

Tien Nguyen

How the changes in dietary behaviour transform Finnish food supply chain?

Helsinki Metropolia University of Applied Sciences

Bachelor of Business Administration

International Business and Logistics

Thesis

Date 04.05.2017

Author(s) Title Number of Pages Date	Tien Nguyen How the changes in dietary behaviour transform Finnish food supply chain? 67 pages + 1 appendix 04 May 2017
Degree	Bachelor of Business Administration
Degree Programme	International Business and Logistics
Specialisation option	International Business and Logistics
Instructor(s)	Kaija Haapasalo, Senior Lecturer
<p>Consumption of food is one of the most important factors influencing to both physical and mental activities of human people. Personal food preferences as determinant of food choices override the wellness and social and economic factors. As the dietary behaviour is changing, the whole food supply chain is also in transition in order to respond to the changes. Several changes in dietary pattern in particular are observed in Finland. As a result of this the individual parties in the food supply chain have to transform their operations so that they are efficient but fulfilling the new demand of the consumers. There is no room to lose the markets.</p> <p>The main objective of this study was to describe the changes and specific trends driving the consumers in Finland nowadays in their decisions of selecting food and how the food supply chain is affected and reacting. Based on these changes, a review of food supply chain was conducted and effects on individual parties in it analyzed. In addition, recommendations to adapt to these changes were given. The results clarified the current situation of food supply chain market in Finland and provided parties concerned new insights into the changes on the market.</p> <p>A literature review on related concepts and definitions was conducted focusing on food supply chain and nutrition as important elements for constructing the research. This study is a qualitative research and based purely on secondary research. The analysis was based on the researcher's own subjective opinions and observation of the changes on the Finnish food market and supply chain.</p> <p>The outcome of the research is a comprehensive review of the performance of the individual players in food supply chain as well as the whole supply chain in Finland. The writer of the thesis is recommending adequate promotion activities by the food supply chain companies in order to improve the performance when the dietary behavior is changing. Also better establishment of logistics networks which coordinate smaller and uncompetitive companies will improve their performance.</p>	
Keywords	Food supply chain, nutrition, Finnish food pattern, Finnish food trend, well-being, informed consumption

Contents

1	Introduction	1
1.1	<i>Background</i>	1
1.2	<i>Thesis Objectives and Research Questions</i>	2
1.3	<i>Research Methodology, Thesis Scope and Limitation</i>	3
2	Food supply chain management in Finland	4
2.1	<i>Logistics Background in Finland</i>	6
2.2	<i>Food supply chain</i>	8
2.3	<i>Food retail logistics in Finland</i>	11
3	Dietary behaviour changes in Finland	17
3.1	<i>Nutrition and health</i>	17
3.2	<i>Finnish food pattern</i>	22
3.3	<i>Finnish food trends</i>	27
3.4	<i>Motivations</i>	33
4	The transformation of grocery SCM in Finland	36
4.1	<i>Short food supply chain</i>	36
4.2	<i>Ecological food supply chain</i>	37
4.3	<i>Wastage reduction</i>	39
4.4	<i>Changes of parties in the FSC</i>	42
4.4.1	Producer	42
4.4.2	Manufacturer	44
4.4.3	Retailer	46
4.5	<i>Evaluation</i>	51
5	Conclusion	52
5.1	<i>Findings</i>	52
5.2	<i>Recommendation</i>	55
	References	57

List of Figures

Figure 1: Sub-scores in Logistics Global Index Global Ranking 2016 of Finland, Sweden, Denmark and Norway (worldbank.org, 2017)	7
Figure 2: Logistics market share in relation to GDP of Finland, Sweden, Norway, Germany and EU (of 28 in total) in 2014 (Schwemmer, 2016; Eurostat, 2017).....	8
Figure 3: The whole system of food supply chain (Dani, 2015)	9
Figure 4: Sales total grocery product from modern grocery distribution retailers and wholesaler in thousand € per capita in 2013 (PlanetRetail, 2014) and the purchasing power of Europe in 2015 (GFK, 2016)	13
Figure 5: Share of Finnish sales channel of the retail sector in percentage of stores by store types in 2015. (PTY, 2017).....	13
Figure 7: Shares of main Finnish food retail groups in 2015 (in % of sales) (PTY, 2017)	15
Figure 8: World Health Organisation recommended healthy diet per day for an adult (of a 2000 kcal diet/ day). (WHO, 2015).....	19
Figure 9: The Baltic Sea Diet Pyramid (Helsinki Times, 2014)	23
Figure 10: Finnish food consumption (kg/person/year) from 2005 to 2015 (Natural Resources Institute Finland, 2016a).....	24
Figure 11: Milk product consumption of Finland in three years: 2005, 2010 and 2015 (kg/person/year). (Natural Resources Institute Finland, 2016a)	24
Figure 12: Cereals consumption in Finland in three years, 2005, 2010 and 2015 (kg/person/year). (Natural Resources Institute Finland, 2016a)	26
Figure 13: Meat consumption in Finland in three years, 2005; 2010 and 2015 (kg/person/year). (Natural Resources Institute Finland, 2016a)	27
Figure 14: Trends and sub-trends on food choice (Kesko, 2017).....	28
Figure 15: Predicted food preference in four Nordic countries in percentage (Ernst & Young Global Limited, 2015, p.11).....	30
Figure 16: Factors influencing purchasing process in four Nordic countries. (Ernst & Young Global Limited, 2015, p. 12).....	31
Figure 17: Some factors affecting food choice and intake (Modified from Sheperd, 1985).....	34
Figure 18: EU organic label and the “Luomu”- controlled organic produce label. (Environmental Administration, 2013).....	37
Figure 19: Food loss and wastes along the supply chain. (The High Level Plane of Experts, 2014, p. 23).....	40
Figure 20: The number of farms (left) and the utilised agriculture area (ha/farm). (Natural Resources Institute of Finland, 2017).....	43

Figure 21: Summary of changes in production	44
Figure 22: Summary of changes in processor	45

List of Tables

Table 1: Characteristics of parties in the FSC (van der Vorst et al, 2009)	10
Table 6: Development of sales of consumer goods by store types from 2012 to 2015 in million EUR (PTY, 2017)	14
Table 2: Overview of the leading retail chain in Finland in 2015 (vuosikatsaus.s-ryhma, 2016) (kesko, 2017) (PTY, 2017) (USDA, 2012).....	16
Table 3: Estimated required daily energy intake for an inactive person (only office work and study, no intensive physical activities) in kilocalorie and the amount of energy delivered by the nutrients in food (kilocalories per gram). (Australian National Health and Medical Research Council, 2006)	20
Table 5: Summary of Kesko's changes towards consumer dietary behavior.....	49
Table 6: Overall performance of S Group, Kesko and LIDL toward changes	50
Table 7: Performance evaluation of food supply chain's transformation toward dietary trend	51

1 Introduction

1.1 Background

As the food industry is going through an evolution of dietary transition, it is obvious for all countries that this leads to a plenty of changes that have to be implemented during this transition process. According to the Food and Agriculture Organisation, the period of 1800 to 1980 observed many switches in typology of dietary behaviour in France. Concerning manufacturing, transformation from raw and fresh product to the sterilised and frozen stuffs on shelves took place after 1950. Furthermore, the soaring demand for processed food was also experienced in the country from 1980 onwards, boosting the sales of ready-to-eat-products. The change in the consumer's shopping behaviour left the local food providers behind when the consumers were abandoning them and aligning to super and hypermarkets instead. (Etiévant, 2017) However, as the transformation keeps evolving, changes recorded in food production and consumption daily are resulting to changes in production.

In order to satisfy the altering demands from the market, a request of transition in food supply chain is identified. The business of food supply chain witnessed several changes when shifting from the rural area to the urban. For instance, in Asia, as the dietary behaviour is aligning towards processed food, protein products and vegetables, the supply chain is lengthened with the increase in large-scale outlets, wholesalers, logistics companies, cold storage firms, etc. (Reardon, 2014, p. 27) In Finland, the changes of consumers' dietary behaviour have recently been observed by the retailers and made them to differentiate their products or services. However, behind the scene, there should be the whole supply chain moving together. By 2050, the food supply chain is expected to feed 9 billion people, said Alltech in 2016. Because of this fact the related parties from production to retailers in the food supply chain are required efficiency as well as sustainability. Hence, the transformation of the food supply chain is expected to meet the transition in dietary behaviour to produce the best outcomes for all.

According to the Nordic food survey about consumer trends by Ernst & Young in 2015, awareness over food supply chain is important in the Nordic countries and also in Finland. Finns are interested in the transformation of food supply chain toward food con-

sumption. This context motivated the author of the research on the particular features of Finnish food supply chain changes over dietary behaviour. The thesis author wanted to focus on the reactions of the Finnish supply chain while trying to cope with the change in dietary pattern. The author wanted to evaluate also the performance of the chain towards the food transition.

1.2 Thesis Objectives and Research Questions

The main objective of this study was to describe the changes and specific trends driving the consumers in Finland nowadays in their decisions of selecting food and how the food supply chain is affected and reacting. According to a literature review as well as personal analysis, the outcomes on Finnish food supply chain performance was conducted. During the desk research, information and data from relevant organisations as well as research institutes supported the ultimate findings. The outcomes from the study do not only influence the comprehension of the transformation of the Finnish food supply chain but are applicable also for other similar food supply chains particularly in the Nordic and in Europe.

According to the Statistics of Finland, food and beverage count for the largest portion in the market of retail trade. In 2007, it accounted for more than 40% of the retail trade turnover. As a reflection to the demand from the market, large proportion of food and beverage in retail trade emphasises its strength in the market. Therefore, an efficiency and productive food supply chain is in need to support the large production. By its particular features, Finnish food supply chain also shows several obstacles, lowering the performance in the retail food industry. Hence, the switching in food selection might challenge the individual operators within the food supply chain and reshape the operations and performance of the food supply chain in Finland.

Based on the objectives described above, research questions were designed as a guideline for the whole research process. The questions contributed to the title of the thesis “How the changes in dietary behaviour transform Finnish food supply chain?”

Four sub-questions were formulated in order to achieve the anticipated answers.

1. What is the current status of the food supply chain in Finland?

This question helps to clarify the current situation of Finnish food supply chain market. Analysis of general food supply chain is represented keeping the focus on the food supply chain management as core value. The study on food retail logistics is also highlighted due to its influence on the supply chain.

2. What is the dietary pattern in Finland? How is the dietary behaviour changing?

Dietary behaviour is changing towards many determinants. However, nutrition transition is considered to be the most vibrant change of all. The research on the dietary behaviour on the perspective of nutrition is focused in this question as the main base in the relation of nutrition and well-being. This section plays the supportive role for the analysis for Finnish food pattern. The Finnish dietary trend is also a further explanation for motivations of change in food choice.

3. What is the relationship between the food supply chain and the dietary behaviour? How the changes in dietary behaviour reshape the food supply chain?

This sub-question plays an imperative role on the study of the thesis. In this category, general changes observed in the whole supply chain is recorded. In addition, the changes in specific parties of the food supply chain is also captured and analysed for deeper understanding about the transformation of the food supply chain over the change in dietary behaviour.

4. How are the parties within the food supply chain performing?

In this question, the performance of the Finnish food supply chain in general and also of the individual actors (producers, processors and retailers) is analysed. The effectiveness and productivity of the players over the change is reviewed. These provide vital assumptions for further discussion and recommendations.

1.3 Research Methodology, Scope and Limitations

According to Green and Tull, a research design appears as the overall operational pattern framework stimulating which information to collect from what sources. While infor-

mation is needed to build the project, research design lays down the proper plan on information acquisition.

In this research, deductive reasoning is implemented. The research problems are resolved from general to specific. In detail, the problem of changes in retailers is observed, leading to the desire of figuring out the relationship between the whole food supply chain and the change in dietary behaviour. Deductive approach is contemplated as tautological, solving no new knowledge but assuming the consequences of that which already assumed. (Evans, 1982, p. 2)

Besides the deductive approach, descriptive reasoning is also comprised into the research design. Descriptive studies are well structure, rigid and fixed. (D'Amico, 1969, p. 56) In order to answer the question "How" and "What", detail framework of research objectives and information would to be collected and figured out explicitly and accurately.

The research is conducted purely by the qualitative methods. The research is guided by personal observation after analysing the Finnish food supply chain market as well as the change in food intake.

Due to the research design of both deductive and descriptive at the same time, secondary data is mainly used in the research. The literature review is covered by both publications of book, journal, article, formal studies and the electronic sources.

As titled, this research targets to investigate the performance of Finnish food supply chain towards the change in dietary behaviour. The empirical part of the research focused on the market in Finland. The features as well as the changes of the mentioned industry manipulate data about Finland. About the limitation needs to be mentioned that data collection might not grasp all the facts. It is quite hard to get access to some market reports due to the constraints of subscription or membership requirements.

2 Food supply chain management in Finland

In the beginning, when the trading process was simply conducted locally, logistics flows of merchandise started from the farm and ended to the neighborhood market. (Grant,

2012, p.5) As the blooming of technology and globalisation, this flow is expanding more and more. Taking the advantage of free trade globally, supply chain has become the strategic differentiator, having the major impact on the final performance of the competition in the market, especially the in the industry of food retailing.

The Council of Supply Chain Management Professional (CSCMP), an organisation of worldwide supply chain management professional, has represented the underlying concepts as well as functions of supply chain management in the business framework. According to CSMP glossary, supply chain management (SCM) is the integration of demand and supply management within a business firm. The chain therefore covers all of the planning and management activities of sourcing and procurement, logistics behaviours and conversion. Nevertheless, there are many partner channels constructing an efficient supply chain such as supplier, intermediaries, third party service providers or customers thus these coordination and collaboration are encompassed. (CSMP, 2016) While featuring the SCM, the concept of logistics has also been defined as a part of the whole process, comprising the behaviours of planning, executing as well as controlling the efficiency of merchandise, services and information flows between the points of origin to the point of consumption, back and forth meeting the specific requirements of the customers. (CSMP, 2016) Hence the concept of logistics suggests the ideas of concentration on procurement, distribution, maintenance as well as inventory management activities within an organisation. With a wider scope, SCM targets larger network coordinating for customer request fulfilment from logistical activities to the customer service, finance, product development etc. (Hugos, 2011, p. 5)

Since the priority criteria of fulfilling the requirements of the customers thus the abstract idea of customer orientation is proverbially focused. A fact that different groups of customers demonstrate different desires in logistical service, mass logistics, in which one logistics approach is implemented for all targeted clients, is not the sufficient option anymore. Tailored logistics, in which customised logistics tactics are segmented for different group of customer with the similar requests, efficiently fulfilled the market. (Murphy and Wood, 2014, p. 6) In a sense of this contemporary issue in the logistics industry, the two Murphy and Wood also emphasise the increasing importance of customer behavior change in SCM. Briefly described, these changes could be covered in many terms, one of those are the market demassification resulted from the distinct preference, individual wants and need in different background creating the diversity in

market segmentation. Therefore, customized services are tailored by the logistics provider, optimises the highest satisfaction.

In this chapter, the concept of logistics back ground in Finland would be described as the based for further analysis about the food supply chain. Furthermore, being the most common and active party in the food supply chain, the activity of food retail logistics would also be researched for deeper insight about the industry.

2.1 Logistics Background in Finland

Finland is located in the northern of Europe, bordering Norway (709 km), Sweden (545 km) and Russia (1309 km) has the total area of 338, 145 sq km and the coastline of 1,250 km. (cia.gov, 2017) According to the Statistics Finland, the total gross domestic product (GDP) of Finland at market price in 2015 is € 209,5 billion. With the population of 5,482,013 in 2015, the country ranks 25th in the gross national income per capita. (World Bank, 2017)

In 2016, Finland ranked 15th in the Logistics Performance Index (LPI), scored overall 3.92/5 by the World Bank. The LPI measurement comprises six different sub-categories performing in the section of foreign trade. The country executes pretty high score in customs system, infrastructure, tracking & tracing as well as shipment time-lines (4.01, 4.01, 4.04 and 4.14 respectively) to be compared to the neighbor country as shown in figure 1. However International shipment (3.51) and logistics competences (3.88) are considered less than satisfactory. Nevertheless, Finland also optimises its geography advantage due to the open shore onto the Baltic Sea. This inland sea of Europe plays an important role on trading among Europe, Russian and even the Far East. Therefore, sea transport has a significant impact to the economy. Different from the dominant road transportation, mostly railway, in the domestic market, sea transport counted for more than 80% of Finnish foreign trade. (Solakivi *et all.* ,2014, p.35-37)

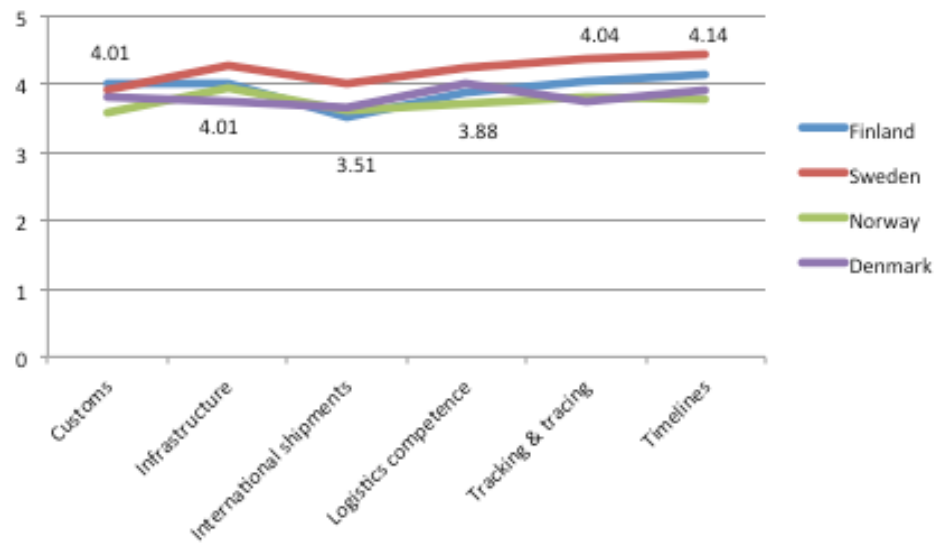


Figure 1: Sub-scores in Logistics Global Index Global Ranking 2016 of Finland, Sweden, Denmark and Norway (worldbank.org, 2017)

As in figure 2 represented below, it appears that the Finnish logistics share in relation to the GDP is higher than other neighbor countries. The digit is reported to slightly decrease to be compared to 2014 of 11,4%. Furthermore, the market size of logistics service in Finland is large relatively considered within the GDP. The market size also increased sharply within a year, from € 8,8 to € 20,8 billion in 2014. (Solakivi et al, 2015) The data performs the development of the industry but also implies the relative high cost of logistics service in Finland.

