

Best Practice Quality Systems in food chains

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1. Introduction

Concerns about quality and safety in agri-food supply chains have been raised among consumers, especially due sector-wide crises, such as the BSE crisis. The EU and the national governments have reacted on the above mentioned crises by setting up regulations for quality and safety of agri-food products. Furthermore, retailers have introduced quality management standards in which they impose quality requirements on their suppliers. However, concerns have been raised about the (administrative) burdens being placed on firms, because firms must comply with many private and public quality regulations. In order to reduce the compliance burdens, European governments want to assign the private sector more responsibility for compliance. In order to comply with the quality requirements, closely coupled agri-food supply chains have emerged in which a platform is established for open communication about specifications and chain process improvements which results in a mutual commitment for each other's quality requirements. Moreover, the exchanges of outcomes of quality tests and – inspections, results in more possibilities for enforcement of quality requirements. This paper aims at recommendations for managers and policy makers for establishing self regulated and integrated quality management systems in agri-food supply chains. The study is a follow-up study of a large scale survey performed in three food chains

1.1 Theory and methodology

Theory

In this study a number of theories have been used. The Supply Chain Management (SCM) and Total Quality Management (TQM) theories are used to define the most important elements of quality management in a supply chain perspective. Due to intensive collaboration in the chain, for example, on quality management, higher performance for the individual firms in the chain is expected. Literature on buyer-supplier relationships frequently states that increased performance is likely to be best achieved by means of committed suppliers and buyers. For measuring performance of a firm buyer satisfaction and revenue growth of the firm were used. In addition, SCM emphasises the importance of information exchange by means of ICT which can be regarded as a catalyst for successful integration of supply chain processes. Transaction Cost Theory underlines the impact of transaction specific investments (TSIs) as needed for the integration of quality management. Due to strong collaboration in chains supported by these investments, opportunistic behaviour of the chain partners is to a large extent prevented. Furthermore, external drivers (*media attention, legislative demands, changing consumer demands* and *societal demands for corporate social responsibility*) put pressure on firms to integrate their quality management. From a Contingency Theory perspective a firm that faces more external pressures will be more inclined to integrate its quality management systems with its suppliers and buyers whereby the importance of the own quality strategy for the success of this integration is emphasised. As was already argued, the integration of quality management with suppliers and buyers

is expected to have a positive impact on self regulation (commitment and enforcement), because firms get common goals and transparency in the chain, which enables them better to control each other. These thoughts are summarised in Figure 1.

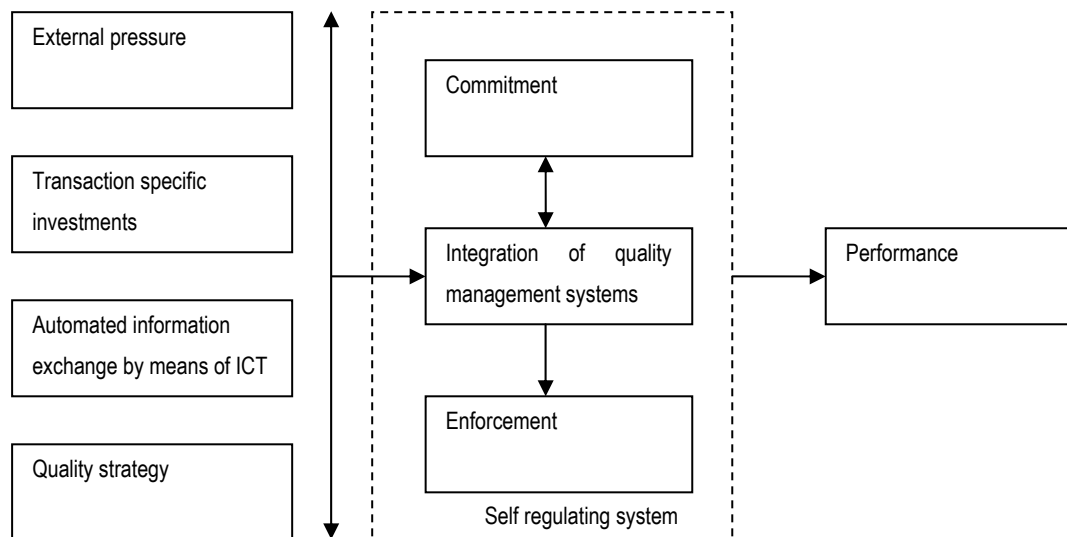


Figure 1 Theoretical model

In this paper we address three research questions:

1. Which (internal and external) factors have an impact on the integration of quality management systems in agri-food supply chains?
2. How do integrated quality management systems affect self regulation and performance in agri-food supply chains?
3. What is the best way to create self regulated quality management systems in agri-food supply chains?

Methodology

An important feature of the study is that it collects data from both the supplier and the buyer side of the firm and includes two successive stages in each chain (primary producers and traders and/or processors). This approach ensures the proper implementation of the SCM approach. Until now, most studies were limited to data collection in the firm or solely about the suppliers or buyers.

The poultry meat chain, the fruit and vegetable chain and the flower and potted plant chain were chosen because:

1. These chains are valid representations of the agri-food sector, they are characterised by a large diversity of marketing channels and products.
2. All these chains are of great interest for the Dutch economy, especially with regard to export
3. All the three chains pay a lot of attention to quality management.

A survey was conducted among primary producers, processors and/or traders in the three chains. The primary goal of the survey was to test hypotheses of the theoretical model.

In total 585 firms reacted to the survey. Table 1 shows the distribution of the respondents across the chains involved. Based on the analysis of the survey, it turned out that the general research model was highly generalisable for the different kinds of firms involved in the study. Therefore, it could be regarded as a robust model for studying quality management and self regulation in agri-food supply chains. However, the measured level of quality management in the flower and potted chain was significantly lower compared to the poultry meat en the fruit en vegetable chain. An explanation is that food safety does not play a role in the flower and potted plant chain.

