

# Quality Management Practices in Local Short Food Supply Chains in Flevoland

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**Title**

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# Preface

This report is written by International Food Business student from Aeres UAS – Marleen Idema. This research project is part of the graduation phase of the study program. The topic of this research is a result of my interest in both supply chain management and quality management.

I would like to thank my research project coach Patrick Burgess for being willing to take the time to provide me with guidance and expert feedback. And I would like to thank the interview participants for making time available to share their experiences and knowledge.

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# Summary

Supply chain quality management may reduce product defects and ensure quality (Song et al., 2017). Quality management practices in food supply chains can be useful in assuring consumers that the quality claimed is true (Theuvsen et al., 2007). The findings of this study may be useful to actors in a short food supply chain, providing insights about the implementation of quality management practices and how to improve those for better performance and quality.

Therefore the purpose of this study is to find out how SMEs can implement quality management practices to support quality management performance in short food supply chains in Flevoland. This was done by using a qualitative research method where eleven interviews were conducted and analyzed using an inductive research approach.

The key findings of this study shows that SMEs can use several factors to implement quality management practices to support quality management performance in short food supply chains in Flevoland. These factors exist out of retrieving independent external advice. Furthermore, keeping up with the administration behind quality management systems such as HACCP and Global Gap. Another factor is to measure if the quality management practice has added value for the business and to test if a newly implemented quality management practice is working. Moreover, when implementing SMEs can first look at what is already done during daily operations and then look at the quality management practice standards from for example Global Gap to see what is missing. Next to that is the close and good relationship with supply chain partners a factor, and involving employees with the quality management practices. Another factor is to digitalize paperwork and to have access to a HACCP-certified kitchen to process or repack food products.

The recommendations exist out of working with independent experts when developing, implementing, and improving quality management practices. Next to that, review and prioritize the relevance of practices in relation to the business requirements, the automation of processes and digitalization when implementing quality management practices it is recommended to take one step at a time and look at what is already in the organization first. Other than that a set of practices that are accepted and more recognized toward short food supply chains specifically might be beneficial.

# 1. Introduction

In recent years the importance of food quality has grown significantly due to the increasing expectations from customers, governmental regulations, and competition in the sector (Kumar et al., 2013). Consumers are concerned about food quality and are more aware and concerned about this in times when scandals are occurring (Theuvsen et al., 2007). The influence of the consumption side of the food supply chain results in the development of a potential market for food products being differentiated based on the quality aspects (Renting et al., 2003). Product differentiation has become an important factor for food and beverage manufacturers (Loizou et al., 2013). Because of this companies transitioned towards differentiated production processes and innovative products (Loizou et al., 2013). There are two main reasons for this (Loizou et al., 2013). The first one is due to increased competition among food companies and the second reason has to do with the new demands from customers in recent years (Loizou et al., 2013).

Another transition according to Trienekens and Zuurbier (2008) is a shift towards quality certification by actors in the food supply chain. These certifications are used to respond to the increasing quality expectations of the end consumer (Trienekens & Zuurbier, 2008). Short food supply chains have the potential to support regional and local development which contributes to increased food quality for the end consumers (Aguilar et al., 2018).

Bremner (2000) defines food quality as a concept and non-physical entity with a fixed position in time and space. Harvey et al. (2005) mention that social trends, social groups, and social movements all contribute irreducibly and independently to the definition of quality food. Another definition of food quality from the Food and Agriculture Organization of the United Nations and the World Health Organization (2003) is more focused on attributes that influence the value of a product for the consumer. Examples of these attributes are the origin of the food product, colour, flavour, processing method, texture or more negative discolouration, spoilage and off-odours (Food and Agriculture Organization of the United Nations & World Health Organization, 2003). Zhong and Wang (2019) add to the attributes in the definition of food quality that food quality refers to the characteristics of food that consumers find acceptable. This last definition that combines both food attributes and the consumers' values will be used throughout this report. There are several criteria typically used to categorise food quality which exist out of health value, suitability value, sensory value, and social value (Leitzmann, 1993; Jeantet et al., 2016). Quality is concerned with evaluations or judgements based on a subjective component (Leitzmann, 1993; Ponte & Gibbon, 2005). According to Ilbery and Kneafsey (2000), quality is complex and the definition varies based on the product, individual, region and countries.

Since quality is an important factor for business performance (Theuvsen et al., 2007), it is incorporated into food systems (Nikolaienko & Bal-Prylypko, 2020). A food system is the entire set of product

properties from raw materials and ingredients until the final product and the profile of reaction processes which exist out of physiological, (bio)chemical, microbial, and physical processes (Luning, Marcelis, & Jongen, 2002). The food system is influenced by food production systems, which can be defined as the entire set of production activities and technological conditions that influence reaction processes to achieve the desired product properties as stated by quality management (Luning, Marcelis, & Jongen, 2002). The desired product properties and quality attributes are relying on experiences and expectations from consumers and customers (Luning, Marcelis, & Jongen, 2002). Luning, Marcelis, and Jongen (2002) conclude that food can be viewed as a complex system with dynamic and variable behaviour since it can change over time and changes can differ between similar food products. In this research, the food systems are focused on local food systems and local food supply chains. Local food systems are described by Radzyńska and Jakubowska (2018) as the trade, production, and consumption of food within a relatively small geographical area. Local food systems are referred to as local supply chains throughout this report. Local food supply chains can be described as supply chains being short in distance between consumers and producers, direct communication between the seller and buyer, and mutual understanding (Markuszevska et al., 2012).

Quality management is a comprehensive collection of tools and principles aimed at fostering continuous improvement and the prevention of defects (Jraisat & Sawalha, 2013). To protect the operational safety of the food supply chain, and due to the growing consumer awareness about food quality, most businesses adhere to food safety and quality standards as developed by the industry and public authorities (Aggelogiannopoulos et al., 2007; Theuvsen et al., 2007). Examples of quality standards developed are ISO Good Agricultural Practises (GAP), Good Manufacturing Practises (GMP), and hazard analysis of critical control points (HACCP) (Song et al., 2017). Such quality standards ensure management practices to secure food quality and safety (Aggelogiannopoulos et al., 2007). Furthermore, implementing a quality standard such as ISO can benefits in several ways since it facilitates chances to improve customer satisfaction, addresses opportunities and risks, and demonstrates the ability to conform as a company to specific quality management requirements (ISO, 2015). Quality standards secure that processes, information input and processes are used consistently (Burgess et al., 2022). Moreover, the standards are standardized so it can be implemented in different types and sizes of (food) companies (Aggelogiannopoulos et al., 2007). Quality standards are important because it provides businesses within the food supply chain with tools and techniques to increase performance (Theuvsen et al., 2007). Furthermore, quality standards improve an organization's safety control capabilities while also increasing its efficiency and competitive advantage (Hammoudi et al., 2009). Production and quality management standards can enhance food safety while increasing customer trust in food quality (Song et al., 2017). Certification may improve the traceability of the food supply chain, whereas documentation makes the manufacturing process more cohesive and visible

(Song et al., 2017). Quality standards can transmit signals outside the organization based on the quality management history, which can help firms reduce transaction costs (Song et al., 2017).

