Localization of a Distribution Center for Locally Produced Fruit and Vegetables
A case study of Svenska Odlarlaget and Samodlarna

Author: Arta Selimi, Therese Svensson
Supervisor: Petra Andersson
Examiner: Helena Forslund
External Supervisor: Stefan Levin
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Arta Selimi & Therese Svensson

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Summary

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Authors: Arta Selimi and Therese Svensson
Tutor: Petra Andersson
Examiner: Helena Forslund

Title: Localization of a Distribution Center for Locally Produced Fruit and Vegetables
- A case study of Svenska Odlarlaget and Samodlarna

Background: There is an increasing trend to purchase locally produced fruit and vegetables in Sweden. This is something consumer are willing to pay more for. The case companies Svenska Odlarlaget and Samodlarna wants to sell more locally produced produce to their largest customers Coop and ICA and have therefore decided to add a new distribution center.

Purpose: To recommend a location for a new distribution center for Svenska Odlarlaget and Samodlarna, in order for more producers to meet Coop’s and ICA’s requirements for locally produced fruits and vegetables.

Methodology: The empirical data used to draw conclusions was collected through a mixed research method (both qualitative and quantitative) was carried out through interviews. This thesis is written from a positivistic perspective with a deductive approach. The scientific credibility of this thesis was secured by for example using many sources both for theory and empirical data collection and following standardized steps of the Center of Gravity method.

Conclusions: The concept of locally produced was described together with Coop’s and ICA’s requirements to sell fruits and vegetables as locally produced. From the requirements it was shown that 73 out of 92 SOL and Samodlarna producers met the requirements with the present distribution structure. Finally a decision on where to locate the new distribution center was made with the use of the Center of Gravity method. The location for the new distribution center is in Norrköping and with this distribution center 89 out 92 SOL and Samodlarna producers met the requirements from Coop and ICA on locally produced.
Table of Content

List of Figures .................................................................................................................6
List of Tables .................................................................................................................6
List of Appendices ..........................................................................................................6

1.0 Introduction ..............................................................................................................7
  1.1 Background ........................................................................................................ 7
  1.2 Case Presentation .............................................................................................. 8
  1.3 Problem Discussion ..........................................................................................11
    1.3.1 Locally Produced ......................................................................................12
    1.3.2 Present Distribution Structure ...............................................................12
    1.3.3 Localization of new Distribution Center ................................................13
  1.4 Purpose ................................................................................................................14
  1.5 Research Questions ...........................................................................................14
  1.6 Thesis Disposition .............................................................................................15

2.0 Methodology ..........................................................................................................16
  2.1 Scientific Perspective .......................................................................................16
  2.2 Scientific Approach .........................................................................................17
  2.3 Case Study ..........................................................................................................18
  2.4 Research Methods ............................................................................................19
  2.5 Data Collection ..................................................................................................20
  2.6 Data Analysis .....................................................................................................22
  2.7 Scientific Credibility ........................................................................................23
    2.7.1 Validity ......................................................................................................23
    2.7.2 Reliability ..................................................................................................24
  2.8 Ethical Approach ................................................................................................24
  2.9 Summary of Research Methodology ...............................................................26

3.0 Locally Produced ....................................................................................................27
  3.1 Theory for Locally Produced ............................................................................27
    3.1.1 Definition of Locally Produced .................................................................27
    3.1.2 Consumer Purchasing Trend for Locally Produced Food .......................28
    3.1.3 Main reasons for customers to purchase locally produced food ..........29
  3.2 Empirical Data ...................................................................................................30
    3.2.1 Coop ..........................................................................................................30
    3.2.2 ICA ............................................................................................................32
  3.3 Analysis for Locally Produced ..........................................................................34

4.0 Present Distribution Structure ................................................................................39
  4.1 Theory for Distribution Structure ....................................................................39
    4.1.1 Distribution structure ..............................................................................39
    4.1.2 Distribution Utility Values ........................................................................40
    4.1.3 Intermediary roles ....................................................................................40
    4.1.4 The Role of Distribution Center ..............................................................41
    4.1.5 Distribution of Perishable Goods ..............................................................42
    4.1.6 Distribution in the Food Industry ..............................................................43
  4.2 Empirical Data for Present Distribution Structure .............................................43
    4.2.1 Company Presentation ......................................................................... 43
      4.2.1.1 Svenska Odlarlaget .........................................................................44
      4.2.1.2 Samodlarna .........................................................................................47
    4.2.2 Present Sales to Coop and ICA ................................................................49
  4.3 Analysis for Present Distribution Structure .......................................................51
4.3.1 Analysis of the Present Distribution Structure of SOL and Samodlarna..................51
4.3.2 Analysis of how SOL and Samodlarna meet Coop’s and ICA’s requirements for locally produce food. .............................................................................................53
  4.3.2.1 How SOL meets Coop’s requirements for locally produced........................................53
  4.3.2.2 How Samodlarna meets Coop’s requirements for locally produced.............................54
  4.3.2.3 How SOL and Samodlarna meets ICA’s requirements for locally produced.................54
  4.3.2.4 Summary of how many of SOL’s and Samodlarna’s producers that meets Coop’s and ICA’s requirements for locally produced. .............................................................................................55

5.0 Localization of New Distribution Center..................................................................56

5.1 Theory for Distribution Strategy Planning and Localization.....................................56
  5.1.1 Distribution Strategy Planning..................................................................................57
  5.1.2 Changes to the Distribution ....................................................................................57
  5.1.3 Distribution Planning Model.....................................................................................58
  5.1.4 Localization of Distribution Center..........................................................................59
  5.1.5 Logistic Option Analysis..........................................................................................60
  5.1.6 Distribution Center Location Modeling.......................................................................60
  5.1.7 Center of Gravity Location Method...........................................................................62

5.2 Empirical Data for Localization of new Distribution Center......................................63
  5.2.1 Data for the Center of Gravity Method.......................................................................64

5.3 Analysis for Localization of Distribution Center........................................................65
  5.3.1 Analysis of Localization of Distribution Center.........................................................66
  5.3.2 Analysis of Center of Gravity Method.......................................................................67
    5.3.2.1 Result from Center of Gravity Method.................................................................68
    5.3.2.1 Sensitivity Analysis for Center of Gravity Location..............................................70
  5.3.3 Analysis of how SOL and Samodlarna meet Coop’s and ICA’s requirements for locally produce food with the new distribution center..................................................73
    5.3.3.1 How SOL meets Coop’s requirements for locally produced with the new distribution center .......................................................................................................................73
    5.3.3.2 How Samodlarna meets Coop’s requirements for locally produced with the new distribution center .......................................................................................................................73
    5.3.3.3 How SOL and Samodlarna meets ICA’s requirements for locally produced with the new distribution center .......................................................................................................................74
  5.3.4 Analysis of SOL’s and Samodlarna’s new situation with the new distribution center ..76

6.0 Conclusion..................................................................................................................78

6.1 Answers to Research Questions..................................................................................78
  6.1. Answer to Research Question 1..................................................................................79
  6.2 Answer to Research Question 2...................................................................................80
  6.3 Answer to Research Question 3...................................................................................80
  6.4 Suggestions for Further Research...............................................................................81
  6.5 Reflections..................................................................................................................81

References.........................................................................................................................83
List of Figures

Figure 2. SOL’s Distribution Structure .................................................. 13
Figure 3. Samodlarna’s Distribution Structure ..................................... 13
Figure 4. Thesis Disposition ................................................................. 15
Figure 5. Qualitative Data Analysis ...................................................... 22
Figure 6. Summary of Research Methodology ..................................... 26
Figure 7. RQ 1 Structure ................................................................. 27
Figure 8. RQ 2 Structure ................................................................. 39
Figure 9. Typical Channel of Distribution ........................................... 42
Figure 10. Geographical Location of SOL’s Producers ........................... 45
Figure 11. SOL’s Business Process ..................................................... 45
Figure 12. Geographical Location of Samodlarna’s Producers ................ 47
Figure 13. Samodlarna’s Business Process ............................................ 48
Figure 14. Geographical Location of Coop’s and ICA’s Warehouses ........ 51
Figure 15. RQ 3 Structure ................................................................. 56
Figure 16. Distribution Strategy Planning .............................................. 58
Figure 17. Distribution Planning Process (Rushton et al., 2006 pg.147) .... 59
Figure 18. Location Determination Process ......................................... 62
Figure 19. Geographical Location of Djurö Kvarn and Norrköping .......... 70
Figure 20. Geographical Location of Sensitivity Analysis and First Location 72
Figure 21. Coop’s Warehouses and Regions ......................................... 74
Figure 22. ICA’s Warehouses and Regions ........................................... 76

List of Tables

Table 1. Empirical Data Collection ...................................................... 21
Table 2. Priority List for Top Three Reasons to Purchase Locally Produced ................................................................. 29
Table 3. Summary of Coop’s and ICA’s Objectives for Locally Produced ................................................................. 38
Table 4. Summary of Coop’s and ICA’s Requirements for Locally Produced ................................................................. 38
Table 5. Locations of Coop’s Warehouses ........................................... 50
Table 6. Location of ICA’s Warehouses ................................................. 50
Table 7. Producers that sell their Produce as Locally Produce with Present Distribution Structure ................................................................. 55
Table 8. Location and Volumes for Producers and Warehouses .............. 65
Table 9. Calculation for Center of Gravity Method .................................. 69
Table 10. Producers that sell their Produce as Locally Produced with New Distribution Structure ................................................................. 78
Table 11. Scenario 1 Calculation for Sensitivity Analysis .......................... 92
Table 12. Scenario 2 Calculation for Sensitivity Analysis .......................... 93

List of Appendices

Appendix 1 Scenario 1. Sensitivity Analysis ................................................. 91
Appendix 2 Scenario 2. Sensitivity Analysis ................................................. 92
1.0 Introduction

1.1 Background

The fruit and vegetable cultivation for most products in Sweden have over the last years been stable or increasing, both in quantity and value as well as the yield per hectare has increased. At the same time the sector is going through a structural change. Over the last years, with an increasing acceleration, the producing companies are becoming fewer and larger (Jordbruksverket, 2012c). In Sweden 58 percent of the fruit and vegetable is marketed by producer organizations (PO) (Jordbruksverket, 2012b). A PO is an organization of producers working together to increase their competitive ability (Rondot and Collion, 2001). For a PO to be recognized by the Swedish state, Jordbruksverket, it has to be an economic association with at least five members and their marketable production has to be at least 1 million kronor per year (Jordbruksverket, 2013). The EU goal for the fruit and vegetable industry is that 60 percent of the production is marketed by POs. In Sweden about 58 percent is marketed through eight POs and they account for 60 percent of the total production value for fruit and vegetable (Jordbruksverket, 2012b).

Even though the production and yield for the fruit and vegetable cultivation has increased over the last years the prices for vegetables cultivated in Sweden are higher than for most imported fruits and vegetables. Most of the imported fruits and vegetable prices are between 40-60 percent of the Swedish price. It is possible for the Swedish producers to have these higher prices due to a number of different factors. The main reason is that Swedish consumers are willing to pay a higher price for Swedish produce; they want to feel secure in knowing the origin of the produce. As an example the Swedish food retailers are willing to pay 2-3 Swedish kronor (SEK) more for tomatoes and cucumbers produced in Sweden (Jordbruksverket, 2012b). One trend in consumer behavior is to buy locally produced fruits and vegetable. This can for the consumer result in a higher price, however; the value of knowing the origin of the produce and that it is produced with the environment in mind offsets the higher price (Mr. Olofsson, Managing Director at SOL, 2013; Jordbruksverket, 2012b). There is today no formal definition of what locally produced is. Livsmedelssverige describes it as food where
production, processing, and distribution to the consumer are performed within a defined area. There is no clear definition about the area size. According to a survey done by YouGov in 2010, 77 percent of the Swedish population believes that locally produced means that it is produced within 200km of the selling point (Ekstrand and Grahn, 2010).

The fresh fruit and vegetable industry is presented by several unique characteristics. It is a labor-intensive industry and the most common organization form is family enterprises. The activities and actors involved in the organization of supply are different due to the large numbers of producers. The perishability of fresh produce in this industry puts a lot of challenges on the logistics and quality management. At the same time the freshness and quality of the produce is dependent on weather conditions, seasonality, grower’s competence, and the availability of cool-chain facilities (Zuurbier, 1999). Thron et al., (2007) state that the sales of perishable goods are important for grocery retailers, and it is a strong factor for competitive advantages. The freshness of the perishables goods is a factor for many customers for the decision on where to purchase. Therefore to have an effective distribution structure with short lead times are essential for perishable products. Since these products have a limited lifetime span, limited inventory possibility, high demand uncertainty, and supply uncertainty a well developed distribution process is crucial to ensure the freshness of the product (Heller, 2002).

The distribution structure is adapted to the time and place constraints of the products, and does not only focus on being the most cost effective (Thron et al., 2007). Most transportation of fruits and vegetables in Europe today is done by trucks (Jordbruksverket, 2012b), and it is common to have several different distribution centers in different locations to be able to keep the products as fresh as possible (Meidem, 1995). The structure of distribution is important for a company, not only for its competitiveness and profitability, but also in order to keep the delivery times as short as possible, which is essential for perishable goods. To be able to have a functioning distribution, intermediaries such as retailer or distributors are used in order to bridge the gap between the producing company and its customers (Jonsson, 2008).

1.2 Case Presentation
The trend within the fruit and vegetable industry is that companies are becoming fewer and larger (Jordbruksverket, 2012c). The case companies in this study, Svenska
Odlarlaget (SOL) and Samodlarna are both POs with producers in southern Sweden within the fruit and vegetable industry. SOL is one of the larger PO in Sweden, in 2012 they had an annual turnover of 260 million SEK (Svenska Odlarlaget, 2012). Samodlarna is a smaller PO with only ecologically produced fruit and vegetables with an annual turnover in 2011 of 35 million SEK (Samodlarna, 2011).

These two companies have committed to merge and as stated in the press release (21/3/2013) “It is too in a more efficient way satisfy the demands today’s and tomorrow’s producers, customers, and consumers will put on good healthy products and environmental friendly and cost-effective logistics” (Svenska Odlarlaget press release, 2013a). From this merge SOL and Samodlarna will be able to increase their sales due to the fact that they can come closer to their customers demands with a more diversified product portfolio. The merge will provide the producers with the ability to have a higher sales price and lower sales fee as well as broaden their network and strengthen their market position (Mr. Olofsson, Managing Director SOL, 9/4/2013; Ms. Sterneborn, Managing Director Samodlarna, 11/4/2013).

With this merge SOL and Samodlarna are looking at the possibility to sell more of their produce to their two largest customers Everfresh (Coop) and ICA as locally produced, due to the trend in the fruit and vegetable industry that consumers are willing to pay a higher price for locally produced produce (Jordbruksverket, 2012c).

