



*Quality assurance between retailers and suppliers in the
Dutch fresh pork meat supply chain*

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Summary

Recent food scandals and animal diseases have led to more concerned consumers and loss of consumer confidence. As meat is sold mostly under the label of the retailer the reputation of the retailer is at stake. Retailers want to deliver fresh pork meat of high quality to consumers to protect their reputation. To be able to deliver this high quality meat, retailers need to assure the quality of fresh pork meat delivered by suppliers and coordination with other actors in the supply chain is needed. Two research questions will be answered in this thesis. The first question is 'How is the governance structure related to quality assurance for retailers and their suppliers the Dutch fresh pork meat chain?' The second question is: 'What influence does the positioning strategy of Dutch retailers have on quality assurance between retailers and their suppliers in different Dutch pork meat supply chains?' Case studies are performed to investigate how quality is assured between retailers and their suppliers and to identify the main governance structure. In-dept interviews are held with four retailers and their suppliers. Table 1 shows some characteristics of the four retailers investigated.

Table 1: Characteristics of the four retailers

	Retailer A	Retailer B	Retailer C	Retailer D
Turnover	1,4 milliard	1,41 milliard	0,75 milliard ¹	4,1 milliard
Market share	5,9%	6%	2,4% ¹	31,6%
Total amount of stores	123	280	185 ¹	428
- Of which are franchise stores	35	280	111 ¹	428
- Of which are own stores	88	0	74 ¹	0
Number of suppliers	3	2	6	14

Quality assurance consist of three steps: setting standards for quality, signalling quality and monitoring quality. The most important quality standards for retailers concern fat content, micro-bacteria, pH, shelf life. As can be seen in table 2 quality standards differ between the four retailers for fat content and temperature. The retailers interviewed buy their meat from different categories, varying from UA/UAA (retailer D), to EA (retailer C), to EAA (retailer A). The standards set for temperature vary from a maximum of 7 degrees (retailer A and D) to a maximum of 4 degrees (retailer B and C). Furthermore, differences are identified in quality assurance systems. Retailer C is the only retailer that delivers meat that complies with 'Milieukeur'. For the suppliers of retailer A and B the quality assurance system BRC is obligated, while this is not yet the case for the smaller suppliers of retailer D. Finally, the suppliers of retailer C can choose between IFS and BRC as a quality standard. Other retailers do not require IFS as a standard. Overall, suppliers stress that not many differences exist between Dutch retailers in quality of meat delivered. Two reasons are given. First, because regulations for quality of fresh pork meat are set at a high level, retailers stick to these standards. The second reason is that standards for quality are communicated between several retailers, which lead to similar standards. The second step in quality assurance is signalling quality. Suppliers have to show compliance to the standards set by the retailer by signalling the quality of fresh meat. The suppliers investigated show major similarities in how the quality of fresh pork meat is signaled to retailers. All suppliers use certifications, give warrantees and use branding and reputation. Test results are not shown on initiative of suppliers, but only showed when asks for by retailers. In the third step in quality assurance, retailers monitor the quality delivered by suppliers to assure the meat complies with the standards set. Many similarities are identified between retailers for strategies to monitor quality. All retailers apply delivery inspections (for which the aspects controlled for are dependent of the type of product delivered); all retailers perform informal audits and inspect test results when visiting the supplier; and all retailers control certificates of suppliers. An interesting result is that none of the retailers asked suppliers for test results on regular basis. The reason for one of the retailers is that the retailer performs its own tests. The other retailers argue that the quality delivered by their suppliers is good because no complaints are received from stores or consumers. Therefore, additional monitoring is not needed. Differences between retailers exist for the monitoring strategy sampling and laboratory testing at suppliers. Retailer D monitors the quality of meat at suppliers by laboratory testing, while others do not. Retailers that do not perform laboratory tests said that such testing is unnecessary double checking because products delivered by suppliers are always of good quality and because quality is already monitored by suppliers and third parties according to quality assurance systems. Differences also exist for traceability. For retailer D (the retailer that performs laboratory tests at

suppliers) traceability is less feasible and therefore less important as a criteria to select suppliers than for the retailers that do not perform laboratory tests at suppliers.

Coordination with other actors in the supply chain is necessary to assure the quality of fresh pork meat. In the literature study, six different governance structures are distinguished: spot market contracts, relational contracts, long term relations with qualified suppliers, formal written contracts, equity participation and hierarchy. The main governance structure identified for the four retailers is long term relations with qualified suppliers. This can be explained by the seven governance structure characteristics identified. The identity of suppliers matters and retailers set specifications for suppliers. Quality standards are highly formalized into written contracts, while other standards are not formalized (e.g. quantity and duration of the relationship). The duration of the relationship can be described as medium to long term for the relation between the retailer and its suppliers (retailer A, B, C and D) and short to long term for the relation between the stores of retailer D and their suppliers. The main enforcement mechanisms identified are reputation and third parties (certification agencies and the government). There is no financial participation between the retailer and their suppliers and price is an important coordination mechanism for all retailers. Besides differences in duration, differences are also identified for importance of price as coordination mechanism. For retailer D price determines which supplier delivers meat to which store. The stores of the other retailers (A, B and C) are always delivered by the same supplier, independent of the price. This difference in price coordination leads to differences in the duration of the relationship between suppliers and the stores.

This thesis investigates the relation between quality assurance and governance structure. A relationship is found between quality assurance and the following governance characteristics: relevance of identity, specifications for suppliers, formalization, duration of the relationship, enforcement and the importance of the coordination mechanism price. An interesting difference is identified between retailers for the importance of price as coordination mechanism. Based on the results of the case study a relationship can be expected between coordination by price and standards set. However, because only a few quality standards are investigated, further research is needed to investigate this relationship. Because no differences are identified in strategies to signal quality, the results of this thesis do not give an indication for the relationship between coordination by price and signalling strategies used. Finally, the results of this research suggest a relation between coordination by price and monitoring strategies used. When the importance of price as coordination mechanism increases, the role of laboratory tests at suppliers increases and the focus on traceability in selecting suppliers reduces. This can be explained by the number of suppliers. A larger number of suppliers are needed to create price competition between suppliers. However, with a larger number of suppliers traceability becomes less feasible (because complexity increases) and the importance of laboratory testing increases. When retailers do not perform laboratory tests at the production location of suppliers, traceability becomes an important criteria in selecting suppliers. The differences in monitoring strategies are found for the retailer D, who has the largest market share. Therefore, the role of the size of the retailer is also an interesting issue that needs to be further researched.

The second relation that is investigated in this research is the relation between quality assurance and the positioning of Dutch retailers regarding price and quality. Because of a lack of information about the positioning of Dutch retailers on quality of fresh pork meat for Dutch retailers, it is not possible to identify the relation between positioning and quality assurance for each individual retailer. Still some interesting results are identified. First of all, the minimum quality level that can be found in the positioning is supported by this research. This minimum quality level exists due to regulations set for quality of fresh meat. Second, the result that little differences exist in the quality of fresh meat is supported by suppliers who argue that little differences exist between retailers in quality assurance and thus in quality delivered. Finally, the results suggest that the general price level of retailer D differs from the price level of fresh pork meat for retailer D.

Foreword

This MSC thesis is written for the chair group Management Studies of Wageningen University. This thesis presents the results of research into quality assurance between retailers and suppliers in the pork meat supply chain.

I would like to thank my supervisors Nel Wognum, Mark Wever and Jos Bijman for their support and advise. I would also like to thank the respondents of this research, which consist of retailers and suppliers in the Dutch fresh pork meat chain. Despite of the limited time, they participated in this research and were very open in providing their information.

Finally, I want to thank everyone else who supported me in this research.

Judith van der Harg
Juni 2009

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1. Introduction

1.1 Introduction to the research problem

The attention for quality assurance has become more important for retailers over the years (Van der Spiegel *et al.* 2004). The meat sector has had a lot of negative media attention over the past years. This is due to several diseases in the meat sector, such as Bovine Spongiforme Encefalopathie (BSE) and Foot and Mouth Disease (FMD). Furthermore, the media recently reported a scandal in the meat sector which received much attention. According to the media sick and weak cows were slaughtered and the meat was sold by retailers. Recent food scandals, animal diseases and the attention these subjects received in the media have led to more concerned consumers (Réviron and Chappuis, 2005; Sans *et al.*, 2005) and loss of consumer confidence (Giraud-Héraud and Soler, 2006). As meat is sold mostly under the label of the retailer (Giraud-Héraud and Soler, 2006) the reputation of the retailer is at stake. Consumers hold retailers responsible for the quality of meat sold in the stores. The quality of meat delivered by suppliers¹ is difficult to assess for retailers, because information asymmetry about quality exists. This can be explained by the type of product. A distinction in product attributes can be made on the basis of the ease with which the attributes can be measured. The three types of product attributes are search, experience and credence (Darby and Karni, 1973). Search attributes are those that can be verified at the time of the transaction. There is no asymmetric information for consumers here. Experience attributes can be assessed only after the transaction has taken place (for example taste). Information asymmetry exists because the consumer can discover the quality of the product only after consuming the product. Finally, credence attributes are those for which even the consumption does not bring information on the quality (for example the amount of pesticides used). Most food products have experience and/or credence attributes. Information asymmetry also exists because the behaviour of the suppliers regarding quality management can not be observed.

In order to protect their reputation, retailers must deliver fresh pork meat of good quality to consumers. To be able to deliver this high quality meat, retailers need to assure the quality of fresh pork meat delivered by suppliers. First, retailers set quality standards for their suppliers (Humphrey and Schmitz, 2000, Havinga, 2006). The suppliers have to show compliance to the standards set, by signalling the quality of fresh meat. These quality signals give information about quality of the product to the retailer (Raynaud *et al.*, 2005). Retailers monitor the quality delivered by suppliers to assure the meat complies with the standards set (Humphrey and Schmitz, 2000, Havinga, 2006). To be able to guarantee the quality of pork meat, coordination with other actors in the supply chain is necessary. This shows the importance of governance structures in the supply chain (Raynaud *et al.* 2005). Governance structure is the relationship through which coordination of transactions in the chain is achieved. Because of the important role of governance structures in assuring quality, it is researched in this study.

In this research quality assurance by the retailer is related to the positioning of the retailers on fresh pork meat. Retailers can position themselves on price and quality of fresh pork meat, thus in studying the positioning of retailers these two factors are taken into account. An interesting question is to investigate whether retailers that are positioned as selling a high quality of fresh meat differ in quality assurance from retailers positioned by consumers as selling a relatively lower quality of meat. Differences in quality assurance might also exist between retailers that are positioned as high-priced and low-priced. In other words, is quality assurance by retailers related to the positioning strategy of retailers with respect to price or quality? A step towards answering these questions about the relation between positioning of Dutch retailers and quality assurance by retailers is made in this research.

There is not much literature that investigates this relationship. Literature is found on the positioning strategy of different Dutch retailers (e.g. Slood and van der Aalst, 2003; GfK jaargids, 2006; Hemmes, 2008). According to Réviron and Chappuis (2005) a product can be either low priced (with no special agreements with upstream agricultural parties) or differentiated at a higher price and subject to long-term agreements with producers committed to the application of product quality specifications

¹ In this research supplier refers to the suppliers that deliver fresh pork meat to the retailer. This can be a processor or an integrated slaughterhouse/processor.

designed to provide consumers with a guarantee of food safety. This research focuses on both the differences in setting standards, and the signalling and monitoring of the quality.

To summarize, retailers set quality standards and monitor these standards to be able to deliver fresh pork meat of high quality. Suppliers show compliance to standards by signalling quality. These three steps in quality assurance are investigated in this research. Furthermore, it is investigated what the governance structure between the actors look like and if and how they influence quality assurance between the two selected actors in the Dutch pork meat chain.

Figure 1 gives an overview the factors that have been researched in this thesis.

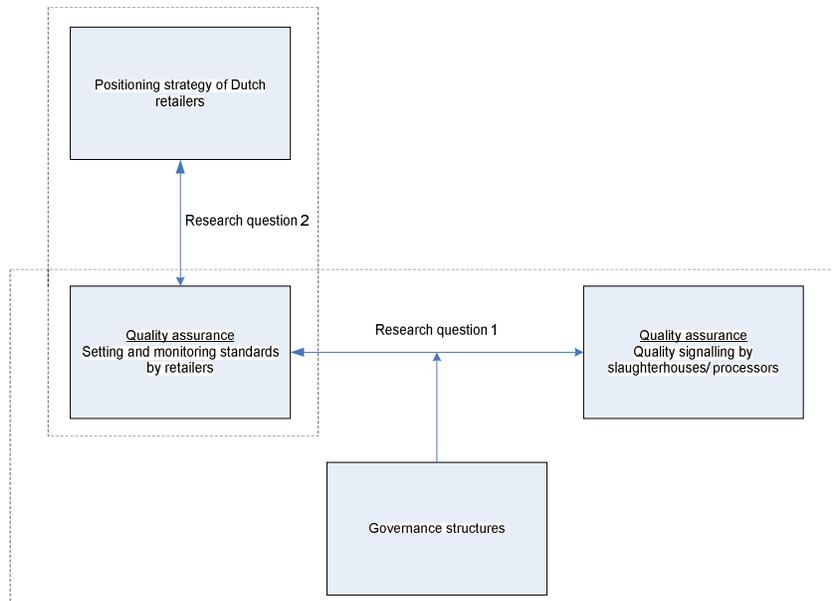


Figure 1: Theoretical framework

1.2 Research objective

The objective of this research is:

'To identify the relation between governance structure and quality assurance between retailers and their suppliers in selected Dutch pork meat chains'

1.3 Research questions

Based on the research objective the following research questions are formulated:

'What is the relation between governance structure and quality assurance between retailers and their suppliers in different Dutch pork meat supply chains?'

'What influence does the positioning strategy of Dutch retailers have on quality assurance between retailers and their suppliers in the selected Dutch fresh pork meat chains?'

Figure 1 shows how the topics researched relate to the research questions. Because of a lack of information about the quality of fresh pork meat of Dutch retailers, it is not possible to answer the second research question in this thesis. This is further explained in the results (6.6) and the discussion (7.2).

To answer the research questions, the following sub questions are formulated.

1. What is the positioning strategy of different Dutch retailers for fresh pork meat regarding quality and price?
2. What similarities and differences can be identified regarding quality assurance in the relation between retailers and their suppliers for the selected Dutch fresh pork meat chains?
3. What governance structures can be identified between suppliers and retailers in selected Dutch fresh pork meat chains?
4. How are similarities and differences in quality assurance of Dutch retailers related to the positioning strategy of Dutch retailers?

The first research question can be answered based on sub question 2 and 3. The second research question can be answered based on sub question 1, 2 and 4. In the first sub question, the positioning of Dutch retailers has been studied to be able to position Dutch retailers regarding price and quality of fresh pork meat. This positioning of Dutch retailers is needed to investigate the relation between the positioning strategy of retailers and quality assurance. In the second sub question, similarities and differences in quality assurance between the selected actors in the fresh pork meat chain is studied. Thereby, the focus is on the three steps quality assurance (setting standards, signalling quality and monitoring quality). In sub question three, governance structures are investigated which is needed to investigate the relation between governance structure and quality assurance. In the last sub question, differences in quality assurance are related to the positioning of Dutch retailers.

1.4 Research model

To realize the objective of this research, several steps have been taken. Based on Verschuren and Doorewaard (2003) the following research framework gives a schematic overview of those steps.

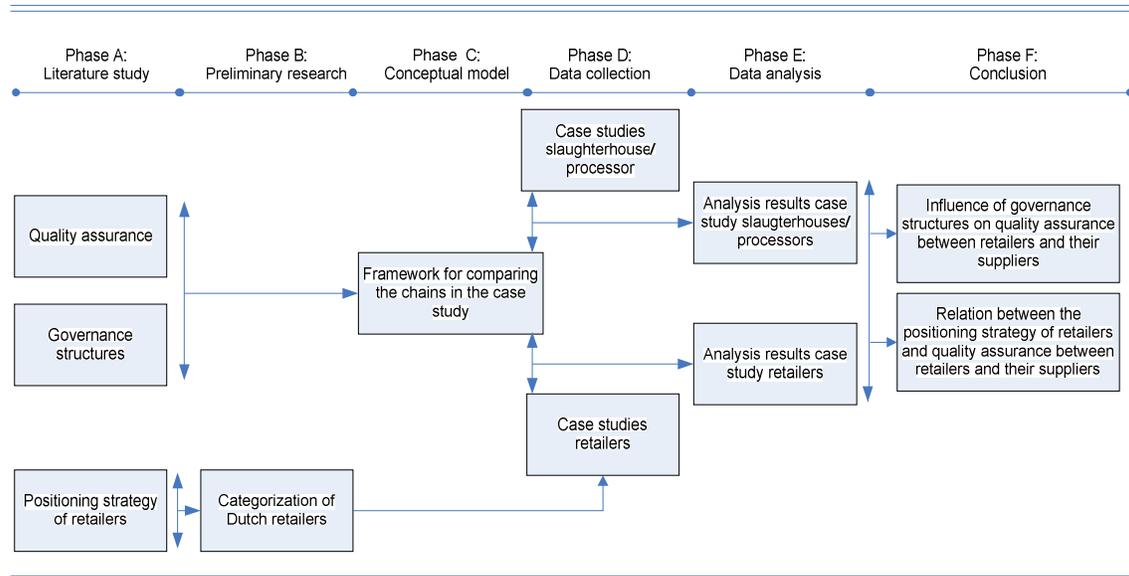


Figure 2: Research model

This research framework works as follows:

- (A) Literature about positioning strategies of retailers is studied which leads to criteria that can be used to make a positioning Dutch retailers regarding fresh pork meat (phase B). Investigating literature about quality assurance and governance structures leads to an overview of factors and variables important for this research (phase C).
- (B) In this phase, Dutch retailers are positioned based on the criteria selected the literature study about positioning strategies in phase A. This positioning is used to select retailers for the case study.
- (C) Based on the literature study, factors and variables important for this research are identified, which leads to the conceptual model. This conceptual model forms the basis for the case studies.
- (D) The retailers are selected based on the positioning. The factors and variables of the conceptual model form the basis for collecting data in the case studies.
- (E) The data obtained in the case study of retailers and suppliers is analyzed by comparing the results for quality assurance and governance structures between retailers and their suppliers.
- (F) Based on the results of the case study the relation between governance structures and quality assurance and the relation between the positioning strategy and quality assurance is investigated for retailers and their suppliers in the Dutch pork meat chain.

1.5 Definitions of key concepts

Pork meat

Meat from the pig. The focus of this research is on fresh pork meat sold by retailers under the label of the retailer. Pork meat products and further processed pork meat (e.g. sausages, bacon) are left out of scope.

Product positioning strategy

A comprehensive plan that defines how a certain product is positioned relative to competitors and thus how a firm can best compete for customers in a certain industry (Schermerhorn, 2002). The goal is to influence how potential buyers see the product relative to the position of competitors.

Quality assurance

The entirety of all planned and systematic actions required to ensure that a product complies with the expected quality requirements (NNI, 1989 in Van der Spiegel *et al.*, 2004, p. 502). In this thesis the focus is on three steps in quality assurance: setting standards by retailers, signalling quality by suppliers and monitoring quality by retailers.

Governance structures

Relationships through which coordination of transactions in the chain is achieved (based on Humphrey and Schmitz, 2000).

Retailer

The actor in the Dutch pork meat chain that buys fresh pork meat from suppliers and sells meat to consumers.

Pork meat quality

The totality of features and characteristics of a product that bear upon its ability to satisfy implied needs' (NNI, 1989, in Van der Spiegel, 2004). Quality is determined by both product and process characteristics.

Supplier

The actor in the Dutch fresh pork meat chain that delivers fresh pork meat to the retailer. This supplier can be a processor or a slaughterhouse/processor.

Processor

The actor in the Dutch pork meat chain that buys meat from slaughterhouses and prepares meat for the retailers. These processors are responsible for activities such as packaging and cutting. Dependent on the processor, also deboning is an activity that can be performed by processors.

Slaughterhouse/processor

The actor in the Dutch pork meat chain that buys pigs from farmers and sells fresh pork meat products to Dutch retailers. Slaughterhouses are responsible for all the activities in the chain from slaughtering to preparing and (dependent of the retailer) packing.

1.6 Structure of the report

The structure of the report is as follows. In chapter two, an overview is given of the fresh pork meat chain and the positioning of Dutch retailers regarding price and quality is described. Chapter three contains the literature study, in which quality assurance and governance structures are researched. In chapter four the theoretical framework is presented. Chapter five describes the research methodology used in this research. In chapter six the results of this research are presented. Chapter seven contains the conclusion of this research and the discussion.

2. The fresh pork meat chain and positioning of Dutch retailers

This chapter consists of two sections. In section 2.1 the context of this thesis is researched by giving a description of the fresh pork meat supply chain and the actors in the fresh pork meat chain. In section 2.2 the positioning of Dutch retailers is investigated. Criteria are identified on which retailers can distinguish themselves and based on these criteria a positioning of Dutch retailers is made. The positioning of Dutch retailers is needed to investigate the relation with quality assurance. It forms the basis for selecting respondents for the case study.

2.1 The fresh pork meat supply chain

2.1.1 Overview of the pork meat chain

A typical fresh pork meat chain in the Netherlands consists of the following actors: Breeders, farmers, slaughterhouses, processors, retailers and consumers. About 95% of all pork meat is produced in this supply chain. An overview of a typical pork chain in the Netherlands is given in figure 3. This figure also shows the supporting elements of the supply chain, like companies that provide input (feed industry, hardware providers and veterinarians) and transport, trade and distribution companies. Furthermore, an overview of the stakeholders of the supply chain is given. These stakeholders are the government, technology developers, branch organizations, financial institutes, research institutes and social pressure groups. Information about supporting elements of the fresh pork meat supply chain and stakeholders of the fresh pork meat chain can be found in Appendix 1 and 2.

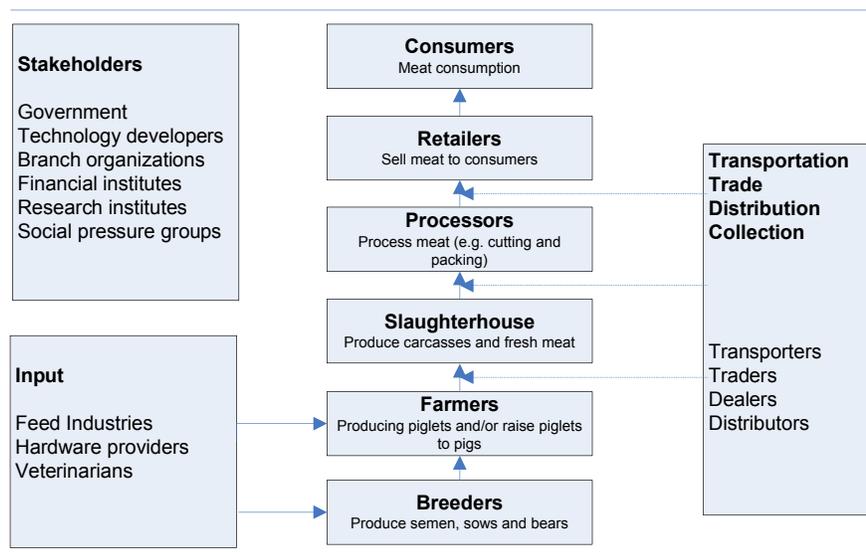


Figure 3: The typical fresh pork meat chain
(Source: based on Wognum et al., 2007)

The different actors in the pork meat supply chain will now be described.