This report focuses on quality management in small and medium-sized enterprises (SMEs). SMEs are companies that keep revenues, assets, and the number of employees below a certain limit (Anggadwita & Mustafid, 2014). According to the definition from the Ministry of Economic Affairs and Climate (2013), a small enterprise exists out of less than 50 employees and a maximal annual revenue below 10 million euros. A medium-sized enterprise has less than 250 employees and a maximum annual revenue of 50 million euros (Ministry of Economic Affairs and Climate, 2013).

### **1.1 Quality management in food supply chains**

Quality management is the activities and decisions carried out in an organization to produce and maintain a product of the desired quality level (Luning, Marcelis, & Jongen, 2002). The definition according to Hellsten and Klefsjö (2000) of food quality management is that it is an organization's management strategy focusing on quality, based on the engagement of all its stakeholders, and aimed for long-term success via customer satisfaction, as well as advantages to all members of the organization and society. Both definitions make it clear that quality management is the responsibility of everyone in the organization, and not only the quality department (Dora et al., 2013). Food quality management is concerned with both food quality and quality management (Luning & Marcelis, 2006). As a result, it affects both the food production systems and the people systems involved in achieving food quality (Luning & Marcelis, 2006). Adopting a quality management standard is a strategic decision that can help an organization improve its overall performance and provide a solid foundation for sustainable development initiatives (ISO, 2015).

Quality management practices in food supply chains are important to be able to track and trace food throughout the chain and to assure the consumer the quality claimed is true (Theuvsen et al., 2007). Companies recognize that only meeting the quality standards from direct customers is not enough since there is a necessity to compete in a rapidly and constantly changing global market (Robinson & Malhotra, 2005). This results in the urge to transform traditional quality systems to a supply chain perspective (Robinson & Malhotra, 2005). It is necessary according to Robinson and Malhotra (2005) to work together with supply chain partners to improve quality to a level that is critical to market satisfaction. Supply chain quality management is the systematic integration and coordination of business activities involving all supply chain partners in order to monitor, analyze, and continuously improve products and processes to generate value for the final customer (Robinson & Malhotra, 2005). It is shown by Aubry & Kebir (2013) that making the food supply chain shorter will result in products with higher quality and traceability because the number of intermediary processes and activities is reduced. According to Mena and Stevens (2010), vertical coordination in supply chains has a strong impact on food quality management.



Supply chain quality management can result in the minimalization of product defects and ensure quality from within the companies in the supply chain but also externally from outside the supply chain and its stakeholders (Song et al., 2017). To achieve superior quality management great effort in coordinating operations is required by all functional departments inside the companies from stakeholders of the supply chain (Song et al., 2017). According to Trienekens and Zuurbier (2008), the level of quality management in a supply chain depends on the size of the stakeholders due to economies of scale, the type of products, the market structure and its chances for new entrants, the type of suppliers and customers, and the commitment of top management.

Challenges within food quality management in supply chains can be found in the emerging requirements of the public sector and the pressure from large retailers to standardize product quality to guarantee food safety (Trienekens & Zuurbier, 2008). Food companies have to focus more on food quality since consumers are getting more concerned with the topic and governments are responding to this by adding regulations and legislation (Trienekens & Zuurbier, 2008). Furthermore, because of the involvement of food supply chains in the global economy, supply chain actors must collaborate in order to produce food products for consumers with the demanded quality (Trienekens & Zuurbier, 2008). This results in the necessity to shift the focus of the food companies' strategies from traditional economic and technological interests to current issues such as the environment, animal welfare, and the healthfulness of food products (Trienekens & Zuurbier, 2008).

## **1.2 Short food supply chains**

According to Murdoch and Miele (1999), the food production sector can be split in two. The first zone is the globalized standardized industrial food network which is ruled by price and the second zone exists out of specialized production processes on a local scale which is focused on production methods taking into concern the environment and health aspect of the food (Murdoch and Mile, 1999). More recently Nayak and Waterson (2019) researched how these standardized globalized food chains are complex and became multi-layered due to interactions across all levels and how this influences food systems and safety. Farmers' direct contact with consumers has been replaced by a complicated structure of players that involves multiple intermediates (Dunne et al., 2010). In the past years, local food supply chains became important in relation to disruptions in global food supply chains (Hendry et al., 2019). Furthermore, it is argued by Hendry et al. (2019) as well that local food supply chains can lead to advantages in terms of business performance but also in terms of the environment since food miles are decreased. These advantages are a reason that there is a shift from global supply chains to more local supply chains (Thomé et al., 2021). In addition to the advantages, concerns such as the local characteristics and social dimensions also lead to the focus on local food supply chains (Hendry et al., 2019; Enjolras & Aubert, 2018). And then there is the research from Climent-López et al (2014) stating that the supply chain networks are evolving in a hybrid form where both standardization and the focus on the environment and health aspects are taken into concern.

However, this research focusses on short food supply chains which means selling products with a limited number of economic operators (from farmer to consumer through a farm shop) and producers, processors, and consumers with tight geographical and social ties (EUR-Lex, 2013). With short food supply chains, the relationship between the consumer and (primary) producer is shortened resulting in clearer indications about the origin and quality attributes of food (Renting et al., 2003). Furthermore, it results in building transparent food chains (Renting et al., 2003).

Renting et al. (2003) listed three categories of short food supply chains. The first one is Face-to-face which includes deliveries at home, farmers' markets, selling food on the roadside, farm shops, and mail orders (Renting et al., 2003). The second category is proximate short food supply chains existing out of regional hallmarks, special events, local shops, and catering for specific institutions such as schools, farm shop groups, and consumer cooperatives (Renting et al., 2003). And the third category is the extended short food supply chain which is focused on certification labels, reputation effects, and production codes (Renting et al., 2003). Consumers have several reasons to choose to engage in local short food supply chains such as the origin of the product; knowing from which farm or farmer food products are from, and the composition of locally produced foods which can result in fewer additives and preservatives, and management practices being linked to sustainability (Galli & Brunori, 2013). When selling face-to-face it emphasizes the relationship between the food product's quality attributes and the place of its production or producer (Renting et al., 2003). The place of production and the producer is an important parameter for food quality because it influences product attributes due to for example natural conditions, cultural traditions, traditional production processes, or a farm-based process (Renting et al., 2003).

