

Arrangements in the Dutch ware potato chain

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Preface

This report is an end product of the MSc thesis of Juliën Jeurissen, MST student of Wageningen University. The aim of an MSc thesis is to independently conduct and clearly describe a management research project. Important elements of such research are to study existing literature, develop a well-defined research objective, choose an appropriate research methodology, gather and process the necessary data and after careful analyses, formulate conclusions and possibly recommendations. This MSc thesis has been set up and executed by Juliën Jeurissen, it is not in command of the University or a commissioner. First of all I would like to thank my supervisor Dr. Jacques Trienekens and my second supervisor Dr. Jos Bijman who helped me in making the right decisions to reach a good final result. Also I want to thank the experts, processors and growers that I interviewed and the growers that responded to the questionnaire, for their time and their support to my research. Without their willingness to share their experiences and preferences this research would not have been possible.

This report (product) is produced by a student of Wageningen University as part of his MSc-programme.

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Executive summary

Two actors in the supply chain experience problems in trade of potatoes; the potato growers and potato processors. The problem for the processors is that they experience an increasing difficulty to collect sufficient quantities of potatoes to keep their processing plants at maximum capacity. The processors have very high fixed costs. A less than optimal supply of potatoes can cost them a lot of money (Rademakers & McKnight, 1998). Because of fluctuating prices a sufficient income in growing of potatoes stays uncertain for the growers. Most contracts that are used, last just for one year and this makes it difficult to do large investments that need to be earned back in five, ten or even more years.

The objective of the research is to make recommendations for potato growers and processors in order to build more sustainable business relationships between the growers and processors. To get insight in these viewpoints and recommendations, the following main research question needed to be answered: *What arrangements are needed among potato growers and processors in the Dutch ware potato chain to build more sustainable business, and which factors determine the feasibility of the different possible arrangements?* To answer this main research question, several specific research questions needed to be answered.

These five specific research questions are:

1. What are characteristics of vertical relationships in the Dutch ware potato chain?
2. What actors are involved in the Dutch ware potato chain and what are their activities?
3. What are characteristics of horizontal relationships in the Dutch ware potato chain?
4. What barriers and opportunities exist for the establishment of vertical relationships among potato growers and processors?
5. What are the wishes of potato growers and processors in arrangements?

The final result is based on a literature study, interviews with three growers and the four biggest processors in the Netherlands and a survey among growers. The literature study served as an input for the interviews, where the interviews were used to construct a useful questionnaire. Eventually the data from the questionnaire was transferred in SPSS. With SPSS it is possible to correlate different characteristics like age, farm size, acreage of potatoes, to the different variables out of the literature study. These variables were:

- | | |
|--------------------------|--------------------------|
| - Grower characteristics | - Information sharing |
| - Risk and control | - Trust |
| - Performance | - Transaction costs |
| - Social capital | - Horizontal cooperation |

The most important outcomes of the research are:

- As well growers as processors need to take into account the characteristics of each other to understand the other party better.
- Not only price risk, but also quality risk needs to be shared by a processor to get a better relationship.
- Nowadays, processors give a premium based only on the quality points like diseases or damages, but not for baking colour or length. These two aspects are very important for the processing plants to fulfil the demand of their customers. So if processors include a risk sharing specification for a length for example of 100mm and a specific baking colour in a contract, the growers get a premium if they are above this specification and if they are below they get a penalty.
- Relation networks are helpful for potato growers as well potato processors, but to get a more sustainable business relationship more information needs to be shared, this creates trust for both actors.
- The smaller growers can cooperate horizontally more to get a better trading position.
- Uncertainty in price as well in quality has to be captured in the contracts, so the contracts can be signed for several years and more sustainable business relationships can be reached.
- Processors need to use different types of contracts to serve all potential growers because growers are persistent to specific types of contracts.

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1. Introduction

The demand, supply and prices in the agricultural markets change; these changes have implications on all actors in the supply chain (Berntsen & Pons, 2012). One of these chains is the potato chain, below in Figure 1 where main actors of the potato chain are shown. This research focuses on the Dutch ware potato growers and processors. The ware potato growers are shown as the producers in the Figure. The potato processors of ware potatoes are shown as processors.

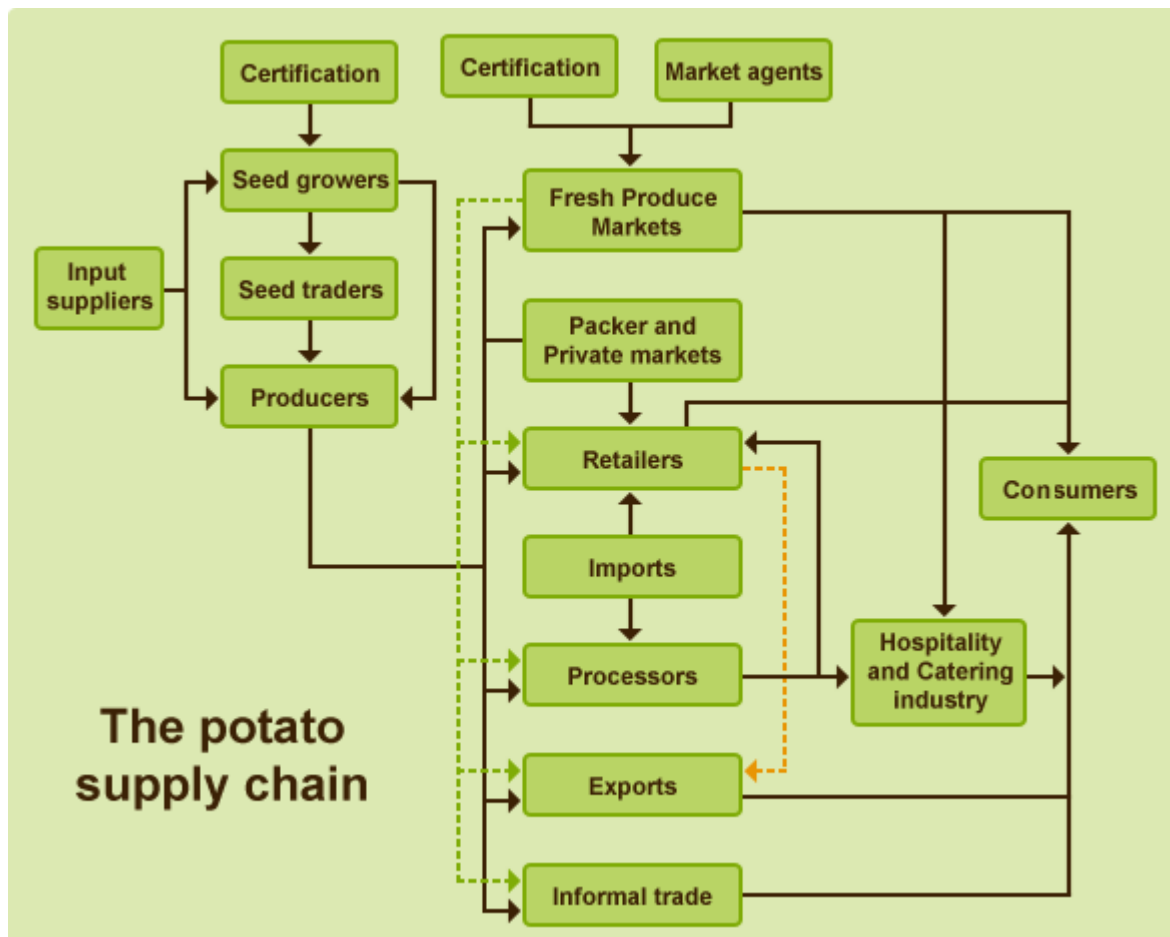


Figure 1 The potato supply chain (Smit et al, 2008)

The potato chain exists of many growers and just a few processors, fast food companies, food services and retailers. This makes that the processors and fast food companies, food services and retailers have the most power in the chain (Smit et al, 2008). The growers just grow on average small amounts of potatoes compared to the big volumes that are processed or collected by the big potato processors, fast food companies, food services and retailers (Smit et al, 2008).