2.1.2 Stages in the pork meat chain

Breeders

At the first stage of the chain semen, sows and boars are produced by a breeding organization. In these breeding companies strict safety procedures are applied. These firms try to produce healthy and disease free herds that have a good fertility and produce a great quantity of lean meat (Kathalas, 2007). Examples of breeding firms are PIC, Topigs and Hypor. Some breeding companies also perform research focussed on genetic improvement and optimization of pork production.

Farmers

At the second stage farmers produce and raise the piglets. Breeding sows purchased from breeders are inseminated and will normally deliver 8-12 piglets. After two weeks of weaning, the piglets are moved to the nurseries. In these nurseries, the temperature is closely controlled. In approximately 6 – 10 weeks the piglets reach the weight of 25 kg. The sows are moved again to sow pens. In three to five days they can be inseminated again. The boars of the farrowing company detect if sows are ready for insemination again. Male pigs are castrated in the first week, in order to prevent boar smell of pork meat (Wognum *et al.*, 2007). Farrowing and finishing are sometimes combined in one firm and sometimes not. In the finishing phase, the pigs are fattened. The pigs can eat as much as they wish till they reach the weight of about 110 kg. At this weight pigs are ready for the slaughterhouse. At this time pigs are normally six months old (Wognum *et al.*, 2007).

Slaughterhouses

At the weight of around 110 kg pigs are moved to the slaughterhouses. Before the slaughter process starts the pigs are kept enclosed for some time to reduce stress from travelling. The reduction of stress of the pigs is important for the quality of the meat. At the slaughterhouses different processes take place: stunning, bleeding, hair and skin removal, head removal, carcass examination, organ removal, splitting and chilling. Most slaughterhouses cut the carcasses in the end of the slaughter process. The slaughterhouse sells the meat to processors, wholesalers or retailers or quality butchers. The modern slaughter process is a very efficient and highly sanitary process and all parts of the pig are used (Wognum *et al.*, 2007). In 2008 there were 19 slaughterhouses in the Netherlands with more than 25.000 slaughters per year (PVE, 2009). Examples of slaughterhouses in the Netherlands are VION, Hilckman and Compaxo. VION is by far the biggest slaughterhouse in the Netherlands, with a market share of 57% over 2008 (www.vion.nl, 2009).

Processors

Slaughterhouses and processors are not always separate links in the chain. In some chains, they are integrated in one firm. Processing firms prepare meat for the consumer. In this phase the four basic cuts into which pork is separated (shoulder, loin, side and the leg) are further processed into products like sausages, spare ribs, loin roast or hams. Furthermore, the meat is packet in sealed, hygienic, airtight packs. Because of these atmospheric packs the quality and shelf life can better be guaranteed (Kathalas, 2007).

Retailers

The most important channel for the pork meat are the supermarkets. Quality standards are increasingly imposed on other parties in the supply chain by large retailers, in order to satisfy changing customer preferences (Wognum *et al.*, 2007). In 2006, the three largest purchase organizations together controlled around 60% of the market. These purchase organizations are Albert Heijn, Laurus, and Superunie (which buys on behalf of sixteen smaller independent retailers). Other channels by which meat is sold are restaurants, hospitals and butchers.

Consumer

The last stage in the pork meat chain is consumption by consumers. Consumers have a strong influence on processes at the supply chain. Not only the buying behaviour of consumers but also the issues discussed in the media (like pig castration and animal welfare) influence the actors in the supply chain (Wognum *et al.*, 2007).

In Appendix 1 more information is given about the supporting elements of the fresh pork meat chain and in Appendix 2 information is given about other stakeholders in the fresh pork meat chain.

Appendix 3 gives more insight in trends in the fresh pork meat chain. In Appendix 4 fresh pork meat consumption in the Netherlands and the role of retailers in selling pork meat is described.

2.2 Positioning of Dutch retailers

2.2.1 Literature on positioning strategies

With a good strategy in place, the resources of the entire organization can be focused on the overall goal. An important aspect of formulating a strategy is defining the competitive advantage of the company. Schermerhorn (2002) distinguishes strategies for competitive advantage. For retailers the most important opportunity for competitive advantage is found in cost and quality. Porter's generic strategies give more insight in how the focus on cost and/or quality can lead to a competitive advantage.

Porter's generic strategies

The model of Porter focuses on the positioning of a specific firm and its products relative to competitors. The model distinguishes between market scope and competitive advantage (Porter, 1980). In this research the focus is not on a specific segment, but on a broad market scope. The reason is that this thesis focuses on fresh pork meat in general instead of a specific niche product like organic fresh pork meat. Therefore, the two positioning strategies that are of interest for this thesis are: (1) cost leadership and (2) differentiation. Cost leadership is a strategy in which organizations try to continuously improve the operating efficiencies of production, distribution, and other organizational systems. The objective is to have lower costs than competitors and therefore achieve higher profits. The differentiation strategy focuses on competitive advantage through uniqueness and tries to develop goods and services that are clearly different from those made available by the competition. The objective is to attract customers who become loyal to the organization's products and lose interest in those of competitors (Porter, 1980).

2.2.2 Criteria to position Dutch retailers on fresh pork meat

Researches exist that studied the positioning of Dutch retailers (e.g. Sloot and Van Aalst, 2003; Hemmes, 2008). In these researches Dutch retailers are positioned based on two aspects: service and price (e.g. Sloot and Van Aalst, 2003; Hemmes, 2008). Service level refers to, for example, store surrounding, provision of extra services, helpful and knowledgeable personnel (Sloot and Van Aalst, 2003). This thesis only investigates fresh pork meat. Therefore, the focus on service level is too broad for this thesis. Dolan and Humphrey (2000) identify the following competitive strategies for food products: quality, consistency, variety, processing, product combinations, packaging, reliability of supply and price. According to the research of GFK jaargids (2006) quality and prices are the most important aspects in the choice for retailer for Dutch consumers. The research of Deloitte (2007a and 2008a) shows that in general, price is the most important aspect for consumers. Within the category fresh meat, a good quality is the most important, followed by choice (Deloitte, 2007a and 2008a). Therefore, the positioning of Dutch retailers regarding fresh pork meat made in this thesis is based on quality and price.

2.2.3 Information about price of fresh pork meat

Information in literature regarding the price of meat of Dutch retailers

In literature, little information is found regarding the price level of fresh pork meat. The price of fresh pork meat depends on the quality of the product. Because the quality of meat is difficult to determine it is difficult to compare the prices of fresh pork meat. However, literature exists that compares Dutch retailers regarding price level in general. Sloot and Van Aalst (2003) made a categorization of Dutch retailers based on both price level and service level. This categorization is shown in table 2.

Table 2: Categorization of Dutch retailers by Sloot and Van Aalst (2003)

Formula type	Description	Formulas (amongst others)
Service	Focus quality, service and/or broad assortment and prices are above average.	Albert Heijn, Coop, Konmar, Sperwer (Plus, Spar en Garantmarkt) en Super de Boer
Value-for-money	Average service level and pricing is average to low.	Boni, C1000, Deen, Dekamarkt, Golf, Jumbo, Jan Linders, Poiesz en Vomar
First price	Positioning based on low prices. Most of the time combined with an average to low service level.	Aldi, Bas van der Heijden, Digros, Dirk van den Broek, Jan Bruijns, Hoogvliet, Lidl en Nettorama

(Source: Sloot en Van Aalst, 2003)

Because in this categorization price level and service level are combined, this categorization is specific enough to use in this research. Hemmes (2008) also categorized Dutch retailers based on price and service level (table 3). This categorization gives a better overview of the differences in price level.

Table 3: Categorization of Dutch retailers by Hemmes (2008)

Formula type	Formulas (amongst others)
Discount	Aldi, Lidl
Full service:	
- Low priced	Dirk, Nettorama, Jumbo
- Medium priced	C1000, Sanders, Dekamarkt, Deen
- High priced	AlbertHeijn, Super de Boer

(Source: Hemmes, 2008)

It is not known on what information the categorization of Sloot and Van Aalst (2003) and Hemmes (2008) is based. Only three or four broad categories are distinguished, which makes it difficult to gain insight in the differences between the retailers in the same category. Therefore, this research will use information about price found on www.supers.nl.

Information regarding price used

On the website www.supers.nl the prices of 22 A-brands products are collected in different Dutch retailers at the same time each month. The products investigated differ per month. The data in table 4 shows the results for 14 months (Januari 2008 till February 2009). Retailers Aldi and Lidl are not included in the research because they do not sell A-brands. For every retailer the deviation from the average is calculated. This is used to categorize the Dutch retailers regarding price.

When this positioning of Dutch retailers regarding price and quality of fresh pork meat is compared with the categorization of Hemmes (2008) and Sloot and Van Aalst (2003), four differences can be identified:

1. Coop is defined as high priced in the positioning made in this research, but defined as medium priced by the categorization of Hemmes (2008) and Sloot and Van Aalst (2003). A possible reason for this difference is that this thesis only uses information about the highest priced formula (because of the availability of this information). This might be different for the other researches.
2. Jumbo is defined as medium priced by Sloot and Van Aalst (2003), while this retailer is categorized as low priced by the positioning made in this research and the categorization of Hemmes (2008). An explanation for this difference is that the research of Sloot and Van Aalst (2003) focuses on a combination of price and service level. The high service level of Jumbo might therefore be the explanation for the positioning as medium priced.
3. Deen is positioned as low priced according to this research, while it is positioned as medium priced by Hemmes (2008) and Sloot and Van Aalst (2003).
4. C1000 is positioned as high priced in the positioning made in this research, while it is positioned as medium priced by Sloot and Van Aalst (2003) and Hemmes (2008).

The reason for the difference for Deen and C1000 might be that Deen reduced prices after January 2008 and C1000 increased prices from January 2008. The data used by research is for 2008 and 2009, while older data is used in the other categorizations.

Table 4: Information regarding the price of Dutch retailers for a package of A-brand products

Supermarket	01-08	02-08	03-08	04-08	05-08	06-08	07-08	08-08	09-08	10-08	11-08	12-08	01-09	02-09	average	Deviation from industry average in %
Nettorama	€ 49.18	€ 48.00	€ 48.40	€ 48.56	€ 46.55	€ 45.33	€ 44.70	€ 43.48	€ 44.53	€ 44.20	€ 44.38	€ 45.80	€ 44.79	€ 44.58	€ 45.89	-5.46
Jan Linders	€ 51.53	€ 51.97	€ 53.22	€ 52.00	€ 51.76	€ 50.07	€ 49.75	€ 47.78	€ 49.47	€ 48.66	€ 48.59	€ 48.45	€ 48.19	€ 47.46	€ 49.92	-2.84
Deen	€ 50.01	€ 48.46	€ 46.22	€ 48.74	€ 47.72	€ 47.88	€ 48.01	€ 46.14	€ 47.33	€ 47.04	€ 47.26	€ 47.02	€ 46.17	€ 46.35	€ 47.45	-2.25
Jumbo	€ 50.68	€ 51.19	€ 49.33	€ 48.91	€ 48.15	€ 47.86	€ 47.26	€ 45.93	€ 47.28	€ 45.07	€ 45.07	€ 46.15	€ 47.07	€ 45.38	€ 47.52	-2.10
Hoogvliet	€ 50.26	€ 50.28	€ 46.95	€ 49.42	€ 49.43	€ 48.07	€ 47.68	€ 45.64	€ 47.07	€ 44.89	€ 46.99	€ 45.69	€ 46.83	€ 46.30	€ 47.54	-2.08
Dirk vd Broek	€ 50.42	€ 49.72	€ 48.73	€ 49.31	€ 48.68	€ 48.14	€ 47.83	€ 45.73	€ 47.68	€ 48.23	€ 45.21	€ 7.73	€ 47.11	€ 46.49	€ 47.93	-1.27
Bas vd Heijden	€ 50.42	€ 49.72	€ 48.73	€ 49.31	€ 48.68	€ 48.14	€ 47.83	€ 45.73	€ 47.68	€ 48.23	€ 45.21	€ 47.73	€ 47.11	€ 46.49	€ 47.93	-1.27
Dekamarkt	€ 50.33	€ 50.37	€ 49.43	€ 49.43	€ 49.20	€ 48.08	€ 47.37	€ 45.85	€ 46.96	€ 47.95	€ 47.94	€ 47.67	€ 47.27	€ 47.37	€ 48.23	-0.65
Vomar	€ 51.18	€ 0.91	€ 7.47	€ 9.90	€ 49.99	€ 8.26	€ 48.14	€ 46.17	€ 47.72	€ 47.80	€ 48.26	€ 48.52	€ 48.14	€ 48.47	€ 48.64	0.19
Plus	€ 49.91	€ 53.25	€ 50.74	€ 50.62	€ 48.44	€ 49.74	€ 51.52	€ 46.93	€ 48.59	€ 48.50	€ 48.08	€ 48.47	€ 47.84	€ 46.47	€ 49.22	1.40
AH	€ 49.53	€ 52.13	€ 51.83	€ 49.17	€ 50.80	€ 50.84	€ 50.65	€ 48.20	€ 6.84	€ 49.59	€ 48.27	€ 49.80	€ 47.26	€ 49.22	€ 49.58	2.14
Super de Boer	€ 51.98	€ 49.90	€ 52.06	€ 51.95	€ 50.89	€ 50.25	€ 47.52	€ 48.35	€ 50.97	€ 47.66	€ 49.91	€ 47.66	€ 49.59	€ 49.05	€ 49.84	2.67
C1000	€ 53.80	€ 52.67	€ 49.08	€ 51.08	€ 52.42	€ 48.12	€ 50.68	€ 48.40	€ 50.19	€ 49.71	€ 47.26	€ 49.49	€ 49.70	€ 49.40	€ 50.14	3.29
Coop	€ 53.45	€ 53.15	€ 49.44	€ 52.51	€ 49.94	€ 51.02	€ 50.71	€ 48.99	€ 50.55	€ 50.48	€ 49.95	€ 50.26	€ 49.32	€ 49.48	€ 50.66	4.36
Lidl	NA	-	-													
Aldi	NA	-	-													

NA= not available. Because these retailers do not sell (all) A-brands studied, they are not investigated by supers.nl

(Source: www.supers.nl)

Limitations

Two remarks can be made for the use of this data. First, the prices for the products investigated are not corrected for price promotions. It is possible that retailers have price promotions on the products investigated, which influences the data regarding price level. To reduce the influence of price promotions, data for 18 months is used. A second remark is that the data does not contain any information about meat. The reason is that for fresh pork meat hardly any A-brands exist and therefore, fresh pork meat is not included in the price comparison between Dutch retailers. This has implications for the generalizability of this research, because the general price level of a retailer might differ from the price level of meat for retailers. An advantage of the data is that the price level of the fourteen largest retailers is investigated and that that recent information is used.

2.2.4 Information about quality of fresh pork meat

Information in literature regarding the quality of fresh pork meat

Information regarding the quality of fresh pork meat of different Dutch retailers is difficult to find. Some Researches are found that focus only on a small number of Dutch retailers or on other types of meat. The comparison in this research is made based on the research of Deloitte (2007a, 2008a).

Information regarding quality used

Deloitte (2007a/2008a) investigated consumer perceptions regarding the quality of fresh meat for their primary and secondary Dutch retailer (table 5). More than 2700 consumers were involved in this research for 2007 and for 2008. The average over the two years is used in the positioning made of Dutch retailers made in this thesis.

Table 5: Information regarding the quality level of fresh pork meat of Dutch retailers

Supermarket	Quality of fresh meat (based on consumer perception)		Average
	2007	2008	
Dirk vd Broek	6.5	7.2	6.85
Bas vd Heijden	7.1	7.1	7.1
Hoogvliet	7.3	7.2	7.25
Vomar	7.1	7.4	7.25
Aldi	6.9	7.6	7.25
Coop	7.3		7.3
SdB	7.1	7.5	7.3
Deen	7.5	7.2	7.35
Nettorama	7.2	7.6	7.4
C1000	7.5	7.5	7.5
Jan Linders	7.3	7.7	7.5
Plus	7.5	7.6	7.55
Dekamarkt	7.3	7.8	7.55
AH	7.5	7.7	7.6
Lidl	7.4	7.8	7.6
Jumbo	7.7	7.8	7.75
Average	7.26	7.51	7.38

(Source: Deloitte, 2007a/2008a)

Limitations of the data

Some remarks can be given for the use of the data in this research. First of all, no information is obtained about how the expectations of consumers influence the valuation of fresh meat. Secondly, no definition of quality is given in the research. Third, this research does not only focus on fresh pork meat, but also on other types of meat. Therefore, the data might not reflect the perceived quality of fresh pork meat. An advantage of the data is that it makes a comparison between the sixteen largest Dutch retailers and the comparison between the retailers is made on the same criteria.

2.2.5 Positioning of Dutch retailers regarding price and quality of fresh pork meat

Table 6 shows the data regarding price and quality used in this thesis to position Dutch retailers for fresh pork meat.

Table 6: Data regarding price and quality used for the positioning of Dutch retailers

Supermarket	Quality	Price
Dirk vd Broek	6.85	-1.27
Bas vd Heijden	7.1	-1.27
Hoogvliet	7.25	-2.08
Vomar	7.25	0.19
Coop	7.3	4.36
Super de Boer	7.3	2.67
Deen	7.3	-2.25
Nettorama	7.35	-5.46
C1000	7.4	3.29
Jan Linders	7.5	2.84
Plus	7.5	1.40
Dekamarkt	7.55	-0.65
AH	7.55	2.14
Jumbo	7.6	-2.10

(Based on: www.supers.nl and Deloitte, 2007a/2008a)

The following positioning is made based on the information regarding price and quality:

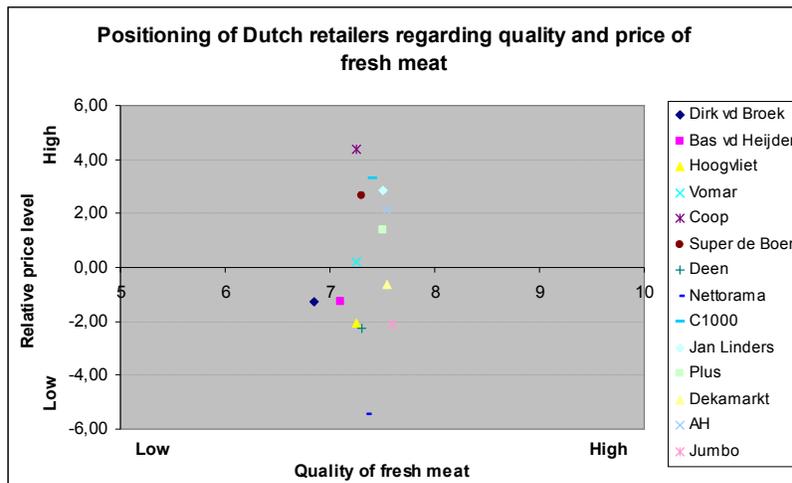


Figure 4: Positioning of Dutch retailers on price and quality
(own compilation based on www.supers.nl and Deloitte 2007a/2008a)

As can be seen in figure 4, only small differences exist between retailers on quality of fresh meat. The difference between the retailer with the highest score on quality and the lowest score on quality is only 0,75 (for fourteen retailers). As is explained in the methodology (chapter 5), the positioning of Dutch retailers regarding price and quality of fresh pork meat forms the basis for selecting retailers for the case study. In the results of the case study the implications of the small differences between Dutch retailers regarding quality is discussed.

2.3 Summary

The fresh pork meat chain consists of several actors: breeders, farmers, slaughterhouses, processors, retailers and consumers. In this thesis the focus is on the relation between the retailer and its supplier (which can be a processor or a processor which is integrated with a slaughterhouse). Information that compares Dutch retailers regarding price and quality of fresh pork meat is not available. Therefore, information related to the quality of fresh pork meat is based on information regarding consumer perceptions of the quality of fresh meat. Instead of the price level regarding the quality of fresh pork meat, the general price level of Dutch retailers is used. The main disadvantage of the data used is that it might not be valid for fresh pork meat. Figure 4 shows the positioning regarding price and quality of fresh pork meat of Dutch retailers.

3. Theoretical background

The literature study of this thesis consists of two sections. Section 3.1 consists of two parts. First, the concept of quality is defined and operationalized (3.1.1). Second, three steps in quality assurance are studied: setting standards, signalling quality and monitoring quality (3.1.2). It is investigated what quality standards may apply to the fresh pork meat chain, which strategies are identified in literature to signal quality and which strategies are identified in literature to monitor quality. In section (3.2) different governance structures are investigated and the transaction cost theory is studied.

3.1 Quality and quality assurance

3.1.1 Pork meat quality

Definition of quality

The concept of quality is difficult to define because it depends on the viewpoint of the authors (Becker, 2000; Van der Spiegel, 2004). According to Luning *et al.* (2002) no unambiguous definition exists for quality. Van der Spiegel (2004) categorizes definitions for quality into three categories, namely:

- management based descriptions
- production based descriptions
- management and production based descriptions

Many authors in quality management literature use a management based quality description (Van der Spiegel *et al.*, 2004). Because in this research the focus is on the managerial aspects of quality assurance, a management based description is used in this research.

Within the management based description a frequently used definition is the definition of ISO, which defines quality as 'the totality of features and characteristics of a product or service that bear upon its ability to satisfy or implied needs' (NNI, 1989, in Van der Spiegel, 2004). According to Becker (2000) this definition is the most popular definition and it is the only definition on food quality agreed on by almost all people coming from different backgrounds (e.g. politics, industry or sciences). A similar definition is 'the entirety of features and characteristics of a product, which refers to the fitness to fulfill given needs' (Deutsche Gesellschaft für Qualität, 1980 in Fox, 2000, p. 7).

While in the 60s and 70s the approach towards quality was targeted towards product oriented quality, the emphasis shifted towards process quality approach in the 80s and 90s (Becker, 2000; Fredendall and Hill, 2005). The reason was that end of line inspection was an expensive way to assure quality. While first, the focus was on product quality, the process characteristics have become more and more important (Becker, 2000). Quality is not only considered as physical product quality, but also includes aspects related to production characteristics (Becker, 2000; Humphrey and Schmitz, 2000; Luning *et al.*, 2002). Although the distinction between product and process quality is not always clear, the definition of quality given will now be further operationalized and specified for the quality of fresh pork meat and the process.

