THE FOOD INDUSTRY'S SUPPLY CHAIN'S EFFECTIVITY MANAGEMENT: SMALL MARKETS' CASE

Navickas VALENTINAS – Valentas GRUŽAUSKAS – Saulius BASKUTIS

Department of Economics, School of Economics and Business, Kaunas University of Technology
Department of Production Engineering, Faculty of Mechanics, Kaunas University of Technology

Abstract

This paper is oriented to the small market's food industry. The main problem of the small market is that they often distribute partial cargo e.g. raw material. Therefore ineffective supply chain management may increase the final price of the product dramatically. The result of that would be lower competiveness level. The authors concluded that optimization in a small market's supply chain is possible only by using combination of different warehousing systems together with different transportation methods. This logistic systems computability stimulates the analyzation of clustering processes and can make a large impact to the logistic cluster formation in small markets. The developed methodology offers to combine sea, truck and railway transportation together with different types of warehouses. To empathize even more the optimization level it is recommended to conduct a mathematical simulation in order to properly evaluate the best combination of different transportation types and warehouses.

Keywords: *Food Industry, Competitiveness, Small market, Supply chain management, Warehousing.*

JEL Classification: L66, L81, N7

Introduction

Businesses are feeling pressure from the world's globalized market. Companies that are established in the small markets must compete not only with the local market, but also with the international market. In order for them to maintain proper competiveness level in the international market, they must work not only in one market. Therefore, supply chain management is necessary for proper competiveness level achievement. Sprenger and Monch created a decision support system for cooperative transportation planning. They analyzed the Germans food industry where several manufacturing companies shared their fleets to reduce transportation cost (Sprenger, Mönch 2014). They developed a methodology that helps to combine transportation together within several manufacturers. This is a practical example and it can be seen that the problem of supply chain is relevant to large markets as well. However, there are not any researches done that describes the distribution process of

partial cargo that is more often found in small markets. Researchers has conducted a specialist interview inside a small market and concluded that partial cargo distribution can increase dramatically the logistic cost in a small market. *"When transporting with fully loaded semi-trailer (32 euro pallets) the pallet price is approximately 40-48 euro per piece. While partial cargo is transported, the price per pallet may vary from 80 up to 120 euro and total costs can rise dramatically. (Navickas, Baskutis, Gruzauskas, Olenceviciute 2015)"* Therefore, enterprises from small markets that distribute partial cargo and they pay too much may reduce their competiveness in the global market. One side of this problem is partial cargo transportation that requires to combine freight together and then distribute them with as minimal transport machines as possible. However, because of international markets the distances between the loading places may increase and the logistic cost may increase dramatically. This problem has been analyzed by a research that studied the effect on warehouses parameters based on traveled distance. They developed a stochastic system that offered the best layout planning for the warehouse, that would provide the best competiveness level (Shqair, 2014). However, their research was done for a large market that did not distribute partial cargo often. Here is the second problem of the partial cargo distribution. The distribution process requires compatibility of various transportation systems like trucks, sea and railway to minimize the cost. At the same time, the warehouses are essential for several reasons. The first reason is that the warehousing of different types of food products requires a proper layout of the warehouse. The second area is the type of warehouse it is - central warehouse, consolidation warehouses, a port or a warehouse prepared for the railway. This kind of competiveness can be achieved by using logistic clusters. Mostly they have been analyzed in large markets (Bosona, Gebresenbet, 2011; Fallah, 2011; Beckeman, Skjöldebrand, 2007; Sun, 2015). However proper understanding of the partial cargo distribution process may promote logistic cluster creations in small markets also.

Novelty of the study. The Authors analyzed the supply chain management effectivity in the small market's food industry. They concluded that optimization in a small market's supply chain is possible only by using combination of different warehousing systems. These warehousing systems stimulates the analyzation of clustering processes and can make a large impact to logistic cluster formation in small markets. By this method the logistic cluster's members achieves proper competiveness level. By these aspects the supply chain optimization strategy in the scientific literature practically is not analyzed.

Therefore, **the research's goal** is to create a methodology for small market's supply chain optimization, while empathizing the warehousing problem.

The study's objectives:

1. Examine the small market's food industry's singularities;
2. Analyze the supply chain compatibility possibilities depending on the transportation method;
3. Create a warehousing concept for small markets.