During the covid-19 pandemic, the consumers' demand for local food increased (European Institute of Innovation & Technology, 2021). Furthermore, 87% of consumers across Europe stated to be likely to continue purchasing local food after the pandemic (European Institute of Innovation & Technology, 2021). Besides the consumers' interest in short food supply chains the chains have gained importance because of new concerns regarding the environment (Bals & Tate, 2018), handling food and its origin of it (Marsden et al., 2000) and food safety (Nath et al., 2019). Large agri-food companies seem to have power over large supply chains due to the monopoly position (Hinrichs, 2000). This results in a disconnection between farmers and consumers (Hinrichs, 2000). Moreover, there is a decline in consumer trust associated with the conventional food sector (Renting et al., 2003). According to Harvey et al. (2005), it is too early to assess the viability and efficiency of short food supply chains in achieving sustainable agriculture and rural development goals. This is due to the lack of empirical data of sufficient reach and quality, but also to the fact that many of these practices are still in their early stages of development (Harvey et al., 2005).

Challenges in short food supply chains lies within the disagreement between stakeholders which not always agree on the environmental and economic benefits (Chiffolleau & Dourian, 2020). It is also researched by Galli and Brunori (2013) that maintaining the motivation of actors within the short food supply chain and other external and internal cohesion factors are challenges to reach not only economic benefits but also social, political, and environmental goals. Furthermore, producers that choose to distribute their goods through short food supply chains mainly small and medium-scaled with limited production and logistical capacity due to a lack of labour, infrastructure, expertise, and money (Bayir et al., 2022). The lack of capacity also influences the option to buy expertise from outside which can be important for sufficient knowledge about food processing (Galli & Brunori, 2013).

However, as stated before the demand for locally produced food from the consumer side is growing (European Institute of Innovation & Technology, 2021). And other benefits of short food supply chains involve the high traceability of the products throughout the distribution in the short food supply chain (Sellitto et al., 2018). Other positive influences exist out of direct communication between producers and end consumers, fewer food miles, and greater freshness and seasonality (Markuszczyńska et al., 2012).

### **1.3 Quality conventions**

Conventions are practices, procedures, and agreements, as well as their related informal or institutional forms, that tie acts together via mutual expectations (Robert & Storper, 1992). Conventions are based on the action itself and not a rule made in advance of the action (Climent-López et al., 2014). Conventions are used to judge and then justify actions (Climent-López et al., 2014). Quality conventions include the involved actor's perception and discourses which are impacted by the actor's knowledge, interests, and (cultural) background thus not only the production regulations (Renting et al., 2003). Conventions may also exist out of a shared set of unintentional regularities (Ponte & Gibbon, 2005). Within the supply chain, actors are involved in the social construction of quality (Kohsaka & Miyake, 2021). Challenges within quality conventions are related to the statement that conventions are not permanent and at any given time and location, multiple justifications for action may be present at the same time (Ponte & Gibbon, 2005). Harvey et al. (2005) argue that in the short food supply chain quality conventions are the main language of production regulations. This is because it refers to the supply chain actors' perceptions and discourses, which are influenced by their personal knowledge, interests, and cultural backgrounds (Harvey et al., 2005). However, significant conflicts between actors occur, not just around the quality conventions involved in short food supply chains, but also in attempts to build compromises and coalitions (Harvey et al., 2005).

### **1.4 Quality management practices**

Several studies have used different quality management practices definitions based on categories (Soares et al., 2017). Kaynak and Hartley (2008) divided the research into the following eight practices:

employee relations, the leadership of management, data and quality reporting, process management, product design, reporting of quality data, and supplier quality management. Research from Kuei et al (2008) suggests the following five categories: IT system quality, relationships with suppliers, customer focus, supply chain quality leadership, and process integration with an external focus. Specific food quality practices used by Kim-Soon et al. (2020) are based on different systems such as good manufacturing practices (GMP), hazard analysis and critical control points (HACCP) or a quality management system such as ISO9000 that focuses on leadership, involvement of people, approaches to certain processes, continuous improvement, decision-making process, customer focus, and supplier relationships. Song et al. (2017) divided it into continuous improvement, teamwork, leadership and its planning, the structure of management, focus on human resources, supplier support, and the quality tools available. Supply chain quality management practices from Siddh et al. (2018) exist out of the following dimensions: Supplier quality, quality of human resources, quality of information and information technology, quality of supply chain integration, customer focus, internal quality and sustainable organizational performance. In order to produce quality products, effective supplier quality practices ensure that input raw food meets process and product quality standards (Bourlakis et al., 2012). Furthermore, supplier quality practices involve engagement in supply chain quality improvement programs from suppliers and working together in order to achieve environmental objectives (Siddh et al., 2018).

In this section, the practices from Siddh et al. (2018) will be further explained. Quality of human resources applies to delivering quality products and services in the supply chain due to skilled employees (Siddh et al., 2018). An important factor for this consists out of quality-related training (Raspor and Jevšnik, 2008). This is important because such programs ensure that employees are familiar with and capable of planning processes, products, and services (Raspor and Jevšnik, 2008). Furthermore, it supports employees' knowledge of how to use quality enhancement tools, such as statistical techniques, quality tools, technological tools, and so on, in their daily tasks (Siddh et al., 2018). Then there is the practice called quality of information and information technology, which is about how information about productivity, food safety, and product quality is shared among stakeholders (Siddh et al., 2018). The next quality management practice identified by Siddh et al. (2018) is the quality of supply chain integration which depends on maintaining long-term relationships through trust and collaborative strategies (Siddh et al., 2018). Moreover, it is an important factor because processing companies in the supply chain can purchase quality raw food which adds value (Bourlakis et al., 2012). The quality management practice customer focus includes the commitment from top management as a basic element (Siddh et al., 2015). Furthermore is trust from the consumer in the producer important (Siddh et al., 2018). The following quality management practice internal quality refers to all of the activities carried out in a company and can be divided into two aspects; process quality and logistic quality (Siddh et al., 2018). Process quality relates to quality checks, product safety,

quality standards, food waste, auditing processes, production volume flexibility, and continuous improvement (Siddh et al., 2018). Logistic quality concerns aspects such as inventory, storage, and transportation condition, but also maintaining food product quality during the logistics process (Siddh et al., 2018). Internal process quality execution throughout these practices has a major impact on economic, environmental and social performance (Siddh et al., 2018). The last practice is sustainable organization performance which consists of economic performance (reducing cost, focus on increasing market share), environmental performance (reduction of pollution and emissions), and social performance (healthy nutritious, safe, and fresh food in response to consumers demands) (Siddh et al., 2018).

## **1.5 Relevance**

The above discussion shows that there is an effort and trend towards improved quality from consumers, policymakers, and companies. For example, Bond et al. (2009) researched that the demand from consumers for speciality produce and value-added is increasing. According to Onozoka et al. (2010), local food is perceived as superior in food quality, freshness, and in nutritional value. Furthermore, it is stated by Bond et al. (2009) that purchases from local producers by consumers have increased. And governments are encouraged to buy and consume food that is produced locally (Chambers et al., 2007). Until now little is known about supply chain quality management practices in local short food supply chains.