Operationalisation fresh pork meat quality

Becker (2000) provides an operationalisation for quality for fresh meat in general. He defines product characteristics as 'those features of a product which are used as (technical) indicators for product quality and are (in principle) measurable with (standardized) analytical (including sensoric) methods' (Becker, 2000, p. 163). Four categories of product characteristics are established for meat quality (Becker, 2000):

- (1) characteristics indicating the nutritional value:
protein, fat, carbohydrate content, ash content, digestibility etc;
- (2) characteristics indicating the processing quality:
share-force, sarcomere, length, pH-value, colour, fatness, water-binding capacity, etc;
- (3) characteristics indicating the hygienic-toxicological quality:
residues, contaminants, micro-bacterial status, additives etc.;
- (4) characteristics indicating the sensoric quality:
texture (tenderness, juiciness), flavour/odour, and colour or appearance (marbling) etc.

The study of Kalathas (2007) identified quality by focussing on sensoric aspects for fresh pork meat. According to this study, sensory aspects for fresh pork meat consist of: colour, firmness, waterholding capacity or drip loss, ultimate pH, marbling-intramuscular fat, tenderness and palatability traits (e.g. taste, flavour, juiciness). In the study of Kalathas the category 'processing quality' and 'sensoric quality' of Becker (2000) are combined. Luning *et al.* (2002) also identifies different categories regarding food quality. Besides health aspects (category 1 of Becker), sensory aspects (category two and four of Becker), and safety aspects (category 3 of Becker), Luning *et al.* (2002) also include shelf life. Shelf life is the time between processing and packaging of the product.

The operationalization for fresh pork meat quality for this research, (figure 5), is based on the research of Becker (2000), Luning *et al.* (2002), and Kalathas (2007).

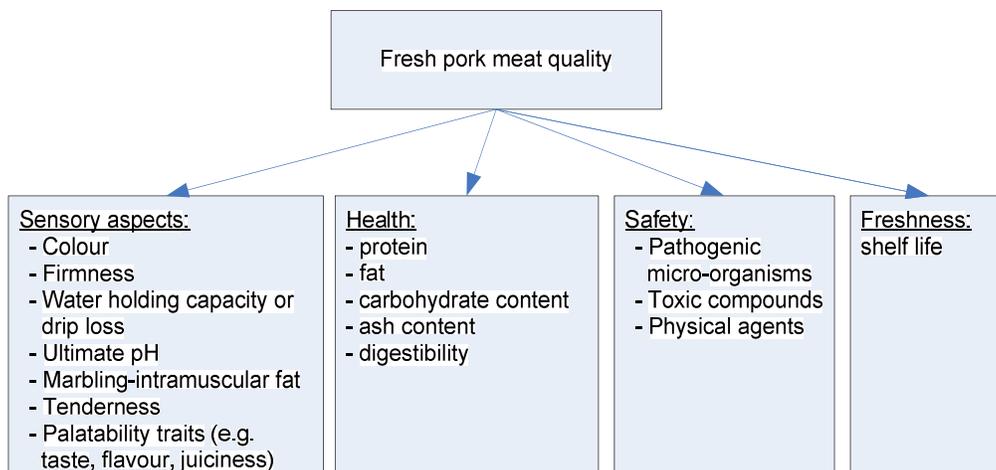


Figure 5: Operationalisation pork meat quality
(Own compilation based on Becker (2000), Luning *et al.* (2002) and Kalathas (2007))

Operationalisation of process quality

To achieve a high quality of fresh pork meat, standards are set for product quality and for process quality (Humphrey and Schmitz, 2000; Becker, 2000). Product standards focus on if the physical standards are in conformance with the standards set, while standards for process quality focus on if the product is produced in conformance with standards set. Standards for process quality are difficult to monitor by other parties in the chain, because it can not be measured by analysing the final product (Ruben *et al.*, 2007). According to Luning *et al.* (2002) process characteristics for food products consist of production system characteristics, environmental implications of food products and marketing activities. Production characteristics focus on the way a food product is manufactured. Examples of production characteristics the retailer might set for slaughterhouses and processor are animal welfare at the slaughterhouses and hygiene. Environmental implications refer to the use of packaging and food waste management. Marketing focuses for example on price and branding (Luning *et al.*, 2002). In this thesis the focus is on product system characteristics because it has a direct influence on the quality of fresh pork meat. Table 7 shows the operationalisation of product system characteristics.

Table 7: Operationalisation of process quality

Animal health	E.g. separation of sick animals, registration and documentation of treatments of animals with diseases, contact with the veterinarian
Animal welfare	E.g. space (housing and transportation), climate, food
Hygiene	E.g. The existence of a hygiene lock, temperature, the use of soap and towels, cleaning
Traceability	E.g. the use of a mark for identification and registration of the pigs, rules for the mark
Food safety and food quality	E.g. the use of medicines, monitoring Salmonella

3.1.2 Quality assurance in the pork meat supply chain

Animal diseases have led to the increased importance of quality assurance for retailers. According to Van der Spiegel *et al.* (2006) quality assurance refers to ‘the entirety of all planned and systematic actions required to ensure that a product complies with the expected quality requirements’ (NNI, 1989 in Van der Spiegel *et al.*, 2004, p. 502). Three steps are identified in assuring quality: setting standards, signalling standards and monitoring quality (Wever and Wognum, 2008). This section presents information on what quality standards might be important for retailers regarding fresh pork meat, what signalling strategies can be identified, and which strategies can be identified to monitor the quality of fresh pork meat.

1. Setting quality standards

The main reason for quality assurance along the chain is risk reduction. The food industry and the government have a common interest in guaranteeing the safety and quality of food, and they perceive a shared fate: if consumers lose confidence in pork meat (for example because of FMD), this affects all firms in the product chain (Havinga, 2006). Quality standards are set to ensure that the product conforms to the necessary standards (Humphrey and Schmitz, 2000). This section investigates what standards are set for fresh pork meat quality by different actors.

Third parties

Third parties that can set standards for quality in the fresh pork meat chain are (1) governmental organizations and (2) non-governmental organizations with or without authority to set public standards. Legislation related to food production can come from different levels: world-wide, European, national and branch level (Luning *et al.*, 2002). Wever and Wognum (2008) discuss two developments in the Dutch fresh pork meat chain with regard to government regulations on quality. First, an increased self-regulation of the chain can be seen. This accounts particularly with regard to setting, signalling and enforcing quality standards. The second development is that Dutch legislation places higher demands on pork production than is required by European law. Non-governmental organizations set standards either by legal or by non-legal agreements (code of conduct, etc.). An example of an organization with legal authority that has a major influence in the fresh pork meat sector is the PVE. The PVE (Product boards for Livestock, Meat and Eggs) consist of employers and employee organisations. Unofficial agencies can set pressure for compliance with labour and environmental standards (Humphrey and Schmitz, 2000). An example of this kind of organization is ‘Varkens in Nood’, who started a discussion about the castration of pigs. Regulations of the government and the PVE contain minimum requirements for the quality of the product regarding safety aspects (water holding capacity, pH and marbling-intermuscular fat), health aspects (protein, fat content, ash content), safety aspects (e.g. Salmonella and animal medication and contaminants) (<http://wetten.overheid.nl>). Wever and Wognum (2008) mention more regulations set for suppliers and retailers (table 8). More information on the content of these regulations can be found in Appendix 5.

Table 8: Quality and safety regulations

Regulations	Set for:	Focus of regulation
HACCP (self regulation)	Retail	Food safety
Meat inspection law	slaughterhouse	Control of fresh pork meat quality and safety
Destruction law	slaughterhouse	Public health (by setting rules for wasted disposal)
VKI	slaughterhouse	Food safety (by setting rules for information exchange)
Foodstuffs law	Processor, retail	Food safety, hygiene, packaging and labeling

Source: Based on Wever and Wognum (2008)

The baseline legislation for quality food from either national government or the EU provides only a part of the picture (Marsden *et al.* 1997). Standards set for quality by the actors in the supply chain are now described.

Actors in the chain

When standards are set by an internal actor of the supply chain, it is normally the buyer who set product and process standards (Humphrey and Schmitz, 2000). The standards can be set at different levels of detail, for example what standards are set and how standards should be attained. When buyers specify precisely how particular standards should be attained, for example by introducing particular production processes, this actor in the supply chain is called the lead firm (Humphrey and Schmitz, 2000; Ponte and Gibbon, 2005). In the Dutch fresh pork meat chain it can be expected that the retailer is the lead firm. Retailers have the economic power and use this power to impose retailer-owned food safety standards on suppliers (Havinga, 2006). Suppliers are dependent on supermarket chains and have to comply with their requirements (Marsden *et al.* 1997).

Because retailers want to deliver products of high quality, they set requirements for suppliers above legal minimum. These standards are normally set by quality assurance systems. Quality assurance systems include policies, processes, and procedures for delivering safe, high-quality food (Wever and Wognum, 2008). Several reasons are given in literature for the use of quality assurance systems by retailers. First, by adopting a quality assurance system, retailers reduce risks in product safety and quality (Van der Spiegel *et al.*, 2004; Hatanaka *et al.*, 2005). Second, the application of this system in the supply chain gives a due-diligence protection in the event of a food quality problem and financial liability is minimized (Marsden *et al.*, 1997; Van der Spiegel *et al.*, 2004; Hatanaka *et al.*, 2005). It shows that the retailer takes all 'reasonable steps' to ensure that the food they receive from upstream suppliers is safe (Hobbs *et al.*, 2001). Third, consumers demand an absolute guarantee for safe food. By showing compliance to quality assurance systems retailers can retain consumers' trust (Van der Spiegel *et al.*, 2004; Havinga, 2006). Fourth, quality assurance systems which work with certifications (such as BRC) reduce the costs of inspections for retailers. Suppliers have to pay for the audits performed by an independent bureau, to receive a certification (Holleran *et al.*, 1999; Hatanaka *et al.*, 2005; Havinga, 2006). Finally, retailers can differentiate their product by the use of quality assurance systems (e.g. by providing consumers with products having a higher level of guarantees in terms of quality and food safety) (Giraud-Héraud and Soler, 2006).

Many different quality assurance systems are discussed in literature. Some quality assurance systems are initiated by retailers (such as BRC, GlobalGap), while others are initiated by food producers. Quality assurance systems exist that focus on the environment while others focus on a specific region or local production (Trienekens and Zuurbier, 2008). In this research the focus is on quality assurance systems that are required by retailers for food or meat products. Quality assurance systems (required by retailers) that might be of interest for this research according to literature are: BRC, GLOBALGAP and ISO (Van der Spiegel *et al.*, 2004, 2006) and IKB (Luning *et al.*, 2002). Table 9 gives an overview of these quality assurance systems and provides a brief description of these quality assurance systems. More information on the content of these quality assurance systems can be found in Appendix 6. Other quality assurance standards identified in literature are SQF (Safe Quality Food), IFS (international food standard). These are not discussed in depth here because the literature does not show that they are demanded by the Dutch retailer.

Table 9: Quality assurance systems in the pork meat chain

Quality assurance systems	Type of standard	Additional requirements regarding:
IKB	Public standard	Food safety, traceability, hygiene, animal health
GLOBALGAP	Private standard (retail)	Food safety, animal welfare and environmental measurements
ISO	Public standard	Implementation, management of food quality, food safety and hygiene in the organization.
BRC	Private standard (retail)	Food quality and safety, traceability, hygiene

To summarize, quality regulations by the government and non-governmental organization with legal authority set minimum legal requirements for quality of fresh pork meat. Quality assurance systems play an important role in standards set for quality by retailers. Section 6.3.1 presents the quality standards that are the most important for the Dutch retailers interviewed.

2. Signalling quality by suppliers

The second step in assuring quality, is signalling quality by suppliers. For retailers it is difficult to observe the behaviour of suppliers regarding quality management and it is difficult to determine the quality of fresh pork meat. This uncertainty can be solved by using quality signals (González-Díaz *et al.* 2003; Starleder and Goldsmith, 2001; Caswell and Mojduszka, 1996). By signalling quality, the supplier communicates the level of some unobservable element in a transaction by providing an observable signal (Kirmani and Rao, 2000). Thus, quality signalling for this research can be defined as the communication of the unobservable quality of fresh pork meat in the transaction between suppliers and retailers by providing an observable signal. In this section the focus is on which signalling strategies are identified in literature if these strategies are used or can be used in the fresh pork meat chain to signal quality of fresh pork meat to retailers.

Signalling strategies

Sporleder and Goldsmith (2001) discuss different strategies to signal quality in food supply chains. Three strategies are identified that might be of interest for signalling quality to retailers: (1) strategies that rely on third-party protocols and procedures, (2) differentiation through branding and reputation, and (3) indemnification strategies such as insurance and warranties.

(1) Strategies that rely on third-party protocols and procedures

In these strategies third-party protocols and procedures are used to signal quality to other parties in the chain. An example of this strategy that is important for signalling quality in the fresh pork meat chain are third party certification systems. Certifications for quality assurance systems are obtained after audits are performed by independent audit bureaus. The independence of third party certifiers from other actors in the food chain distinguishes third party certification from first (audited by suppliers) or second party certification (audited by retailers) (Tanner, 2000 in Hatanaka *et al.*, 2005). Such independence gives third party certification greater legitimacy since third-party certifiers are thought to have no stake in the outcome of the transaction (Fagan, 2003 in Hatanaka *et al.*, 2005). Another example of this strategy in the Dutch fresh pork meat chain is the inspection of incoming pigs and outgoing pork meat by the VWA. Samples are taken to control the carcasses, organs and meat on antibiotics and other unwanted or illegal materials in the meat (Wever and Wognum, 2008). These monitoring activities of the VWA serve as a quality signal of an independent party. Test results of independent laboratories hired by suppliers can also serve as a quality signal in food chains.

(2) Differentiation through branding and reputation

The second type of strategies consists of signalling mechanisms based on differentiation through brands or reputation (Sporleder and Goldsmith, 2001; Raynaud *et al.*, 2005). Brands can perform different functions: they may identify, grade, describe and promote the product (Kotler, 1997 in Verbeke and Viane, 1999). Branding of food products aims at differentiating products from those of competitors, at enlarging product attractiveness and at assuring the consumer of a certain level of product quality (Verbeke and Viane, 1999). Some firms may not have brands on the products they sell but they still may have a substantial stake in their reputation. Reputation can also be seen as a form of signalling (Sporleder and Goldsmith, 2001). 'Reputation is some forecast of consistency over time given knowledge of the aggregate of past events' (Sporleder and Goldsmith, 2001, p. 597). The strategy branding and reputation may also be important for suppliers. When suppliers deliver pork meat to retailers, they build up a reputation. Fresh pork meat is normally sold under the label of the retailer and therefore suppliers normally label fresh meat with the brand of the retailer (Fearne and Hughes, 1999). Branding strategy does not only have to be related to a product, quality programs can also be seen as a branding strategy. An example is the quality programs developed by meat company VION. The four quality concepts are: 1) global, for world-wide export and aligned with demands from countries like South-Korea and Japan, 2) retail, which focus on Dutch retailers for pre-packed meat, 3) welfare, for the British market for bacon and fresh meat, and 4) organic, for the biological market (www.vion.nl). For this research the quality concept retail is of interest. By communicating compliance to one of the quality programs and communicating the content of this quality program to retailers, VION signals the quality delivered.

(3) Indemnification strategies

The third strategy distinguished by Sporleder and Goldsmith (2001) are indemnification strategies. Interesting indemnification strategies for this research are warranties or money-back guarantees. These strategies signal that a negative event likely would result only from uncontrollable circumstances, rather than negligence on the part of the firm (Sporleder and Goldsmith, 2001).

To summarize, three strategies for signalling quality are identified in literature: strategies that rely on third-party protocols and procedures (e.g. quality assurance systems), differentiation through branding and reputation and indemnification strategies (e.g. warranties). In the results (6.3.2) presents which strategies are used by suppliers to signal quality to retailers.

3. Monitoring quality by the retailer

In the third step of quality assurance, retailers monitor the quality of fresh pork meat delivered by suppliers. Monitoring takes place in order to mitigate some of the uncertainty about food safety (Starbird, 2005). In literature, different monitoring strategies are identified: direct measurement, sampling and laboratory testing, and audits and certifications. These monitoring strategies are now discussed.

Direct measurement

Direct measurement can be done by visual inspection (e.g. shape, colour) or by the use of instruments (such as PH). This strategy can be used by suppliers (to monitor quality of their products), by the retailer (to monitor the quality of the delivered product) and third parties (e.g. by the VWA).

Sampling and laboratory testing

Some product characteristics can not be monitored by direct measurement and need to be analysed more extensively (such as micro-bacteria). For these product characteristics samples need to be taken which are analysed in laboratories. Different types of analyses that can be conducted to check the quality of the pork meat product. However, these analyses will not be discussed in depth, because this research focuses on the managerial point of view instead of technological point of view. Laboratory testing (and delivery inspection) are mechanisms that buyers can use to address contract verification (Holleran *et al.* 1999). Retailers can hire independent laboratories to take samples and analyse these samples. Independent laboratories can also be hired by suppliers to monitor the quality of fresh meat. Another third party that takes monsters to monitor the quality of meat is the KDS (Kwaliteitskeuring Dierlijke Sector). Monsters can be taken at the production location of suppliers or at the moment of delivery in the stores. An example of this monitoring strategy is the tests to monitor meat on E-coli or Salmonella (mandated by the Hazard Analysis Critical Control Point regulation) (Starbird, 2005).

Audits and certifications

When the quality level is critical to the end-product, organizations insist on monitoring a supplier's processes. Monitoring and enforcing compliance with quality standards for the process is more complicated than monitoring the compliance with product standards. The reason is that these quality standards for the process relate to characteristics of the process which may not be evident in the product itself (Luning *et al.*, 2002). An important monitoring strategy for the production process is auditing. The production process can be audited for compliance with governmental regulations or for the standards set by retailers. Standards set by the government for the process (such as hygiene, cleaning and disinfection and tools and equipment) are monitored by the KDS under supervision of the VWA (Wever and Wognum, 2008). When standards are set by the retailer, audits can be performed by the retailer itself or by an agent who act on behalf of the retailer. When quality assurance systems are wide spread (such as BRC), monitoring the process is normally done by independent bureaus. According to Havinga (2006) suppliers are normally responsible for hiring an audit bureau to show compliance with the quality assurance systems set by the retailer. Suppliers normally pay for the costs made for auditing (Hatanaka *et al.*, 2005). Examples are also known of retailers who perform their own audits (Havinga, 2006).

Retailers can control compliance with the quality assurance systems by asking suppliers for the certification obtained by the audits, by inspection of the audit report or even by hiring an independent bureau to analyse the audit report (Havinga, 2006). According to Havinga (2006) it is common for

Dutch retailers to ask for the certification and most retailers do not inspect the audit report or hire an audit bureau to analyse the report.

To summarize, retailers can monitor quality by direct measurement, sampling and laboratory testing, audits (by the retailer or an independent audit bureau) and controlling certifications (controlling the certificate, inspecting the audit report or analyse the audit report). Quality can be monitored by different actors (third parties and actors in the chain). In the results (6.3.3) the strategies used by retailers to monitor quality are presented.

3.1.3 Summary quality assurance

In this chapter fresh pork meat is operationalized for the product and the process. Furthermore, the three steps in quality assurance are discussed: setting standards, signalling quality and monitoring quality.

The first step in assuring quality is setting standards. Different actors set quality standards:

- (Governmental) regulations set minimum standards for fresh pork meat quality by regulations, such as HACCP and foodstuffs law.
- Retailers can set standards above legal minimum. This can be done by requiring compliance to certain quality assurance systems, such as BRC.

Quality standards regarding product are:

- Sensory aspects: colour, firmness, waterholding capacity (or driploss), ultimate pH, marbling-intermuscular fat, tenderness and palatability traits
- Health: protein, fat, carbohydrate content, ash content, digestibility
- Safety: Pathogenic micro-organisms, toxic compounds, physical agents
- Freshness: shelf life

Quality standards regarding process are:

- Hygiene
- Food safety
- Shelf life
- Traceability
- Food quality
- Animal welfare
- Animal health

In section 6.3.1 it is presented what quality standards set by the four Dutch retailers are the most important in assuring quality.

The second step in assuring quality is signalling quality by suppliers. Quality can be signaled by different strategies:

- (1) strategies that rely on third-party protocols and procedures: such as product quality tests of independent parties such as the VWA and independent laboratories, and certifications for quality assurance systems,
- (2) Differentiation through branding and reputation,
- (3) Indemnification strategies: warranties and money-back guarantees

In section 6.3.2 it is presented which strategies are used by suppliers in the Dutch pork meat chain to signal quality.

The third and last step in assuring quality is monitoring quality. Monitoring strategies identified in literature are:

- (1) direct measurement (visual or instrumental)
- (2) sampling and laboratory testing (e.g. microbiological testing).
- (3) Audits and certifications

Quality can be monitored by

- actors internal to the supply chain: retailers and suppliers
- third parties: KDS/VWA, independent laboratories

In section 6.3.3 it is presented which strategies are used by the selected Dutch retailers to monitor the quality of meat delivered by suppliers.

3.2 Governance structure

In previous section, three steps in assuring quality are described. As discussed in chapter 1, uncertainty exists for the retailer about quality of fresh pork meat. The quality of the final product strongly depends on the behaviour of actors at different stages of the productive chain. To be able to guarantee the quality of pork meat, coordination with other actors in the supply chain is of major importance (Raynaud *et al.*, 2005). The coordination between actors in the chain takes place in a particular governance structure. Therefore, governance structures are important to study in this thesis. This section defines governance structures (3.2.1), identifies different governance structures (3.2.2) and presents the theoretical background of governance structures (3.2.3).

3.2.1 Definition of governance structure

In literature different terms exist for governance structures with more or less the same meaning. Some articles use the term governance structures (Révion and Chappuis, 2006; Wever and Wognum, 2008), while others use the term (vertical) partnerships (Fearne, 1998), (vertical) coordination (Hobbs and Young, 2000) and vertical alliances (Hoyt and Huq, 2000). Furthermore, the same terms are used in different ways in different articles. In this research the term governance structures is used. Governance structure is defined by Humphrey and Schmitz (2000, p. 5) as 'the inter-firm relationships through which non-market co-ordination of activities in the chain is achieved'. This definition suggests that market-based relationship is not a form of governance, while it is distinguished as a governance structure in this research. Therefore, in this thesis governance structure is defined as 'the inter-firm relationship through which coordination of transactions in the chain is achieved.' Different governance structures are now described.

3.2.2 Typology of governance structures

Different types of governance structures are identified in literature. Most authors use the continuum as proposed by Williamson, 1991.

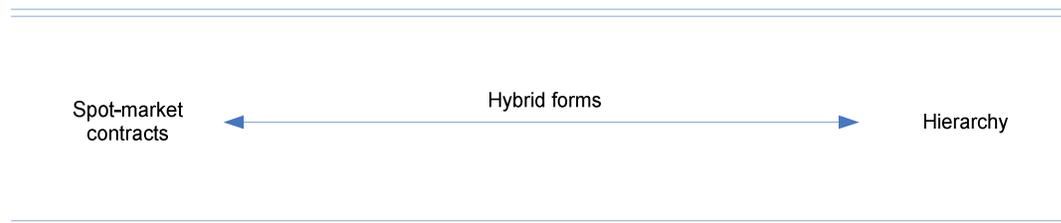


Figure 6: Continuum of governance structures
(Williamson, 1991)

Spot market contracts can be described as 'a contract for the immediate exchange of goods or services at current prices (Milgrom and Roberts, 1992) and where the identity of the parties is irrelevant (because of the switching costs to find a new partner is low) (Raynaud *et al.*, 2005). Hierarchy refers to the situation where 'two or more successive stages in production and distribution are brought under common ownership and management' (Raynaud *et al.*, 2005, p. 17). Criticism on the focus on only the polar forms spot market transaction and hierarchy led to the introduction of hybrid forms (Williams, 1991). Hybrid contracts can be distinguished based on the difference between classical contracts (where everything is fixed ex ante for the entire duration of the contract, covered by the law of contract) and relational contracts (allowing for gaps not closed by contract law, embedded in a social system of relationships and subject to continuous re-negotiations) (Ruben *et al.*, 2007). Other articles distinguish hybrid forms based on the duration of the contract (medium-term and long-term contracts or relational contracts and single or repeated transactions).