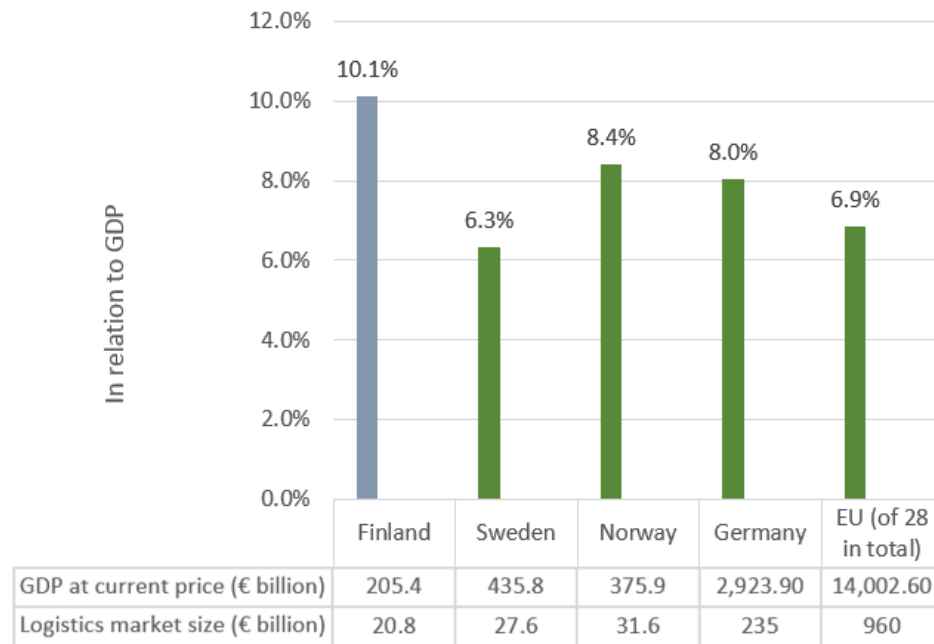


Figure 2: Logistics market share in relation to GDP of Finland, Sweden, Norway, Germany and EU (of 28 in total) in 2014 (Schwemmer, 2016; Eurostat, 2017)

Despite the high rank over the logistics industry worldwide, the country exposes its incompetency in cost efficiency. Having the disadvantage of remote distance to the main market and the long harsh winter thus speed is reduced, logistical time and cost are added thus higher their logistics cost over the GDP. Besides the inconsistency in infrastructure competence between the South and North Finland is also an obstacle of the country's logistics industry. According to Finland State of Logistics survey in 2014, the shortage of capacity of the road in the South and technical issues in the North are the two main problems value down Finnish logistic performance in the sector of infrastructure.

2.2 Food supply chain

Food has always been an essential part of human life. According to Maslow, food is indicated as the foundation, the basic physiological need in the hierarchy of need pyramid and also the first demand for survival. (Martin and Joomis, 2007, p. 72) While the world total population in 2015 was 7.347 billion (worldbank.org, 2017). The United Nation, in their report of world population has revealed that number is estimated to increase 1 billion by every 12 coming years and expected to reach 9.6 by 2050. The quest of feeding the world is also a challenge for the SCM. Additionally, food also counts for the major participant in the SCM industry. For instance, the food segment

was reckoned at the largest portion, 27% of the total shipping industry in EU. (Schwemmer, 2016) Subsequently, the demand for the sufficient food supply chain is now vigorously outpacing.

Dani (2015, p. 2-10) suggested the abstract idea of a food supply chain (FSC) is the full series of complicated processes, operation and entities of product from the farm to the fork. The chain comprises different functional parties interconnecting for the final product. A regular food supply chain always starts with the supplier as the input which could be the food producer, and ends by the consumer. In between occupy the channel of manufacturing/ processing and mediate distributors. The smooth operation of each party results to the peak perform of the supply chain, leading to the adequate food distribution.

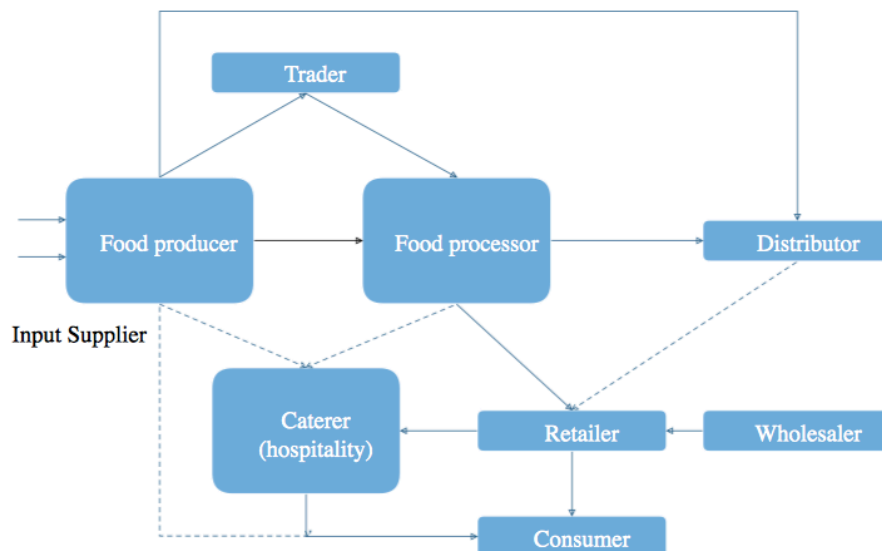


Figure 3: The whole system of food supply chain (Dani, 2015)

The whole chain of food supply is illustrated in detail. The four main participants of the process: producer, processor, distributor and retailer/wholesaler/caterer as well as the flows of foods are demonstrated clearly.

Producers: As the first actor in the supply chain, they are usually the farmers from either the local family business to the large professional providing the raw material such as vegetables, fruits, sea food, meat etc. In 2015, there are 50 999 farms over Finland, with the average arable land and area of 45,0 ha. Crop production is counted for 65,9%

as the major agriculture sector of the country; the next comes for milk production, other cattle farming and pig and poultry. (stat.fi, 2017)

Processor: This is the most vital part of the whole chain. Raw material from the producers would be manufactured into different categories fulfilling consumers' demands. Therefore, the post-manufactured products might be varied from fresh (fruit), raw (meat product), preserved (jam, pickles), or cooked (bakery), frozen and others. In order to keep up with the change in demands, technology development, distribution management and innovation are the three main principles to advance.

Retailers and distributors: According to Dani in his book of Food supply chain management and logistics, distributors are the connecting firms among the actors of the supply chain in which products are distributed from the producer to either processor or retail/wholesale customers. Warehouses and distribution centres crucial for delivery and storing. On the other hand, retailing is proposing the final product to customer. Retailer could be wide-ranging in scope, product specialisation and operation such as hypermarket, supermarket or convenient store. Producer, processor and distributors all depend on the retailers' sales. Competition in the industry is pretty high between the processors/ distributors for showcasing their products on shelf and also among the retailers in the market.

Hospitality sector: this actor is the "made to order" service signified as the hotel, restaurant and catering sourcing the raw ingredients from the producers in a large scale and processing the food themselves for the customised desires. In Finland, Hotels, cafés, restaurants and public administration institutions are the main segmentation for this food service. As the figures from the Finnish Grocery Trade Association, 868 million meals are served per year by the professional kitchens in Finland. (PTY, 2016)

From the specific descriptions of the FSCs' players, some characteristics of them could be accomplished.

Table 1: Characteristics of parties in the FSC (van der Vorst et al, 2009)

Parties in the FSC	Characteristics
Producer	<ul style="list-style-type: none"> • Diversity in quality and quantity • Long time constraint (especially in agriculture sector)

	<ul style="list-style-type: none"> • Seasonal dependence in production
Processor	<ul style="list-style-type: none"> • Capital-intensive business process • High level of specialisation and volume of production • High dependence on the outcome of the previous factor (producer) • Strict requirement in storage management since for the best quality of material/ product.
Distributor & Retailer	<ul style="list-style-type: none"> • Quality dependence on outcome from producer and processor • Global sourcing for fulfilling demand for seasonal product, higher quality or good deal due to comparative advantage • Inventories and transportation requirement

With regards to the features of the actors participating in, characteristics of FSC itself would be concluded determinedly. First and foremost, farming condition is the most imperative factor impacting to the whole chain deciding the productivity and also the quality of the outcome. Secondly, global sourcing is the future of food logistics. Since different producer in different place might have their own competitive advantages, free trade would be the most efficient solution for all parties. Next comes the lifespan of product. Fresh food retailing is concerned for their short life cycle thus well-organised supply chain is necessary in this case. Another character to pay attention to is the food choice psychology. The food consumption and choice are somehow tricky for the demand forecasting. And last but not least, the food supply chain is interconnected network that is easy to collapse whenever there is any disruption happened in any component. (Ala-Harja, 2014)

2.3 Food retail logistics in Finland

As discussed in the previous sub-chapter, food retailing is a key element in the food supply chain where the products interact to the consumer. In particular, food retail plays the vital role in the retail sector and also enhances the economy. According the European Commission, the retail and wholesale services counted for 11% of the EU's GDP, which accounted for 15% of total occupation in the EU (around 33 million jobs).

Within the business of retailing, there are many stages respectively considered before a whole completed process. The first category to study is the culture in which food cul-

ture, demographic issues and lifestyle are involved, said Gustafsson et al in their book of Retailing logistics & Fresh food packaging (2006, p. 19). Briefly described, the local habit of food consumption, religion, structure of population and so on would reshape the retailed food market. Retail locations and outlets are also addressed as another component. The outlet scope could be varied from small convenient store on the way to the large mega mall in the vast area depends on the location of retailer. The next factor to cogitate is the retail manager/ shopkeeper acting as the central standard of the business. Product sourcing and distribution, business relationship and also merchandising selling are also the components of the retail process. All of these parts operate together for a sufficient system of retailing process.

With a low figure of population density, which is only 15 people per kilometre in 2015 (World bank, 2017), Finnish retailing market is rather concentrated and integrated with the specific features. In 2016, Finnish grocery trade is at its strongest since the economic crisis with the grocery sales of EUR 16,730 billion. (Nielsen, 2017) Despite the continuous stagnancy in the economy from 2012 to 2014, the year 2015 witnessed the recovery of the GDP of 0.21% with 0.5% increasing from the previous year. In 2016, the real GDP rate reaches 0.91% and forecasted to slightly grow in the next coming two years of 2017 and 2018. On the other hand, the unemployment rate appears to fall to 8.8% in 2016 from the peak of 9.4% in 2015. Although population aging is a problem to the labour force, the unemployment rate tends to slow down owe to the job expansion in construction and service areas. (OECD, 2016) The rise of GDP growth rate and fall of unemployment rate are the positive signals for the rise in private consumption. According to the report from planetretail.net, the total sales of grocery products including all edible, non-edible products and services is € 3.300 per capital in 2013, which ranks 9th out of 41 surveyed European countries. However, the purchasing power of the country is only at the average level of Europe. The purchasing power is higher in the Southern and up- Northern parts of the country. Notably, the figure only reaches its peak in the metropolitan area. In general, the purchasing power index of Finland is still lower than other Scandinavian countries while the total grocery sales per capital is pretty high illustrate either the high grocery price, the lack in subsistence needs fulfilment or the dominant of several players in the food retailing market.

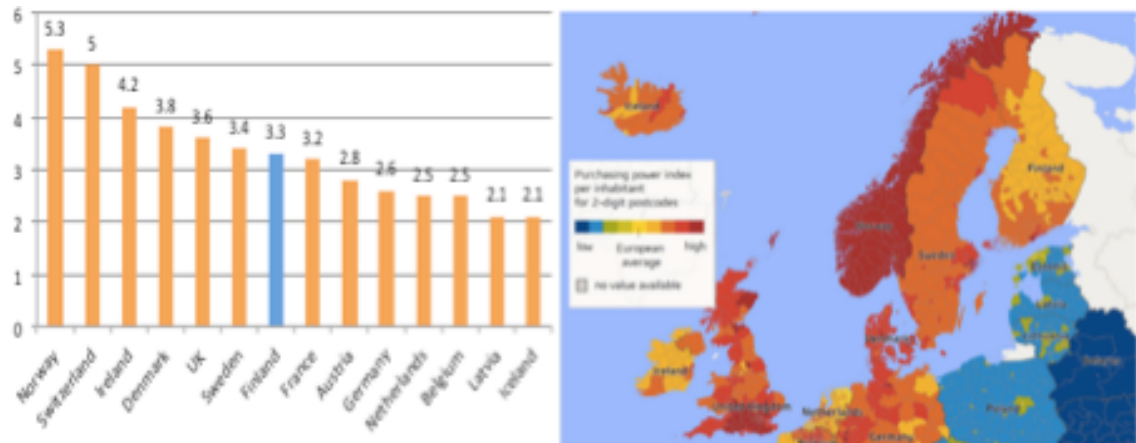


Figure 4: Sales total grocery product from modern grocery distribution retailers and wholesaler in thousand € per capita in 2013 (PlanetRetail, 2014) and the purchasing power of Europe in 2015 (GFK, 2016)

The grocery retail trade sector of Finland is rather concentrated and highly depends on the formation of chains and centralisation of procurement and distribution centres. As in most of the other European countries, Finnish retail market is mostly duopoly. Two main players, S-Group and Kesko Oy are sharing about 78,2% the portion of the industry. (PTY, 2017) Another characteristic of the food retail sector in the country is the large volume of hypermarket and large supermarket.

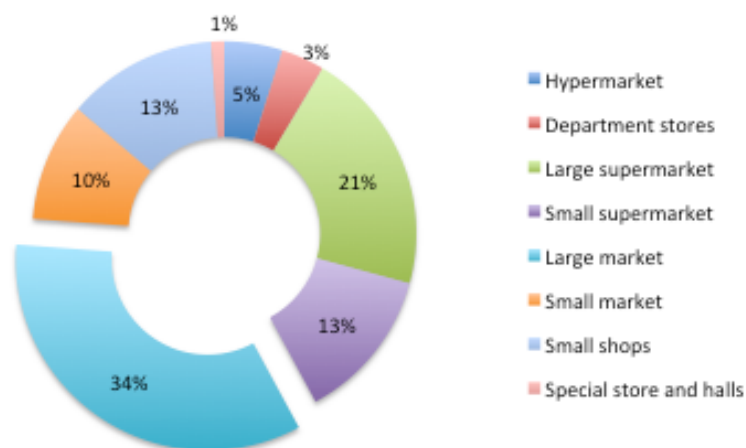


Figure 5: Share of Finnish sales channel of the retail sector in percentage of stores by store types in 2015. (PTY, 2017)

With regard to the data from the Finnish Grocery Trade Association released in 2017 presented in figure 5, it could be seen easily that the large market, with the sales area from 200-399 m² counted for the majority 34% of the retailer area. On the other hand, the large supermarket placed second with 21% of market share. The large supermarket is often having the sales area larger than 1,000 m² with the share of consumer goods is more than 2/3. Hypermarket and small market are also popular with the share of 13%. There are several names for the hypermarket could be listed as Citymarket, Prisma and Minimani.

Table 6: Development of sales of consumer goods by store types from 2012 to 2015 in million EUR (PTY, 2017)

Store type	2012	2013	2014	2015
Hypermarket	4,398	4,524	4,519	4,592
Department stores	584	567	571	541
Large supermarket	5,482	5,775	6,019	6,046
Small supermarket	1,859	1,871	1,783	1,709
Large market	2,541	2,601	2,628	2,499
Small market	461	456	438	415
Small shops	325	338	346	324
Special store and halls	240	268	296	298
Total	15,891	16,399	16,599	16,424

It is a fact that the large market is not only one of the most popular retailers but also the most favourite retail destination of Finnish which is accounted for the largest portion 36.8% (EUR 6,046 million) of total grocery sales in 2015. Coming after large supermarket are the hypermarket and the large market. Consequently, large-scale retailers appear to have the strong position in Finnish food retailing industry and established throughout the country. Owing to the vast and thinly population distribution, it is imperative to focus on large store for cost efficiency. However, the association also signified the role of smaller store in the market. Ensuring the competitive strength of the small supermarkets is also the strategy of the Finnish Grocery Trade Association due to their potential of secured grocery distribution in resident.

With the high level of concentration of Finnish retail market, around 78.6% of the market share is occupied by the two main Finnish retail groups. Particularly, S-Group represent 45.9% and K Group segmented for 32.9% (PTY, 2017) These groups are having a strong network of distribution channel and logistics service comprising a nationwide system of delivery system and outlets as retailers, supermarket, department stores and also food service of catering, hotel and restaurants.

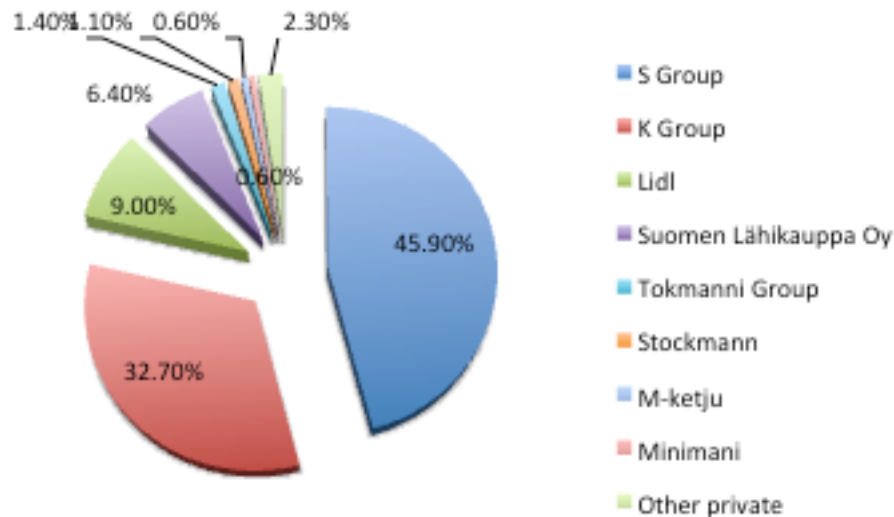


Figure 7: Shares of main Finnish food retail groups in 2015 (in % of sales) (PTY, 2017)

As shown in figure above, despite the high amount of dominant share, the market is moderately intensive in competition not only between the Finnish-based groups but also to the foreign discounter, LIDL Suomi. The year 2016 experiences the strong continuously rise in market share of this retailer over 4 years from 2012 to 2015. From a minor portion of 6.7% in 2012, with the strategic promotion tools in the background of economic stagnancy, LIDL Suomi has been increasing constantly to 9.2% in 2014. (PTY, 2015) The group is not only focusing on the budgeted pricing strategy but also address to the supplying of the premium product. (Euromonitor, 2017) In the middle of 2015, in response to this price-based competition, S Group implemented the price cut policy in which the average grocery basket from Prisma Jumbo overtook LIDL Kamppi's to be the lowest. (Helsinki Times, 2015) In 2016, the volume sale of S Group was improved due to the active adjustment in pricing. On the other hand, Kesko Oy also implies the competitive price level as a preconditioned factor in their strategy. In the beginning of 2016, they announced the reduction in price of 2,000 products due to the fall in raw materials and costs. (kesko, 2016) In addition, the group also completed the acquisition of the whole share capital of Suomen Lähikauppa Oy in April 2016. In this transaction, Kesko invested to replace all Siwa and Valintatalo by K-market stores,

expanded the density of store outlets in the neighbourhood resulting the rise in their sales in 2016. In short, the overview of the retailers and their network in outlet chains, and transportation and distribution channel is described in table 8 bellow.