This research may be relevant because of consumer purchasing behaviour and meeting their needs. Several challenges influence consumers' purchasing behaviour (Theuvsen et al., 2007). This includes restricted rationality, asymmetric information, and time constraints (Theuvsen et al., 2007). However, consumers are not willing to or not able to intensely and thoroughly verify the quality of food products (Theuvsen et al., 2007). Consumers are looking for ways to simplify the purchasing decisions by choosing a well-known brand or a respective certificate (Theuvsen et al., 2007). Therefore consumers must reestablish trust in all stakeholders of the food supply chain (Theuvsen et al., 2007). Next to stakeholders consumers have to trust the controlling institutions which are monitoring and controlling throughout the supply chain (Theuvsen et al., 2007). So consumers are demanding food quality concepts where a food supply chain is controlled and coordinated by a focal actor in that chain (Theuvsen et al., 2007). Despite the fact that industrialization in food systems has achieved considerable success in lowering production and distribution costs and making food available to more people, it has also drawn criticism owing to its harmful impact on the environment and society (Chiffolleau & Dourian, 2020). And not only because of environmental concerns but also due to food quality problems (Bayir et al., 2022). These disadvantages have resulted in the creation of alternative food systems including short food supply chains in recent years (Bayir et al., 2022). For actors within a local short food supply chain the outcome of this research may be beneficial and give new insights related to the implementation of quality management practices and how to improve those for better performance and quality.

## **1.6 Originality of the study**

Research about small and medium-sized enterprises and its food supply chains is primarily focused on the food safety part of quality assurance management and not specifically on quality management practices (Dora et al., 2013). Other studies about quality management practices are non-food related (Soares et al., 2017), or focused on large, multitiered food supply chains (Besik et al., 2022). Then different studies focusing on food quality management focused on the development and integration of quality systems (Luning & Marcelis, 2006). Such as Legnani et al. (2004) where the focus is on how to take corrective actions on problems caused by improper food handling. It has not been researched yet what the quality management practices are in short local food supply chains in Flevoland.

## **1.7 Objective of the study**

By answering the main question actors in local short food supply chains will have an idea about the different types of quality management practices that can be applied and how the different types of quality management practices are implemented. Actors within the local short food supply chain can use this information to make decisions related to quality management practices, how to implement these in daily operations, and how to increase performance related to this.

This study aims to answer the following research question: How can SMEs implement quality management practices to support quality management performance in short food supply chains in Flevoland? Sub-questions to answer the main question are stated below:

- How are short local food supply chains designed in Flevoland?
- What quality management practices are used by companies operating within a small local food supply chain in Flevoland?
- How are those practices implemented in the daily operations of companies operating within a small local food supply chain in Flevoland?
- How can the implementation of practices be improved to support the quality performance of local and short food supply chains?

## 2. Material and methods

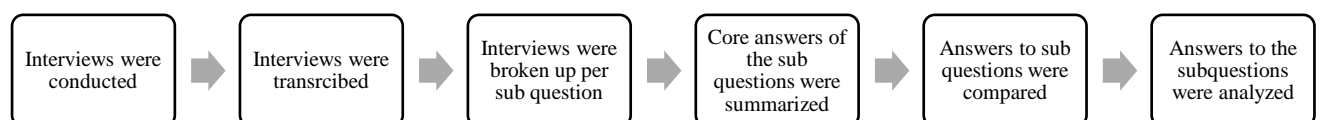
To find the answer to the question ‘How do small local food supply chains in Flevoland implement quality management practices?’, a qualitative research method was chosen. Therefore, patterns and underlying thoughts became clear. The goal of this report was to find out how quality management practices are implemented in local short food supply chains in Flevoland and how this supports the performance of quality management practices in that same chain. To answer the main question, this research was divided into four sub-questions. These questions were all answered by interviewing participants. The following research material was the same for all sub-questions.

Within Flevoland eleven actors in local short supply chains were interviewed. Examples of participants exist out of farmers with farm shops, breweries with their own bar and/or store, or primary producers delivering products directly to the end consumer. The interviews consisted of 10 open questions and was semi-structured. During the interview, follow-up questions were asked and are based on individual answers which made the data collection open and flexible. Follow-up questions were used to gain more specific or broader information or to validate and verify inconsistencies. The duration of each interview was about half an hour. The interview were held online using MS Teams, through a phone call, or face-to-face.

### 2.1 Overall research approach

A qualitative approach was adopted. This approach can use focus groups, interviews, and observations (Denny & Weckesse, 2022). This research adopted an interview method with stakeholders and experts that are in the industry (Canfield et al., 2022). The inductive theory was used. An inductive research approach means that theory was gathered as the outcome of the research (Bryman & Bell, 2011). On the opposite side, deductive theory means that theory guides the research (Bryman & Bell, 2011). The theory of inductive research was constructing generalizable inferences from observations derived from for example an interview (Bryman & Bell, 2011). Moreover, This research used a narrative approach to understand and present the answers from the information derived from participants (Wang & Geale, 2015). Figure 1 shows the steps taken for research.

Figure 1. Research process.



Interviews were conducted according to the interview protocol as shown in Table 1. The interviews were recorded using digital audio recording which is then used to transcribe the interviews. The

interviews were held in Dutch and transcripts are available (to be translated) upon request. The next step was to break up the interviews according to the sub questions. After that the answers to those sub questions were summarized and translated into English. To discuss the results the answers to the sub questions were compared among each other and analyzed.

*Table 1. Interview protocol.*

| Time       | Topic                          | Questions   |
|------------|--------------------------------|---|
| 5 minutes  | Introduction                   | Introducing myself and asking basic introductory questions to the interviewee.<br>What is your role in the SME?<br>What is the role of the SME in the supply chain?   |
| 15 minutes | Structure of the supply chain  | Can you describe and explain your supply chain?<br>What are the actors in the supply chain?<br>Why is the supply chain designed in such a way?  |
| 15 minutes | Quality management practices   | What are the quality management practices used throughout the supply chain?   |
| 10 minutes | Implementation                 | How are the quality management practices implemented in daily operations?   |
| 15 minutes | Improvements on implementation | What are possible improvements in the implementation of quality management practices?<br>If you would have to implement new quality management practices how would you do that?<br>Why would you choose to do it like that? |



# 3. Results

The results are structured and divided into sub questions. Before results are provided per sub question the role of participants within the short food supply chain are discussed.

## 3.1 Role of participants

Participant one is the co-owner of an arable farm in Dronten. The participant takes care of the farm shop by herself and started in 2014 with it. In the farm shop, only products from their own arable farm are sold.

Participant two is the owner of the farm shop and education center which is on the property of the dairy farm from her husband. In the farm shop the participant sells milk from their own cows, and other products from their property such as strawberries, and next to that the participant purchases products from other farms in Flevoland. The education center is meant for kids and teaches them about the farm in a playful manner.

Participant three is the owner of the ice cream company located on the dairy farm the participant runs with her husband. The participant started producing ice cream from the milk of their cows five years ago. The ice cream is sold on their own farm and other farms in Flevoland. Moreover, the participant produces ice cream at the request of other farmers in Flevoland. For example, producing ice cream from the buffalo farm's milk so that the buffalo farm can sell ice cream in their farm shop.