This thesis investigates what organizational mode governs the transaction between the retailer and its supplier in the fresh pork meat chain. To analyze the governance structure of the transaction, a typology of governance structures is used based on Raynaud *et al.* (2005) and Williamson (1991). The governance structures distinguished are: spot market contracts, relational contract, long term relations with qualified suppliers, formal written contracts, equity participation and hierarchy. A description of these governance structures is now given based on Milgrom and Roberts (1992) and Raynaud *et al.* (2005).

Spot market contracts

A contract for the immediate exchange of goods at current prices (Milgrom and Robert, 1992), whereby the identity of the party is irrelevant (Raynaud *et al.*, 2005).

Relational contracts

A non-written contract that specifies only the general terms and objectives of the relationship. In this governance repeated transactions with the same agents take place.

Relational contracts with 'qualified suppliers'

This structure is close to the previous one. However, agents are not free to choose their partners, but have to select a "qualified" transactor (accredited for instance by a collective organization).

Formal written contracts

A legally enforceable set of promises that defines all or part of each party obligations.

Equity participation

One actor in the chain is a stockholder of another actor in the chain, but the actors stay legally independent. An example of this type of governance structure is a joint-venture, which is characterized by a particular level of equity participation.

Hierarchy

In this governance structure two successive stages of the supply chain are brought under common ownership and management.

Several governance structures coexist for a particular transaction. In this thesis it is investigated what the main governance structure is for the relation between retailers and their suppliers. Table 10 shows the six governance structures and specifies the governance structure characteristics. The characteristics which are used to distinguish between different governance structures are: relevance of identity, specifications for suppliers, formalization, duration, enforcement, financial participation, the importance of coordination by price and the importance of coordination by authority. The governance structure characteristics are now briefly explained.

Relevance of identity

Relevance of identity refers to whether the identity of the partners does matter or not (Slangen *et al.*, 2008). The relevance of identity increases when moving from spot market contracts to hierarchy.

Specifications

Retailers can set specifications for the transaction with suppliers. Specifications carry three intertwined goals: they make commitments as observable as possible; they standardize steps in production and/or distribution, thus facilitating quality control; and they develop uniformity in order to reduce the costs of monitoring (Menard, 2004). These specifications can refer to: product quality (standards, consistency, monitoring), sanctions in case of non-compliance, quantity to deliver, contract duration, price, order frequency and timing, packaging and payment conditions (Ruben *et al.*, 2007) and restrictions on sets of input and restrictions on the set of potential suppliers (Raynaud *et al.*, 2005). The amount of specifications increases when moving from spot market contracts to hierarchy.

Formalization

Formalization refers to whether verbal or written contracts exist for the transaction. Formalization increases when moving from spot market contracts to hierarchy.

Duration

The duration of the contract can vary from short term (spot market contracts) to long term (hierarchy) and the contract can be for a single transaction or repeated transactions. In hybrid forms, contracts vary from long-term contracts to short-term contracts which are automatically renewed (Menard, 2004).

Enforcement mechanisms

The model used in this research distinguishes between: no enforcement mechanism, reputation, third party enforcement and hierarchy (internal enforcement). Third party enforcement mechanism consists of court, the VWA and KDS and certification agencies (e.g. IKB, HACCP, and BRC).

Financial participation

Financial participation refers to whether retailers are financially involved with suppliers.

Importance of price as coordination mechanism

This coordination mechanism refers to the influence of price as coordination mechanism. Price is the main coordination mechanism for spot market contracts and becomes less important when moving towards hierarchy (Williamson, 1975).

Importance of authority as coordination mechanism

In this coordination mechanism the transaction is coordinated by executive fiat and hierarchical decision-making (Williamson, 1975). Authority is the main coordination mechanism for hierarchies and becomes less important when moving towards spot market contracts.

Table 10 shows how the governance structure characteristics relate to the six governance structures (based on Raynaud *et al.*, 2005).

Table 10: Governance structures

Governance structure typology	Spot market contract	Relational contract	Long term relations with 'qualified suppliers'	Formal written contract	Equity participation	Hierarchy
Governance structure characteristics						
Relevance of identity	No	Yes	Yes	Yes	Yes	Yes
Specifications	No	Few	Few/many	Many	Many	Yes
Formalization	No	No	Yes/no	Yes	Yes	Yes
Duration	Short	Short/Long	Short/Long	Short/long	Long	Long
Enforcement	No/third party	Reputation/third party	Reputation/Third party	Reputation /third party	Third party /hierarchy	Hierarchy
Financial participation	No	No	No	No	Yes	Yes
Relative importance of price as coordination mechanism	high					low
Relative importance of authority as coordination mechanism	low					high

3.2.3 Theoretical background on governance structures

In this research it is investigated what governance structures exist in the Dutch pork meat chain. Theoretical background on governance structures is studied to gain more insight in why different governance structures exist and what governance structure is preferred in what situation.

Why transaction cost theory?

Different theories exist in literature that explains the existence of certain types of governance structures with their context. In this research the transaction cost theory is used to explain governance structures in the supply chain for several reasons. The most important reason is that the transaction cost theory deals with intermediate forms of governance. In the transaction cost theory different types of hybrid governance structures are described and operationalised, which helps to give more insight in governance structures that might be used in the Dutch pork meat chain. Second, in contrast to the principal agent theory, transaction theory takes into account both ex ante and ex post features. In the principal agent theory ex post enforcement problems are assumed to be non-existent (Kim and Mahoney, 2005). Finally, the transaction cost theory does not assume contracts to be complete, in contrast to the principal-agency theory (Menard, 2004; Kim and Mahoney, 2005). These are the most important reasons to use the transaction cost theory in this thesis.

Background information about the transaction cost theory

In the transaction cost theory the focus is on a minimalisation of transaction costs and maximization of the value of the transaction (Douma and Schreuder, 2002). Transaction costs are the costs of undertaking an exchange between a customer (buyer) and a supplier (seller). Transaction costs consist of information, negotiation and monitoring cost (Hobbs and Young, 2000). Costs for information searching consist of, for example, expenditure of time and resources for identifying suitable trading partners and specifying/identifying product quality. Negotiation costs arise during the transaction and include for example costs of determining contractual terms. Monitoring costs occur ex post to a transaction and refer to costs to ensure the pre-agreed terms of the transaction (Cheung, 1987 in Hobbs and Young, 2000). When transaction costs increase, a shift is expected from spot market contracts to more integrative governance structures (Coase, 1937 in Hobbs and Young, 2000).

Two assumptions are underlying the transaction cost theory: human are boundedly rational and sometimes display opportunistic behaviour (Hobbs and Young, 2000). Bounded rationality means that the capacity of human beings to formulate and solve complex problems is limited. Bounded rationality leads to an increase in transaction costs, because not every conceivable transaction can be safeguarded by a complete contract. Therefore, costs are involved in negotiations about aspects of the transaction (Williamson, 1975). Opportunism is described by Williamson as 'self interest seeking with guile' (Williamson, 1975, p. 27) or in other words trying to exploit a situation to your own advantage. Opportunism leads to increased transaction costs because costs are involved for controlling the supplier (Leiblein, 2003). When the threat of opportunism is high, transaction cost theory suggest that a more hierarchical governance structure is chosen to reduce that threat and when the threat of opportunism is low or limited, non-hierarchical structures are appropriate (Boehlje, 1999).

Whether transaction costs for a particular transaction is high or low depends on the critical dimensions of that transaction. These three critical dimensions are: 1) asset specificity, 2) uncertainty/complexity, and 3) frequency (Williamson, 1987).

(1) Asset specificity: An asset is transaction-specific if it cannot be redeployed to an alternative use without a significant reduction in the value of the asset. As asset specificity increases, a more integrated governance structure is preferred. This can also be seen in figure 7, which shows the governance cost as a function of asset specificity (Williamson, 1991).

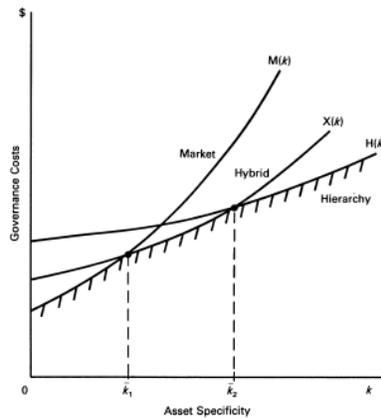


Figure 7: Relation between asset specificity and governance costs
(Williamson, 1991)

(2) The governance structure depends on the type of uncertainty. Barney and Lee (2000) identify two types of uncertainty: behaviour uncertainty and demand uncertainty. An example of behavioural uncertainty that exist in the fresh pork meat chain is uncertainty about product quality. As uncertainty increases, more integrated governance structures can be expected because costs for searching information and monitoring increases (Hobbs and Young, 2000). When demand uncertainty is high, a hybrid form of governance is preferred over hierarchical forms of governance.

(3) The frequency of the transaction influences the governance structure. A higher the frequency of the transaction leads to a more integrative governance structure.

These three criteria will not be studied in dept in the case study, but is it important for a better understanding of the existence of different governance structures.

3.2.4 Summary governance structure

In this research governance structure is defined as 'the inter-firm relationship through which coordination of transactions in the chain is achieved.' Different types of governance structures are identified in literature, varying from spot market contracts to hierarchy.

For this research a distinction is made between:

- spot market contracts,
- relational contract,
- long term relations with qualified suppliers,
- formal written contracts,
- equity participation,
- hierarchy

Characteristic on which these governance structures are distinguished are:

- Relevance of identity relationship,
- specifications set for suppliers,
- duration of the relationship,
- enforcement methods,
- financial participation,
- the importance of price as coordination mechanism,
- the importance of authority as coordination mechanism

The transaction cost theory explains the existence of different governance structures by focusing on a minimization of transaction costs and value maximization.

4. Theoretical framework

In the literature study quality assurance and governance structures are studied. In this chapter, the factors and variables identified in literature for quality assurance (4.1) and governance structures (4.2) are given. Thereby, this chapter summarizes the literature study. The theoretical framework forms the basis for the interview questions.

4.1 Quality assurance

In section 3.1.2 literature about quality assurance is investigated by focussing on three steps in quality assurance: 1) setting standards, 2) signalling quality and 3) monitoring quality.

4.1.1 Setting standards by retailers

Table 11 gives an overview of the quality standards for fresh pork meat identified in literature. In the case studies it is investigated which standards are set by retailers regarding the quality of meat.

Table 11: Quality standards for fresh pork meat

Standards can be set regarding:									
Product	<table border="0"> <tr> <td>Sensory aspects</td> <td> <ul style="list-style-type: none"> ▪ Colour ▪ Firmness ▪ Water holding capacity or drip loss ▪ Ultimate pH ▪ Marbling-intramuscular fat ▪ Tenderness ▪ Palatability traits (e.g. taste, flavour, juiciness) </td> </tr> <tr> <td>Safety</td> <td>Free of: <ul style="list-style-type: none"> ▪ Pathogens ▪ Micro-organisms ▪ Toxic compounds ▪ Physical agents </td> </tr> <tr> <td>Health</td> <td>Food composition and nutritional balance: <ul style="list-style-type: none"> ▪ Protein ▪ Fat ▪ Etc. </td> </tr> <tr> <td>Freshness</td> <td>Shelf life</td> </tr> </table>	Sensory aspects	<ul style="list-style-type: none"> ▪ Colour ▪ Firmness ▪ Water holding capacity or drip loss ▪ Ultimate pH ▪ Marbling-intramuscular fat ▪ Tenderness ▪ Palatability traits (e.g. taste, flavour, juiciness) 	Safety	Free of: <ul style="list-style-type: none"> ▪ Pathogens ▪ Micro-organisms ▪ Toxic compounds ▪ Physical agents 	Health	Food composition and nutritional balance: <ul style="list-style-type: none"> ▪ Protein ▪ Fat ▪ Etc. 	Freshness	Shelf life
Sensory aspects	<ul style="list-style-type: none"> ▪ Colour ▪ Firmness ▪ Water holding capacity or drip loss ▪ Ultimate pH ▪ Marbling-intramuscular fat ▪ Tenderness ▪ Palatability traits (e.g. taste, flavour, juiciness) 								
Safety	Free of: <ul style="list-style-type: none"> ▪ Pathogens ▪ Micro-organisms ▪ Toxic compounds ▪ Physical agents 								
Health	Food composition and nutritional balance: <ul style="list-style-type: none"> ▪ Protein ▪ Fat ▪ Etc. 								
Freshness	Shelf life								
Process	<ul style="list-style-type: none"> ▪ Hygiene ▪ Food safety ▪ Shelf life ▪ Traceability ▪ Food quality ▪ Animal welfare ▪ Animal health 								

Different actors are identified that can set standards for quality:

- Third parties: the government or non-governmental organizations with legal force (set minimum quality standards).
- Actors in the chain: the retailer (set quality standards above legal minimum).

In section 6.3.1 of the results the most important quality standards for retailers are identified. Furthermore, it is explained how governmental standards are used in setting standards for quality.

4.1.2 Signalling quality by suppliers

Table 12 gives an overview signalling strategies identified in literature. In the case studies it is investigated which signalling strategies are used by suppliers to signal the quality of meat to retailers.

Table 12: Quality signalling

Quality signalling strategies:

Third party test results (VWA, private laboratories)
Quality assurance systems (audits by private firms are performed to receive certifications)
Branding of the product
Reputation of the firm
Indemnification strategies: warranties

In section 6.3.2 of the results the strategies used by suppliers to signal quality in the fresh pork meat chain are identified.

4.1.3 Monitoring quality by retailers

Table 13 gives an overview of monitoring strategies identified in literature. In the case studies it is investigated which monitoring strategies are used by retailers to monitor the quality of meat.

Table 13: Monitoring quality

Strategies for monitoring quality:

Product	Direct measurement (to monitor visual aspects like colour) Sampling and laboratory testing
Process	Inspection of certification and/or audit report Performing audits

Actors that can perform quality controls in the relation between supplier and retailer:

- third parties: KDS, VWA, independent laboratories, independent audit bureaus
- actors in the chain: the retailer

In section 6.3.3 of the results the strategies used to monitor quality by retailers are identified.

4.2 Governance structures

In section 3.2, a distinction is made between six governance structures. The characteristics on which governance structures are distinguished are:

- Relevance of identity
- Specifications set for suppliers
- Formalization
- Duration and terms of notice (for the retailer and for the stores)
- Enforcement
- Financial participation
- Importance of price as coordination mechanism
- Importance of authority as coordination mechanism

In the case studies the governance structure characteristics are investigated to identify the governance structure for the relation between retailers and suppliers. In section 6.4 of the results, the main governance structure for the relation between the retailer and their supplier is identified.

5. Methodology

In the literature study, positioning strategy, quality assurance and governance structures are studied. The literature framework gives an overview of the factors and variables that has been studied in the case studies. Appendix 7 shows the list of topics which forms the basis for the interviews. In this chapter it is explained what research methods are used (5.1), how the respondents are selected (5.2), measurement (5.3), data collection (5.4) and how the case studies are analyzed (5.5).

5.1 Research methods

In this section the two methods used in this research are discussed: desk research and case studies.

Desk research

For this research strategy existing literature is investigated to gain insight in existing theories in the field of interest (Verschuren and Doorewaard, 2003). Two types of desk research are used in this research: literature study and secondary research. In the first type the researcher uses scientific publications that are published by other scientists. This type of desk research is used in this study to investigate the fresh pork meat chain (section 2.1), pork meat quality (section 3.1.1), quality assurance (section 3.1.2) and governance structures (section 3.2). For secondary research, existing data is analysed from a different point of view. This can be statistical information which is used to perform a quantitative analysis (Verschuren and Doorewaard, 2003). This research method is used in this study to research the positioning of Dutch retailers (section 2.2). Information on price and quality is used to for the positioning of Dutch retailers regarding price and quality of fresh pork meat. An advantage of desk research is the possibility to collect a large amount of data in a relatively short time span. A disadvantage is that the data might be collected for a different purpose (Verschuren and Doorewaard, 2003).

Case studies

The second methodology used is the case study. A case study enables a researcher to investigate how situations are in practice and why they are as they are. It enables the researcher to gain a profound insight into one or several objects or processes (Verschuren and Doorewaard, 2003). Thereby, the case study differs from other research strategies such as surveys and experiments. The case study is particularly useful for explorative research, because there is not much known yet about how retailers in the Dutch fresh pork meat sector assure the quality of fresh pork meat and what governance structures exist. This 'holistic view' is of interest to this research because it has been researched how quality is assured, what methods are used to assure quality and why is quality assured in this way. In relation to governance structures it is of interest to this research to investigate what governance structure can be identified and why this governance structure exists. Because not much information is known in advance, the case study leaves the possibility to adjust and switch the focus during the research. A disadvantage of case studies is that the external validity is often under pressure (Verschuren and Doorewaard, 2003). This can be reduced by performing more case studies. In this research comparative case studies are performed. Different retailers and their suppliers are compared with each other. Two types of comparative case studies are identified by Verschuren and Doorewaard (2003): Hierarchical method and sequential method. In the hierarchical method the case studies are first researched individually and independent of each other. Afterwards, the results are used for a comparative analysis between the different cases. In the sequential method the researcher focuses on one case which is studied in depth. Based on the results of this case study, a second case study is chosen, which is compared with the results of the first case study. In this research the hierarchical method is used, as the case studies with retailers are selected and analyzed at the same time. This method leads to a better overview of the results obtained per topic and reduces the possibility that relevant details are missing in the analysis of the results (Eisenhardt, 1989).

5.2 Selection of the case studies

5.2.1 Selection strategy case studies

The positioning strategy of the retailers forms the basis for selecting the case studies. Therefore, the retailers have been selected first. Afterwards, suppliers have been selected by using the snowball selection method. This entails that, based on the interviews with selected retailers, the suppliers have been selected for the case studies.

5.2.2 Selection of retailers

The positioning of Dutch retailers made for this research is shown in figure 4. Twelve Dutch retailers are included in the positioning of Dutch retailers, since there was information available about these retailers on both price and quality. Although the focus of this research is not on price, a distinction between retailers is also made regarding price level. This makes it possible to take into account the influence price might have in this research.

Selection criteria for retailers for the case study:

- Data needs to be available on price and quality of fresh meat of the retailer
- The retailer needs to be located in the Netherlands, because of limited time and resources
- The retailers purchase their meat (partly) from Dutch suppliers
- The retailers sell fresh pork meat.
- The supply of fresh pork meat must be organized by the purchaser of fresh pork meat at the retailer and not be outsourced to suppliers (category management). The reason is that the role of the retailer in quality assurance can be expected to be different than in other cases.
- The retailers must be willing to cooperate.

Of the fourteen retailers included in the positioning of Dutch retailers regarding price and quality of fresh pork meat (figure 4), ten retailers comply with these criteria. Three retailers have a supplier as category manager and therefore, did not comply with the criteria set. One of the retailers only purchased meat from outside the Netherlands. Of the ten retailers left, four wanted to cooperate in this research. According to Eisenhardt (1989) less than four cases leads to problems with generalizing the results. More than eleven cases can lead to too much information and complexity, which can result in problems with validity and correctness of conclusions (Eisenhardt, 1989). Since this case is based on four retailers, it lies within Eisenhardt's range.

Selecting respondents by retailers

Interviews have been held with:

- (1) the purchasers of fresh pork meat of different Dutch retailers
- (2) the person responsible for quality assurance of incoming fresh pork meat.

Not all retailers have a quality manager for fresh pork meat. In these cases or when purchasers have the information needed to research quality assurance, only interviews have been held with the purchaser of fresh pork meat.

Purchaser fresh pork meat

Purchasers of fresh pork meat are of interest for this research because of the following reasons:

- they can give information about what the purchase process of pork meat looks like
- they can give information on quality aspects important for the purchaser when buying pork meat
- they can give information about which suppliers deliver to this retailer
- they can describe the governance structures for the different suppliers

Quality manager fresh pork meat

Quality managers of fresh (pork) meat are of interest for this research for the following reasons:

- they can give information about the quality of fresh pork meat
- they can give information about how quality is assured by the retailer in the supply chain, for example:
 - o what standards are set for quality by retailers
 - o how suppliers signal quality to the retailer
 - o how the quality of meat is monitored by the retailer

5.2.3 Selection of suppliers

After interviewing retailers, suppliers that deliver meat to the selected retailers have been interviewed.

Criteria for selecting processors and slaughterhouses:

- Because of limited time and resources, the focus is suppliers in the Netherlands.
- The suppliers are active in slaughtering and/or processing fresh pork meat
- The suppliers deliver fresh pork meat to the selected retailer

Most retailers have more than one supplier that delivers fresh pork meat. Because of limited time and resources, the maximum number of suppliers researched is two per retailer. The criteria for selection of the suppliers for the case study are:

- The frequency of delivery: the supplier that most frequently deliver pork meat to the retailer has been selected
- the willingness of suppliers to cooperate

Selecting respondents at suppliers

For the suppliers, interviews have been held with:

- (1) the person responsible for selling meat to the retailers
- (2) the quality manager

The respondents need to be in such a position in the organization that they can give useful information on the topics researched. Also at these links in the chain the number of respondents depends on the knowledge of the respondent.

Person responsible for selling pork meat to retailers

By interviewing persons responsible for selling pork meat to retailers information is obtained about:

- what quality standards are important to the retailers
- to which retailers the supplier delivers fresh pork meat
- what the governance structures in these relationships look like
- how quality requirements of retailers differ (when delivering to multiple retailers)

Quality manager pork meat

By interviewing the quality managers at suppliers, information can be obtained about:

- how quality is assured by the retailer in the supply chain, for example,
 - o what requirements are set by retailers
 - o how quality is signaled to the retailer
 - o how the quality of meat is monitored by the retailer
- how quality requirements set by retailers differ (when delivering to multiple retailers)

5.3 Measurement

The interview questions are based on the theoretical framework presented in chapter 4. An overview of the topics investigated in the interviews can be found in Appendix 7. In this section it is explained how the factors and variables of the theoretical framework are investigated in the interviews.

Quality assurance

Setting standards for quality

Table 11 (chapter 4) shows the operationalisation of quality standards. In the case studies retailers and suppliers are asked what the five most important standards are for quality for the retailer. Thereby, no complete picture is given for quality, but the focus is on the most important aspect. The reason is that it is too complex to investigate all quality standards in the interviews. For the most important quality standards it is investigated how the standard is specified, what the role of regulations are in setting standards and how these standards are communicated to retailer.

