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**IMPLEMENTING ISO/FSSC 22000
Food Safety Management System in a SME**

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ABBREVIATIONS

CB	Certification body
FSMS	Food safety management system
FSSC 22000	Food safety system certification based on GFSI and ISO standards
FST	Food safety team
GFSI	Global food safety initiative
GVA	Gross Value Add - productivity metric that measures the contribution to an economy, producer, sector or region.
HACCP	Hazard analysis and critical control point
ISO	International organization for standardization
ISO 22000	International standard for food safety management systems
OPRP	Operational pre-requisition program
PRP	Pre-requisition program
SME	Small and medium-sized enterprises
TQM	Total quality management
QMS	Quality management system

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ABSTRACT:

The purpose of this thesis was to find out how to implement a food safety management system, ISO/FSSC 22000, in a small and medium sized enterprise. The thesis work was carried out in parallel with the starting of implementation in a case company. During the course of the thesis the secondary purpose was to find out the benefits and challenges for implementing a quality system such as this.

The theoretical framework includes main concepts such as quality management, continuous improvement and document management. The theory part also presents the concept of ISO 22000 and FSSC 22000 and main aspects to consider in case implementing other quality systems in retrospect.

The main method in the empirical part is literature review, to understand the food safety management system standards and requirements. Benchmarking has also been performed to create a better picture of how other companies within this branch has experienced the implementation. The main result of the thesis was a guideline for how to implement and what to consider when acquiring the ISO or FSSC 22000 certificate.

KEYWORDS: Quality Management, Quality Management System, Food Safety Management System

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1 INTRODUCTION

In the autumn of 2016 a company called Arctic Birch was founded as a result of a joint decision between two companies with the aim to produce Finnish organic birch sap. The product development started already approximately 10 years ago and during this time the birch sap and also birch ash has been exported mainly to European countries. Nowadays the export reaches outside the European market and as proof that the product has been produced with regards to food safety a food safety management system (FSMS) will be put in place.

1.1 Background

The idea of the topic for this theses emerged sometime during the winter of 2016-2017. The newly founded case company, Arctic Birch, needed to develop their quality system according to customer demands. In the beginning the demands consisted only of creating a HACCP plan and maintaining a self-monitoring system (as defined in Evira guidelines 10002/2), but since this is a big portion of the FSMS in the ISO/FSSC 22000 standard requirements, it was decided to go along with implementation. This way the company would increase their competitiveness on the market.

After attending an ISO/FSSC 22000 course in Tampere in March 2017, the picture got clearer and helped with understanding the requirements. The company already had a resource working on the key elements of the HACCP, and together with this

resource it would not be an overwhelming job to acknowledge the (additional) requirements for acquiring a certificate for ISO or FSSC 22000.

1.2 Purpose

The major challenges in this research consisted of creating a logical setup of the system in regards to the documentation and to understand the different parts of the standard. Therefore, it was decided that undersigned would start mapping out the requirements and create a setup for the FSMS together with the resource at the company. The aim is to acknowledge the requirements for implementing ISO/FSSC 22000 on micro-sized company and to ensure that a quality system is in place for acquiring the certificate. Therefore, the first research question is: *How do you implement a quality management system in a micro-sized company?*

Some benchmarking will be done to find out how other companies have experienced the implementation and auditing process, which brings us to research question 2: *What are the benefits and challenges of implementing a quality standard in a company manufacturing food?*

1.3 Delimitation

When implementing the ISO/FSSC 22000 it is required that all suppliers for the certified company meet certain expectations. Not all company products are manufactured by Arctic Birch, instead a supplier is used. This manufacturing facility should also meet the requirements of the standard, mainly in regards to the FSSC

22000. The work done to prepare this thesis can act as a framework for them, hence they will not be included in detail in this case study.

The thesis will not include the auditing results from the certification organ, since it is not possible to perform an audit before there is proof that the requirements have been met and implemented successfully. The audit will most likely take place in spring 2019. This is because some of the production is only up and running during one month in spring, due to the restricted availability of the raw material.

1.4 The company

Ab Arctic Birch Oy (further revised to as “the company”) was founded by two driving spirits in December 2015, but the story began long before that. Since early 2000’s two companies, with a common interest for Finnish Birch products, started producing Birch ash and Birch sap products for export to Germany and Sweden. As the market grew and the demand along with it, the company was founded by RTC Granholm’s and Arctic Food. The company invested in a factory building, previously owned by Valio, in Kaitsor, Vörå, and the facility was re-built to fit the need and the scale of the production.

Most of the activity takes place in the spring as sap starts flowing through the trunk of the birch tree. The company has over 50 suppliers of birch sap, all with forest areas located in the archipelago of Maxmo and the coastline near the production facility. All forest areas as well as the production is certified according to Finnish food ministry Evira’s organic production program.

1.5 Disposition

This thesis starts with providing the background to the selection of this topic and proceeding on to the theory related to the topic in chapter two. In chapter three the method for answering the research question is explained. Chapter four and five provides the results and conclusions of the case study. In the conclusion there is also explained further actions that the case company can use to further develop their quality system.

2 THEORY

Implementing the ISO and/or FSSC 22000 quality management system requires studying the ISO 22000 standard and for FSSC 22000 the international standard developed and recognized by the Global Food Safety Initiative (GFSI) which is based on existing ISO standards (FSSC 22000 2017). All quality standards are based on the concept of continuous development and is developed with the aim to support the companies' quality management system. In this chapter the concept of quality management is explained and the quality systems effecting the case company narrated. In addition to international standards, the local government legislations and regulations should be taken into account. For this company this includes the Finnish Food Act as well as the Finnish Ministry of Agriculture and Forestry legislation for organic food production, since the company is certified for organic production.

A great portion of having a quality system also includes implementing an effective document handling system, hence some basic concepts will be explained.

2.1 Quality management

During the last decades when globalization has led to new markets for companies the customers' demands has increased as a result (Oakland 2014). This is something that every consumer can relate to. The range of products has increased and the consumers' choice is most likely based on quality and opinions from others in addition to the price of the product. In recent decades it has become ever more

important to create high quality products to increase the competitiveness of the company. John S. Oakland (2014: 3-4) states in his book *Total quality management and operational excellence* that “any organization basically competes on its reputation”. There are many definitions of quality, but they all have some common features included: product characteristics, customer requirements and expectations. According to John S. Oakland (2014: 4) this can be compressed in one sentence; “*Quality then is simply meeting the customer requirements*”.

The quality aspect is perhaps most important when it comes to services (e.g. health care) and food. In Finland the concept of REKO-rings emerged in 2013, which is based on a French concept called AMAP. The idea is based on locally produced, good quality foods being sold directly to the consumer from the producer, without generating extra costs for logistics and marketing. The customer can see the quality and knows that it is straight from the producer without having gone through numerous distribution channels. Currently there are around 130 REKO-rings all over Finland. (Eko Nu! n.d.)

2.1.1 Commitment to quality

Implementing a quality system of any sort requires commitment from the management. According to Oakland (2000: 33) the CEO of the company “*should accept the responsibility of and commit to a quality policy in which he/she must really believe*”. This is essential, since it is then spread throughout the organization in every level. If the CEO does not commit fully to the implementation, it will lead to a failed attempt to change quality for the better. By leading by example and by communicating the beliefs to rest of the organisation, the continuous improvement

will move in the right direction towards better quality within the whole organisation. Quality should be something that can be seen, heard and felt. (Oakland 2014: 33)

It all starts with the quality police, which in this case study translates to the food safety policy, which is one of the requirements of ISO/FSSC 22000. The quality policy is the basic requirement in the creation of total quality management (TQM) and is something that should be known to all employees as a sort of guideline and a way of thinking within the organisation. The policy should be properly thought out and should together with continuous improvement allow for smooth operations and the reduction of errors and waste. Within TQM the following aspects should be taken into account when creating a quality policy; customer needs, the ability of meeting the customer needs economically, ensuring that the suppliers deliver material of required standards, ensuring that sub-suppliers share the organisations beliefs, focusing on prevention instead of detection, education and training for quality improvement within the organisation and for sub-suppliers, measurement of customer satisfaction and keeping regular reviews of the quality management systems. (Oakland 2014: 34)

By extending the quality policy a little bit the company can also create a vision and mission statement. The vision is what the organisation want to be, while the mission is the actual goals, i.e. what the organisation wants to achieve. In addition to the vision and mission the core values and beliefs, i.e. who does the organisation want to be, of the organisation should be stated as well as the purpose, i.e. what are we here for. A basic framework can be seen in Figure 1 below. (Oakland 2014: 37)

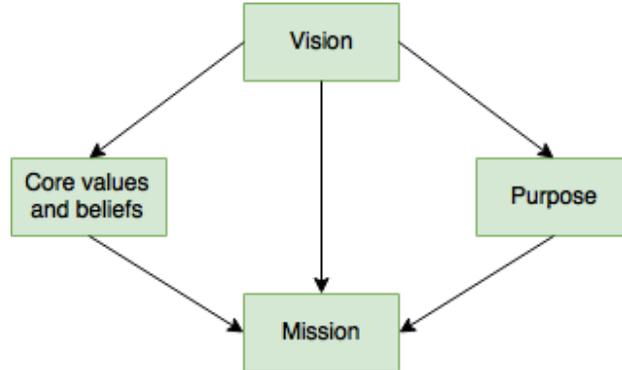


Figure 1. Vision and mission (Oakland 2014: 37).