The Singularities of Small Markets Food Industry

The beginning of food processing starts in ancient Egypt and it symbolize the history of the culture of mankind. At present, bread, which is characterized by using fermentation action of yeast and which uses flour as its raw material, is baked all over the world. The beginning of beer also starts in Babylon and Egypt in the period from

3000 to 5000 BC. In the beginning of humanity, human's hunted wild animals, first with their hands, later they construct tools from stone, wood. In addition, they collected wild plants and made food. In every age, humans became smarter and more creative. They started to keep some products for example, for winter. From as early as 11,000 BCE, humans began a gradual transition away from a hunter-gatherer lifestyle toward cultivating crops and animals for food (Anon, 2002).

Nowadays, the processed foods that are thriving in grocery shops are modern processed foods and traditional foods, but their manufacturing technology, process control and manufacturing and packaging environmental facilities have been advanced and rationalized to an incomparable extent in the last 30 years. Seeing that food science is progressing, due to the general introduction of hygienic, applied microbiology, mechanical engineering, chemical engineering, electronic engineering and high-polymer technology, products with uniformity and high quality are being manufactured. The most monumental developments until now have been pre-cooked frozen foods, resort pouch foods and dried foods. The mass production of food without using unnecessary food additives has been made possible in the last 30 years, when companies started to grand and inspect the process material, carry out proper inspections of processed foods. The history of processed food is the history of the rationalization of advanced technology related to raw material treatment operations, processing operations, storage operations, other processing equipment, cleaning of facilities, sterilizing and conservation treatment operations and effluent and waste treatment operations (Manual, 1993). As mentioned earlier, one of the most important development was frozen food. In addition, frozen products need quality maintenance. If the company based on frozen products, it has to have good refrigeration equipment. Not all products need the same temperature in order to keep it good for use. However, not all products have the same requirements for transportation or storage. The distribution side of the food products depend a lot on the classification and requirements.

The classification of the food products is important to understand in order to plan properly the supply chain. The food classification scheme can vary depending on the organization, however they all will be similar. One of the classification organizations is European Food Safety Authority. EFSA has developed a preliminary standardized food classification and description system called **FoodEx2**. The system consists of descriptions of a large number of individual food items aggregated into food groups and broader food categories in a hierarchical parent-child relationship (Food Authority, 2015). This particular classification is a detail one that consist not only of product group, but also the processing. However, for this particular situation a more general one is more suitable then a complex one for manufacturing purpose. In general, the products can be classified in a hierarchy. The first level is the class. The class consists of plant origin, animal origin and mineral water. The next level is the type, for example vegetables, fruits, nuts, spices, poultry, bee products etc. Then there can be a more detailed hierarchy that consists of groups that are more exact, what kind of spices, is it beef or chicken etc. In addition, the last level of the hierarchy is the exact product. However speaking about the singularities of the small market the more basic understand of the products can be used. It is important to classified different products because their requirements differs that is important to the supply chain.

The most important factor in food industry is to keep good quality of products. For supporting this factor, food must be stock in right temperature, when it is transporting and stored in warehouses.

Nevertheless, that food products are divided in to 40 groups according to natural origin, also food could be dry, powdery, having a solid form, liquid and etc. Different consistency products have to be transported and storage differently. For example, dry products have been storage at the temperature up to 23° C. While ice cream must be stored at the temperature from -12° C to -18° C. All required temperature is reported in the 1 Table below:

Table 1 Required temperature for food products

Group of product	Required temperature	Indoor relative humidity
Dry products	Up to +23 ° C	Up to 60 %
Bread, cake and pastries	From +6 ° C till +23 ° C	Up to 60 %
Dairy products	From 0 ° C till +6 ° C	
Milk(raw or heat-treated) in tanks	Up to +4 ° C	
Confectionery (floury, confectionery)	+6 °C – +20 °C	
Confectionery (pastry with cream)	0 °C – +6 °C	
Semi-finished products from vegetables	0 °C – +6 °C	
Fresh chilled meat, except rabbit meat, small meat of wild animals, poultry	Up to +7 ° C	
Products from eggs	+4 ° C	
Chilled poultry, rabbit meat, meat of wild animals and their semi-finished products	Up to +4 ° C	
Cold-smoked sausages	0 °C – +15 °C	70 – 85 %
Products from hot smoked meat	0 °C – +6 °C	70 – 85 %
Frozen melt lard and tallow	- 18 °C	
Frozen meat, minced meat, fish and their semi-finished products, mollusks, crustaceans	- 18 °C	
Ice cream	-12 °C till -18 °C	