Signalling quality

Table 12 (chapter 4) shows the operationalisation of signalling strategies. In the case studies suppliers and retailers have been asked how suppliers signal the quality of fresh pork meat. Thereby, the strategies to signal quality used by suppliers in the fresh pork meat chain have been identified. These results are compared to the strategies identified in literature in section 6.3.2.

Monitoring quality

Table 13 (chapter 4) shows the operationalisation of monitoring strategies. In the case studies suppliers and retailers have been asked how retailers monitor the quality of fresh pork meat. Thereby, the strategies to monitor quality used by suppliers in the fresh pork meat chain have been identified. These results are compared to the strategies identified in literature in section 6.3.3.

Governance structures

In chapter 4 a summary is given of the characteristics on which the governance structures are distinguished. Each of the characteristics has been investigated in the case studies to determine the governance structure.

5.4 Data collection

The interviews consist of open-ended questions, because in this way more information can be obtained about why things are as they are. Explanations and argument can be asked in order to better understand the answers of the respondents and to be able to explain existing differences. The interviews are semi-structured. Semi-structured interviews give a certain degree of structure to make sure that all the topics that need to be researched are discussed. This is important for comparing the answers of different interviews. On the other hand, semi-structured interviews allows some flexibility to discuss topics in more depth or to discuss topics that are not included in the interview but appear to be important.

Several actions are taken to increase the internal and external validity of this research. To increase the internal validity, the method of triangulation is used: in the literature study information is obtained from different sources and data is obtained from different sources in the field. By interviewing both suppliers and retailers in the supply chain, the validity of the results is increased. Finally, a checklist is made to make sure that the same topics are discussed in different interviews and thus, that the answers of the respondents can be compared. A disadvantage of interviews is the chance that people give answers of which they think that they are more socially acceptable, instead of answers that reflect the real situation. Furthermore, suppliers have been asked about differences between their customers. The answer to this question may include sensitive information that they do not want to become public. To reduce the chance that respondents will keep from answering the questions truthfully, respondents are told in the interviews that the information is used anonymously.

In preparing for the interviews, information about the organization is studied (e.g. the website of the organization). The face-to-face interviews have been performed at the offices of the retailers and suppliers. Face-to-face interviews (in comparison to telephone interviews) make it easier to get an impression of the companies researched. Furthermore, with face-to-face interviews (in comparison to interviews by telephone) it is better possible to ask for explanations and other details of questions asked. Furthermore, it is possible to receive background information of suppliers, for example about quality standards set. In the interviews a recorder has been used.

5.5 Analysis of the case studies

After conducting the interviews, the answers have been analyzed. Several steps need to be taken in analyzing the results. First, the case studies are researched individually and independent of each other. For each retailer the results are studied related to quality assurance (setting standards, signalling quality and monitoring quality) and governance structures. Secondly, a comparative analysis is performed between the different cases, and similarities and differences for quality assurance and governance structures are identified. The third step in analyzing the results is to identify the relation between quality assurance and positioning strategy. The similarities and differences in quality

assurance are related to the similarities and differences in governance structure. The last step is to identify the relation between quality assurance and positioning strategy. Similarities and differences in quality assurance have been related to the positioning strategy of retailers. By comparing the results of the case study with the positioning made in the literature study, the positioning made in the literature study can be supported or criticized. Furthermore, the relation between quality assurance and positioning strategy can be investigated, by relating the similarities and differences in quality assurance to the positioning of retailers.

6. Results

In this chapter the results of the case studies are presented. In section 6.1 a description of the selected fresh pork meat chain is given and the retailers and suppliers (slaughterhouses/processors and processors) investigated are described. In section 6.2 the positioning of the four selected Dutch retailers regarding price and quality is given. In section 6.3 the results regarding quality assurance are presented based on similarities and differences in setting standards, signalling quality and monitoring quality. In section 6.4 the governance structures are described based on similarities and differences between the actors researched and the results of this research is related to the typology of governance structures. Based on these results, the relation between quality assurance and governance structures is analyzed in section 6.5. In section 6.6 the relation between quality assurance and positioning is analyzed.

6.1 Description of the selected chains

6.1.1 General description

In the interviews differences are identified between the fresh pork meat chains for the link supplier - retailer. Because of the influence on quality assurance, these differences between supply chains will be now be explained. An overview of the different supply chains is given in figure 8.

Two main differences are identified: (1) differences in the existence of butcheries in stores and (2) differences in vertical integration of actors in the supply chain from slaughterhouse to retailer.

1) Differences in the existence of butcheries in stores leads to differences in the product delivered. Bulk meat products are ordered by stores with a butchery, while pre-packed meat is ordered by stores without a butchery. Based on the type of fresh pork meat ordered, the activities performed in the supply chain differ. Some processors also prepare and pack meat while other suppliers only debone and cut the meat (see figure 8). This difference leads to differences in quality assurance. This is further explained in the results for quality assurance (section 6.3).

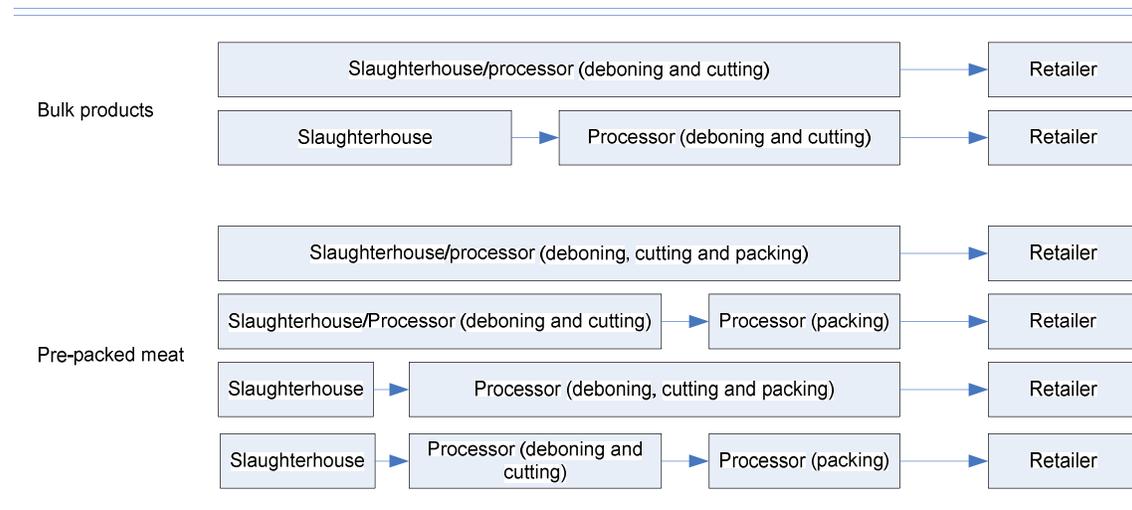


Figure 8: Types of supply chains found in the case studies for fresh pork meat

(2) Vertical integration can be seen between processors (some processors only debone or only prepare and pack the meat, while others perform both activities) and between slaughterhouse and processors (some slaughterhouses are only active in slaughtering, while others also debone and pack the meat) (figure 8). This leads to differences in the supply chain for the number of actors in the chain and thereby the controllability of the supply chains (see section 6.3.3).

6.1.2 Background information of the selected retailers

In this section, first general background information about the retailers studied is given. Second, an introduction is given to the fresh pork meat supply chain from slaughterhouse to retailer.

General background information about the four retailers

Table 14 gives an overview on the general background of the four retailers researched. The information is based on articles, annual reports, websites (of retailers) and the interviews with retailers.

Table 14: General background of the selected retailers

General background information	Retailer A	Retailer B	Retailer C ¹	Retailer D
Turnover	1,4 milliard	1,41 milliard	0,75 milliard ¹	4,1 milliard
Market share	5,9%	6%	2,4% ¹	31,6%
Total number of stores	123	280	185 ¹	428
- Of which are franchise stores	35	280	111 ¹	428
- Of which are own stores	88	0	74 ¹	0
Average selling floor	1295m ²	920m ²	963m ² ¹	970m ²
Number of formulas (website retailers and interviews)	1	1	3, the formulas differ on price setting, but not on quality level	1

¹ The information about this retailer is based on the three formulas together.

The table shows that the retailers investigated together have a market share of 45,9%. Several differences can be identified between the four retailers researched. Table 14 shows that retailer D is the largest retailer investigated in this research. This retailer has the highest turnover, the most stores and the biggest market share of the retailers researched. This difference in size might have an influence on how quality is assured in the supply chain. A second difference can be identified for retailer A, which has fewer stores than retailer B and C but a turnover and market share which is almost equal to retailer B. This can be explained by the size of the stores. Retailer A has the biggest average selling floor. Differences in store size can influence the assortment of the retailers. However, the assortment is not investigated as it is not the focus of this research. A third difference is that several retailers only have stores which are managed by franchisers, while others have a mix between franchisers and own stores. The retailers interviewed explained that there are no differences in the ordering process and the quality of meat ordered between franchise stores and stores owned by the retailer. Finally, differences are identified in the number of formulas of each retailer. Because the respondent in the interview explained that the formulas do not differ in quality of meat ordered and the relation with suppliers, it can be expected that this does not influence the results of quality assurance and governance structures. In section 6.2 the positioning of the four selected Dutch retailers on fresh meat quality and price is given.

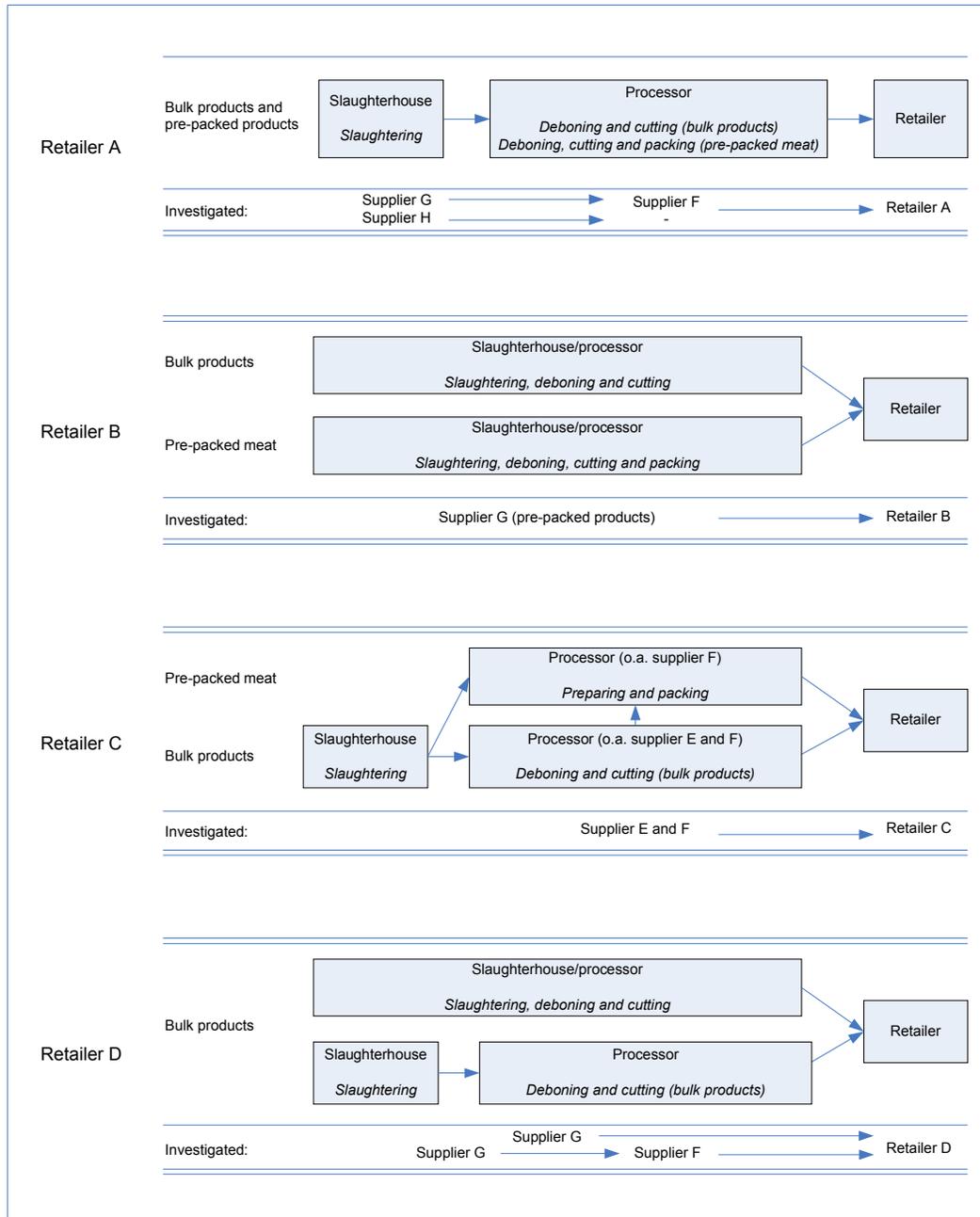


Figure 9: Supply chains of the retailers investigated

Background information regarding the supply of fresh pork meat for the four retailers

Table 15 and figure 9 give an overview of supply chains from slaughterhouse to retailer for the four retailers researched. This information is obtained in the interviews.

Table 15: Overview of background information about the supply of fresh pork meat

Supply chain information	Retailer A	Retailer B	Retailer C	Retailer D
Percentage of meat originated from the Netherlands	90%	50%	All fresh meat that is part of Milieukeur	90%
Number of suppliers	3	2	6	14
Percentage of stores with butcheries	95%	50%	60%	100%
Type of product ordered	Bulk (95%) and pre-packed (5%)	Bulk (50%) and pre-packed (50%)	Bulk (60%) and pre-packed (40%)	All bulk products except for organic products
Type of supplier	processors	Slaughterhouse/processor	processors	Processors and slaughterhouses/processors
Which supplier delivers which store?	Regional procurement	Depends on the type of product ordered	Depends on the type of product ordered and the choice of the stores (fixed choice)	Depends on the choice of the stores (can choose weekly depending on the prices set by suppliers)
Communication lines	Retailer communicates only with the direct supplier	Retailer communicates only with the direct supplier	Retailer communicates only with the direct supplier	Retailer communicates only with the direct supplier

Some interesting differences are identified. First of all, for several retailers the majority of fresh pork meat is originated from the Netherlands (around 90%), while only 50% of the meat ordered by retailer B originate from the Netherlands. This difference does not influence the results of this research, because this research focuses only on the Netherlands. Second, a major difference can be seen in the number of suppliers (which varies from 2-14). Third, differences are identified in the existence of butcheries in the stores, which influence the type of product ordered. Fourth, differences exist in the type of supplier. Finally, differences are identified between retailers for the criteria that determine which supplier delivers which store (e.g. region, type of product or prices). The influence of the last four differences on quality assurance is explained in section 6.3.

6.1.3 Background information of the selected suppliers

Figure 10 shows the supply chain from slaughterhouse to retailers for the four suppliers researched. Table 16 gives more information about the suppliers investigated. The information is obtained in the interviews and by annual reports.

Table 16: Background information about the suppliers researched

	Supplier E	Supplier F	Supplier G	Supplier H
Turnover	n.a. ¹	n.a. ¹	7140 million euro	225,7 million euro
Market share	n.a. ¹	n.a. ¹	57%	n.a. ¹
Type of supplier	Processor	Processor	Slaughterhouse/ processor	Slaughterhouse
Activities performed by this supplier	Deboning and cutting	Deboning, cutting, preparing and packing	Slaughtering, deboning, cutting, preparing and packing	Slaughtering
Delivers to	Retailer C	Retailer B and D	Retailer B Retailer D (direct and indirect)	Indirect to retailer B and D

¹ N.a. means not available

Although not all information is available regarding turnover and market share, a major difference is found in turnover. This influences the results of this research in that this supplier delivers many retailers in the Netherlands and outside the Netherlands and because this supplier is a big player in the sector, this supplier has a good overview of differences in quality assurance between retailers. A second difference can be found for the type of supplier and thus, the activities performed at suppliers. The influence this has on quality assurance is explained in section 6.3.

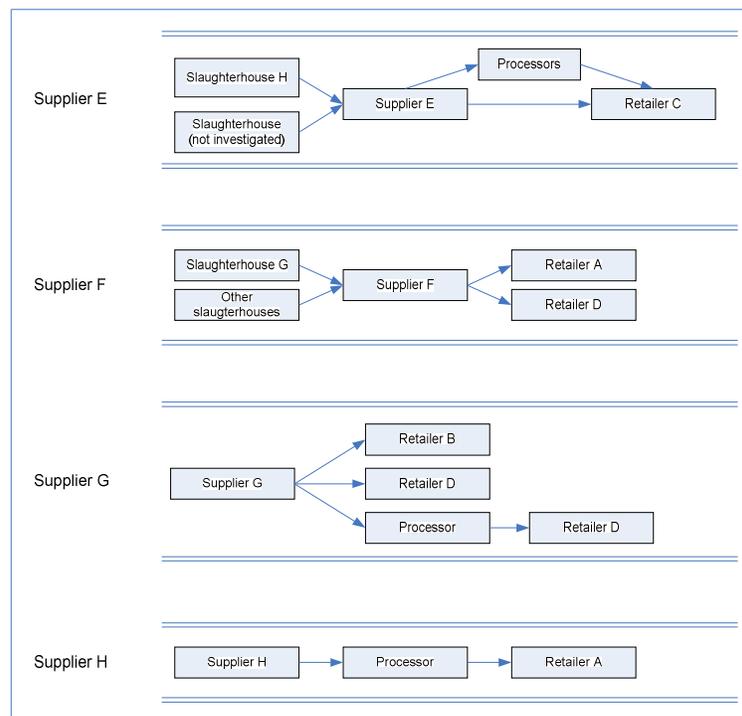


Figure 10: Supply chains of suppliers investigated

6.2 Results positioning Dutch retailers on quality and price

In section 2.2, it is explained how the positioning of Dutch retailers regarding price and quality is made. Figure 11 gives an overview of the positioning of the four Dutch retailers investigated in the case studies.



Figure 11: Positioning of retailers investigated

This figure shows that little differences exist between the selected retailers on quality of fresh meat. The four retailers investigated all score between 7,3 and 7,8 for quality of meat (which is based on the average over the last two years, on a 10-point scale). As can be seen in figure 11 three of the four retailers selected have a higher price level than the average of Dutch retailers researched. An interesting result is that the higher the retailers are positioned on quality, the lower the retailers are positioned on price. According to figure 11, retailer A is the retailer with the lowest price level of the four retailers researched and relatively the highest quality of fresh meat. Retailer C has the lowest score on quality of the four retailers, but relatively the highest price level (see figure 11). The positioning regarding price for this retailer is based on the formula with the highest price setting (because this data was available). When the two other formulas of retailer C would have been taken into account as well, the positioning regarding the price level would have been different. Retailer B and retailer D score lower on quality than retailer A, but higher than retailer C. Regarding price, retailer B and D have a higher price level than retailer A, but lower than retailer C. Because only small differences are identified in positioning regarding quality for the four retailers, it is not possible to make a distinction between retailers with high quality level and retailers with a low quality level. The implications for the results are further discussed in section 6.6.

6.3 Results for quality assurance

In this section the results related to quality assurance are presented by focusing on the three steps: 1) setting standards for quality by retailers, 2) signalling quality by suppliers, 3) monitoring quality by retailers.

6.3.1 Results setting standards for quality by retailers

The retailers investigated are asked what quality standards are the most important. The results are shown in table 17. The quality aspects are not written down in a special order. During the interviews, information is also obtained about other aspects than the five most important. Therefore, the table 17 contains more than five quality aspects.

Table 17: Most important aspects on which retailers set standards for quality

	<i>Retailer A</i>	<i>Retailer B</i>	<i>Retailer C</i>	<i>Retailer D</i>
Fat content	x	x	x	x
Micro bacterial values	x	x	x	x
pH-value				x
Shelf life	x	x	x	
Packaging	x			x
Temperature		x	x	
Process characteristics: - Quality Assurance systems	x	x	x	x
<i>Others:</i>				
Colour	x	x	x	x

The similarities and differences between the four retailers are now given for each quality standard. Table 18 gives an overview of these similarities and differences.

Fat content

Standards are set for the level of fat the meat is allowed to contain. All retailers set requirements for fat content by 1) a precise description what the meat cuts delivered should look like (deboning quality) and 2) defining fat percentage for the meat cut. 1) Deboning quality refers to the way the meat is cut, thus what parts have to be on the delivered meat cuts and what parts need to be removed. This is important for retailers because it has a significant influence on the return on the meat cuts. Deboning quality is only investigated in this thesis related to the fat content. The shape and size of fresh pork meat are left out of scope because they are not defined as quality by this research. 2) Fat content is reflected by different categories in the SEUROP system. The different letters stand for differences in percentage meat and fat (see Appendix 8). Besides the SEUROP system the type of pig (the muscularity and shape) is used in ordering meat. For the type of pig also different categories exist, varying from AA to A, B and C (see Appendix 8). Differences are identified between retailers for categories used when ordering meat. According to supplier E and G, Dutch retailers buy their meat within the three highest categories (S, E and U). The retailers interviewed buy their meat from different categories, varying from UA/UAA (retailer D), to EA (retailer C), to EAA (retailer A) (table 18). However, retailer B and supplier F and G said retailers do not use the purchase classes anymore when buying meat. According to them, retailers buy meat based on meat and fat percentage (for example 80-20 or 90-10). The processor receives the information about meat-fat percentage and translates this information into the SEUPROP classification, which is used by processors to order meat from slaughterhouses. Thus, based on the results it can be said that different systems are used by respondents. The results also show that fat percentage is a quality aspect on which retailers can distinguish themselves from other retailers.

Micro bacterial values

All retailers set requirements for micro-organisms. Many different types of micro-organisms exist, of which some are more relevant than others when looking at fresh pork meat. An important group of bacteria is the enterobacteriaceae, which includes different types of Salmonella and the E-Colli bacteria. The complexity of this quality aspect is shown by the fact that more than 200 salmonella types exist. Moreover, the values set for maximum amount of micro-bacteria differ between fresh pork meat products. Because of this complexity the respondents are asked whether standards differ from governmental regulations and whether differences exist between retailers. There are government regulations that set minimum standards for several types of micro-bacteria (e.g. Salmonella). According to supplier E, F and G, the standards for micro bacteria set by government regulations do not differ much from that used by retailers. The reason given is that the governmental regulations already set strict standards for micro bacteria.

PH-value

Standards regarding pH are set by defining the upper and lower value. PH value is important because it is an indicator for the tenderness of the meat. Furthermore, it is related to the colour of meat and drip loss (interview retailer D). According to the suppliers interviewed, retailers set standards regarding pH according to governmental regulations.