Participant four is working on the farm together with his parents and brother. The role of participant 4 is to manage the fries division of the arable farm. From the potatoes of their farm fries are cut and sold to local snack bars, restaurants and on their own property.

Participant five is the owner of a cherry farm in Flevoland. The participant does this part-time and sells cherry products made from the cherries he grows in greenhouses. In 2016 the participant started growing cherries in the greenhouses where roses used to grow.

Participant six is the owner of a garden in which herbs, spices and seeds are growing ecologically. The participant was always busy in the garden and growing unique sorts of plants. In 2019 the participant got the chance to grow on a larger scale and sell the herbs, spices, and seeds.

Participant seven is the co-owner of a chicory farm. It is a family company in which chicory is sold both locally and internationally.

Participant eight is the co-owner of an ecological arable and chicken farm and sells the products grown (mainly garlic), and poultry meat from their chicken on their own farm next to products from other farms in Flevoland. The participant started 10 years ago with the chicken division and 25 years ago with the garlic division.

Participant nine is the owner of a duck farm and the owner of the brand the participant uses to sell the meat from the duck directly to the consumer. With this brand, the participant wants to show that duck meat can be consumed in everyday life.

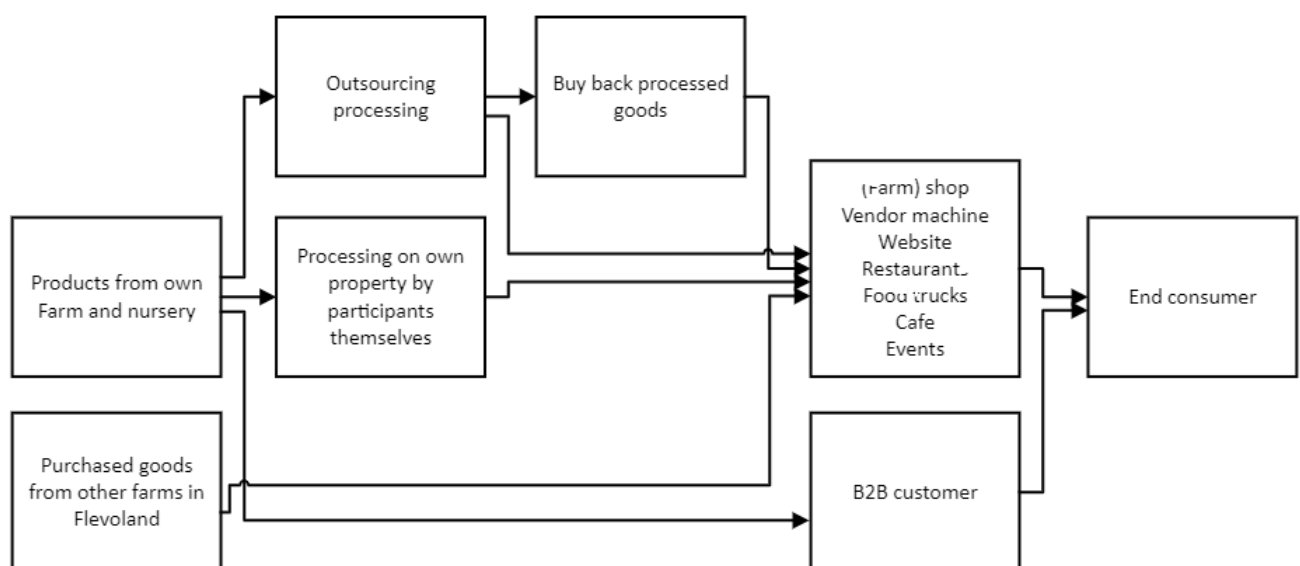
Participant ten is the owner of a beer brewery and distillery. The brewery brews its own beer from the participant and uses ‘rental brewers’ to generate more volume. From this year on the participant starts with a new collaboration and division which is the distillery.

Participant eleven is the owner of a vineyard. With the grapes grown in the vineyard wine is produced on the same property. The participant started with this in 2012 and can nowadays sell about 4500 bottles of wine per year.

### 3.2 Supply chain design

Figure 2 shows how the short food supply chains are designed among the eleven interview participants based in Flevoland where the connecting black lines represent the product flow.

Figure 2. Supply chain map.



The supply chain from participant one exists out of the fruit and vegetables that are grown and harvested from the farm and then will directly go to the shop that is located on the farm property, furthermore are fruit juices and jams purchased from another fruit grower in Flevoland. The consumers can purchase the products in the farm shop and contact with customers is maintained through social media.

The supply chain from participant two starts with the milk from the dairy farm which is sold through a vending machine in the farm shop that is located on the dairy farm’s property. Next to that, the owner of the farm shop purchases local products from other farmers in Flevoland such as fruits, vegetables, ice cream, juices and meat so customers can buy different types of food products in the farm shop.

Participant three sells ice cream which is made with milk from the cows from the dairy farm. The production of the ice cream is done at the same property and is also sold. Other revenue streams of the

supply chain from participant three exist out of making ice cream on request with ingredients from other farmers in Flevoland. For example with buffalo milk from a buffalo farm in Flevoland. Next to that, the participant rents out an ice cream cart to events.

For participant four the supply chain starts with the potatoes grown on the family farm which are then cut on the farm and sold. The cut fries are sold to local restaurants and food trucks and delivered by employees from the farm. Next to the restaurants and food trucks fries are directly sold to customers on the farm.

Participant five its supply chain starts with growing cherries inside greenhouses. After that, a part of the cherries are processed at another facility into jam. Another part of the cherries can be picked by consumers themselves directly in the greenhouse and already picked prepared portions are sold at the farm shop.

The supply chain from participant six begins with picking the fresh herbs from the garden and then dry them so the dry herbs and spices can be sold or ordered through the webshop and picked up or bought in the store located in the garden.

The next participant, participant seven's supply chain starts with growing the chicory roots on the farm. After that, the roots will grow in the nursery to then be sold to a Business to Business (B2B) customer such as a supermarket. The end consumer can buy the chicory through the supermarket. Other than that the company sells starter kits for consumers to grow their own chicory. This is sold through their website. Participant seven describes the supply chain as follows: 'We do not have the seed and we do not eat everything ourselves, but we do all the steps in between'.

For participant eight the supply chain begins with products from both the arable and chicken farm. The products from the arable farm such as garlic are sold directly in the vendor machine. The chicken will first go to a processing facility and will then go into the frozen vendor machine located on the farm where consumers can buy their products. Next to the products from participant eight's farm food products are purchased from other farmers in Flevoland and sold in the vendor machine.

The supply chain from participant nine starts with growing ducks on the farm which are then sold to a processing facility and then bought back so the meat can be transported to consumers that purchased the meat on the webshop.