SOLs and Samodlarna’s largest customers are Everfresh (Coop) and ICA. Everfresh is a supplier of fruit and vegetables to retailers and their largest customer is Coop. At the same time, Everfresh is the main and by far the largest supplier of fruits and vegetables to Coop. Everfresh works as an intermediary between SOL and Samodlarna and Coop. In this case Coop represent the end-customer and their requirements. Based on this, in this research Coop will be seen as one of SOL and Samodlarnas largest customer together with ICA. 30 percent of SOL’s annual sales are to Coop, and 33 percent is sold to ICA (Levin, Distribution Manager, 21/3/2013). 70 percent of Samodlarnas annual sales is to Coop, and less than 1 percent to ICA (Ms. Sterneborn, Managing Director Samodlarna, 1/5/2013).
In this case the authors will research the possibility to increase the share of produce sold as locally produced to Coop and ICA, by recommending a location for a new distribution center. Today SOL is selling 3 percent of their produce as locally produced to Coop and ICA and Samodlarna is selling 1 percent to Coop and ICA as locally produced (Mr. Olofsson, Managing Director SOL, 24/4/2013; Ms. Sterneborn, Managing Director Samodlarna, 1/5/2013). This share has been increasing for both companies over the last years. To be able to increase the share for more producers they have decided to add an additional distribution center. This distribution center needs to be located in a different location from today’s distribution center. The decision on where to locate the new distribution center needs to take into consideration the location of the producers, the locations of Coop’s and ICA’s largest warehouses, and take into consideration the requirements on locally produced produce from Coop and ICA. This is in order for SOL and Samodlarna to be able to sell their fruits and vegetables as locally produced.
1.3 Problem Discussion

There is a high demand for locally produced produce in today’s market and consumers are willing to pay a higher price for locally produced fruits and vegetables (Jordbruksverket, 2012b). With the merge between SOL and Samodlarna they will increase their product portfolio. They will also increase the number of producers as well as the geographical area where they are present. This is illustrated in figure 1.

![Figure 1. Geographical Location of SOL’s and Samodlarna’s Producers](image)

To be able to meet the market demand for locally produced produce, SOL and Samodlarna need to adapt the distribution structure by adding an additional distribution center in a location that makes it possible for more producers to sell their produce as locally produced. In order to recommend where to place the new distribution center, the researchers first needs to understand the concept of locally produced produce and know the requirements from the market. In this study the requirements from the market will be limited to the requirements of SOL’s and Samodlarna’s two largest customers Coop and ICA. Then the researches need to identify how the present distribution structure accomplishes the requirements from the market. Lastly, a recommendation on where to locate the new distribution center will be given.
1.3.1 Locally Produced

For SOL and Samodlarna to be able to adapt the distribution structure to meet the market demand for locally produced fruits and vegetables they need to understand and the concept of locally produced. Today, there is no formal definition of what locally produced is (Ljungberg et al., 2012; Björklund et al., 2008). Livsmedelsverige defines it as; food where production, processing, and distribution to the consumer are performed within a defined area. There is no definition of the area size (Jordbruksverket, 2012b; Ekstrand and Grahn, 2010). In this study the market demand for SOL and Samodlarna is channeled through their two largest customers COOP and ICA. Therefore SOL and Samodlarna need to be aware of the requirements that COOP and ICA set for the produce in order to sell them as locally produced.

Research question 1: What are Coop’s and ICA’s requirements on fruit and vegetables to sell it as locally produced?

1.3.2 Present Distribution Structure

In the present distribution situation SOL and Samodlarna have different distribution structures. The distribution structures of SOL and Samodlarna are illustrated below in figure 2 and 3. SOL has a distribution center in Helsingborg, Sweden where their produce is gathered. The customer then collects the produce at the distribution center after the purchase (3a). The distribution from producer to the distribution center is done either by the producers themselves, this option is used by 15 percent of the producers, or they use a third party offered by SOL (1a). The distribution of Samodlarna’s produce is done by a third party. A large part of the produce from the producer is transported to the third party’s distribution center in Helsingborg (1b), where either the customers collects it or the third party transport it to the end-customer (3b). A small part of the produce for both SOL and Samodlarna is distributed directly to the end-customers (2a, 2b), 3 percent for SOL and 1 percent for Samodlarna, without being transported to a distribution center in Helsingborg first (Mr. Olofsson, Managing Director SOL, 24/4/2013; Ms. Sterneborn, Managing Director Samodlarna, 11/4/2013). With the business strategy of selling more locally produced produce to Coop and ICA, SOL and Samodlarna present distribution structure needs to be evaluated against the requirements for locally produced fruit and vegetables from Coop and ICA. Thereafter SOL and Samodlarna need to change their distribution structure to offer more producers the
possibility of selling their produce as locally produced, by adding an additional distribution center.

Research Question 2: How does the present distribution structure of Svenska Odlarlaget and Samodlarna meet the requirements from Coop and ICA for locally produced fruit and vegetables?

SOL’s Distribution Structure

![SOL's Distribution Structure](image)

Samodlarna’s Distribution Structure

![Samodlarna's Distribution Structure](image)

1.3.3 Localization of new Distribution Center

With this merge SOL and Samodlarna needs to decide a location for a new distribution center that provides more producers the possibility to sell their produce as locally produced. When deciding on where to locate a new facility it is important that it is long-range planning. It is important that the facility location takes into consideration anticipated business conditions and is flexible and responsive to the customers demands. The location of a new facility might result in an improved distribution network. If the location of the new facility is wrong on the other hand, it can cause productivity problems and transportation system inefficiency (Randhawa and West, 1995; Bardi et al., 2006). For SOL and Samodlarna it is important to take both the location of producers and the location of Coop’s and ICA’s warehouses into consideration when deciding on where to locate the new distribution center, in order to meet Coop’s and ICA’s requirements for locally produced produce for as many producers as possible.
Research question 3: Where should a new distribution center be geographically located for as many of Svenska Odlarlaget and Samodlarna’s producers as possible to be able to sell their fruit and vegetables as locally produced according to Coop’s and ICA’s requirements.

1.4 Purpose
The purpose of this study is to recommend a location for a new distribution center for SOL and Samodlarna, in order for more producers to meet Coop’s and ICA’s requirements for locally produced fruits and vegetables. To achieve the purpose, the definition of locally produced fruits and vegetables needs to be identified and the current distribution structure needs to be examined to identify how it meets Coop’s and ICA’s requirements for locally produced fruits and vegetables.

1.5 Research Questions
Research question 1: What are Coop’s and ICA’s requirements on fruit and vegetables to sell it as locally produced?

Research Question 2: How does the present distribution structure of Svenska Odlarlaget and Samodlarna meet the requirements from Coop and ICA for locally produced fruit and vegetables?

Research question 3: Where should a new distribution center be geographically located for as many of Svenska Odlarlaget and Samodlarna’s producers as possible to be able to sell their fruit and vegetables as locally produced according to Coop’s and ICA’s requirements.
1.6 Thesis Disposition

Figure 4. Thesis Disposition
2.0 Methodology

2.1 Scientific Perspective

The researches knowledge of theory and the perception of the empirical reality need to be considered in scientific research. *Positivistic* and *Hermeneutic* are two perspectives on how a research should be studied (Remenyi et al., 1998). When the researches use of theory as a framework in order to support the study and test the subject in reality with the help of constructed hypotheses it is the Positivistic perspective. Using this framework, researches should study the subject form a distance and should stay objective. The positivism method is according to Bryman and Bell (2007) the study of social reality and follows five principles:

1. “Only phenomena and hence knowledge confirmed by the senses can genuinely be warranted as knowledge (principle of Phenomenalism)

2. The purpose of theory is to generate hypotheses that can be tested and that will thereby allow explanations of laws to be assessed (principle of Deductivism)

3. Knowledge is arrived at through the gathering of facts that provide the basis for laws (principle of Inductivism)

4. Science must (and presumably can) be conducted in a way that is value free (that is, objective)

5. There is a clear distinction between scientific statements and normative statements and a belief that the former are true domain of the science”.

(Bryman and Bell, 2007, pg.15)

While in the Hermeneutic perspective own assumptions and preferences are made by the researchers, in order to create an interpretation of the situation aimed for the study. This perspective was used due to the reason that is stated; that it is not possible to execute a perfectly interpretation of the situation, and in order to understand the situation, the researcher should be subjective (Patel and Davidsson, 2003). In this perspective, the understanding of reality was more than just explaining casual relationship through objectivity and statistical analysis, it requires a personal commitment throughout the processes (Bryman and Bell, 2007).
Scientific perspective on this thesis
This thesis used the Positivistic perspective were several general theories such as distribution structures, distribution strategy, location of delivery center and labeling were reviewed. These theories were used in order to create a framework for the empirical data as well as the analysis. Together with appropriate empirical data and findings, it will helped answering the research questions as well as generating recommendations for the case company to become more efficient in the distribution.

2.2 Scientific Approach
The scientific approach explains the relation between theoretical and empirical data and in what way it was combined in order to gather information to answer the research question. There are two scientific approaches, deductive and inductive, and it clarifies what standpoint the study takes. In a deductive approach, the researchers use the theory as a standpoint, which later is applied to the empirical findings. The opposite approach is the inductive approach that has its starting point at the empirical findings and they are then later applied into theoretical models (Bryman and Bell, 2007). According to Patel and Davidsson (2003) the deductive way is explained as a validating way, while the inductive way is explained as a discovering way.

Scientific approach of this thesis
Using existing theory in order to collect data is according to Ghauri and Grønhaug (2005) the classical view of research, which is the deductive approach and is used in this study. Reviewing literature gives the ability to gather and create a theoretical framework, which is used as a foundation for the research and helps in order to collect relevant empirical data. In this thesis the deductive approach were used, since the theory was build around the company problem and research question. Theory that will be presented is distribution structures, distribution strategy, location of delivery center, labeling.
2.3 Case Study

Case study is defined by Bryman and Bell (2007) as a research with rich, detailed and intensive analysis of a specific area. Describing the complexity and particular nature of a case is according to Stake (1995) a case study and it can use different approaches, such as researching a single organization, a single location, a person, or a single event.

As a researcher of a case study, it is needed to be in control of behavioral events, because of the fact that a case study examines to why and how decisions are made and implemented (Yin, 2009). The best way of explaining studies of revelatory nature is by conducting single case studies, since it give each case the chance to be well examined (Ghauri and Grønhaug, 2009; Yin, 2009). According to Yin (2009) having a multiple case studies is an advantage due to the fact that data is collected form several sources. Using the case study method creates the ability to capture the holistic and meaningful characteristics of a real-life event within the different processes in the case organization.

Case Study for this thesis

According to Yin (2003) five main types of case studies are: descriptive, illustrative, cumulative explorative, and critical case studies. Among these, the two most common ones are descriptive and explorative. To formulate hypothesis is called an explorative case study and to exemplify and illustrate is called a descriptive case study. Conducting a case study is appropriate in this study due to the fact that the research questions aims at answering the how questions. This was done in order to investigate the problem areas and give suggestions on how the company can become more efficient in their future distribution. The research that was conducted to answer the research question (location of the delivery center) tends to be more of the explorative type. The research that was conducted to answer (how they can improve the distribution structure to keep local presence and freshness of the produce high and transportation short) tends to be more of the descriptive type. In order to present reliable result a combination of both descriptive and explorative approaches was used in the research. This was done to ensure the best and most realistic outcomes.
2.4 Research Methods

There are two research methods, depending on the purpose of the study and how data is going to be analyzed. The two methods are qualitative and quantitative. The qualitative study design is preferable in cases when the researcher needs to gain a deeper understanding of the study subject or situation (Patel and Davidsson, 2003) and focuses on how to makes sense of processes and meanings of phenomena (Merriam, 2009). Observations and interviews are common ways of collecting the data in this method. According to Ghauri and Grønhaug (2009) a researcher is often examining objects that they do not fully understand, which opens words such as why and how, and this creates a basis for the researcher to be open for information to gain understanding of the subjects. The qualitative research is described by Marshall and Rossman (2011) to be highly interpretive, and can be explained by the empirical data that is collected by the researchers.

The qualitative design is the alternative to the qualitative study design and is used when the empirical data can be measured or valued numerically. The basis of this method is a scientific context and involves making a measurement for numeric values such as numbers, times, length, weight, and the results needs to be quantifiable for the measurements. The numerical data is then used in order to research its topic. The quantitative research uses mathematical models for the data collection and it contains very detailed information (Patel and Davidson, 2003). According to Bryman and Bell (2007) there is also a type that combines both quantitative and qualitative research methods, because they both have their strength and weaknesses. Combining these two gives the researchers the ability to use the strength of one method to complement the weaknesses of the other method.

**Research methods for this study**

In order to gain a deeper understanding of the present situation, and to be able to collect the information needed to answer the research questions a mix of both qualitative and quantitative methods were used to collect the data in order to answer the research questions. The focus was on qualitative research method which were needed in order to
provide in-depth answers and a quantitative research method is mainly used to answer the research question, where geographically to place the new delivery center.

### 2.5 Data Collection

There are two types of data: primary and secondary. Material collected by the researcher for a specific study is called primary. Data can be collected through interviews, observation or questionnaires. The most important source to a case study and mostly used in a qualitative research is interviews. Personal direct contacts, phone, e-mail, or other communication media can be used for interviews (Yin, 2009). In order to gain a deeper understanding form a real life-scenario interviews are done, where the interviewer asks the question to the interviewee. During the interview it is also possible to capture the interviewee’s opinion, qualities, and feeling. All this is important in order to gain full understanding of the operations (Kvale, 2009; Merriam, 2009). During the interview in qualitative research, communication brings the knowledge and according to Kvale (2009) it is the interviewers ability to examine the question that decides the quality of the answers. According to Merriam (2009) there are different types of interviews depending on the degree of structure desired. It can vary form being highly structured interviews to open conversations. The different types are called; structured, semi structured and unstructured. In structured interviews questions are predetermined and asked in a specific order, in semi structured interviews there are clear guidelines with more flexible interview questions where specific data usually is required from the interviewee and follow-up question are common, and in unstructured the interview is not directed to a specific subject and questions are not designed. For an interview, person-to-person is the most common way, (Merriam, 2009) and there are different ways of how an interview can be registered, the most common way is by using a dictaphone (Kvale, 2009).

**Data collection for this thesis**

Both primary and secondary data were used in this study. Personal interviews are the primary source to collect required data in this thesis. This gave the researches a deeper understanding and also chances for responsiveness and observation. During the interviews a dictaphone was used, which according to Kvale (2009) provides the researches with the freedom to fully concentrate on the subject, and also makes the
transcription easier to follow and understand. For the research method in this study, semi structured interviews were conducted in order to minimize the limitations and to get a broad view of the subject. Other ways of collecting the data have been through e-mails and telephone.

