil into a tasteless, odorless powder finer than flour (Micro-encapsulation products). The innovated products could endure any food manufacturing procedure which was the first industry discovery. (ONC, n.d.)

- The support service

ONC customers enjoy many services from critical technical and regulatory support to global marketing support.

- The management team

ONC has more than 300 experts in research, development, manufacturing and marketing of Omega 3 ingredients. The management team was successful to position the company as an industry leader. The management is diversified with international experience to ensure sustainable and global growth.

### **Meg-3**

Meg-3 is the Omega-3 ingredient produced by ONC. Meg-3 is a trusted source of Omega-3 EPA/DHA with more than 100 Billion servings in dietary supplements and food products around the world. Meg-3 is purified to reduce the environmental contaminants found in the fish like PCBs, dioxins and mercury. Meg-3 are then concentrated for maximum Omega-3 EPA/DHA potency. Meg-3 provides all the goodness of fish without the odor or taste. (ONC, n.d.)

## **Advantages**

The first important advantage for choosing the supplier is the cost effective production. ONC is the world largest Omega-3 EPA/EHA ingredient supplier. Since the production volume is higher than other Omega-3 ingredient suppliers, the Meg-3 production cost beats competitors to position ONC in a good competitive advantage in the market.

The second advantage is the innovative technological development. Meg-3 fish oil is the world's only to receive USP (United States Pharmacopoeia) dietary supplement ingredient verification. Also, Meg-3 conforms to global quality and purity standards: including these established by the European Union, Norwegian Food Safety Authority, Health Canada and the US FDA. (ONC, n.d.)

Third, People in Qatar are educated and rich .More knowledge means higher demand for convenience and quality including efficacy and purity. Consumers read on pack health guidelines, they want manufacturers to be information resources, empowering them to make healthier choices. The North American norms make it mandatory to clarify the nutrition, sourcing and manufacturing on the package labeling which is a good way to attract consumers.

Moreover, a lot of students come from Qatar to study in North America. When they come back, they bring with them the way of thinking and the things that they learned especially in the nutrition field.

**What's the demand in oversea markets? How to estimate? What are the challenges? How to address them?**

The law of demand proposes that as the price of a good falls, the quantity demanded rises. The quantity demanded is the amount of a good that consumers are willing to buy at a given price, holding constant the other factors that influence purchases.

If the price of a good goes up, consumers will look for substitute. When there are fewer substitutes, quantity demanded is less sensitive to price changes. The only substitute to fish oil is to have the requested amount of Omega-3 by eating fish twice a week. That being said, the demand for fish oil is very high because many countries do not have access to the oceans. Even for countries that do have fishing activities, people stay away from eating fresh fish because of the toxic components into it.

in the other hand, a large part of the society has fixed income. When there is inflation or the price of an essential good like oil increases, it lowers the purchasing power for other goods. When it comes to buy goods, people do prioritize depending on their needs. Fish oil is mandatory to health which makes it a potential product.

Regarding the demand, it was estimated at the retails level. The formulation was used by Oppenheim (1990), Hsu and Chen (1994). The level of consumer demand for shopping at a retail establishment is assumed to be a function of access time, the price level, and establishment size.



## Consumer Demand

The average demand level per consumer in an

$$\text{establishment: } A = K q_s^\sigma \text{ price}^{-\varepsilon} e^{-\frac{bd_e}{v}}$$

Being the product sold at the retails level, the total demand on the market would be the sum of all the demands at each retail store knowing the number of retailers.

The average demand per consumer is the share of this customer of the number of items supplied by the retail establishment depending on the average distance of the customer to the establishment, its average speed and the sensitivity of the customer to the item price, access time and number of items supplied by the establishment.

We assume that  $\varepsilon = \sigma = b = 1$  which means that all the customers have the same sensitivity to these factors. If the price of the item drops, the average demand would increase which confirms the law of demand.