For participant ten the supply chain begins in the brewery where the beer is brewed for the brand of the participant. The beer produced under that brand is sold at the location of the brewery in either the café or shop. And this is the same for the distillery division. Furthermore, the beer is sold to local liquor stores and supermarkets.

Participant eleven its supply chain starts with growing and picking the grapes which then will be processed into wine. Once the wine is bottled it is sold in the shop on the vineyard on in the café next to the shop.

### 3.3 Quality management practices

During the interview, the following question has been asked to every participant ‘What quality management practices are you using?’. Graph 1 shows the answers from the participants. Participant one uses Global Gap, visual product controls, SKAL, and the focus on selling products as fresh as possible as quality management practices. For participant two the focus is on HACCP practices and outsourcing the processing of fruits into jam. Participant three responded to the question about quality management practices as follows: ‘The one practice that basically describes everything we do around quality here is HACCP’. Participant four uses Global Gap, visual controls, tasting, sending samples of the potatoes to the laboratory to test, and interviewing customers about the products sold. The answer from participant five exists out of visual controls and tasting during the picking process. The focus during the visual controls is on the colour and size. For participant six the quality management practice mainly exists out of visual controls and being part of an expert group in which the participant visits members of the group to audit their quality and members of the expert group also audit the herb garden from participant six. Participant seven uses ‘an external party to control the critical control points throughout the supply chain’. Next to that the company from participant seven sends samples to the laboratory to test, uses Global Gap and is certified as Planet Proof. Participant eight is outsourcing the processing part of the garlic paste, has Global Gap, and uses visual controls of the products coming from their own farm but also for purchased foods from other farmers in Flevoland. The focus on cooled transport and the constant circumstances in which the ducks grow up is the quality management practices participant nine described. For participant ten HACCP, tasting, and the tracking and tracing of the beer is part of the quality management. Participant eleven describes tasting during the yeasting process twice a day, visual controls during the picking process, and chemical analysis in the laboratory as quality management practices in the wine company.



Graph 1. Quality management practices.

### **3.4 Implementation of quality management practices**

Participant one mentions an example about implementing Global Gap ‘implementing these practices is not a big deal or something where we spend a lot of time on, for example, the emergency exits you install them once because it is required but after that, it is done’. Furthermore, the participant mentions that the requirements from Global Gap, such as basic hygiene principles, were already implemented in daily operations. The participant mentions that at some point in time, large customers required Global Gap certification but does not remember how this was implemented at that time.

Participant two recently implemented HACCP in the short food supply chain. ‘To implement the HACCP plan I followed a specific course designed for it so I was up to date about the requirements and could apply the HACCP plan to our farm’. While following this course and implementing the HACCP plan in the day-to-day operations the participant noticed that it is not doable and allowed to process for example own fruits from the garden into jam. This is because a HACCP-certified kitchen is required. This contributed to the decision of the participant to outsource the jam-making process. And the same counts for repacking large bags into smaller portions to sell them. Furthermore, the principle is implemented in daily operations by controlling the temperature of the milk tap and providing information about pasteurizing the raw milk.

Participant three also uses HACCP during daily operations and this results in ‘working in a clean kitchen and using paper towels for example instead of a cloth towel’. Furthermore, the temperature of the freezers has to be controlled on a regular base. Moreover is this participant registered by an organization (COKZ) that audits the participant on a yearly basis. Other daily tasks related to HACCP include sending samples to the laboratory to test, the temperature during transport, measuring the quality of raw ingredients used, and the use of cleaning materials. This is implemented after advice from the auditor.

Participant four implements its principles by having for example a conversation with a customer when delivering the fries. The participant would ask questions related to product quality and especially when potatoes from a new harvest are used. Moreover, the fries are tested on a regular base at the farm by frying them. Another way participant four tests its products is by sending samples to the laboratory to test. The quality principles the participant uses in his company and supply chain are mainly implemented by using past experiences and knowledge and not by using a written down system in which fixed principles are used. It is based on the situation.

The next participant, participant five, implements the principles based on the situation as well and there is no fixed and written down the system. During the process of picking the cherries, the pickers look at the colour and taste of the cherries to control if the cherries are ready to be picked. Moreover, the jam-making process is outsourced. As an entrepreneur, the participant evaluates on a yearly base to see what can be improved for the next year.

Participant six walks by the plants every day to do a visual control and pest control as part of quality principles. 'Bij doing my control rounds every day I remove for example the Chrysolina herbaceous. The participant does not use other day-to-day activities besides that. This quality management principle is implemented as part of pest control.

For participant seven the implementation of quality management principles during daily activities consists of controlling the critical control points throughout the process. This involves 'testing the soil and how quickly the crop is developing'. Next to that basic hygiene practices are followed.

Participant eight explained that the only practices used within the short food supply chain next to Global Gap are visual controls and outsourcing the production of garlic paste. Moreover purchased products from other farmers from Flevoland are controlled with a visual inspection. When purchasing the vendor machine in which the chicken meat is sold, the decision-making got influenced by the first in first out (FIFO) method. This means that customers can not pick a specific piece of meat in the vending machine but the machine will provide the customer with the meat that has been in the vending machine the longest.

Participant nine's main focus is on the transport of the duck meat. The meat is transported using a carrier and has to be deep frozen at the time of delivery. This is done by clear agreements. When a customer would receive a piece that is not deeply frozen the participant will send a new order to the customer. Furthermore, the participant is focused on a day-to-day base to keep the environment of the ducks constant. This involves measuring humidity and temperature. But also using the same feed every day.

The answer from participant ten is related to the use of HACCP. Daily activities the participant does around this plan involve hygiene practices, for example, the use of specific cleaning materials. Other practices are focused on tasting and sending samples to an independent laboratory. Next to that, the participant mentioned the use of an app to measure customer satisfaction.

Participant eleven is tasting the wine twice a day during the yeasting process. The assessment of the quality of the wine is based on experience. During the picking process, volunteers are instructed by the participant and will do visual controls. Furthermore, is traceability a day-to-day task in which specific numbers are linked to a specific batch.

### **3.5 improvements on implementation**

Graph 2 shows the summary of the answers of the participants. Participant one explained that it would be beneficial to have a critical look at the norms from a certificate such as Global Gap and then 'look from the inside out' to see what standards are already used on a daily basis and what has to be added to them. Next to that, the participant explained that it is important to be professional with it from the start and this involves for example getting external help from a specialized organization.

The improvement in implementation according to participant two is mainly in retrieving useful and clear information. This could be through an independent advisor who is aware of new standards and requirements from the Netherlands Food and Consumer Product Safety Authority. The participant now retrieves such information through a Facebook group with other farmers in short food supply chains where questions regarding quality norms are asked and answered by each other. Another improvement according to participant two could be a HACCP-certified kitchen in Flevoland in which operators in the short food supply chain can repack or process small batches of for example jam a few times a year.

Participant three mentioned that an improvement would be 'to have someone or an organization which is focused on small scale farm shops that are willing to give advice and updates regarding quality regulations and norms'. Next to that would it be an improvement according to participant three to have clear directions on where to start with for example HACCP and what paperwork is necessary for it.