Table 1 Number of firms per chain

Firm	Number of firms			Total
	Poultry meat	Fruit and vegetables	Flowers and potted plants	
Primary producers	116	151	102	369
Traders/processors	34	98	84	216
Total	150	249	186	585

This study has shown that if firms perceive stronger external pressures, their quality management systems will be more integrated with suppliers and buyers (see Figure 2). Many of the pressures are not aimed at specific firms, but often influence all firms in a supply chain. However, incorrect actions of only one firm in the supply chain may result in increasing external pressures on all firms in the chain. By integrating quality management systems in agri-food supply chains, managers try to prevent this. Interestingly, *legislative demands* have hardly any impact on the integration of quality management systems with buyers and suppliers, while *media attention, societal demands for corporate social responsibility* and *changing consumer demands* have a great impact.

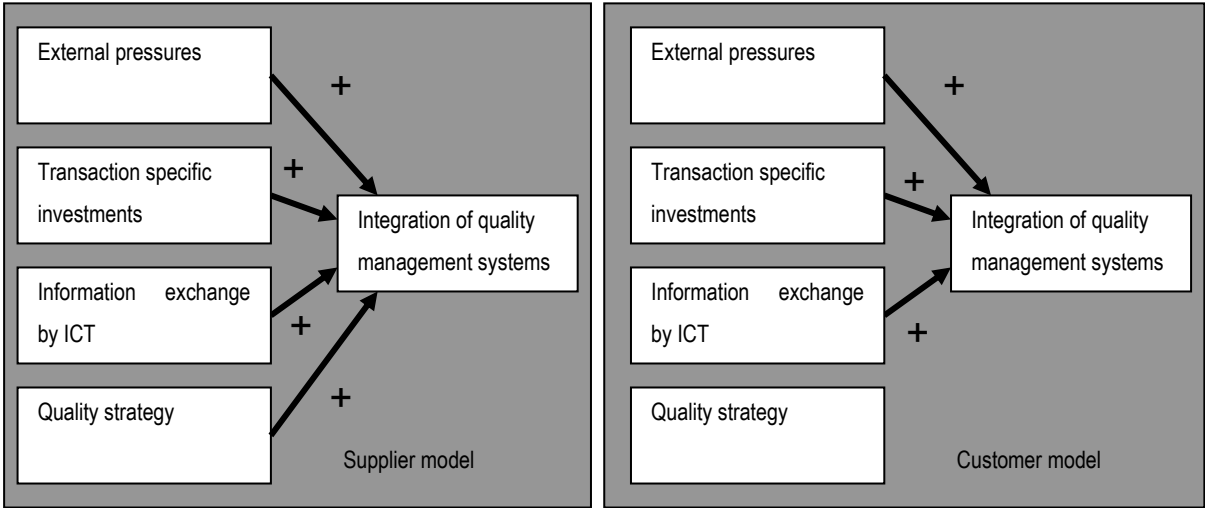


Figure 2 Factors influencing integration of quality management with the supplier (left) and buyer (right); no line means no significant relationship.

TsIs and integrated ICT systems (for example ‘tracking and tracing systems’) also contribute to the successful integration of quality management systems. Integration and collaboration on quality lowers

the risks for opportunistic behaviour. Firms send an important signal to other parties in the chain that the relationship is highly valued by TSIs and integration of quality management systems. Interestingly, the quality strategy of the focal firm has an impact on the integration of quality management with the suppliers, but not with the buyers. The most likely explanation is that firms are able to impose their quality requirements upstream, but not downstream in the chain. When selecting suppliers, the firm is able to let its interest for quality management play an important role, whereas this is much more difficult in the choice of its buyers.

The study showed empirical evidence that integrated quality management systems are strongly positively related to self regulation, see Figure 3. Due to the integration of quality management systems a platform is established for open communication about specifications and chain process improvements which results in a mutual understanding and commitment for each other's quality requirements. Moreover, the exchanges of outcomes of quality test and – inspections, results in more possibilities for enforcement of quality requirements.

This study also shows that integration of quality management leads to higher performance. Firms that have integrated their quality management systems with their suppliers and buyers achieve higher levels of performance (both for buyer satisfaction and revenue growth). This effect is achieved by commitment of the parties in the chain and not by means of enforcement. A policy that is focused too much on enforcement and sanctions has no effect in the supplier model and works even detrimentally in the buyer model. Enforcement has the potential to result in conflicts with suppliers, especially if sanctions are imposed that are perceived to be unjust or unreasonable. However, although a large majority of firms will comply with quality requirements as well as possible and too strong enforcement is de-motivating for them, a certain level of enforcement is needed for firms that will behave opportunistically.