2.1.2 Internal assessment, audits and reviews

An important part of the quality management is self-assessment, meaning that every once in a while it is important to look back and review the operations to define strengths and improvement areas. The methods for self-assessing the operations are several, e.g. group discussions, surveys and activity audits, but the key activities remain the same, see Figure below. (Oakland 2014: 165)

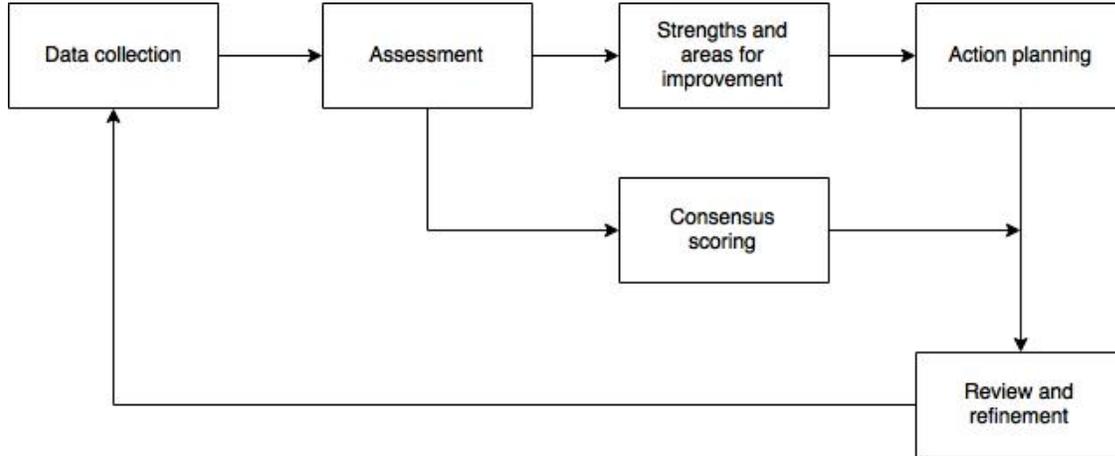


Figure 2. Key steps in self-assessment (Oakland 2014: 165).

Within every management system reviews are needed to ensure that the system reaches the desired effect and audits are needed to ensure that the methods used correspond to the documented procedures. During the reviews, the results of the audits should be used. This because, if there is a problem with a process it usually means that there are difficulties following a documented procedure. Thus, by altering a process it is possible to solve auditing problems. (Oakland 2014: 172-173)

The ISO 22000 clearly states that the management should have regular documented reviews with the food safety team (FST) to go through the challenges and need for improvement. According to Oakland (2014: 173) the objectives of the review is to ensure that the system is attaining the desired results, reveal defects and irregularities in the system, check management levels, indicate corrective actions necessary to get rid of waste or loss, uncover potential danger areas and to verify that corrective action procedures are effective.

There are three types of audits; first party, second party and third party audits. The first party audits are also called internal audits, which is the term used in ISO 22000, and are carried out by the company itself on itself. The people performing the audit can be employees who are independent of the systems being audited or by an outside agent. The second party audit can e.g. be carried out by a customer on the company from which it purchases goods from based on their own or international standards. As an example, A makes minced meat and B is a grosser buying the minced meat products from A. B visits A to audit their operations to ensure they can trust A. The third party auditing process consist of an independent agency which is not bound by any contract between supplier and customer. Third party auditing usually relates to the company acquiring a certificate that proves that they meet the requirement of an international standard. (Oakland 2014: 173, 175)

More information about the auditing process for ISO/FSSC 22000 can be found in chapter 2.2.4.

2.1.3 Benchmarking

There was once a teacher in Vasa University that defined benchmarking as "*legally stealing*", which is basically a correct perception if you look at the theory. According to Oakland (2014: 178) the concept of benchmarking includes comparing your own company's operations, products and services against those of your competitors. The aim with benchmarking is to improve your own company's way of working to stay competitive. (Oakland 2014: 178)

When performing benchmarking activities there are five main stages: plan, collect, analyse, adapt and review. The planning stage consist of recording the current

performance and identifying the need. The collecting phase includes selecting the best competitors to compare with, preparing a method and using it. Next the data is analysed to compare with the competitor and to identify the prominent practices. The analysis is followed by adapting the information through implementing and sharing best practices. The last stage is to review the results of the benchmarking study, what was learned and assess the outcome and identify further development opportunities. The benchmarking activity will through these five steps contribute to the continuous improvement process in the company. (Oakland 2014: 182-185)

2.2 Quality management system

The definition of quality management system is, according to American Society for quality, "a formalized system that documents processes, procedures, and responsibilities for achieving quality policies and objectives". John Oakland (2014: 245) defines the QMS as "an assembly of components, such as the management, responsibilities, processes and resources for implementing total quality management". The purpose of a quality management system is to improve processes, reduce waste, reduce costs, facilitate and identify training purposes, engage the staff and set an organization-wide direction. A good QMS ensures that both customers' and organisations' requirements are met. (American Society for Quality n.d.; Oakland 2014: 245)

Since the beginning of the QMS era the International Organization for Standardisation (ISO), a non-government network of national standards institutes, has developed several standards to aid in an organisations pursuit to achieve quality. The most known is perhaps the ISO 9001 standard for quality management.

Other well-known standards issued by ISO is environmental management ISO 14001, occupational health and safety OHSAS 18001, energy management system ISO 50001, risk management ISO 31000, information security ISO 27001, social responsibility ISO 26000 and food safety management ISO 22000. (ISO n.d.)

Nowadays there are standards for almost everything. A few examples are given in the ISO (2017) published *ISO and food – Great things happen when the world agrees*. There is, for example a standard, ISO 7304, which provides guidelines for cooking pasta to perfection, another one, ISO 3103, which defines what makes a good cup of tea and finally an ISO 3959, outlining the best conditions for ripening green bananas. In addition to the above there are also several, perhaps more useable, Microbiology standards to help determine what the safe levels of micro-organisms are, e.g. ISO 16140 *Microbiology of the food chain – Method validation* and ISO 6579-1 which explains the process for detection of salmonella. These are only a fraction of the number of standards related to food. (ISO 2017)

2.2.1 FSSC 22000

FSSC (The Foundation for Food Safety Certification) is a Dutch maintained and GFSI approved certification program, which is based on the ISO 22000 standard. In contrary to ISO 22000 the FSSC 22000 is applied on the complete food chain and the organization must, in addition to the ISO 22000 requirements, also comply with the sector specific PRP-program requirements of ISO/TS 22002-1 and the additional requirements in the FSSC 22000 Scheme (Additional requirements for the food safety system, Part II). The additional requirements in FSSC 22000 aim to ensure

consistency and integrity as well as provide governance and management of the Scheme. (Lassheikki, Skogster & Söderström 2016; FSSC 22000 2017)

The first version of the FSSC 22000 was published in 2010. In 2016 version 4 was launched internationally and is said to be more transparent and easier to understand than previous versions. The latest version, 4.1, was drafted only a few months after version 4, because of developments influencing the FSSC 22000. Starting from 1st of January 2018 all audits will be according to version 4.1. (Bureau Veritas Finland 2017; FSSC 22000 2017)

In Figure 3 below is a schematic explanation of the structure of FSSC 22000. In this Figure, one can also see that ISO 22000 in turn is built on the HACCP-plan including self-monitoring and additional requirements stated in the published ISO 22000 standard. Except for these, the company should also take into account the national regulations. (Bureau Veritas Finland 2017)

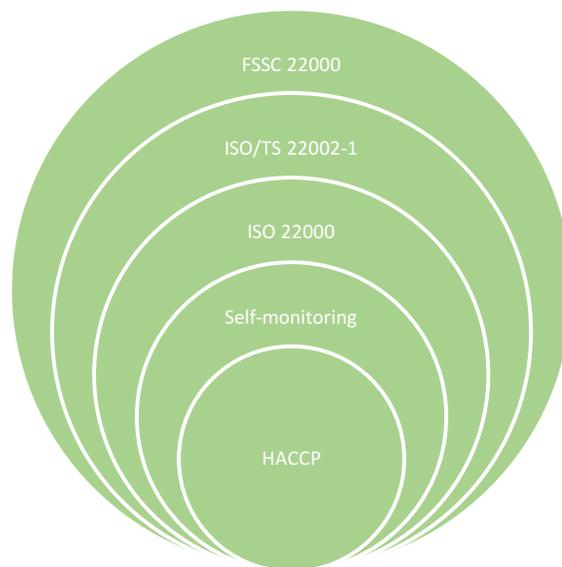


Figure 3. FSSC 22000 structure (Bureau Veritas Finland 2017).

2.2.2 ISO 22000

ISO 22000 is international and when certified to, a proof of the company's commitment to producing safe food products. ISO 22000 can be used by any organisation independent on the role in the food chain or the size of the organisation, since it only maps out what the organization needs to do to prove that it controls the food safety hazards to ensure a safe food (ISO n.d.). The current valid ISO 22000 is from 2005 (ISO 22000:2005), but since then new challenges in food safety has emerged requiring an update of the standard. The new version is expected to be published in June 2018 and the main changes include a new high level structure, which will be the same as for all other ISO management system standards, modifications to the risk approach and clarification of the PDCA-cycle (plan-do-check-act). In addition to these, a clearer description will be given in regards to the difference between CCPs, OPRPs and PRPs. (ISO n.d.)