<table>
<thead>
<tr>
<th>Name</th>
<th>Titel</th>
<th>Company</th>
<th>Communication tool</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olle Olofsson</td>
<td>Managing Director</td>
<td>SOL</td>
<td>Telephone</td>
<td>3/15/13</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>3/21/13</td>
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<td>9/4/13</td>
</tr>
<tr>
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<td></td>
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<td>4/24/13</td>
</tr>
<tr>
<td>Jacob Gammelgaard</td>
<td>Sales Manager fresh food</td>
<td>Coop</td>
<td>Telephone</td>
<td>4/24/13</td>
</tr>
<tr>
<td>Peter Hägg</td>
<td>Senior Category Manager F&amp;V</td>
<td>ICA</td>
<td>Telephone</td>
<td>4/30/13</td>
</tr>
<tr>
<td>Charlotta Trolin</td>
<td>Category Area Manager</td>
<td>ICA</td>
<td>Telephone</td>
<td>4/30/13</td>
</tr>
<tr>
<td>Liselott Sterneborn</td>
<td>Managing Director</td>
<td>Samodlarna</td>
<td>Email</td>
<td>4/11/13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Email</td>
<td>5/1/13</td>
</tr>
<tr>
<td>Stefan Levin</td>
<td>Distribution Center Manager</td>
<td>SOL</td>
<td>Personal Meeting</td>
<td>3/21/13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Personal Meeting</td>
<td>4/9/13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Telephone</td>
<td>5/1/13</td>
</tr>
<tr>
<td>Jan Sähl</td>
<td>Distribution Manager</td>
<td>Coop</td>
<td>Telephone</td>
<td>4/24/13</td>
</tr>
</tbody>
</table>

Table 1. Empirical Data Collection

The secondary data was collected from books, articles, reports and the Internet. Books used in this thesis were accessed through Linnaeus University’s library. The search engines were accessed through Linnaeus University’s database, examples of databases used are: Emerald, Science Direct, and Google Scholar. Keywords that were used include fields such as; distribution structure, distribution strategy, transportation of perishable goods, labeling about the products quality and origin, and fruit and vegetable industry.
2.6 Data Analysis

According to Marshall and Rossman (2011) the process of data analysis is to bring order, structure and meaning to the collected data. Often in qualitative studies there is an overwhelming amount of data that the researcher needs to handle. Through the use of data analysis the researcher manipulates data to gain understanding, clarify problems and test hypothesis. There is no general agreed upon best approach for data analysis (Ghuari and Grønhaug, 2005). According to Ghuari and Grønhaug (2005) they recommend Miles and Huberman’s interactive model from 1994. It separates the following components in qualitative data analysis: data reduction, data display, and conclusion drawing/verification.

Data reduction is the process of transcribing, selecting, simplifying and transforming data that was collected. These processes are important in order to give meaning to the data collected in the interviews. This is were the researcher generates categories and identify themes and patterns. The data display takes place after the data reduction; the data is organized in a way that permits drawing conclusion and taking actions. This can be done through analytical activities such as: categorization, abstraction, comparison, dimensionalization, integration, iteration and refutation.

Figure 5. Qualitative Data Analysis

Source: Miles and Huberman (1994), as cited by Ghauri and Grønhaug (2005)
Data analysis for this thesis
The described process above was used for the data analysis for the qualitative data. This provided the ability to filter the collected data down to what was really needed and what was relevant to the theories. The quantitative data were analyzed with the help of the center of gravity model to be able to determine the best location for the delivery center. The analysis of the collected data will provide a base to conclusion and recommendations.

2.7 Scientific Credibility
To be able to judge the credibility of this thesis, and reach high quality of the empirical findings, there are several criteria to follow. Yin (2003) suggests four tests; construct validity, internal validity, external validity and reliability

2.7.1 Validity
When collecting data it is essential to secure an objective judgment, and this is called construct validity. Working with case study, this may be a problem and in order to ensure validity, a researcher needs to collect information from many sources. This is best done when combining multiple sources of evidence, establishing chain of evidence and reviewing report by key informants. Internal validity handles the cause and effect relationship, when arguments are said in the study. Everything should be well supported and by addressing explanations and sources to arguments in the study validity problems can be avoided. External validity is to find out how much of the findings from this study can be applied into other cases and still be applicable (Yin, 2003). Yin (2003) also explains it as how much generalization and assumption can be done from the empirical finding without loosing its content and still be used in other cases.

Construct validity of this thesis: During this case study, employees of different positions in the organization were interviewed, as well as both primary and secondary sources were used. This creates a high validity on this thesis. A theoretical framework with a broad range of literature were also reviewed in order to strengthen the validity. The key informants of the study was the supervisor at the company, which have high competence in this research area as well as tutors and opponent group at the university.
Internal validity of this thesis: In this thesis, assumption while writing this thesis were avoided. In order to get a clear understanding of the subject, in-depth discussion with the case company were held. Having several sources answering to same subject also make the internal validity strong. Litterateur reviews to strengthen the understanding of the subjects were made.

External validity of this thesis: The thesis was based on one single case company and was very specific in order to solve their problems. As mention in the background, more companies in this industry are facing the same problems, such as not being able to stand alone. If that is the case, and other companies in this industry are having the same challenges, then this study can be applicable. The literature review is more general and can be applicable in some areas, in industries that have perishable goods and in need of a new distribution system.

2.7.2 Reliability
Reliability is the ability for another researcher to achieve the same results at another point of time. In order to make the study reliable, it needs to be well documented and described, and leave no room for mistakes, in a way that another researcher can follow the same actions and reach the same results. To minimize the errors and biases in the study is the purpose of reliability (Yin, 2003).

Reliability of this thesis
Empirical findings for this study were collected by semi structures interviews with several persons at the case company. Since it was semi-structured interviews with several employees at the company, it will be difficult for other researchers to end up with the same conclusions. To make it possible, a researcher needs to speak with the same persons at the company in order to collect the same information. The quantitative data is from the company’s database and can be collected at another time, however the company is continuously changing, which means that they need to collect the information from the same time period to get the same data.

2.8 Ethical Approach
The relationship between the researcher and the participants is a very sensitive one in the process of research. The decision on whether to inform the participant about the whole truth about the real purpose of the research might make the participant reluctant
to give full cooperation (Ghauri and Grønhaug, 2005). In a research study there are ethical issues in relation to participants. The researchers need to consider why a person would give their time to participate, and if it is ethical to disturb an individual. It is important to consider the relevance and the usefulness of the research before collecting data for it, in order to convince others that it is relevant. Collecting data for the research without the knowledge of participant is considered unethical. The collected data needs to be carefully used in order to minimize the risk of harming the respondents. The collected information should only be used for the purpose of the research, otherwise it is unethical. The confidence of the participants from the case company will also increase by having repeatedly visits and meetings with the researchers, since these meetings will give the participants the chance to follow the process (Kumar, 2005).

**Ethical approach for this thesis**

Since this was a case study in close collaboration with the case companies, the participants were aware of the purpose of the thesis, the real purpose of the research and the use of the collected information. The time and place for the meetings where information was collected was chosen by the participant in order to be as convenient as possible for them. To make this as ethical as possible the participants in this research had the choice of being anonymous. In order to reassure them that the gathered information will be used in an ethical way, they have the chance to look through the paper, during the process, before the final submission, and the end results and also decide whether or not names and titles can be written in the paper.
2.9 Summary of Research Methodology

Figure 6. Summarizes the research methodology in this thesis.

<table>
<thead>
<tr>
<th>Scientific Perspective</th>
<th>• Positivism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific Approach</td>
<td>• Deductive</td>
</tr>
<tr>
<td>Case Study</td>
<td>• Descriptive</td>
</tr>
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<td></td>
<td>• Explorative</td>
</tr>
<tr>
<td>Research Method</td>
<td>• Mixed Method</td>
</tr>
<tr>
<td>Data Collection</td>
<td>• Primary</td>
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<td>• Secondary</td>
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<td>Data Analysis</td>
<td>• Data Analysis Approach</td>
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<td>• Construct Validity</td>
</tr>
<tr>
<td></td>
<td>• Internal &amp; External Validity</td>
</tr>
<tr>
<td>Ethical Approach</td>
<td>• Reliability</td>
</tr>
</tbody>
</table>
3.0 Locally Produced

The aim of this chapter is to gather theory and empirical data to analyze to answer research question 1:

What are Coop’s and ICA’s requirements on fruit and vegetables to sell it as locally produced?

The theory section studies the concept locally produced, and the trend amongst consumers to purchase locally produced. The empirical data presents Coop’s and ICA’s objective for locally produced and their requirements on produce to sell it as locally produced. The last section combines theory with empirical data in order to conduct an analysis and highlight the similarities and differences between Coop’s and ICA’s requirements for locally produced.

3.1 Theory for Locally Produced

3.1.1 Definition of Locally Produced

People places different bases into the concept locally produced which makes it a very diffuse concept. There is a lack of formal definition on what a locally produced products are. One of many definitions is Livsmedelsveriges definition that describes locally produced as food where production, processing, and distribution to the consumer are performed within a defined area. They do not give any definition to the areas size. In a survey conducted by YouGov in Sweden in 2010, 77 percent of the questioned people believe that locally produced means that it is produced within 200km of the selling point.
point. (Ekstrand and Grahn, 2010). In a survey conducted by Coop in 2009, 78 percent of their customers defined the area for locally produced as their region, there is however no definition of the region size, and 47 percent believed it to be locally produced if it came from the county in which they live (Coop Report, 2009).

3.1.2 Consumer Purchasing Trend for Locally Produced Food.

When choosing what food products to purchase in the stores there are several factors that affect the consumers. For most consumers the taste of a product is the main deciding factor, but also the nutrition and sustainability of it. During the last years environmental issues have gained increased attention in the society, and also when it comes to food purchase. People are more aware that they should consider, the origin of the food, how their food has been produced, and the effect it has had on the environment (Biel and Magnusson, 2005). 77 percent of the Swedish population is according to a SIFO (2010) survey ready to pay more for a product that is environmentally friendly and locally produced (Skanes Livsmedelsakademi, 2010). The Swedish food retailer is willing to pay 2-3 SEK more for Swedish produced cucumber and tomatoes than for imported ones (Jordbruksverket, 2012b).

According to Biel and Magnusson (2005) many consumers want to make purchasing decision with the environment in mind. To purchase locally produced products is one way to decrease the transport distances for food. Purchasing locally produced fruits and vegetables decreases their environmental footprint because the transportation of the produce accounts for a large part of their environmental impact and green gas emission. This is because the cultivation of these products has a relatively low affect on the environment with smaller green house gas emission than for example livestock. Produce that have been transported from southern Europe often have double the environmental impact than produce produced in Sweden. Therefore to purchase produce produced in Sweden will have a smaller environmental impact and therefore be more environmental friendly (Mat och Klimat, 2013).

The interest for locally produced produce has never been greater (Lantbrukarnas Riksförbund, 2013). To purchase locally produced is a food trend that is increasing. There are several different factors to why consumers choose to purchase locally produced products. Some purchase it because they know where it has been produced or
that it comes from a small local farm. Others because they believe it has been produced with the environment in mind, or that it has better taste and have a longer lifecycle than other products. The consumer expects healthy, good tasting, and fresh food when they purchase locally produced. For producers there is a marketing advantage in locally produced food, it is a way for them to add value to their products (Jordbruksverket 2012a; Ljungberg et al., 2012).

3.1.3 Main reasons for customers to purchase locally produced food
According to Lantbrukarnas Riksförbund (2013) 40 percent of the consumers believe that it is important that the food is locally produced. They also state that giving the consumer the option to purchase locally produced food will increase the customers satisfaction, and 95 percent would buy more locally produced if it was available in the stores. The factors to why consumers want to purchase locally produced produce are that people want to promote small Swedish farms for a living rural area, the environment, and shorter transportations (Lantbrukarnas Riksförbund, 2013, Ipsos – Eureka 2004). Ipsos Eureka (2004) asked 2250 persons over telephone to prioritize the there most important reasons to why they purchase locally produced food in a questionnaire. The results are illustrated in table 2 below.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promote employment</td>
<td>45 %</td>
</tr>
<tr>
<td>Environment</td>
<td>43 %</td>
</tr>
<tr>
<td>Support living rural area</td>
<td>42 %</td>
</tr>
<tr>
<td>Support the farmers</td>
<td>37 %</td>
</tr>
<tr>
<td>Livestock ethic</td>
<td>27 %</td>
</tr>
<tr>
<td>Higher quality</td>
<td>22 %</td>
</tr>
<tr>
<td>Taste</td>
<td>18 %</td>
</tr>
<tr>
<td>Healthier</td>
<td>11 %</td>
</tr>
<tr>
<td>Ecological</td>
<td>10 %</td>
</tr>
<tr>
<td>Small scale production</td>
<td>8 %</td>
</tr>
</tbody>
</table>

Table 2. Priority List for Top Three Reasons to Purchase Locally Produced

Ipsos-Eureka, 2004
According to (Björklund et al., 2008) many of the larger grocery stores that sell locally produced food have their own rules of what can be called locally produced. They set the rules of what is seen as locally produced based on the request from the customers.

There is no guarantee that the consumers get food of better quality when purchasing locally produced. There are quality laws that all producers have to follow, but that locally produced would be better has no foundation from investigations. Quality is in the eye of the beholder therefore it is impossible to generalize and say that some products have better quality than others only based on what area they are produced in. However for freshness it can be stated that locally produced products are naturally fresh when they reach the consumers because they often have a shorter transportation distance and time (Jordbruksverket 2012, Ljungberg et al., 2012).

There is no regulation for labeling of locally produced food because there is no formal definition and it is therefore impossible to decide on any specific label that would match every specific case of locally produced (Jordbruksverket, 2012a)

3.2 Empirical Data

In this section empirical data from SOL’s and Samodlarna’s largest customers Coop and ICA will be presented including their objectives and requirements for locally produced. The empirical data is gathered through interviews with Mr. Gammalgaard, the Sales Manager for Fresh Food and Jan Sühl, Distribution Manager at Coop. For information about ICA, Mr. Hägg, Senior Category Manager for Fruit and Vegetable and Charlotta Trolin, Category Area Manager were interviewed.

3.2.1 Coop

Coop is one of the largest food chains in Sweden and it is owned by 3.2 million members. The chain is part of the Cooperative Union (KF) driven by 42 consumer groups (Coop, 2012). Today Coop has 22 percent of the total consumable goods market in Sweden (Nyhets byrån direkt, josefin svensson). Coop has warehouses in Malmö, Växjö, Umeå, Luleå, Karlstad, Gävle, Bro, Västerås, and Enköping. The three largest are Bro, Västerås, and Enköping (Jan Sälh, Distribution Manager, 24/4/2013).

Coop wants to be the top grocery retailer in Sweden for locally produced food. Having the possibilities to offer local or regional food is essential for Coop, because there are demands on these products from the consumers (Mr. Gammalgaard, 24/4/2013). Coop
is constantly working to increase the quantity of local and regional food. The overall goal with selling local and regional food is to create competitive advantage for the local store. This is beneficial not only for the store but also for the local or regional producers. 78 percent of Coop’s customers believe that locally produced food is produced within their region (Mat från regionen, 2009).

The regional and local food needs to follow the same strict quality procurement standards as products that are not sold as local or regional products. Coop distinguishes between local and regional food. Local food has to be produced within three kilometers of the city of sale. This means the food has to be produced, transported and sold within this area (Mr. Gammalgaard, 24/4/2013). Regional food is food that is produced and sold within a geographical region. The region may be different sized geographical areas, it might for example be a county such as Östergötland, or several nearby counties with natural connection (Mat i regionen, 2009). As a guideline they have divided up Sweden in 10 different regions. The divisions have been made with the end-customer in mind, all customers should be able to see the food as regional (Ljungberg et al., 2012). It is up to each store to set up own regions for their store; however, the region cannot be larger then the region description in the guidelines (Mr. Gammalgaard, 24/4/2013).

- Skåne-Halland
- Skåne-Blekinge
- Småland
- Gothenburg (includes Bohuslän and down to Halmstad)
- Värmland
- Mälardalen, Stockholm and Gotland
- Gästriket och Dalarna
- Härjedalen och Jämtland
- Västerbotten
- Norrbotten

In order for Coop to decide what they can sell as regional food, they follow the consumers’ requirements on what they accept as regional food. Mr Gammelgaard (24/4/2013) states that:

“Food produced in the region, but then transported to a distribution center in an other region, and then transported back to the original region can not be sold as regional food”.
This is a way of guaranteeing the consumers that the food that is sold as regional food is not only produced there but also only transported within the region (Gammalgaard, 24/4/2013). 85 percent of Coop’s customer purchase locally produced to contribute to a better climate with short transportation routes (Coop Report, 2009). Most suppliers deliver their products to the closest warehouse from where Coop delivers it to the stores. If the supplier is only supplying one or two stores it can be delivered directly to the stores by the supplier themselves (Ljungberg et al., 2012).