Table 2: Overview of the leading retail chain in Finland in 2015 (vuosikatsaus.s-ryhma, 2016) (kesko, 2017) (PTY, 2017) (USDA, 2012)

Retail Groups/ Outlet type	Outlet type	Sales (EUR million)	No. of outlets	Own brands	Logistics provider
S Group	Hypermarket (Prisma) Department store (Sokos) Supermarket (S-market) Small shop (Alepa, Sale) Discount store	7,479	1,026	Rainbow Kotimaista X-tra	Innex Partners Oy (subsidiary of S Group)
Kesko Oy (K-Group)	Hypermarket (K-City market) Department store (Anttila) Supermarket (K-supermarket) Small shop (K market, K rauta) Discount store	5,236	885	Pirkka Pirkka Organic K-Menu	Keslog Oy (subsidiary of Kesko oy)
LIDL Suomi		1,492	148		
Suomen Lähikauppa Oy	Siwa Valintatalo + Euromarket	1,060	627	Eldorado First Price Maistuva	Tuko Logistics
Stockmann	Department stores	190	7		Tuko

Group					Logistics
-------	--	--	--	--	-----------

3 Dietary behaviour changes in Finland

The diets are what people eat, in all varied cultures defined as the premise for the health, growth and development. (WHO, 2003) An unhealthy diet is the major root for health risk. A healthy diet is exposed by the sufficient dietary behaviours of adequate nutrition or calorie intake, consumption pattern based on the food decision. The dietary behaviour is the explanation for the association between the food choice and the health.

In this chapter the relation between health, food intake and nutrition intake would be analysed. Being considered as the main determinant for the switch in food choice, the concept of a healthy diet would be portrayed in this chapter. However, as the research is expanded, food trend among Finnish consumer will be collected and analysed within the context of detailed consideration of motivations encouraged.

3.1 Nutrition and health

As mentioning a healthy diet, the balance between the demand of essentials nutrients and human energy requirement, said a Joint FAO/WHO/UNU Expert Consultation. (2013). In the scientific perspective, the U.S. National Library of Medicine (1998) has clarified the general principles of nutrition as:

“Nutrition is defined as the "science of food, the nutrients and other substances therein, their action, interaction and balance in relation to health and disease, and the processes by which the organism ingests, absorbs, transports, utilizes and excretes food substances.”

Briefly described, the ultimate goal of healthy diet is all about the nutrition. Nutrition is the intake of food, refers to the dietary demand of the body. A healthy diet is understood as the balance of nutrition. (WHO, 2017) In detail, the body is in demand of nutrients for satisfied operation. The nutrients could not be self-produced but obtained from external resources, food. There are two categories of nutrient, “micro” and “macro”, classified based on the needed amounts of body. (FAO, 2013, p.75)

Often consumed in a large amount for the proper function of the whole body, macronutrients are well-known under three formations: carbohydrate, protein and fat. First and foremost, carbohydrate plays a vital role to the diet. Coming from three main resources of sugar, starch and fibre. According to research of the Food and Agriculture Organisation (FAO), carbohydrates should be the main component, accounted for 50%-65% of a healthy diet, in which a large amount of fibre and starch would be included but limited sugar intake evolved. There has been many research and discussion about sugar intake and its affect to the health. Sugar is absorbed either as simple sugar (fruit, vegetables, milk products, lactose and maltose) or refined-sugar (processed food, confectionary, and beverage. Refined-sugar is shortage in nutrient but filled with calories. Over-consumption of this type of carbohydrates may lead to the lack of essentials vitamin and mineral. On the other hand, simple sugar is broken down rapidly and raises the blood sugar level. (Palacios, 2013) Though it was failed to prove the relationship between simple sugar consumption and other health problem such as obesity, high level of simple sugar intake might cause the excess in energy consumption. (Prentice, 2005) Next, starch is also an important source of carbohydrate found in many cuisines around the world, usually playing the role as the base to any meal. Starchy food takes longer to absorb and digest hence stays longer in the body, resulting the fullness for an amount of time. However, it is recommended by FAO to consume unrefined starch such as whole grains since the lost in nutrition during the refining process. Grains (rice, corn, oat), legumes (beans) or some types of fruit (banana, water chestnut) are the main sources of starch. Last but not least, fibre, coming from the wholegrain cereals, starchy roots, fruit, vegetables etc. is the holding the responsibility of cleaning out the digesting system. (FAO, 2013, p. 76)

Protein is an essential nutrient for the growth and development of a human body. Structured with the amino acids, protein helps constructing cells and tissues, building the muscle and organ. Proteins could be found in animal and plant food. (FAO, 2017) However, animal food is containing all amino acid the body needed while plant food like grains, nuts, seeds or veggies is not having enough. This might lead to the lack in amino acid for vegetarians or vegans. (Harvard T.H Chan School of Public Health, 2017)

The last macronutrients element is fat comprise edible fat and oil. Diet fat can be found in both plant and animal based products. Fat is an important nutrient supports in the transformation of fatty acid which is benefits metabolism. (FAO, 2017) In the book of

Eating well for good health, FAO has classified fatty acid into two categories unsaturated fatty acid (UFA) and saturated fatty acid (SFA). Out of the two types, UFA, which could not be self-produced by the body, is necessary because of its importance for health. UFA would come from oil (soybean, peanut, sunflower, canola, olive oils etc.), nuts (almond, walnuts, hazelnuts, etc.) seed (pumpkins, sesame, flaxseeds, etc.), avocado and fatty fish such as salmon, trout and herring. Notably, these fishes are fat in omega-3 fatty acid in which supporting in brain function, lowering the risk of stroke and heart diseases. Meanwhile, SFA could be obtained from either animal product such as fat from meat product and dairy product or plant-based product such as coconut or red palm oil. Besides two different type of fatty acid above, trans-fat and cholesterol are the contemporary issues of fat intake. Trans-fat, such as margarine, shortening or other processed bakery product, is the hard-processed fat, resulting to the transformation of fatty acid to trans-fatty acid. Trans-fatty acid is considered to cause negative effects on health resulting to stroke, diabetes or other heart diseases, which should be avoided in daily diet. (FAO, 2013, p.82-84) On the other hands, cholesterol, a fatty constituent produced by the liver is also contributing in proper functioning of the body, be found in either human body or some food. Stable cholesterol level does not hurt the body but the high level would worsen the health condition. Since the combination of cholesterol and saturated fat caused the rise in cholesterol level, unhealthy diet is the reason for bad cholesterol. (National Health Service, 2015)

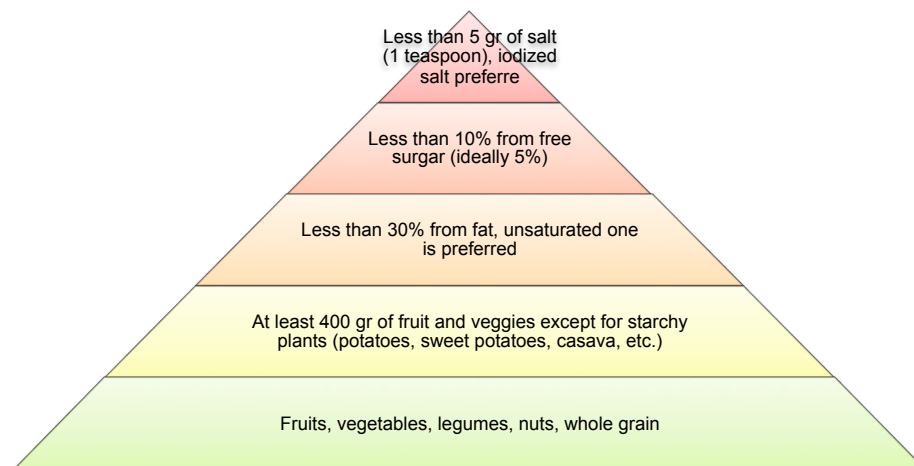


Figure 8: World Health Organisation recommended healthy diet per day for an adult (of a 2000 kcal diet/ day). (WHO, 2015)

In brief, based on the nature, advantages as well as constraints of the nutrients, WHO has listed the suggestion of a healthy diet shown in figure above. As discussed before,

the intake of fruit, legumes, nuts and whole grains are encouraged but not the starchy product. In addition, saturated fat is acclaimed to be discarded and the amount of free sugar intake should be controlled. Lastly, the portion of salt used should be limited.

Besides the fulfilment of attaining adequate amount of nutrients, satisfaction of energy requirements is the crucial demand for a nourishing body. Sufficient energy intake with enough necessary nutrients is the key for a healthy diet. Through several studies, the energy requirement is described to be the needed amount of energy obtained from food consumption used as the main resources for proper metabolism system or heat system. The energy intake is in charge for the growth and development of the body, adjusting the body size and composition as well as encouraging the physiological and metabolic function. Energy could be converted from the macronutrients acquired from the food. Carbohydrates, protein and fat act as the fuel for the body (FAO:WHO:UNU, 2004)

For energy intake measurement, the measured unit is indicated as kilojoule (KJ) or megajoule (MJ=1000 KJ). Converting to the unit of heat energy, 4.18 kilojoule are equivalent to 1 kilocalorie (1000 calories). (FAO:WHO:UNU, 2004) The basic formula for an adequate diet is the balance between the obtained and the consumed.

Table 3: Estimated required daily energy intake for an inactive person (only office work and study, no intensive physical activities) in kilocalorie and the amount of energy delivered by the nutrients in food (kilocalories per gram). (Australian National Health and Medical Research Council, 2006)

Age	Male	Female
12-15 years	1967- 2368	1770- 1962
16-18 years	2464- 2608	2010- 2033
19-30 years	2464	2010
31-50 years	2368	1913
51-70 years	2177	1818
Adults over 70 years	1985	1722

Nutrients	Energy delivers (kilocalo/gram)
Carbohydrates	3.9
Protein	3.9
Fat	9

In order to benchmark the energy intake, the Australian National Health and Medical has released the estimated energy requirement guide. The table indicate the specific range of sufficient energy intake within a day for different age groups. The figures are referred to a mediocre person with a low level of physical activity frequency or intensity. In the male section from 19-year-old above, the estimated intake is designed for man with 180cm tall and weighs 71.3kg. At the same range of age in the female side, woman with 170 cm in height and 63.6 kg in weight is applicable. On the other hand, the calories delivered from three main types of macronutrients are also indicated. With this estimation, the food selection could be revised and improved.

As the major resource for the main nutrients body needed, food is a part of the life. While each category of food delivers different form of nutrient, a detailed guidance of the popular-consumed daily victuals would be a vital contribution to the effective food selection. This guidance is summarised from the report of Nordic Nutrition Recommendation 2012 by the Nordic Co-operation.

- All plant foods are contributing to the biological function, working with the anti-oxidant, signalling, cell cycle and repairs system.
 - Vegetables, fruits and berries contain a high amount of fibre, starch, vitamins (C, pre-A, E, K) and minerals (iron, zinc, magnesium, potassium). Nuts and seeds, on the other hand, is a good source of unsaturated fatty acid, protein, vitamin (E, B6), minerals and antioxidants. However, the level of energy in leafy vegetable is pretty low. Nuts, seeds and other starchy, root vegetable is higher in energy dense.
 - Potatoes have the high content of carbohydrates, minerals such as potassium and magnesium and vitamin.
 - Whole grain is also a rich source of fibre, starch, minerals and also vitamins. Though, phytic acid transformed from phytochemical within cereals in general could lower the absorption of iron and zinc, grain-based product with long fermentation period is recommended to used instead. On the other hand, processed products are popular sources of cereal in the market shelves. They consist a variety range of commercial products such as flour, pasta, rice, cereals, bakery products. These products are lower in nutrient content since the loss of vitamin and minerals during the manufacturing process. Furthermore, these products are also claimed to contain a large amount of hidden sugar, fat and salt, which might cause unawareness overconsumption of “empty” calories.
- Oil and butter is rich in fat-solute vitamins (A, D, K) and also high in energy.
 - Vegetable oil and its production are popular in the daily diet. Vegetable oils are extracted from plant seeds contains UFA. Also, rapeseed and soybean oil are proved to contain a large amount of omega-3 fatty acids though palm and coconut oil are declared to be high in SFA level.
 - Butter and margarines are constructed mainly by SFA, also part of cholesterol and 3%-5% trans- fatty acid.
- Fish and seafood are rich in omega-3 fatty acid, vitamins (D, A, B12) and minerals. However, there would be difference in nutrient level between wild and

farm fish. Fish and seafood could also be contaminated due to the pollutant or environmental toxins.

- Milk & milk products deliver large amount of protein, fat, vitamin (A, B12), calcium and iodine. The fat content within 100 gr of milk is 0.1 gr – 4gr, protein is 3.0 – 3.5 gr. The fat in milk are mostly UFT (75%). However, milk
- Egg comprises high content of protein, fat, vitamin A & D. Cholesterol is also found in the egg yolk.
- Meat is definitely a plenty good source of protein (20%-30%), vitamins (B6, B12) and minerals. The energy contained and proportion of fat is diverse among different categories.
 - “Red” meat is the term for beef, pork, lamb, reindeer, etc. Red meat often has high level of SFA, 35% - 40% in pork, and 40% - 45% in beef. In addition, the level of trans-fatty acid is also rather high, counting for 3%-5% in several selections (beef, mutton).
 - “White” meat is often known as chicken and turkey. These types are lower in SFA to be compared to the “red” team, only 30%. The trans-fatty acid content is also lower in white meat, only 1%.
 - Besides, there is also a category of processed meat illustrates the preserved meat such as sausage, ham, bacon or salami. This sort is often having higher salt content than the unprocessed one.

3.2 Finnish food pattern

Framed by the geographic features and regional culture, Finland shares similarities in their diets to the neighbour countries. The specific diet Finland and also the Nordic in general highlights the cuisine of animal, processed and sweetened product, concluded non-alcoholic beverage, soft drink and also fat spread and dairy products to be compared to the rest of Europe. (Nordic Council of Minister, 2012, p. 19) This could be explained by the location and the weather condition, remoteness and hard winter. Furthermore, the Nordic Council of Minister sympathised in their Nordic Dietary Survey the high intake level of SFA and simple sugar in food and beverage. In detail, Finland ranks the highest in the Nordic countries for vegetables consumption, especially the potatoes. Berries are eaten the most in Finland. On the other hands, bread with high fibre is also consumed the most in Finland.



Figure 9: The Baltic Sea Diet Pyramid (Helsinki Times, 2014)

Though the negative facts about the consumption patterns in Finland, the Nordic local treats could be outlined to construct a nutritious yet diverse diet. Therefore, Kenerva and her team has researched and constructed the Baltic Sea Diet Pyramid in 2011 widened the healthy selections for Finns. (Helsinki Times, 2014) The diet focuses on the local specialities from the Norden such as the healthy whole grains (rye, oat, barley), traditional Finnish legumes (root vegetables, cabbage), popular Northern fruits (apple, berries), low-fat milk products, rapeseed oil and fish. The diet also recommended lowering the use of red meat and processed meat as well as alcohol.

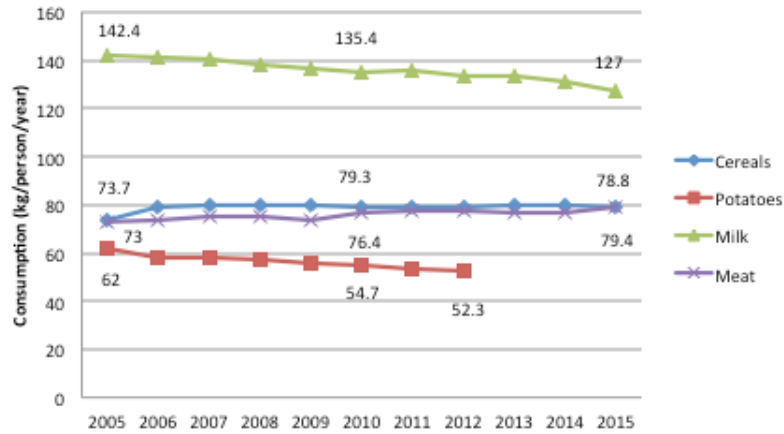


Figure 10: Finnish food consumption (kg/person/year) from 2005 to 2015 (Natural Resources Institute Finland, 2016a)

As figures collected by the Natural Resources Institute Finland, released in 2016, the food commodity of Finland is highlighted. The chart above indicated the large consumption of milk, cereals and meat in Finland. While the milk drinking is slightly decreasing over years, the consumption of cereals and meat fluctuated and recorded to be increasing. However, in general, the regular trends seem to remain for years. Specific changes in eating behaviour could be analysed by the detailed figure of each category of eating commodity.