The complete ISO 22000 family consist of many publications and the one mentioned above, ISO 22000:2005, is the first one published and the only one that can be certified to. On the next page is a table displaying all the standards that are part of the ISO 22000 family. (ISO n.d.)

Table 1. ISO 22000 family (ISO n.d.).

ISO 22000 family	
Standard	Title
ISO 22000:2005*	Food safety management systems -- Requirements for any organization in the food chain
ISO/TS 22002-1:2009	Prerequisite programmes on food safety -- Part 1: Food manufacturing
ISO/TS 22002-2:2013	Prerequisite programmes on food safety -- Part 2: Catering
ISO/TS 22002-3:2011	Prerequisite programmes on food safety -- Part 3: Farming
ISO/TS 22002-4:2013	Prerequisite programmes on food safety -- Part 4: Food packaging manufacturing
ISO/NP TS 22002-5**	Prerequisite programmes on food safety -- Part 5: Transport and storage
ISO/TS 22002-6:2016	Prerequisite programmes on food safety -- Part 6: Feed and animal food production
ISO/TS 22003:2013***	Food safety management systems -- Requirements for bodies providing audit and certification of food safety management systems
ISO 22004:2014	Food safety management systems -- Guidance on the application of ISO 22000
ISO 22005:2007	Traceability in the feed and food chain -- General principles and basic requirements for system design and implementation
ISO 22006:2009	Quality management systems -- Guidelines for the application of ISO 9001:2008 to crop production

* Will be replaced by ISO/DIS 22000

** Currently under development

*** Will be replaced by ISO/DIS 22003

2.2.3 Continuous improvement

An important concept in all quality management systems is continuous improvement. The concept is closely linked to the company strategy and should have a chosen approach and a defined method used to achieve continuous improvement (Oakland 2014:266). Within ISO/FSSC 22000 the concept can be managed by the PDCA-process displayed in Figure 4 below. The PDCA-process can be applied in all quality management systems independent of type. (Bureau Veritas Finland 2017)

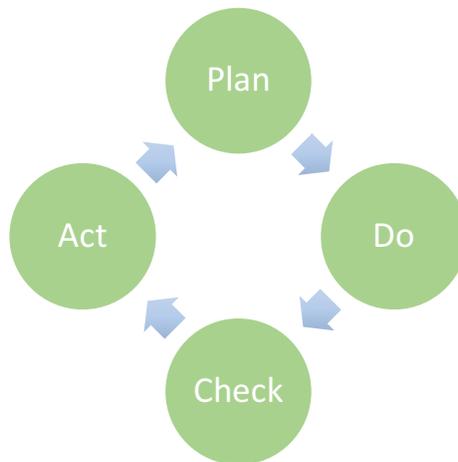


Figure 4. PDCA-process (Bureau Veritas Finland 2017).

In the planning phase you set up the objectives and processes, which are needed to reach results in regards to the company quality policy. In the do-phase the processes are carried out. In the check-phase the processes and products are followed up, measured and compared to the objectives, policy and product requirements. The results should be reported and in the act-phase measures are taken to improve the weaknesses and reduce wastes in the process, thereby improving the quality and

reaching the objectives. Within ISO/FSSC 22000 the PDCA-process is particularly important when it comes to the hazard analysis. In the quite recently published ISO 22004 additional guidance is provided on this matter. Among other things the ISO 22004 provide guidance on how to reach continuous improvement with the PDCA approach, see Figure 5. (Bureau Veritas Finland 2017)

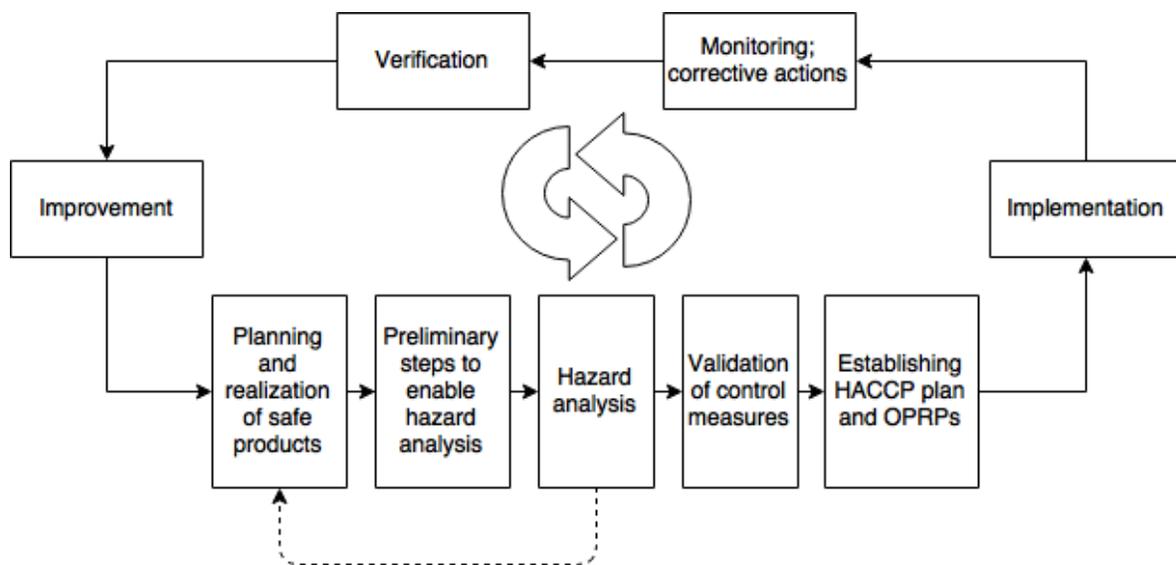


Figure 5. Continuous improvement within ISO 22000 (Bureau Veritas Finland 2017).

2.2.4 Road to certification

According to DNV (Det Norske Veritas 2017) there are ten steps to acquiring certification to a QMS:

1. Get to know the standard. At this point one should also reflect whether or not this is suitable for the company.
2. Study the written standard to understand the requirements.
3. Get a team together to create a strategy.

4. Acknowledge the educational need.
5. Map out possible need for consultation.
6. Create the documentation for the QMS.
7. Determine, manage and document processes.
8. Implement the processes and way-of-working through communication and education.
9. Conduct the possible pre-certification with the certification body (CB) to acknowledge areas of improvements.
10. Chose the CB carefully to get accredited.

In addition to this, Det Norske Veritas (2017) also provide tips and tricks that they have found useful for the companies on their path to certification. One of these tips is to start the certification process with a correct mind-set. Another states that it is beneficial to thoroughly study the standard and use it as a guideline when setting up the management system. At the same time, the company should think about what kind of effect the management system will have on the company. The fourth tip is to use the standard for continuous improvement and the fifth is to acknowledge the risks and processes which have an impact on the company's ability to reach their objectives. The last tip is that the company acquiring certification should choose their CB (and cooperation partner) wisely, since the cooperation with the chosen CB will continue for many years as the certificate requires maintaining to reach continuous improvement and keeping the certificate. (Det Norske Veritas 2017)

The process within Bureau Veritas is quite similar. According to "*Instructions for the organisation being audited*" (free translation from the Finnish title "*Ohjeita auditoitavalle organisaatiolle*"), which was received by e-mail from Bureau Veritas 25th September 2017, the certification process is basically the same for all ISO QMS.

The CB cannot take part in the actual creation of the QMS, however, they are allowed to provide education concerning the contents of the standard. According to Bureau Veritas (2017) the complete certification process in brief:

1. The company creates their QMS and implements it in its activities.
2. Before certification the company must perform one internal audit and one management review.
3. After the contract has been signed between the CB and the company, the first certification audit is in two steps. In step one the CB checks that everything has been taken into consideration. At this stage the CB does not go through the actual activities. This first step is usually called a “pre-audit”.
4. The second step is the actual audit, where the company activities are examined. If deviations are noticed, the company has three months’ time to correct the deviations. The corrections are then notified and approved by the auditor if everything is in order.
5. After the audit is performed and deviations corrected and approved, a certification request can be made. If and when everything is in order a certificate will be awarded, which is valid for three years.
6. Periodical audits are performed by the CB after the first and second year after awarding the certificate.

In regards to step 3 above, it is recommended that the audits are not started before the QMS is defined, documented, educated and communicated as well as the internal audit and management review performed within the organisation being audited. These actions provide the actual evidence of the QMS. (Bureau Veritas 2017)

After the certificate has been awarded and after the first three years, a re-certification audit has to be ordered well in advance before the certificate expires. If the re-

certification is made and deviations are found, there needs to be time to correct these before the expiration. (Bureau Veritas 2017)

If the company initially has been certified to ISO 22000, the steps for acquiring the FSSC 22000 certificate is quite simple. The two-step certification process is not needed, instead the audit is based on the recertification Scheme requirements. This recertification corresponds to a normal audit with the aim to “*confirm the continuing conformity of the food safety management system as a whole with all Scheme requirements*”. In addition, the audit report from the CB should disclose the information, i.e. transition audit from ISO 22000. The report should also include details from previous audits related to nonconformities and should also confirm the validity of existing certificate as well as compliance with all Scheme requirements. The certificate for FSSC 22000 is valid for three years as well, but at least one of the two annual audits should be unannounced. (FSSC 22000 2017)

2.2.5 Implementing an ISO standard in a SME

The EU determine an SME according to staff size and turnover/balance sheet total, see Table 1 below for company categories. According to this the case company applies to SME company category *Micro*. (European Commission 2015)

Table 2. EU company category for SMEs (European Commission 2015).