Shelf life

All retailers set requirements for shelf life by defining the time from the slaughter process to the arrival in the store and by developing requirements for shelf life as from arrival in the stores. According to supplier E and F, the standards set for shelf life do not differ much as all retailers want their meat as fresh as possible and in all chains a certain time is needed to debone and cut the meat. Because different types of data are obtained in the interviews with retailers, the data regarding shelf life can not be compared between retailers. Data is obtained about maximum amount of days from the slaughter process until the arrival in the stores and data for maximum amount of days from arrival in the stores to sales. Moreover, the data obtained differs because some respondents use internal shelf life (shelf life according to the suppliers) and other respondents use external shelf life (shelf life communicated on the package and communicated to consumers). Therefore, the data can not be used in this research.

Process quality characteristics

Standards regarding process quality are set by quality assurance systems for which certifications can be obtained. None of the retailers set additional standards for the process. The reason is that when standards for quality are set stricter than these quality assurance systems, monitoring compliance to these additional standards is very difficult for retailers' (retailer D). The suppliers of all retailers have to comply with HACCP (which is regulated by the government) and IKB. Besides this similarity differences are also identified between retailers regarding quality assurance systems. First, retailer C is the only retailer that delivers meat that complies with 'Milieukeur'. Thus, suppliers of retailer C have to comply with the quality assurance system 'Milieukeur'. Second, differences exist between retailers for standards for BRC and IFS. For the suppliers of retailer A and B the quality assurance system BRC is obligated, while this is not yet the case for the smaller suppliers of retailer D. The suppliers of retailer C can choose between IFS and BRC as a quality standard. Other retailers do not require IFS as a standard. The quality assurance systems HACCP, BRC and IFS are all accepted and seen as equal according to GFSI. Thus, the main difference between the four retailers is the quality standard 'Milieukeur'.

Packaging

Packaging was mentioned several times in the interviews, but was not included in the operationalisation of quality in this research. Packaging refers to for example the weight of the product, how many meat products have to be in one packaging, the materials used, the size of the packaging and if the label contains all the right information. The standards set for packaging are left out of scope since they are not included in the definition of quality used in this research.

Temperature

In the case studies, information is obtained about standards set for temperature. Temperature was not included in the operationalisation of quality in this research. However, because temperature has an important influence on quality aspects like micro-organisms, colour, PH-value and shelf life, the results

for this aspect have been included in this research. Different standards are set for temperature. According to the governmental regulations, the temperature of meat must be maximally 7 degrees. Retailer B and C set stricter standards for temperature. For these retailers the temperature of fresh pork meat has to be below 4 degrees. Retailer A has plans to change the maximum temperature from 7 degrees to a maximum of 2 degrees.

Colour of meat

All retailers set requirements for the colour of meat. This is done by pictures of different colours of meat in the handbook for the supplier. Because it is not possible to make a comparison between the pictures in the handbooks of the retailers, it will not be further investigated in this research.

Table 18: Results setting standards

	<i>Retailer A</i>	<i>Retailer B</i>	<i>Retailer C</i>	<i>Retailer D</i>
Quality standards regarding the product				
Fat content	EAA	SEUROP classification is not used	EA	UA
Micro-bacterial values	According to regulations	According to regulations	According to regulations	According to regulations
pH	According to regulations	According to regulations	According to regulations	According to regulations
Shelf life	Data can not be compared	Data can not be compared	Data can not be compared	Data can not be compared
Temperature	Maximum 7 degrees	Maximum 4 degrees	Maximum 4 degrees	Maximum 7 degrees
Quality assurance systems	IKB, HACCP and BRC	BRC and HACCP	BRC of IFS 'Milieukeur'	HACCP and/or BRC
Additional standards for process quality	No	No	No	No

Summary

The most important quality standards set by retailers are: fat, micro-bacteria, pH, shelf life. The standards are communicated to suppliers by handbooks. Similarities are identified between retailers for pH and micro-bacteria and differences are identified for fat content and temperature. Quality standards regarding the process are set by quality assurance systems. Differences are identified in quality assurance systems required by retailers. All suppliers researched state that little differences exist between Dutch retailers. Two reasons are given. The most important reason is the role of governmental regulations. Regulations play a role in setting minimum standards, e.g. for fat content, different types of micro-bacteria, pH and temperature. According to supplier F, the regulations for quality standards are quite strict. Therefore, the standards are taken over by retailers or standards set by retailers do not differ much from the governmental regulations. A second reason given by retailer B, is that retailers discuss the standards for quality set between the retailers which are part of the purchase organization. However, according to supplier G, standards are not only the same for the retailers that are part of the same purchase organization, but standards are also similar between retailers which are not part of the same purchase organization. Although differences are identified in this research for fat content, temperature and quality assurance systems, the suppliers E and G argue that the most important differences between suppliers are the standards set for meat cuts and packaging.

6.3.2 Results signalling quality by suppliers

In the literature study, several signalling strategies are identified. In this section it is explained what signalling strategies are used by the suppliers of the four Dutch retailers to signal the quality of the fresh pork meat delivered. Table 19 gives an overview of the results for signalling quality by suppliers. The results show that suppliers use the same strategies to signal the quality of meat to retailers.

Table 19: Results signalling standards

Signalling strategies	Retailer A	Retailer B	Retailer C	Retailer D
Third party test results Sharing test results on the initiative of the supplier	No, only when the retailer request it			
Certification strategy Hiring an independent bureau for auditing and showing the certificate on initiative of the supplier	Yes, every year	Yes, every year	Yes, every year	Yes, every year
Reputation Performance in the past serves as a quality indicator for customers	Yes	Yes	Yes	Yes
Branding The brand name of the product communicates the quality of the product	Yes, retailers brand	Yes, retailers brand	Yes, retailers brand	Yes, retailers brand
Indemnification strategy If the product delivered does not comply with standards set, money-back and warranties are provided.	Yes	Yes	Yes	Yes

The results for the four retailers are now presented for each signalling strategy.

Third party test results

Only one signalling strategy distinguished in the literature study is not used by suppliers to signal quality: third party test results. Quality tests are performed at slaughterhouses and processors by the suppliers themselves and by third parties such as the VWA. These test results are not shared with retailers on initiative of suppliers but on the initiative of the retailer. Therefore, it is not a signalling strategy of suppliers, but a monitoring strategy of retailers. Therefore, this is further explained in section 6.3.3.

Certification

Each year, suppliers are audited by an independent bureau in order to update the certification for the quality assurance system (e.g. HACCP). This bureau is hired by the supplier. It is not clear if the certificate is shown to retailers on initiative of the retailer (in that case it is not a signalling strategy, but a monitoring strategy) or on the initiative of the supplier. The certification system is important in signalling quality, since retailers place high trust in the certification systems. This is shown by statements as 'When you comply with BRC, everything is monitored and documented' (interview, supplier B).

Reputation

Reputation also plays an important role in signalling quality. This is shown by statements of retailers like 'A supplier that performs good in our own tests, which receives no complaints from stores and from customers and everything looks good when visiting the supplier, less attention is paid to this supplier' (interview retailer D) and 'Our suppliers deliver fresh pork meat for a long time and they have a good reputation in the market' (retailer A). According to retailers, a decrease in reputation of suppliers is quickly widely known in the sector, and makes it difficult to attract new customers. This shows the important role reputation has in the relationship with retailers.

Branding

Private brand names of suppliers are not common for most fresh pork meat products. The fresh pork meat products delivered by suppliers contain the brand name of the retailer. This brand name communicates a certain level of quality of the retailers' product to consumers. Suppliers have to comply with standards set, before they are allowed to deliver fresh pork meat under the label of the retailer.

Indemnification strategies

Indemnification strategies are identified in the Dutch fresh pork meat chain. Money-back guarantees are given when the product delivered does not comply with the standards set. Thereby, suppliers guarantee a minimum level of quality for fresh pork meat.

Summary

Only similarities between suppliers are identified for quality signalling strategies used. The suppliers use the following strategies to signal quality: quality assurance systems and certifications, reputation, branding and indemnification strategies (warrantees and money back guarantees). The certifications for quality assurance systems and reputation are seen as most important by retailers and suppliers. Suppliers do not signal the quality of meat delivered by showing test results on regular basis, but only when the retailer asks for the test results.

6.3.3 Results monitoring quality by retailers

The third and last step identified in assuring quality is monitoring quality. In the literature study strategies are identified that can be used to monitor quality in the fresh pork meat chain. The results of the case study show that all strategies for monitoring quality distinguished in literature are identified in the selected Dutch fresh pork meat chains: direct measurement, sampling, controlling test results, controlling certifications, performing audits and laboratory testing. Besides the similarities identified between the four retailers researched, interesting differences are found for audits and for sampling and laboratory testing. An overview of the results is given in table 20.

Table 20: Summary of the results for monitoring quality

Monitoring strategies	Retailer A	Retailer B	Retailer C	Retailer D
Direct measurement Visual delivery inspection in the supermarket	Yes	Yes	Yes	Yes
Screening Suppliers are requested to show test results	Only in case of complaints	Only in case of complaints	Only in case of complaints	Only in case of complaints
Controlling certification - Show certification yearly - Inspect audit report - Analyze audit report by independent audit bureau	Yes If necessary	Yes If necessary	Yes If necessary	Yes If necessary
Audits Type of audit	Yes Informal, announced	Yes Informal, announced	Yes Informal, announced	Yes Informal, announced and unannounced
Performed by: Focus of the audit	The retailer Visit the production area and inspect quality test results	The retailer Visit the production area and inspect quality test results	The retailer Visit the production area and inspect quality test results	The retailer Visit the production area and inspect quality test results
Frequency	Irregular, between 1-5 times a year	Two times a year	Irregular, between 1-5 times a year	Several times a year, dependent of the supplier
Sampling and laboratory testing Monsters are taken and analysed in independent laboratories	Yes, for minced meat at arrival and in store (several times a year), other meat only in case of quality problems (sporadic)	Only in case of quality problems (sporadic) On regular basis only visual aspects in the store (e.g. hygiene, temperature)	Only in case of quality problems (sporadic)	Yes, at suppliers (each supplier 8x a year), at arrival and in store

For each monitoring strategy the similarities and differences between retailers are now described.

Direct measurement

All retailers use direct measurement to monitor the quality of fresh meat. The controls are performed when the fresh pork meat is delivered in the store. The inspection is only visual, because there are no

facilities in store to control the meat otherwise. All retailers have handbooks, which describe the quality aspects that need to be controlled and the standards set for these quality aspects. The aspects on which fresh pork meat is monitored in the stores differs, depending on the type of product delivered. When pre-packed meat is delivered by the supplier, delivery inspection in the stores only consist of monitoring the colour of meat, packaging, temperature and shelf life. As supplier G said 'when the product is pre-packed, the retailers perform less extensive controls on the product'. When the products that are delivered in the store still need to be prepared and packed, quality is monitored more extensively. Besides controlling colour, packaging, temperature and shelf life, the fresh meat delivered is also monitored for fat content. Thus, differences in monitoring depend on the type of product delivered. For retailer A, B and C, the type of product delivered depends on the existence of a butchery in store. Stores with a butchery order bulk products and perform less extensive controls than stores without a butchery which order pre-packed meat. For retailer D, all meat delivered needs to be prepared and packed. Therefore, the delivery inspection of retailer D is focused on more aspects than when pre-packed products are delivered.

Screening

When retailers receive complaints from stores or customers, retailers control the quality of fresh pork meat by requesting test results from suppliers. For some fresh pork meat products (like minced meat) test results are requested more often because of higher quality risks. Retailers do not inspect the results of quality tests on a regular basis for different reasons. According to retailer B suppliers communicate results when major variations exist in quality. Furthermore, the BRC system leads to a high level of control. One of the respondents also argues suppliers are forced to deliver high quality meat, because retailers have the opportunity to switch between suppliers. Retailer D does not inspect the test results because they have their own test results.

Controlling certifications

All the retailers control the certification of suppliers, which needs to be updated every year. None of the four retailers hires auditing bureaus to analyze the inspection report.

Audits

None of the four retailers investigated perform official audits at the supplier. The reason given by retailer C is that this is already done once a year in order to receive a new certificate for several quality assurance systems. The reason given by retailer A is that the retailer is too small to perform official audits. All retailers visit the supplier to inspect quality test results and to visit the production. The number of visits each year depends on the quality delivered by the supplier and the amount of meetings with the supplier. Besides these similarities also a difference is identified between the four retailers. While retailer A, B and C perform only announced visits, retailer D also performs unannounced visits. The unannounced visits of retailer D focuses on the production process, while the announced visits normally focus on the documentation for quality test results.

Screening: test results

The quality assurance systems HACCP and BRC require suppliers to perform tests to monitor the quality of the fresh pork meat products. The KDS also takes monsters to analyze the quality of meat. Retailers are allowed to inspect these test results. The results of the case studies show that the test results are not shown on initiative of the suppliers and are only sent to retailers when they request it. The retailers researched do not ask for test results on regular basis, but only when complaints about fresh pork meat are received from stores or consumers. The only exception can be found for fresh pork meat products which contain higher risk, for example minced meat. For these products it is more important to monitor the quality of the product.

Sampling and laboratory testing

Retailer D is the only retailer that hires an independent bureau to take monsters in the production area of their suppliers to analyze the quality of meat. Retailer A and D are the only two retailers that hire an independent laboratory to take monsters from the butcheries in the stores to analyze the quality. Retailer A takes monsters of minced meat at arrival in the store and in the shelves to control the product delivered by suppliers and to control the product sold to consumers. Thereby, the performance of the butcher in the supermarket is also controlled. Retailer B only hires an independent bureau to perform visual inspections in the store, to monitor the quality of meat sold to consumers and to be able to compare the quality of meat between different stores. The control is only focused on visual aspects like hygiene and temperature. The reason not to perform laboratory tests is that the

supplier (processor and slaughterhouse) already hires an independent bureau that performs microbiological tests each week or several times a week. These tests are always available for inspection by the retailer (Retailer B). When quality problems arise, suppliers communicate this to the retailer. When suppliers comply with the regulations set for quality, additional information is not necessary (Retailer B).

Other results

Traceability refers to the possibility to trace back fresh pork meat throughout the chain. Both IKB and BRC set out standards for traceability. In this research traceability is not studied on its own, but it is included through investigating whether retailers comply with IKB and BRC. The results of the case studies suggest that traceability is more important for the retailers that do not control the quality of fresh pork meat in independent laboratories. In selecting suppliers for fresh pork meat, traceability is an important issue for retailers A, B and C. Retailer A has two suppliers that both perform all the processes from slaughtering to delivery. The reason to have this small number of suppliers and to choose suppliers who perform all the activities in the chain is the controllability of the supply chain. This retailer controls the traceability of products two times a year. A fresh pork meat product is taken from the distribution center and the supplier has to trace it back to the origin. This retailer also interacts with the supplier about the delivered quality, the amount of rejections before and after slaughtering in the slaughterhouse and the farmers that provided these pigs. Retailer B buys their meat from processors. For retailer B it is important that the processors are involved in the processes in the beginning of the chain. Suppliers are selected that buy their own pigs (and thereby are in contact with the farmer), which are slaughtered by the slaughterhouse. The fresh pork meat of retailer C is for 95% delivered by one supplier (E), who has a 50% share in the slaughterhouse in which the pigs are slaughtered. The pigs are bought from a group of farmers called 'De Hoeve'. The origin of the meat in this chain is even more important because the whole supply chain has to comply with 'Milieukeur'. Retailer D has 14 suppliers varying from slaughterhouses/processors to different types of processors. Based on IKB and BRC, the exact origin of meat can be traced back to the origin. However, no special focus on monitoring the supply chain is mentioned by this retailer.

Summary

Similarities between retailers are identified for monitoring quality. The four retailers all apply delivery inspection and require test results of suppliers in case of complaints. Furthermore, all retailers control the certification of suppliers but do not analyze the audit report and all retailers perform informal audits by visiting the production area and by inspecting the test results documented by suppliers. Differences between the four retailers are identified for monitoring quality. Only retailer D performs unannounced audits. The most important difference is found for sampling and laboratory testing and traceability. The difference for sampling and laboratory testing and for traceability might be related to each other. For the retailers that do not take samples of suppliers and perform laboratory tests (or only for minced meat), less information about quality is obtained. For these retailers, traceability becomes more important. The retailer that performs laboratory tests receives enough information about the quality of fresh pork meat, which reduces the importance of the extra focus on traceability (when quality assurance systems such as IKB exist).

6.4 Results for governance structure

In the literature study six governance structures are identified based on eight governance structure characteristics. The main governance structure for the four retailers is 'long term relations with qualified suppliers'. Table 21 gives an overview of the results for each retailer for the governance structure characteristics.

Table 21: Results governance structure

Governance structure characteristic	Retailer A	Retailer B	Retailer C	Retailer D
Relevance of identity	Yes	Yes	Yes	Yes
Specifications	Yes, regarding quality standards			
Formalization	Yes, for quality standards and monitoring Not for quantity or duration	Yes, for quality standards and monitoring Not for quantity or duration	Yes, for quality standards and monitoring Not for quantity or duration	Yes, for quality standards and monitoring Not for quantity or duration
Duration/termination /frequency	Moderate to long term/ duration is not defined and termination is at will /high	Moderate to long term/ duration is not defined and termination is at will /high	Moderate to long term/ duration is not defined and termination is at will /high	Stores and supplier: short to long term, Retailer and suppliers: moderate to long term/ duration is not defined and termination is at will /high
Enforcement	Reputation /third parties (certification agencies/KDS/VWA)			
Financial participation	No	No	No	No
Relative importance of price as coordination mechanism	+	+	+	++
(Expected) relative importance of authority as coordination mechanism	++	++	++	+

The similarities and differences between retailers will now be described for the eight governance structure characteristics.

Relevance of identity

The identity of suppliers is important to retailers. Suppliers have to comply with quality standards and it is important to the retailers that the suppliers have a good reputation.

Specifications

All retailers set specifications for their suppliers, e.g. regarding quality (standards and monitoring), penalties in case of non-compliance, packaging, timing of the orders and payment conditions. For other aspects of the transaction, specifications are set during the transaction: quantity to deliver, contract duration and price.

Formalization

Some of the specifications set by retailers for their suppliers are formalized in written contracts, such as quality aspects (standards and monitoring), penalties in case of non-compliance, packaging, timing of the orders and payment conditions. For other aspects of the relationship verbal agreements are made, such as quantity to deliver, contract duration, and price. These aspects are not formalized in written contracts, because it would reduce the flexibility of retailers. Quantity is not formalized in written contracts, because it depends for a large part on external factors such as the weather. The duration of the contract is not defined by the retailer, because it leaves the possibility for retailers to switch suppliers. Prices are determined by the market (Dutch, German and Belgian market) and fluctuate every week. Thus, some aspects of the transaction are formalized in written contracts, while others are not.

Duration of the relationship and terms of notice

Two retailers recently changed suppliers. For retailer C these changes are due to the implementation of 'Milieukeur'. No information is obtained about the motivation for the change of retailer B. Retailer A and D have long term relationships with their supplier. According to retailer D the only changes in the last years is a merger between suppliers. The suppliers of retailer A, B and C deliver to the same stores every week. Therefore, no differences exist between the duration of the relation between suppliers and the retailer and the suppliers and the stores. These differences do exist for retailer D. The list of approved suppliers of retailer D has not changed over the last years, but the stores can change their supplier weekly. Thus, for retailer D the relation between the retailer and the supplier can be defined as moderate/long term, while the relation between suppliers and stores can vary from short to long term. The duration of the relationship between retailers and their suppliers is not defined. As long as the retailer is satisfied with the supplier, the relationship continues. According to supplier G retailers prefer to have long term relationships with their suppliers. The reason is that switching suppliers leads to inconsistencies in quality of meat. Furthermore, it leads to costs because audits need to be performed every time a retailer switches to a new supplier.

Enforcement

Two enforcement mechanisms are identified in the relation between retailers and their suppliers: enforcement by third parties and reputation. The most important types of third party enforcement are: enforcement by certification agencies and enforcement by the KDS/VWA. These parties set standards for quality and organize that these standards are monitored. Court is hardly used as an enforcement mechanism, because other methods are preferred. When a supplier does not deliver according to the quality standards set, retailers and suppliers first discussed how the quality delivered can be improved, audits can be performed at the supplier and finally, the retailer can end the relationship with the supplier. Retailers and their suppliers all mention that reputation plays an important role as enforcement mechanism. According to retailer A 'A good reputation is essential to remain in businesses as most suppliers and retailers know and interact with each other.' Second, retailers have the possibility to switch suppliers, which shows the importance of a good reputation. 'We have an open relationship with suppliers. When I want to change suppliers, I'm free to go tomorrow' (Retailer B).

Financial participation

At the moment of the interviews there was no financial participation between the retailers and their suppliers.

Relative importance of price as coordination mechanism

Price is an important criteria (amongst others) in selecting suppliers. Retailers and suppliers negotiate regularly on the prices for fresh pork meat (weekly or monthly). An interesting difference is found

between the four retailers for the importance of price as coordination mechanism. For retailer A, B and C, price does not influence which supplier delivers to which store. The stores are delivered by the same supplier every week. For retailer D, the prices set by the suppliers do influence which supplier delivers which store. Every week, this retailer makes a list of meat prices set by their suppliers to stimulate price competition. Based on this list, stores choose their supplier weekly. Thus, the coordination by price is more important for retailer D than for retailer A, B and C. This also leads to differences in quantity delivered for the supplier. For suppliers of retailer D the quantity delivered is more variable than for retailer A, B and C. Because coordination by price is more important for retailer D, the governance structure of retailer D is closer to spot market contracts and the governance structure of retailers A, B and C is closer to hierarchy. This is shown in figure 12.

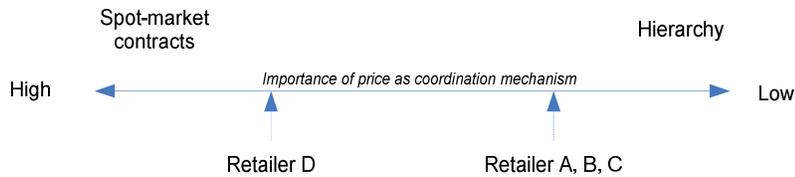


Figure 12: Results for relative importance of price as coordination mechanism

Relative importance of authority as coordination mechanism

The results regarding the importance of authority as coordination mechanism can not be presented based on the interviews.

Summary of the results for governance structures

Based on the characteristics for governance structure, the main governance structure for the four retailers is long term relation with qualified suppliers. Figure 13 shows how the results for governance structure characteristics relate to the six governance structures.