Source: Anon, 2002

As it is shown in table 1, all food products are divided in to 15 groups, which have different requirement for temperature. Temperature is relevant factor, when company is based on food transportation, storage and reputation pursuit. For this factor, companies have to have perfect refrigeration system, which is very expensive for partial loads, when logistics is not developed and it could decrease competitiveness because of cost. Food industry has two factors, which exclude it from other industry. It is time and temperature requirement. As it is known, all food products have expiration date, which means that each minute of delayed could mean a huge loss. Products with label always show the date with text: „best before", which means that these products could be use longer time, but the quality is lower. Sometimes the product could not have a label, storage period may be useful. Tightly packed products as salt, sugar, flour,

rise, starch, oatmeal, pasta, dry pastries, dried fruits, nuts, coffee, tea, honey in dry place (when temperature is 15-20° C) could be storage more than 6 months. Therefore, the supply chain management is essential for proper food product distribution. At the same time in small market's the food product quantity is small and variety is large, therefore the computability of the distribution process is also important.

Food Industry's Supply Chain

Planning of product path is important and responsible activity, when company tries to reach profitability and recognition. When customers are imagining how product came to their hands, they did not realize all complex operations. Manufacturing, delivery and purchase sounds very easy, but companies have to discuss more than few aspect: where is possible to get cheaper but qualitative raw materials, how to transport it in to factory with lowest costs and etc. Nowadays there is a way to answer all questions and get results faster – Supply Chain Management. Shapiro (2001) says that a supply chain comprises geographically dispersed facilities where raw material and intermediate or finished products are acquired, transformed, stored or sold, and the transportation links that connect the facilities along which products flow (Pettersson & Segerstedt 2013).

Supply Chain Management (SCM) includes main activities, which create companies added value: from designing, planning and buying to manufacturing and product delivery. SCM is conception, which describes movement of raw materials, services, information, finances from suppliers to final customers. SCM also includes processes, which create and deliver product or service to final customer.

Supply chain could be separated in to 3 parts (Turban 2008):

- Upstream part – it describes activities with first level suppliers (it could be extended to primary raw materials level).
- Internal part – it related with all activities, which are performing inside of the company:
    - production planning and control;
    - write off raw materials, products accounting, labor power, technological materials, equipment load;
    - Planning needs of raw materials, internal logistics.
- Downstream part – it describes product delivery to final customer:
    - Warehousing
    - Distribution
    - Transport and logistics
    - Wholesale and retail trade
    - Support

All these part are necessary in order to have good profitability and customers' acceptance. If company has good supply chain management, it could save a lot of money for logistics, warehousing, raw materials ordering. No company is able to control all recourses, which are required to run their business. There appears an important term „Supply Chain Management" and it includes purchase of goods and services (Beniusiene, Stankeviciene, 2007). A key to success - to ensure an uninterrupted flow of information and materials.

As it is known, in this century nobody imagine their life without internet. Internet technology systems could help in all industries, in every step from raw materials

to customers. In supply chain, internal part company could use transaction processing system (TPS) which includes all functional areas. Customer relationship management (CRM) is a system for managing a company's communications with current and future clients. CRM include using technology for sales, marketing, customer service, technical support organization, automation and synchronization and it could be used in upstream part in Supply Chain.

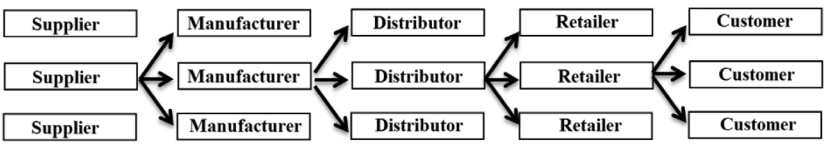
As it is discussed, the companies which are using supply chain are getting better results (Meidutė, 2012):

- Booking procedure value and time decrease from 20 to 40 %;
- Access to the market shorten from 15 to 30 %;
- The time of purchase reduce from 5 to 15 %;
- Warehousing cost decrease from 20 to 40 %;
- Production cost decrease from 5 to 15%
- Profit increase from 5 to 15 %.