Company category	Staff headcount	Turnover	OR	Balance sheet total
Medium-sized	< 250	≤ 50 m €		≤ 43 m €
Small	< 50	≤ 10 m €		≤ 10 m €
Micro	< 10	≤ 2 m €		≤ 2 m €

In the European Union SMEs make up for 99 % of all businesses (European Commission, 2015). Globally SMEs are estimated to be 90-95 % of all businesses. SMEs are less complicated and more flexible than large businesses and are the ones generating growth and jobs. For example, SMEs employ approximately 60 % of private-sector workforce world-wide. SMEs grow faster and are better at innovation compared to large firms. They contribute around 50 % to world gross value add (GVA). (Gasiorowski-Denis 2015: 7-9,13)

The benefits of implementing an ISO standard in a SME are easier access to global markets, increased operational efficiency and increased confidence thanks to the well-known concept if ISO standards. There are downsides and challenges as well. One of the biggest is the manager commitment, usually due to reluctance of allocating necessary resources, such as time, money and personnel. This is the reason why the vast majority of SMEs do not implement standards, since the lack of resources forces the company to think short-term. The implementation of a standard is a long-term process and the benefits are not always visible. If, however, the management is fully on-board and participating, the return of investment can be of considerable size. The amount of SMEs to implement standards may also increase with improved relationships between companies in the same industry group, creating so to say "*strength in numbers*". (Gasiorowski-Denis 2015: 9-10,12)

According to Gasiorowski-Denis article "*The small-business advantage*" in ISOfocus Magazine edition 109 (2015), SMEs are not doomed to fail. Instead, because of the innovative culture in SMEs and developed standard solutions to help small businesses to leverage their competitive advantage, the SMEs may play a big part in shaping the world as we know it in the future. (Gasiorowski-Denis 2015)

2.2.6 Implementing ISO 9001 and 14001 in retrospect of ISO/FSSC 22000

The ISO standards are all connected and a vast part of the standards are similar. In ISO 22000 standard the Annex A provides cross-references between ISO 9001 and ISO 22000 and vice versa, providing the user with a brief overview and confirmation of the similarities between the two standards. Many sections are exactly the same when comparing to ISO 9001, e.g. both standards use the same definitions with some additions related to FSMS, the same requirements for document control and the same internal audit requirements. Other sections that require more focus on FSMS, but are similar to ISO 9001, are control of monitoring and measuring as well as management review. With these common points a simultaneous use of two standards enable the user to have less documents to manage, more consistent guidance to the workforce, more understandable system that is better supported by the management and an integrated system that might be the foundation for a more comprehensive business management system in the future. The implementation of additional ISO standard might become even easier in the future, since, as earlier stated in section 2.2.2, the updated ISO 22000 standard, expected during 2018, will have a high level structure, which will be the same as for all other ISO management system standards. (ISO & ITC 2007)

2.2.7 Domestic and EU regulations

In addition to the ISO standard and FSSC 22000 requirements, the company must also conform to all local regulations that applies. Concerning food safety, the company is obligated to follow the Finnish Food Act 13.1.2006/23, the European Union legislation concerning food and food control as well as the Ministry of

Agriculture and Forestry act for organic production 21.4.2015/454. The actual supervision is performed by the Finnish Food Safety Authority, which in Finland goes by the name Evira. The Ministry of Agriculture and Forestry is the advisory committee for preparing Finnish legislations concerning food and food safety. (Evira 2016)

According to Evira web-page (2016) the company should ensure that the food that is produced, handled, manufactured, packed, transported, imported, stored and sold are safe and in accordance with regulations. To provide proof of this the company should have a self-monitoring system, which corresponds to company operations, in place. The control authority's (municipal level) main purpose is to ensure that the self-monitoring of the company is in order.

2.3 Document management

“Document management is the process of applying policies and rules to how documents are created, persisted, and expired within an organization.”

(Microsoft n.d.)

In any company, large or small, implementing an effective document management system is essential. Nowadays there is a nearly unlimited amount of documentation handling system software available to assist companies depending on the need. For this particular company it has been decided to use the already implemented open source cloud services for storing the quality system related documents in addition to physically stored paper copies. For this to be effective a logical structure with

revision handling is significant to enable every person with access to easily find the relevant and latest information.

Based on the requirements listed in ISO 22000, certain documents must be set up and the company must be able to display these documents during an audit. It has also been decided within the company to archive old revision of documents for a certain time period. There are no requirements in the ISO 22000 on how to store the documents or the layout of the document, the standard only requires that the document includes some basic information (other than the actual content): date, name of the creator and a header. Based on the standard, the certified company must also ensure that the information is accessible at any time. (Bureau Veritas Finland 2017)

In order to plan and develop the information lifecycle an information management system must be created. Based on Figure 2.12 "*The information life cycle in Effective Document Management*" written by Bob Wiggins (2000), a document life cycle suitable to the company was created, see figure below. (Wiggins 2000)

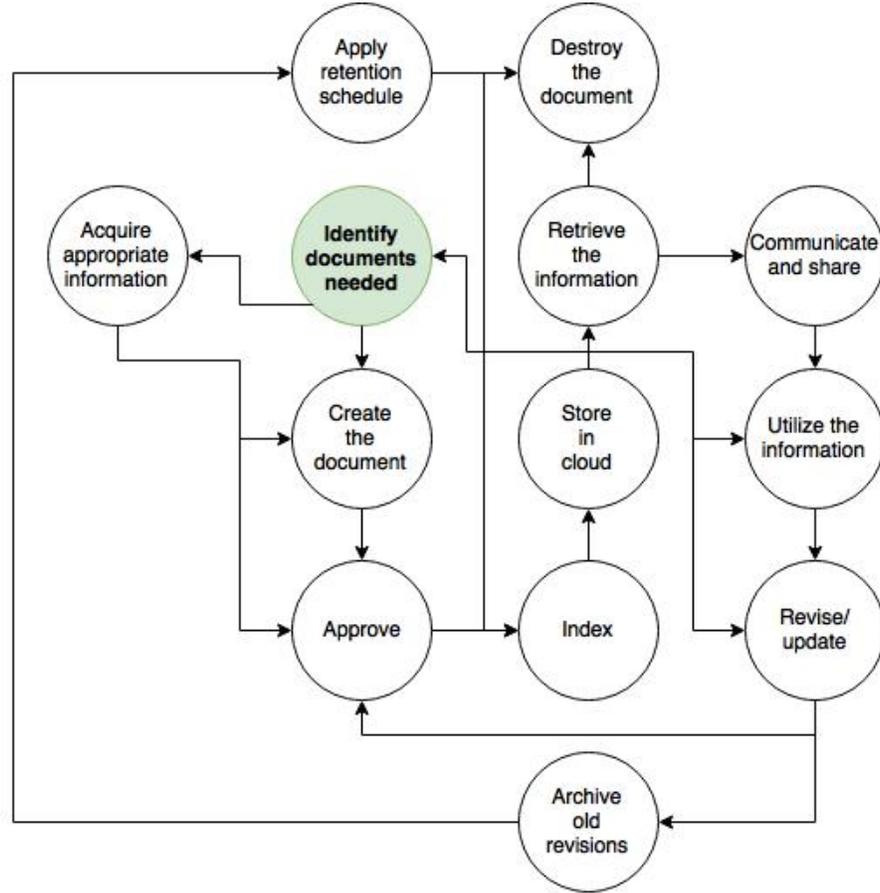


Figure 6. Document life cycle (Wiggins 2000).

3 RESEARCH METHODOLOGY

In this part of the master thesis the methods for answering the research questions is presented. The research questions are:

1. *How do you implement a quality management system in a micro-sized company?*
2. *What are the benefits and challenges of implementing a quality standard in a company manufacturing food?*

To answer question one, available literature will be studied along with starting the certification process in the case company. The benchmarking procedure will also have a positive influence in answering this question. Question two will be answered with input from companies who have already implemented ISO/FSSC 22000 in their procedures. Relevant literature will also be studied. Below the different methods are explained in more detail.

3.1 Literature review

Certifying to ISO/FSSC 22000 requires a deeper understanding of the requirements in the standard ISO 22000:2005 *Food safety management systems – Requirements for any organization in the food chain*. Therefore, the standard will be carefully studied together with the additional requirements in ISO/TS 22002-1:2009 *Prerequisite programmes on food safety -- Part 1: Food manufacturing* and FSSC 22000 certification Scheme in the event that the case company decides to go all in and acquire a certificate for FSSC 22000. The ISO 22000:2005 was purchased, while the ISO/TS 22002-1:2009 requirements have been made partly available in the course material

received in March 2017 from Bureau Veritas. The course material also included the FSSC 22000 requirements, but these are also available for download free of charge at the official FSSC 22000 web-page www.fssc22000.com. In addition to the purchased ISO 22000:2005, a related hand-book published by ISO/ITC called *“ISO 22000 Food Safety Management Systems – An easy-to-use checklist for small businesses – Are you ready?”* will be used to further understand the requirements of the standard.

3.1.1 Acknowledging the requirements to qualify for the certificate

The ISO 22000:2005 standard consist of requirements for several areas. First is the food safety management system general requirements followed by the documentation requirements. Next is the management responsibilities which deals with management commitment, food safety policy, FSMS, responsibility and authorities, food safety team, communication, emergency preparedness and response and management review. The following section brings up requirements concerning resources, such as human resources, infrastructure and work environment. Next comes the actual planning and realization of safe products including PRPs, hazard analysis, OPRPs, CCPs and HACCP plan, verification planning, traceability systems and non-conformity control. At the end of the standard the requirements regarding validation, verification and improvement of the FSMS is explained.