The locally produced food is labeled “Mat från regionen” to inform the customers that the food is locally produced and fulfills the quality requirements (Gammalgaard, 24/4/2013). This works as guidelines for the 87 percent of Coops customers that thinks it is important to buy locally produced food.

“We must protect Sweden and our open landscape. Producers must get properly paid for their work, otherwise they shut down their business” (Coop Report, 2009 pg. 14).

3.2.2 ICA
ICA Sweden AB (ICA) is the largest food chain in Sweden. ICA is a joint venture between Hakon Invest and Royal Ahold. The ICA stores in Sweden can have three different ownership structures. The dominating ownership structure is that the stores are owned and operated by an independent owner that have agreements with ICA. Another structure is a combination where the independent owner owns parts of the store and ICA owns other parts, but to the customer it looks like one store, and lastly the store can be owned and operated by ICA. In 2011 ICA had 36 percent market share of the total consumable goods market in Sweden. ICA has warehouses in Helsingborg, Borlänge, Kalhäll, Kungälv, Västerås (ICA, 2012).

ICA’s customers are demanding more locally produced products because of this ICA is constantly trying to increase the quantity of locally produced products in their stores. By buying locally produced products the customers believe that they contribute to a living rural are and to decrease the environmental impact from the product because of shorter transportation (ICA, 2011).
According to Peter Hägg (30/4/2013) ICA defines locally produced as products produced in Sweden; however, the many independent storeowners can set their own definition and requirements for locally produced. Many ICA stores are owned by independent owners that often has local ties to the area of business, this often contributes to that they want to support local producers. And therefore wants to sell locally produced products from their region (Omvärldssaktuellt, 2010).

ICA does not have any restrictions for the geographical distance on what can be sold as locally produced. The main reason for this is that it gives every store the option to choose the region size from where their locally produced products are purchased. Since there are no restrictions the stores can listen to their customer’s demands and customer requirements on what can be considered as locally produced and use this as guidelines when purchasing products. It is up to each store if they want to have locally produced products. There is no specific label for locally produced products in ICA, it is up to each store if they want to label the food as local. The only required marking is to show the origin of the product. It is up to each store if they want to display the food as locally produced or sells it as a part of their regular product range (Hägg, Thorn, 30/04/2013). Most suppliers deliver their products to the closest warehouse from where ICA delivers it to the stores. If the supplier is only supplying one or two stores it can be delivered directly to the stores by the supplier themselves (Hägg, 30/04/2013).

ICA has the most local suppliers compared to other stores in the same industry; however they know they can strengthen this position by helping more producers reach out to consumers through the ICA’s stores (Hägg, 30/04/2013; Werner 2007). ICA wants to be the “world champion” in locally produced products, and ICA should appear as those who care about the locally produced. ICA knows that they have a key position in preserving the Swedish agriculture (Werner, 2007).

“Smak på Lokalt” is ICA’s latest venture for locally produced food. This initiative started in 2007 and is about finding small producers and helping them reach their local market through ICA’s stores. The locally produced food needs to follow the same strict quality standards as other products (Länsstyrelsen 2007).
Torget is ICA’s data system where Swedish producers can market their product to ICA stores against a fee. In this system ICA stores can search for products that suppliers are able to deliver to the area in which the stores operate. The store can search for category of product, product, name of producers, or all producers in the area. These products can be sold as locally produced (Hägg, 30/04/2013). To be a supplier on Torget the supplier needs to be quality certified from ICA. The supplier inserts information about quantities that can be delivered, when, and to what geographical are they can deliver. There are several requirements on the producers to be listed on Torget. The first is that the products can be label with ENA codes; these can be printed from Torget. The second is that the producers themselves can transport and deliver the goods with a 95 percent delivery accuracy. Thirdly the producer must have a certified food site and lastly the producer must have a self-inspection program (Länstyrelsen, 2007).

3.3 Analysis for Locally Produced

*In this section theory about locally produced and Coop’s and ICA’s requirements to sell fruit and vegetables as locally produced are analyzed to answer research question 1.*

Research Question 1.

*What are Coop’s and ICA’s requirements on fruit and vegetables to sell it as locally produced?*

To buy locally produced is a consumer trend that has been increasing over the last years, and customers are willing to pay more for the locally produced produce. As an example; Swedish retailers are willing to pay 2-3 SEK more per kilo for Swedish produced tomatoes and cucumbers compared to imported. The main reason is that the consumers feel more secure when they know the origin of the produce. Other reasons are that consumers believe the produce has been produced with the environment in mind and has not been transported great distances (Jordbruksverket 2012b). According to Lantbrukarnas Riksförbund (2012) 40 percent of the consumers believe that it is important to buy locally produced produce, and 95 percent would buy more locally produced produce if it was available in the stores (Lantbrukarnas Riksförbund, 2013). There is no formal definition for what locally produced is, one of many definitions is from Livsmedelssverige they describe it as it as food where production, processing, and distribution to the consumer are performed within a defined area. There is no definition
of the areas size, however from a survey made by YouGov in 2010, 77 percent of the consumers believe it to be locally produced if it is produced within 200km (Ekstrand and Grahn, 2010).

Coop and ICA has 58 percent of the total market share for consumable goods in Sweden. To keep this market share both companies need to constantly follow the demands and trends of their customers. Purchasing locally produced produce is a trend that has been increasing over the last years. Coop and ICA follows this trend however they have different ways to approach the concept of locally produced, and they have different requirements for it. According to Björklund et al. (2008) many large grocery stores set their own rules on what can be called locally produced and many times the requirements are set based on the customers requests. According to Lantbrukarnas Riksförbund (2012) 40 percent of the consumers believe that it is important to buy locally produced produce. When Coop in 2009 asked their customers about purchasing locally produced food 87 percent said that they believe it to be important to purchase locally produced products (Coop Report, 2009). Because of this it is very important for Coop to offer their customers locally produced products. The goal for Coop is according to Mr Gammelgaard, sales manager at Coop, to be the top provider of locally produced produce. For ICA it is according to Mr Hägg (30/04/2013), category manager for fresh fruit and vegetables, important to follow the market trends and their customers demands. ICA wants to be the “World Champion” in locally produced produce, by offering the small producers access to ICA stores, and by extension offering their end-customers the option to buy locally produced products (ICA, 2012).

For Coop to sell the produce as locally produced the produce needs to be produced, transported, and sold within the same region. Coop has as a guideline for their stores divided up Sweden in different regions based on their customers preferences; however, it is up to each store to set their own region restrictions (Coop, 2007; Mr Gammelgaard, 2013). For ICA to sell the produce as locally produced the produce needs to be produced in Sweden. They have no restrictions on where the produce can be produced and sold or any restrictions on transportation. It is up to each store to set their own regions for the locally produced produce they offer. To set the restrictions the stores listens to the demands from their customers (Mr. Hägg, 30/04/2013 and Ms. Trolin 30/04/2013). As an example; customers in Skåne are often requesting produce produced
in Skåne and therefore ICA stores in Skåne often offer this to their customers under a specific label with information that produce originates in Skåne (Mr Hägg, 2013). In Coop’s and ICA’s cases, having a big share of 58 percent of the total market share for consumable goods in the Swedish market allows them to have great impact on the Swedish population. Following the increased trend for more locally produced produce, they have the ability to attract more consumers to purchase locally produced and work towards a more environmental friendly environment across Sweden. It is essential for both Coop and ICA to constantly follow the changing market demands and trends of their customer to gain competitive advantage.

Coop and ICA have different objectives and selling requirements for locally produced produce. Since there is no formal definition of the concept this gives both Coop and ICA the ability to create their own requirements based on customers demands. Coops way of defining the concept and giving the stores restrictions on transportation is a way of guaranteeing the customers that what they purchase is local and that it has not been transported outside the region. From the producers point of view the producer give their closest consumers what they are requesting. This is good for network building and trust in the produce and it supports the local farms, which in the long run can lead to promoting the employment in the local rural area. As a drawback Coops restriction limits the area where producers can sell their produce as locally produced. ICA’s way of defining the concept gives their stores the option to choose from a large number of suppliers from across Sweden. All ICA’s stores have the option to follow their customers demands for locally produced produce when setting regional restrictions, however there is no guarantee to the customers that the produce has not been transported great distances. Based on the survey made by YouGov in 2010, 77 percent of the consumers have a perception that locally produced food is produced within 200km of the selling point (Ekstrand and Grahn, 2010). It is then evident to say that Coop’s restrictions on area and transportation distance are closer to the demands from the consumers than ICA’s. This is a fact that ICA needs to consider and be aware of too not loose market share to Coop. However ICA’s definitions and selling requirements for locally produced produce might have the advantage of being more flexible, which gives them the ability to concentrate and listen to the their customer requests without any specific restriction.
The top three reasons to why people purchase locally produced food are; to promote employment, the environment, and support a living rural area in their region (Ipsos-Eureka, 2004). When these three reasons are taken into consideration it is clear that Coop’s requirements for locally produced produce is closer to guaranteeing their customers that they will contribute to these factors. ICA’s definition of the concept can only guarantee their customers that they promote the employment and support a living rural area across Sweden. However since the ICA stores have the option to set their own region restrictions there are stores that can guarantee their customers that they contribute to employment, environment, and support the rural area in their region.

In Coop’s stores the produce that is sold as locally produced needs to follow the same strict quality procurement standards as produce that are not sold as locally produced. The produce is labeled and displayed with “mat från regionen” food from the region, to inform the customer that the produce is local and has not been transported outside the region (Mr. Gammelgaard, 2013). In ICA stores the produce that is sold as locally produced needs to follow the same strict quality procurement standards as produce that are not sold as locally produced. There are no central label restrictions for the locally produced; it is up to each store to make arrangements with the producer about labeling. The only information that it required to be labeled on the produce is that it is produced in Sweden. Many ICA stores do have displays for locally produced produce to meet the customers’ requests (Mr. Hägg, 2013). Since there is no central restriction for labeling at ICA, the different ICA store have the ability to use different marketing that is suitable and attractive for their specific region, based on the customers requests. In Coop there is a label restriction that is used in every Coop and this makes it easy for the customer to recognize the labeling and what it represents.

Coop’s goal is to be the top provider of locally produced produce, and offer their customers a large quantity of locally produced produce in every store. ICA’s goal is to be the “World Champion” in locally produced produce, by offering the small producers access to ICA stores across Sweden. Working towards these goals will create different benefits for the companies. Coop believes that selling locally produced produce will create competitive advantage for the local store (Mr. Gammelgaard, 2013). Competitive advantage can be created due to that customers are requesting locally produced produce and they are willing to pay more for it. By offering the customers locally produced
produce with clear restriction on region of origin, transportation, quality, and labeling they meet the customers demands and work towards their goal. ICA believes it is important for the ICA stores to be able to choose from a large number of suppliers across Sweden. This is to enable the stores to offer their customers locally produced produce (Mr. Hägg and Ms. Trolin, 2013). By letting the stores set their own restrictions on region and labeling and keeping the quality standards the same as on other products, the stores can follow the customer’s demands in their region.

The following tables summarize Coop’s and ICA’s objectives and requirements for locally produced produce.

Table 3 Summarizes of Coop’s and ICA’s Objectives for Locally Produced.

<table>
<thead>
<tr>
<th>Objectives for Locally Produced</th>
<th>Coop</th>
<th>ICA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goals with locally produced food</td>
<td>Be the top provider of locally produced produce</td>
<td>Be the “World Champion” in locally produced produce, by offering the small producers access to ICA.</td>
</tr>
<tr>
<td>Advantages of having locally produced food</td>
<td>Create competitive advantage for the local store</td>
<td>ICA stores have more choices in suppliers (can choose small local producers)</td>
</tr>
<tr>
<td>Customers demands</td>
<td>Customers demand locally produced products</td>
<td>Customer trend, follow the market trends</td>
</tr>
</tbody>
</table>

Table 3. Summary of Coop’s and ICA’s Objectives for Locally Produced

Table 4. Summarizes Coop’s and ICA’s requirements for locally produced produce.

<table>
<thead>
<tr>
<th>Requirements on Locally Produced</th>
<th>Coop</th>
<th>ICA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locally produced area requirements</td>
<td>Local produced within 3 km. For regionally produced area is set according to customers demands in the region</td>
<td>From ICA’s central org. that it is produced in Sweden. Each store set their own area requirements.</td>
</tr>
<tr>
<td>Transportation requirements</td>
<td>Produce needs to stay within the regions boarder</td>
<td>No transportation requirements.</td>
</tr>
<tr>
<td>Quality requirements</td>
<td>Same quality standards as other produce</td>
<td>Same quality standards as other produce</td>
</tr>
<tr>
<td>Label requirements</td>
<td>Labeled with “mat från regionen” (food from the region)</td>
<td>No central requirements. Each store decides the labeling.</td>
</tr>
</tbody>
</table>

Table 4. Summary of Coop’s and ICA’s Requirements for Locally Produced
4.0 Present Distribution Structure

The aim of this chapter is to gather theory and empirical data to analyze to answer research question 2:

“How does the present distribution structure of Svenska Odlarlaget and Samodlarna meet the requirements from Coop and ICA for locally produced fruit and vegetables?”

Theories that will be studied in this chapter are; distribution structure, perishable goods, and distribution in the food industry. The empirical data presented is SOL’s and Samodlarna’s current distribution structure and Coop’s and ICA’s warehouse presence. The analysis will be based on theory and empirical data combined with the analysis from research question 1. This is done to see how SOL’s and Samodlarna’s present distribution structure meets Coop’s and ICA’s requirements for locally produced produce.

Figure 8 illustrates the structure for chapter 4, Present distribution structure.

4.1 Theory for Distribution Structure

4.1.1 Distribution structure

The structure of distribution is essential for a company’s competitiveness and profitability. It is the point where products are distributed to a large number customer, either from production or storage locations. The distribution needs to have high delivery service and this can be accomplished by keeping the delivery times as short as possible and deliver the products to the market in a cost-effective way (Jonsson, 2008; Chopra, 2007; Rushton et al, 2006; Ross, 2004; Colye, 1996). According to Christopher (1985,
Traditionally the channel of distribution is the means whereby products are physically transferred through the system and through which the acquisition transaction takes place. He also states that supply and distribution channels must be incorporated into the organizations strategic thinking in order to achieve the corporate goals.

### 4.1.2 Distribution Utility Values

The physical link that connects a company’s customer, suppliers, warehouse and channel members is referred to as the physical distribution channel. It works as the bridge between the seller and the buyer, and more importantly it adds value to the company with the ability to physically move the goods to the desired place and at the time requested (Rushton et al, 2006). Consumers do not always consume at the same place and are usually widespread on the market and producers do not always produce at the same time as the customer’s request it (Jonsson, 2008).