Price: unit item price

$q_s$ : The average number of items supplied by each retail establishment

$d_e$ : Average customers' access distance to the establishment

$V$ : Average travel speed of the customer

$K$ : Constant

$\varepsilon$ ,  $\sigma$ ,  $b$ : Customers' sensitivity to the number of items supplied by the establishment, the item price, and access time

The average total demand of all customers within the market boundary of a retail establishment:

$$\begin{aligned}
 q_D &= 4 \int_0^{d_0} \int_0^{d_0-x} A(POP) dx dy \\
 &= 4 K (pop) q_s^\sigma \frac{v}{b} price^{-\varepsilon} \left( \frac{v}{b} \left( 1 - e^{-\frac{bd_e}{v}} \right) - d_0 e^{-\frac{bd_e}{v}} \right) \\
 &= 2 K (pop) q_s^\sigma \frac{v}{b} price^{-\varepsilon} \left( \frac{v}{b} \left( 1 - e^{-\frac{b\mu^{-\frac{1}{2}}}{v}} \right) - \mu^{-\frac{1}{2}} e^{-\frac{b\mu^{-\frac{1}{2}}}{v}} \right)
 \end{aligned}$$

$d_0$ : Half diagonal length of the market boundary

$$d_0 = (2\mu)^{-\frac{1}{2}}$$

$$b = \frac{b'}{\sqrt{2}}$$

$q_D$ : Average demand for a retail establishment

The total demand over the entire market area:  $Q_D = \sum q_{D_i}$

$$Q_D = 2 K M \mu (pop) q_s^\sigma \frac{v}{b} price^{-\varepsilon} \left( \frac{v}{b} \left( 1 - e^{-\frac{b\mu^{-\frac{1}{2}}}{v}} \right) - \mu^{-\frac{1}{2}} e^{-\frac{b\mu^{-\frac{1}{2}}}{v}} \right)$$

**For Logistics: What are the challenges? How to address them? How to estimate the total logistic cost?**

The distribution system used is: Manufacturing – Terminals – retailers. The product is usually assumed to be distributed from intermediate local terminals to many retail establishments.

In order to take a competitive advantage in the market, the logistic system used should be effective in terms of time and cost. The reduction in cost should be controlled at every level of the distribution system. In practice, Logistic costs are associated with the cost of manufacturing, inventory cost and transport costs including the costs of shipping, storage, insurance, and delivery.

The Cost at the inventory level is the main component compared to other costs. In other words, the supplier needs to limit the optimal density of intermediate terminals that should be set up in a given region so as to distribute and sell the product. That being said, the average transportation cost depends on the transportation distance, shipping frequency, and unit-distance transportation cost, so it is proportional to the density of retail establishments.

On the other hand, the average inventory cost depends on the average headway, which is the inverse of shipping frequency, so it is inversely proportional to the density of retail establishments. The density of retail establishments plays an important role in the trade-off between average transportation and average inventory cost.

Average logistic cost appears as a part of item price, which will consequently affect consumer demand. From here comes the topic of this research to reduce logistic costs, increase demand and rise profit. Consumer demand for items in retail establishments usually depends on the access time to the establishment, unit price, and total supply of items at the retail establishment.

The cost advantages due to larger but more distributed retail institutions leads to larger market areas but longer access distance. The density of retail establishment affects both the total supply of items at each establishment and average access distance to this establishment. Holding the shipment size constant, the shipping frequency increases with the density of retail establishments. (Hsu and Tsai 1999)

### **Logistic Cost**

For terminal shipping, the retail-establishment density affects the average local transportation cost directly and the average terminal cost indirectly. On the other hand, the number of terminals affects directly both line-haul transportation cost and terminal cost. The following Formulas are taken from Hsu and Tsai (1999)

## Line-Haul transportation Cost

The line-haul transportation is the shipping of merchandises from the plant to the terminal.

It is the sum of the costs for both the Marine shipment from the plant in South Africa to the port in Qatar plus the land shipment from the port to the terminal.

The average Land Distance:  $D_T = K_0 M^{1/2}$

M: Total market area of study

$K_0=0.75$ . It is a corrective coefficient assuming the Terminal is located at 75 % of the length of the market area.

Line-haul shipping frequency:  $f_1 = Q_1/S_1$

$Q_1$ : Total number of items to be shipped from the plant to the terminals

$S_1$ : Total shipment capacity of the line-haul fleet

The land transportation cost for the unit distance of the line-haul fleet:  $\alpha_1 = a_1 S_1 + b_1$

$a_1, b_1$ : Constants for the line-haul fleet

Total Land transportation cost to each terminal:  $TTC_L = (a_1 S_1 + b_1) \frac{Q_1}{S_1} K_0 M^{1/2}$

The assumption is that we have only one terminal to cover the market area. The Total Land transportation Cost is the number of shipments from the port to the terminal multiplied by the cost of a unit distance multiplied by the number of unit distances.