The ISO/TS 22002-1:2009 standard, explicitly used within food manufacturing, specifies in more detail the requirements to be considered in relation to ISO 22000:2005. These mainly relate to the PRPs already mentioned briefly in ISO 22000:2005. The FSSC 22000 certification Scheme consist of six parts, where the last

four consist of general requirements and requirements for certification process, CB and accreditation bodies. The last two mentioned will not be studied since they do not apply to the party acquiring for certification. The FSSC 22000 certification Scheme also consist of eight annexes, which do not state any requirements, but in turn provides information about audit time calculation, the actual certificates, auditor competence, nonconformity grading, accreditation scopes as well as audit report templates.

There is also two additional option for the literature review, which are the published ISO 22004:2014 *Food safety management systems -- Guidance on the application of ISO 22000* and ISO 22005:2007 *Traceability in the feed and food chain -- General principles and basic requirements for system design and implementation*. These publication does not contain any additional requirements to ISO 22000, instead it provides advice on the implementation of the ISO 22000. These will be used if seen necessary.

3.1.2 Acknowledging the benefits and challenges

The 15th edition of the journal called *Kasvu* published by MTT (currently known as Luke, the Natural Resources Institute Finland) and written by Kotro et al (2011) will also be used, since it includes a section where the benefits and challenges of the food chain quality standards are presented. These benefits and challenges have been collected by the writers as a result of studying numerous sources of literature. (Kotro, et al 2011)

3.2 Case study – Arctic Birch

As stated in chapter 1.2 the purpose of this thesis is to “*acknowledge the requirements for implementing ISO/FSSC 22000 on micro-sized company and to ensure that a quality system is in place for acquiring the certificate*”. To fulfil this purpose and to answer research question number one, a case study will be done at Arctic Birch. As framework for this case study, chapter 2.2.4 will be used to create a structured way of working. By working together with the companies own resources to develop the FSMS, the aim is to create a quality manual including all the necessary processes, work instructions and technical documents for acquiring a certificate for ISO or FSSC 22000 in the future. The main part of the quality manual will be made in house by the resource. In this process the checklist published by ISO & ITC (2007) will be used to ensure that everything is in place in regards to the ISO 22000 standard. The management will also be involved in developing the management responsibilities related documents and processes.

To further get an overview of everything that needs to be developed, if acquiring the FSSC 22000 certificate, a complete checklist will be made that covers ISO 22000:2005, ISO/TS 22002-1:2009 and FSSC 22000.

3.3 Benchmarking

The main method for answering research question number two is benchmarking. For this, three Ostrobothnian companies manufacturing food have been chosen; Oy Snellman Ab, Jeppo Potatis Ab/Jepuan Peruna Oy and Oy E. Boström Ab. Jeppo Potatis is certified according to ISO 22000, while the other two is certified to FSSC

22000. Jeppo Potatis and Boström have used Bureau Veritas Finland as CB while Snellman have used Inspecta.

3.3.1 Focus areas

The five stages of benchmarking are plan, collect, analyse, adapt and review according to chapter 2.1.3. In this case the planning case was quite simple, since there is not a certificate in place and no finalised procedures to compare to yet, however, some documented procedures are already in use during the production in accordance with Finnish legislation. The need for information and comparison with others is on the other hand large, since it would benefit the case company to know how others go about their certification process.

Instead of asking the spot-on questions, the question will be made on a higher level, with possible supporting questions if needed. The companies will initially be contacted by phone to establish a relationship, followed up by the actual questions by e-mail. The questions would be presented to the benchmarking companies on the language by their choice, either English, Swedish or Finnish. The questions can be seen in Appendix 1. The three last steps of the benchmarking, i.e. the actual results, will be presented in chapter four.

The focus areas of the benchmarking questionnaire will mainly be on the process; i.e. how did they go about to acquire the certificate for ISO/FSSC 22000. Since one or more of the companies might also be certified for organic production as the case company, a question related to this will also be asked. Since the selection of the CB is very important, the reasons for choosing Bureau Veritas and Inspecta will also be asked.

In addition to the focus area, some supporting questions will, as earlier mentioned, also be asked if needed in retrospect of the first e-mail. This to ensure that a reply will be received concerning the benefits and challenges of implementing and using the ISO/FSSC 22000.

3.3.2 Benchmarking companies

When choosing the companies to contact, the search mostly included the following criteria; ISO or FSSC 22000 certified, familiar and nearby. The familiarity aspect mainly came from having contacts at two of the chosen companies, which could make it easier to receive a reply from them. The companies having used different certification bodies will also provide a good angle, as well as the fact that one or perhaps two of them are certified to organic production, as is the case company.

Of the three benchmarking companies the Snellman Group is the largest with a turnover of 296 million in 2016 (Granroth 2017) of which the meat refinery parts accounts for 216 million (Kauppalehti yrityshaku 2017). The company produces meat products since 1951 and employs around 700 people in their factory in Pietarsaari, Finland. Their meat refinery subsidiary is besides FSSC 22000, which is their most recent certificate, also certified to ISO 9001, ISO 14001 and ISO 50001. (Snellman 2017)

Jeppo Potatis Ab - Jepuan Peruna Oy had a turnover of 12 million in 2016 with 55 employees (Kauppalehti yrityshaku 2017). The company dates back to 1976, when the local potato farmers formed a potato refinement corporation to produce potato products. Today the company refines or distributes cooked potato products, raw potato products and organic potato products. The factory is located in Jeppo and

Voltti, Finland, and both plants are certified to ISO 22000, since 2015 respective 2016. (Jepo 2016)

Oy E. Boström Ab is a bakery founded in 1939 which is perhaps most known for their Swiss rolls. The company employs around 30 people and had a turnover of 5 million in 2016 (Kauppalehti yrityshaku 2017). About 25 % of their production goes on export. The company is located in Lepplax, Finland, and is certified to ISO and FSSC 22000 by Bureau Veritas Finland. (Boström n.d.)

4 RESULTS

In this part of the thesis the results of the research will be presented and the purpose of the thesis is attempted to be fulfilled. To acquire the results, the research methods described in chapter three have been used. Chapter 2.2.4 and the answers to the benchmarking questions has also been used as a framework for these results. As the literature was studied and replies to the benchmarking questions were received, it was noticed that it would be of greatest benefit for the company to have a described process of each step of acquiring the certificate. The actual requirements of the standards will not be elaborated further, since it could violate the copyright laws. Instead, descriptive documents have been created for the company alongside this thesis to assist them in the implementation. These documents will only be used internally by the company.

To create a logical setup for the reader, the benchmarking results will be presented first. Based on these and the literature review the actual process will be presented followed by quality handbook setup and the benefits and challenges found. Last, but not least, a discussion is available where the reflections concerning the topic, used methods and thereby acquired result is provided.

4.1 Benchmarking results

In this section the results of the benchmarking process will be presented and corresponds to the collection phase. The method for acquiring these results are explained in chapter three. Which answer belongs to which company is not

important nor relevant and is, therefore, not disclosed. Of the three companies asked to participate, two replied.

Question number 1: Why did the company choose to certify to ISO 22000:2005 (and FSSC 22000)?

Of the companies who replied, one stated that they prepared for what is to come, i.e. they implemented the ISO 22000 to meet any requirements from the market in advance. Also, they explained that implementing the FSMS improves the internal processes and provides a certain systematics in the business. The other company agrees with the latter and further states that the fundamental reason for them for implementing the FSSC 22000 was the customer requirements, in their case various food retailers and supermarkets. The company also chose the FSSC 22000, since it is a part of the same “family of standards” as they are previously certified to. Before the FSSC 22000 they were also certified to ISO 9001, ISO 14001 and ISO 50001.

The company certified to ISO 22000 further explains that for them, it was enough to certify to ISO 22000 since it is widely used. Some customers, e.g. Lidl, would require a BRC or FSSC 22000 certificate. Some other certificates have no CB in Finland who could perform the audit.

Question number 2: Could you explain the company’s process from making the decision to acquire the ISO / FSSC 22000 certificate until receiving the certificate?

One of the companies asked used a consultant to implement the FSMS. And the following points is the consultant’s description of the process:

1. Getting acquainted with the initial data
2. Creating a schedule
3. Establishing the FST (HACCP team)
4. Management of the FST

5. Supervision of self-monitoring
6. Consulting visits
7. Training
8. Writing the system
9. Updating the self-monitoring
10. Reviewing customer feedback
11. Monitoring the implementation of sampling plan
12. Monitoring of legislation
13. Participation in inspections made by authorities
14. Participation in audits

In the case of this company, the above process lasted around 1,5 years, but the same scope could be done in one year.

The other company did not use a consultant, thus all activity, previous to receiving the certificate, was performed in-house. The decision to certify to the FSMS was made in the management board and after this a project team was created, which consisted of people from all levels in the organisation and led by the systems manager. When already certified to other ISO management system, they only needed to add the changes brought on by the FSMS to their current operations and instructions. After this, training was arranged for all of the employees followed by internal audits before certifying to FSSC 22000.

Question number 3: If you also have the certificate for organic production, how did that influence your certification process?

Both companies replied that the certificate for organic productions is not applicable for them. One of the companies distributes organic products, but since they do not refine the product, they do not need the certificate for organic production. They only need the organic certificate.