The number of ware potato growers has decreased over the last years. The average area of ware potatoes increased per grower as can be seen in Table 1 below. The total area and yield of ware potatoes decreased over the last 12 years. In the table an indication of this decrease is shown per for each five years and for 2011 and 2012. In 2004 the potato prices were low so that ware potato growers decided to increase their area in 2005(CBS & LEI, 2012). This led to higher prices in 2005 through which the area of ware potatoes increased again in 2006, but now is decreased again in 2012. The average yield per hectare stays stable.

	Period	2000	2005	2010	2011	2012
Area	ha	87,413	65,828	73,035	72,607	67,452
Number of growers	number	10,887	7,035	6,666	6,720	6,268
Average area per grower	ha	8	9	11	11	11
Average yield per hectare	tonnes	53.1	49	49.4	53.4	50.2
Total yield	tonnes	4,465,429	3,213,019	3,546,049	3,857,284	3,383,604

Table 1 Ware potato growers (based on report CBS & LEI, 2012)

To invest in their potato equipment, the growers prefer a certain income in the future, excluding the risk takers, or else it can be that growers choose to grow other crops (Janssens et al., 2013). Yearly 3.5 million tons of potatoes are processed in the Netherlands, this results in 1.85 million tonnes finished potato products (Kimman, 2013). About 2.5 million tons is produced in the Netherlands and 1 million tons is imported. This makes the Netherlands, the second largest potato processing industry in the world, after the United States of America, followed by Canada, Germany and Belgium. The potato processing industry in the Netherlands employs about 3500 people. The Dutch processing companies in the Netherlands are:

- Agristo
- ASN
- Aviko
- Bergia
- Bex
- CêlaVita
- Fano Fine Food
- Farmfrites
- FritoLay
- Johma
- LambWeston
- McCain
- Oerlemans
- Peka
- Quickly
- Schaap Holland

Aviko, Farmfrites, LambWeston and McCain are the four biggest potato processors in the Netherlands, they process 80% of the potatoes in the Netherlands (Kimman, 2013). Times are changing, the demand for food increases and the fight against climate change introduces bio energy, produced by crops, for example cereals (Rathmann et al, 2010). An implication of this is that the price of cereals has increased for the last years and remains at a higher level. Growers may benefit more from other crops and choose to decrease their acres of potatoes. The competition for land use in the Netherlands will increase in the coming years, so it will probably be harder for processors to collect sufficient quantities of potatoes to fulfil the demand of the retailers (Harvey& Pilgrim, 2011). As can be seen in Figure 2 below, the area of potatoes in the Netherlands decreased over the last 17 years, as opposed to crops like wheat and corn, which are nowadays not only used for food production but also for bio-energy. Especially abroad bio-energy is produced, which increases the wheat and corn world prices, therefore also in the Netherlands. In the United States, 45% of the corn that is produced is used for bio-fuel production (Bange, 2012).

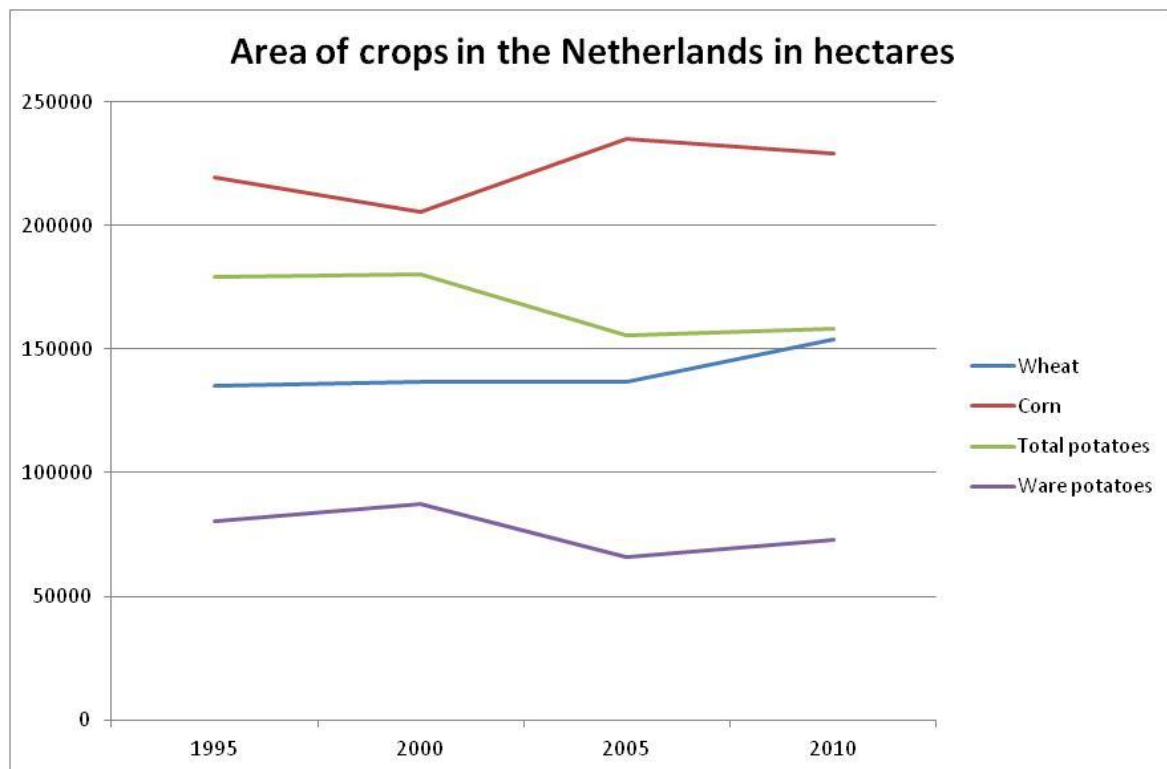


Figure 2 Area of crops (based on report CBS & LEI, 2012)

There are three options for the growers to sell their potatoes to the processing industry: price contracts, volume contracts and spot market (Janssens et al, 2013). About 70% of the potatoes are sold through price contracts, 20% through volume contracts and 10% in the spot market. Most potato contracts are just for one year. This gives the growers the opportunity to switch from processor or crop. With price contracts, the price in kilograms or tonnes is confirmed in advance. Volume contracts are contracts in which the potato grower arranges with the processors a certain amount of potatoes in kilograms or tonnes that will be delivered to the processor, the price is not confirmed in advance. Potatoes on the spot market don't have any arrangements or contracts in advance of the selling time. These are also called 'free potatoes'.

1.1 Conceptual design

1.1.1 Problem description

The problem description is a closer description of the existing problem in which the research takes place (Verschuren en Doorewaard, 2007). Two actors in the supply chain experience problems in the supply of their potatoes; the potato growers and processors. The problem for the processors is that they experience an increasing difficulty to collect sufficient quantities potatoes to keep their plants on maximum capacity. The processors have very high fixed costs, so a less than optimal supply of potatoes can cost them a lot of money (Rademakers & McKnight, 1998). Because of fluctuating prices, a sufficient income in growing of potatoes stays uncertain for the growers. Most contracts that are used, last just for one year and this makes it difficult to do large investments that need to be earned back in five, ten of even more years. So both actors have difficulties with a certain supply in the future.

1.1.2 Research objective

The research objective is a description of what is hoped to be achieved (De Vaus, 2001). The objective of the research is to make recommendations for potato growers and processors in order to build more sustainable business relationships between the growers and processors. More sustainable business relationships are business relationships that last for several years and not only for one year (Zuidhof, 2014). To grow and store potatoes specialised machinery, like for example planting and yielding machines and in-to storage equipment and other techniques, are required. By giving the potato growers a more certain future in potato production, they get the opportunity to invest and specialise in their potato equipment for their activities. For the potato processors with high fixed costs, a secure supply is needed so that the production process will be constant. This research is executed as an independent MSc thesis by Juliën Jeurissen and is guided by Wageningen University professors.