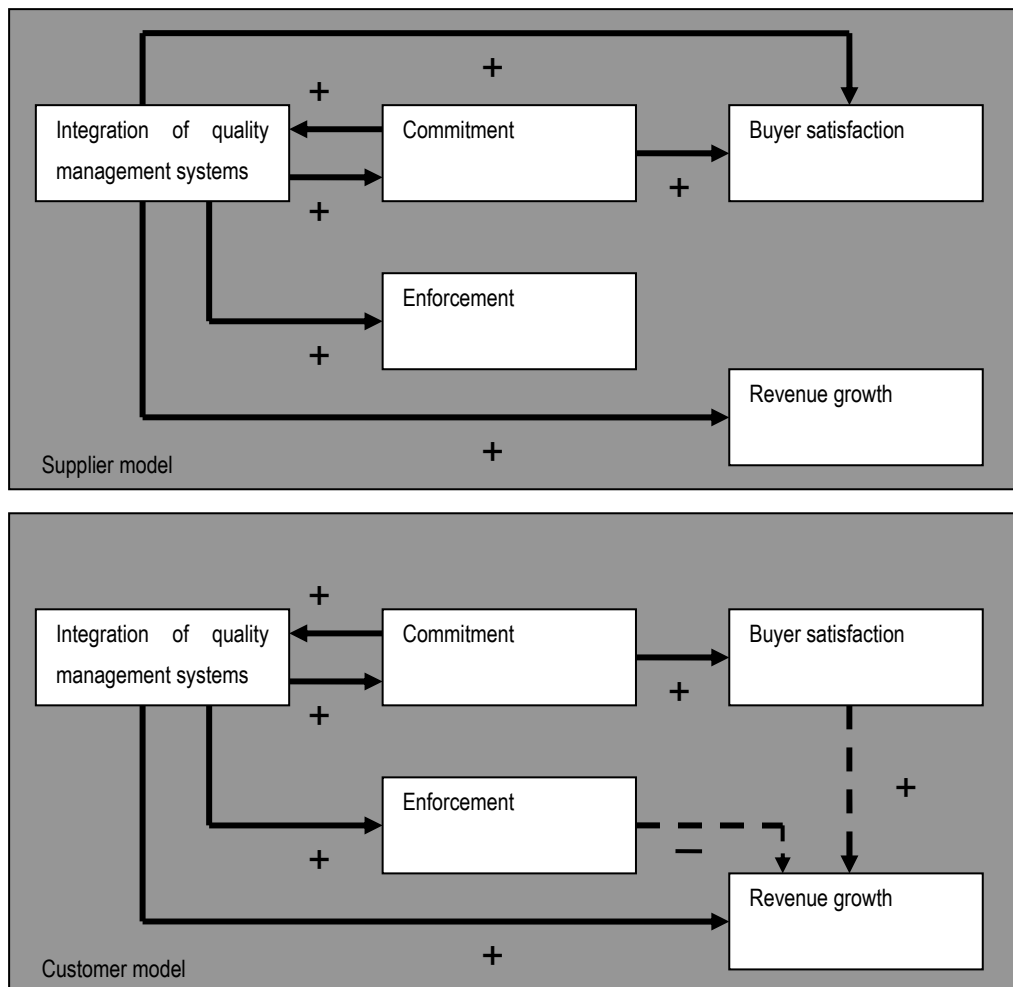


Figure 3 *Impact of integration of quality management on self regulation and performance of firms in agri-food supply chains (dashed arrow means weak significant relationship).*

2. Research into Best Practices

Based on these outcomes 14 in-depth interviews were held with stakeholders of the three chains. The interviews were carried out from July to September 2006. Willingness to participate in an interview was asked in a personal phone call in which the objective of the interview was explained. None of the potential experts refused. For each chain involved in this study the objective was to interview at least:

- One primary producer
- One trader and/or processor
- One person employed at an interest organisation (e.g. Products Board or trade association)
- One certifier

The study successfully achieved this objective, however, in the poultry meat sector no certifier was included, because the interviewed poultry farmer had a very broad knowledge of the sector and could

easily make comparisons between different quality management systems ¹. Another reason was that two representatives of the Product Boards of Livestock, Meat and Eggs (PVE) were involved, assuring the 'helicopter' view in this chain. In total, fourteen people were interviewed. Their working experience ranged from two years to thirty years, with an average of nineteen years. For these experts quality management was their full time job, assuring that experts were well informed about quality management and self regulation. Firms included in the study were relatively large firms from an agri-food perspective. Those firms often have more resources available to build 'best practice' quality management systems and to deliver products to buyers that have very stringent quality requirements. The outcomes of the in-depth interviews are presented according to the research model in Chapter 3.

2.1 Factors influencing integration of quality management

The main factors influencing integration of quality management, as described in the research model were:

- External pressure
- Transaction specific investments (TSIs)
- Information exchange by ICT
- Quality strategy.

The outcomes for these factors in the in-depth interviews are discussed below.

External pressure

For most experts in the in-depth interviews it was difficult to give examples of 'best practices' on how to deal with external pressures on individual firms. The business environment was regarded as unpredictable and firms had only limited influence on it. Moreover, most pressures from the business environment were often not targeted at one specific firm but groups of firms or even a whole sector.

Nine of the fourteen experts mentioned that in many sectors quality management systems exist that deal with specific quality requirements. Compliance with such systems can be regarded as a 'best practice' for dealing with the external pressures. In the fruit and vegetable chain an example is Nature's Choice initiated by the British retailer Tesco. In this system, besides the requirements that are comparable with Eurep-GAP (see Chapter 2), firms must have a plan for managing the business environment, including detailed actions, such as, protecting and encouraging wildlife diversity. Pollution control and energy use are also important parts of the scheme, with specific controls on discharges to local watercourses, and energy use reviews by independent third parties. Participating in sector-wide initiatives can be regarded as another 'best practice' for dealing with certain pressures. These initiatives are usually developed by interest organisations or Product Boards and prevent each

¹ In the past this poultry farmer was involved in different research activities, has been asked as a speaker on several congresses and attended many meetings in which representatives of the poultry chain were invited.

firm from developing its own approach, resulting in many different quality management systems. For example, three experts from the fruit and vegetable sector mentioned the initiative 'Food Compass' (see also Chapter 2) which helps traders to comply with legislative demands on pesticide residual limits. Two experts mentioned teams in which representatives of the whole sector are involved for dealing with potential crises. In those teams, members are trained to effectively communicate with the media, for example.