The main aim of every supply chain is to maximize overall value. The value a supply chain generates is the difference between what the final product is worth to the customer and the costs the supply chain incurs in filling the customer's request (Chopra, Meindl, 2010). The value of supply chain is strongly connected with supply chain profitability, the difference between the revenue generated from the customers and whole outgoings across the supply chain. To understand the Supply Chain, variety of stages should be discussed. The basic stages include: customers, retailers, wholesalers/distributors, manufacturers, component/raw material suppliers.

All stages in supply chain are related with the flow of products, information, funds. It could be seen in figure 1 below. Suppliers are always related with manufacturers, and they are connected with distributors. Distributors joined with retailers and they are linked with customers.

Figure 1 Supply Chain Stages



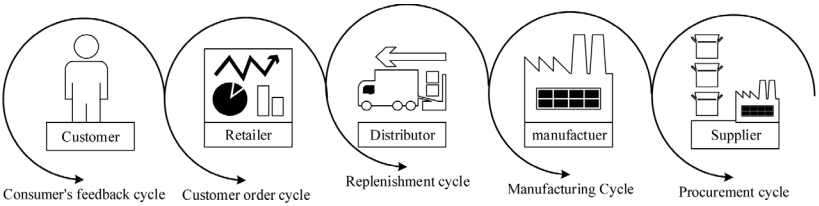
Source: Chopra & Meindl 2010

All Supply Chains could be named as continuance of flows and connections. As it is known, supply chain has five main stages and it could be retailed with five cycles: customer order cycle, replenishment cycle, manufacturing cycle, procurement cycle and consumer's feedback cycle.

A cycle view is useful when considering choices of activity. First, discuss about customer order cycle. It includes customer arrival in to supermarket or other place where he/she could buy necessary product, telling their needs, ordering the right product from inventory, and customer receive product. Replenishment cycle shows all processes replenishing retailer inventory: trigger and entry ordering, fulfillment and receiving orders. Manufacturing cycle includes product arrival from retailer, production scheduling, manufacturing and transportation and receiving at distributor.

The procurement cycle involve information about material and their adequacy for manufacturing. The consumer's feedback cycle is also important, especially in the food industry's supply chain. The final product may be received directly by the customer or by the supermarket, nether less the customer is the one that consumes the product and only he will identify the quality of the product that is closely related with the supply chain. All cycles are shown in Figure 2.

Figure 2 Supply Chain process cycle



As it is known, supply chain incorporate raw material ordering, manufacturing, warehousing, but all these activities are dependent on transportation. Without transportation, manufacturing process could not be implemented. If company has not has vision and schedule for transportation, raw material arrival could be delay, what affects manufacturing process and transportation in to warehouses. The activity which affects supply chain is logistics.

„Logistics" is a relatively new and complex word which is used in many context. However, the meaning of it is very simple – transportation from one location to another.

The basic definition of logistics is: „Logistics in and among companies is the organization, planning, and realization of the total flow of goods, data, and control along the entire product life cycle (Groznik, 2012)". Logistics includes all product travelling paths over its entire life cycle. Logistics network compose of the suppliers, manufacturers, distributors, retailer and users.

Logistics is the key for success supply chain. When company starts its activity, transportation causes the biggest discussion because it takes largely cost. It could increase product cost but also decreasing is thinkable and desired. World biggest companies get biggest profit because of their thoughtful logistics path. As it is seen logistics exist in every step; raw material must be transported in to manufactures, after manufacturing process product is transporting in to warehouses, products are transported by retailer and then customer could get it. If one part of a chain stops, then all logistics stops. The main object in logistics is material flow. All logistics is about this flow movement. Material flow includes raw material, incomplete product and final product movement. Some physical movement is granted for those material flows: loading, unloading, purchase, transporting, sorting, consolidation, dissolution. If product does not move in logistics system, it is named as reserves. All reserves and their warehousing would be discussed in chapter about warehousing. The main product properties, which generate logistics, cost are: cost, produces assortment, package size, weight, vulnerability, risk (when transporting, warehousing). Logistics cost is analyzed by density index. This ratio is related with transporting and warehousing costs. Products with high density ratio take low cost for transporting and warehousing. The place for those products is used optimally. Next important ratio is cost and weight

ratio. Production with low ratio has low cost for warehousing but high cost for transportation. The biggest influence for warehousing is load value and for transportation – load weight. Time and cost are most important criteria for company and for customers. Company is trying to reach lowest cost for manufacturing and transportation and get the shorter path for transporting products. The cost includes both job processing costs and delivery costs, and time refers to the time interval between the time when a customer places an order and the time when the customer receives the ordered product (Han, 2015). Customers are trying to reach the same purpose: the lowest cost and the faster delivery always win if they need to choose. Ordinary customers did not realize how hard is to choose the fastest and cheapest transportation structure. First step for lower expenses is to combine good path for production. The company has to choose with type of transport production could be transported. Transport has three basic forms: land, water and air. Transportation is separated in to seven types: air, package carriers, trucks, tail, water, pipeline, Intermodal.