1.1.3 Research issues

In this chapter the general research question and specific research questions are stated. The main research question is a translation of the research objective, if this question can be answered, the objective can be achieved. The specific research questions will help to answer all together the general research question. So the answers on the research questions need to include the knowledge to reach the research objective (Verschuren en Doorewaard, 2007).

The general research question is:

What arrangements are needed among potato growers and processors in the Dutch ware potato chain to build more sustainable business, and which factors determine the feasibility of the different possible arrangements?

1. What actors are involved in the Dutch ware potato chain and what are their activities? The Dutch ware potato chain is built up out of different actors. This structure of the chain can influence arrangements that can be used among potato growers and processors. To answer the research question the role of the different actors in the Dutch ware potato chain are given. So with answering the question, it becomes clear what different actors are involved in the Dutch ware potato chain and what their activities are.

2. What are characteristics of vertical relationships in the Dutch ware potato chain? Vertical relationships show the arrangements among the actors in the supply chain. To answer the research question, the relations among the potato grower and processor are investigated in the Dutch ware potato chain by checking the vertical relationships among these two actors. To answer the research question, existing organizational vertical arrangements are investigated, like for example contracts or other agreements among the actors in the Dutch ware potato chain and how these vertical relationships impact production possibilities.

3. What are characteristics of horizontal relationships in the Dutch ware potato chain? Not only vertical relations can be used in the Dutch ware potato chain, also horizontal relationships can offer improvements in arrangements within the Dutch ware potato chain. To answer the research question the relations among different potato growers and among different potato processors are investigated by checking the horizontal relationships among actors.

4. What barriers and opportunities exist for the establishment of vertical relationships among potato growers and processors? If the involved actors and relationships among them are clear, the barriers and opportunities among them can be investigated. Before any recommendations can be made, the barriers and opportunities have to be clear that occur according to arrangements between potato growers and processors.

5. What are the wishes of potato growers and processors in arrangements? To come up with suitable recommendations, the wishes of the potato growers and processors have to be taken into account. It is important to assess all wishes of both actors to come up ultimately with recommendations in which both actors are satisfied.

1.1.4 Research framework

In the research framework, the construction of the research is shown. The start of the research is the literature study; the literature research results in the theoretical framework, which is used in the empirical study. The research framework is needed to form the theoretical background of the research (Verschuren & Doorewaard, 2007). In this part the current supply chain arrangements among potato growers and processors are investigated. From this information, the analysis can be done. In the analysis the different arrangements and viewpoints are considered for the Dutch ware potato chain. In the conclusion, the outcomes of the analysis and recommendations are given.

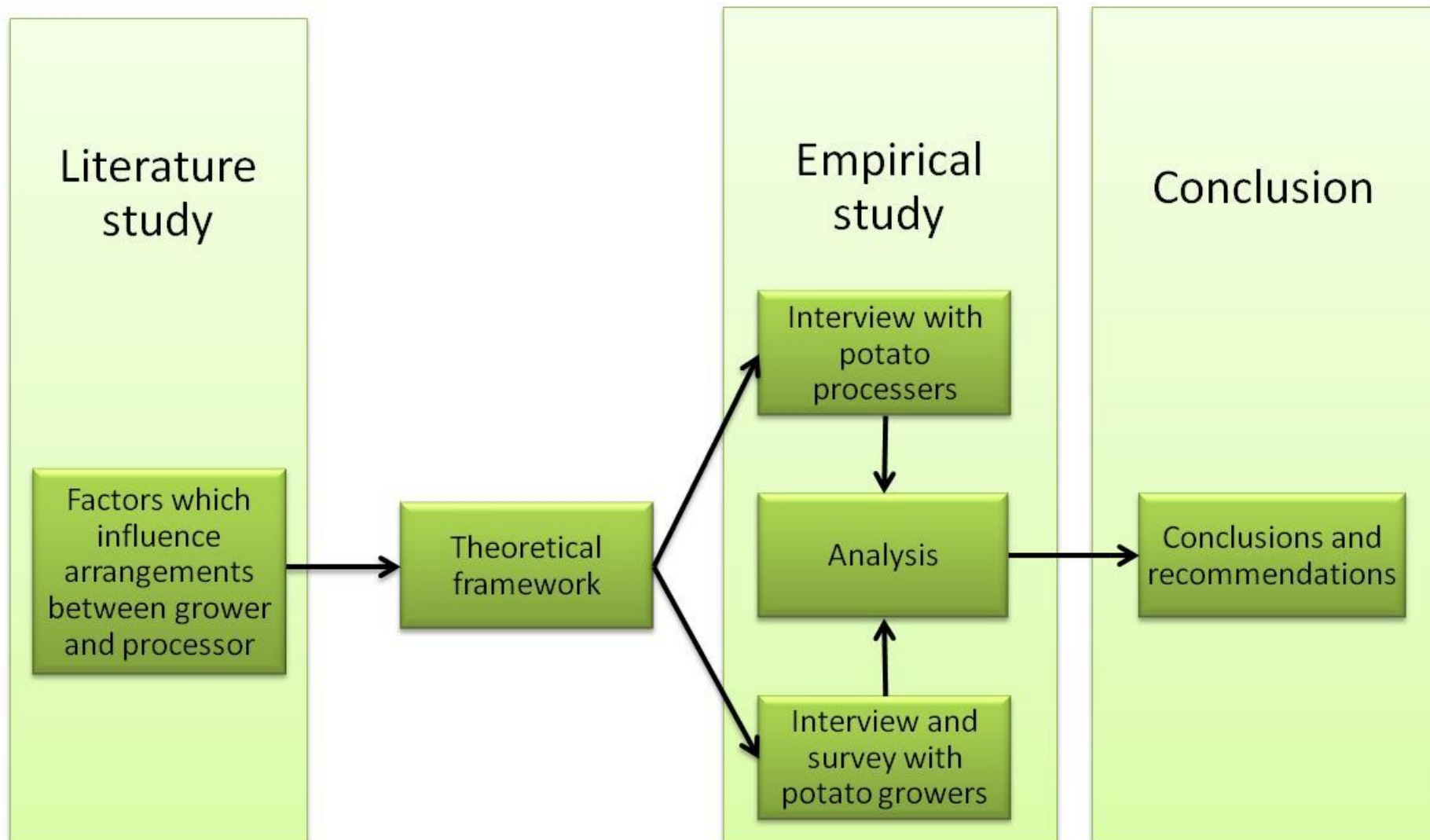


Figure 3 Research framework

In the literature study the factors which influence arrangements between grower and processors are investigated. The objective of the research is to make recommendations for the potato growers and processors, which they can adopt to create more sustainable business relationships. To get insight in what influences such arrangements, different variables are investigated in the literature study.

These variables are linked to the potato growers and processors in the theoretical framework. This forms the basis of the empirical study. The empirical study is done with two actors in the potato chain; the potato growers and processors. The four biggest potato processors (Aviko, FarmFrites, Lamb Weston Meijer and McCain) are interviewed about their current view and wishes in arrangements. With the potato growers an interview and a survey are done. First three interviews are done to get a good view about what is important for the growers in arrangements. Then a survey is done to reach more growers, here a minimum of 70 respondents was required, to get significant representation of the market (Alles over marktonderzoek, 2010).

These results are analysed and will form then the basis to make recommendations, which are given in the conclusion.

1.1.5 Key concepts

In the key concepts, important concepts are defined and elaborated, so it is clear what is meant with the concepts in the report (Verschuren en Doorewaard, 2007).

Arrangement

An arrangement is a method of supply trading, mostly vertically used in a relationship to procure goods and services. Arrangements include a set of predetermined conditions that will apply to bid solicitations and resulting contracts. They allow client departments to solicit bids from suppliers for specific wishes and the other way around. In this research aspects that influence an arrangement will be investigated, here the focus will be on potato contracts. (Government of Canada, 2013)

Contract

A contract is an exchange relationship created by oral or written agreement between two or more persons, containing at least one promise and one recognized in law as enforceable (Blum, 2007)

Governance structure

Governance structures are institutional arrangements, or transaction mechanisms for carrying out transactions, such as a market or a firm, and they often contain a certain structure for administering the transactions. Standard forms of governance structure are markets, firms and contracts. Governance structures are also called modes of organisation (Slangen *et al*, 2008).