Two experts, a trader of fruit and vegetables and a processor of poultry meat were able to give examples about how their firms have directly dealt with external pressures, in their case action groups. In one case the demands of the action groups (Milieudefensie, Natuur en Milieu and Greenpeace) were focused on the compliance with Maximum Residue Limits (MRLs) of pesticides on fruit and vegetables. In the other case demands from the Dutch Animal Welfare Society were focused on lowering the growing speed of chickens. In both cases the firms co-operated with suppliers and action groups and have launched product-market combinations that take into account the wishes of the action groups. The fruit and vegetable trader had success, the slaughterhouse did not, due to a lack of the consumers' willingness to pay extra for the new product- market combinations.

Transaction specific investments (TSIs)

At least eight experts mentioned TSIs in quality conscious personnel to effectively deal with the specific quality requirements of their buyers. For example, a pepper grower who was delivering to Tesco trained his personnel in the detection, recognition and report of harmful insects and plant diseases:

Every year a biologist visits our firm to educate our personnel about harmful insects and plant diseases. The early detection leads to decreased use of pesticides resulting in a safer product and less problems with pesticide residuals. This is necessary because our buyer (Tesco) pays a lot of attention to the reduction of pesticide use.

A pepper grower

Another example was a big fruit and vegetable trader who employs agronomists who visit, and train suppliers abroad to comply with European MRLs. Four experts add that motivation of the employees is important for quality management. Motivated personnel will not leave the firm, so it is not necessary to teach new personnel the quality procedures again and again. Therefore, firms take a lot of effort to find the right personnel, not only as to job requirements, but also personality and culture.

One expert from the flowers and potted plant sector mentioned the participation in a highly specialised quality system of a grower association as an example of a TSI. Before a grower can fully participate in the quality system a learning trajectory is started. During the learning period the grower pays only 20% of the quality costs. When the grower has reached the desired quality level, an independent certifier visits the firm. If the outcomes of the own audits are comparable to those of the certifier, the grower

receives his certificate. Due to the compliance in this system, the grower is able to deliver to British retailers, who place extremely high quality requirements on their suppliers.

Information exchange by ICT

In each chain investigated, large integrated ICT systems exist between buyers and suppliers. Four experts mentioned that especially the large traders and or processors are initiators of these standardised ICT systems. For example, a big fruit and vegetable trader has developed an Internet based system to which suppliers deliver requested quality data to integrate the six different ICT systems of these growers. The outcomes of quality tests and inspections can be (anonymously) published on a web site on which firms can log in and compare their own scores with the scores of others. For some firms benchmarking is an extra stimulus to try to be the best performing firm in their sector.

Five experts emphasised that quality management systems should not be stand alone systems in the chain, but should be integrated with e.g. production management. For example, the quality management system of a slaughterhouse also includes information monitoring, for example, which feed and medicines were used during the growing period of chickens at the farms. Due to this integration of quality management, firms gain more insight in their production processes, what increases and provides more possibilities for improvement, because firms get information more promptly and more frequently.

A group of six experts, including all traders and/or processors, indicated that due to standardisation and integration easy access to data was obtained in order to answer questions from buyers adequately. As was emphasised by one of the experts:

Some time ago a buyer needed data about a specific product within a short time period. The grower was contacted, however, the quality management system was managed by an external person. However, this person was involved in a big sport event at that moment and could not be reached. What would you think about such practices if you were a buyer?

A pepper grower

Quality strategy

One expert stressed that a firm should have a clear strategy on which position quality management should take relative to the other activities of a firm. If quality management is integrated with the commercial, financial and personnel strategy of the firm, it will more easily be supported by the personnel and it will not be regarded as a bureaucratic burden. If the main interest of a firm is to obtain a quality certificate, but it does not have an appropriate quality strategy, the quality management system will not be successful in the long term. One of the experts made a nice comparison of how the management of a firm should deal with quality management:

For these firms, quality management is like a marriage after the wedding day (the day a firm obtains the quality certificate). From that moment the real marriage starts and you have to go for it (applying the quality management system in such a way that it fits within your organisation and with the organisation of the suppliers and the buyers). This will guarantee success in the long run. By doing so, quality management will not be regarded as something that is mandatory and nasty, but as a helpful tool for better firm performance.

Director of a certification firm

Often awareness of the importance of quality management starts at the strategic level, and goes down through the whole firm or chain. The personnel will find it in their working instructions and the management will have to give good examples to its personnel, like one expert stated:

If an employee sees that something goes wrong, resulting in bad quality of products or processes, does he stop to solve the problem, or does he continue his work because he is busy or wants to leave the firm because it is five o'clock? Or just another example; if a buyer demands products that are available, but do not comply with quality requirements, the firm's management should have the discipline to block the delivery.

Quality manager of flower and potted plant trader

2.2 Self regulating behaviour

The in-depth interviews paid paramount attention to self regulation and its dimensions, *commitment* and *enforcement*. Attention was also paid to the roles of industry organisations, certifying organisations and interest organisations, such as Product Boards and trading associations, in designing self regulated quality management systems.

Commitment

For many traders and/or processors it is a challenge to tie the best performing suppliers on quality to their firm. Three traders and two primary producers emphasise the presence of supplier panels. These panels serve as communication channels between suppliers and buyers and are very useful for increasing commitment as an expert from a big slaughterhouse stated:

Every six weeks, we have a meeting with a panel of poultry farmers to discuss topics of quality management ranging from new marketing concepts on quality to the reduction of Salmonella and Campylobacter contamination. We also organise excursions for them to our slaughterhouse. This makes them aware of the consequences of their quality management practices for our quality management. These activities create a lot of commitment for quality management among the poultry farmers.

Quality manager of a poultry slaughterhouse/processor

Among suppliers in such panels there are vivid discussions of all kind of topics aimed at improving quality performance. For example, a grower that delivers to Tesco organises a monthly meeting with other growers in which novelties, feedback from consumers, information about actions and demanded

quantities of products are discussed. Also a newsletter is published every month in which quality management forms are included. Suppliers participating in such panels often come up with improvements and suggestions themselves.