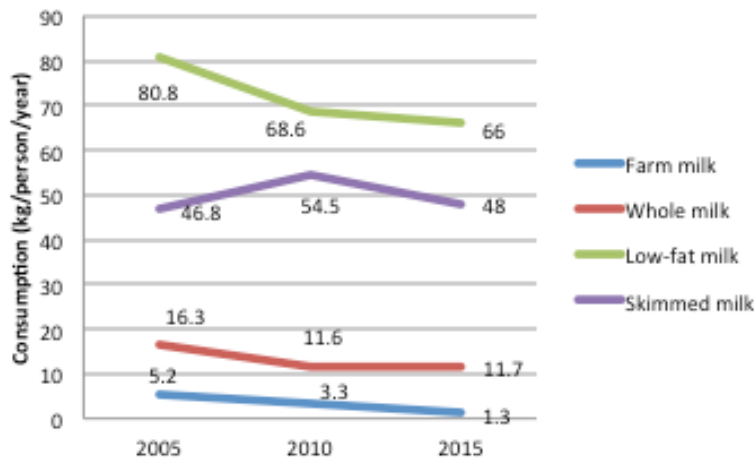


Figure 11: Milk product consumption of Finland in three years: 2005, 2010 and 2015 (kg/person/year). (Natural Resources Institute Finland, 2016a)

With regard to the data from Natural Resources Institute Finland, milk appears to be a high competitive product in the market. The market of milk is divided by the fat content.

The milk drinks comprise the categories of farm milk, the fresh milk delivered right from the farm; whole milk, which is 3.5% in fat content; the low-fat milk in which include 1% of fat and the last type of skimmed milk that usually contains no more than 0.2% of fat. (Dairy Council of California, 2017) Drinking low-fat milk is still the major trends in the market. Though the figures are reported to fall slightly in five years (from 68.6 kg/person in 2010 to 66kg/person in 2015), it is mainly because of the downstream in milk consumption volume in general. Skimmed milk used to peak the trend in 2010 but eased the heat quickly in five years. Whole milk and farm milk are not the popular choices in the market and tended to decrease in volume by years. On another hand, the competitive landscape of milk production in Finland is quite dominant by several main players. The two most highlighted are Valio (33% in market share) and Arla (30% in market share). These two companies are also the most active in the market, whose product profiles are large and marketing campaign and production strategies are launched properly. (Euromonitor International, 2017) As forecasted by Euromonitor in their report of dairy in Finland, the coming trend of milk product intake would be prospective to align to the high protein content, lactose composition and also domestic ingredient due to the rising in health awareness. Moreover, in the research of other dairy and milk-based product, the prospected trends are reported to be addictive-free, lactose-free, health and wellness product but on in the convenient side.

Next, cereals contribute as a major portion into the daily diet of Finnish. In 2015, each person in the country consumed 78.8 kg of cereal grains, in which was accounted by 56.0% of wheat, 19.8% of rye, 7.6% of oat, 6.6% of rice and only a minor percentage of barley (3.0%) according to the Natural Resources Institute Finland.

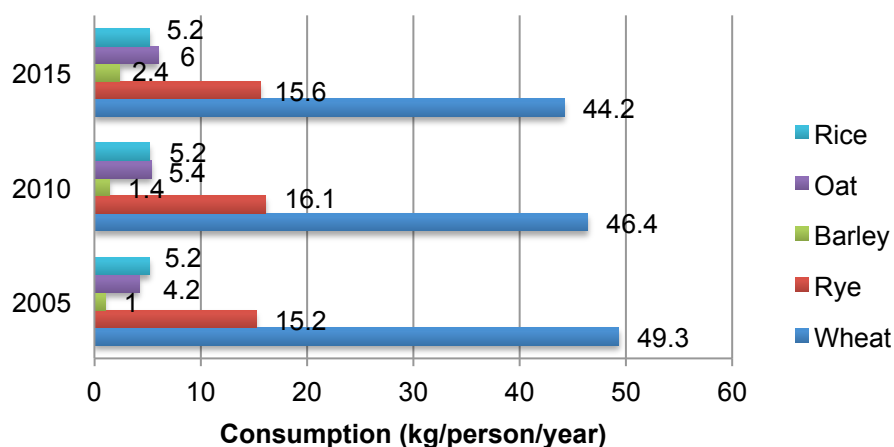


Figure 12: Cereals consumption in Finland in three years, 2005, 2010 and 2015 (kg/person/year). (Natural Resources Institute Finland, 2016a)

On the other hand, as the statistics data from the Natural Resources Institute Finland, the figure 13 was conducted for comparison purpose. As it could be seen from the chart, the main source for carbohydrates in Finnish diet is still wheat, marks up for more than 50% of cereals selection in ten years. However, the figure is observed to decrease gradually. While the total cereal consumption did show the stability, there might be a cut of wheat in individual shopping cart and switching to other source of carbohydrates. The change would be directed to oat and barley, with 42.8% and 140% respectively rising in consumption figure in ten years, from 2005 to 2015. These two cereal grains could be the ultimate alternatives for wheat in the future. Additionally, the intake of rice remains the same among the years. There has been fluctuation in rye consumption but not too significant. Hence, this type of grains is still the second important carbohydrates source in Finnish diet. Conversely, on the side of production, barley attributed as the main grain crop in Finland. In 2016, the barley crop was 1.6 million tones; marked up to 44.4% of the total grain harvest of the country. Slightly increased from the previous year (6%), oats crop contributed 27% into the total cereals crop, which is 1 million ton. (Natural Resources Institute Finland, 2017) With the tendency in oat and barley intake per capita, the rise in these grain crops would be the premise for the raise in local production and consumption.

As a main source of calories as well as nutrients such as protein, carbohydrates, vitamins and mineral, meat and meat production consumption are essential in every diet. From the number and data from the food commodity balance collected by the Natural Resources Institute Finland, the trend in meat consumption is signified. The meat intake per capita of Finnish is only considered average in Europe (from 51.8- 64.4 kg/person/year), lowered than other countries in Europe such as Sweden, Spain, Italy, France, Germany, etc. (FAO, 2011) However, in this context, it appears that the trend in meat consumption has been upstream slightly according to figure 11. The year 2015 also experienced the rise in meat and meat product consumption in Finland, especially eggs and poultry.

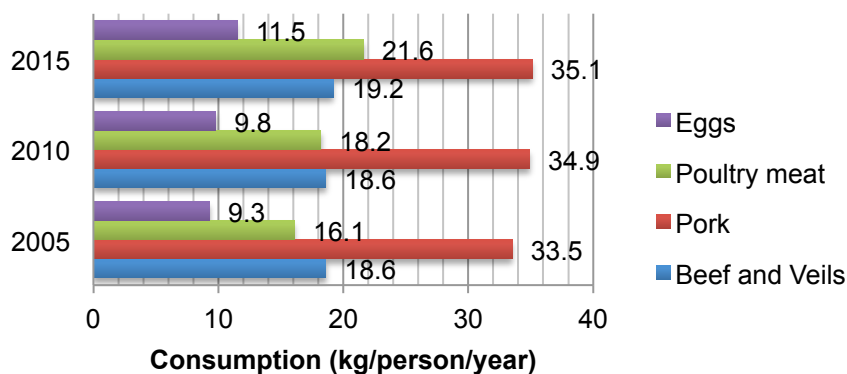


Figure 13: Meat consumption in Finland in three years, 2005; 2010 and 2015 (kg/person/year). (Natural Resources Institute Finland, 2016a)

With regard to the data extracted from the food commodity balance sheet of Finland in 2015, the trend in meat consumption in 2015 is poultry meat and eggs, with the rising rate of 7.4% and 6.4% respectively within a year from 2014 to 2015. (Natural Resource Institute Finland, 2016a) Beef and pork consumptions also showed their growth but not as strong, only almost three and two percent.

Besides, demand for fish in daily diet is also increasing. In the Fish Market Review 2015 of the Natural Resources Institute Finland, Jari Setälä has indicated the potential of the domestic fish market. The growth of fish consumption in Finland is reported to rise approximately 2% per year in which counted for 82% of imports in 2015, mostly from Norway and Sweden. Imported salmon, rainbow trout, Baltic herrings and other wild-caught fish made up the Finnish fish market trend. Salmon and rainbow trout are the most popular choices over the range of selection, accounted more than half of the fish consumption in 2015. On the other hand, the intake of fresh fruits was also on the rise in 2015 (7.4%). (Natural Resource Institute Finland, 2016b) Banana ranked first among the selections (around 33%). Citrus fruit and apples are the next popular categories with 25% and 20% of consumption. Besides, preserved and dried fruit are also alternative options for consumer.

3.3 Finnish food trends

The trend in Finnish food pattern and consumption exhibits the change in dietary behaviour. Hence, based on the analysis about the market and country background, the trends in food retailing could be conducted. There are two main motives for the trans-

formation; the first could be the logical reasons of life-style, the second motivation is mostly feeling-based. According to the report of Food Trend 2017 from Kesko, the trend based on experience and feelings is on the rise in the coming years. As categorised, life-style trend could be recognised by well-being, convenience and efficient consumption awareness. On the other hand, the tendency of experience and feeling in food shopping could be seen through the behaviours of culinary exploration, fine-tuned food or tailor well-being.

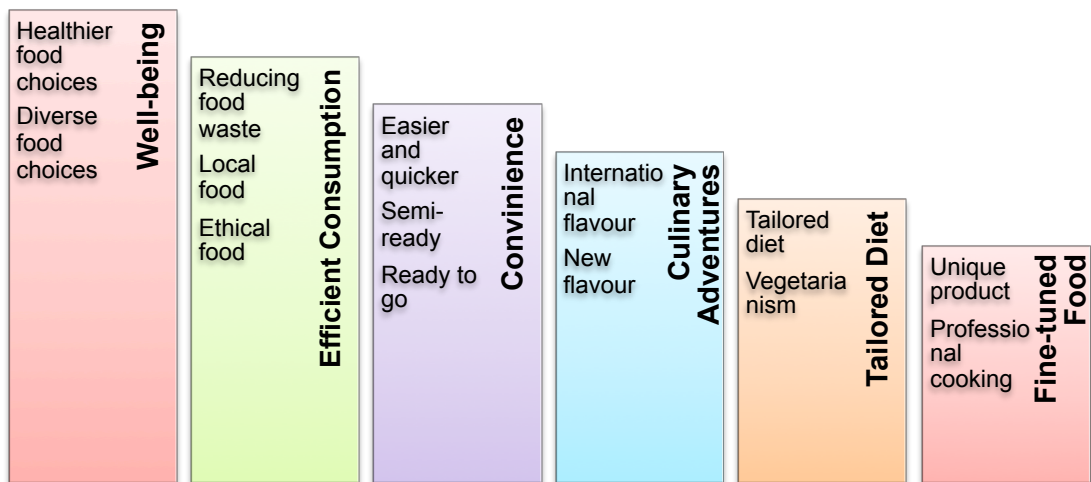


Figure 14: Trends and sub-trends on food choice (Kesko, 2017)

First and foremost, healthiness and well-being awareness is the main trend for the change in dietary pattern. According to data from Nielsen Global Health and Wellness survey in 2014, 75% of the global average chose changing diet as approach for losing weight. This figure in Europe is higher at 78%, 83% in North America, 75% and 71% respectively in Latin America and Pacific-Asia. (Nielsen, 2015, p. 5) Well-being trend in everyday food in Finland could be considered as own well-being awareness, healthier and diverse choice for food. In 2016, 53% of Finnish customer aimed for the changes in their diet, 43% is trying to address to the better choice of food including healthiness, variety in selection and also enjoyment. The trend is more intense in the northern and eastern parts of the country. (Kesko, 2016c) Briefly described, the diets are changing toward fewer consumption of fat, sugar, processed and more fresh foods. For instance,

among the changes in diet due to overweight problem in Europe, there is 60% is cutting down on fat, 66% of cut in sugar and sugary products and 29% of lower in processed food consumption. On the other hand, 56% is looking for fresh and natural foods. (Nielsen, 2015, p.6)

Nevertheless, protein consumption is highlighted to potentially grow, especially in Nordic countries. 23% of consumer across Sweden, Norway, Denmark and Finland predicted to consume more protein from the healthy sources and specified on the category of chicken. Other 24% expected to consume less meat in coming five years, so does 22% of Finnish consumers. Following the worldwide trend, consumers from Nordic countries also focus on vegetables and fruits, free addictive product, lowering fat and carbohydrates (27%), superfoods as well as other healthy alternative grain. (Ernst & Young Global Limited, 2015, p. 9)

Hence, the well-being movement also impacts on Finnish diets. Consequently, the desire for everyday healthier food is increasing. The demand for fresh vegetables and fruits as well as the reduction in sugar intake are the results of the raise of well-being awareness. As a forecast from Kesko in 2016, customers tend to consume several products more frequently rather than usual such as berries (51%), nuts & seeds (48%), sweet potato (42%), avocado (34%), honey (30%), Finnish super food (26%) or minced turkey (24%). Notably, Ari Akseli, Kesko's Vice President, grocery trade division, has emphasised on the importance of fresh berries and avocado on shelves due to the sale boost in 2016. Avocado is also reviewed to be the most potential product with 2.1 million kilos sold, appeared to be the best-selling product in Helsinki Region.

Secondly, efficient consumption is rising strongly among other dietary behaviours of Finnish. As researched by Kesko, the three-main typical sub-trends of this change in Finland are reducing food waste, local food and ethical food. Smart consumption is becoming popular in the eastern and northern part of Finland due to the harsh weather as well as remoteness. Being efficient in food consuming, 47% of consumers concentrates on reducing food wastes. Meanwhile, other 34% is looking for either local or local-produced food for their shopping cart, which is not only because of the flavour but also increase the efficiency of the whole supply chain in general. On the other hand, the concept of ethical food is much more popular in the Helsinki and the Uusimaa region. Several behaviours from this trend could be listed, such as buying product with less environment impact or with clear-labelled origin. (Kesko, 2016c)

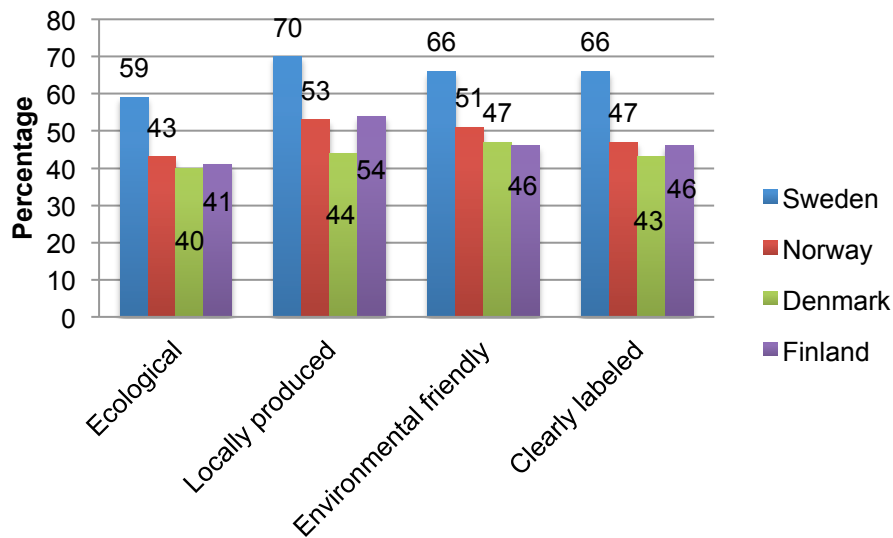


Figure 15: Predicted food preference in four Nordic countries in percentage (Ernst & Young Global Limited, 2015, p.11)

With data from the report of Nordic food survey 2015: Consumer trends, Ernst & Young Global Limited (EY) has figured out several preferences in informed consumption of four Nordic countries. As could be seen from figure 15, the Nordics are strongly aware of ecological, local product, environment and also the labelling when it comes to food choice. Out of the four countries reviewed in four categories, Sweden reached the highest. Finland, on the other hand, also shows the cautions on efficient food consumption but only perform at an average level. However, it could also be conducted from figure 15 the fact that local production is high valued among Finns rather than other countries (54%). In this context, Kesko has reported that 56% of consumers would like to pick up bread from local bakeries into their shopping cart, 52% for local meat producer and 45% favours bread from Finnish rye. (Kesko, 2016c) Also environmental problems and labelling are interested. In 2017, it is predicted that there would be 30% rising in environmentally friendly product and 33% upstream in organic Finnish products. Nonetheless, it appears that the ethical issue is also a problem in food choices, proved by the growth of Fair trade label vegetables and fruits or either favouring products from small manufacturer.

Next, due to the hustle and the bustle of urban area, convenience is a key requirement readdressing the shopping selection. In the set of convenience, time and distance are

vital. Within time criteria, 38% of Finnish consumer is fond of the easy and quick food solution, other 18% goes for the food, which could be ready in 15 minutes such as ingredients for stews (54% in growth rate) or fish from the fish counter (43%). Furthermore, 17% prefers the semi-ready product such as ready-made salad (21%), pre-chopped vegetables, or ready-to-use salad ingredients (24%) and also the healthy and addictive-free convenience food. The demand for quick and convenient food is also higher during the weekdays and lower in weekends due to the working schedule. Also, the distribution of convenient food is varied among the country. In the eastern and northern part, the option of takeaway is more popular. However, in the south, consumers much more refer to the healthy semi-production option. (Kesko, 2016c)

Besides the concept of time, distance is also important for Finns or the Nordics in general when considering convenience. Out of other criteria, having stores close to neighbourhood or big traffic hub is considered as the most important factor. Because of the long and hard winter, easily accessing to grocery store is vital.

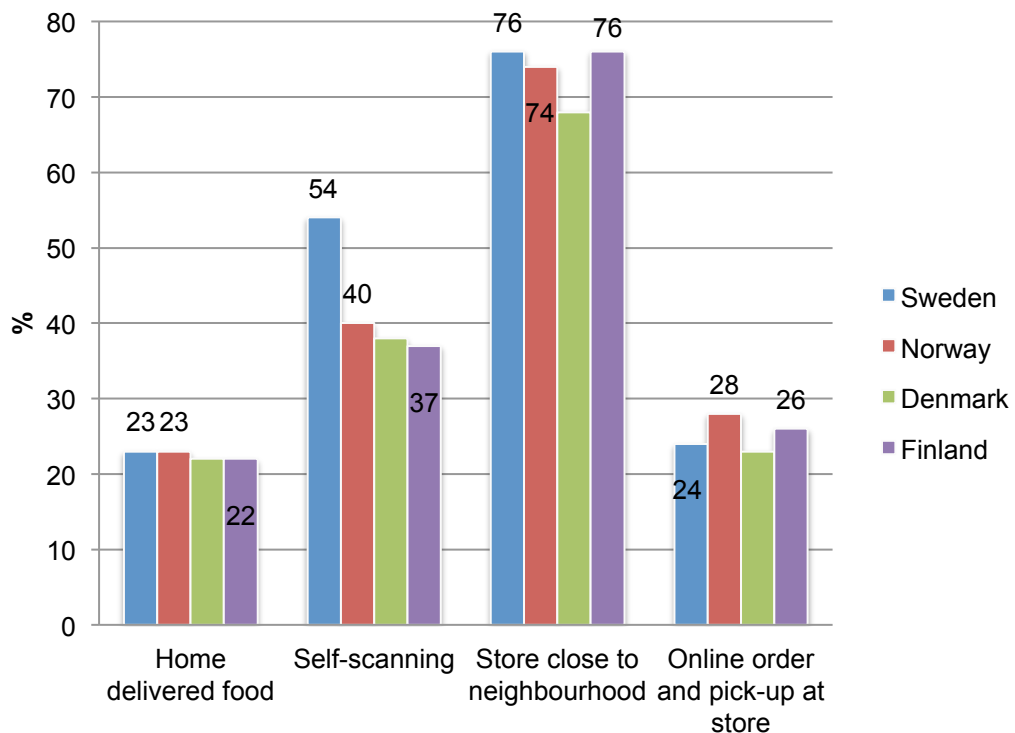


Figure 16: Factors influencing purchasing process in four Nordic countries. (Ernst & Young Global Limited, 2015, p. 12)

Obviously, it is imperative for Finnish to directly access to a physical grocery store as stated in figure 16. Other online or home delivery service is also available but not really popular among consumer. In short, in the category of convenience, the demand of store location as well as quickly prepared food is on the rise in Finland.