Ware potatoes

Ware potatoes are potatoes that are intended for human consumption (Arso, 2012).

2. Theoretical background

The goal of a supply chain is that supply chain actors make gains by working together effectively. The outcomes of the supply chain actors are influenced by the used governance mechanisms, interventions and the context the actors are in, as can be seen in the model below. To investigate the arrangements in the potato supply chain, influencing variables are derived from this model and will be used to measure the viewpoints of both actors (Pilbeam *et al*, 2012). These variables are: (1) Risk and uncertainty, (2) Relationships and power, (3) Production contracts, (4) Information sharing and trust, (5) Transaction costs, (6) Social capital, (7) Control and (8) performance. From these variables, factors are measured later on in the research. These results will be analysed and used to make recommendations for the potato growers and processors (Pilbeam *et al*, 2012).

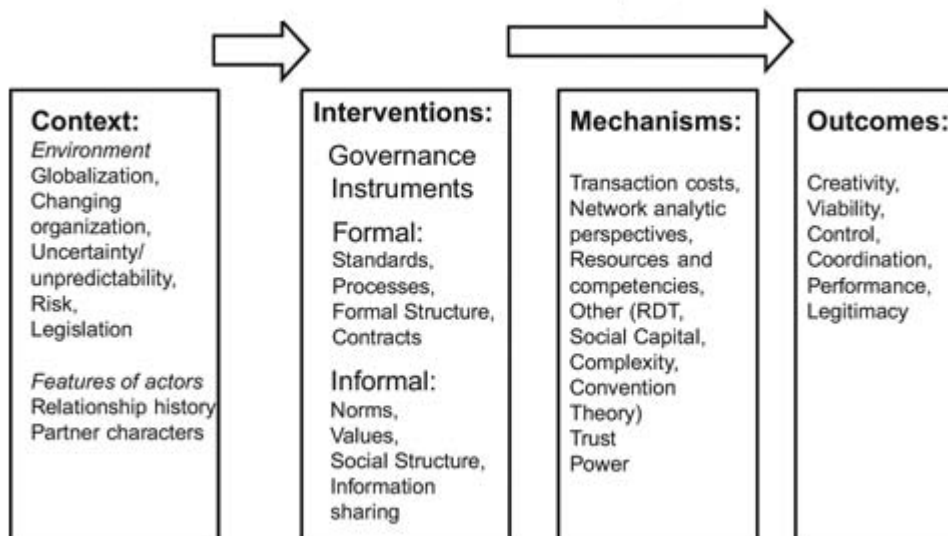


Figure 4 How governance secure specific outcomes (Pilbeam *et al*, 2012)

Every supply chain is surrounded by a certain context. This context has an influence on the decisions that are made by supply chain actors. The context is formed by the environment and by features of other actors in the supply chain. All influences from the environment together form interventions made by the actors in the supply chain. These are the governance instruments and can be formal or informal and influence the different mechanisms, which influence the outcomes (Pilbeam *et al*, 2012).

It is hard to change the context of a supply chain, governance instruments can be changed more easily. All transactions are concluded with some form of contract. A contract is an oral or written agreement between two parties who consent in advance to exchange goods or services (property rights), whether or not in return for a certain payment (Groenewegen *et al*, 2010).

From Figure 4 the most important concepts will be elaborated in this literature study, these are derived from the model in Figure 4.

These are:

- | | |
|--|----------------------------|
| - <i>Risk and uncertainty</i> | - <i>Transaction costs</i> |
| - <i>Relationships and power</i> | - <i>Social capital</i> |
| - <i>Production contracts</i> | - <i>Control</i> |
| - <i>Information sharing and trust</i> | - <i>Performance</i> |

2.1 Risk and uncertainty

Risk can be defined as uncertainty that affects an individual's welfare, and is often associated with adversity and loss. (Harwood *et al*, 1999) Risk is uncertainty that "matters," and may involve the probability of losing money, possible harm to human health, repercussions that affect resources and other types of events that affect a person's welfare. To have risk, uncertainty is needed, but that does not mean that uncertainty automatically lead to a risky situation. (Harwood *et al*, 1999)

Potato growers and processors have to deal with different kinds of uncertainty that can lead to risks, namely:

- Production or yield uncertainty; Potato growers have to deal with biological and technical uncertainties during the growing and storage process. For potato processors production uncertainties can be that for example the machinery will have malfunctions.
- Price or market uncertainties; Price uncertainties can be that the purchasing of the products is too expensive or that the selling price is too low, which decreases the profit. Market uncertainties are the uncertainties that there will be an overflow or shortage in supply. A shortage in supply can costs the potato processors a lot of money because they have orders to fulfil and high fixed costs of their machinery which need a constant supply.
- Institutional uncertainties; Changes in policies and regulations can influence the Dutch ware potato chain. Mostly these changes are price or production constraints like for example the stricter rules for potato growers in use of pesticides.
- Human or personal uncertainties; these can be uncertainties like diseases, accidents or divorces for potato growers or processors. Also personal uncertainties can be here contracting risk, which involves opportunistic behaviour and the reliability of contracting partners.
- Financial uncertainties; These uncertainties can be like for example fluctuations in interest rates, equity losses or problems with debt payments for potato growers or processors. (Harwood *et al*, 1999)

2.2 Relationships

Vertical relations

Relations can have influence on decisions that are made by actors in the potato chain. For a potato grower there are three modes (Smit *et al*, 2008) with respect to the sales of his potatoes:

- Unconstrained (free) growing
- Growing through a cooperative organization
- Growing under contract

These three different modes mostly result in a different relationship within the supply chain. If a grower joins a cooperative he acquires supplying rights and obligations. This causes another relation between grower and processor than when growers grow free. Incentives for the different modes of cooperation are based on taking risks and having trust in other actors in the supply chain (Smit *et al*, 2008). In a cooperative information can more easily be shared and the trust level will be higher because it is one company.

Decisions that are made can influence the whole supply chain. For example if the retailers want to convert to sustainable production and growers don't agree on it then it can be that the retailers will not buy their potatoes anymore. But also growers, individual or in groups can decide to grow less potatoes, this can influence the supply of the processors or the price for the customers.

If relationships are long term in the potato chain, delivery contracts are still mostly for the duration of one year only. This gives the actors in the chain the opportunity to switch from supplier or customer. However the advantage of long term relationships is that they build trust, which decreases the transaction costs (Smit *et al*, 2008). As long as there are no economic reasons, mostly actors in the chain will not break the relationship. If a chain is broken this will have consequences when a new chain has to be entered.

The supply chain is increasing in interdependency because of the power structure. The most power within the chain is at the end-users in the chain. This is because there are just a few retail actors and fast-food sectors which buy a lot of potatoes, for example MC Donald's. These big companies have a lot of market power and are setting the standard, they can determine who supplies and at what price. Because of these asymmetric power relations, growers are obligated to work more efficient and it will have effect on their profit margins. The growers have the least influence in the supply chain, this because they mostly deliver small amounts of potatoes. Projects to co-operate more between growers and give them more influence in the supply chain have not had great successes up till now (Smit *et al*, 2008).

Horizontal relations

Because fast food restaurants and large retailers get more and more power, not only the competition between potato processors increased, also they start to co-operate horizontally. Large retailers or fast food restaurants change more often from processor. This results into a demand with 'peaks and dips'. Because potato processors have really high fixed costs, it is hard to handle these fluctuations. To overcome these, processors might buy end products of each other to fulfil the demand of their customers. For the other processors it will help them to reach the production capacity, so both parties can gain from the co-operation. However the trust that is needed for this co-operation is very hard to establish because on the other hand the potato processors are intense competitors. If these co-operations are made, it can create a competitive advantage regarding other potato processors (Rademakers & McKnight, 1998).