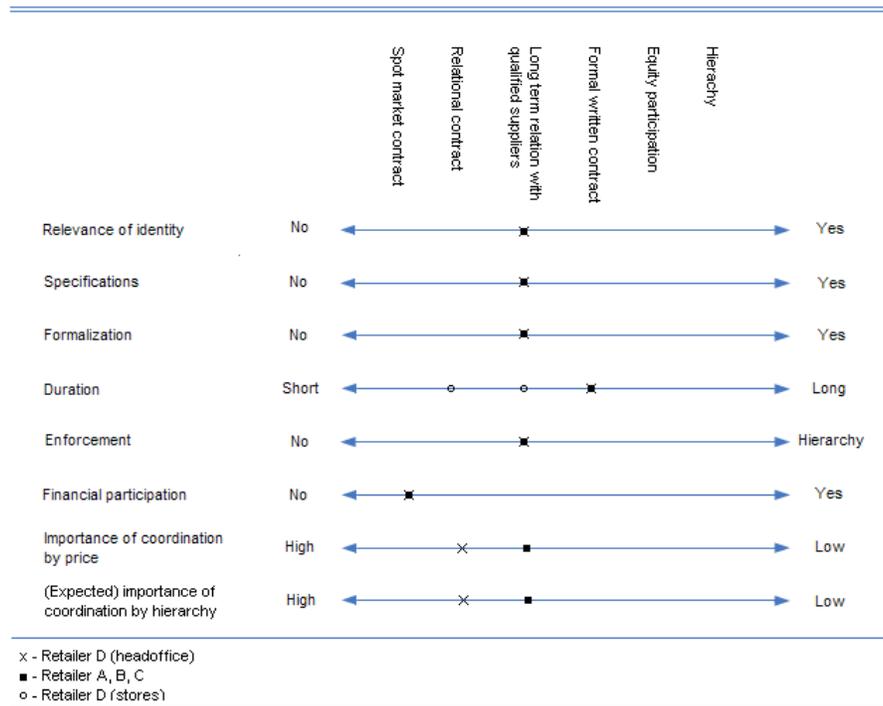


Figure 13: Results governance structure

6.5 Results for the relation between quality assurance and governance structure

Previous sections described the similarities and differences between retailers regarding quality assurance (6.3) and governance structures (6.4). In this section it is explained how the governance structure criteria relate to the three steps in assuring quality (setting standards, signalling quality and monitoring quality). A summary of these results is given in table 22.

Table 22: Relation between governance structure characteristics and quality assurance

	Setting standards	Signalling quality	Monitoring quality
Relevance of identity (reputation)	-	+	+
Specification	+	+	+
Formalization	+	+	+
Duration/frequency	n.a.	+	+
Enforcement	+	-	+
Financial participation	-	-	-
Coordination by authority	n.a.	n.a.	n.a.
Coordination by price	n.a.	-	+

+ relation is found

- no relation is found

n.a. not available

Relevance of identity

As can be seen in table 22 a relation is identified between relevance of identity and signalling quality and between relevance of identity and monitoring quality. The relation between relevance of identity and signalling quality can be explained by reputation. The identity of suppliers is relevant, because reputation is important in selecting suppliers. Reputation is an important signalling strategy. A relation is identified between relevance of identity and monitoring quality because the frequency of monitoring depends on the reputation of the supplier. Because the standards set by retailers do not differ between different suppliers, no relation is found between relevance of identity and standards set.

Specifications

As can be seen in table 22 a relation is found between specifications and setting standards, between specifications and signalling quality and between specifications and monitoring quality. An important specification set by retailers for their suppliers are quality standards. Suppliers can not deliver meat when they do not comply with these quality standards. Warrantees/money back guarantees (signalling strategy) are given by the supplier when the product delivered does not comply with the quality standards set. Finally, the quality standards set form the basis for monitoring quality.

Formalization

As can be seen in table 22 a relation is identified between formalization and setting standards, between formalization and signalling quality and between formalization and monitoring quality. Quality standards are formalized in written documents (handbooks). In these handbooks detailed information is given about the quality standards. Because standards are formalized in written contracts, warrantees can be given when retailers do not comply with the standards set. Based on these formalized quality standards, the quality of meat delivered by the suppliers is monitored.

Duration and terms of notice

A relation is identified between the duration of the relationship and signalling quality and between the duration of the relationship and monitoring quality (table 22). An important signalling strategy is reputation. Reputation has to be built up in time. Therefore, this signalling strategy is more important in moderate to long term relations. As one retailer said, the frequency of monitoring depends on the reputation. Thereby, an indirect relation is identified between the frequency of monitoring and the duration of the relationship. Based on this research no indication is given that standards set by retailers differ depending on the duration of the relationship. However, because short term relations

between retailers and suppliers are not investigated in this research, further research is needed to investigate whether short term relations differ in standards set that moderate/long term relations.

Enforcement

Table 22 shows a relation between enforcement and setting standards, between enforcement and signalling quality and between enforcement and monitoring quality. The relation between enforcement and setting standards exist because quality standards need to be set to be able to enforce the standards. The relation between enforcement and signalling quality can be explained by the signalling strategy reputation. A good reputation is essential to suppliers for staying in business. Therefore, reputation is an important enforcement mechanism. Finally, an important step in enforcing standards is monitoring. In the case studies investigated standards are set and enforced by the government (VWA) and by certification agencies (e.g. IKB, HACCP).

Financial participation

In the case studies financial participation of retailers with their suppliers is not found. In this thesis no indication is given for a relation with quality assurance when no financial participation is identified. Further research should investigate whether differences in financial participation can be related to differences in quality assurance.

Relative importance of authority as coordination mechanism

In the case study no information is obtained about the relationship between the importance of authority as coordination mechanism and quality assurance. Further research is needed to investigate this relationship.

Relative importance of price as coordination mechanism

In the case studies a difference is identified between retailers for the importance of coordination by price. An interesting question is whether differences in importance of price mechanism are related to differences in quality assurance. Based on the results of the case study a relationship can be expected between coordination by price and standards set. Differences exist between retailers in quality standards set. However, because only a few quality standards are investigated, further research is needed to investigate this relationship. Because no differences are identified in strategies to signal quality, the results of this thesis do not give an indication for a relationship between coordination by price and signalling strategies used. Finally, the results suggest a relationship between coordination by price and monitoring strategies. As can be seen in table 23, the retailer for which coordination by price is more important, uses a different monitoring strategy than the other retailers. This retailer monitors the quality of meat by taking samples at the production location of suppliers and performing laboratory tests. For this retailer traceability is less feasible and therefore less important in selecting suppliers than for the other retailers. For retailer A, B and C price is less important as coordination mechanism for the transaction than for retailer D. These retailers do not perform laboratory tests at the production location of the suppliers and traceability is an important criteria in selecting suppliers.

Table 23: Differences in governance structure characteristics and differences in monitoring

	Retailer D	Retailer A, B, C
Importance of coordination by price	Relatively high	Relatively low
Laboratory tests at suppliers	Yes	No
Importance of traceability	Relatively low	Relatively high

The relation between the importance of coordination by price and monitoring strategies can be explained by the number of suppliers. Retailer D has a longer list of (approved) suppliers, for the reason that more suppliers increases price competition between suppliers. In contrast to the other retailers, the suppliers of retailer D face direct competition of the other suppliers. The reason is that stores can switch suppliers weekly. Suppliers have to set competing prices to receive orders from stores. However, with a larger number of suppliers it is more difficult to control the supply chain of the suppliers. This might be the reason that the focus of retailer D is on laboratory control in the end of the supply chain and less on traceability. The other retailers do not perform laboratory tests at the production location of the suppliers. For these retailers the small number of suppliers is chosen because it increases the traceability of meat. The retailers know which companies deliver their

suppliers and suppliers are selected that have short supply chains. The stores of these retailers are delivered by the same supplier week by week. Therefore, price as coordination mechanism is less important in the transaction between suppliers and stores than for retailer D.

Summary

A relationship is identified between quality assurance and the governance structure characteristics: relevance of identity (reputation), specifications, formalization, duration/frequency, enforcement and importance of coordination by price. This means that the way quality is assured in the supply chain is related with the governance structure used. Thereby, it also gives an explanation why hybrid governance structures are more useful in assuring quality of fresh pork meat than spot market contracts or hierarchy. The results of this research suggest a relation between coordination by price and monitoring strategies used. When price becomes more important as coordination mechanism and the number of suppliers increases, the importance of laboratory tests at suppliers increases and the focus on traceability reduces. Because the differences found are for the retailer with the largest market share, the role of the size of the retailer is an interesting factor that needs to be researched. Further research is needed to investigate whether larger retailers differ in monitoring from smaller retailers.

6.6 Relation between positioning strategy and quality assurance

Figure 11 shows the positioning of the four retailers regarding price and quality of fresh pork meat. To answer the second research question, the positioning of the four retailers needs to be related to the results for quality assurance by retailers.

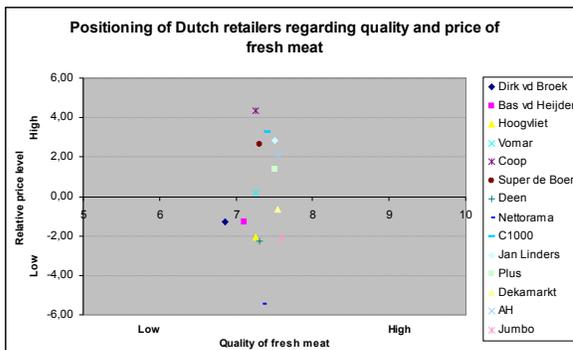


Figure 4: Positioning of Dutch retailers regarding price and quality (own compilation based on www.supers.nl and Deloitte 2007a/2008a)



Figure 11: Positioning of retailers investigated

Some interesting results are identified for the four retailers in general. First, the minimum quality level that can be found in the positioning is supported by this research. As is shown in figure 4 and 11, the lowest score of all retailers on quality of fresh meat is 7.3. The respondents in the case study argue that 'because of the regulations set for quality of fresh meat, nobody can permit themselves to deliver a low quality of fresh meat'. Because strict regulations are set by the government, a relatively high minimum level of fresh meat exists. Second, suppliers stated that little differences exist between Dutch retailers regarding quality standards set. This result can also be seen in the positioning made for the four retailers investigated (figure 11) and for the Dutch retailers in general (figure 4). The reason given is that regulations for quality of fresh meat are quite strict and therefore, the standards set by retailers do not differ much from the regulations. Finally, the results suggest that the positioning of Dutch retailers regarding price does not reflect the prices set by retailer D for fresh pork meat. Price competition between suppliers is stimulated by this retailer in order to lower the prices of fresh pork meat. However, in the positioning made, retailer D is positioned as high priced.

The relationship between the positioning and quality assurance for each retailer can not be identified for several reasons. First, because the four retailers selected do not differ much on the quality of fresh pork meat (see figure 11), it is not possible to categorize retailers as high or low on quality of fresh pork meat. Therefore, it is not possible to identify differences in quality assurance between two groups.

Second, no data is available that compares the quality of fresh pork meat of Dutch retailers. The data used to position Dutch retailers is based on the quality of meat in general, which does not have to reflect the quality of fresh pork meat. When no information is obtained about the quality of fresh pork meat, it is not possible to determine what quality differences exist and by what differences in quality assurance they can be explained. For these reasons, it is not possible to identify the relation between positioning and quality assurance for each retailer. More research is needed in which the quality of fresh pork meat of Dutch retailers is researched. Because differences between Dutch retailers appear to be small, this research suggests to compare retailers from different countries.

Summary

Some interesting results have been found, when relating the results of this study to the positioning made. The positioning made supports the finding that a (high) minimum level exists for quality and that little difference exists between retailers regarding the quality of fresh pork meat. Furthermore, the results also suggest that the positioning regarding price is not supported by this research for retailer D. Based on this research, the relation between quality assurance and the positioning of the individual Dutch retailer can not be analyzed because of lack of relevant information. Further research is needed to position Dutch retailers regarding quality and price of fresh pork meat.

7 Conclusion and discussion

This chapter consists of two sections. In the conclusion (section 7.1) the sub questions are presented and the answers to the research questions are given. In the discussion (section 7.2) the value of this thesis is explained, and the limitations of this thesis and suggestions for further research are given.

7.1 Conclusion

Positioning of Dutch retailers

The first sub question is 'What is the positioning strategy of different Dutch retailers for fresh pork meat regarding quality and price?' Because of a lack of information about the quality and price for fresh pork meat, the positioning made is based on quality perceptions of consumers of fresh meat in general and on the general price level of retailers. Figure 4 shows the positioning of Dutch retailers regarding price and quality.

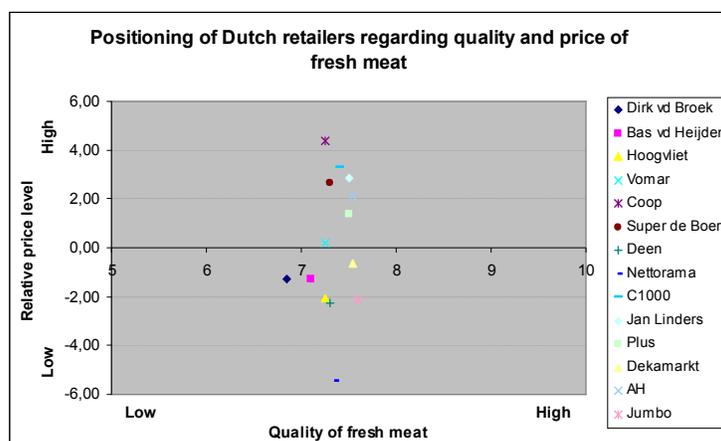


Figure 4: Positioning of Dutch retailers regarding price and quality (own compilation based on www.supers.nl and Deloitte 2007a/2008a)

Quality assurance

The second sub question is 'What similarities and differences can be identified regarding quality assurance in the relation between retailers and their suppliers in the selected Dutch fresh pork meat chains?' This question is answered by focussing on three steps in assuring quality; setting standards, signalling quality and monitoring quality.

The most important standards for quality are PH, fat content, micro-bacteria and shelf life. Furthermore, the quality assurance systems play an important role. Other standards mentioned in the interviews are: temperature, colour and packaging. Differences between retailers are identified regarding standards set for fat content, temperature and for quality assurance systems. For fat content, different systems are used in ordering meat. Most retailers stated to use the SEUROP system, while suppliers and retailer B stated they use fat percentage categories. Besides differences in the categorizations used in ordering fresh pork meat, differences are also identified for the standards set for fat categories. For temperature, several retailers set standards higher than legal the minimum (maximum of 4 degrees) while others do not (maximum of 7 degrees). Finally, the suppliers of retailer C have to comply with 'Milieukeur'.

For the second step in assuring quality, signalling quality, only similarities between suppliers are identified. Strategies used by suppliers to signal quality are reputation and branding, quality assurance systems and certifications, and warranties and money back guarantees.

All retailers perform visual delivery inspection in the stores, which is more extensive when products are not pre-packed. The four retailers only request test results of suppliers in case of complaints from stores or consumers. Retailers control the certification of suppliers, but do not inspect the audit report

or hire a bureau to analyse the results. All retailers perform their own informal audits several times a year, which implies visiting the production location and inspecting test results. Retailer D is the only retailer which performs unannounced visits. Another difference between the four retailers is found for sampling and laboratory testing. Only retailer D hires an independent laboratory to take samples at the production location of suppliers and to analyse these samples. Finally, differences between retailers are identified for the importance of traceability. For retailer A, B and C traceability plays an important role in the selection of suppliers and a less important role for retailer D. The differences in monitoring strategies might be related to each other. When retailers do not perform laboratory tests at suppliers, less information is obtained about the quality delivered by suppliers and traceability becomes a more important issue.

Governance structure

The third sub question is ‘what governance structures can be identified between suppliers and retailers in the selected Dutch fresh pork meat chains?’ The governance structure of all four retailers can be described as ‘long term relation with qualified suppliers’. This can be explained by the characteristics of the governance structure: relevance of identity, specifications, formalization, duration, enforcement, financial participation and the importance of price as coordination mechanism. For all retailers the identity of the supplier (reputation) matters as it plays an important role in selecting suppliers; all retailers set specifications for suppliers (i.e. on quality standards); quality standards are highly formalized into written contracts by all retailers, while other standards are not (e.g. quantity to deliver); the duration of the relationship and terms of notice are not defined; the main enforcement mechanisms identified are reputation and third party enforcement (by certification agencies or the government); there is no financial participation between the retailers and its suppliers; and price is an important coordination mechanism for all retailers. Differences between the four retailers are identified for the governance structure criteria importance of coordination by price and duration of the relationship. For retailer D price determines which supplier delivers meat to which store. The stores of the other retailers are always delivered by the same supplier, independent of the prices. This leads to differences in the duration of the relationship between suppliers and the stores. For retailer D, the relation between stores and suppliers varies from short term to long term, while for the other retailers the relation between the stores and suppliers varies from moderate to long term.

Relation between quality assurance and governance structures

Based on the answers of sub question two and three, an answer can be given to the first research question: ‘What is the relation between governance structure and quality assurance between retailers and their suppliers in different Dutch fresh pork meat chains?’ Table 22 shows the relation between the eight governance structure characteristics and the three steps in quality assurance.

Table 22: The relation between governance structure characteristics and quality assurance

	Setting standards	Signalling quality	Monitoring quality
Relevance of identity (reputation)	-	+	+
Specifications	+	+	+
Formalization	+	+	+
Duration/frequency	n.a.	+	+
Enforcement	+	-	+
Financial participation	-	-	-
Coordination by authority	n.a.	n.a.	n.a.
Coordination by price	n.a.	-	+

+ relation is found
 - no relation is found
 N.a. not available

The results of this thesis suggest a relation between the importance of price as coordination mechanism and monitoring strategies. When prices are set by the market, more suppliers are needed to create direct price competition. When the number of suppliers increases, traceability becomes less

feasible. Therefore, traceability becomes less important in selecting suppliers and laboratory tests at suppliers become more important.

Relation between positioning strategy and quality assurance

The fourth sub question is 'How are similarities and differences in quality assurance of the retailers related to the positioning strategy of Dutch retailers?' The relation between quality assurance and the positioning of the individual Dutch retailer can not be investigated based on this research because of lack of relevant information. However, the positioning made supports the finding that little difference exists regarding the quality of fresh pork meat between retailers and that a (high) minimum level exists for quality. Furthermore, the results do not support the positioning made for retailer D regarding price. Based on the results of this thesis the second research question can not be answered. Further research is suggested on the positioning of Dutch retailers regarding quality and price of fresh pork meat.

7.2 Discussion

Value of the research

This thesis gives valuable information about quality assurance in the Dutch fresh pork meat chain. Information is obtained about what standards are set by retailers and how these standards are communicated by retailers. Furthermore, information is obtained about the role of the government in setting standards by Dutch retailers. Also differences in standards set between Dutch retailers and retailers in other countries are briefly described. Moreover, insight is given in how slaughterhouses and processors signal the quality of fresh pork meat and what actions are taken by retailers to monitor the quality of fresh meat. This research shows what governance structures exist between retailers and their suppliers to coordinate the transaction of fresh pork meat. Finally, this research gives an overview of the existing information about the positioning of Dutch retailers on fresh pork meat regarding price and quality. The results are of interest for suppliers of fresh meat, because information is given about what quality standards are the most important for retailers, how retailers control the quality of fresh meat and why certain governance structures exist. Furthermore, the results of this thesis are of interest for indirect suppliers because they do not have information about standards set by retailers. For consumers this study shows the effort of the government, suppliers and retailers to assure quality. This might create a higher level of trust and confidence.

Limitations

Food quality is a complex issue. Many different quality aspects can be identified as can be seen in the operationalisation made (section 3.1). Some of these quality standards are very complex, like quality standards set for micro-organisms. Different types of micro-organisms exist (e.g. Salmonella) and within these categories different types exist (e.g. over 200 types of Salmonella exist). Quality standards can vary between fresh pork meat products (for example minced meat and bacon), and within a certain pork meat product (e.g. minced meat and lean minced meat). Therefore, the focus in this research is on the most important quality aspects. The consequence of this decision is that no complete picture of quality assurance can be given in this research.

As mentioned in section 3.1, this research only focuses on the managerial aspects of quality assurance as the research is performed for the chair group management studies. Therefore, quality itself is not studied, but the quality assurance is studied by comparing the standards with governmental standards (in the interviews with retailers and suppliers) and between retailers (in the interviews with suppliers). In literature no information is found regarding the quality of fresh pork meat for the Dutch retailers. Therefore, not much information can be given about the relation between quality and quality assurance in this research. Further research is needed to determine the quality of fresh pork meat of the four retailers.

The process characteristics are researched in relation to quality assurance systems. Therefore, limited information is obtained about the importance of the different process characteristics for retailers.

In the case studies only four retailers and four suppliers are investigated, which together have a market share of 45.9% (Deloitte, 2008b). Because not all Dutch retailers are investigated, the results of this research might not be valid for other Dutch retailers. Further research in which more Dutch retailers are investigated is therefore useful.

Further research

Several suggestions for further research can be given based in this study.

First, research is needed to investigate the positioning of Dutch retailers on quality of fresh pork meat and price level of fresh pork meat. It is a difficult topic because quality can be studied based on different points of view (e.g. consumer perception of quality or technological quality). The price of fresh pork meat of Dutch retailers is also difficult to investigate because of differences in quality of fresh pork meat. At this moment there is no research that compares the quality of fresh pork meat between the Dutch retailers. Therefore, this research suggests to select the most important quality aspects to investigate the positioning of Dutch retailers regarding the quality of fresh pork meat. The selected quality aspects can be discussed with an expert to verify and discuss the selection. When a positioning of Dutch retailers is made regarding quality, differences in positioning on quality can be related to differences in quality assurance. An interesting question in investigating this relationship is, for example, whether a higher quality level of fresh pork meat is caused by higher standards set or by a different type of monitoring quality.

Second, further research needs to investigate the role of authority as coordination mechanism in the relationship between retailers and their suppliers in the Dutch fresh pork meat chain.

Third, further research needs to investigate the importance of process characteristics for retailers to gain insight in the motivation to adopt a certain quality assurance system.

Fourth, based on this research it can be said that a relation might exist between the size of the retailer and monitoring strategies and between the number of suppliers and monitoring strategies. Because only four retailers are investigated, further research is needed to investigate this relationship.

Finally, in the case studies information is obtained about differences between standards set for quality in different countries. One of the respondents said that quality assurance for fresh pork meat does not differ much between Dutch retailers, but differences do exist between different countries. According to this respondent, Scandinavian countries and England set higher standards (e.g. regarding animal welfare) than countries in the south of Europe (like Spain). Therefore, differences between countries regarding standards set for quality are an interesting area for further research.

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Abbreviations

BRC	- British Retail Consortium
GFSI	- Global Food Safety Initiative
HACCP	- Hazard Analysis Critical Control Point)
IFS	- international food standard
IKB	- Integrale Keten Beheersing
ISO	- International Standard Organization

- KDS - Kwaliteitskeuring Dierlijke Sector
- PDO - Protected Designation of Origin
- PVE - Product boards for Livestock, Meat and Eggs
- SQF - Safe Quality Food
- VWA - Food and Foodstuffs Authority (In Dutch: Voedsel- en Warenautoriteit)

Appendices

Appendix 1: Supporting elements of the pork meat chain

Several supporting elements of the supply chain can be identified. These are the feed industry, hardware providers, veterinarians, and traders and distributors.

Feed companies are an important supporting element of the pork meat chain because they provide the feed for the pigs. Besides the supply of feed these companies also give advice to companies. Furthermore, they are often brokers for the so-called pig-rights. The number of pigs is limited to a fixed maximum in the Netherlands. If firms want to extend, they need to buy these pig rights of farmers that sell their business (Wognum *et al.*, 2007). Wognum *et al.* (2007) also mention an integrative role for feed companies between farmers and slaughterhouses, although they recognize that this is still limited. In 2006, the largest 10 feed companies controlled about two third of the market (Wognum *et al.*, 2007). Hardware providers are also involved in the pork meat chain, because they sell the housing equipment and technology which is important for the pig production. Examples of these technologies are food dispensers and spraying equipment.