Question number 4: What affected your choice of certification body?

One of the benchmarking companies replied that a request for quotation was made to four CB's: Bureau Veritas, Det Norske Veritas, Lloyds Register and Inspecta. Bureau Veritas was chosen based on good references in addition to their experience from the food industry. The other company replied that they chose the CB based on their skills and earlier experience and cooperation with the company.

Question number 5: How did the company set up its quality management system in practice to allow a logical setup of the documentation handling system?

One of the companies has a separate quality management software, which was acquired solely for maintaining their QMSs. The whole system is described in the software, including the processes and related documentation. In addition to this the quality management software enables linkage to other software used in the company. The other company has integrated their QMS in the company's intranet and all documentation can be retrieved from there, except for a few paper copies.

Question number 6: Are there any tips and tricks that you would like to share?

The benchmarking companies had a lot of tips and tricks to share. One of the companies recommends the use of an external consultant as he/she has knowledge about e.g. keeping internal meetings and performing internal audits. The company also use this consultant as a contact person regarding audits. Other advice received was the importance of management and personnel commitment and collaboration

regarding the FSMS. The management should be pledged to the system and internal resistance against change should be handled. The company implementing the FSMS should reserve enough time for preparing for the certification and include a wide and broad enough group of people to be included in the project, who are engaged and committed to do the required work to receive the certificate. One of the companies also pointed out that it is beneficiary to include people from all levels of the organisation and to also go through the requirements with the entire organisation. The last tip was that one should educate oneself on the system to be able to argue why certain things should be done in a certain way.

4.2 ISO/FSSC 22000 implementation process

Before the ISO / FSSC 22000 implementation process in Figure 7 (see also Appendix 2) was created, the implementation work had already begun by the case company. When this thesis is written they are in the process of creating, documenting and implementing way-of-working, hence the first phases of the process have already been conducted. Depending on the size of the SME-company, the phases set up in the process can vary in size and importance. For example, in a company with fifty employees the need for planning and education of the implementation project team members can be of more importance and more extensive than in a company with five employees. If the company is of micro-size, i.e. less than ten employees, the project team might only consist of two people. Depending on the financial resources and time available there might not be a fixed time schedule either, unless acquiring the certificate is crucial for making business. For the case company, the

implementation process is done alongside normal every day work and production, without a fixed schedule and deadline. This is possible due to high-season being during spring-time.

The overview in Figure 7 is based on literature and benchmarking results and the phases are such that they, in one way or the other, must be performed. In all the literature and in the benchmarking the message is clear: the management must be on board and make the decision to start the implementation project. It is up to the management to recognize and take action based on the need, whether it is a customer demand or a strategic move to enable entry to new markets. Both companies participating in the benchmarking described that they based their decision to implement the FSMS on customer demands and future need.

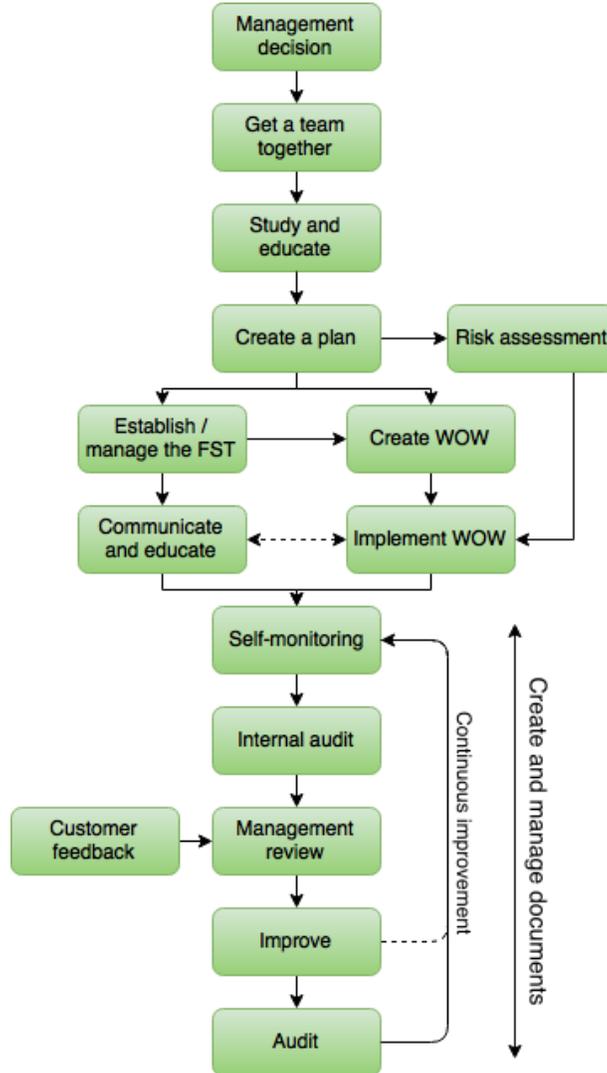


Figure 7. ISO/FSSC implementation process

When the need of a QMS has been recognized, the next step is to set up a team. In a large company the team would involve people from all levels of the organisation, but since the case company is of micro-size, the resources at hand was to be used; one owner and one employee. In a small organisation, the project team could also be the same as the FST team, which is the case in Arctic Birch with the addition of undersigned.

During the study and educate phase the standards were studied in detail and the creation of checklists begun. Since both FST members are familiar with FSMS activities from before it was seen as enough if only one of the project team was to attend the ISO/FSSC 22000 course in Tampere, arranged by Bureau Veritas Finland.

In regards to the planning phase, no deadline has been set for implementing ISO/FSSC 22000. However, for the case company it has to be taken into account that full-scale production is currently only taking place during one month every year. Therefore, the case company should preliminary aim at performing the internal audit during production in spring 2018 and actual audit in 2019.

In the planning phase it might also be good to evaluate the risks and take actions to eliminate or reduce them already at this stage. The risk management concept in OHSAS 18001 can be used in this aspect, see Figure 8. The same risk management concept should also be used in the hazard analysis phase. In conjunction to this, it may also be beneficiary to implement a near miss report function to easier identify the risks before something happens.

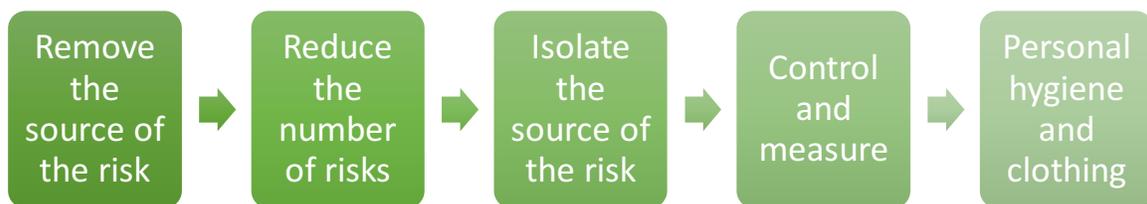


Figure 8. Risk management (free translation of material in Bureau Veritas 2017).

If the FST and FST leader has not yet been nominated, it should be done after the planning. At this point the management should also start preparing the policy, which will be the base for the way-of-working in the company. It will also be a

guideline for the FST for what to put focus on. After the targets have been set in the policy the FST could further elaborate the way of working according to the requirements in the standard and available legislation. Certain tasks must be performed, e.g. mapping out the PRPs, conducting a hazard analysis, recognizing the CCPs and OPRPs and setting up a HACCP plan for controlling these. Appendix 3 and 4 are based on the Codex Committee on Food Hygiene (CCFH) and includes guiding processes for creating the HACCP and identifying the CCPs.

There should also be in place methods for validating and verifying self-monitoring activities as well as ways to handle suppliers, product traceability, internal and external communication, non-conformity control to name a few. All the processes and instructions should be documented and managed according to Figure 6. All the requirements are mapped out in the checklists provided solely for use by the case company.

Next is the implementation of the way-of-working simultaneously as the rest of the employees are educated on how to conform to the requirements during their work. All the employees should follow the processes and learn to perform self-monitoring activities according to their assigned responsibilities. The self-monitoring results should be stored in documents according to the decided way-of working. The self-monitoring has already been in place in the company during last season in accordance with the certificate for organic production and Finnish food act. The HACCP was also partly developed during last season.

Next phase is the internal audit, which can basically be performed by anyone who is not directly involved in the processes. The target is to go through the process from beginning to end and see how the processes work in practice, see Figure 2. Since the

case company is very small and everyone is basically included in every process, it was early on decided to use an external consultant, not involved in but familiar with the FSMS, to perform the internal audit. The aim with the internal audit is to find areas of improvement and deviations that can be brought up at the management review and corrected before the actual CB audit. During the management review the earlier conducted second party audits, i.e. customer audits, should also be reviewed and areas for improvement should be recognized in addition to solving other concerns in the system recognized by the FST. For the improvement process the P-D-C-A process presented in 2.2.3 should be used.

Latest when all of the above has been performed, the CB should be carefully selected and an audit should be scheduled. After the contract has been signed with the CB it will take up to 4-6 months before the auditing process can start. During this time, the CB identifies an auditor, which is to be suitable for the type of operations in the company. The audit usually consists of a pre-audit and the actual audit. As earlier explained, the pre-audit consists of checking that every aspect has been taken into consideration, while the audit investigates the actual activities performed.

After the audit has been completed a report will be shared with the company stating the areas for improvement. At this point the company can now also apply for the certificate. If there have been deviations found during the audit, these must be corrected before the case company can apply for and be granted the certificate.