It is important to understand the contribution the distribution adds to the supply chain and to the end-customer (Jonsson, 2008; Chopra, 2007; Ross; 2004). In order to create customer satisfaction through the activities in the supply chain there are four utility values; the *form utility* which creates value through value refinement of input goods to finished products, *place utility* where value is created by having the products at the right place and available for acquisition, *time utility* which creates the value by having the products available at the right time for the customer. This is especially important in a dynamic goods market where production need to be on a continuous basis to meet the customers demands and the *ownership utility* which is created when the customer have the rights to use the delivered product. The time added value in time and place utility is based on the companies distribution unit although in the recent years the distribution unit has also contributed to the form utility process (Jonsson, 2008). Getting the right goods at the right times is as important as low costs in todays market place (Bogataj et al, 2005).

### 4.1.3 Intermediary roles

To bridge the gaps between the seller and the buyer a company use different types of intermediaries to handle the distribution functions, such as retailers, different agents and distributors in order to achieve cost-effective bridging. They play a major role to provide the end-customer with products at the best cost and price and the distribution is critical for the companies overall success (Jonsson, 2008; Rushton et al, 2006; ross,
When forming a channel strategy the organization must look at two directions, forwards to its customer but also backwards to its supplier. Using intermediary, such as distributors, wholesalers, retailer, third-party etc., can work on closing several gaps that exist between production and consumption in a more cost effective way. There are several distribution structures for the flow of goods, and it differs between one company to another, such as the types of intermediaries a company chooses to use, how many companies that handle the product and if a company uses different intermediaries at different levels (Rushton et al, 2006). Direct distribution takes place when the producer handles the physical flow of goods directly to the end-customer. However, the flow of goods is often set up by several parties, for example a third party distribution company that performs all or parts of a company’s distribution functions. This is very common for services such as transportation, warehousing, distribution and the use of a third-party distribution companies is increasing (Rushton et al, 2006; Colye, 1996).

### 4.1.4 The Role of Distribution Center

According to Russell and Taylor (2009), distribution centers incorporate warehousing and storage. It is a place, a building that receives, handles, store, package, and then ships the goods. Warehousing is many times defined as the storage of goods, but it also includes facilities and the location of the facility. It is the point in the logistics system, where raw materials, semi-finished goods or finished goods are held in various period of time. There are several value-adding roles in warehousing, two examples are the transportation consolidation where distribution centers or warehouses receive different volumes and then consolidate smaller shipments to larger shipment, which is a great advantage in transportation savings. Another example is the ability to have mix products at the warehouse according to the customer order (Jonsson, 2008; Coyle, 1996). There are also different types of distribution centers depending on what is most suitable for the physical distribution structure; distribution centers that receives finished goods with the purpose of holding the stocks, distribution centers that are central, regional or local, and distribution centers that acts as intermediary points for further transfer. Distribution center play an important role in transportation and logistics (Wang et al, 2012). The strategy of a distribution center location is aimed to establish the most appropriate combination of storage and transportation to achieve high delivery service to the customers (Rushton et al., 2006).
There are different structures of distribution. Figure 9 illustrates a typical channel of distribution according to Rushton et al. (2006)

![Typical Channel of Distribution](Figure 9. Typical Channel of Distribution)

**4.1.5 Distribution of Perishable Goods**

Perishables are not always but usually foodstuffs and include frozen produce, meats, seafood, dairy products, fresh flowers, fruit and vegetables to mention a few. Something that is easily injured or destroyed is described to be “perishable”. Perishables need to be treated carefully in order to keep its value, since it is sensible products. There are a lot of influences that can affect the quality of perishable during its useful life (Osvald and Stirn, 2008; Tsiros and Heilman, 2005; Frith, 1991). Many foodstuffs, such as fruits and vegetables have a fixed known lifetime, which means they have an expiration date. The produce that remains unsold by the expiration date must be moved from inventory and is considered outdated but in some cases sold at a discounted price (Hahn et al, 2004).

In the case of fruit and vegetables the producer needs to carry out the harvesting at the correct maturity as well as the packaging to keep the quality during transfer that can keep the effect on air conditions and cooling. The temperature is extremely important
both for long and short transportations, and there is regulations in Europe and developed countries to control different steps of the chain (Bogataj et al, 2005; Tsiros and Heilman, 2005; Frith, 1991). However, temperature and other preservation control are essential at each stage of the supply chain, in order to keep the quality of the produce until it reaches the end-consumer. The temperature is not only important for the quality, it is also essential to keep the final consumer safe from different hazards. Food safety regulations used by many countries are; product temperature regulation throughout the supply chain, recording of air and product temperature in refrigerated vehicles as well as standardized equipment used for controlling (Bogataj et al, 2005). Travel time plays an important role in the distribution of perishable goods, the longer it spends in transit, the shorter the lifetime becomes (Oswald and Stirn, 2008). Many times the quality of the goods is the main factor for many consumers where to purchase the fruit and vegetables (Aiello et al, 2012) and according to Heller (2002) perishables have become the main reason for many consumers to choose one supermarket over another.

4.1.6 Distribution in the Food Industry
There have been some major developments in the grocery distribution such as having higher concentration of production and storage and sales have taken a more spatial form as well as an increased tendency to have food distribution through wholesaler distribution centrals. Through these developments, several changes have occurred in how the groceries are transported, for e.g. numbers of serving depots and warehouses are increasing. The average distance between the producer and the consumer has due to the concentration on production increased, while intermediate has made the route between delivery centers and consumer more direct (Meidem, 1995).

4.2 Empirical Data for Present Distribution Structure

In this section the case companies SOL’s and Samodlarna’s will be presented followed by a presentation of SOL’s and Samodlarna’s present sales to Coop and ICA and an illustration of the locations of Coop’s and ICA’s warehouses.

4.2.1 Company Presentation

In this section the case companies SOL and Samodlarna will be presented. Firstly company fact will be summarized followed by an illustration of their presence. Secondly a description of SOL’s and Samodlarna’s business process is described and illustrated. Lastly SOL and Samodlarna’s present distribution structure is described and illustrated.
4.2.1.1 Svenska Odlarlaget

Svenska Odlarlaget (SOL) is a Producer Organization (PO) in southern Sweden under the EU regulations for fruit and vegetable producers. They have approximately 80 producers across southern Sweden, see figure 10 below for illustration and their annual turnover in 2012 was 270 million SEK. They are one of the major players in the country in terms of sales of greenhouse vegetables and fruits. The company’s head office as well as distribution center is located in Helsingborg, Sweden. To provide a sustainable and cost effective way to sell the members produce to wholesale customers are the organizations goal. The wholesale customers then distribute the products to retail chains and food service companies (Svenska Odlarlaget, 2012). Their largest customers are ICA and COOP, ICA accounts for 33 percent of their sales and Coop 30 percent (Mr. Levin, distribution center manager, 2/5/2013).

The business concept in the long-term is to have: transparency, fairness, quality, cost effectiveness and comprehensive offerings. This creates openness and justice among all members of the organization. They use vegetable auction as their selling techniques for 50 percent of their capacity, which offers the customer with quick handling, fresh products and at the same time sets a price that benefits both the customers and the members of the PO. Remaining volumes are sold by business agreements, annual contracts, weekly rates and daily price over the telephone. Svenska Odlarlaget has the ambition to work towards sustainable development with an environmental approach and with concern about the consumers’ health. The ambition is to increase consumption of Swedish-grown green quality. This is done through increased sales under the production quality-brand Svenskt Sigill and Odlarna.se (Svenska Odlarlaget, 2012; Mr. Olofsson, Managing Director at SOL, 21/3/2013).
Geographical Location of SOL’s producers

Figure 10. Geographical Location of SOL’s Producers

SOL’s Business Process

Figure 11 illustrates a model that shows the process of how the produce move from producer to customer.

Information
Transportation

Figure 11. SOL's Business Process
The process of the produce movement starts with a notification (1) of the delivery capacity from the producers to SOL’s distribution center. It can either be done by telephone or added straight into the data system, at latest by 13:30, and then the information is transferred to SOL’s database. The goods are available at SOL’s distribution center the next day. When SOL has the information about the capacity of goods for delivery (2), they have different options for the sales process (3). Approximately 50 percent of the fruit and vegetables are sold through an auction this is mainly tomatoes and cucumbers, while 50 percent are sold with orders from the customers or with weekly or year agreements. The auction takes place at SOL’s distribution center at 15:00 o’clock, where the customers bids on vegetables and fruits either in person or over the phone. The next day the goods from the producers are available for the customer at the distribution center. The distribution from the producers to the distribution center is done by a third party or the producers themselves (4). The produce that is sold towards orders is available the next day as well. It is the customers responsibility to collect the purchased produce at the distribution center of SOL (5).

**Present Distribution Structure**

SOL has a distribution center in Helsingborg, Sweden where their produce is gathered. The customer then collects the produce at the distribution center after the purchase (3a). The distribution from producer to the distribution center is done either by the producers themselves, this option is used by 15 percent of the producers, or they use a third party offered by SOL (1a). A small part of the produce for SOL, 3 percent, is distributed directly to the end-customers (2a), without being transported to the distribution center in Helsingborg first (Mr. Olofsson, Managing Director SOL, 24/4/2013).
4.2.1.2 Samodlarna

Samodlarna produces ecological fruit and vegetables. They are the largest PO in Sweden for ecological vegetables and fruits. The PO was founded in 1986. Their goal is to provide all Sweden’s consumers with a wide variety of ecological produce. Samodlarna’s strength is flexibility, quality, and diversity. They have approximately 100 producers across Sweden. They have had this number of farmers over the last ten years, but the farmers have grown bigger. At the time of this research 19 producers were actively producing in the organization, see figure 12 below for illustration. In 2011 their annual turnover was approximately 35 million Swedish kronor. The producers active in Samodlarna can by selling their produce together offer larger quantities and have a stronger position for negotiations with large customers. Their largest customer today is Coop, they account for 70 percent of the sales (Samodlarna, 2013 and Nilsson, 2007).

Geographical Location of Samodlarna’s producers

![Geographical Location of Samodlarna's Producers](image)

Figure 12. Geographical Location of Samodlarna's Producers
Samodlarna’s Business Process

Figure 13 is a model that shows Samodlarna’s present business process, it illustrates how the produce moves from producer to customer.

Figure 13. Samodlarna's Business Process

The process of the produce movement starts with a notification (1) of the delivery capacity from the producers to Samodlarna’s sales office in Nacka, Sweden. Samodlarna sell their produce towards orders form customers (2). The sales office in Nacka distributes the orders between producers (3). The distribution from the producers is done by a third party. For orders that are not fulfilled by one producer or where there the delivery is not agreed upon to be straight from producer to customer the third party transport the produce to their distribution center, which is located in Helsingborg (4). At the distribution center produce are gathered to fulfill the orders and then the produce is either delivered to the customers or the customers collect it themselves (5). If one producer is able to fill one order and it is agreed upon with the customer, the produce can be delivered directly to the customer by the third party (6). If a consumer is
interested in purchasing Samodlarna’s fruit and vegetables they can call or email Samodlarna and they will guide them to a store that sells it (Mr. Olofsson, Managing Director SOL, 9/4/2013; Ms. Sterneborn, Managing Director Samodlarna, 11/4/2013).

**Present Distribution Structure**

The distribution of Samodlarna’s produce is done by a third party. A large part of the produce from the producer is transported to the third party’s distribution center in Helsingborg (1b), where either the customers collects it or the third party transport it to the end-customer (3b). A small part of the produce for Samodlarna is distributed directly to the end-customers (2b), without being transported to a distribution center in Helsingborg first (Ms. Sterneborn, Managing Director Samodlarna, 11/4/2013).

Samodlarna’s Distribution Structure / Produce Flow

![Diagram of Samodlarna's Distribution Structure](image)

**4.2.2 Present Sales to Coop and ICA**

SOL and Samodlarna produce is today sold to Coop and ICA’s central procurement departments and transported to their warehouses from SOL’s distribution center in Helsingborg and Samodlarna’s third party distribution center also located in Helsingborg. From the warehouses Coop and ICA distributes it to their stores. 3 percent of SOL’s produce is today sold and transported directly to Coop and ICA stores, since this is a very small part of their total sales this will be excluded for the remaining part of this paper. In order to be able to complete research question two, to see how the present distribution structure meets the requirements from Coop and ICA for locally produced fruit and vegetable it is necessary to know the location of Coop and ICA’s warehouses. Coop has warehouses across Sweden with the three largest being located in Bro, Enköping, and Västerås. ICA’s warehouses are located in central and southern Sweden. See illustration below in figure 14.
### Coop’s Warehouses

<table>
<thead>
<tr>
<th>Location</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malmö</td>
<td>Skåne- Halland, Skåne- Blekinge</td>
</tr>
<tr>
<td>Växjö</td>
<td>Småland</td>
</tr>
<tr>
<td>Umeå</td>
<td>- Västerbotten</td>
</tr>
<tr>
<td>Luleå</td>
<td>- Norrbotten</td>
</tr>
<tr>
<td>Karlstad</td>
<td>Värmland</td>
</tr>
<tr>
<td>Gävle</td>
<td>Gästriket och Dalarna</td>
</tr>
<tr>
<td>Bro</td>
<td>Stockholm, Mälardalen, Gotland</td>
</tr>
<tr>
<td>Västerås</td>
<td>Stockholm, Mälardalen, Gotland</td>
</tr>
<tr>
<td>Enköping</td>
<td>Stockholm, Mälardalen, Gotland</td>
</tr>
</tbody>
</table>

*Table 5. Locations of Coop’s Warehouses*

### ICA’s Warehouses

<table>
<thead>
<tr>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helsingborg</td>
</tr>
<tr>
<td>Borlänge</td>
</tr>
<tr>
<td>Kallhäll</td>
</tr>
<tr>
<td>Kungsålv</td>
</tr>
<tr>
<td>Västerås</td>
</tr>
</tbody>
</table>

*Table 6. Location of ICA’s Warehouses*
4.3 Analysis for Present Distribution Structure

This section will analyze research question 2 in two sections. First the empirical data on the present distribution structure of SOL and Samodlarna will be analyzed with theory. The second section will analyze how well SOL and Samodlarna meet Coop’s and ICA’s requirements on locally produce food.

Research Question 2: How does the present distribution structure of Svenska Odlarlaget and Samodlarna meet the requirements from Coop and ICA for locally produced fruit and vegetables?

4.3.1 Analysis of the Present Distribution Structure of SOL and Samodlarna

In this section the empirical data about the present distribution structure of SOL and Samodlarna will be analyzed with the theory about distribution.

In the industry of perishable goods the distribution structure varies and there is no clear answer of what structure is most favorable (Meidem, 1995). It is essential that the distribution structure offer high delivery service for a company to be competitive and profitable. This can be accomplished by keeping the delivery times as short as possible (Jonsson, 2008; Chopra 2007; Rushton et al, 2006; Ross 2004.). The structure for the distribution can differ between companies; one example can be the type of intermediaries a company chose to use for their flow of goods. The use of intermediaries can help the company close the gaps between production and consumption in a cost effective way. A common way to distribute goods is using a third party distribution company that handles parts of a company’s distribution (Rushton et
al, 2006; Ross 2004; Colye 1996). Today SOL and Samodlarna have different distribution structures. They have chosen different approaches to create customer satisfaction. SOL has their own distribution center and uses a third party for the distribution of their produce from producer to distribution center. Samodlarna uses a third party for both their distribution and the storage of the produce.