In the 'Table of Eleven' (see Section 3.6), *commitment* consists of the individual dimensions 'knowledge and clarity of regulations', 'the (im) material (dis) advantages of regulations', 'the degree to which regulations are accepted', 'the willingness to comply with regulations' and 'the chance of discovering and sanctioning by third parties'. These are discussed in detail below. This discussion reveals the experts' opinions about how self regulation should be improved.

The knowledge and clarity of regulations

Four experts mentioned that most private quality systems in agri-food chains are accredited systems, which means that the regulations and procedures are clearly described and are supervised by an independent Council of Accreditation. According to them, in this way, it is completely clear to firms what the requirements of private quality management systems are. Five experts mentioned that, however, the public regulations from the government were sometimes difficult to understand.

The (im) material (dis) advantages of non-compliance

Firm experts thought they would not gain financially by non-compliance with quality systems, because it could be easily detected by their buyers. Experts like the idea and the emerging practice in which good performing firms on quality are inspected less frequently by the VWA than bad performing firms. If the costs of these controls are charged to firms it introduces a bonus-malus principle for compliance with quality requirements. This approach could increase the motivation of firms to adopt quality regulations, because they know that compliance with the private quality management systems will result in lower inspections. This will remove annoyance, for example because three experts from good performing firms held the opinion that they were inspected too often, although they had an outstanding quality management system.

Three experts mentioned that legislative demands on quality management may result in (logistic) problems in the production processes. An expert from a big poultry processor said that legislative demands on inspections constrained his production process. For example, in The Netherlands a maximum of 9,000 chickens per hour is allowed to be slaughtered, because otherwise controlling agents are not able to control the total flow. This is quite low compared to Belgium and Germany, where 11,000 and 12,000 chickens per hour are slaughtered. It is recommended that government implements quality control systems that are competitive with those of countries abroad². In case of more self regulation such problems may not exist.

The degree to which regulations are accepted

² Recently a pilot study was started in which cameras are placed on the slaughter line to foster control.

According to six experts self regulation might increase the acceptance of quality regulations. The government often works according to the inspection principle, in which each detail is controlled extensively. This way of working of governmental agencies can be frustrating for firms with good performing quality management systems as an expert complained:

These kinds of inspections are disruptive in character, removing initiative and de-motivating. If you trust someone, you do not check everything with a checklist and you do not want to see everything.

A poultry farmer

Audits make quality requirements more acceptable to firms. If a firm has a certified quality system, the audit is a learning process, in which auditors take the total structure of the firm into account. For example, how processes are organised and how information is communicated within the firm. An auditor is not regarded as a police officer, but as an improver of the firms' processes. Experts would like governmental agencies to work like auditors, because the added value of an auditor is that he helps the entrepreneur to find the balance between the quality requirements and how these requirements should be met within the firm. This difference might partly explain the lack of trust of experts of the VWA in the current quality management systems.

The willingness to comply with regulations

Three experts mentioned that The Netherlands has an important competitive advantage for the introduction of self regulation. In almost all agricultural sectors there is an extensive network of industry organisations, Product Boards and other kinds of associations which represent many firms, whereas many other countries show a lack of organisation of the agricultural sector. These organisations are often active in translating new or changed legislation to their members or introducing initiatives for compliance with quality regulations (e.g. Food Compass), preventing many troubles for firms. This results in a higher willingness to comply with quality regulations.

The chance of discovery and sanctioning by third parties

The VWA expert reported that based on Regulation EU 882/2004³ it is necessary to be transparent about the outcomes of inspections of controlling agencies. In fact this regulation introduces among others a kind of societal control by the public. The Ministry of Agriculture, Nature and Food Quality and the Ministry of Health, Welfare and Sport have decided that the fruit and vegetable sector will be a pilot sector to work out this EU regulation. The VWA has launched a web site in which all the results of the residual controls are published with the names of the traders and retailers ('blame-and-shame' approach). If the products fail, it is mentioned on which aspects and whether these aspects are harmful to human health. This approach may increase the efforts of firms to comply with quality management regulations, because they do not want to damage their quality reputation. However, this approach could also have some drawbacks as one of the experts stated:

³ <http://eur-lex.europa.eu/LexUriServ/site/nl/consleg/2004/R/02004R0882-20060525-nl.pdf>

This information is also accessible for Non-Governmental Organisations (NGO) which may use this information in order to put retailers under pressure to come with even more stringent requirements to their suppliers.

Representative from an interest organisation in the fruit and vegetable chain

The expert further warns that when the government introduces more frequent inspections for bad performing firms and less frequent inspections for good performing firms, the possibility of finding an offence will become much higher. When these outcomes are published it might seem that the number of non-compliances in The Netherlands is high, especially if these outcomes are used for comparisons of offences across countries.

Enforcement

Regarding enforcement, experts pointed out that almost all big market parties, especially retailers, have summarised their quality requirements for suppliers in certified systems (see Chapter 2). Independent auditors take care of the compliance with such systems and in case of repetitive non-compliance firms will lose their certificate. However, experts warn against using very stringent enforcement principles, because firms that are performing well are hampered by stringent enforcement, which might disillusion and demotivate them. As one of the experts stated:

Would it be necessary to develop a very stringent sanctioning system with many controls and inspections for a very small number of firms performing badly and hampering all firms that are performing well? Or would it be better to visit the less good performing firms and to look where the problems occur and to discuss with them how to solve these problems?

Quality manager of a poultry slaughterhouse/processor

Moreover, in case of very stringent quality regulations firms might fake compliance with regulations by manipulating measurements. When faking compliance, it might seem that these stringent regulations having some effect, but in practice they do not. If the sanctions are not very severe, it will stimulate timely notification of problems.