First of all consider air transport. Air transportation could offer fast transportation, but for it location has to have airport. Airplane speed could reach 1000km/h and they are traveling international. In addition, airplanes could reduce path because they are traveling in air without traffics and roads. However, air transport as well has some limitation: feeder and distribution centers are needed, weight and volume are limited, dependent on air and cost is very high. Nowadays airlines are more for passengers not for cargo. This type of transportation is useful when product delivery is more important than cost of load. This type of transportation has very high cost and it is not useful for food industry. Package carriers are companies which deal with transportation like FedEx, UPS and also postal system. However, it is understood that no one send frozen food with postal services. This type is useful when load is small and time-sensitive. Package carriers have truck and could pick up loads and make deliveries. Truck transport type also named as road transport. This transport mode is dominating in, for example, United States and in most countries. In addition, it is dominating in Europe. Road transport is very maneuverable and flexible. It could offer point - to – point service between almost any origin and destination (Pienaar, Vogt, 2012). Road transportation has no limitation to fixed terminals or fixed route. Also whit this type of transportation, load could be delivered in any country. Time of transportation could be easy calculated because of road length and speed limitations. In addition, this type is right for food industry because of refrigerated trucks. Time is not the most dangerous factor, but temperature is. For this type load dimensions and weight are limited. In addition, trucks made high air pollution, there could be traffic jams. Road transport, especially trucks, consumes a lot of fuel for movement and cooling. Moreover, cargo could be stolen if it is without care. Nevertheless, road truck is very popular and also beneficial in intermodal operation. Next type is rail transport. In some countries rail transport is dominating type of transportation (Eastern Europe). This type of transportation is useful in intermodal operations. Also for rail type, terminals are needed. One of the most advantages is low cost. This type could offer terminal – to – terminal service. Any type of production could be transported with rail, and food is not an exception. Also load dimension and weight is not limited like in other types. As it was mentioned, low cost is very attractive and there is no limitation for weather or traffics. Nevertheless, rail transport has some limitation: distribution services and feeder are needed, load has to be packed safer than in road transportation. Delivering time is very slow and could not deliver expressage. For a large number of companies transportation cost is more important than transportation time. Water transport is important type when land has port. This type is cost-effective way of transporting

for long distances and it is high usage for international transportation. Advantages of water transport are: low cost, no limitation for load, no traffic in open sea, also it offers very safe and secure service. However, as all types there are some limitations. This type is useful between countries with ports. It is also terminal – to – terminal service. Water transport is dependent on bed weather and it could make cargo delay. In addition, sea transport offers slow transportation. Despite this, water transport is very useful in intermodal transportation. Pipelines are primarily used to move petroleum, natural gas, and chemicals. They offer a closed system with little risk of loss or damage to the products moved, and extremely low costs because minimal labor is involved in their operations (Gourdin, 2001). This type of transportation is useful for chemicals industry not for food industry, so it will not be important for food transportation.

As it was mentioned before, the biggest logistics problem is how to decrease cost for transportation? For this intermodal transportation is useful. Intermodal transportation is the use of more than one transportation type. The most popular model is rail – truck model. As remember, rail transportation is very cheap but it could not be door – to – door service. Truck could deliver load to rail terminal in country A and in other country load could be taken from other terminal to warehouses. It could save money for long road transportation. It is mentioned because Rail Baltic is one of the most expected project in Europe rail life. This project will open path from Finland to Germany with rail. It will help to save money from transportation and would be useful for food industry. Water – truck model is also acceptable. It would save money, because of water transportation cost. Truck could deliver load in terminal A, from where it could be transported by ships and in terminal B other truck could take load for final transportation. The logistic type computability is essential for partial cargo distribution, however just transport is not enough. In the next chapter, the warehousing types will be overviewed and a case study will be conducted to indicate the impotency of warehousing in small markets.