Providing the right goods at the right time is as important as low costs in today’s market place (Bogataj et al, 2005). In SOL’s case having their own distribution center adds value to their customers by providing; form, place, time, and ownership utility (Jonsson, 2008). SOL creates form utility through labeling and packaging according to orders. This is done either at the producer or at SOL’s distribution center. Gathering all produce at the delivery center and making it available for procurement creates place utility. SOL has a standardized distribution structure that assures that the produce is available to the customer at the same time every day this creates time utility. Ownership utility is created as soon as the customers purchase the produce. It is then up to the customer to collect the produce or make arrangements with SOL about storage time at SOL’s distribution center. In Samodlarna’s situation they cannot create these values for their customers since they use a third party for all their distribution. By doing this they shift the responsibility of creating the values from themselves to the third party.

In SOL’s case providing the different distribution utility values creates a better physical link to the customer by providing them with the goods at the decided place and at the decided time. This creates trust and confidence from the customers in SOL. Samodlarna’s physical link with the customer is weaker than SOL’s because Samodlarna loses parts of control over their produce as soon as it leaves their producers with the third party. This means Samodlarna puts a lot of confidence into the third party that they will create the utility values the customers wants.

Since SOL and Samodlarna are in business with perishable goods they need to treat their produce carefully in order to for it to keep its value. The produce has a fixed know lifetime and in this time the produce needs to be harvested, packaged, transported and sold. During all the stages it is important to have control in order to keep the quality and freshness until it reach the end-customer. There are EU regulations in the European union to assure that the produce is safe and of good quality throughout the entire
process (Bogataj et al, 2005, Frith, 1991). Both SOL and Samodlarna follow the regulations for their produce to ensure the quality and freshness and to meet the requirements of their customers.

4.3.2 Analysis of how SOL and Samodlarna meet Coop’s and ICA’s requirements for locally produce food.

This section analyzes how SOL and Samodlarna can sell their produce as locally produced to Coop and ICA under their requirements with the current distribution structure.

Coop’s and ICA’s requirement on Locally Produced

<table>
<thead>
<tr>
<th>Requirements on Locally Produced</th>
<th>Coop</th>
<th>ICA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locally produced area requirements</td>
<td>Local produced within 3 km. For regionally produced area is set according to customers demands in the region</td>
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<tr>
<td>Transportation requirements</td>
<td>Produce needs to stay within the regions boarder</td>
<td>No transportation requirements.</td>
</tr>
<tr>
<td>Quality requirements</td>
<td>Same quality standards as other produce</td>
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<tr>
<td>Label requirements</td>
<td>Labeled with ”mat från regionen” (food from the region)</td>
<td>No central requirements. Each store decides the labeling.</td>
</tr>
</tbody>
</table>

Table 4. Summary of Coop’s and ICA’s Requirements for Locally Produced

4.3.2.1 How SOL meets Coop’s requirements for locally produced

Coop has clear restrictions for the produce they sell as locally produced including that the produce has to follow the same quality standard as other produce. For produce to be sold as local produce the restriction is that it needs to be produced within three kilometers surrounding the city area. All SOL’s produce is collected and stored in their distribution center in Helsingborg. Because of this only the produce from producer three kilometers from Helsingborg can be sold as local produce to a Coop store within the same area.

For produce sold as regional produce, which is still locally produced, Coop has a restriction that the produce cannot leave the region. The regions are set on a case-to-case bases, but there are central guidelines on regions. SOL has producers in four of Coop’s regions; Skåne-Halland, Skåne-Blekinge, Småland, and Mälardalen-
Stockholm- Gotland. Since all the produce from the producers are first collected and stored in Helsingborg, it is only the produce from Skåne-Halland and Skåne-Blekinge that can be sold as regional produce since this produce never leaves the region. For the produce to be sold as regional, it is essential that the produce is not mixed in the distribution center in Helsingborg with produce from other regions. For regional food Coop has a label to inform the customer that the food is produced in their region. Since it is Coop responsibility to label their products, this does not affect the work at the distribution center in Helsingborg.

4.3.2.2 How Samodlarna meets Coop’s requirements for locally produced
Samodlarna has producers in Skåne-Halland, Småland, Mälardalen- Stockholm-Gotland, and Värmland of Coop’s regions. Samodlarna’s produce is transported by a third-party to a distribution center in Helsingborg; because of this only the produce produced in the region Skåne- Halland can be sold as locally produced. For Samodlarna this means that only the producers located in Halland can sell their produce as locally produced. The rest of Samodlarna’s produce does not follow Coop’s requirements for what can be sold as locally produced.

4.3.2.3 How SOL and Samodlarna meets ICA’s requirements for locally produced
ICA has no central requirements for locally produced except that it is produced in Sweden and follows the same quality standards as other produce. In theory this makes it possible for both SOL and Samodlarna to sell all their produce as locally produced to all ICA stores in Sweden. However, it is up to each ICA store to set their own requirements, which often reflects the customer demands for that specific store and location. This limits the produce SOL and Samodlarna can sell to ICA stores as locally produced. ICA has no restrictions on labels and also this is up to the stores to decide.

If it were to be assumed that all ICA stores set their regional requirements after what consumers believe to be locally produced, which is according to 77 percent in a YouGov survey (2010) that the produce is produced and transported within 200km from the selling point (Ekstrand and Grahn, 2010). Then only some of SOL’s producers and Samodlarna’s producers situated in Halland, Skåne, Småland, and Blekinge would be able to sell produce as locally produced to ICA with the current distribution structure. For SOL this is because ICA has a warehouse in Helsingborg to where SOL sells most of the produce sold to ICA. From this warehouse ICA stores can purchase the produce
and ICA stores from within the 200km region would be able to purchase the produce produced by SOL’s producers within the same region and sell it as locally produced in their stores. For Samodlarna’s produce from Halland it works the same way, but the rest of their produce would have been transported too far to be classified as locally produced in ICA stores.

4.3.2.4 Summary of how many of SOL’s and Samodlarna’s producers that meets Coop’s and ICA’s requirements for locally produced.

Table 7 summarizes how many producers can sell their produce as locally produced under the present distribution structure to Coop and ICA.

<table>
<thead>
<tr>
<th>Present Distribution Structure</th>
<th>Coop</th>
<th>ICA</th>
</tr>
</thead>
</table>
| SOL                           | 70 out of 73 Producers  
Producers located in Skane  
Halland Blekinge | Theoretically all producers  
With assumption of 200km radius: 70 out of 73 Producers |
| Samodlarna                    | 3 out of 19 Producers  
Producers located in Halland | Theoretically all producers  
With assumption of 200km radius: 3 out of 19 Producers |

Table 7. Producers that sell their Produce as Locally Produce with Present Distribution Structure
5.0 Localization of New Distribution Center

The aim of this chapter is to gather theory and empirical data to analyze to answer research question 3:

“Where should a new distribution center be geographically located for as many of Svenska Odlarlaget and Samodlarna’s producers as possible to be able to sell their fruit and vegetables as locally produced according to Coop’s and ICA’s requirements.”

The theory section studies distribution strategy planning together with theory for different approaches for where locate a new distribution center. The empirical data presents the current location of the producers and their volumes as well as the location of SOL’s and Samodlarna’s customers Coop and ICA. The method that is used to analyze the best location for a new distribution location is the center of gravity method.

Figure 15. RQ 3 Structure

Figure 15 illustrates the structure for chapter 5, Localization of new Distribution Center.

5.1 Theory for Distribution Strategy planning and Localization
5.1.1 Distribution Strategy Planning

There are several matters that need to be dealt with when developing a distribution strategy, and if the system has been in place for a number of years it is often a good idea to reevaluate it against the current business situation. The planning of distribution needs to work with both short-term and long-term views. Short-term planning normally covers a calendar year, also called operational planning, while long-term covers five or more years and is also known as strategic or resource planning. The operational planning of distribution normally concerns the day-to-day management of the system, such as vehicle scheduling, lead-times, inventory replenishment, warehouse utilization etc. The strategic planning of distribution is more concerned about numbers and locations of delivery centers, if there are any changes in the transport mode or new channels of distribution. The first matter to deal with when planning the distribution is to link the distribution to the corporate strategy. This can be achieved by making distribution a central part of the corporate plan, and that factors from the function is used as inputs in the planning process. The second is how the distribution is integrated in the competitive strategy. This will vary from company to company, and often other functions such as marketing will have to be included to understand the fully integrated nature of distribution. The third is the logistics strategy; where a distribution plan is developed based on the company’s business and competitive strategy. The steps are illustrated in figure 16. Inventory strategy, warehousing strategy, transport strategy and customer communication strategy should all be included in the core of the distribution planning. These will support the decisions on the amount of stock, the numbers of stockholding points, the location of delivery centers, vehicle utilization targets, transport modes, as well as order cycle times and order processing. (Rushton et al, 2006; Christopher, 1985).

5.1.2 Changes to the Distribution

There are several aspects in the business environment such as changes that influences the logistics and distribution network and that might suggest that a revaluation of the network is performed. Examples of changes can be; changing customer service requirements or shifting location of customer or supply markets, change in corporate ownership, cost pressure, competitive capabilities, and corporate organizational change. All of these changes do not happen at once to one firm, but they are all changes that happen in the business environment rather frequently (Coyle, 1996).
5.1.3 Distribution Planning Model
Rushton et al. (2006) describes an approach to distribution strategy planning, they describe the practical steps necessary to take when developing a physical strategy from the corporate business plan. The steps are illustrated in figure 17 below.
In this study the researchers will focus on where to locate a new distribution center and will therefore only discuss the Logistic Option analysis step.

### 5.1.4 Localization of Distribution Center

The location of distribution centers in the distribution network is recognized to be one of the most crucial elements in the determining the efficiency and success of a product flow (Liu et al., 2011). When deciding on where to locate a new distribution center it is important that it is long-term planning because today’s decision on distribution center location will have a long-term affect on several business departments such as marketing and sales and on future costs. It is important that the distribution center location takes into consideration anticipated business conditions and is flexible and responsive to the customers needs as their demands may change in the future (Russell and Taylor 2009; Rushton et al., 2006; Kuo and White, 2004; Randawa and West, 1995). The optimal location of the distribution center does not have to be the location that reduces transportation costs the most, but the location that also improve the business performance and increase competitiveness (Thai and Grewal, 2005). The location of a new distribution center might result in productivity improvements, and an improved distribution network; however if the location of the new distribution center is wrong this can cause productivity problems, transportation system inefficiency, and increased
capital expenditure (Russell and Taylor 2009; Rushton et al., 2006; Kuo and White, 2004; Randawa and West, 1995).

5.1.5 Logistic Option Analysis

**Sourcing model**

The first step in justifying a logistic system is to investigate the optimal sourcing patterns. With multiple products from multiple sources it might be tempting to source the markets with the closest plant, however if it is not always possible for that plant to produce, it might be more efficient to have sourcing from further away, or if the customers have certain requirements. Also one pattern might not be sufficient because of changes in the market conditions, product price, and transportation cost. With the help of linear programming the optimal sourcing solution can be attained. All available sources are described with capacities, changeover penalties, raw material costs, and approximate logistic costs and with this linear programing software is available to identify the optimal solution for sourcing (Rushton et al., 2006).

5.1.6 Distribution Center Location Modeling

When information about where the products are located has been gathered, the next step is to develop the most suitable distribution structure for the flow of products. This includes deciding on the most appropriate number of distribution centers, the type, and the location of them (Russell and Taylor, 2009). The decision involves both quantitative and qualitative factors, and is a very time and effort consuming challenge for the responsible professional (Liu et al., 2011). Due to the fact that there are many different factors involved over time, many different models have been developed with different levels of simplicity (Klose and Drexl, 2005). There is no single model or technique that will select the best location for all organizations (Russell and Taylor, 2009). The principle modeling techniques to be covered here are optimization and heuristic, and simulation technique.

One way to solve the dilemma of where to place the delivery centers is by the use of optimization model, which is mathematical programming, such as linear programming. The programs use a logical step-by-step procedure to reach the best solution. A major drawback of these systems is that they can be inadequate, and the best solutions might not be the best solution for the overall picture. An operational research technique that is
also widely used is simulation. This technique is capable of representing complex problems and cost relationships. It does not produce best solutions, but it can describe relationships and evaluate different alternatives. A carefully derived simulations model used with the experience and expertise of a distribution specialist is likely to result in acceptable solutions that can be implemented and it is therefore no drawback that the technique does not produce best solutions. Another method that can be used is the heuristic method. Heuristic is a Greek based word that describes the method of solution that is resulting on a “rule of thumb” principle. In this method common sense and experience is used to reject unlikely solutions from the problem. The heuristic method is often very valid to use for location problems because there is often a couple of solutions that are completely inappropriate (Ruchton, 2006, Coyle, 1996).

After choosing what model to use there are certain steps to go through to decide on the best location. The main steps necessary to take in in order to determine the best suitable location is illustrated in figure 18. It is important throughout the model to test and check the model to make sure that it fits the requirements of the system. After the preliminary solution has been chosen it is important to analyze the model from a ‘what if’ point of view to test the sensitivity of the chosen location if there is a change in the business environment (Ruchton, 2006, Coyle, 1996). In this study the center of gravity location method is used to determine the location for the new distribution center.
5.1.7 Center of Gravity Location Method

The center of gravity method, also called the grid method is a heuristic quantitative method used for deciding where to locate a distribution center that receives goods from several suppliers and distributes the goods to several demand points based on distance and weight (Russell and Taylor, 2009). The greatest benefit of the method is its conceptual simplicity and ease of use. Large problems involving many suppliers and demand points can be dealt with using simple arithmetic (Ballou, 1973). The method determines the least cost center of gravity location within a geographical grid. The method assumes that the company knows how much they consume or sell of each product; it also assumes that the raw material source and finished goods market are fixed. It determines the location of the new distribution center with the help of a grid that is placed over the supply and demand points. The grids zero point, as well as all points in the grid correspond to an actual geographical location. From this grid the company can identify all supplier and demand points in terms of grid coordinates, vertical and horizontal. The center of the mass can then be calculated with the help of the following equation (Russell and Taylor, 2009).
Once both the x and y coordinates are obtained that is the optimum least cost location for the facility from a distribution distance and weight point of view (Russell and Taylor, 2009, Coyle et al., 1996).

The method cannot choose the optimum location under all circumstances. The potential errors of the method are known, but there is a lot of confusion on how much error is expected under different circumstances (Ballou, 1972). The practitioner needs to understand that it is a statistical approach that shows the best location with the current situation. There are several factors that need to be considered, first changes in volume or change in location can have large impacts on the center of gravity. Second, the optimal location might be in a location that is not geographically possible, such as in the middle of a lake. Third, the method does not consider the actual movement of the goods, goods do not move vertically and then horizontally. Fourth, it assumes transportation rates to be linear and in reality this might not be the case (Rushton et al., 2006). Randawa and West (1995) also states that other attributes that influence the decision of location is not included in this model, such as taxes, legal requirements, and community attitudes.

5.2 Empirical Data for Localization of new Distribution Center

In this section the data that will be used in the center of gravity method to calculate the location for the new distribution center is presented. The data includes the location of
the chosen producers and their volume together with the location and purchasing volumes of Coop and ICA.