The dimensions of *enforcement* of the 'Table of Eleven' are combined in two dimension 'credibility' and 'sanctioning', because they are very close to each other or are difficult to apply in agri-food supply chains.

Credibility (chance of control, chance of detection and chance of selection)

The expert from the VWA stated that for the introduction of reliable self regulation it is necessary for certifiers to employ highly qualified independent auditors. Auditors should have the time, knowledge and experience to judge the system on its contents. This enables them to make a judgement on whether all hazards are clearly identified, whether these hazards are really hazards, and whether corrective and preventive actions are needed. According to the expert of the VWA some quality systems deal with the transfer of responsibility to the suppliers and not really with the assurance of

quality itself. Another point of attention with regard to the credibility according to this expert was that the government takes care of exact compliance with requirements, whereas in many private quality management systems the certificate is obtained if a firm complies with a certain percentage of the requirements. Therefore, it should be investigated whether partial compliance assures the same level of quality assurance as exact compliance. Three experts from business further stated that the government should realise that fraud is always possible, also with governmental control. For each control organisation, whether it is private or public, it is impossible to check a total firm on its behaviour, as an expert summarised:

If people want to do things wrong you can hardly prevent it. If a person wants to use a kind of forbidden pesticide, it is not in the storage of the firm, but in the cabinet at home, or at the neighbours. Inspection agencies will not look in those places.

Lead auditor of a certification firm

These experts further argued that certifiers know firms and develop relationships with them in which improvement of quality management is very important. As a result they have more insight in the problems and can help to resolve problems. Therefore, they know best whether or not a firm complies well with the quality requirements. Therefore, they may be more effective in preventing fraud because certifiers know firms and develop relationships with them in which improvement of quality management is very important. Experts from business were also aware that introduction of self regulation would not lead to a decrease of the level of quality requirements, but it may even increase the level of the quality regulations, as one expert stated:

An important problem with self regulation is that governmental agencies will develop very stringent requirements for self regulation, because they are afraid that something will go wrong if they partly transfer their responsibilities to the market.

Senior consultant of interest organisation in the flower and potted plant chain

Sanctions (chance and type of sanction)

According to the expert from the VWA the introduction of a Council of Accreditation is a critical success factor for the introduction of self regulation. The commercial relationship between firms and certifiers could hamper certifiers in their sanction possibilities. If a certifier states that a certain firm does not deserve the certificate the firm might go to another certifier. According to an expert from the VWA this could be quite simple for firms, because there is a strong competition between certifiers. However, two experts explicitly mentioned that the common sanction for repeated non-compliance is withdrawal of the certificate or exclusion from delivery, which is much more effective for a firm than a fine as one expert stated:

Loosing the certificate is often a more rigorous and effective 'shame-and-blame' sanction for a firm than a fine, because a firm is than loosing its market and excluded from the chain, whereas in case of a fine, it can still deliver to the buyer, because the buyer does not know it.

Lead auditor of a certification firm

Furthermore, retailers themselves are keen to enforce of quality regulations as an expert from the flower and potted plant chain said:

For the English market it is important to follow exact specifications, although this leads sometimes to very strange situations. For example, the number of fruits on a citrus plant should be in between eight and twelve according to the specifications. In this case the strange situation occurs that extra fruits have to be removed from a plant in order to comply with the specifications.

Quality manager of a flower and potted plant trader

According to a firm expert the VWA should not worry about the strictness of sanctions in certified quality management systems. However, firm experts warn that the government should take care of firms that operate at the bottom of the market where certificates have no value at all and are only seen as a burden. For some firms the revenues are much higher than the fines: they calculate the fines of the VWA in advance and add them as a budget item in their business administration. One expert of the fruit and vegetable chain guesses that less than one percent of the total trading volume is traded by firms that are not performing well on quality. Big firms in The Netherlands are performing well on quality, but they mainly export their products, whereas bad performing firms often sell their products to the domestic market.

Performance

Performance was measured by using an operational indicator, *buyer satisfaction* and a financial performance indicator, *revenue growth* of the focal firm. Both are discussed below.

Buyer satisfaction

Eight experts explicitly mentioned that in relationships with strongly integrated quality management systems firms take the initiative to make customised appointments to monitor, to align and to improve the production processes. A flower and potted plant trader gave an example on how this works in practice:

For big orders that are placed in advance we visit the growers regularly to make appointments about production according to certain quality specifications. During the growing period we visit them to monitor production, but we also expect growers to notify us in advance in case of problems. Timely notification is important, because it can help us to change our planning schedule.

Quality manager of a potted plant and flower trader

As already stated, six experts mentioned that firms choose to co-operate with firms that have a similar attitude toward quality management. These firms are often in close contact with each other to achieve common goals (e.g. by means of panels). Within these relationships clear appointments are made about the way these goals should be achieved. An expert stated:

Suppliers know to what requirements they have said 'yes' and it prevents expectations (from both sides) that cannot be made true. Discussions at the moment of delivery are annoying, because nothing can be changed at that moment. Most quality systems are nothing else than descriptions how the desired quality should be delivered.

Quality manager of a flower and potted plant trader

Three experts mentioned that for achieving buyer satisfaction, commitment is much more important than enforcement. If the relationship is good, problems are usually solved in good harmony.

Revenue growth

One expert from a big slaughterhouse was able to give a very specific example on how integration of quality management had a positive impact on the revenue growth and even optimised the total revenues of the whole chain:

Due to our extensive registration system we observed that a certain chicken race (A), delivered the biggest quantity of filet per chicken, but took one day more for the farmers to grow in order to obtain the same weight as for other races. Together with a panel of poultry farmers race A was selected and we compensated poultry farmers for the longer growing period of the chickens. As a result the profit of both the slaughterhouse and the chicken farmers grew.