2.3 Production Contracts

To secure the possibility that parties keep up to their side of the contract, often sanctions of non-observance, like penalties are included or formal rules of liability. If an actor has to pay a penalty, his profit will decrease. This gives the actor motivation to reach the goals of the contract. Formal contracts are legally enforceable promises. But not all contracts are formal, also informal contracts exist that facilitate compliance with the agreement. But these aren't used in the potato market. Contracts are used by parties, because they think that they can benefit from them. Here a difference between long-term and spot transactions can be made. (Groenewegen *et al*, 2010)

In an ideal world in which parties act entirely rationally and are fully informed, individuals can transfer property rights and record their agreements in complete contracts (Groenewegen *et al*, 2010). This implies that any agreement can be monitored and enforced free of charge. In a perfect market, full information and competition would force all parties to meet their contractual obligations.

Normally contracts are used if involved parties have enough confidence that the agreements will be met by all parties. Contracts can be used in many sorts of transactions. They can apply just between two people (buyer and seller) but also to groups of people (collective labour contracts) and can be nonrecurring or recurring. (Groenewegen *et al*, 2010)

Contracts have always played an important role in agriculture transactions. Design of contracts is a complex activity. It can be seen as a multi-criterion decision problem. You have to deal with different aspects of importance. If one issue is solved, the risk arises that new problems are created. Contracts are made for three reasons (Bogetoft & Olesen, 2004):

- *Coordination*: to guarantee that the right products are produced at the right time and place.
- *Motivation*: to guarantee that involved parties have individual incentives to make coordinated decisions.
- *Transactions costs*: to guarantee that coordination and motivation are provided at the lowest possible cost.

For these three reasons, the so called ‘ten rules of thumb’ (Bogetoft & Olesen, 2004) can be subdivided:

1. Coordinate production
The main function of contracts is to coordinate actions of independent parties. This coordination must guarantee that production is optimised and costs are minimized throughout the supply chain. Coordination can be achieved by instructions from other parties or price signals or a combination of both.
2. Balance the pros and cons of decentralization
In decentralized contracts, the producers have the highest supervision in making decisions. In centralized contracts, the processors have the highest supervision in making decisions. Decentralized contracts reduce the need for costly information and risk of neglected important information. But it can also create problems in matching and synchronization and the risk of uncoordinated decision making can be increased. Because collecting information costs money, a good contract minimizes the required information. The characteristics of decentralization and centralization are given below in Table 2.

<i>Problem</i>	Decentralization	Centralization
Use all important information	X	
Reduce costly communication	X	
Coordination		X
Information requirement	X	X
Moral hazard		X
Hold-up	X	
Reduce information rents		X

Table 2 Characteristics of decentralization and centralization (Bogetoft & Olesen, 2004)

3. Minimize the costs of risk and uncertainty
Agriculture production can have different kinds of risk, for example biological risk, price risk and institutional risk. Behavioural uncertainty can also occur when one party does not what actions the other parties take. Uncertain transactions are normally less valuable. Parties have two options to reduce these costs, minimize the risk or share the risk.

4. Reduce the costs of post-contractual opportunism
Contracts should motivate parties to take the right actions, even if they are unobservable. To provide incentives for unobservable actions, the outcome must be compensated to the producers. Usually there is a relationship between actions and the outcomes. Important is that the compensation is balanced, because lots of factors influence the outcome. When parties are risk averse, a risk premium originates. Good contracts can reduce the post-contractual opportunism costs.
5. Reduce the costs of pre-contractual opportunism
Before a contract is signed, both parties often know what they want to earn, this is called the reservation value. Processors try to design contracts that exactly fulfil this reservation value. If producers have private information about cost structure of the processor, he can decide to ask more than his reservation value. This is the problem of pre-contractual opportunism, also called adverse selection.
6. Do not kill cooperation
Full economic benefits can only be reached if parties cooperate. In good cooperation, parties can increase their own utility. A good cooperation is difficult to establish, and cooperating can give rise to influence costs. These costs arise from activities that are designed to influence the decisions of others for self interested purposes. By limiting the number of decisions, influence costs can be reduced.
7. Motivate long-term concerns
Activities require investments. If an investment is specific for a relationship between parties, a long term contract is recommended. In this way the costs of asset specificity can be reduced. Many costs can be reduced by using long term contracts, however it is always risk full to cooperate for a longer period because the future is uncertain.
8. Balance pros and cons of renegotiation
If contracts can be renegotiated, involved parties can make changes in the contract in order to changes in the environment. It can reduce commitment to the others or lead to strategic behaviour. For example if a party knows that a contract can be renegotiated they do not live up to the initial contract but to the incentives they expect in the renegotiated contract.
9. Reduce the direct costs of contracting
Direct costs of contracting are the time and money spent on collecting, monitoring and bargaining information and conflict resolution. These costs need to be minimized because these costs don't make direct profits. But they are required to give information to make coordinated decisions.
10. Use transparent contracts
To get a clear view what the incentives of involved parties are, the contracts have to be transparent. There can be a difference between observed incentives and true incentives. In simple contracts parties can relate their choices to the compensation scheme in the contract. (Bogetoft & Olesen, 2004)

2.4 Trust and information sharing

Trust can be defined as a partner's ability to perform according to intentions and expectations of a relationship or not to defect his or her intentions. (Nooteboom *et al*, 1997) Effective supply chain planning based on sharing of information and trust between and among partners is an essential element for successful supply chain implementation. To share information, actors sometimes need to release guarded information like for example financial marks or strategic plans to their partners who might be also their competitors. Information sharing and trust create often a relationship and involves a higher degree of interdependency between supply chain partners. (Kwon & Taewon, 2005)

Sharing information in an effective way provides relevant information to supply chain partners and helps them to understand what you are doing. This is increasing the transparency and affecting trust levels. Factors that can be used as indicators for measuring trust are; relevance, accuracy, reliability, quality and frequency of information sharing. If a potato grower and processor sign a contract together it is clear that they have trust in each other that the contract specifications will be met. (Fischer, 2013)

2.5 Transaction costs

Property rights are transferred in a contract. All costs that arise from the specification of a contract and monitoring compliance with the agreement are called transactions costs. These costs can be divided in two groups; ex-ante (in advance) costs and ex-posts (afterward) costs. Transaction costs are caused by the combined effect of human behaviour and attributes of the transaction. These behavioural assumptions can be bounded rationality and opportunism (Williamson, 1981). The attributes of transaction are:

- *Asset specificity*; if one of the contracting parties has made specific investments for that contract, the interdependence increases from which the other party can abuse
- *Uncertainty*; uncertainties can occur in transactions, not only in for example the market but also with respect to the contracting party.
- *Frequency*; the costs from a transaction also depend on the frequency of a transaction. These transaction costs can be recovered easier in long term relationships. (Wever *et al*, 2012)

Transaction costs can be expressed in time or money, for potato growers this can be machinery, production input like seeds en fertilizer or effort. Below in Table 3 the effort for potato growers during the different stages of the season for different kind of sales is shown. With a fixed price contract, only during arranging the contract costs the growers the most effort. Here a grower needs to find a buyer and the contract price and size needs to be discussed. More or less it is the same for growers who sell their potatoes in pool contracts. When a grower has no contract with a processor he needs to find at the end of the season a buyer what can cost a lot of effort, depending on the market. In general it is harder to find a buyer at the end of the season in the free market instead of a fixed price or pool contract in the beginning of the season because processors want to safeguard their variety position. If a grower sells his potatoes on the future market, it will cost him a lot of effort during all stages because he needs to follow the happenings in the market.