The average marine Shipment cost per terminal:  $C/N$

Marine Shipment cost:  $C$

The average Line-haul transportation cost per item per terminal:  $ATC_L =$

$$(a_1 S_1 + b_1) \frac{Q_1}{S_1} K_0 M^{1/2} 1/Q_T + C/N/Q_T$$

$Q_T = m_1 \mu q_s$  : Total number of Items served by each terminal

Number of transshipment terminals:  $N = Q_1/Q_T$  The assumption is that each terminal serves the same amount of products.

### Local transportation Cost

The local transportation is the shipment of products from the terminal to retail establishments.

The total transportation cost for each Terminal:  $TTC_{Local} = \alpha_2 \frac{m_1 \mu q_s}{s_2} k_0 m_1 \mu^{\frac{1}{2}}$

Average local transportation per item for each terminal:  $ATC_{Local} = \frac{\alpha_2}{s_2} k_0 m_1 \mu^{\frac{1}{2}}$

$m_1$ : The average market area served by each transshipment terminal

$\mu$ : The retail establishment density.  $\mu = \frac{N'}{M}$  ( $N'$  is the total number of retails)

$q_s$ : The average number of items supplied by each retail establishment

$S_2$ : Total shipment Capacity of local vehicle fleet

The transportation cost for the unit distance of the local fleet:  $\alpha_2 = a_2 Q_T + b_2$

$a_2, b_2$  : Constants for the local fleet

### **The inventory Cost of terminal shipment**

The inventory Cost per item delivered for terminal shipping:

$$AIC_T = PR \text{Max} ( T_1, T_2 )$$

P: Average production cost per item

R: Inventory carrying rate

$T_1$  : Headway for line-haul vehicles arriving at the terminal

$T_2$  : Headway for local vehicles departing from the terminal

We assume  $T_1 = T_2$  for optimal operating condition of terminal shipping

$$T_1 = \frac{S_1}{Q_1} \quad \text{Because the Line haul shipment frequency } f_1 = \frac{1}{T_1}$$

$$T_2 = \frac{S_2}{\mu q_s m_1} \text{ Because the Local vehicle shipment frequency } f_2 = \frac{1}{T_2}$$

### Terminal Cost

$$\text{The fixed terminal cost per item: } F = \frac{f}{Q_T}$$

f: fixed cost per terminal

The average total number of items served by each terminal:  $Q_T = m_1 \mu q_s$

$$\text{The terminal cost per item: } T = \frac{f}{m_1 \mu q_s} + v_a$$

$v_a$ : Variable handling cost per item at the terminals

### The logistic cost of terminal shipment

The average logistic cost per item for terminal shipment:  $ALC_T = \frac{\alpha_1}{S_1} N K_0 M^{\frac{1}{2}} +$

$$\frac{c}{Q_T} + PR \text{ Max } ( T_1, T_2 ) + \frac{f}{m_1 \mu q_s} + v_a + \frac{\alpha_2}{S_2} K_0 m_1 \mu^{\frac{1}{2}}$$

This cost is the average logistic cost per item delivered at the retail shelf. It covers the delivery cost which is the sum of the land shipment from the port to the terminal, the marine shipment, the inventory cost, the terminal cost plus the shipment from terminal to retails.



## Numerical Analysis

We have one unknown in the formulas of the logistic cost and the total demand which is the quantity supplied by each retail establishment ( $q_s$ ). The rule of thumb for Free Trading is when the excess demand from one country equals the excess supply from the other country. What makes the basis for international trade is known by Arbitrage, the practice of taking advantage of a price difference between two markets and the profit being the difference between the market prices (Industry Canada, n.d.). In order to do so, my calculation is going to be based on the following assumptions (Hsu and Tsai 1999):

- Equality between the number of items supplied by each retail establishment and the total demand within the market area of the establishment.

$$q_s - 2K(\rho p) q_s^\sigma \frac{v}{b} p^{-\varepsilon} \left( \frac{v}{b} \left( 1 - e^{-\frac{b\mu}{v}} \right) - \mu^{\frac{1}{2}} e^{-\frac{b\mu}{v}} \right) = 0$$

- Price equals the average logistic cost plus the average production cost.

$$Price = ALC_T + P$$

- The optimal coordinated schedules for local vehicles and Line-haul vehicles of terminal shipment  $T_1 = T_2$

- $\mu, q_s, S_1, S_2 > 0$

Parameter	Initial Value	Unit
f	10000	\$
$v_a$	1	\$
$\alpha_1$	$0.0005S_1 + 20$	\$/km
$\alpha_2$	$0.00025S_2 + 8$	\$/km
M	11437	<i>km<sup>2</sup></i>
P	5	\$/item
R	0.1	
v	0.5	Km/mn
POP	69	Person/ <i>km<sup>2</sup></i>
$\sigma$	0.5	
$\epsilon$	1	
K	1	
b	0.5	

Some of these parameters were calculated such as population per Kilometer square.