Quality manager of a poultry slaughterhouse/processor

Four experts had the perception that quality management systems also result in higher costs due to costs for auditing, administration and training as one grower of flowers and potted plants added on the questionnaire:

From 1998 to 2004 I was certified for ISO and FloriMark. The costs and revenues of the systems are totally out of ratio. The buyers buy on basis of trust and not on basis of paperwork.

A flower grower

Quality management systems cost money, particularly in the implementation phase, because though firms have the systems they do not yet have the reputation of delivering high quality. Moreover, the exact revenues of good quality management are often difficult to quantify. One expert thought that the relationship between revenue growth and integration of quality management was behaving according to the law of decreasing margins. Thus, if a firm improves from a bad level of quality management, the revenue growth will be great. However, if a firm has already achieved a high quality level, improvements will not contribute much to revenue growth any more. Probably the right answer to the question on whether or not a quality management system results in higher revenues was given by one of the experts:

If you believe in good quality management you see only advantages, but if you do not believe in your quality management system you see only disadvantages.

3. Implications for managers and policy makers

Implications for managers

The recommendations for managers are focused on establishing 'best practices' in quality management. Managers in agri-food firms might ask themselves questions such as: *'How should we start or strengthen the integration of quality management with our buyers and suppliers?'*, *'What factors do influence (and how strongly) the integration of quality management with our suppliers and buyers and How can we benefit from integration of quality management systems?'* The present study has identified a number of important implications from the three phases (conjoint analysis, survey and in-depth interviews) conducted in this study, summarised below:

1. Jointly dealing with pressures

Managers should realise that in order to deal effectively with pressures from the business environment, firms should integrate their quality management systems with other firms in the chain. The main reason for this is that failure of the quality management system of one firm affects the reputation of all firms in the chain. In strongly integrated supply chains, ideally, the goals of the entire chain become the common objectives of each firm, but also, more information and control actions will become available to the firms in each stage of the supply chain to enforce quality regulations. In this way, integration of quality management increases compliance behaviour. However, managers should realise that they can use their buying power to impose their quality strategy on their suppliers, but it seems to be less possible to impose their quality strategy on their buyers.

2. Collaboration to improve performance

Managers active in agri-food chains should strive for integration of quality management with their buyers and suppliers, because it is advantageous for firms. It turns out that firms that have higher levels of integration of quality management achieve higher levels of performance in terms of buyer satisfaction and revenue growth. To achieve a high level of performance, and especially buyer satisfaction, it is necessary to find committed parties in the chain that share the firm's objectives with regard to quality management. Commitment can be regarded as the 'glue' that holds together successful buyer supplier relationships. Commitment can be enlarged by:

- Maintaining high quality standards and link up the own firm with exchange partners that have similar visions on quality management.
- Communicating timely quality information and by intensifying the relationships through personal contacts and visits with suppliers and buyers.
- Sharing the benefits from better quality management throughout the supply chain and stimulating the notification of problems without directly imposing sanctions.

Enforcement of quality requirements should be avoided as much as possible. Strict enforcement does not lead to higher performance in most cases because:

- Strong enforcement of quality regulation has the potential to be destructive and initiates dysfunctional conflict behaviour, especially if sanctions are imposed that are perceived to be unjust or unreasonable. Therefore, stringent enforcement may ruin the necessary (long-term) relationships on quality management in agri-food supply chains.
- If buyers use strong sanctions for non-compliance with quality requirements, suppliers might be faking compliance behaviour and will not notify their buyers in case of quality problems, because they are afraid of stringent sanctions.
- Stringent enforcement by frequent or many controls de-motivates firms that are performing well and results in high and unnecessary monitoring costs for the enforcing firm.

3. Better use of quality data

Managers should be aware that due to the compliance with quality requirements, they possess a rich source of information about their quality performance over time. At the moment these quality measures are often only used to verify compliance. Analysing this data deeper might reveal the roots of quality problems and indicate ways to solve these problems.

4. Aligning quality strategy with firm strategy

Managers should develop a clear strategy that positions quality management within the other activities of the firm. If quality management is integrated with the commercial, financial and personnel strategy of the firm, it will not be regarded as a bureaucratic burden and can be better aligned in the firm's processes. Motivation of the personnel could be further improved by developing effective procedures that are short and practical. If the only interest of a firm is to obtain a quality certificate, not supported by an appropriate quality strategy, the quality management system will not be successful in the long run. Therefore, managers should take care that quality management is 'alive' within the firm and should avoid practices that might decrease the perceived importance of good quality management by their employees. Examples are enhancing the quality systems just before auditing or selling products that do not meet the quality requirements in times of product shortage. Such practices may be interpreted by personnel that quality management is just another management fashion, to which they should pay only limited attention.

Implications for policy makers

The study has also derived important implications for policy makers. These recommendations mainly focus on facilitation and improvement of self regulation in agri-food supply chains. Policy makers might be interested in the answers to questions such as: *'What hampers the self regulation of quality management in agri-food supply chains?'*, *'How can we improve quality management of firms in agri-*

food supply chains?’ and ‘What is the role of the government with regard to inspections of quality management in the near future?’ This study provides the following implications:

1. Application of ‘control-on-control’

Within the concept of ‘control-on-control’ the government should retain ultimate responsibility for quality assurance, especially with regard to the mandatory legal European requirements. ‘Control-on-control’ is likely to increase the overall level of quality management in agri-food firms. Good performing firms will become even more motivated to improve their quality management, because the governmental inspection frequency of their firms will decrease, lowering the administrative and financial burdens of the inspections. Bad performing firms will be controlled more frequently. Even if the vast majority of firms do the right thing, there is always the chance that irrational, incompetent and stubborn firms will produce serious harm. No less than in other walks of life, there are firms that are simply resistant to new chances. While relatively small and operating at the bottom of the market, these minority of firms cannot be ignored. For such firms, direct inspections offer the most efficient way of ensuring a basic level of quality management. As a result the effectiveness of the governmental inspections will increase, because the government is ‘fishing where the fishes are’. The government should stress this higher effectiveness of the ‘control-on-control’ approach to other governments in Europe. This is also important in order to avoid unjust comparisons with other EU countries that control all firms. Because bad performing firms are inspected more frequently, it might falsely be suggested that the number of non-compliances in The Netherlands is high. Fair comparisons are extremely important for Dutch agri-food supply chains, because most agri-food chains are highly internationally oriented (see Section 2.2, 2.3, 2.4).