Participant four brought up that digitalization within the supply chain the participant operates would improve the implementation. This means keeping track of all activities around quality management practices in for example software instead of paper.

For participant five the improvements are within the costs of having a Global Gap certificate for small companies. The cost is too high for this participant to implement such a standard.

Participant six explained that getting external help from a professional from the start would 'save time and uncertainty' regarding quality standards. Moreover, would the costs of certification such as SKAL be too high for the smaller-scaled entrepreneurs operating within the short food supply chain.

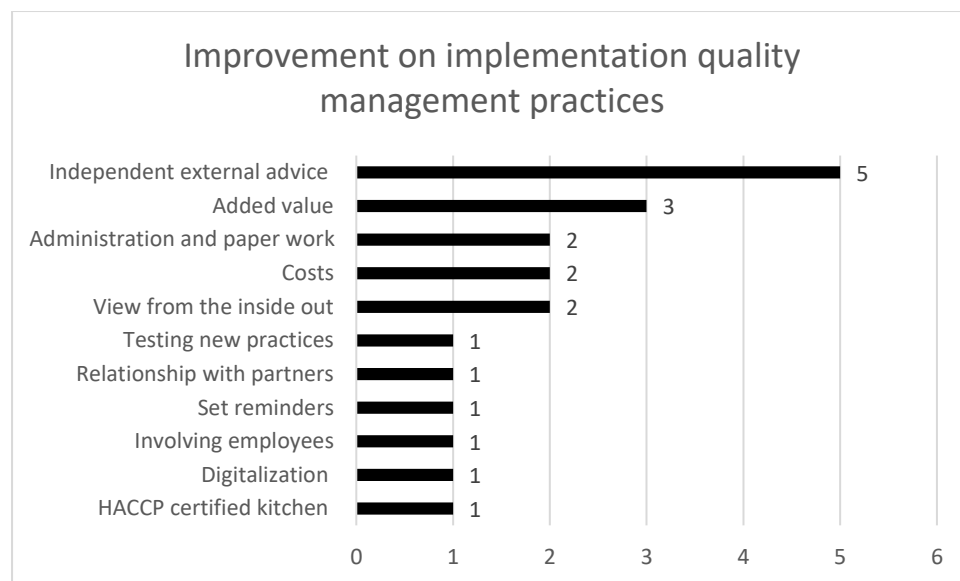
Participant seven explained that for quality management practices such as Global Gap and Planet Proof it is important to have everything clear on paper. This participant explained that practices were already implemented before the certification came but that the certification forced the participant to register the activities on paper and that it is important to do this thoroughly and correctly. Furthermore, the participant explained the importance of involving employees closely with the standards and keep for example yearly meetings with everyone in which changes and developments regarding this are discussed. Furthermore, mentioned to this participant that it is useful to look from the inside out, so what is already there and what has to be added to be successful. Moreover, quality management practices have to add value to the company and product and it is useful to measure this in advance of the possible implementation.

According to participant eight, there is improvement in making the documentation of quality management practices as efficient and practical as possible so time is saved on that part and set reminders for tasks that only take place once in a while so that it is not forgotten. Next to that, it is useful to research in advance what the added values are of implementing new quality management practices.

Participant nine explained that it is important to have a good relationship with partners, in his case, the carrier of the meat from the company to the consumer.

Participant ten told about the challenge of retrieving the right information that applies to the specific product that is produced and sold. According to this participant, an improvement would be to work together with an independent party that is allowed to give specific advice that is applied to that specific product and also keeps the product owner up to date about new or changing regulations or norms.

According to participant eleven, the improvement in implementing practices is testing them using their own experience and knowledge. And to look at the added value of new and existing quality practices.



Graph 2. Improvement in the implementation of quality management practices.



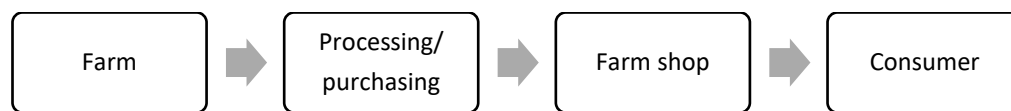
## 4. Discussion of results

The objective of this research is to find out how SMEs can implement quality management practices to support quality management performance in short food supply chains in Flevoland. This main question has been answered after conducting the eleven interviews where participants answered the four sub-questions. In this chapter, the most important findings per sub-question are described. Next to that, a critical reflection on the conducted research is provided.

### 4.1 Supply chain design

Similarities in the first sub-question ‘How are short local food supply chains designed in Flevoland?’ were found among eight participants where the supply chain was designed as shown in Figure 3.

*Figure 3. Summarizing supply chain.*



Supply chains from other participants had a step in between where meat is being bought back, beer is sold through a café and retailers, meat is sold through a website, and chicory via a retailer. The diversity of the supply chains may impact the quality management practices used, and the way those practices are implemented. As stated by Trienekens and Zuurbier (2008) the degree of quality management within a supply chain depends on the size of the SME, stakeholders, type of products and the market structure. For example, supply chains that use a retailer in between have to use Global Gap or HACCP as a quality management practice since this is required by (larger) retailers.

All the short food supply chains from the participants interviewed can be categorized as face-to-face since products are sold directly from the (farm) shop on their own property or an online shop (Renting et al., 2003). Next to that, there are three short food supply chains that can also be categorized as proximate short food supply chains where products such as ice cream are sold at events, beer and chicory are sold through retailers, and fries through restaurants (Renting et al., 2003).

Vertical integration was shown within four of the supply chain designs where for example, participants process the raw materials themselves. Another example is delivering products to customers and having a nursery to grow chicory. It is shown by research from Mena and Stevens (2010) that vertical integration does have an impact on food quality management. This is because actors in such a supply chain have to consider more practices because certain activities are not outsourced (Mena & Stevens, 2010).

### 4.2 Quality management practices

The participants work with and create quality management practices based on their processes and operations within the different types of businesses. As shown in the results the most mentioned quality

management practices are visual controls, Global Gap and tasting. Participants that have a smaller enterprise do not use certified quality management practices such as Global Gap, SKAL, or Planet Proof. Other quality management practices such as visual controls, tasting, storage optimization and testing samples in a laboratory were used based on logic because it directly influences quality according to participants. Quality management practices related to certificates such as Global Gap were used in the company based on the requirement from customers outside the short food supply chain but buying products in bulk from the farm. This is also shown in research by Aggelogiannopoulos et al. (2007) and Theuvsen et al. (2007) which states that businesses conform to quality management practices, such as Global Gap, SKAL, or Planet Proof, developed by industry and public authorities to protect operational safety and comply with the growing awareness of customers and consumers.