Others were taken from a market which is very similar to the one on study.

**Total Number of retails establishments in Qatar** (www.qatcom.com)

Supermarkets: 57

Convenience store: 2

Department stores: 23

Diet Centers: 4

Pharmacies: 87

Health food products: 5

Recreation centers: 5

The total number of retails that sell the product in the market is: 183

$\mu$ : The retail establishment density.  $\mu = \frac{N'}{M}$  (N' is the total number of retails)

$$\mu = \frac{N'}{M} = \frac{183}{11437} = 0.016 \quad (M: \text{Total market area of study})$$

$$q_s - 2 K (pop) q_s^\sigma \frac{v}{b} p^{-\varepsilon} \left( \frac{v}{b} \left( 1 - e^{-\frac{b\mu^{-\frac{1}{2}}}{v}} \right) - \mu^{-\frac{1}{2}} e^{-\frac{b\mu^{-\frac{1}{2}}}{v}} \right) = 0$$

$$q_s - 2x1x(69) q_s^{0.5} \frac{0.5}{0.5} (MIN ALC_T + 5)^{-1} \left( \frac{0.5}{0.5} \left( 1 - e^{-\frac{0.5x0.016^{-\frac{1}{2}}}{0.5}} \right) - 0.016^{-\frac{1}{2}} e^{-\frac{0.5x0.016^{-\frac{1}{2}}}{0.5}} \right) = 0$$

$$q_s - \frac{137.547}{5+MIN ALC_T} q_s^{0.5} = 0$$

I had difficulty getting the information from the manufacture regarding the production cost, how many item per container, and the price on the market. I have assumed the numbers.

The price on the market is estimated as the average market price. The production cost was estimated based on comparison to other industries. The following analysis would provide us with the number of items in a container.

Container Cotenant number of Items assumption ([www.searates.com](http://www.searates.com))

Number of Boxes: 1568

Number of Items in each box: 25

Weight of each Item: 400 g

Box size: L=500, Width = 300, H=300 weight= 10 kg

Container type: 40 'hq (L =12024, Width = 2350, H=2697) Weight capacity = 26460 kg

Cargo volume: 70.56 m<sup>3</sup>(93 % of total volume)

Cargo weight: 15680 kg (59 % of Max load) => Cargo quantity is limited by volume

**Number of Items: 39200 = S<sub>1</sub> = S<sub>2</sub> = Q<sub>T</sub>**

N =1 (Number of Terminals)

$$\text{Min } ALC_T = \frac{\alpha_1}{S_1} NK_0 M^{\frac{1}{2}} + PR \text{Max} (T_1, T_2) + \frac{f}{m_1 \mu q_s} + v_a +$$

$$\frac{\alpha_2}{S_2} K_0 m_1 \mu^{\frac{1}{2}} + \frac{c}{Q_T}$$

$$= \frac{(0.0005 \times 39200 + 20)}{39200} 1 \times 0.75 \times \sqrt{11437} + 100 \times 0.1 \times 1 + \frac{10000}{11437 \times 0.016 \times q_s} +$$