The fourth notable tendency in food consumption of Finnish is a feeling-based trend, cuisine adventures. To be specific, the concept of new and international flavor, new and exotic ingredients or recipes are much more widespread. Italian, Mediterranean or Asian recipes are preferred to try at home. Southern Finland is much more familiar to the transformation. However, the trend is spreading in the west of the country. (Kesko, 2017) The movement of culinary exploration in Finland brought interesting ingredients such as coconut milk, ginger or herb such as coriander or Thai basil to the shopping cart. Sushi also reaches high sales volume and showing the potential for future growth.

Another change recently in food selection of Finnish consumer is the customized healthy diets. This trend might be inspired by the well-being trend but varied among individuals. Consumer tends to eat healthy by several specific diets, which might or might not health-problem relevant. Several names of the common diet could be listed such as high protein, low carb, gluten-free, lactose-free, fat free and etc. These tailored diets are seen to grow dramatically in the country with 16% in term of development in 2017. Another trend in the tailored well-being section is the vegetarian diets with 13% of the growing rate. The main focus for these diets is the healthy food with good sources of nutrients. Healthy food with high protein content is often favored such as seeds & nuts, quark, protein bars, pulled oat. Vegetable, both fresh and frozen, fruits such as berries or smoothie ingredients are also popular choices. These foods not only meet the healthy requirements about needed nutrient but also perfect options for several tailored-diets due to the free in gluten, lactose or vegetarian.

The last trend to pay attention to when mentioning change in eating pattern is the fine-tune food. This is a term used by Kesko to describe the trends of professional home cook, product with a background as well as the unique product. This tendency is rather minor and also more on the feeling based but not sensitive reasonably widespread. However, Kesko also predicted this trend to grow in 2017. Briefly described, besides the weekdays convenience food, more and more people are on the side of proper weekend meals; this trend is predicted to grow 16% in 2017. Then, the products with background are also strategic items in this category. 2016 witnessed the rise in sales of

product with background, which could be sustainable, environmental, ethical, artisanal or society related. (Kesko, 2016c) This trend is raising in the south of the country, where the population density is high, thus the high media effect from the marketing influence. Several items with high growth rate in this section are products from local or small manufacturer (56%), seasonal foods (39%) or Finnish superfood (26%).

In short, trends of food consumption in Finland is changing, aligning the selections towards well-being, convenient, sustainability, being environmental friendly and also diverse. The dietaries have been changed but on the optimistic side. The health risk would be reduced due to adequate diet pattern. However, it is a challenge for cooperation to reform the food supply chain for better movement.

3.4 Motivations

For deeper understanding about the changes in dietary behaviour of Finns as well as affiliating the trend toward further activities of the supply chain, the motives for food choice and intakes are studied. However, encouragement of change is resulted from everyday purchasing behaviours. Shepherd described an abstract idea of factors affecting food consumption in his research paper of Social Determinant of Food Choice via a qualitative model. The model is modified and present in figure 17 below.

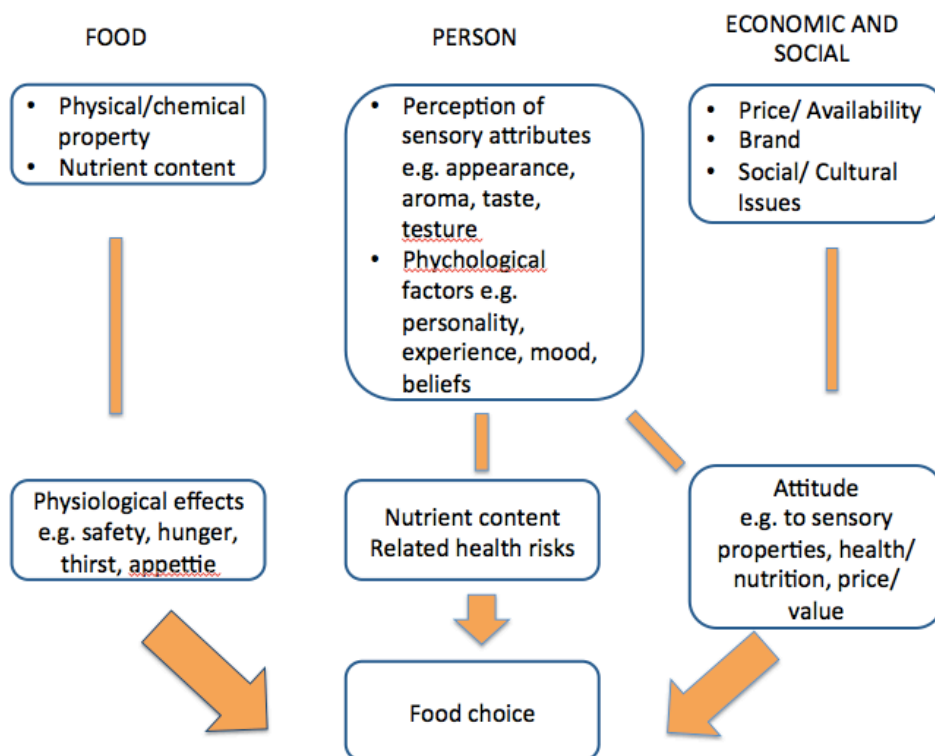
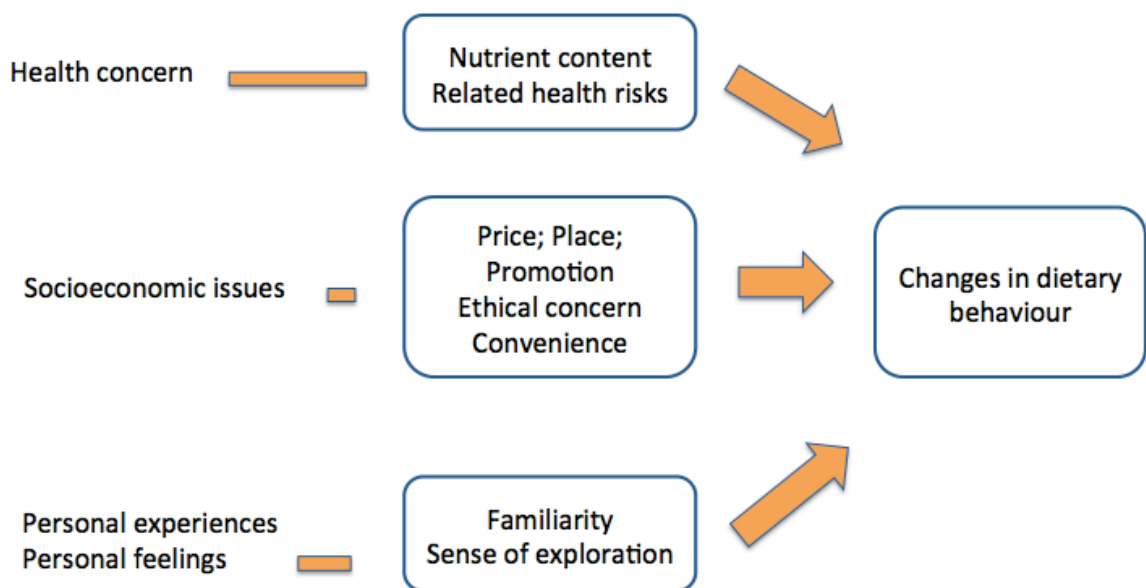


Figure 17: Some factors affecting food choice and intake (Modified from Sheperd, 1985)

Three elements of food selection have been encompassed in the model. First, foods themselves attract consumers by the physical/chemical properties and the nutrient content, which influence the physiological effect such as hunger or thirst. Hence, beside the natural demand of food, health concern is also motivating the food choice and intake. The second factor is the personal feeling and experience with the psychological components as personality, experience, mood or belief. With the available perception about the sensory attributes such as appearance, aroma, taste and texture, the food choice is conducted. In other words, the personal feeling and experience would judge the sensory attributes and decide if the product is purchased or not. The third and also the last component in the model is the economic and social factor. This determinant comprises the price, availability of the food in the store, brand and social/culture issue.

As the Sheperd model of food choice and intake as well as the trend and pattern of dietary behaviour in Finland, the motivations of the changes are analysed.



The first encouragement for the recent change of shopping behaviour is the health concern. In this context, numerous researches have investigated thoroughly the scientific tie between food and health. As analysed before, imbalance diets are the root for overweight. In another word, obesity and excessive body fat is the cause of chronic disease, leading many types of cancer. Several health risks such as coronary disease, high blood pressure, stroke and diabetes type 2 are also resulted from overweight and

obesity problems. (Nordic Co-operation, 2012, p.21) In Finland, as a study of Europe Association for the Study of Obesity (EASO) carried out by independent strategic insight agency Opium, the average proportion of obesity in different population groups of Finland is 17% in adult men, 16% in adult women and 11% in children (under 18). Meanwhile, the estimated rate of overweighting is properly higher, reaching 33%, 31% and 23% for adult men, women and children under 18 respectively in 2015. The number of overweight teenager has also seen to increase. Among eighth and ninth grade teenager in secondary school, the obesity rate is 15% in 2015, including 18% in girls and 13% in boys at the age range. (YLE, 2015) Also in 2011, the incidence of type 1 diabetes, ages 0 to 4 of Finland is 57.6 per 100,000, ranked first over the world. (Diabetes UK, 2011) As the data extracted from the International Diabetes Federation, in 2015, one in 11 adults has diabetes. Furthermore, the number of people with diabetes in Europe is 59.8 million, which is also high comparing to other continents. (International Diabetes Federation, 2015) On the other hand, balance diet with adequate nutrition intake would decrease the risk of several health problems such as hypertension, cardiovascular type-2 diabetes thus the rise in plant food such as vegetables and fruit and the switch to good sources of protein and fat and other well-being trend is blooming in Finland. (Nordic Co-operation, 2012, p.21)

The second motivation for the change is the social and economic issues. Within this incentive, marketing plays an important role to the redirection of shopping behaviour. By the strategy dimension of right price, place and promotion, food retailer is also an important driver in the healthy diet revolution. With the rise in availability and diversity of healthy products on shelf, the cut in price and the push of suitable promotion campaign, the trend is reformed and boosted. On the other hand, as the strength of media, social and ethical issues such as labour right, environmental and other society related problems are highly aware. In another world, those external influences are the cause for the change in dietary behaviour and considered to sharp the trend in the future.

The last component attributes to the change in dietary behaviour is the personal feeling and experience. In this category, the exploration sense of new cuisine and flavour is the major inspiration. In short, the three factors above are the main drivers of the transformation in dietary behaviour in Finland.

4 The transformation of grocery SCM in Finland

Within the features of Finnish food supply chain analysed in chapter 2 and the highlight of food trend described in chapter 3, the urge figuring out the transformation of food SCM in Finland is motivated. In this chapter, the popular transition is captured including local food supply chain, ecological food supply chain and wastage reduction. Furthermore, the performance of individual parties in the chain is also prevailed. In general, the transition is reviewed from general to specific, featuring deeper understanding about current situation of the food supply chain and play the role as supporting further analysis in the future.

4.1 Short food supply chain

With regard to concerns in better nutrition in food supply chain, sustainability effect of food and also substitute for global supply chain, local food supply chain is considered to be the solution. (Paloviita, 2010) Ernst & Young Global Limited has indicated local product to be an important factor in food selection and consumption, with 54% of Finnish respondents predicted to shop more frequently in five years. In 2012, the Ministry of Agriculture and Forestry reported the share of local food over daily-consumed goods was 8%. The proportion is higher, 10%, in special stores and public catering.

Local food is the locally produced food, being processed from raw materials collecting within a specific region. Local food would be consumed in one certain region but could also be promoted in numerous distribution channels throughout the country. Furthermore, the local food is not only the processed but also the wild or local origin products. The concentration of local food supply lowers the number of player in the food supply chain. In general, local food contributes to the local agriculture and short supply chain. (The Ministry of Agriculture and Forest, 2012) There are several factors motivates this sector, the first is to increase the consumption of fresh and healthy food. The next motivation is to tighten the connection between parties in the supply chain, e.g. farmer and consumer. Sustainable development is considered as the final encouragement. There are several popular local products contributing to the adequate diet of Finnish such as cereals, vegetables, root plants, milk, fruits, wild berries, meat and fish. (European Parliamentary Research Service, 2013)

Since the growth of local products is rising, the food supply chain is transforming to fulfil the need. With the shortest food production chain, high in quality and freshness as well as environmental and sustainable effect, the balance between volume and cost is mandatory. (The Finnish Innovation Fund, 2012) SITRA has also consider cost-efficiency is the challenge for the local food market. As a solution for the problem, joint supply chain is implemented. In detail, local products from the small and medium farm are collected and combined to distribute together creating a joint supply chain management. Moreover, the legislative supports as well as advisory are also provided to the small and medium food processor for better local production. (The Ministry of Agriculture and Forest, 2012)

4.2 Ecological food supply chain

As the diet patterns are changing, the tendency in informed consumption has boosted the organic market. This growth has raised the production and sales of the sector, reforming the food supply chain ecologically.

The organic food chain shares similar elements as an ordinary one but the production input. Briefly described, chemical fertilisers, chemical pesticides, concentrate supplement and similar chemical are eliminated from the production process. Moreover, even the medication used in livestock crop is controlled legislatively by organic food organisations such as International Federation of Organic Agriculture Movements (IFOAM) or Finnish Food Safety Authority (EVIRA). Usually, organic product is supervised and certified separately. Organic products are often recognized by logo or labeling. (Nuttilla et al, 2014, p. 7)



Figure 18: EU organic label and the “Luomu”- controlled organic produce label. (Environmental Administration, 2013)

For instance, the two logos above are the official Eco labels of European Union and Finland. The Luomu sign is used for product, which is produced and manufactured in Finland and certificated by EVIRA. (Environmental Administration, 2013)

Notably, organic production and consumption are observed to grow steadily. In 2016, the organic production sector counted for 10% total cultivation of the country in 2016, with over 241 000 field hectares of total cultivation with about 4400 organic farms. Besides, wild food also contributes to the organic food section with 13 million hectares of forest, offers a large range of organic products such as blueberry, lingonberry, bilberry or cloudberry. (Finnish Organic Food Association Pro Luomu, 2016) Also in the same year, organic sales in Finland were rocketed, seen to increase 14%. The encouragement of this positive change is the introduction of new products, especially to the small niches market with no organic option before. This is the premise for the growth of organic food chain. (Finnish Organic Food Association Pro Luomu, 2017) The market share of organic foodstuffs in 2016 was 2% in which 55% attributing products is domestic. These figures emphasise the importance of local organic product in the food market as well as the essentials in organic product development. Organic milk is the most interested product over the other food categories, account for 15% of the total grocery sales. Fruit, vegetables, flakes, flour and also eggs are also popular organic choice among Finnish. (Finnish Organic Food Association Pro Luomu, 2016)

Despite the rise in sales and also large interest from the customer, organic food chain also experiences several obstacles. Though the high volume of raw organic material production, the organic producers do not provide their full capacity to the organic market. A large part of the organic materials flow to the conventional manufacturing. For instance, organic livestock products under organic livestock farm in Finland are mostly wasted for the conventional. This controversy is mainly because of the lack in marketing channel, downgrade the opportunities for market entrance, On the other hand, many organic farms also failed to find a proper organic product manufacture, this is also the cause for the waste in organic production. In general, the main problems of Finnish organic market are the high production under the small marketing market and long distance manufacturing process. (Ministry of Agriculture and Forestry, 2014)

However, there are optimistic signal from the retailer improving the situation. Though the stuck in the organic supply chain, retailers play an important role, proactively supported the marketing and lower the price. For instance, organic product accounted for

1.3% of Kesko Food's Sales in 2014, with a range of 1,400 selections. Moreover, a large range of the organic products under Kesko's private brand, Pirkka, is also a good budgeted choice for consumer. (Kesko, 2014) Meanwhile, S-Group is also pushing their activities in fulfilling the organic demand of the market. In 2015, the group claimed to be the largest retailer of organic products in Finland with a selection range of 3,200 products in 2015, accounted for 48.6% of organic sales market and experienced the raise of 7.4% in organic grocery trade compared to previous year. Moreover, the group had the plan of developing the organic product profile; focus on the strategic product of vegetables, juices and biscuit. (SOK Corporation, 2015) In short, the marketing and product development actions from grocery retailer are the motivation for the growth of organic product.

4.3 Wastage reduction

Smart consumption is becoming a tendency changing the shopping behaviours. As one of the major concerns of consumer in sensitive consumption, reducing food wastage is popular throughout the whole country, especially in the eastern and northern parts. (Kesko, 2016c)

Along the food supply chain from the producer to the end consumer, wastage in food production is caught in every stage. The major wastage is recorded in the household level. The food losses and wastes along the food chain are described in the chart below.