5.2.1 Data for the Center of Gravity Method

To calculate a location for the new distribution center the center of gravity method will be used. Some assumptions were made to choose the most appropriate data to use in the method. Producers that are located in Skåne, Halland and Blekinge are excluded in the method because they will continue to use the distribution center in Helsingborg. ICA’s warehouse in Västerås is also excluded because they do not purchase anything from SOL or Samodlarna today. SOL sells 33 percent of their produce to ICA, of these 28 percent is sold to Borlänge, 27 percent to Helsingborg, 23 percent to Kungälv, and 22 percent to Kallhäll. Samodlarna sell 1 percent of their produce to ICA and it is assumed that it is all to ICA in Helsingborg. For Coop their warehouses located in the northernmost parts of Sweden are excluded, this includes the three warehouses located in Gävle, Luleå and Umeå. SOL sell 30 percent of their produce to Coop these 30 percent are in the method divided on the Coop warehouses as follows; 11.11 percent to Malmö, Växjö and Karlstad, and 22.22 percent to the larger warehouses in Bro, Enköping, and Västerås. Samodlarna sell 70 percent of their produce to Coop these 70 percent are in the method distributed over Coop’s warehouses as follows; 11.11 percent to Malmö, Växjö and Karlstad, and 22.22 percent to the larger warehouses in Bro, Enköping, and Västerås.

<table>
<thead>
<tr>
<th>Location</th>
<th>Zip codes</th>
<th>Loads in kg (w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gotland</td>
<td>62183</td>
<td>120000</td>
</tr>
<tr>
<td>Gotland</td>
<td>62183</td>
<td>601000</td>
</tr>
<tr>
<td>Gotland</td>
<td>62183</td>
<td>2500</td>
</tr>
<tr>
<td>Gotland</td>
<td>62183</td>
<td>586000</td>
</tr>
<tr>
<td>Gotland</td>
<td>62183</td>
<td>397000</td>
</tr>
<tr>
<td>Gotland</td>
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<td>4000</td>
</tr>
<tr>
<td>Gotland</td>
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<td>35000</td>
</tr>
<tr>
<td>Gotland</td>
<td>62183</td>
<td>6800</td>
</tr>
<tr>
<td>Gotland</td>
<td>62183</td>
<td>2500</td>
</tr>
<tr>
<td>Gotland</td>
<td>62183</td>
<td>6900</td>
</tr>
<tr>
<td>Gotland</td>
<td>62183</td>
<td>350000</td>
</tr>
</tbody>
</table>
5.3 Analysis for Localization of Distribution Center

Before the center of gravity calculation is performed the theory about distribution structure and localization of distribution center is analyzed with empirical. The center of gravity calculation is then performed and the result is analyzed. This analysis is performed with the help of a sensitivity analysis. After the location for the distribution center has been decided on an analysis is conducted to see how SOL and Samodlarna’s meet Coop’s and ICA’s requirements on locally produce food with the new distribution

<table>
<thead>
<tr>
<th>Location</th>
<th>Code</th>
<th>Volumes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gotland</td>
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</tr>
<tr>
<td>Jönköping</td>
<td>55466</td>
<td>25000</td>
</tr>
<tr>
<td>Östra Skymnäs</td>
<td>66195</td>
<td>35000</td>
</tr>
<tr>
<td>Öland</td>
<td>38792</td>
<td>40000</td>
</tr>
<tr>
<td>Skara</td>
<td>53237</td>
<td>480000</td>
</tr>
<tr>
<td>SOL’s Producers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Väderstad</td>
<td>59022</td>
<td>300000</td>
</tr>
<tr>
<td>Linköping</td>
<td>58729</td>
<td>25000</td>
</tr>
<tr>
<td>Högsby</td>
<td>57992</td>
<td>450000</td>
</tr>
<tr>
<td>ICA’s Warehouses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helsingborg</td>
<td>25661</td>
<td>98270</td>
</tr>
<tr>
<td>Borlänge</td>
<td>78462</td>
<td>71610</td>
</tr>
<tr>
<td>Kallhäll</td>
<td>11396</td>
<td>56265</td>
</tr>
<tr>
<td>Kungälv</td>
<td>42290</td>
<td>58822</td>
</tr>
<tr>
<td>Coop’s Warehouses</td>
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<td></td>
</tr>
<tr>
<td>Malmö</td>
<td>21226</td>
<td>253077</td>
</tr>
<tr>
<td>Växjö</td>
<td>35261</td>
<td>253077</td>
</tr>
<tr>
<td>Umeå</td>
<td>90353</td>
<td>0</td>
</tr>
<tr>
<td>Luleå</td>
<td>97452</td>
<td>0</td>
</tr>
<tr>
<td>Karlstad</td>
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<td>253077</td>
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<tr>
<td>Gävle</td>
<td>80641</td>
<td>0</td>
</tr>
<tr>
<td>Bro</td>
<td>19792</td>
<td>506154</td>
</tr>
<tr>
<td>Västerås</td>
<td>72159</td>
<td>506154</td>
</tr>
<tr>
<td>Enköping</td>
<td>74592</td>
<td>506154</td>
</tr>
</tbody>
</table>

Table 8. Location and Volumes for Producers and Warehouses
center. Lastly an analysis of SOL’s and Samodlarna’s new situation with the new distribution center is conducted.

Research Question 3: Where should a new distribution center be geographically located for as many of Svenska Odlarlaget and Samodlarna’s producers as possible to be able to sell their fruit and vegetables as locally produced according to Coop’s and ICA’s requirements.

5.3.1 Analysis of Localization of Distribution Center

In the business environment changes to customer service requirements or shifting location of customers or supply markets occur rather frequently. When these changes occur it influences the distribution network and revaluation of the network ought to be performed to satisfy the new aspects of the business environment (Colye, 1996).

With the merge SOL and Samodlarna are changing their corporate structure and they need to have one central corporate strategy. Having one central corporate strategy will help SOL and Samodlarna meet their objective, which is stated in SOL’s and Samodlarna’s press release (2013a): “It is too in a more efficient way satisfy the demands today’s and tomorrow’s producers, customers, and consumers will put on good healthy products and environmental friendly and cost-effective logistics”. In this new corporate strategy the distribution needs to have a central part. It is important to link distribution to the corporate strategy. Factors from the distribution should be used in the planning process to ensure that the distribution structure can satisfy the demands from the customers and also work towards becoming more environmentally friendly and cost effective. From the corporate strategy the competitive strategy is developed. It is important to include distribution factors in the competitive strategy. There is a consumer trend to purchase locally produced produce (Jordbruksverket, 2012). SOL and Samodlarna wants to market and sell more produce as locally produced and to be able to do this their distribution plays a vital role. With the current distribution structure only some of SOL’s and Samodlarna’s producers can sell their volumes as locally produced therefore they need to revaluate their current distribution structure. It important that the distribution structure enables SOL and Samodlarna to offer their produce as locally produced. TO do this SOL and Samodlarna have decided to add a new distribution center in their distribution. This will give SOL and Samodlarna a greater competitiveness in the market. From the corporate and competitive strategy a
distribution strategy is develop to meet the goals of the organization. With this new
distribution center SOL and Samodlarna wants to provide more of their producers with
the ability to market and sell their produce as locally produced. With the new
distribution center parts of unnecessary transportation will be avoided. The new
distribution center will strengthen SOL’s and Samodlarna’s market position, and they
will more successfully meet the customer’s demands. A new distribution center can also
attract more producers in the surrounding areas to join the producer organization of
SOL and Samodlarna and increase their product portfolio.

Where to locate the distribution centers in a distribution network is recognized to be one
of the most crucial elements in determining the efficiency and success of a product flow
(Liu et al, 2011). The decision on where to locate the distribution center needs to take
the long-term and anticipated business conditions into consideration. This is because it
will have an affect on several business departments and the overall success of the
business (Russell and Taylor, 2009; Rushton et al., 2006; Kuo and White, 2004;
Randhawa, West, 1995). The best location for the distribution center does not
necessarily lead to decreased transportation costs, but the location can lead to other
improvements such as increased competitiveness and business performance (Thai and
Grewal, 2010). The deciding factors on where to place the new distribution center
should include both the customers’ requirements and the producers’ capabilities. To add
a new distribution center into their distribution structure might not decrease the costs for
SOL and Samodlarna; however, they will have an increased competitiveness which
enables them to follow the increasing consumer trend to purchase locally produced
produce. The location of the new distribution center should decrease the transportation
for certain producers produce, and this will decrease their environmental impact from
transportation and contribute to making them a more environmentally friendly
organization.

5.3.2 Analysis of Center of Gravity Method

For this study the heuristic method center of gravity method was used to help determine
the location for the new distribution center. The center of gravity method is suitable to
use for SOL and Samodlarna since they have several producers and demand points in
different locations with different weights and distances. According to Ballou (1973) the
simplicity and ease of use is the greatest benefit of this method. There are multiple
producers and demands points in this case and the center of gravity method deal with this data with the use of simple arithmetic.

With the empirical data from section 5.2.1 the center of gravity method will be used to find the location for the new distribution center, but before the calculation was performed a few assumptions were made to the data. For the producers in Gotland it was assumed that their goods are located in Nynäshamn instead because they have to be transported there by sea before they are transported further. Nynäshamn was selected over Oskarshamn which is an alternative port approximately 160 km further south because it is closer to Coops large warehouses in Bro, Västerås, and Enköping, and ICA’s warehouse in Kallhäll and Borlänge, and it is closer to the Stockholm area which is a large potential market.

5.3.2.1 Result from Center of Gravity Method

The table below shows the calculations for, and the results of the center of gravity method.

<table>
<thead>
<tr>
<th>Location</th>
<th>Zip codes</th>
<th>Loads in kg (w)</th>
<th>X-coord</th>
<th>Y-coord</th>
<th>W*X</th>
<th>W*Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samodlarnas Producers</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
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<td>Nynäshamn</td>
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<td>1623572</td>
<td>6533608</td>
<td>194,828,864,000</td>
<td>784,032,960,000</td>
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<td>3,926,698,408,000</td>
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<td>4,058,930,000</td>
<td>16,334,020,000</td>
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<td>586000</td>
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<td>6533608</td>
<td>951,413,192,000</td>
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<td>250000</td>
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<tr>
<td>Location</td>
<td>ICA's Warehouses</td>
<td>Coop's Warehouses</td>
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<td>1,561,112,813,733</td>
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**Table 9. Calculation for Center of Gravity Method**

From the center of gravity method the location for SOL’s and Samodlarna’s new distribution center is established to be in Djurö Kvarn, in the region of Östergötland. When the location has been generated it needs to be assessed if the location is geographically suitable for the new distribution center. According to Rushton et al. (2006) it is also necessary to use experience and common sense to exclude unlikely locations. Since Djurö Kvarn is small village with no large industrial area or any infrastructure appropriate for large vehicles the distribution center will be located in the closest city, which in this case is Norrköping. Norrköping is located 12km from Djurö Kvarn, has good infrastructure and a large industrial area appropriate for a distribution center, and is in close proximity to a large European highway with. All these facctors make Norrköping appropriate for the new distribution center. Figure 19 illustrates the location of Djurö Kvarn and Norrköping.
It is also important to understand that the center of gravity is a statistical approach that shows the best location for the current situation, and changes in volumes or location of supply or customer can have a large impact on the location generated by the method (Rushton et al., 2006) and if the location is wrong it can cause transportation system inefficiency and increased capital expenditure (Kuo and White, 2004; Randhawa, West, 1995). Because of this a sensitivity analysis with two different scenarios will be performed to test the sensitiveness of the generated location.

5.3.2.1 Sensitivity Analysis for Center of Gravity Location

The location generated by the center of gravity method will in this section be tested on how sensitive it is. It will be tested against two scenarios. In the first scenario ten new producers will be added to the analysis to see how sensitive the location is to adding new producers. This scenario was chosen because one of the benefits that can come out of the new distribution center is that new producers join SOL and Samodlarna. In the second scenario ICA and Coop will increase their purchasing quantities by 50 percent. The second scenario was chosen because it is what SOL and Samodlarna want to achieve with the new distribution center. The sensitivity analysis will show if the chosen location can manage these scenarios.

The producers that will be added in scenario one will be added in areas of Sweden that are considered prime farming area. Five will be added on Öland and five will be added
in different locations on Västgötaslätten; Nybro, Hultsfred, Vimmerby, Vetlanda, Åtvidaberg. The median weight of produce by the producers in the center of gravity analysis is 40000kg. Therefore in this sensitivity analysis all the new producers will be assigned a weight of 40000kg. With these new producers the new location of the distribution center would be Eggeby in the region of Östergötland. This location is only 7km from Norrköping, the original location that the center of gravity method calculated for SOL and Samodlarna’s new distribution center. Eggeby is a small village and Norrköping is the closest big city to this location as well, that means that if Eggeby would have been the location suggested by the center of gravity the new location of the distribution center would still have been Norrköping.

In the second scenario the quantities purchased by Coop and ICA are increased by 50 percent. With this increase in quantities the location of the distribution center will be in Isöga in the region of Östergötland. Isöga is located 40km south of Norrköping, the original location generated by the center of gravity method. Just as in scenario one the new location is a small village with Norrköping as the closest big city. This means that if the center of gravity had generated Isöga the new location for the distribution center would have still been Norrkoping because of the developed infrastructure and closeness to the European highway.

Figure 20 below illustrates the location of the two scenario locations and the original location, Norrköping.
These two scenarios show that the location generated by the center of gravity method is not very sensitive to changes in the current situation. In the first scenario if SOL and Samodlarna were to add more producers to their organization the new location for the distribution center would still be at the center of the gravity. The distribution center would still be in the center of the gravity this implies that all the producer and customers would still have approximately the same distance to transport the produce. In the second scenario the customers quantity is increased which leads to a larger change in distance with the new location however the change is not large enough to have any impact on the location of the distribution center. This is because in the region where the two scenarios locations are located Norrköping is the largest city, and the most appropriate for a distribution center. This implies that Norrköping is a location that can be beneficial for SOL and Samodlarna in the long term even if their conditions change.
5.3.3 Analysis of how SOL and Samodlarna meet Coop’s and ICA’s requirements for locally produce food with the new distribution center.

This section analyzes how SOL and Samodlarna can sell their produce as locally produced to Coop and ICA under their requirements with the new distribution center.

5.3.3.1 How SOL meets Coop’s requirements for locally produced with the new distribution center

With a new distribution center located in Norrköping it is possible for all SOL’s producers to sell their produce as locally produced to Coop. The producers located in the regions Skåne-Halland and Skåne-Blekinge will continue to transport their produce down to the distribution center in Helsingborg. The producers in the region of Mälardalen, Stockholm and Gotland will transport their produce to the distribution center in Norrköping. As long as the produce located in Helsingborg is purchased by Coop’s warehouses located in Malmö and Helsingborg, and sold in stores within the regions Skåne-Halland and Skåne-Blekinge that produce can be sold as locally produced. The same is valid for the produce located in Norrköping, as long as it is purchased by Coop’s warehouses located in, Bro, Västerås, and Enköping, and sold in a store in the region of Mälardalen, Stockholm, and Gotland, it can be sold as locally produced.