Small market's warehousing and distribution possibilities

A warehouse is not only the place for inventory storage, but it also has some functions which are important for logistics effort. In fact, warehousing is integrally involved in four distinct supply chain processes: sourcing logistics, processing/ manufacturing, outbound distribution, and reverse logistics (returns, recycling, etc.) (Gourdin, 2001). The basic definition of the term warehouse is *„Building for goods receiving and storing, prepare and send"*. Warehouse is one of the most important element in logistics, because requirement of the warehouse is felt in every step of material flow movement. Some of warehouse roles are in following sequence (Rushton, 2010): inventory holding point, consolidation center, cross – dock center, sortation center, assembly facility, trans – shipment point, returned goods center. These types of warehousing may differ depending on the transportation method. Therefore, the computability issue is essential. However, the management part of various systems can require increasing expenditures, however at the same time it increases the efficiency as well. Another of the key issues to decrease warehousing cost is to pick best size of warehouse. Size must adapt to load flow. Characteristics, which has influence for warehousing systems are type of transportation, handling unit and intensity of flow (Meidutė, Vasiliauskas, 2007). In addition, warehouse designing is very important because warehouses has requirements, which have to be perform. The typical design of warehouses mainly consist of warehousing rooms, auxiliary rooms and administrative

rooms. The warehousing part is one of the most important in the food industry. This is the part where the products are warehousing, therefore proper temperature and humidity level needs to be maintained. These issues may require greater investments from the enterprise for equipment and energy. The auxiliary rooms are more important to manufacturing companies. There they heled their equipment's, dispose waste and uses for other activities that are more related with manufacturing. Moreover, the last important part of the warehousing is the administrative part. This is the part where the documents for distribution is being handled. Next step is to choose the location of warehouse and quantity; is one warehouse enough or more is needed. Good solution of location could save money because warehouse is related with logistics. Each company has to answer in to questions: How many warehouses should be there? Where should they be located?

When company calculates flows than solution could be adopted: is one warehouse enough or company need one consolidating warehouse to get all products from different locations. In addition, the company has to discuss will warehouse be near public transport or near the shops or other location. The best way to find location is to calculate all flows and then check the required quantity of warehouses and the best location for it. Logistics cost is normally referred to as cost components related to distribution or transportation cost, and costs for warehouses as reflected by the definition of logistics (Pettersson, Segerstedt, 2013). The main aim of this research is to get minimum cost for logistics and warehousing. The objective is to find connections between transportation and warehouse location and choose the best solution. Location could be dependent on many aspects as cost, environment, transportation time and etc. Ozcan used only main criteria that consist of unit price, stock holding capacity, average distance to the shops, average distance to main suppliers, and movement flexibility (Location, Factors, 2013).

The transport computability, warehousing type and position is essential in order to achieve proper competiveness level. A case study has been conducted in Lithuania, that analyzed various food manufacturing enterprises. It was concluded that various manufacturing companies are important raw material from Europe usually from United Kingdom, Belgium, Netherlands and Germany (Navickas, Baskutis, Gruzauskas, Olenceviciute, 2015). Similar freight forwarding statistics happen with export, however there are more enterprises that export full cargo (32 euro pallets). The enterprises that import raw material or export partial cargo can achieve better competiveness level by using logistic clustering process. This is a simple idea to combine freight forwarding together inside the group of manufactures then they will not need to outsource logistic services and by this method they will reduce total logistic cost. While transporting partial cargo the price per pallet may vary from 40 to 120 euro, it is common sense that outsourcing logistic company's has a margin, however by creating a logistic cluster this margin can be used within the manufacturers to develop better products and services. For this purpose partial cargo transportation methods needs to be implemented inside the cluster. The problem is that in order to achieve proper cost optimization different transportation possibilities needs to be combined. For example particularly in Lithuania, there are port in Klaipeda region. Cargo may be consolidated in Belgium Antwerp, Netherlands Amsterdam or Germany Hamburg. Another issue is rail transportation that needs a central warehouse in order to distribute part of the products by railway, the establishment of the warehouse may be in Germany Berlin, Hanover or Bielefeld. In addition, several consolidation warehouses in United Kingdom, Netherlands may be established. At the same time, partial cargo transportation requires to load freight from several addresses and the

distance drastically effects the final transportation price. This is why a mathematical optimization method is essential to find the best warehousing and logistic computability way. One side of the method is the correct evaluation of possible warehousing possibilities. After the gathered information bout the suppliers and manufactures the optimal locations of the warehouses were chosen, however the locations where modified regarding the transportation possibilities. Nether less this is not enough to properly evaluate the efficiency of the supply chain.