Quality management practices can be divided into two categories: soft quality management practices and hard quality management practices. Hard quality management practices focus on tools and techniques such as information systems, process controls and structural assurance (Abdullah & Tarí, 2012). Soft quality management practices are focused towards trust, relationships, and leadership (Abdullah & Tarí, 2012). The hard quality management practices retrieved from the interviews exist out of Global Gap, HACCP, SKAL, Planet Proof, track and trace, storage optimization, and testing raw material and finished products in a laboratory by an external party. The soft quality management practices exist out of the visual controls done by participants, tasting the products throughout the process, outsourcing the processing part of the supply chain, interviewing customers, evaluations done on a yearly basis, and using an expert group to evaluate quality.

When comparing quality management practices from consumers with practices in literature several similarities and differences can be found. For example participant seven mentions involving employees in quality management. According to research from Kaynak and Hartley (2008) the relationship between employers and employees is a quality management practice. Other quality management practices described in literature but not mentioned by participants involve the leadership and management, product design, supplier quality management, process integration with external focus, and customer focus (Kaynak & Harley, 2008; Kuei et al., 2008).

#### **4.3 Implementation of quality management practices**

After asking the question for the first time seven of the participants answered that the quality management practices were just done when they had to, and there was not really an implementation. After asking follow-up questions two participants explained that they could not remember the implementation because for example, Global Gap was already in the company when they started working. Other participants without a certified quality management system such as SKAL, Global Gap, or HACCP implemented the quality management practices based on experience and do not have a written down document. Challenges with the implementation according to the participants are in finding up-to-date, clear, and useful information that can be applied to a specific supply chain or sector.

Information can be retrieved at organizations but participants find this not independent and experience the pressure to register at such an organization. This is not obligated but participants that talked to these organizations explained how the organization would only provide them with all the information once registered. Moreover, participants experience that it is hard to stay up to date with changing requirements. Often it occurs that these new requirements are brought to light after an audit but several participants would like to retrieve this information from another trustworthy source before.

#### **4.4 Improvements on implementation**

For the performance of SMEs, quality is important (Theuvsen et al., 2007). The answer given most to the questions ‘What are possible improvements in the implementation of quality management practices?’ and ‘If you would have to implement new quality management practices how would you do that?’ existed out of retrieving independent external advice. It was explained that gaining information from for example the Netherlands Food and Consumer Product Safety Authority was not preferred since this is not independent according to several participants. Moreover, it has been discussed that quality management practices should have added value to the business other than that it is just required by (large) customers by three participants. According to literature from Theuvsen et al. (2007) quality management practices are important to implement because it provides businesses with techniques and tools to increase performance. However, several participants explained that implementing quality management practices was more about paperwork and registering than that it increases performance since the standards from the quality management practices were already done daily but not written down as a quality management practice. But according to Son et al. (2017) having such documentation makes a process more cohesive and visible.

#### **4.5 Reflection, limitations and future work**

Reflecting on the methodology of semi-structured interviews the benefits and challenges of that approach existed out of arranging the interviews by calling participants. One participant did not show up at the discussed time and place for the interview. All the other interviews could be held according to the pre discussed moment and place. One in one interviews allowed for the participants to speak freely about their own situation compared to using a focus group.

What could have been improved was following the interview protocol better during interviews in which participants already gave answers to questions on the list without the questions being asked. Due to this conversations were not as structured. Moreover, when reading through the transcripts more open questions should have been asked at moments when participants were not giving (elaborate) answers to the questions asked.

By using interviews as a method for this research experiences, opinions, and knowledge of each participant were different which causes the research to be influenced by non-influential circumstances. Moreover, the interview participants are all owning and working in different companies, and selling

different products this means that the answers are subjective and in relation to the participants' own operations. The outcome of this research is based on the questions that have been asked during the interviews. Asking or not asking specific questions could have influenced the answers from the participants and thus the outcome of the research. The used method allowed to gain initial insights into a research area where there is limited data. Next to that, it gives an understanding of several factors. However, due to the number of participants, it does not provide a global perspective on how many more quality management practices there are used among other short supply chains.

Therefore, for future work, it is suggested to use a quantitative methodology to identify more quality management practices, prioritize those and elicit more factors. Moreover, provided this research a broader view based on one interview per participant. Because of this, it can be beneficial to use a case study in which quality management practices are observed and more specific information can be retrieved.

## 5. Conclusion and recommendations

The objective of this research is to find out how small and medium enterprises in Flevoland can implement quality management practices to support quality management performance in short food supply chains. To find this out eleven interviews have been conducted to answer four sub-questions.

The supply chain from eight out of the eleven interview participants starts at the farm where the products are grown and harvested. In four cases the products from the farm are processed and in six cases more food products are purchased. The food products from the farm and purchased products are then sold in the farm shop on the farm's property. The supply chain from another participant has an extra step in the supply chain as described before which involves buying back the processed meat. Four participants use other ways of selling their food products to the end consumer than a farm shop. This exists out of a website, café, events, and retailers.

The quality practices used are different between the participants due to the difference between operations and products. The following quality management practices are used in the order from most often to least often: visual controls, Global Gap, tasting, HACCP, outsourcing processing of raw materials grown on the farm, testing raw materials in the laboratory, SKAL, storage optimization, interviewing customers, yearly evaluation, being part of an expert group, Planet Proof, focus on transport and track and trace.

The implementation also differs per participant on how it is implemented on a daily or regular basis. Participants started with the implementation as a result of requirements from customers buying products from the farm in bulk. Other implementations were done because it was common logic according to participants. Examples of implementations exist out of taking a course to understand and implement HACCP within the short food supply chain, following up advice from an auditor, and using own knowledge and expertise to control quality.

Pieces of Advice from participants about how to improve the implementation of quality management practices to support quality management performance in the short food supply chain in Flevoland exist out of the following: Retrieve independent external advice, measure if the quality management practice has added value for the business, administrating and keeping up with the paperwork on a regular base, costs of certification such as Global Gap should be lower for smaller businesses, work from the inside out of the company to implement quality management practices instead of looking at the certification requirements first, test if new practices are working, have a close relationship with partners throughout the supply chain, use reminders for quality management practices that are not happening on a regular basis, involve employees in the quality management practices, digitalize paperwork, and have access to a HACCP certified kitchen to process or repack food products.

The unique design of the short food supply chains shows the incentive to understand quality management practices and the implementation of those practices. Within the short food supply chains practices are both unique to those and also more generalized to global supply chains. Therefore, the implementation process of such practices is important to understand.

As a result of this study short term recommendations are to work with independent experts when developing, implementing, and improving quality management practices. Furthermore, reviewing and prioritizing the relevance of practices in relation to the business' requirements and how those practices can contribute to quality management performance might be beneficial to actors in short food supply chains. The automation of processes and digitalization can help actors to keep up with administration of quality management practice and other retrieved data towards performance. Furthermore, when implementing quality management practices it is recommended to take one thing at a time and look what is already in the organization first. After that the missing parts of quality management practices as provided by for example, Global Gap, can be implemented one by one.

A long term recommendation is to develop a set of practices that is accepted and more recognized toward short food supply chains specifically.

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