	Arrange contract	Growing (till harvest)	Sales
Fixed price contract	+(+)	0	+
Pool	+(+)	0	0
Free market, daily price	+	+	+++
Future market	++	+++	+++
0 = little effort, +++ much effort			

Table 3 Transaction costs for potato growers during the season for different kinds of sales. (Janssens *et al*, 2012)

2.6 Social capital

Social capital can be defined as the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition. (Portes, 1998)

Supply chain effectiveness in the long-term requires trust, shared values and mutually beneficial relationships to reduce risks and cost. Social capital is the information, trust and norms within social networks. It exists in relationships, as expectations and obligations, in information flows and norms or sanctions of a social structure and can be developed between groups or individuals who are linked by sector or geographically. Social capital consists of three dimensions:

- *Structural dimension*: Network ties, network configuration and appropriable organisation
- *Cognitive dimension*: Shared codes and language and shared narratives
- *Relational dimension*: Trust, norms, obligations and identification

These dimensions of social capital may play an influential role in facilitating the four formative capabilities for supply chain resilience and indicate the potential for these to be mutually reinforcing. (Johnson *et al*, 2013)

Agri-food chains are more and more evolving from transaction based networks to alliance based networks. This implies an increasing role of social capital. Agri-food supply chains possess some unique characteristics, which implies different applications of social capital compared to other manufacturing supply chains. Interfirm dependency and product differentiations are important factors in transaction governance. Contractual distortions can be mitigated by self-enforcing agreements. Here social capital and trust influence the networks. Financial risks that occur in agrifood chains may imply that actors in the chain prefer embedded contracts rather than flexible contracts. With social capital, the actors can create a reputation and can learn from each other to become more efficient overtime. This increases the level of trust within a network which decreases the probability of opportunism. If this trust is fully formed, repeated transactions will occur and a productive relationship will be established. Then the actors will have strong incentives to continue in cooperating and avoid switching costs. These are costs to establish trust with a new partner to generate relationship benefits. (Sporleder and Wu, 2006)

2.7 Quality control

Because potatoes are eatable products, the food safety and quality is very important. The VAVI (Vereniging Aardappel Verwerkende Industrie) is an association that supports 8 processors in the Netherlands. To keep up to these standards the VAVI has chosen for two certificates;

- VVA; certificate for food safety
- Global Gap; certification for ware potatoes

The control of these certificates is executed by different independent companies. Growers can choose between:

- NAK Agro
- SGS Nederland
- SKAL

Besides the certificates, the growers and processors have to comply with the regulation by the European Union and Dutch government. For a good quality standard, the processors also do their own quality control. To exclude bad quality potatoes, growers and processors sort the potatoes on shortcomings, tarra and size. When the potatoes enter for example a French fries plant, samples will be taken from different places in the truck. Here the processor does a quality control on shortcomings, baking colour, underwater weight and temperature. (VAVI, 2013)

2.8 Performance

Performance can be defined as the accomplishment of a given task measured against preset known standards of accuracy, completeness, cost and speed. In a contract, performance is deemed to be the fulfilment of an obligation, in a manner that releases the performer from all liabilities under the contract. (Umasankar and Shani, 2012)

In Figure 5, the supply chain management indicators of performance are shown. Also the Dutch ware potato chain actors can use this scheme to set their own performance indicators. These can be divided into four elements; end customer benefits, supply chain management improvement, financial benefits and supply chain management goals.

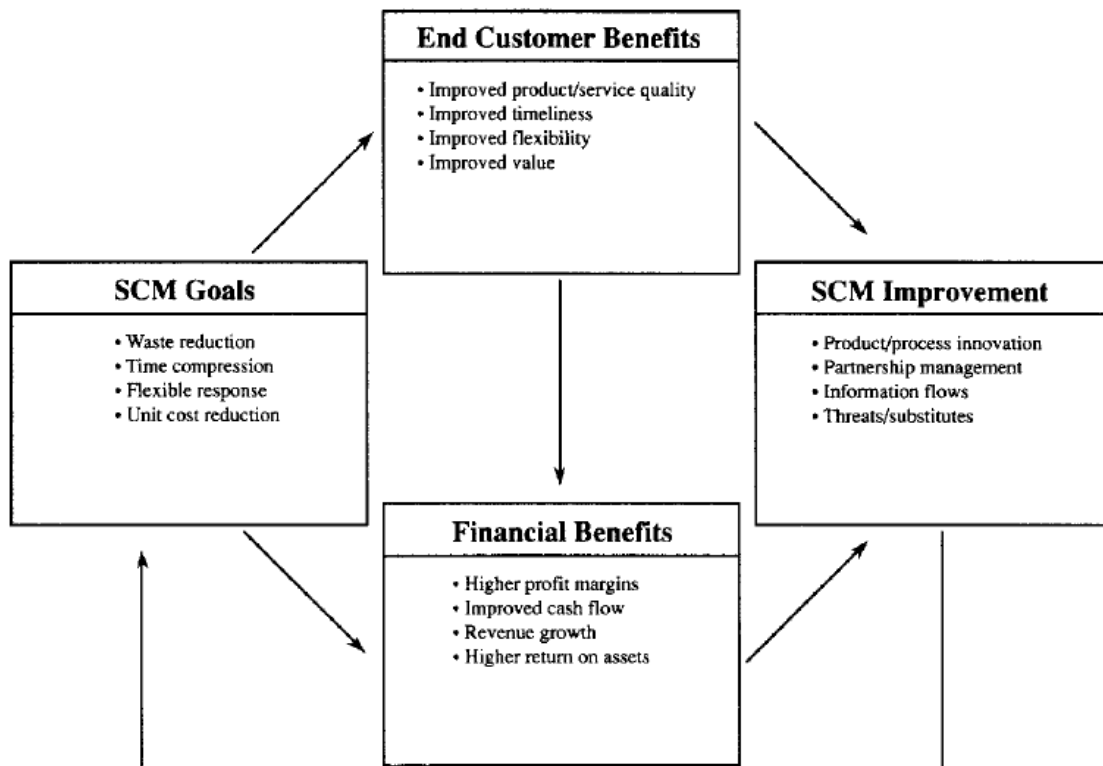


Figure 5 Supply chain management performance framework (Brewer and Speh, 2000)

2.9 Theoretical framework

All theoretical background given in this chapter is used in the theoretical framework below in Figure 6.