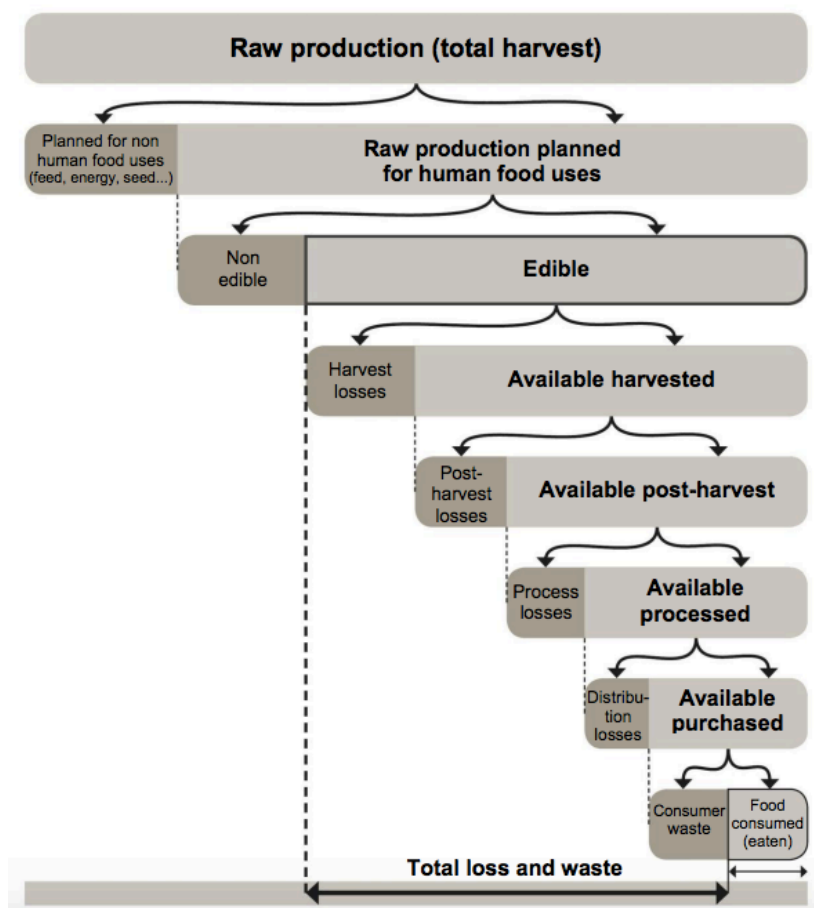


Figure 19: Food loss and wastes along the supply chain. (The High Level Plane of Experts, 2014, p. 23)

According to the report of Food losses and waste in the context of sustainable food systems by The High-Level Panel of Expert, food wastage is defined as the leftover or discard of food at consumption level. The other wastes during the rest of the supply chain are the loss of food. As a study from Stuttgart University in corporate with German Federal Ministry of Food and Agriculture, consumer hold the largest amount of food wastes, attributed for 61% of the chain, 17% counted for the catering sector, another 17% is the loss during the supply chain and retailer only counted for a minor portion of 5%. (Hafner et al, 2012, p. 6) In Finland, the number of wastage in food production is 335-460 million kg annually, without around 28%-38% comes from the household sector. (Katajajuuri et al., 2014) The popular wasted group of foods was fresh vegetables, milk products and home-cooked meal. Also, according to the Nordic Cooperation, organic product had higher chance in wastage rather than other categories. This may be related to the short shelf life compared to other conventional dimensions.

There are several important reasons for food waste at the household level. Poor purchasing management leads to the inadequate storage or misapprehension of expiry date is the cause for the excess. (Silvennoinen et al., 2014) On another hand, packaging is also another reason causing food wastage. The imbalance between package size and consumption is the cause for the loss. Inefficient package form is also a cause. Though the waste is minor by single unit but at the total consumption level, the loss is rather high. (Williams et al., 2012, p. 9) Last but not least, promotions from retailer motion may also be the major cause for unnecessary overstocking. The promotion may be related to the high volume of supply (e.g. seasonal vegetables or fruits), excess demand, high consumption of specific product during holiday season (e.g. Christmas, Easter, etc.) or the last minute flash sales of “about-to-expire” products (Nordic Co-operation, 2016, p. 47)

For efficiency in wastage reduction, beside the actions at household level, there have been contributions from retailers, the gatekeeper to the food market. The first behaviour change is the improvement in demand management and forecasting. Together with the implication of short supply chain, the freshness and shelf life of product is optimised. This could reduce the overstocking in the warehouse, down grade either the waste in retailing and also the unnecessary consumption at household level. In the case of Kesko, fresh products such as meat or dairy product usually comes from local supplier. Each K-store is eligible to outsource the product on their own and local producers are favoured among all. This straightforward process reduces the supplying time, maximise the quality and also supports on efficient tracking on the whole logistics system. (Syroegina, p. 64) As the second action to save the food waste, retailer also paid attention in the limitation for volume promotion. For instance, volume promotion is not favourable in S-Group outlets. Discount for nearing expired products is usually implemented. To be compared, K-food stores also prefer discount than volume promotion. However, as different in power structure and each K-food store is independent in decision making, the action is not consistent but rather varied on individual outlet. (Syroegina, p 68) Another behaviour retailer performs is to educate consumer for efficient consumption. Both S-Group and K-food retailer took part in the campaign and event such as the Consumer Association’s Wastage Week or Wastage Festival (The Consumer’s Association of Finland, 2014) Also in order to improve the efficiency in consumption, mobile app for meal planning is also launched by Kesko for better shopping management. K-ruoka mobile app also provides recipes, preventing overstocking as well as over-preparation.

In the manufacturer level, proficient packaging to reduce food wastage during transportation process and suitable package size for informed food consumption is the main awareness. 70% of Finnish packaging is wood-based which lower the negative effect to the environment and also maximise the efficiency during transportation. (The Finnish Funding Agency for Innovation, 2017) Changing the package labelling is also an option for reduction in food wastage. Besides the changes in sizes, transformation in data labelling could also lower the loss. The Nordic Co-operation, in the study of Food waste and date labelling has indicated that during the manufacturing process, the prolonged in product durability up to one day could reduce the food wastage. This extension of the product lifespan might require the improvement of content quality as well as distribution condition from the supplier and retailer. (The Nordic Co-operation, 2016, p. 46)

4.4 Changes of parties in the FSC

4.4.1 Producer

Being the beginner in the FSC, the role of producer is rather imperative, deciding the input of other stages. Since the dietary behaviour is changing, the producer is also reforming for efficient performance.

Take a look at the current situation in Finland, the country hold a number of 50 999 agriculture and horticulture farm in 2015 with the average arable land area up to 45.0%. The number of farms was seen to slightly decrease up to 26.6% within ten years from 2005. However, the proportion of 36.6% increasing in arable land is noted. (Statistics Finland, 2017) As the number of farms decreased, the area of farmland increased. The average arable land of the country is rather low compared to other European countries. As in figure 20, most of the farm located in central and south west Finland thus the distribution of the farms is rather concentrated. The intensively utilised farming area (>52ha/farm) is not consistent among the farms.

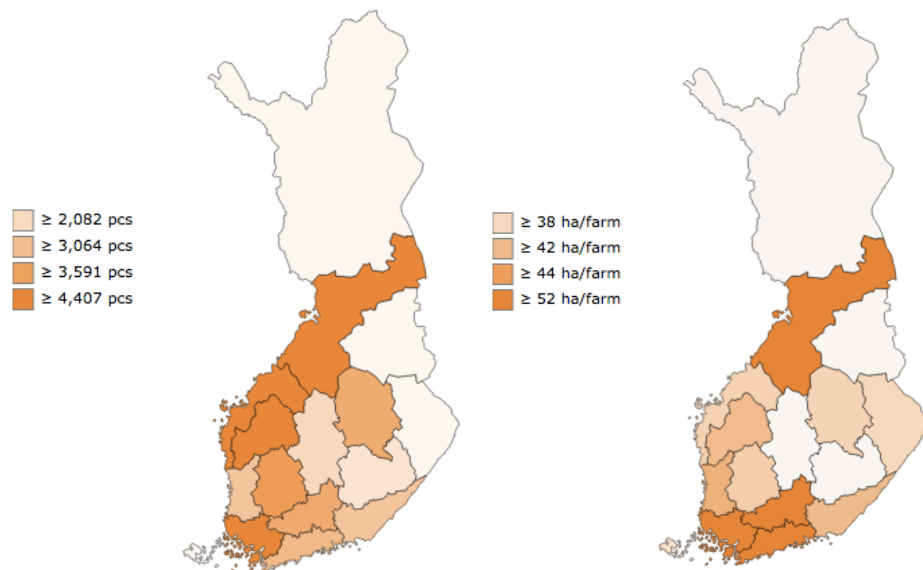


Figure 20: The number of farms (left) and the utilised agriculture area (ha/farm). (Natural Resources Institute of Finland, 2017)

As the country data from Food and Agriculture Organisation, 25% of the country is covered by water. Another 86% is the forest. Only a minor portion 8% is spent on farmland hence comes the vast in farm distribution and also the loose in utilised area. This is one obstacle in the farming industry, leading to the over cost in transportation and also difficulty in farm extension. Since the shortage in farming land and the sizeable area of forest within casual farm, forestry role is rather imperative, acting as a reserved resource and financial supports to the farm. On the other hands, in 2014, 87% of Finnish farms is family-owned and 11.3% is operated by the heirs and family companies. The rest is owned by cooperatives and limited companies, States and other public sectors. (Niemi and Ahlstedt, 2015, p. 15) On the hand, small and medium-size family farming forms Finnish agriculture structure, being the main supplier fulfilling the local demand.

As the dietary pattern is changing, the transformation of food production is also observed. The first step of new, healthy and sustainable food production is proceeding within the industry. The most notable change is the switch into organic production. According to the Statistics Finland, within 10 years from 2005 to 2015, the share of organic farms in the industry experienced a rise of 43.1%. The popular organic vegetable productions are carrots, garden peas and onion. Wild berry is also a strategic option for producer with the rise in the plant of currant. Organic strawberry and apples are also popular among the organic horticulture production. (Niemi and Ahlstedt, 2015, p. 32)

On the other hands, due to the rise on healthy protein consumption, many local sustainable alternative resources of protein are increasing in production volume. Specifically, for the vegetable based sources of protein, broad bean (fava beans) and pulled oat has marked their appearance in the market. Anneli Partaa, the senior statistician from Luke, Natural Resources Institute of Finland indicated 10% higher in oat growth rate in 2015. Board bean also performed its popular with a large grown area of 17,000 hectares, even higher than sugar beet (12,000 hectares) and is catching up with the potatoes (22,000 hectares). Other good source of protein from domestic market such as wild mushroom, wild fish would overtake the normal product.

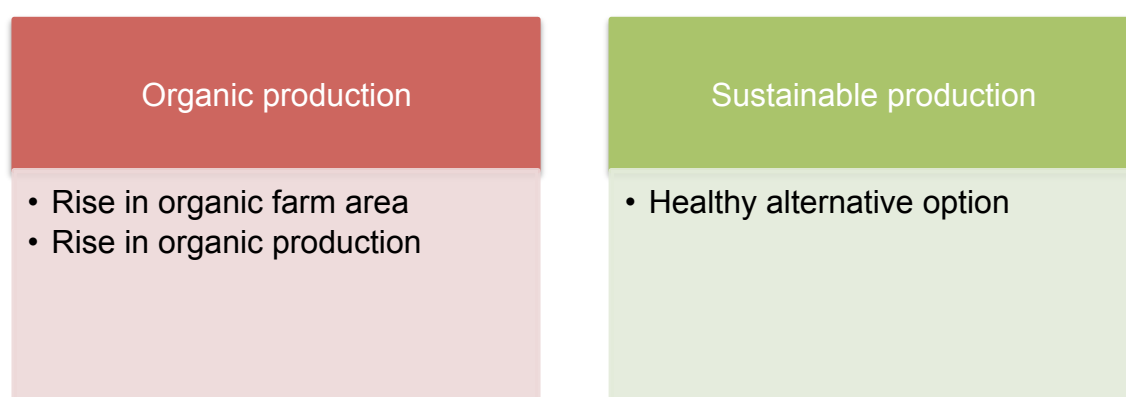


Figure 21: Summary of changes in production

4.4.2 Manufacturer

Being considered as a significant industry, food manufacturing is viewed as the third largest industry sector in Finland. With the total output of € 12 billion and value added of € 2.8 billion, the food industry attributes 1.6% into total GDP of the country in 2013. (Niemi and Ahlstedt, 2015, p. 16) Also in the report of Finnish Agriculture and Rural Industry in 2015, Niemi and Ahlstedt featured Finnish food processing as raw material intensive and being dependent on domestic and raw material. According to Export Finland, 82% of the material comes from the local, which performs the self-sufficiency of the FSC and also lower the cost of transportation. Besides, rural enterprises are the main actor compounding the profile of food industry. Finnish food processing industry is structured by several large firms and various small and medium enterprises, located in rural area. Notably, 71% of the rural processor is micro-enterprise with fewer than 5 employees working within a firm. The most popular product sector is bakery and meat

processing. (Niemi and Ahlstedt, 2015, p. 12) Moreover, as the trend of diversified farming, farms are also integrating food processing as supportive function agriculture and horticulture activities. The major food groups for this category are vegetable, wild berries, bakery and slaughtering and meat production.

Since the change in dietary behavior and the switch in input from the production sector, several changes have been observed in manufacturing. The first trend captured is the concentration on high quality local product. Several large manufacturers such as Valio or Atria are promoting qualified and sustainable product from Finland. Valio claims to offer sustainable Finnish dairy products, focusing on nutrition facts such as more vitamin D, less added sugar, low or free of lactose. (Valio, 2015) As another example, Astria is also announce to offer the market qualified chicken product with no antibiotics added as well as the maximisation of animal well-being. (Astria, 2017) On another hand, production of naturally healthy packaged food is also seen to grow in Finland. According to Euromonitor, Vaasan Oy and Fazer Leipomot Oy are the two large enterprises in the market of food processing. Both Vaasan and Fazer are actively promoting the high fibre bakery as well as product in rich of good protein (wholegrain cereals, nuts, etc.)

In traceability, food labeling is gaining more attention from both consumer and processor. Label with provenance of origin, informative and transparent nutrition facts are becoming popular. Moreover, several signs for health alert such as heat symbol, a sign confirming a better choice for health. (Sydanmerkki, 2017)



Figure 22: Summary of changes in processor

4.4.3 Retailer

As a direct distribution channel communicating to the consumer, retailer is the group with the most proactive responds to the change in the dietary behaviour of consumer. In another word, retailer is also the gatekeeper, taking part in the purchasing decision of the consumer. With the market structure and retailers analysed in the sub chapter 2 of Food retail logistics, performances of three main players in the retailing industries S-Group, Kesko and LIDL are chosen to review. By spring 2017, all Siwa and Valintatalos would become K-market and soon be detached into K-retailers in 2018 (Kesko, 2016e), thus the case of Suomen Lähikauppa Oy would not be analysed.

S Group

The first and also beginning change noted in the distributing process of S-Group is the adjustment in sourcing. Sourced products are favoured toward the dimension of sustainability, Finnish origin, well-being and ethic. First of all, the sustainable production and raw materials are highly valued within the group. S Group is active in certifying or production labelling for better responsible consumption. According to the data from the group official website, the group ultimate goal is to provide a large range of certified products as well as to apply sustainable certificate to several specific private products. For instance, in the grocery category, S Group attempts to offer product with environment and sustainability certificates such as Fair Trade, Nordic Swan eco-label or EU eco-label. (SOK Cooperation, 2015) Within private brand sector, the group hold 107 products with environment certificate. Sustainable certificate for private products containing palm oil or coffee beans are the next goal by 2020 of the product. (SOK Cooperation, 2017)

Secondly, in order to promote local production, several gateways are established by the cooperatives for efficient local sourcing. According to their official website, 89% out of 20,000 suppliers is from Finland. The group has developed efficient channel for local producer to enter the outlet. Local farmer would directly contact local outlet for product entry. If the demand for that specific product keeps going, the integration in to the cooperative's outlets would be implemented. In case the local producer is capable for large volume production, the local product could be distributed along the retailing network of S-Group in the whole country. This is the most efficient solution for the large number of family-owned local food enterprise in rural area. Furthermore, for better product recognition, the cooperative has customised the new line of Kotimaista for

Finnish origin product. The line is qualified enough for the Hyvää Suomesta and Sirk-kalehti labelling necessity. By the end of 2015, there are total 268 products in the Kotimaista line. (SOK Cooperation, 2017)

The next factor influencing the sourcing process of S Group is the well-being. In this section, the cooperative aim to develop purchasing mobile service for health alert. On the other hand, S Group also highly focuses on the offer of vegetable and vegetarian option. Last but not least, with the ethical principle in the food supply chain, the group highly concern to the issue of human right. The group is using the Supplier Ethical data Exchange system from Sedex to supervisor supplier's performance. In addition, the Business Compliance Initiative (BSCI) principles are also applied to strengthen the sourcing policies. The BSCI system and the result of S Group BSCI audits by area in 2015 are represented in appendix 1. (SOK Cooperation, 2015)

As the practises in store, S Group is penetrating on the price and promotion in the actions respond to the change in the dietary behaviours. To be specific, the group prefer to conduct survey to collect consumer viewpoints in increasing vegetables intake. After the survey, S Group launched their price reduction campaign, lowering the price of 900 popular grocery items, comprising 100 home grown vegetables. (Helsinki Times, 2017) This campaign is not only an action supporting the large consumption on vegetables among consumer, encouraging healthy diet but also supporting reduction on food wastage and secure the freshness of product range. In the packaging sector, S Group has implemented transparent origin labelling in their private brand. Hence, the product from their private label is always clarified with not only the country of manufacturer but also the origin of raw materials. (SOK Cooperation, 2015)

In the section of assortment, S Group concentrates more on the price fighter and value for money-product. (Co-operatives UK, 2016) X-tra and S Rainbow are the budgeted lines while Kotimaista is developed into "value for money-product" line regard to the price, quality and Finish origin. Kotimaista shows the potential for further development. (Cottam, 2014)

Table 4: Summary of S-Group's changes toward consumer's dietary behaviours

Dimensions	Changes toward dietary behaviours
Sourcing	Local/ Shorten supply chain
	Sustainable
	Well-being

	Ethical
In-store	Promotions & Price cut on vegetables
	Sustainable labelling
Assortment	Private label

Kesko

Being the main competitor of S Group, holding a portion of 32.7% in the retailing market share in 2015, Kesko is a pro-active player in the market. As the shopping behaviour is changing toward the food trend, K-food store is also transforming.