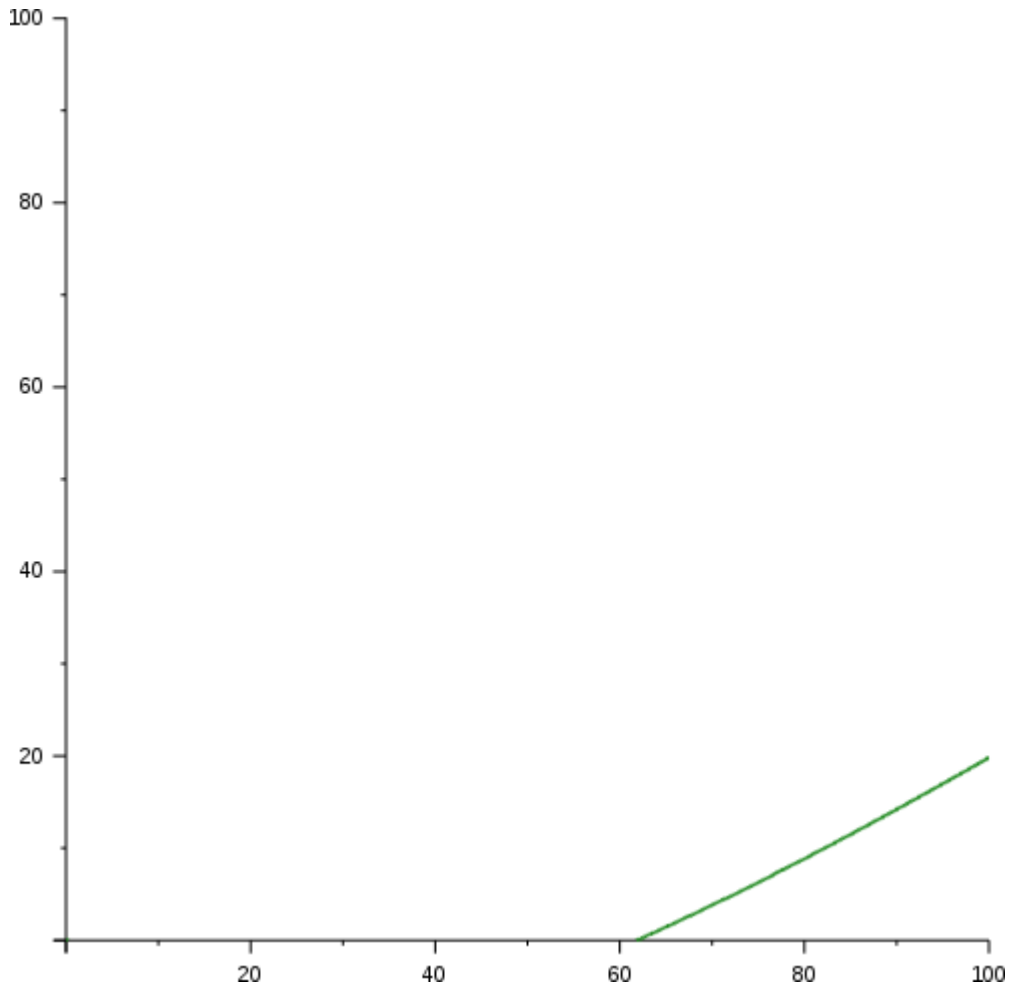
$$1 + \frac{(0.00025 \times 39200 + 8)}{39200} 0.75 \times 11437 \times \sqrt{0.016} + \frac{1500}{39200}$$

$$= 0.08103 + 10 + \frac{54.647}{q_s} + 1 + 0.493 + 0.0383$$

$$= 11.61 + \frac{54.647}{q_s}$$

$$\text{Thus: } q_s - \frac{137.547}{5 + \text{MIN } ALC_T} q_s^{0.5} = 0 \Rightarrow q_s - \frac{137.547}{5 + 11.61 + \frac{54.647}{q_s}} q_s^{0.5} = 0 \Rightarrow$$

$$q_s - \frac{137.547}{16.61 + \frac{54.647}{q_s}} q_s^{0.5} = 0$$



This graph will give us  $q_s = 62$

The average logistic cost per item for terminal shipment:  $ALC_T = \frac{\alpha_1}{S_1} NK_0 M^{\frac{1}{2}} +$

$$\frac{c}{Q_T} + PR \text{Max}(T_1, T_2) + \frac{f}{m_1 \mu q_s} + v_a + \frac{\alpha_2}{S_2} K_0 m_1 \mu^{\frac{1}{2}} =$$

$$\frac{(0.0005 \times 39200 + 20)}{39200} 1 \times 0.75 \times \sqrt{11437} + \frac{1500}{39200} + 100 \times 0.1 \times 1 + \frac{10000}{11437 \times 0.016 \times 62} + 1 + \frac{(0.00025 \times 39200 + 8)}{39200} 0.75 \times 11437 \times \sqrt{0.016} = \$ 12.488$$

The maximum demand:  $M \mu q_s = 11437 \times 0.016 \times 62 = 11345.504$

Single item price in the Market: \$ 22

***Profit per item = Market price - (Production Cost + Logistic cost) = 17.84 - 12.488 = \$ 5.352***

### **Investors Analysis**

Investors will approach companies that already have existing value and in which are able to add more values. After all, the investors' goal is to achieve high return on their investment.

The first thing they look at is the management team. They want to make sure that the entrepreneur and managers have the skills to lead the company to success. Also, the team should be capable of functioning under stress and finding creative solutions that will secure the company's anticipated success even in front of a tough environment. However, this business counts on the suppliers teams who include managers, technology and business development leaders and business analysis in the field of finance and international business. In addition, this business relies on the suppliers' commitment to their businesses by being the leaders in the industry.