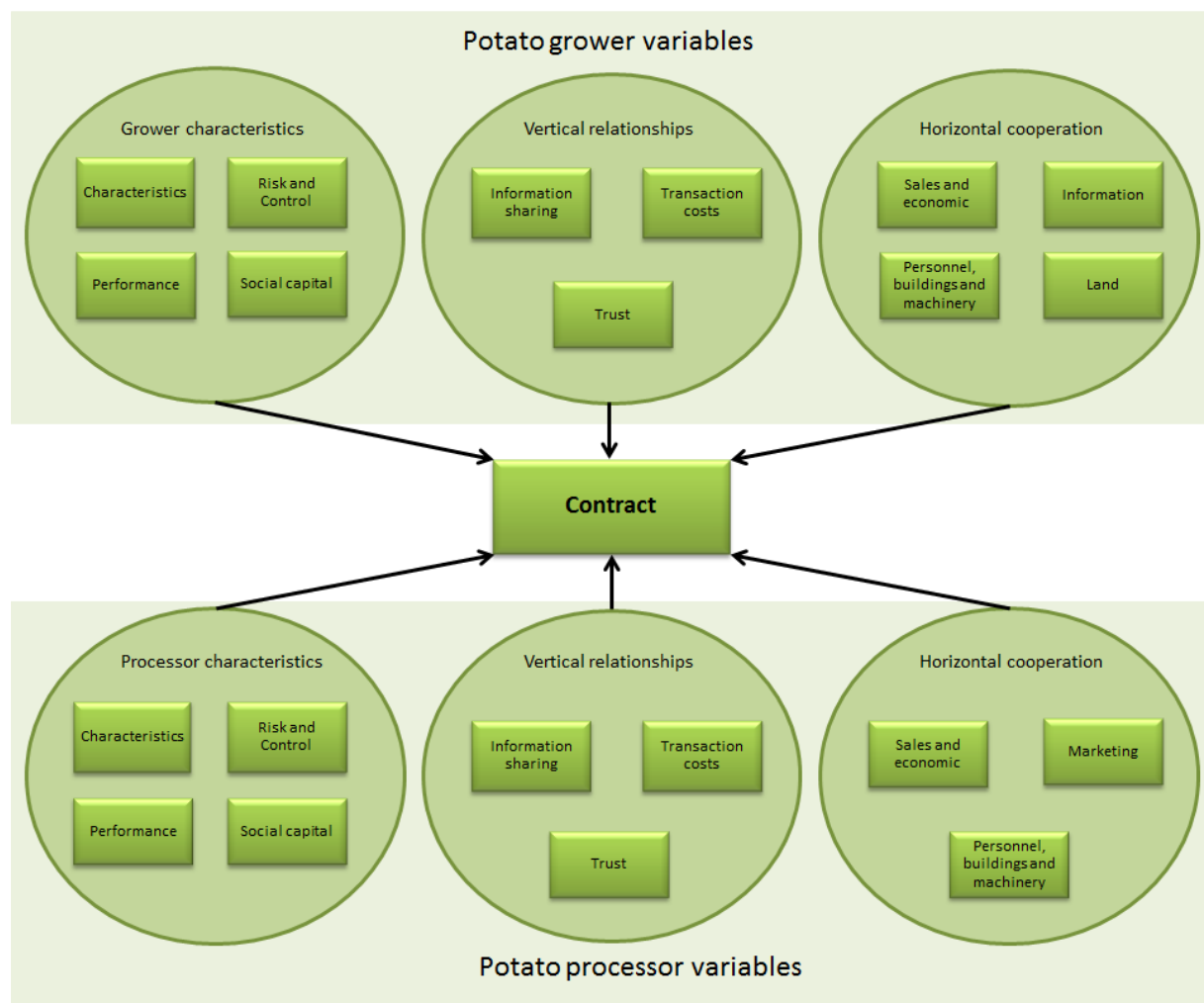


Figure 6 Theoretical framework

The theoretical framework is the last part of the literature study. Now the step towards the empirical research can be made. This empirical part consists of interviews with potato processors and interviews and a survey with potato growers, here the relevant theoretical knowledge will be tested. From here the information is analysed to make recommendations and to answer all the research questions.

In the upper part of the theoretical framework, the potato grower variables are given. These are divided into three groups; grower characteristics, vertical relationships and horizontal cooperation. The lower part of the theoretical framework is represented by the potato processor variables. Also these are divided into three groups; processor characteristics, vertical relationships and horizontal cooperation. The grower and processor variables combined are the independent variables that influence the contract, which is the dependent variable.

In the grower characteristics the variables are measured that define the characteristics of a grower. 'What kind of grower is he, risk taker or risk averse, what kind of farm does he run, how does the grower perform in comparison with other growers and who is making contract decisions' are questions that need to be answered to measure the grower characteristics variable.

In the vertical relationships of the potato grower variables, the vertical relationships between potato grower and potato processor are measured from potato grower perspective. 'How and which information is shared, how does the grower trust the processor and how does the grower handle transaction costs' are questions that need to be answered to measure the vertical relationships of the potato grower variables.

In the horizontal cooperation, relationships between potato growers are measured. 'Do the potato growers cooperate to sell their potatoes or do they share land, machinery, buildings and/or personnel to produce potatoes' are questions that need to be answered to measure the horizontal cooperation among potato growers.

The processors characteristics measure the characteristics of a processor. 'What kind of company is it, how does the company perform in comparison to other processors, how does the company handle risks and who is making contract decisions?' are questions that need to be answered to measure the processor characteristics.

The vertical relationships of potato processors measure the vertical relationships between grower and processor from processor perspective. 'How and which information is shared with the potato growers, how does the processor trust the growers and how does the processor handle transaction costs?' are questions that need to be answered to measure the vertical relationships of the potato processor variables.

In the horizontal cooperation, relationships between potato processors are measured. 'Do the processors cooperate to sell their products or do they share machinery, buildings and/or personnel to process potatoes?' are questions that need to be answered to measure the horizontal cooperation among potato growers.

All these variables combined influence then the middle part of the theoretical framework, the contract. By the influences of all these variables a specific contract arises. By measuring these variables and the wishes of the growers and processors, data will be collected which can be analysed to make recommendations.

3. Methodology

The methodology chapter of a research is the guidance of the research framework from research questions to final products. The methodology is explained in different main aspects, this can be seen in Figure 7.

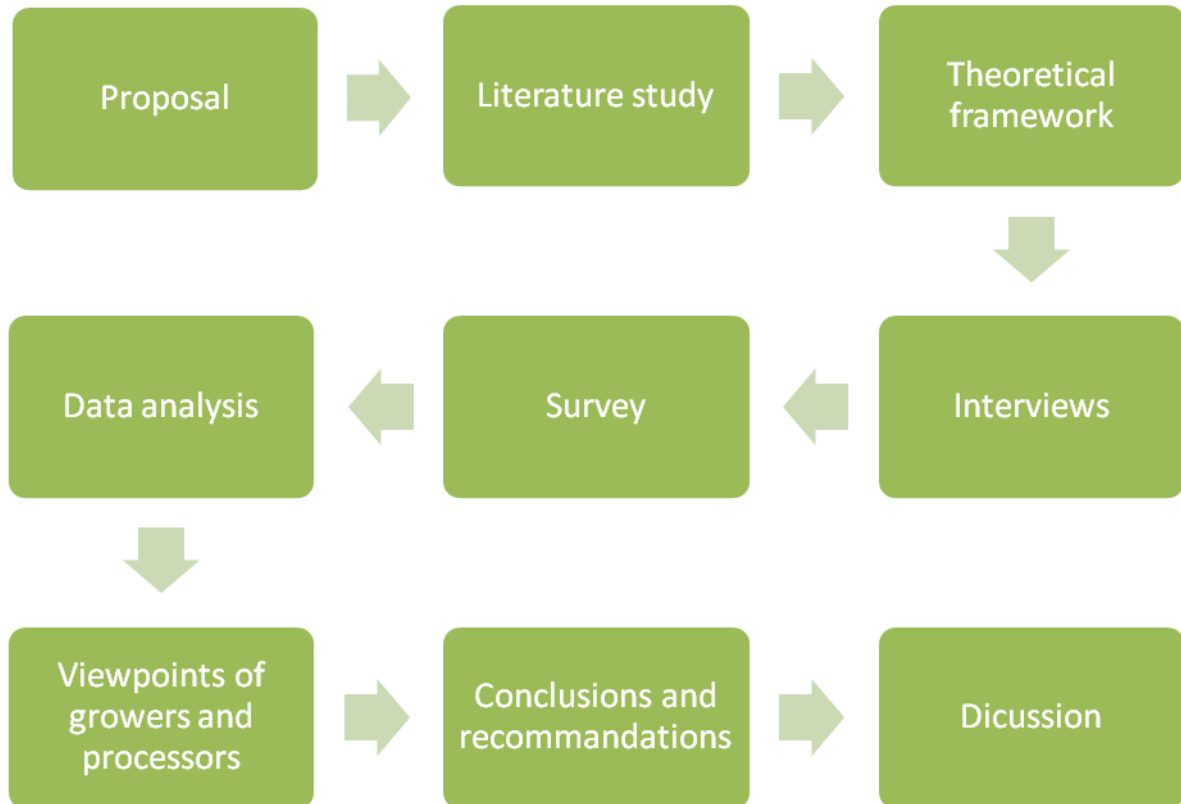


Figure 7 The flow of methodology

Proposal

In the proposal an introduction to the problem is given, research questions are stated and a research framework is designed. Also research material, a strategy and a planning are shown in the proposal. To finish the MSc research successfully the research questions need to be answered.

Literature Study

In the literature study, the theoretical background is given. Here the factors which influence arrangements between grower and processors are investigated. These factors are derived from a supply chain management model, so the factors are academically underpinned. The literature study also became a basic knowledge for the identification of interviews and survey questions.

Theoretical framework

The factors that derived from the literature study are shown in a model that represents the theoretical framework. These factors have variables that are measured in the interviews and survey to make it possible to compare all the results in the analysis.

Interviews

The four biggest potato processors (Aviko, FarmFrites, Lamb Weston Meijer and McCain) are interviewed about their current view and wishes in arrangements. With potato growers an interview and a survey are done, the topic lists of these interviews are given in appendix 1. First 3 growers were interviewed to get a good view about what important is for the growers in arrangements, helping making a good survey. In these interviews, the factors were measured to compare the results. All these interviews are recorded and transcribed. Transcript of interviews and literature study were the basis of the information to develop the survey and are shown in appendix 2.