2. Uniform certification procedures

Policy makers should realise that even the traditional ‘command-and-control’ approach of governmental control is not a kind of golden standard for a 100% compliance with quality regulations. Fraud will always be possible. However to minimise the chance of fraud, the procedures should be clearly described and supervised by an independent Council of Accreditation. This prevents the commercial relationship between audited firms and certifiers from hampering certifiers in their evaluation. ‘Control-on-control’ might even be more effective in preventing fraud -because certifiers know firms and develop relationships with them in which improvement of quality management is very important. As a result they have more insight in the problems and can help to resolve problems a firm has in complying with regulations better than governmental agencies. Moreover, a common sanction for repeated non-compliance with certified quality management systems is withdrawal of the certificate or exclusion from delivery. This is a severe sanction, because firms that are excluded from their chains no longer have the possibility to deliver to their buyers, which is a more stringent sanction than a fine.

3. Innovative approaches

The present study showed that not *legislative demands*, but more consumer oriented measures such as increasing *media attention* and *societal demands for corporate social responsibility* have the most important impact on the integration of quality management in agri-food supply chains. Therefore, policy makers should focus on innovative approaches that positively emphasise the efforts of firms to deliver safe and high quality foods, for example:

- Create awards for firms with 'best practice' quality management systems comparable to the corporate social responsibility award of the Ministry of Agriculture, Nature and Food Quality. Winners receive a lot of positive attention in the media.
- Develop a 'score card' including a number of criteria on which the quality management of firms should objectively be assessed. Based on this score card of quality performance a ranking list of firms can be composed and published. It is expected that this ranking list will start a kind of competition among firms in order to achieve a higher ranking. Of course, this list has to be updated regularly, for example, once a month. This score card could possibly be connected with existing private initiatives such as the Action Plan for Salmonella and Campylobacter and Food Compass (see Section 2.8.4 and 2.9.4).
- Extend the publication of the inspection results on the Internet page of the Dutch Food and Non-Food Authority to all agri-food sectors, instead of only the fruit and vegetable chain. In order to safeguard their quality reputation firms may intensify the integration of quality management with their suppliers and buyers as a means of complying with quality management regulations (shame-and-blame approach).

4. Commitment instead of enforcement

Commitment and not enforcement lead to better performance with regard to quality management. This also has consequences for the government. At the moment, the government works according to the inspection principle, which means that many details are checked extensively. Firms perceive this as an enforcement based way of working. In order to change this perception, the government should work according to the auditing principle. The added value of an auditor is that he helps the entrepreneur to find a balance between the quality requirements and the way these requirements should be met within the firm and this is perceived as a commitment based way of working. In this way, the inspection of quality requirements will be perceived more positively by firms.

5. Retain the advantages of 'control-on-control'

Finally, regarding the possibilities of effective sanctioning in private quality management systems, policy makers should be sure that they do not develop too stringent requirements for self regulating systems if they transfer part of their responsibilities to the market, because they are afraid that something will go wrong. Recent research has shown that self regulation in other sectors such as health, higher education and environmental management did not lead to lower administrative burdens for firms (Dorbeck-Jung *et al.*, 2005). Regulations of the government were replaced by all kinds of regulations of private organisations. Because these organisations

formulate and implement their regulations from a specific interest, there is less room for own initiatives of firms. Firms face many costs in order to show that they comply with all these new regulations. If this happens, the expected advantages of self regulation will be gone for firms. In order to prevent this, an independent organisation, comparable with a Council of Accreditation or Product Board could judge whether or not these (administrative) regulations are justified.

4. Concluding remarks

This paper discussed the results of fourteen in-depth interviews that were held with experts in three food chains on integration of quality management systems. It provides a number of additional qualitative insights to the survey performed in previous research, by focusing on the 'how' and 'why' questions to better explain the relationships found. The questions were open-ended, because then the expert would not be hindered by any framework or bias of the researcher. From these interviews it became clear how firms have implemented self regulating 'best practices' quality management systems in agri-food supply chains and helped to formulate practical recommendations for managers and policy makers. During the interviews it became apparent that it is not always clear what belongs to quality management systems and what not. The boundaries between quality management systems and other systems of the firm are blurring. Information structures that were created for the transfer of information about quality compliance are increasingly used for the transfer of all kinds of product and process related information. One should note that the term 'best practice' quality management system depends on the market a firm is operating in. At the bottom of the market in particular quality regulations are regarded as something firms have to comply with and the perception exists that firms should do as little as possible for the assurance of quality.

Regarding self regulation, the in-depth interviews were useful, because self regulation is quite a broadly defined term in current management and policy research. The discussion of the outcomes of the interviews shed light on the two main dimensions of self regulating behaviour, commitment and enforcement. During the interviews, it turned out that firms would like the implementation of '*control-on-control*' as soon as possible. The main reason was that their quality efforts would be rewarded, because they would get a lower inspection frequency of governmental agencies. In addition, many experts believed that certifiers are able to implement and to supervise the quality management systems better and that certifiers had enough sanction possibilities for firms that tried to cheat the 'rules of the game' in quality management systems. The commercial relationship, the education of the auditors and the necessity of accredited systems were important points of attention to take into account according to the VWA.