From the operation point of view, it is a low tech business. The operations are easy to understand and easy to supervise since the complicated part such as manufacturing are

done by outside sources. The logistical is not complex as well because few locations and product lines are involved.

From the market perspective, it is a direct customer base business. It is easy to target customers through retail stores and provide the information to the investors about suppliers, customers, market potentials, products ....All information that investors need to take the decision. The investors do not have time to build the business through all these steps. On the other hand, the product is well positioned in the market, has competitive advantages over the competitors and well desirable by customers for the reasons explained on the paper.

Financially, this business has stable cash flow. That enables the business to pay its debt and to have financing for extension. Also, it provides the opportunity to acquire assets such as terminals and trucks which are very liquidation assets that facilitates the process of having credit lines from the banks. Hence, there is no turnaround needed since the business would be profitable from its start.

Unit Margin (\$): Selling price per unit – cost per unit = 17.84 -12.488 = \$ 5.352

Margin (%) = Unit Margin/Selling price per Unit = 5.352/17.84 = 30 %

It gives the profit by selling the product to retailers, 30 % of total sales is profit.

The retail's profit is  $(22-17.84)/22 = 19 \%$

Return on Investment/Container:  $ROS (\%) = \text{Net Income (Before Interest and Tax)}/\text{sales} = 39200*(17.84-12.488)/ (39200*17.84) = 30 \%$ .( the number of items per container is 39200)



It is used to evaluate a company's operational efficiency. It provides insight into how much profit is being produced per dollar of sales.

Return on Equity / Container = Net Income/Shareholder's Equity=  $39200 * (17.84 - 12.488) / (39200 * 12.488) = 42.85\%$ . (The assumption is that the shareholders will pay cash for one container).

It provides the amount of net income returned as a percentage of shareholders equity. It reveals how much profit a company generates with the money shareholders have invested.

This business gives the ability to investors to add value and exit with profit. That being said, it is good time for investors to get in now and have the capability to improve the business performance. First, there is potential for growth by broaden distribution and open new market to the other gulf regions. Second, once the business is established, they can add more product lines. This industry has a rising trend and is growing fast.

The options to exit are running the company in perpetuity, getting out in a secondary public offering, liquidating the assets or selling out to another organization.

## **Chapter IV: Conclusion**

The paper provides a clear strategy how to trade a product internationally. To sum up, following is the progress that led to the solution. If there was lack of information, it made sense to have assumptions based on common sense.

The ideal product comes from a business that is sustainable. It is reflected directly from the country culture and the awareness of its people. Well educated people that seek quality lead firms to compete and innovate to increase the market share. The paper discussed four parameters of a nation. These factors are the ground for companies to be created, operate and compete. That being said, not all nations have these factors available. Businesses cannot outstand without production infrastructures. However, these infrastructures should be as a package at different level from transportation system to legal, technology and communication systems. These factors are mostly found in advanced countries that have the capital, the natural resources and the research capacity.

Home demand plays a key role in choosing the product. In one hand, if the demand in the home country is too high that would guide producers to compete through innovation to differentiate them self. Local market that has sophisticated population and scientific improvement trend would target best products to satisfy the population need. The North American market is very competitive one. Companies do not compete only to provide the best products but also in the way the companies are managed. The North American firms

outstand internationally because of the advanced management systems that they use and the leadership expertise that characterized them. For instance, the MBA program was first invented in the states. On the other hand, if the demand is not too high that would indicate that the demand overseas would be low as well.

Many factors should be taken into consideration when dealing with locations such as the labor cost, distance to the market, and raw materials availability. The model suggests that the suppliers should be in the same geographic area as the manufacture. In one hand, this theory applies to the fish oil ingredient suppliers which have their plants close to the oceans either in Peru or Nova Scotia, in the other hand this theory does not apply to the final product which is the fish oil supplement which has the assembling plant in South Africa where the labor cost is cheap and it is close to the final sale point. The last point concerning locations is about where the final market is located in Qatar where the demand is high and the population is growing with the highest GDP in the world plus the ability for the business to expand to the rest of the Middle East.

The logistic cost is calculated per item and includes the inventories for terminals and transportation cost. By adding the logistic cost to the production cost, we obtain \$12.488 which is the cost per item.

The demand is calculated as the sum of the demand of every single retail establishment. The total demand is estimated to be 11346 items. The profit per item is \$ 7.512 thus the total profit for the project per container is \$ 294470

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