Table 2 Warehousing cost in Europe

Country	Size, m^2	Rent price, per m^2	Service price, per m^2	Total rent cost	Land price,	Construction cost, per m^2	Total construction cost per m^2	Management cost, per month
Germany	368,64	7,56 €	1,51 €	3.344 €	160,00 €	1.500,11 €	553.000 €	11.262 €
	737,28	7,18 €	1,44 €	6.354 €	160,00 €	891,11 €	657.000 €	14.270 €
	1440	6,76 €	1,35 €	11.685 €	160,00 €	687,50 €	990.000 €	17.897 €
Belgium	368,64	9,80 €	1,96 €	4.335 €	300,00 €	1.462,13 €	539.000 €	12.547 €
	1440	8,75 €	1,75 €	15.120 €	300,00 €	845,14 €	1.217.000 €	20.403 €
	1440	8,75 €	1,75 €	15.120 €	300,00 €	845,14 €	1.217.000 €	20.403 €
Netherlands	368,64	10,22 €	2,04 €	4.521 €	360,00 €	1.529,95 €	564.000 €	11.711 €
	737,28	9,24 €	1,85 €	8.175 €	360,00 €	1.121,69 €	827.000 €	15.082 €
	1440	8,82 €	1,76 €	15.241 €	360,00 €	912,50 €	1.314.000 €	19.216 €
United Kingdom	368,64	12,60 €	2,52 €	5.574 €	550,00 €	1.871,74 €	690.000 €	13.026 €
	737,28	11,48 €	2,30 €	10.157 €	550,00 €	1.413,30 €	1.042.000 €	16.887 €
	1440	10,22 €	2,04 €	17.660 €	550,00 €	1.187,50 €	1.710.000 €	21.563 €
Lithuania	368,64	4,90 €	0,98 €	2.168 €	50,00 €	821,94 €	303.000 €	4.804 €
	737,28	4,50 €	0,90 €	3.981 €	50,00 €	538,47 €	397.000 €	6.179 €
	1440	4,20 €	0,84 €	7.258 €	50,00 €	400,69 €	577.000 €	7.867 €

Table 2 was gathered by an interview and statistical information regarding the countries. It shows warehousing possibilities in different areas – Germany, Belgium, Netherlands, United Kingdom, and Lithuania. By evaluating the suppliers three type of possible warehouse sizes were distinguished. The interview also provide the rent and services prices. In addition the construction price were calculated by using an online calculator provided by a construction company (Warehousematch, 2015). In addition, the average maintenance cost were evaluated by using the statistical average net income by country and time required for loading and unloading work. This information is necessary in order to properly evaluate the warehousing possibilities. The size of the warehouse depend of the cargo quantity it needs to service, if the positioning of the warehouses changes or the lead-time of loading and unloading differs all the logistic system is being effected.

One side of the supply chain management is experience and knowledge of various system usage. The other side of the supply chain optimization is mathematical modeling. This paper described the importance of small markets partial cargo

distribution and that it is necessary to combine various warehousing systems with sea, truck and railway distribution. Only then, a small market may create a logistic cluster that will provide the necessary competiveness level required to compete in the international market.

Conclusions

Today's consumers has a new trend to require fresh, high quality food. In addition, the social environment has expended dramatically and there is no nation that does not have many different cultures and beliefs inside their population. Therefore, the demand for large variety of food products has also appeared in recent years. Moreover, consumers are even more considering the health aspect of food and beverages. This is why the understanding of product requirements and classification is essential in order to properly conduct a competitiveness strategy. Here comes in the supply chain management concept what is necessary to distribute the food products to the consumer. After all the supply chain, management goal is to distribute the right product, to the right people at the right time at the right place. Therefore, the cycle time of distributing is also very important. This computability issue of quality food and less lead-time can be a huge problem for small markets, because wrong decision-making can increase the final product's price dramatically and competiveness will be lost. Therefore, different transportation types like railway, truck and sea needs to be combined together with consolidation warehouses. Depending on the case, it is recommended to conduct a mathematical simulator to evaluate the best combination of different transportation types and warehouses.

Literature

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Correspondence address:
Professor Valentinas Navickas, Kaunas University of Technology School of Economics and Business, Department of Economics, K. Donelaičio str. 20-501, LT- 44239 Kaunas, Lithuania. E-mail: *valna@ktu.lt*