5.3.3.2 How Samodlarna meets Coop’s requirements for locally produced with the new distribution center

With the new distribution center located in Norrköping it is possible for 16 out of Samodlarna’s 19 active producers to sell their produce as locally produced to Coop. The producers located in Skåne-Halland will continue to transport their produce down to the distribution center in Helsingborg, where it can be sold to Coop’s warehouses in Malmö and Helsingborg and sold in stores within the same region as locally produced. The producers in Gotland, Jönköping, Öland Skara and Östra Skymnäs will transport their produce to the distribution center in Norrköping. The produce from Jönköping and Gotland can then be sold to Coop’s warehouses in Bro, Enköping, and Västerås and to stores in the same region as locally produced because they are located in the same region according to Coop, the region of Mälardalen, Stockholm, Gotland.
85 percent of Coops customers wants to purchase locally produced produce, and with SOL and Samodlarna’s new distribution center SOL and Samoldarna can promote more producers to Coop to provide them with more locally produced produce. This can contribute to Coop increasing their purchasing volumes from SOL and Samodlarna and become an even larger customer to them. For Coop it will assist them meeting their customer’s requests for locally produced produce and help Coop reach their goal to be the top provider of locally produced produce.

The figure (21) below illustrates Coop’s warehouses and regions Skåne-Halland, Skåne-Blekinge and Mälardalen- Stockholm- Gotland together with SOL’s and Samodlarna’s producers and the distribution centers.

![Figure 21. Coop's Warehouses and Regions](image)

### 5.3.3.3 How SOL and Samodlarna meets ICA’s requirements for locally produced with the new distribution center

The fact that ICA does not have any requirements for locally produced produce except that it is produced in Sweden made it theoretically possible for both SOL and Samodlarna to sell their produce to them as locally produced before the new distribution center was added. If it on the other hand were assumed that all ICA stores set their own requirements after what consumers believe to be locally produced then it would not be possible for all producers to sell their produce as locally produced. According to
Ekstrand and Grahn, (2010), 77 percent believes that locally produced produce is produce that is produced and transported within 200km from the selling point. If ICA were to follow this there would be more limitations for the producers. With two distribution centers in different locations in Sweden, more producers will be able to sell their produce as locally produced within this radius. From the distribution center in Helsingborg SOL’s producers in Skåne and Halland and Samodlanarnas producers in Halland and Jönköping will be able to sell their produce as locally produced as long as it is purchased by ICA’s warehouses and stores from within the same radius of 200 km. From the distribution center in Norrköping SOL’s producers in the region of Östragötalands and Småland and Samodlarna’s producers in Gotland, Öland, Jönköping, Skara and Östra Skymnäs will be able to sell their produce as locally produced as long as it is purchased by ICA’s warehouses and stores within the same radius of 200 km.

Today ICA has no central restrictions for locally produced produce, however the consumer trend of purchasing locally produced produce has been increasing. If ICA wants to be the “World Champion” in locally produced produce they need to listen to their customer’s requests. Many customers have higher requirements on the produce than it just being produced in Sweden, such as the produce being produced within 200km of the selling point. ICA could change their restrictions and add central requirements for locally produced produce similar to Coop’s restrictions, the new distribution center of SOL and Samodlarna would enable SOL and Samodlarna to sell their produce as locally produced to a large number of ICA’s warehouses.
Figure 22 illustrate SOL’s and Samodlarna’s Producers, ICA’s Warehouses as well and the Distribution Centers in Helsingborg and Norrköping.

Figure 22. ICA's Warehouses and Regions

5.3.4 Analysis of SOL’s and Samodlarna’s new situation with the new distribution center

According to Rushton et al. (2006) the structure of distribution is essential for a company’s competitiveness and profitability. For SOL and Samodlarna it is important that the distribution structure enables them to offer their produce as locally produced. With the new distribution center in Norrköping the distribution structure will change and provide them with greater competitiveness in the market. The distribution center will enable SOL and Samodlarna to be more flexible and responsive to the customer’s demands and sell more produce as locally produced to Coop and ICA. The distribution center can also help attract new producers because of the possibility it offers to sell produce as locally produced to many customers.

When generating the location for the new distribution center with the help of the center of gravity method information from two directions was used, both forward from the customer and backwards from the producers. This is important to ensure that the distribution center is located in a location that meets the customer demands for locally produced produce and also is beneficial for the producers. In order to ensure that the
location is the most suitable for the new distribution center the location was tested with the help of a sensitivity analysis. In the analysis two different scenarios were used and in both scenarios the location of the distribution center was the same as the original location. This implies that the location for the new distribution center is the most suitable one.

The consumer trend to purchase locally produced produce is increasing and consumers are requesting more locally produced produce. According to (Ipsos-Eureka, 2004) 45 percent of consumers purchase locally produced with the environment in mind and according to (Biel and Magnusson, 2005) consumers are more aware of the impact their purchased produce has on the environment. SOL and Samodlarna have the ambition to work towards sustainable cultivation and environmental friendly distribution. With the new distribution central the transportation can become more effective and shorter, which will decrease the produce environmental impact. According to Oswald and Stirn, (2008) transportation time has a large impact on the produce known life cycle. The longer it spends in transit the poorer the quality and freshness is when it reaches the customer. According to Aiello et al. (2012) and Heller (2002) the quality of the produce is the main factor for many consumers when deciding where to purchase their produce. The new distribution structure with two distribution centers will decrease the transport for a large quantity of SOL’s and Samodlarna’s produce and thereby offer their customers produce with a longer lifetime and higher freshness.

Having a new distribution center adds value to the company because it provides them with the ability to in an enhanced way physically move the goods to the desired place and at the requested time. With this more of Coop’s and ICA’s warehouse will be able to purchase produce from SOL and Samodlarna as locally produced. The decision to establish a new distribution center might not be the cheapest alternative to change the distribution structure however according to Bogataj et al. (2005) getting the right goods at the right times is as important as low costs in todays market place. This indicates that even thought it might be costly for SOL and Samodlarna to establish the new distribution center the benefits can outweigh the negative aspects.

Table 10 below summarizes how many of SOL’s and Samodlarna that can sell their produce as locally produced to Coop and ICA with the new distribution center.
New Distribution Structure | Coop | ICA |
--- | --- | --- |
SOL | 73 out of 73 Producers located in Skane Halland Blekinge | Theoretically all producers With assumption of 200km radius 73 out of 73 |
Samodlarna | 16 out of 19 Producers located in Halland | Theoretically all producers With assumption of 200km radius: 19 out of 19 producers |

Table 10. Producers that sell their Produce as Locally Produced with New Distribution Structure

6.0 Conclusion

In this section the three research questions will be answered and suggestions for future studies will be made.

6.1 Answers to Research Questions

To answer research question 1; What are Coop’s and ICA’s requirements on fruit and vegetables to sell it as locally produced?, theory about the concept locally produced was reviewed as well as the trend amongst consumer to purchase locally produced products. This was done to develop an understanding of the concept before gathering empirical data on the subject from Coop and ICA. The empirical data was gathered to obtain information about Coop’s and ICA’s requirements for locally produced fruit and vegetables.

Before answering research question 2; How does the present distribution structure of Svenska Odlarlaget and Samodlarna meet the requirements from Coop and ICA for locally produced fruit and vegetables?, theories about the importance of distribution structure and distribution of perishable goods were studied to gain an understanding of distribution structures. To answer research question 2 the distribution structure for both SOL and Samodlarna needed to be assessed. This together with Coop’s and ICA’s requirements from research question 1 answered research question 2.

After assessing SOL’s and Samodlarna’s present distribution structure and how they meet the requirements from Coop and ICA for locally produced produce, different theories about localization of distribution center were reviewed to be able to answer research question 3; Research question 3: Where should a new distribution center be geographically located for as many of Svenska Odlarlaget and Samodlarna’s producers
as possible to be able to sell their fruit and vegetables as locally produced according to Coop’s and ICA’s requirements?.

In order to decide the location for the new distribution center empirical data about producers location and volumes as well as Coop’s and ICA’s warehouse locations and volumes were collected. This information was then used as input into the center of gravity method to obtain the most appropriate location.

6.1. Answer to Research Question 1.

What are Coop's and ICA’s requirements on fruit and vegetables to sell it as locally produced?

The following tables summarizes Coop’s and ICA’s empirical data for locally produced with their requirements on fruit and vegetables to sell it as locally produced. Table 3 Summarizes of Coop’s and ICA’s Objectives for Locally Produced.

<table>
<thead>
<tr>
<th>Objectives for Locally Produced</th>
<th>Coop</th>
<th>ICA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goals with locally produced food</td>
<td>Be the top provider of locally produced produce</td>
<td>Be the “World Champion” in locally produced produce, by offering the small producers access to ICA.</td>
</tr>
<tr>
<td>Advantages of having locally produced food</td>
<td>Create competitive advantage for the local store</td>
<td>ICA stores have more choices in suppliers (can choose small local producers)</td>
</tr>
<tr>
<td>Customers demands</td>
<td>Customers demand locally produced products</td>
<td>Customer trend, follow the market trends</td>
</tr>
</tbody>
</table>

Table 3. Summary of Coop's and ICA's Objectives for Locally Produced

Table 4. Summarizes Coop’s and ICA’s requirements for locally produced produce.

<table>
<thead>
<tr>
<th>Requirements on Locally Produced</th>
<th>Coop</th>
<th>ICA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locally produced area requirements</td>
<td>Local produced within 3 km. For regionally produced area is set according to customers demands in the region</td>
<td>From ICA’s central org. that it is produced in Sweden. Each store set their own area requirements.</td>
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<tr>
<td>Transportation requirements</td>
<td>Produce needs to stay within the regions boarder</td>
<td>No transportation requirements.</td>
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<tr>
<td>Quality requirements</td>
<td>Same quality standards as other produce</td>
<td>Same quality standards as other produce</td>
</tr>
<tr>
<td>Label requirements</td>
<td>Labeled with “mat från regionen” (food from the region)</td>
<td>No central requirements. Each store decides the labeling.</td>
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Table 4. Summary of Coop's and ICA's Requirements for Locally Produced
6.2 Answer to Research Question 2.

How does the present distribution structure of Svenska Odlarlaget and Samodlarna meet the requirements from Coop and ICA for locally produced fruit and vegetables?

The table below summarizes how many of SOL’s and Samodlarna’s producers that meet Coop’s and ICA’s requirements for locally produced produce under the present distribution structure.

<table>
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<th>Present Distribution Structure</th>
<th>Coop</th>
<th>ICA</th>
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</thead>
<tbody>
<tr>
<td>SOL</td>
<td>70 out of 73 Producers</td>
<td>Theoretically all producers</td>
</tr>
<tr>
<td></td>
<td>Producers located in Skane</td>
<td>With assumption of 200km radius</td>
</tr>
<tr>
<td></td>
<td>Halland Blekinge</td>
<td>70 out of 73</td>
</tr>
<tr>
<td>Samodlarna</td>
<td>3 out of 19 Producers</td>
<td>Theoretically all producers</td>
</tr>
<tr>
<td></td>
<td>Producers located in Halland</td>
<td>With assumption of 200km radius</td>
</tr>
<tr>
<td></td>
<td>3 out of 19 producers</td>
<td>3 out of 19 producers</td>
</tr>
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</table>

Table 7. Producers that sell their Produce as Locally Produce with Present Distribution Structure

6.3 Answer to Research Question 3.

Where should a new distribution center be geographically located for as many of Svenska Odlarlaget and Samodlarna’s producers as possible to be able to sell their fruit and vegetables as locally produced according to Coop’s and ICA’s requirements.

With the use of the center of gravity method the decision to locate the new distribution center in the city of Norrköping was made.

The table below summarizes how many of SOL’s and Samodlarna’s producers that meet Coop’s and ICA’s requirements for locally produced produce under the new distribution structure with the new distribution center in Norrköping.

<table>
<thead>
<tr>
<th>New Distribution Structure</th>
<th>Coop</th>
<th>ICA</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOL</td>
<td>73 out of 73 Producers</td>
<td>Theoretically all producers</td>
</tr>
<tr>
<td></td>
<td>Producers located in Skane</td>
<td>With assumption of 200km radius</td>
</tr>
<tr>
<td></td>
<td>Halland Blekinge</td>
<td>73 out of 73</td>
</tr>
<tr>
<td>Samodlarna</td>
<td>16 out of 19 Producers</td>
<td>Theoretically all producers</td>
</tr>
<tr>
<td></td>
<td>Producers located in Halland</td>
<td>With assumption of 200km radius</td>
</tr>
<tr>
<td></td>
<td>19 out of 19 producers</td>
<td>19 out of 19 producers</td>
</tr>
</tbody>
</table>

Table 7. Producers that sell their Produce as Locally Produce with Present Distribution Structure

With the new distribution center in Norrköping all SOL’s producers can sell their produce to both Coop and ICA as locally produced. This is an increase by three producers both for Coop and ICA. For Samodlarna there is an increase of 13 producers that can sell their produce as locally produced to Coop. To ICA Samodlarna has an increase of 16 producers which means that all their producers can sell their produce to ICA as locally produced.
6.4 Suggestions for Further Research

*In this section we will give two suggestions for further research.*

The first suggestion is to perform a study to evaluate the new distribution center. This study could research if the new distribution center meets the requirements from the market. It could also be evaluated to see if the new distribution center has had positive impact on the producer’s distribution and if it has attracted new producers to the organization.

The second suggestion is to conduct a study around locally produced product labels to see if the present labels meet the customers’ requests. According to Jordbruksverket (2012b) there is a strong customer wish for knowing where food is produced and how. The study could evaluate what information the customers are requesting to have on the label and how these demands can be fulfilled. It can be evaluated if the customers are requesting one unified label or marking for locally produced food. The study would also help to develop a more clear definition for the concept of locally produced because it would gather information about what customers expect when purchasing locally produced.

6.5 Reflections

At the starting point of this study, information about the case from the company was not clear. In time, the researchers had the possibility to have in-depth discussion with the case company to get a full understanding on what the case would include and what achievement could be done. It was also necessary to evaluate and make limitations and a few assumptions to complete the project. Having a close collaboration with the case company, secures both the participant and the researchers with awareness and the aim of the paper and that all collected data were treated in an ethical way.

Since this thesis is based on a case company, the analytical results are specifically made for the case. Semi-structured interviews with several employees from the company were held, which makes it difficult for other researches to achieve the same results if they do not have contact with the same persons. Another fact is that the industry is constantly changing which may not bring the same result for other researchers. Because of this
generalization on companies in the same industry cannot be done or might not be applicable to conduct future studies on the subject.

This study gives the case company a suggestion for where to geographically locate a new distribution center by the center of gravity method, based on the current situation. In order to find out how sensitive the result is it was tested with a sensitivity analysis with two different scenarios. The location was not very sensitive to either scenario, which suggests that the location is appropriate. However, the optimal procedure in this case would have been to follow the entire process of the changes in the distribution structure in order to find out the actually result and what could possible be done otherwise. Due to the time-frame for the study compared to the time it takes to make these large changes in a company, this was not possible.
References


**Interviews**


Sähl, J., 2013. Interviewed by Arta Selimi and Therese Svensson [telephone]


Sterneborn, L., 2013. Interviewed by Arta Selimi and Therese Svensson [e-mail] Interviewed: May 1, 2013

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### Appendix 1.

#### Scenario 1. For Sensitivity Analysis: The center of Gravity for scenario 1

#### Appendix 1 Scenario 1. Sensitivity Analysis

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Table 11. Scenario 1 Calculation for Sensitivity Analysis

Appendix 2
Scenario 2. For Sensitivity Analysis: The center of Gravity for scenario 1

Appendix 2 Scenario 2. Sensitivity Analysis
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Table 12. Scenario 2 Calculation for Sensitivity Analysis