In sourcing, the group presents high-qualified sustainable product throughout strict policies for supplier. K Group applies different sustainable policies over specific product categories such as fish and shellfish, palm oil, soy and timber. In detailed, green list species of fish and shellfish are selected to be on shelves. In addition, product with palm oil or soy contain is designed to be sustainable produced, meeting the requirement of Certified Sustainable Palm Oil and the responsible produced soy. (Kesko, 2016f)

As approximately 80% of the food from Kesko's chain originated from Finland, local food production plays an imperative role in the food range of the cooperatives. Individual K-food retailer is in charge of fulfilling local food demand and local product selection. Each outlet is customised-designed; independently offer product and service according local need. Local sourcing is highly recommended by Kesko. K-city market is the strongest performer in the section of local treats among other K-food stores. Also as an action to highly value the contribution of Finnish producer, specific events such as "Thank the Producer" or the local food dates has been organised to highlight the local production and also raise consumer's awareness about local agriculture welfare. (Kesko, 2016f)

In the category of well-being, healthy food selection is actively promoted. The group announced to optimise the healthy food selection as well as products promoting healthy lifestyle along the chain. According to the annual report of Kesko in 2016, several activities such as annual Fruit & Veg campaign, as well as expansion of vegetables and plant-based product shelves has been launched. These actions are to fulfill the growing demand for fruit and vegetarianism. Furthermore, according to Kesko, the group would imply the product reformulation policy monitoring the adequate amount of salt, sugar or fat intake.

Besides the strategic policies in sourcing, Kesko also performs their strength in the section of in-store management. One of the first and foremost innovations under this sector is the refurbishment of the retailer's concept. The cooperative is building the concept of quality image over the supply chain, focuses on the freshness and Finnish origin. It was also the first strategic focus area of them in 2015 and now being developing smoothly. (Kesko, 2016) In November 2015, the store of K Myllypuro, a tested food store, has been launched into operation. The store is not under Kesko management, penetrating mainly on local demand: fresh and Finnish origin products. The store offers are based on the wishes and the needs of the local, whose feedbacks have been collected before. This is an example of Kesko to implement their strategic store concept into the market. (Kesko, 2015) According to Bryan Robert in Kantar Retail, the store does not really successfully feature its ultimate concept and changes are obviously would be made for better improvement but this is a meaningful attempt of Kesko to tailor the local demand and strengthen their public image on the dimension of quality side. In the promotional material, the main price reduction and membership discount is the main approach. In January 2016, the group has announced the price reduction in large scale, applied to 2,000 products. (Kesko 2016g)

In the categories of assortment, K-food concentrated on the price-fighter and "value for money" product. Two private labels from the group are Pirkka and *K-menu*. Pirkka won the popularity among consumer due to its affordability and adequate quality. The brand includes 2,500 products in which 100 of them are organic and 40 are labeling Fairtrade. Local production is preferred for Pirkka. On the other hand, *K-menu* is a new budgeted line, first launched in 2014. The brand emphasizes on quality everyday items with lower price and new package designs. (Kesko, 2016h) The product range of K-menu is quite limited, covering fresh and processed meat, pasta, juices, and frozen and canned food.

Table 5: Summary of Kesko's changes towards consumer dietary behavior

Dimension	Changes toward dietary behaviour
Sourcing	Sustainable
	Well-being
	Local
In-store	Renew the store concept
	Promotion/ Price reduction
	Freshness focus
Assortment	Private brand

LIDL Suomi

The last retailer to investigate is LIDL Suomi, the large German discounter. With fifteen years in the market and a market share of 9% in 2015, LIDL appears as a stiff competitor for the local retailer. The retailer focuses mainly on pricing as their competitive advantage. Furthermore, changes or transformation toward Finnish consumers is not the main penetration. (YLE, 2012)

In sourcing, LIDL optimise their profit by importing low cost product from Germany. The retailer has improved the entrance of German food to the market. However, their strategy has been re-addressed into the Finnish producers. (Niemi and Ahlstedt, 2015) In the product range, though not pushing toward the trend as vigorously as the other two, LIDL has already penetrated on the niche product ranges of organic, gluten free, domestic milk or free-range chicken eggs. The discounter also applies promotion and discounts frequently. (LIDL, 2017)

In general, three different retailers have different approaches transforming the food supply chain to fit the demands of the market. Toward the change in the eating patterns of Finnish, the reviews of transformation over three largest retailers are conducted.

Table 6: Overall performance of S Group, Kesko and LIDL toward changes

	S Group	Kesko	LIDL
Local sourcing	Proactive	Average	Low level
Sustainable sourcing	Proactive	Proactive	-
Well-being sourcing	Average	Proactive	Average
Healthy life-style promotion	Average	Proactive	Low level
Private brand	Proactive	Average	-
Packaging improvement	-	Low level	-
Promotion over healthy item	Proactive	Proactive	Low level
Communication to consumer	Proactive	Proactive	-

In general, S Group and Kesko are considered to be proactive toward the change of the market. S Group's strategy is bias on local production, constructing short supply chain. The group performs strongly in developing distribution channels for local producer. One highlight from the cooperative is the Kotimaista line. With the clear prove-

nance, affordable price and adequate quality, the line is a success from S Group to cope with the change. Kotimaista provide a large range of product from fresh to processed, be able to promote the value of Finnish product but at the same time satisfied demands of many groups of consumers. On the other hands, implementing different strategy, Kesko concentrates more on well-being sourcing and the promotion of healthy-life style via the refurbishment of store concept. K-food store is changing toward the criteria of health (fresher, less salt, less sugar and fat). The group is also performing well with the private brand of Pirkka on offering local food. On the other hands, the line *K-menu* has not really been highlighted. To be compared, Kotimaista from S Group is well defined, associated with the Finnish origin and the budget feature while the *K-menu* is rather vague. In the other word, Kesko aims to promote the concept of healthy eating, presenting the upgrade of the retailer chain in the sense of understanding and performing every day well-being However, both S Group and Kesko have developed a strong communication channel, collecting feedback and opinion of consumer to prepare for the change. Lastly, as a discounter, LIDL is not performing many obvious changes in their chain.

4.5 Evaluation

As the information about the transformation of food supply chain analysed in this chapter as well as the features of the dietary trend in chapter 3, the evaluation of the transformation could be conducted.

Table 7: Performance evaluation of food supply chain's transformation toward dietary trend

Dietary trend	Transformation of food supply chain	Performance
Well-being	Producers focus on organic, sustainable and safe product. Processors increase the manufacturing of naturally healthy packaged food and healthy alternative product. Retailer focus on sourcing and promotion well-being items.	High performance in promoting well-being
Informed consumption	Short supply chain Ecological supply chain Wastage reduction	High performance

Convenience	Retailers increase fresh product	Medium performance
Culinary adventure	Retailers start to diversify product range	Low performance
Tailor diets	Retailers expand vegetarian and other diets (e.g. lactose free) choices	Medium performance
Fine-tuned food	Retailers increase high quality local products	Low performance

In general, retailers show the high performance when coping with the change of the market. They are the key driver in adjusting the supply and also at the same time educating consumers. On the other hands, several changes have been observed in producer and processor but not obvious. The changes are driven by the demand of the market. These two parties are quite passive in re action to the changes while the retailers perform the reactiveness and innovation.

5 Conclusion

In the final chapter, summarisation is delivered as the reflection of outcomes for the thesis. In addition, based on the findings throughout research process, recommendations from the author are also concluded.

5.1 Findings

The research is carried by qualitative method, constructing by the secondary data, collected from published sources of books, journals, reports, etc. as well as online resources. The research requires extensive literature review of Finnish FSC features as well as the trend of dietary behaviour. In order to review the solving of research question, the four sub-questions are quickly summarised.

1. How is the food supply chain in Finland?

The principles of actors in food supply chain are represented in Chapter 2 with the highlight of Finnish retail food logistics. In general, the grocery retail trade sector of

Finland is rather concentrated and highly depends on the formation of chains and centralisation of procurement and distribution centres. As in most of the other European countries, Finnish retail market is mostly duopoly leading to the empowerment of supplier. The performance of retailer partly portrays the features of the FSC which is concentrated and reserved.

2. What is dietary pattern in Finland? How is the dietary behaviour changing?

Mostly high fibre cereal, milk, vegetable and fruit make up the Finnish dietary pattern. Fish, eggs and poultry meat are also favoured among Finns. There has been a decrease in meat consumption. However, the consumption of sweet product is relatively high in the country.

As analysed in Chapter 3, the food intake of Finnish is transforming toward several dimensions. The trends could be listed as:

- Well-being: concerns about nutrient intake, healthy products are preferred.
- Informed consumption: concerns about efficiency, sustainability and ethical products.
- Convenience: preference in convenient product such as ready-to-go or semi-finished.
- Culinary adventure: interest in international cuisine.
- Tailored-diet: sub-trend of well-being, usually vegetarianism, allergy prevention or particular diets.
- Fine-tuned food: preference in professional cooking.

Among six dimensions listed above, well-being and informed consumption are the most common trend in the country and also the most influencing factors affect the FSC.

3. What is the relationship between the food supply chain and the dietary behaviours? Or in another word, how the dietary behaviour changes reshape the food supply chain?

In general, the changes in food supply chain to cope with the transition in dietary behaviour are relatively separated, weak and inactive. Finnish food supply chain does not perform proactively in reshaping for better outcomes fulfilling demand of the consumers. Specific changes would be investigated to prove the thesis statement. Firstly, the shortened of the food supply chain is the respond for the rise in local food consump-

tion. This transformation is largely promoted by retailer and processor. However, due to the large amount of small and medium food enterprise in rural area, the shortening of food supply chain might be the opportunity but also the obstacle for these players due to the weakness in distribution network. Secondly, as the growth of organic food consumption, ecological food supply chain is developed. Although organic production as well as consumption is reported to increase, the productivity is underperformed due to the waste of organic raw material into conventional manufacturing. The reason lies behind the lack of marketing channel of the producer. Retailer has supported to improve the situation, support promoting organic products. However, this stagnancy in organic production is a waste of the supply chain. The last transformation to review is the transition of the supply chain in wastage reduction. The issue of reducing waste in household, retailing as well as manufacturing level is successfully implemented in the FSC. Via the behaviour of modifying the packaging, controlling and forecasting demands and supply, Finnish FSC performs the efficiency in both retailing and manufacturing. In short, the change of the supply chain is mostly focused on the trend of informed consumption. The concept of well-being is also reflected but not too strong. The food supply chain in a whole does not perform its peak in coping with change due to the inconsistency of parties in transition. The change would only be promoted in one single party hence the final total efficiency is not qualified.

4. How are the parties within the food supply chain performing?

Given the board respond of individual parties, producer; processor and retailer, over the change of the market, the performance of individual is analysed and reviewed in Chapter 4. In general, as the main communicator to consumer, retailer is prevailing to be proactive to cope with the change. The two main players in the Finnish retailing industry, S Group and Kesko, present their effective sourcing policy, promotion, assortment and customer communication. On the other hand, they also impact reversely to the consumer, educating customer about healthy lifestyle by their event and campaign. In order not to be left behind the movement, the switching into local, high quality and sustainable production is also taken placed within the large food manufacturer. However, the local small and medium one, usually located in rural area, are not strong enough for the transformation. Besides the retailer and processor, producers are the key element providing the input raw ingredients. However, the transition of this group is still slow and still in the beginning phase.

Up to this point, the four sub-questions are answered. The objective of the research “How the changes in dietary behaviours transforming Finnish food supply chain?” is also clarified. The changes in dietary behaviour, especially the awareness on health and informed consumption, are changing the Finnish food supply chain toward the direction of locally, ecologically and wastage reducing. Being proactive and adaptive to the change, Finnish retailers are moving forward in the movement. Manufacturers and producers are also observed to change. However, the changes from these two parties are rather slow and not so effective.

5.2 Recommendation

An improvement of promoting activities in small and medium producer and manufacturer

Being the real people behind every product, these two parties rarely have chance to integrate their image over a healthy or ethical product. Unlike the large manufacturer and retailer, who are stronger in marketing and promotion, it is the blur of the rural local manufacturers or producers, who are also the heroes. According to the thesis writer, event or campaigns should be launched to promote the activities of the producer or manufacturer. In this way, not only consumers are aware of production and other activities of these parties but also help integrating these small and medium food enterprise into the transition of the supply chain, raise the productivity and also encourage them to proactively behave in the market.

Logistics solutions for rural food small and medium enterprises

Another obstacle preventing the small and medium food enterprise from extracting larger market share is the weakness in logistics system and distribution channel. The local products from these manufacturers are usually unattractive, simple packaged, small number available on shelf and also much more expensive than the usual conventional product. This hardship in logistics solution might leave them behind in the competition. As recommendation to these actors, improvement on logistics system is a must. The entry to market is feasible since the local sourcing policy from several retailers. The cooperation in distribution channel is also noted. However, packaging and promoting is an important criterion. For better financial performance, cooperation be-

tween enterprises is recommended; focusing on logistics solutions for the best performance is encouraged.

References

- Ala-Harja, H. (2014). *Logistic decisions' effects to the food supply chains' sustainable performance*. Available: http://www.uva.fi/materiaali/pdf/isbn_978-952-476-573-2.pdf. Last accessed 20th March 2017.
- Alltech. (2017). *Our Food Supply Chain is Changing Radically as We Innovate to Feed 9 Billion!*. Available: <http://ag.alltech.com/en/blog/our-food-supply-chain-changing-radically-we-innovate-feed-9-billion>. Last accessed 20th March 2017.
- Atria Plc. (2017). *No unnecessary antibiotics – or none at all!*. Available: <https://www.atria.fi/en/group/corporate-responsibility/safe-products/safe-atria-quality/no-unnecessary-antibiotics/>. Last accessed 20th March 2017.
- Australia National Health and Research Council (2006) *Nutrient Reference Values for Australia and New Zealand Including Recommended Dietary Intakes Dietary Energy*, Commonwealth of Australia: National Health and Medical Research Council.
- Central Intelligence Agency. (2017). *THE WORLD FACTBOOK*. Available: <https://www.cia.gov/library/publications/the-world-factbook/geos/fi.html>. Last accessed 20th Mar 2017
- Council of Supply Chain Management Professionals. (2013). *CSCMP Supply Chain Management Definitions and Glossary*. Available: http://cscmp.org/imis0/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms.aspx?hkey=60879588-f65f-4ab5-8c4b-6878815ef921. Last accessed 17th Mar 2017
- D'Amico, V (1957). *Marketing Research*. 3rd ed. New Dehli: Tata McGraw-Hill Education. p54.
- Dairy Council of California. (2017). *Types of Milk*. Available: <http://www.healthyeating.org/Milk-Dairy/Dairy-Facts/Types-of-Milk.aspx>. Last accessed 8th Apr 2017

Dani, S (2015). *Food Supply Chain Management and Logistics*. London: Kogan Page. p2-10.

Diabetes UK. (2011). *LIST OF COUNTRIES BY INCIDENCE OF TYPE 1 DIABETES AGES 0 TO 14*. Available:

https://www.diabetes.org.uk/About_us/News_Landing_Page/UK-has-worlds-5th-highest-rate-of-Type-1-diabetes-in-children/List-of-countries-by-incidence-of-Type-1-diabetes-ages-0-to-14/. Last accessed 18th Apr 2017

Environmental Administration. (2013). *Ecolabels*. Available: http://www.ymparisto.fi/en-US/Consumption_and_production/Ecodesign_of_product_and_services/Ecolabels. Last accessed 20th Apr 2017

Ernst & Young Global Limited. (2015). *Nordic Food Survey 2015 Consumer trend*. Available:

[http://www.ey.com/Publication/vwLUAssets/EY_food_Survey_2015/\\$FILE/EY-food-Survey-2015.pdf](http://www.ey.com/Publication/vwLUAssets/EY_food_Survey_2015/$FILE/EY-food-Survey-2015.pdf). Last accessed 20th March 2017.

Euromonitor International. (2016). *Dairy in Finland*. Available:

<http://www.euromonitor.com/dairy-in-finland/report>. Last accessed 8th Apr 2017

Euromonitor International. (2017). *Grocery Retailers in Finland*. Available:

<http://www.euromonitor.com/grocery-retailers-in-finland/report>. Last accessed 30th Mar 2017

European Commission. (2017). *Retail services*. Available:

http://ec.europa.eu/growth/single-market/services/retail_en. Last accessed 22nd Mar 2017

European Parliament Research Service. (2013). *Local Agriculture And Short Food Supply Chains*. Available: <https://epthinktank.eu/2013/10/14/local-agriculture-and-short-food-supply-chains/>. Last accessed 20th Apr 2017

eurostat. (2016). *Gross domestic product at market prices*. Available:

<http://ec.europa.eu/eurostat/tgm/refreshTableAction.do?tab=table&plugin=1&pcode=tc00001&language=en>. Last accessed 21th Mar 2017

Evans, J (2014). *The Psychology of Deductive Reasoning (Psychology Revivals)*. 2nd ed. New York: Routledge & Kegan Paul Ltd. p11.

Export Finland. (2016). *FOOD FROM FINLAND*. Available:

http://www.etl.fi/media/aineistot/liiton-toimintaan-liittyvat-dokumentit-saannot-jne./food-from-finland_etl_sivut.pdf. Last accessed 14th Mar 2017

Food and Agriculture Organisation (2013) *Eating well for good health Lesson on nutrition and healthy diet*, Rome: Food and Agriculture Organisation of United Nations

Food and Agriculture Organisation. (2017). *Family Farming Knowledge Platform - Finland*. Available: <http://www.fao.org/family-farming/countries/fin/en/>. Last accessed 23th Apr 2017

Food and Agriculture Organisation. (2017). *Proteins*. Available:

<http://www.fao.org/nutrition/requirements/proteins/en/>. Last accessed 31th Mar 2017

Food and Agriculture Organisation. (2017). *Dietary Fats*. Available:

<http://www.fao.org/nutrition/requirements/dietary-fats/en/>. Last accessed 31th Mar 2017

Finnish Grocery Trade Association. (2016). *Finnish grocery trade 2016*. Available:

http://www.pty.fi/fileadmin/user_upload/tiedostot/Julkaisut/Vuosijulkaisut/EN_2016_vuosijulkaisu.pdf. Last accessed 20th March 2017.

Finnish Organic Food Association Pro Luomu. (2017). *Organics in Finland*. Available:

<http://proluomu.fi/english/2016>. Last accessed 25th Apr 2017

Finnish Organic Food Association Pro Luomu. (2017). *Organic sales continue to boom in Finland – increase by 14% in 2016*. Available: <http://proluomu.fi/organic-sales-continue-to-boom-in-finland-in-2016/#lightbox/1/2017>. Last accessed 25th Apr 2017

GfK. (2016). *EUROPEAN RETAIL IN 2016*. Available:

https://www.gfk.com/fileadmin/user_upload/dyna_content/CH/documents/News_2016/Geomarketing/GfK_2016_EuropeanRetailStudy.pdf. Last accessed 29th Mar 2017

Grant, D (2012). *Logistics Management*. London: Pearson. p5.