Veterinarians have an important influence in the chain because they take care of pig health. They also perform quality audits and give advice to farmers. Some breeding companies support the pork chain by genetic improvements and cultivation of pig species. By doing research the pork production can be improved and optimized.

Transporters are needed between the different links in the chain to transport live cattle (between primary producers and slaughterhouses) and chilled meat products (between slaughterhouses and processors and between processors and retailers). Trucks may be owned or be provided by transport companies. In the transport sector, many independent truck owners are active with only a small number of large companies (Wognum *et al.*, 2007).

Furthermore, traders, dealers, and distributors play an important role in the chain. Traders combine supply and demand in the chains. Dealers because they offer products (for example feed and fertilizers) and services (like advise and credit). The distributors are the link between processors and large customers in the chain, because they combine advanced order systems with dedicated storage and transport (Wognum *et al.*, 2007). An example of a distributor in the case of meat is Distrifresh, which is a part of VION Food Group.

Appendix 2: Other stakeholders of the pork meat chain

As can be seen in figure 3 there are several other parties in the environment of the supply chain that have influence on organisation and operation of the pork meat chain. These stakeholders are: the government, technology developers, branch organizations, financial institutes, research institutes and social pressure groups (Wognum *et al.*, 2007).

The first stakeholder mentioned is the government. The government influence the supply chain by imposing rules and regulations to safeguard pork safety. Examples of these rules and regulations for animal welfare, hygiene and traceability. In the Dutch pork chain this is the ministry of Agriculture, nature and food quality. The second group of stakeholder identified are technology developers, who influence the supply chain by providing new housing concepts, technology for reducing emissions or improving animal welfare. Branch organizations is a group of stakeholders that develop policies and act as agents for parts of the chain or for the whole chain. Examples of branch organisations in the Netherlands are PVE (platform for employers and employee organizations), ZLTO (farmers), CBL (food sector, especially supermarkets), Consumentenbond (consumers). The fourth stakeholder group, financial institutes, support investments by providing loans to actors in the supply chain. Research institutes and universities are important because of the research to improve production and chain organization. An example of an research institute in the pork meat sector in the Netherlands is Wageningen University. The last stakeholder group identified are social pressure groups. These social pressure groups influence the pork meat chain by influencing the speed of developing solutions to achieve animal welfare and food and environmental safety. An example of a Dutch national pressure group is 'Milieudefensie' (Wognum *et al.*, 2007).

An overview of trends in the pork meat sector is given in Appendix 3. As mentioned before, the focus of this research is on the retailer and its supplier. Thus, the other links in the fresh pork meat chain, the supporting elements and other stakeholders are left out of scope in this research. In Appendix 4 background information can be found about fresh pork meat consumption in the Netherlands and the role of supermarkets in selling pork meat.

Appendix 3: Trends in the pork meat sector

Different trends in the pork meat supply chain can be identified. These trends will now be described.

Farmers

- The amount of pigs in the Netherlands is decreasing. In 1990 there were 13.915 pigs, while in 2006 there were 11.356 pigs. The reason for this trend is the pig-rights, which are discussed earlier.
- A trend of upscaling can be seen at the farm level. The farms increased in size, but the number of farms reduced (LEI, 2007).
- Specialization in farrowing and finishing

Slaughterhouses

- The amount of slaughters is reducing. In 1990 there were 19.942 slaughters, while in 2006 there were only 14.027 (LEI, 2007).
- The number of slaughterhouses is decreasing while the average size (or the amount of pork slaughtered) of the slaughterhouses is increased (LEI, 2007).
- This trend for concentration can also be seen for the Dutch slaughterhouses. Since 1990 mergers, take-overs and alliances occurred in the sector, which lead to a reduction of the number of slaughterhouses (Lindgreen *et al.*, 2005).
- Another trend that can be seen is the more intensive competition between slaughterhouses. Because of the pig rights, producers deliver fewer pigs, while slaughterhouses have increased their capacities (Lindgreen *et al.*, 2005).

Retailers

- There is a decrease in the amount of stores in the Netherlands, due to the disappearance of smaller retailers (Hemmes, 2008). In 2004 there were 1564 stores with an average selling floor smaller than 400 m², while this amount is 1449 in 2006. It is expected to reduce to 1363 in 2007 and 1000 in 2015 (Deloitte, 2007b). The average size selling floor is increasing.
- Another important trend in the retail sector in the Netherlands is the price war between retailers. In 2003 Albert Heijn started the price war by lowering prices for 1000 premium brands. The goal of the price war is to win back customers, create customer loyalty, increase market share and to improve the perception of the consumers about the price level of the retailer (GFK jaargids, 2006).
- According to Hemmes (2008) there will be a decrease in the amount of formulas in the future. The existing formulas will continue to reposition themselves and there will be an increase in the focus on freshness and low prices.
- More meat is sold by retailers and the amount of butchers has decreased (Hoste *et al.*, 2004). This is partly because retailers have started to offer pork meat at discount rates (Wognum *et al.*, 2007)
- Consolidation has also taken place in the retail channel, which has led to a stronger position of the retailer in the chain (Taylor, 2006; Dolan and Humphrey, 2000). According to Wognum *et al.* (2007) this consolidation is a consequence of (1) globalisation, and (2) desire for necessity of retailers to occupy a stronger position with respect to suppliers and customers.

Consumers

- There is a greater concern for food safety and animal welfare by consumers (Lindgreen *et al.*, 2005). In the pork meat sector, this is shown by the (media) attention for problems in the pig sector.
- Consumer behaviour has changed (Wognum *et al.*, 2007):
 - o The demands of the consumer have become more diverse. Different markets require different types of products.
 - o The contribution of convenience products has increased

Finally, there are some trends identified by Wognum *et al.* (2007) that apply to more than one actor in the chain:

- An increase in production control can be seen (for example in the area of example hygiene and animal disease) which has lead to higher productivity within limits set by environmental

requirements. By reducing the change on production damage and diseases, damage to sector image is reduced as well. This control is needed because damages has increased by intensified production.

- Production costs have increased due increased environmental costs. Furthermore, production costs in the Netherlands are higher than abroad.
- Professionalism in the chain has increased due to quality requirements like IKB.
- Genetic improvements have led to healthier and more efficient animals.

Appendix 4: Pork meat consumption and the role of retailers in selling pork meat.

The report of Hoofd Bedrijfschap Detailhandel (2007), show that in 2006 21,8 milliard euro is spend on food. The market share of retailers has increased in comparison to specialty stores. The major player in the food sector is the retailer. 78% of the food is sold by retailers, which is 16,9 milliard euro (HBD, 2007). The research shows the expenditures of consumers for different food categories. Meat is the most important, followed by drinks and dairy. The expenditures for meat in the supermarkets in 2006 in the Netherlands is 4,0 milliard euro. This is 550 per household and 240 euro per person (HBD, 2007). Thus, meat is an important product category for retailers.

About 6% of the total food consumption consists of pork meat (De Groof and Kuijpers, 2005 in Wever *et al.*, 2008). In 2006, 690.000 tons of pork meat was sold. Of all types of meat, pork is sold the most. As can be seen in figure 14 pork meat accounts for 26% of the meat assortment of the retailer (PVE, 2003). A major player in the food sector is the retailer. 78% of the food is sold by retailers, which is equal to 16,9 milliard euro (HBD, 2007). Retailers are also an important channel for the sales of pork meat. The yearly consumption of pork meat is 42,4 kg per head (PVE, 2004) of which 20 kg is sold by the retailers. Figure 15 shows the shares of the channels that sell pork meat. Because most of the meat is sold by retailers, the focus of this research is on the retailers.

Meat has the largest share in the consumer expenditures on food in the supermarkets. It serves as a trigger for consumers to come to the store and once in the store also other products are bought. Of all types of meat, pork is sold the most. As can be seen in figure 14 pork meat accounts for 26% of the meat assortment of the supermarket (PVE, 2003). Most of the meat is sold by retailers, as can be seen in figure 15.

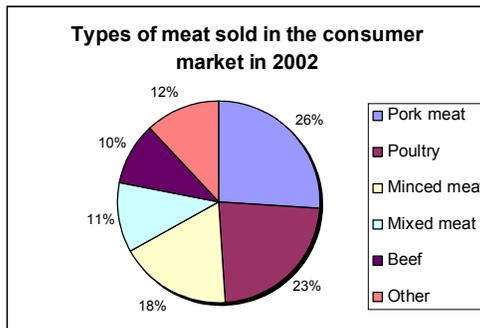


Figure 14: Type of meat sold
(Source: PVE, 2003)

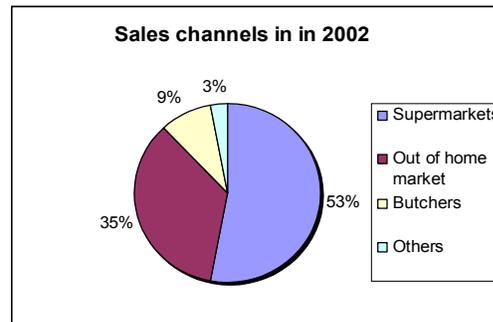


Figure 15: Sales channels
(Source: PVE, 2003)

Appendix 5: Regulations by third parties

Hazard analysis and critical control points (HACCP)

HACCP is a systematic approach to the identification; evaluation and control of those steps in food manufacturing that are critical to product safety. HACCP identifies risks in the production processes that can lead to unsafe products, and designs measurements to reduce these risks to acceptable levels. It is a tool to assess hazards and establish control systems that focus on prevention rather than relying mainly on end-product testing. The HACCP system consists of seven steps to identify food safety hazards (chemical and biological). These steps are shown in figure 16.

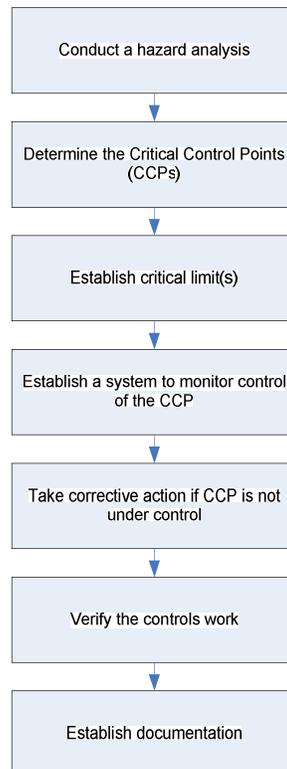


Figure 16: Seven principals of HACCP
(source: www.fao.org)

Currently HACCP principles are the basis of most food quality and safety assurance systems (Codex Alimentarius, EU and US Food legislation, most private standards). HACCP is basically designed for application in all links of the food chain, ranging from growing, harvesting, processing, distribution and retail to preparing food consumption. HACCP is obliged for slaughterers, meat processors and retailers (Trienekens and Zuurbier, 2008). For the slaughterhouses a hygiene code and HACCP workbook is defined by the PDV (Production Board Animal Feed). Which is focussed on personal hygiene, cleaning and disinfection, tools and equipment, support and maintenance, slaughter actions, carcass control, bacteriological blood control, control of by-products of slaughtering, bug fighting, water usage, and environmental impact (Wever and Wognum, 2008). The KDS (Kwaliteitskeuring Dierlijke Sector) inspects and controls the compliance to the hygiene requirements. For retail the hygiene code is defined by CBL (Centraal bureau voor Levensmiddelen).

Meat inspection law

The meat inspection law (in Dutch: Vleeskeuringswet) is aimed at to barring out meat and meat products that put public health at risk (Wever and Wognum, 2008). The control of the compliance to this law is the responsibility of the VWA (Food and Foodstuffs Authority) According to this law, the animals have to be checked before slaughtering and after the slaughter process the meat has to be checked.

Destruction law

The destruction law contains rules for disposal and processing of animal waste unsuited for human consumption (Wever and Wognum, 2008). Examples are slaughter waste. In some cases this material can be harmful for public health or spread diseases. The destruction law regulates the treatment of this disposal depending on the risk level.

VKI regulation

In January 2008 the food chain information (VKI) regulation is introduced. According to this regulation slaughterhouses have to collect information about the feed given to the pig to be slaughtered. The farmers need to supply the information to the slaughterhouse 24 hours in advance. This makes it possible for the slaughterhouses to make decisions at slaughtering with respect to measures to assure food safety. The information should be available in IKB databases to reduce delaying paperwork (Wever and Wognum, 2008).

Foodstuffs law

The Foodstuffs law is aimed at safeguarding adequate foodstuffs and other consumer products. Adequate in this context means that products should not jeopardise consumer health and safety (Wever and Wognum, 2008). The Foodstuffs law focuses on different parts in the supply chain: raw materials, food production, food preparation, packaging and selling points. In order to keep the law actual decisions and rules need to be added continuously. The ROW (Regulier Overleg Warenwet) gives advice to the government about changes in the law. The ROW is a discussion platform, consisting of representatives of different parties: the foodstuff industry, trade and consumers (Wever and Wognum, 2008). Food companies are forced by the Foodstuffs law to apply a control system, which can be done by the use of HACCP. The hygiene codes gives specification of HACCP for different industry sectors (Wever and Wognum, 2008). Examples of the Foodstuffs law are requirements for packaging to prevent contamination of the food because of the packaging, measurement and registration of coolers and heating equipment and control and registration of delivered meat or meat products. The Foodstuffs law also set standards for the labels on the package of meat. These labels should consist of the following information: the name of the product, the name of the producer, the ingredients in case of multiple ingredients, the sell-by date, and instructions for preservation and preparation if necessary, country of origin if the product does not originate from the Netherlands. This is controlled by the KvW (Keuringsdienst van Waren).

Appendix 6: Quality assurance systems

ISO (International Standard Organization)

ISO standards are international standards in order to achieve uniformity and to prevent technical barriers to trade throughout the world (Trienekens and Zuurbier, 2008). The standards are applicable to all types of companies and have gained global acceptance (Reid and Sanders, 2005). The essence of an ISO-series is that all activities and handling must be established in procedures, which must be followed by ensuring clear assignment of responsibilities and authorities. It includes typical elements of quality management such as inspection tasks and responsibilities and also pays attention to economic aspects of quality assurances (Trienekens and Zuurbier, 2008). To receive ISO certification, a company must provide extensive documentation of its quality processes. This includes methods used to monitor quality, methods and frequency of worker training, job descriptions, inspection programs, and statistical process-control tools used (Reid and Sanders, 2005). Whilst HACCP pay attention to both technological and management issues, ISO focuses on management. Most used of all ISO standards is the ISO 9000 series for quality. In the pork meat sector ISO 9001 and ISO 9004 are used the most (Kalathas, 2007). ISO 9001 is the standard that provides a set of standardized requirements for a quality assurance system (www.iso.org). The standard covers a wide range of topics, including top management commitment to quality, customer focus, adequacy of resources, employee competence, process management (for production, service delivery and relevant administrative and support processes), quality planning, product design, review of incoming orders, purchasing, monitoring and measurement of processes and products, calibration of measuring equipment, processes to resolve customer complaints, corrective/preventive actions and a requirement to drive continual improvement of the QMS (www.iso.org). ISO 9004 contains guidelines for process improvements. ISO 9004 is not a standard for certification, but can be used as guideline. The ISO-series are widely used in the Dutch pork sector.

IKB (Integrale Ketten Beheersing)

IKB is an initiative of Productschap Vee, Vlees en Eieren (PVE), which is focused on the Netherlands. The regulation has been formulated in a collaborative effort of cattle farmers, feed suppliers, veterinarians, and the processing industry. It is a sector based quality assurance that covers more than 95% of slaughtered pigs in the Netherlands, although it is not obligatory. Goal of IKB is to regulate the processing conditions for all food chain elements to support and guarantee cattle and meat quality. The slaughterhouse plays a central role in creating an IKB production chain for the primary production (Wever and Wognum, 2008). The IKB system sets out standards for product safety, traceability, hygiene, animal health and welfare, but not on the environment. Requirements are set for different links in the chain. Independent bodies control the compliance to the IKB standards. The IKB standard can be considered as an instrument for providing the necessary vertical collaboration between different parties in the supply chain. The IKB system uses guidelines of the quality assurance systems GMP and HACCP. Most Dutch retailers sell pork meat products that are produced according to the IKB requirements.

EuroGAP/GlobalGap

Eurep is an organization of more than 20 large European retailers and purchase organizations (E.g. Ahold, Tesco). GAP stands for Good Agricultural Practice. It is a package of norms aiming to guarantee environment-friendly, safe and high-quality products. EurepGAP pays major attention to food safety, human resource management, animal welfare, and environmental measurements and aims at primary producers. The EurepGAP certificate is developed to make business processes transparent (Trienekens and Zuurbier, 2008; Ordóñez *et al.*, 2006). The norms of the EurepGAP retailers are more rigid than (EU) governmental demands. A disadvantage of EurepGAP is that it takes the legislation of the country where it is implemented as a starting point and there is still not uniform certification scheme. This explains why EurepGAP implementations can differ from country to country. GlobalGAP is the successor of EurepGAP (Wever and Wognum, 2008). GlobalGAP applies mainly to the primary production sector and uses guidelines of HACCP and ISO as guidelines for certification. EuroGAP is also demanded by Dutch retailers for pork meat.

BRC (British Retail Consortium)

The British Retail Consortium (BRC) is an initiative of large British retailers, such as Tesco and Sainsbury. The British Retail consortium has taken the initiative to define common criteria for the inspection of suppliers of food products, called the BRC-Food standard. The inspections are carried

out by certified inspection organizations. Before the BRC-Food standard was introduced retailers carried out inspections separately; joint inspections, however, reduce costs. Thus suppliers have now the same standards from different customers and reduce the different audits. The BRC-Food standard is now compulsory for suppliers of many of the large retailers in Europe (Trienekens and Zuurbier, 2008). In 2001 Dutch retailers decided to translate the BRC standard, known as the CBL-BRC code, in order to have a common standard for retailer own-branded food products (Havinga, 2006). The advantage for the retailer of this standard is that not every retailer has to formulate its own standards, convince suppliers to comply and monitor compliance at suppliers' sites. Furthermore, it maximizes the pressure on suppliers to comply with this standard, leaving retailers the choice of many certified suppliers. The norms of the British Retail Consortium are converging with HACCP norms, although more attention is paid to issues like factory environment and facilities. In this standard, important elements of ISO 9000 for quality management and food safety are included (Trienekens and Zuurbier, 2008). Besides the HACCP plan it includes requirements for management and supply of information.

Appendix 7: Topics researched in the interviews

1. Background information about the background of the respondent

Goal: to get to know the respondent, find out what information can be asked and what information is the responsibility of other persons

- Responsibilities and tasks
- Time working in the organization
- Time working in this position

2. Background information about the supply chain

Goal: A description of supply chain and the information flows between links and within the organization

Interview with retailers:

- Number of suppliers
- Type of suppliers (e.g. processors, slaughterhouses/processors)
- Type of meat ordered (e.g. pre-packed or bulk products)
- Origin of the meat
- Communication lines in the chain
- Differences in ordering and quality assurance between stores

Interview with suppliers:

- Number of retailers delivered
- Type of meat delivered
- Communication lines in the chain
- Differences in ordering and quality assurance between stores

3. Governance structures

Goal: To find out what governance structures exist between the retailer and the supplier

To determine the governance structure:

- Relevance of identity
- Do retailers set specifications for suppliers? On what aspects?
- Formalization: What aspects are formalized in written contracts?
 - The duration of relationship between suppliers and retailers
 - The term of notice
 - Quantity delivered
 - Timing of delivery
 - Price or price determining mechanism (fixed, variable, what market)
 - Penalties in case of non compliance
 - Quality standards
 - Quality control (when, how, who is responsible, who pays)
- The duration of the relationship
- The terms of notice
- Frequency of the transaction (repeated transactions, duration)
- What mechanisms exist to enforce compliance with standards set?
- Is there financial participation of retailer in the supplier?
- How is the transaction coordinated:
 - How does price coordinate the transaction? Do price differences influence the demand for fresh pork meat of retailers?

4. Quality assurance

4.1 Setting standards for quality

Goal: To find out what quality standards are the most important for retailers and how these standards are set

- Discussion of the categorization of quality made
- What are the most important quality standards for retailers?
- How are governmental regulations for quality used in setting standards for suppliers? (minimum requirements of the government or stricter standards?)
- How are quality standards communicated to suppliers?

4.2 Signalling quality

Goal: To find out what signalling strategies are used by suppliers to communicate the quality level to retailers.

How is quality signaled to retailers by suppliers?

- Test results
 - Who performed the tests? (Suppliers, KDS, independent laboratory, others)
 - How often/when are the tests shared with retailers?
 - What test results are shared with retailers?
- Audits and certifications
 - Who performed the tests? (Suppliers, KDS, independent laboratory, others)
 - How often/when are the tests shared with retailers?
 - What test results are shared with retailers? (certificate or audit report)
- Branding of the product
 - What information is shared with retailers by the brand?
- Warrantees
 - In what cases are warrantees given to retailers?
 - Why are warrantees given to retailers?
- Reputation of the supplier

4.3 Monitoring quality

Goal: To find out how retailers monitor the quality of fresh pork meat delivered by suppliers

Quality standards regarding the product:

- How are the standards controlled?
- At what stage in the chain are these standards controlled?
- Who controls the quality of fresh pork meat?
- How often is the quality of fresh pork meat controlled?
- On what aspects is the quality of meat controlled?
- What is done with the results of the tests?
- What happens in case of non-compliance?

Quality standards regarding the process:

- How are the standards controlled?
- On what aspects is the process controlled?
- Who controls the standards set for the process?
- How often is the process controlled?
- What is done with the results of the tests?
- What happens in case of non-compliance?

Appendix 8: Quality determination of the Dutch Slaughterhouses

The classification system of the Dutch slaughterhouse is based on the type of animal, the muscularity and the percentage meat and fat.

SEUROP standard

In the Dutch meat sector the classification of meat is governed by strict rules. The classification system is based on and complies with the European SEUROP standards. In order to determine the degree of conformation, the carcasses are grouped into 15 different classes. These classes form the basis for the classification into the SEUROP classes. The SEUROP quality classification system is the basis for payments of the farmers.

Table 24: SEUROP classification

	Confirmation (proportion of meat)	Class
S	superior	
E	Excellent	1 - 3
U	Very good	4 - 6
R	Good	7 - 9
O	Moderate	10 - 12
P	Poor	13 - 15

Thanks to the SEUROP classification buyers can tell what type and quality of carcass they can expect.

Type of pig

In the Netherlands, a second quality measurement is used: the type of pig. Based on the shape and the circumference of the ham, rib, shoulder and belly, the pig is categorized in one of the four classifications:

Table 25: Classification for the type of pig

AA	Excellent muscularity
A	Good muscularity
B	Mediocre muscularity
C	Poor muscularity

The quality classification in the Netherlands is indicated by a combination of meat percentage and type.