The work does not end here. After the audit the actual improvement work can start and it is the responsibility of the CB to check that the company is striving for continuous improvement and is worthy of the certificate also in the future. The certificate is valid for three years, but every year a follow-up audit is made to ensure

the company complies with the requirements and is performing activities to improve the food safety.

4.3 The documentation for FSMS – Quality handbook

As earlier stated there should be a logical setup of the documentation and clear instructions on how to handle the documents during their lifetime. The documentation is an important part of the FSMS, since it provides information and evidence on how the system is setup and functions. The auditing process is useless without documentation. There have been many discussions internally within the company on how to setup the documentation system in practice. The information received during the Bureau Veritas course was that the documentation should be setup logically. One of the participants in the course explained that they had not planned this enough during their implementation, which in the end caused a lot of work to redo it. During the process of deciding on a logical setup there were many suggestions. One was to follow the setup according to the standard, however, that was found to be too complicated. Another suggestion was to base it on a first level including PRPs, CCPs, HACCP and OPRPs, but that too would cause confusion. In the end, it was decided to go for a version based on the suggested documentation layout in the Bureau Veritas course material, see Figure below.

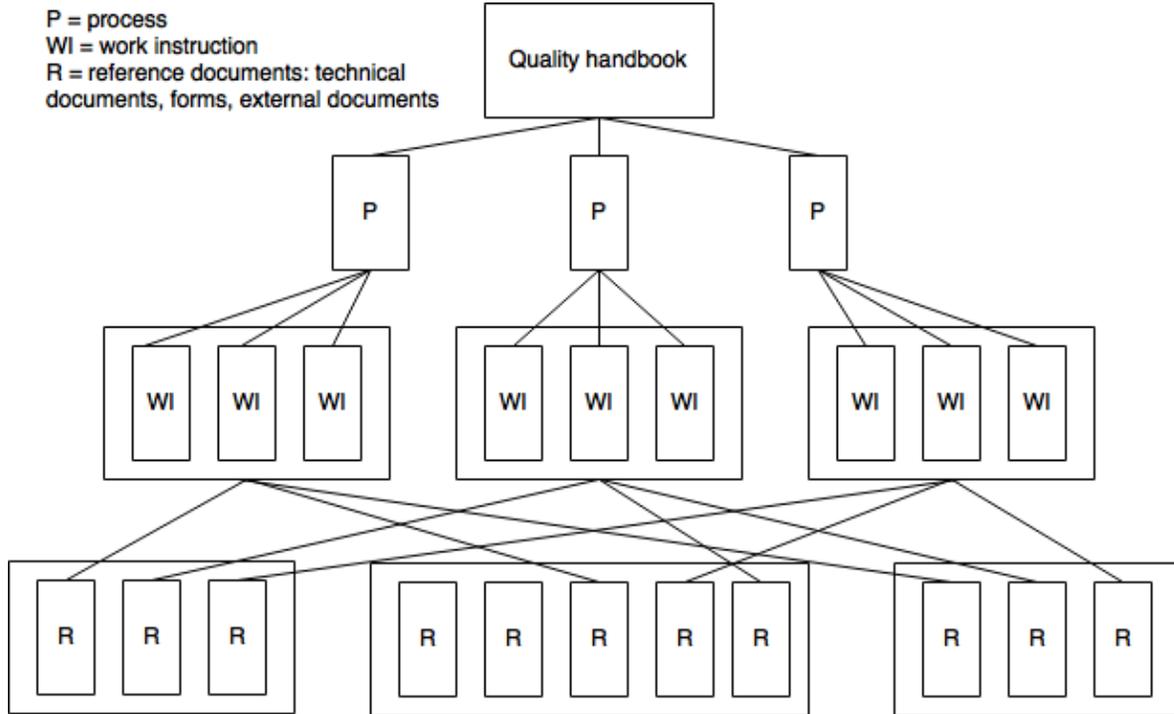


Figure 9. Quality handbook setup.

The basic idea with this setup is processes in the first level, work instructions in the second level and then all related documentation in the third level. This documentation should also be setup to enable easy implementation of other QMS in the future, therefore it was decided with the case company to further divide the high level of the system into management responsibility, quality management system, resource management, communication and operations. When creating this high level structure, the various requirements were taken into account as well as already existing documentation. It was found that this would be the best and most logic approach to implement the documentation part of the FSMS in the cloud services used in the company.

The management responsibility part would consist of documentation, processes and work instructions regarding e.g. the policy statement, responsibility matrix, management review, emergency preparedness and improvement. The quality management system would include aspects concerning internal audits and document handling. The resource management part would include personnel related information and instructions, infrastructure documents and sub-supplier handling. The communication part would include documents concerning internal and external communication, where external communication would include instructions for visitors, sub-supplier training material and external product descriptions to name a few. The operations part of the documentation is the biggest and would e.g. include instructions related to the PRPs, OPRPs, CCPs, HACCP plan, handling of raw material, manufacturing, deviations and traceability.

4.4 Benefits and challenges for the company implementing a QMS

The main purpose of the report published in MTT Kasvu 15th edition was to bring forward the strengths and good practices of the Finnish food chain and to present a concept that is close to customer and helps in the progress of responsibility and transparency in the food chain and create added value. One part of this is presenting which QMSs related to food are used in Europe and to bring forward the benefits for the companies operating in the food chain using a QMS and the challenges which are connected to the implementation of a QMS. The QMSs mentioned in the beginning of this report are small independent QMSs; Svenskt Sigill, The Red Tractor, QS-Qualitätssicherung and Global G.A.P.

According to the report, studies have shown that the biggest benefit of implementing a food related QMS is the ability to strengthen the customers trust in the company's products. Being certified to a food related QMS also maintains and improves the reputation of the company by e.g. adding more transparency in the food chain. The biggest reason for implementing a QMS is the positive affect on other parties of the food chain, especially retail. It is more likely that a company implements a QMS if it is related to their transactional targets. All benefits are presented in Table 3 along with the challenges.

The challenges in implementing a food related QMS is very much a result of the actual benefits. The biggest of these challenges are the one related to resources, mainly financial such. The total sum of implementing an international standard can be very high and cause the company to suffer on the market due to the QMS being too unknown. In some cases, the company may also experience it as the investment being higher than the return of the investment. This may be the case if two QMS are implemented simultaneously and their differences can cause difficulties fulfilling the requirements of both. The additional challenges, according to the report in MTT Kasvu, is visualised in Table 3 below.

Table 3. Benefits and challenges of the quality systems in the food chain (Kotro, et al 2011).

Benefits	Challenges
Maintains and improves the reputation of the company	The information about the benefits in respect to the costs
Strengthens consumer trust	The lack of training
Improves the transparency of the food chain	Resistance for change

Helps with maintaining and increasing the market shares	Understanding the importance of documentation
Helps with entering new markets	Lack of confidence in third party certifications
Acts as an instrument for developing the business	The time-consuming familiarisation and implementation
Acts as an instrument for controlling the beginning of the food chain	The insufficient knowledge of quality management in small firms
Acts as an instrument for positioning, segmenting and diversifying in the food industry	Alignment of costs
Improves customer satisfaction	The collective tendency of the system
Decreases quality costs	
Improves the employee relationships	
Has a positive impact on other operations in the food chain	
Helps communication about products' safety and remembering the quality features.	
Improves the knowledge about quality among the employees	
Decreases production costs	
Increases the competitive advantage	

Based on the answers provided to the benchmarking questions the biggest benefits identified includes meeting customer demands, meeting market demands and improving internal processes. Another benefit of implementing ISO 22000 is that it is internationally recognized and known by many, which enables trust even though the company is not known. Another benefit is by being positive towards customer audits the company will receive advice that is free of charge and will help the company to improve their operations and further comply with customer demands. As earlier stated the results of the customer audits should also be taken into account during the management review.

In regards to the challenges it became quite apparent that getting the management and employees involved is the biggest challenge and should therefore be emphasized and taken into account throughout the implementation process. Another challenge might be the lack of resources, however in the one of the benchmarking companies, they solved this by using an external resource to supervise and assist in the implementation project. The company implementing the QMS may also find that there is some resistance internally and this should be suitably dealt with, either through education or by being able to argue why it is important that things are done in a certain way.

4.5 Discussion

The FSMS implementation process created was made based on literature and benchmarking results. The process is on quite high level and the reason for this is the copyright law on a purchased product. Instead of presenting the actual requirements it was chosen to in parallel with the process create guidelines for the case company in form of checklists. This was a good idea, since the thesis would then not state something that is already presented in the actual standards.

The documentation part has been discussed over and over again at the case company and the challenge for them lies in having a logical setup of the system. The benchmarking did not help as much as foreseen, since it seems to be well baked in with the rest of the benchmarking companies' documentation and not a separate part. On the other hand, the answers provided a good idea to foresee future implementation of QMSs and prepare the documentation setup with that in mind.

As the benchmarking questions were developed it was pointed out that going into specifics would not be of value. By presenting the questions on a higher level, the answers provided much needed information about the actual certification process as well, which in the creation of the results was a huge benefit and provided much added value.