Gustafsson, K., Jönson, G., Sparks, L. (2009). *Retailing Logistics & Fresh Food Packaging: Managing Change in the Supply Chain*. London: Kogan Page. P19.

Hafner, G., Barabosz, J., Schneider, F., Lebersorger, S., Scherhauser, S., Schuller, H., Leverenz, D.. (2012). *Determination of discarded food and proposals for a minimization of food wastage in Germany*. Available:

http://www.bmel.de/SharedDocs/Downloads/EN/Food/Studie_Lebensmittelabfaelle_Kurzfassung.pdf?__blob=publicationFile. Last accessed 20th March 2017.

Harvard T.H. Chan. (2017). *Protein*. Available:

<https://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/protein/>. Last accessed 30th Mar 2017

Helsinki Times. (2015). *Prisma overtakes Lidl as cheapest grocery shop in capital region, price comparison shows*. Available: <http://www.helsinkitimes.fi/finland/finland-news/domestic/13392-prisma-overtakes-lidl-as-cheapest-grocery-shop-in-capital-region-price-comparison-shows.html>. Last accessed 30th Mar 2017

Helsinki Times. (2017). *S Group cuts price of over one hundred home-grown vegetables*. Available: <http://www.helsinkitimes.fi/finland/finland-news/domestic/14466-s-group-cuts-prices-of-over-one-hundred-home-grown-vegetables.html> . Last accessed 20th March 2017.

International Diabetes Federation. (2017). *IDF DIABETES ATLAS*. Available: <http://www.idf.org/sites/default/files/Atlas7e-poster.pdf>. Last accessed 18th Apr 2017

Joint FAO/WHO/UNU Expert Consultation (2001) *Human energy requirements*, Rome: United Nation University World Health Organisation Food and Agriculture Organisation of the United Nation.

Joint WHO/FAO Expert Consultation. (2003). *Diet, nutrition and the prevention of chronic diseases*. Available:

http://apps.who.int/iris/bitstream/10665/42665/1/WHO_TRS_916.pdf. Last accessed 20th March 2017.

K Citymarket. (2017). *Ruokatarjoukset*. Available: <http://www.k-citymarket.fi/tarjoukset/ruoka/>. Last accessed 20th March 2017.

Katajajuuri, J., Silvennoinen, K., Hartikainen, H., Heikkilä, L., Reinikainen, A. . (2014). Food waste in the Finnish food chain. *Journal of Cleaner Production*. 73 (1), p322-329.

Kesko. (2014). *GOOD SELECTION OF ORGANIC PRODUCTS IN K-FOOD STORES*. Available: <http://www.kesko.fi/en/media/news-and-releases/news/arkisto/Good-selection-of-organic-products-in-K-food-stores/>. Last accessed 20th Apr 2017

Kesko. (2015). *K-GROUP TESTS NEW KIND OF FOOD STORE*. Available: <http://www.kesko.fi/en/media/news-and-releases/press-releases/2015/k-group-tests-new-kind-of-food-store/>. Last accessed 20th March 2017.

Kesko. (2016). *Kesko Annual Report*. Available: http://kesko-ar-2016.studio.crasman.fi/file/dl/i/3VehAg/Jh2WWCyJNfMbHZ3tyJo5vQ/Kesko_Annual_Report_2016.pdf . Last accessed 20th March 2017.

Kesko. (2016). *K-FOOD STORES REDUCE WASTAGE IN MANY WAYS*. Available: <http://www.kesko.fi/en/media/news-and-releases/news/2016/k-ruokakaupat-vahentavat-monin-tavoin-ruokahavikkia/>. Last accessed 22nd Apr 2017

Kesko. (2016a). *KESKO HAS COMPLETED THE ACQUISITION OF SUOMEN LÄHIKAUPPA – SIWA AND VALINTATALO STORES TO BE CONVERTED INTO K-MARKETS*. Available: <http://www.kesko.fi/en/media/news-and-releases/news/2016/kesko-has-completed-the-acquisition-of-suomen-lahikauppa--siwa-and-valintatalo-stores-to-be-converted-into-k-markets/>. Last accessed 30th Mar 2017

Kesko. (2016b). *K-FOOD STORES WILL REDUCE THE PRICES OF 2,000 PRODUCTS IN JANUARY AND FEBRUARY*. Available: <http://www.kesko.fi/en/media/news-and-releases/press-releases/2016/k-food-stores-will-reduce-the-prices-of-2000-products-in-january-and-february/>. Last accessed 30th Mar 2017

Kesko. (2016c). *FOOD TRENDS 2017*. Available: https://www.kesko.fi/contentassets/e77df2b1aacb4b3893c7838041efa69f/kesko_trendit_eng_lowres.pdf. Last accessed 17th Apr 2017

Kesko. (2016e). *Grocery Trade*. Available: <http://annualreport2016.kesko.fi/strategy-report/divisions/grocery-trade/#start>. Last accessed 20th March 2017.

Kesko. (2016f). *K-FOOD STORES WILL REDUCE THE PRICES OF 2,000 PRODUCTS IN JANUARY AND FEBRUARY*. Available: <http://www.kesko.fi/en/media/news-and-releases/press-releases/2016/k-food-stores-will-reduce-the-prices-of-2000-products-in-january-and-february/>. Last accessed 20th March 2017.

Kesko. (2016g). *RESPONSIBLE PURCHASING AND SUSTAINABLE SELECTIONS*. Available: <http://annualreport2016.kesko.fi/gri-report/responsibility-programme/responsible-purchasing-and-sustainable-selections/>. Last accessed 20th March 2017.

Kesko. (2016h). *OWN BRANDS PIRKKA AND K-MENU*. Available: <http://www.kesko.fi/en/customer/own-brands/pirkka-and-k-menu/>. Last accessed 20th March 2017.

Kesko. (2017). *GROCERY TRADE*. Available: <http://www.kesko.fi/en/company/divisions/grocery-trade/>. Last accessed 30th Mar 2017

LIDL SUOMI. (2017). *Laadukkaasti halpa*. Available: <https://www.lidl.fi/valikoima.htm>. Last accessed 20th March 2017.

Martin, D., Joomis, K (2007). *Building Teachers: A Constructivist Approach to Introducing Education*. Belmont : Wadsworth. p72-75.

Ministry of Agriculture and Forestry. (2013). *Government development programme for the organic product sector and objectives to 2020*. Available: http://mmm.fi/documents/1410837/1890227/Luomualan_kehittamisohjelmaEN.pdf/1badafec-bc12-4952-a58a-37753f8c24ad. Last accessed 20th March 2017.

Murphy, P., Wood, D. (2013). *Contemporary Logistics*. London: Pearson. p6.

Must, M. (2014). *Nordic eating habits top favoured Mediterranean diet*. Available: <http://www.helsinkitimes.fi/themes/themes/science-and-technology/13013-nordic-eating-habits-top-favoured-mediterranean-diet.html>. Last accessed 2nd Apr 2017

Natural Resources Institute Finland. (2017a). *Crop Production Statistics and the quality of the grain harvest 2016*. Available: <http://stat.luke.fi/en/tilasto/175>. Last accessed 11th Apr 2017

Natural Resources Institute Finland. (2017b). *Structure of agricultural and horticultural enterprises 2016*. Available: <http://stat.luke.fi/en/structure-of-agricultural-and-horticultural-enterprises>. Last accessed 23rd Apr 2017

Natural Resources Institute Finland. (2016a). *Balance Sheet for Food Commodities 2015, preliminary and 2014 final figures*. Available: <http://stat.luke.fi/en/balance%20sheet%20for%20food%20commodities>. Last accessed 6th Apr 2017

Natural Resources Institute Finland. (2016b). *Finns had an appetite for meat and fruit in 2015; milk consumption decreased*. Available: <https://www.luke.fi/en/news/finns-had-an-appetite-for-meat-and-fruit-in-2015-milk-consumption-decreased/>. Last accessed 12th Apr 2017

Natural Resources Institute Finland. (2016c). *Oats, broad bean and oilseed rape – Finnish fields produce increasing types of plant energy*. Available: <https://www.luke.fi/en/news/oats-broad-bean-and-oilseed-rape-finnish-fields-produce-increasing-types-of-plant-energy/>. Last accessed 25th Apr 2017

National Health Service. (2015). *High cholesterol*. Available: <http://www.nhs.uk/conditions/cholesterol/Pages/Introduction.aspx>. Last accessed 2nd Apr 2017

Nielsen. (2017). *FINNISH GROCERY TRADE AT ITS STRONGEST SINCE THE BURST OF THE ECONOMIC CRISIS*. Available: <http://www.nielsen.com/content/dam/niensglobal/fi/docs/Nielsen%20Press%20Release%2023%20March%202017.pdf>. Last accessed 25th Apr 2017

Niemi, J., Ahlstedt. (2015). *Finnish Agriculture and Rural Industries 2015*. Available: https://jukuri.luke.fi/bitstream/handle/10024/519301/luke-luobio26_2015.pdf?sequence=3&isAllowed=y. Last accessed 20th March 2017.

Nordic co-operation (2012) *Nordic Nutrition Recommendations 2012 Integrating nutrition and physical activity*, Denmark: The Nordic Council of Ministers. p21, p105-108

Nordic co-operation (2016) *Food waste and date labelling Issues affecting the durability*, Denmark: The Nordic Council of Ministers. p46-47.

Nordic Council of Ministers (2012) *Nordic Dietary Survey Study designs, methods, results and use in food-based risk assessments*, Denmark: The Nordic Council of Ministers. p19

Nuutila, J., Siiskonen, P., Kahiluoto, H., Mikkola, M., Schäfer, W., Tikkanen-Kaukanen, C. . (2014). *Research Programme for Organic Food and Farming in Finland*. Available: http://luomuinstituutti.fi/wp-content/uploads/sites/2/2014/03/Research_Programme_for_Organic_Food_and_Farming_2014-2018_ENG.pdf. Last accessed 20th March 2017.

OECD. (2016). Finland. *OECD Economic Outlook*. 2016 (2), p150-152.

OECD. (2017). *Real GDP forecast*. Available: <https://data.oecd.org/gdp/real-gdp-forecast.htm>. Last accessed 25th Apr 2017

Opium. (2015). *Obesity - Finland Report*. Available: <http://gucdv1wwi8pslzdfpv7t0dk6.wpengine.netdna-cdn.com/wp-content/uploads/2015/05/FI-summary-EN.pdf>. Last accessed 18th Apr 2017

Palacios, A. I.. (2011). *What Are Simple Sugars?*. Available: <http://www.livestrong.com/article/379749-what-are-simple-sugars/>. Last accessed 30th Mar 2017

Paloviita, A. (2010). Consumers' Sustainability Perceptions of the Supply Chain of Locally Produced Food. *Sustainability* 2010. 2 (6), p1.

Planetretail. (2014). *European Grocery Retailing - Change is the only constant*. Available: <https://www.planetretail.net/presentations/ApexBrasilPresentation.pdf>. Last accessed 29th Mar 2017

Prentice, A. (2005). Macronutrients as sources of food energy. *Public Health Nutrition*. 8 (7A), p933.

Prisma. (2017). *Tuotteet*. Available: <https://www.foodie.fi/products/search/kotimaista> April 26th. Last accessed 20th March 2017.

Reardon, T., Tschirley, D., Dolislager, M., Snyder, J., Hu, C., White, S. (2014). *Urbanization, Diet Change, and Transformation of Food Supply Chains in Asia*. Available: http://www.fao.org/fileadmin/templates/ags/docs/MUFN/DOCUMENTS/MUS_Reardon_2014.pdf. Last accessed 20th March 2017.

Setälä, Jari. (2016). *Fish Market Review 2015*. Available: <http://jukuri.luke.fi/bitstream/handle/10024/537843/Fish%20Market.pdf?sequence=1&isAllowed=y>. Last accessed 25th Apr 2017

Shepherd, R. (1999). Social determinants of food choice. *Proceedings of Nutrition Society*. 58(1), p807-812

Silvennoinen, K., Katajajuuri, J., Hartikainen, H., Heikkilä, L., & Reinikainen, A. (2014). Food waste volume and composition in Finnish households. *British Food Journal*, 116(6), p1058-1068.

Smith, M. (2012). *Retail Food Sector Report for Sweden and Finland*. Available: https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Retail%20Foods_Sweden_Sweden_9-6-2012.pdf. Last accessed 20th March 2017.

SOK Cooperation. (2017). *S Group's 100 responsibility acts*. Available: <https://www.s-kanava.fi/web/s-ryhma/en/100-tekoa>. Last accessed 25th Apr 2017

SOK Cooperation. (2017). *S Group*. Available: vuosikatsaus.s-ryhma.fi. Last accessed 30th Mar 2017

SOK Cooperation. (2017). *Responsible products and services*. Available: vuosikatsaus.s-ryhma.fi. Last accessed 25th Apr 2017

Solakivi et al. (2015). *FINLAND STATE OF LOGISTICS 2014*. Available: <https://www.doria.fi/bitstream/handle/10024/117920/Finland%20State%20of%20Logistics%202014.pdf?sequence=2>. Last accessed 20th Mar 2017

Statistics Finland. (2017). *National Accounts*. Available: http://www.stat.fi/tup/suoluk/suoluk_kansantalous_en.html. Last accessed 25th Apr 2017

Statistics Finland. (2017). *Agriculture, Forestry and Fishery*. Available: http://www.stat.fi/tup/suoluk/suoluk_maatalous_en.html. Last accessed 25th Apr 2017

Sydänmerkki. (2017). *Heart Symbol a better choice*. Available: <http://www.sydanmerkki.fi/en>. Last accessed 20th March 2017.

Syroegina, A. (2016). *Retailer's role in reducing food waste Case study of Finnish retailers*. Available: https://aaltodoc.aalto.fi/bitstream/handle/123456789/21500/hse_thesis_14678.pdf?sequence=1&isAllowed=y. Last accessed 20th March 2017.

TeKes. (2017). *Packaging Valley: Finnish expertise in packaging can reduce food wastage*. Available: <https://www.tekes.fi/en/tekes/results-and-impact/cases1/case-examples-2017/packaging-valley-finnish-expertise-in-packaging-can-reduce-food-wastage/>. Last accessed 25th Apr 2017

The Finnish Innovation Fund. (2017). *ORGANIC AND LOCAL FOOD*. Available: <https://www.sitra.fi/en/topics/organic-and-local-food/#what-is-it-about>. Last accessed 20th Apr 2017

The High Level Panel of Expert . (2014). *Food losses and waste in the context of sustainable food systems*. Available: <http://www.iufost.org/iufostftp/FLW-%20FAO.pdf>. Last accessed 20th March 2017.

The Ministry of Agriculture and Forestry. (2015). *Local Food – But of Course!*. Available: http://mmm.fi/documents/1410837/1890227/LocalFood_ButOfCourse.pdf/ef43072b-6700-47ad-af7e-5972e7fe046f. Last accessed 20th Apr 2017

The Nielsen Company. (2015). *Health and Wellness Report*. Available: <https://www.nielsen.com/content/dam/niensenglobal/eu/nielseninsights/pdfs/Nielsen%20Global%20Health%20and%20Wellness%20Report%20-%20January%202015.pdf>. Last accessed 20th March 2017.

United Nations . (2013). *World Population Prospects The 2012 Revision* . Available: https://esa.un.org/unpd/wpp/publications/Files/WPP2012_HIGHLIGHTS.pdf. Last accessed 20th March 2017.

Valio. (2017). *Health, taste and world-class innovations*. Available: <https://www.valio.com/responsibility/2015/products/health-taste-and-world-class-innovations/>. Last accessed 20th March 2017.

Vorst, J.G.A.J. van der., Silva, C.A. Da., Trienekens, J.H.. (2007). *Agro-industrial supply chain management: concepts and applications*. Available: <http://www.fao.org/3/a-a1369e.pdf>. Last accessed 20th March 2017.

World Bank. (2017). *GNIPC*. Available: <http://databank.worldbank.org/data/download/GNIPC.pdf>. Last accessed 20th Mar 2017

World Bank. (2017). *Global Rankings 2016*. Available: <http://lpi.worldbank.org/international/global?sort=asc&order=LPI%20Rank#datatable>. Last accessed 20th Mar 2017

World Bank. (2017). *Population, total*. Available: <http://data.worldbank.org/indicator/SP.POP.TOTL>. Last accessed 21th Mar 2017

World Bank. (2017). *Population density (people per sq. km of land area)*. Available: <http://data.worldbank.org/indicator/EN.POP.DNST>. Last accessed 25th Mar 2017

Schwemmer, M. (2017). *Top 100 EU 2015 Executive Summary*. Available: <https://www.scs.fraunhofer.de/content/dam/scs/de/dokumente/studien/Top%20100%20EU%202015%20Executive%20Summary.pdf>. Last accessed 23rd Mar 2017

Williams, H., Wikström, F., Otterbring, T., Löfgren, M., Gustafsson, A. . (2012). Reasons for household food waste with special attention to packaging. *Journal of Cleaner Production*. 24 (1), p9.

World Health Organisation. (2015). *Healthy diet*. Available: <http://www.who.int/mediacentre/factsheets/fs394/en/>. Last accessed 31st Mar 2017

World Health Organisation. (2015). *Nutrition*. Available: <http://www.who.int/topics/nutrition/en/>. Last accessed 31st Mar 2017

YLE. (2012). *Budget chain Lidl challenges Finnish retail food giants*. Available: http://yle.fi/uutiset/osasto/news/budget_chain_lidl_challenges_finnish_retail_food_giants/6274936. Last accessed 20th March 2017.

YLE. (2015). *THL: 15 percent of Finnish teenagers obese*. Available: http://yle.fi/uutiset/osasto/news/thl_15_percent_of_finnish_teenagers_obese/8367421. Last accessed 18th Apr 2017

BSCI'S operating principles and the result of S Group BSCI audits by area in 2015

BSCI'S OPERATING PRINCIPLES

 The rights to freedom of association and collective bargaining	 No child labour
 No discrimination	 Protection of young workers
 Fair remuneration	 No precarious employment
 Occupational health and safety	 No bonded labour
 Decent working hours	 Protection of the environment
	 Ethical business behaviour