The literature review for presenting the benefits and challenges was very useful, however slightly outdated. The writers could have included also the ISO QMSs, but for some reason chose to go on a deeper level with smaller independent systems. On the other hand, when comparing with the benchmarking results, the benefits and challenges seem to be the same independent of the type of certificate. In the literature and the answers, the benefits are the same, i.e. the possibility to enter new markets, to improve company processes and meeting customer demands. In regards to the literature stating that the benefits would create decreased quality and production costs, this is the case on a long-term. However, as the theory in 2.2.5 told, it could be hard for a SME to think long-term due to lack of resources. With this benchmarking it is hoped to create better relationship with other actors on the food market to improve the common benefit of “leaning on each other” for advice.

The challenges presented in the literature review might be regarded as outdated, when one challenge was the insufficient knowledge of QMS in small firms. QMS has since 2011 become more popular than ever and there is indeed a small boom going on. The same thoughts can be applied when literature states that there is lack of confidence in third party certifications. The confidence has probably grown a lot during the last decade or so, especially when it comes to certificates for ISO standards. The common features with the benchmarking answers are the challenge

of getting the management and employees involved as well as finding the resources to get the QMS implemented, hence this will also be pointed out to the case company.

In the theory it was stated that local regulations should be taken into consideration. In the results part there was not much emphasis on this, since the case company has already been audited several times by Evira and displayed their conformity to the legislation through them.

5 CONCLUSIONS

In this chapter I will conclude my thesis and point out some aspects and advise towards the case company. The benefits of using a thesis writer will also be pointed out. I will also reflect somewhat on the use of method and how the theory was applied as well as areas for further research on the topic as well as for the case company. The conclusions will end with final thoughts and include a review of an article written about QMS a decade ago.

5.1 Use of method

The methods used for reaching the results in this thesis felt like a logical way to go. The course in Tampere in March was a huge asset and provided much inside information that one would not normally get. The literature review was almost mandatory in this kind of research since the QMS is based on a standard. Again, the course and the ISO/ICT checklist gave a much needed complement to the standard. The benchmarking part was also beneficial, however, in the end I gained much more information about the actual process than on the benefits and challenges. I believe that the MTT journal together with the benchmarking results was a much bigger asset in this case and confirmed the already known suspicions.

During the whole benchmarking process, I followed the phases presented in the theory besides the actual adapting and reviewing phases. This is something that the case company should continue with and therefore the benchmarking process used in this thesis will not be completely finalised.

5.2 Benefits for the company

The company did not have the sufficient amount of personnel resources to go through all the material and themselves develop their own process. During the time of the course in Tampere the company was fully busy with preparing for the high season. In this case it was the perfect opportunity to involve a thesis writer.

During this process I have become aware of many aspects that are important in the implementation process, but the most important one is perhaps if they decide to go for the FSSC 22000 certificate. The supplier refining some of Arctic Birch's products would in my interpretation be forced to be audited under the FSSC 22000 as well when it comes to the Arctic Birch products. The FSSC sees all products that are manufactured through a common process as one and the refining process would be regarded as an outsourced service and therefore included in the certification scope. My advice to the company is to start small and further develop the ISO to FSSC when and if they see fit. As described in 2.2.4 the auditing process for upgrading from ISO 22000 to FSSC 22000 is quite similar to a re-certification audit.

Another thing that I have learned is that even though the ISO standard is very comprehensive one should not get stressed about all the requirements. Many of them are such that they are already a part of the Finnish legislation. One should also remember to keep things as simple as possible, since it will make the operations in the company and the auditing process much easier on everyone. Even though the standard is comprehensive does not mean that you should make the QMS more extensive than needed. Always use common sense.

5.3 Further research

When writing this thesis, I came across some information regarding SMEs and QMSs and the challenges that are exceptionally large for small companies. It would be interesting to go deeper into this and find out how to solve this. The Garowski-Denis article gave an interesting approach called "*strength in numbers*" and it would be interesting to see if this would make it easier for SME's to implement FSMS in the future. The financial resources might not be large enough to hire a consultant.

Another thing that might be of interest to the company as well is the large amount of QMS available. Depending on the country you are selling to there might be additional QMS requirements made by the grossers. For example, some retailers might require the seller to be BRC and/or IFS certified, which are food quality and safety standards explicitly developed by retailers. These are good to have in mind in case a customer presents additional demands on the company.

5.4 Final thoughts

The interest and the occurrence of QMS have become more and more common during the last decades. When coming across the amount of theses and dissertations written on the topic in the Tritonia library database alone there are almost 290 publications since 1987 using keyword "Quality system" in Swedish, Finnish and English language. Most of these publications are from the 2000's which gives an indication that this is when the popularity of the quality systems started to ramp up. (Tritonia, n.d.)

In 2009 an article was published by Martina Frisk in Kvalitetsmagasinet website, where an expert named Nils Brunsson expressed his view that quality systems are not for everyone. The article was called "Quality systems – trend with downsides" (free translation from the Swedish article name "*Kvalitetssystem – en trend med baksidor*"). The main point in the article is that quality systems may not be suitable for everyone, since implementing a standardized quality system can risk causing an administrative burden for the company, at least in the implementation phase. According to Brunsson the organization is buying themselves an expensive authority to gain respect and a good reputation even though the quality system may not exactly be suitable for their operations. This criticism was more in the perspective of schools and government agencies and not so much directed to private manufacturing companies. (Frisk, 2009)

In any case, things must have changed since 2009. Whether or not you are buying yourself a good reputation, there are regular controls that the quality system is followed and thus it demands the company to comply with the requirements to have a good quality way of working that is continuously improved. This is what creates the international reputation of the company on the market, since most quality systems are globally acknowledged, e.g. ISO has members in 162 countries (ISO, n.d.). In the article (Frisk, 2009) Brunsson also pointed out that the quality thinking may very well be on its way of becoming a matter of course, if not already, within all kind of organizations in the future.

After 2009 several of the QMS has been updated, as they too follow the process of continuous improvement. The QMS are getting clearer in turns of concepts and structures becoming more uniform. The updated ISO 22000, which is to be published

during 2018, will have the same high level structure as for ISO 9001, which in turn would make it easier for companies to implement ISO 9001 in retrospect.

5.5 Thanks

I would like to point out that without the financial support made available by the company for attending the Bureau Veritas course and purchasing the standards it would not have been possible to do the job. The material used for creating the TS 22002-1:2009 and FSSC 22000 checklist and the importance of attending the course was the foundation for this thesis. I would like to thank Samuel Granholm, Kim Finne and Magdalena Gammal for all the support so far in the process. Even though the thesis work ends here I will continue to work together with the company to acquire the certificate.

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7 APPENDICES

APPENDIX 1: Benchmarking questions

APPENDIX 2: FSMS implementation process

APPENDIX 3: Logical sequence for application of HACCP (Codex Committee on Food Hygiene (CCFH), 2003)

APPENDIX 4: Example of decision tree to identify CCPs (Codex Committee on Food Hygiene (CCFH), 2003)

Main questions:

1. EN: Why did the company choose to certify to ISO 22000:2005 (and FSSC 22000)?
SE: Varför valde företaget att certifiera sig enligt ISO 22000:2005 (och FSSC 22000)?
FI: Miksi yritys valitsi ISO 22000:2005 (ja FSSC 22000) sertifikaatin?

2. EN: Could you explain the company's process from making the decision to acquire the ISO / FSSC 22000 certificate until receiving the certificate?
SE: Kan ni förklara förfarandet, från det att ni bestämde er för att certifiera er, tills dess att ni erhöll certifikatet för ISO / FSSC 22000?
FI: Voisitteko kuvailla yrityksen prosessia, ennen kuin saitte ISO / FSSC 22000-sertifikaatin?

3. EN: If you also have the certificate for organic production, how did that influence your certification process?
SE: Om ni även är eko-certifierade, hur påverkade det er certifieringsprocess?
FI: Jos teillä on luomu-sertifikaatti, miten se vaikutti sertifiointiprosessiin?

4. EN: What affected your choice of certification body?
SE: Vilka faktorer påverkade ert val av certifieringsorgan?
FI: Mitkä tekijät vaikuttivat sertifiointilaitoksen valintaan?

5. EN: How did the company set up its quality management system in practice to allow a logical setup of the documentation handling system?
SE: Hur satte företaget upp sitt kvalitetshanteringssystem i praktiken för att skapa ett logiskt dokumenthanteringsystemet?
FI: Kuinka yritys perusti laatu-järjestelmän, jolla mahdollistetaan asiakirjojen looginen hallintajärjestelmä?

6. EN: Are there any tips and tricks that you would like to share?

SE: Har ni några goda råd att dela med er?

FI: Onko teillä hyviä neuvoja, mistä haluatte kertoa meille?

Directional questions (if seen as needed a second mail will be sent including these):

1. EN: Greatest benefits of implementing ISO/FSSC 22000?
SE: Största fördelarna med att införa ISO/FSSC 22000?
FI: Mitkä ovat suurimmat edut ISO / FSSC 22000 -sertifikaatin käyttöönotossa?

2. EN: Greatest challenges of implementing ISO/FSSC 22000?
SE: Största utmaningarna med att införa ISO/FSSC 22000?
FI: Mitkä ovat suurimmat haasteet ISO / FSSC 22000:n käyttöönotossa?

3. EN: Are there any drawbacks of implementing ISO/FSSC 22000?
SE: Finns det några nackdelar med att införa ISO/FSSC 22000?
FI: Onko ISO / FSSC 22000:n käyttöönotossa ongelmia/haittoja?

4. EN: How did the company experience the actual certification audit from the class?
SE: Hur upplevde företaget själva certifieringsauditeringen?
FI: Kuinka yritys koki sertifiointitarkastuksen?