Survey

The survey is sent to the potato growers that provided their email addresses, after a phone call request to cooperate. The survey was an online survey by Google docx and the same factors are measured as in the interviews. The survey questions and results are given in appendix 3 and 5.

Data Analysis

From the online survey, the data was analysed by SPSS 20 software. Here correlation analyses were done on the factors that influence the viewpoints of potato growers and processors in making arrangements. The results of the significant correlations are given in appendix 4.

Viewpoint of growers and processors

Results of data analysis are examined carefully. These results are linked to the literature study. Therefore this literature study had a function of strengthening output to come up with the good viewpoints.

Conclusions and recommendations

From the results in combination with the literature study, viewpoints can be concluded; therefore recommendations to growers and processors can be given.

Discussion

The pitfalls and ideas for further research are given in the discussion chapter.

3.1 Survey methodology

For the survey and interviews different variables are measured by asking different questions. These questions are the same for the potato growers as for the potato processors as much as possible to be able to compare the same data afterwards. In this chapter is described what and why questions are stated.

To have a good response and no missing values there is chosen for an online survey. It is easy for a respondent to fill in the questionnaire whenever he wants and to send it. Missing values can make questions not useable in the analyses, so I required in the online survey that all questions needed to be answered before the response can be sent so there can't be any missing values. The survey was made in Google docx because it is a free tool, all email addresses accept Google tools, and it is simple and gives a clear database. To eliminate missing values all questions were required.

To collect enough respondents, an address file of Kamer van Koophandel is used. Here all growers in the Netherlands are documented. The website of the Kamer van Koophandel shows free addresses of farms that did not complain against publishing their addresses. In the database, the selection that is made is agriculture; growth of one-year crops; tuber vegetables; potatoes. This brings in 1221 addresses of all kinds of potato growers. In excel a random selection is executed, with a random selection tool of 500 potato growers. In the national phone directorty (Telefoongids), all phone numbers of the 500 potato growers are searched including the addresses. Then all 500 potato growers were called with the question if they are a ware potato grower and if they want to co-operate by filling out the survey. From these 500 phone calls, 110 email addresses of ware potato growers that want to co-operate were secured. Other growers did not have potatoes any more or only had starch or seed potatoes. Then the 110 growers that wanted to co-operate were mailed with the link of the survey. A week later a reminder was sent. After three weeks, the survey went offline. At the end 77 respondents filled in the survey. This data from Google docx is copied into excel and filled in by hand in SPSS 20. Here all Kendall's tau (non-parametric) correlations test is done because Kendall's tau only needs ordinal data, which was the most used in the survey and is better in small samples than for example Spearman's correlation coefficient (Field,2009). For all ordinal variables correlations tests are done. Only the significant results are written in the results. For this is measured with a significance of 10%. For the non-ordinal data, frequency graphs are made to compare the variables. All remarkable frequency graphs are discussed in the results.

To come up with a good academic supported survey, almost all questions in the survey are used from existing academic researches.

Characteristics

To get an insight in the different types of growers some questions about their characteristics are stated. These are the characteristics which are measured from the potato growers:

- Age
- Acreage in total
- Acreage potatoes
- Full owner/ others
- Experience in growing potatoes
- Types of potatoes
- Processors to who your sell

All topics can be related to the characteristics of growers. Do certain types of growers give the same answers on specific questions? For example are there significant differences in answering between young and old growers, experienced and new growers, full owners or shared several owners, between different sorts of potatoes and the processors to who they deliver? These characteristics of growers combined form a picture to compare answers from different types of growers about their opinions, behaviour and wishes. The questions are used from an earlier questionnaire held for potato growers (Jiwmed, 2012) and a PhD thesis (Peng, 2011) to underpin the questions academically.

Processor characteristics

The different processors also need to be compared to see whether certain characteristics result in different answering. These are the characteristics which are measured from the potato processors:

- Yearly revenue of processed potatoes in the Netherlands
- Tonnes potatoes what you process yearly in the Netherlands
- Division import vs. export
- Locations in the Netherlands
- Types of potato products
- Market share ware potatoes in The Netherlands
- Number of growers
- Type of company (BV, Holding , NV, CV, Soci tas Europa)

The topics in the interview are afterwards related to the characteristics of the different processors. Here can be checked whether different types of potato processors give the same answers on specific questions. So maybe there are significant differences between processors with, high or low revenues, lots of tonnes or just a few, a lot of import or just a little, a lot of locations or growers in the Netherlands or just a few, small of big market share and a BV or SE. All these characteristics combined form the picture to compare answers from different types of processors about their opinions, behaviour and wishes. The questions are used from a PhD thesis (Peng, 2011) to underpin the questions academically and from a sustainability report (Aviko Group, 2012) from a potato processor to underpin practical characteristics.

Risk and control

How the potato growers and processors behave in risk and control can have influences on a contract that is chosen. To measure how they are in risk and control two questions are stated; are they someone who buys immediately new innovative products like for example GPS or do they wait for experiences of others and how do the scale themselves on risk behaviour and entrepreneurship. Interesting to check then is what kind of contracts, do risk takers choose and what kind of contracts do certain growers choose. The questions are used from two PhD thesis's (Peng, 2011) and (Plaggenhoef, 2007) to underpin the questions academically.

Performance

The performance of the potato growers and processors are measured by asking them how satisfied they are with the purchased quality, delivered quality, the selling and purchasing price and the profitability compared to others. Here can be checked whether there are significant differences in choosing certain contracts by different scoring in performance. The questions are used from two PhD thesis's (Peng, 2011) and (Plaggenhoef, 2007) to underpin the questions academically.

Social capital

Social capital can also have an influence on a contract that is chosen by a potato grower or processor. To measure the role of social capital from the potato growers and processors, questions are stated about how networks help to find new buyers/growers, markets or to get better prices. So afterwards is tested if growers or processors which have support of social capital in their business choose or require specific contracts. These questions are collected from an earlier PhD thesis to make them academically underpinned (Lu, 2007).

Information sharing

The role of information sharing in contracting can be measured by first asking the growers and processors how they share information. This is done by asking them how frequent information is exchanged, how credible this information is, if they are willing to provide information to the processor/growers and how they think the other party is willing to provide information. From these scores it was tested how contracts are influenced by information sharing. The questions are used from two PhD thesis's (Peng, 2011) and (Plaggenhoef, 2007) to underpin the questions academically.

Trust

How trust influences the contract can be measured by checking how the one party trusts the other. The growers and processors are asked how credible they think the processor/grower is and if the processor/grower keeps up to promises. With these scores the influence of trust is tested. The questions are used from two PhD thesis's (Peng, 2011) and (Plaggenhoef, 2007) to underpin the questions academically.

Transaction costs

The size of transaction cost can have big influences on certain contracts. To measure the transaction costs the growers and processors are asked if they made large investments for selling potatoes and quality of potatoes, if they switch how they think about wasting of knowledge and how many times did they switched from business partner. With the scores of the transaction costs the influence of transaction costs on contracts are measured. The questions are used from two PhD thesis's (Peng, 2011) and (Plaggenhoef, 2007) to underpin the questions academically.

Horizontal cooperation

Horizontal cooperation between growers or processors, changes their characteristics and can so influence their contracts. To measure horizontal cooperation, the growers and processors are asked if they cooperate with colleagues or competitors to sell or purchase products and to grow or process the potatoes and if so, how they do this. By measuring how certain growers and processors cooperate horizontally or not, the influence of horizontal cooperation on contracts are tested. The questions are picked from characteristics of horizontal cooperation in an academic article (Rademakers & McKnight, 1998).

Contract

To measure how growers and processors think about contracts they are asked which types of contracts they use, which contracts are preferred, for how many years they sign contracts, for how many years they would sign if it gives them a certain future, what aspects they think should be fixed in a contract and if they could change a contract, what would it look like. By these questions the behaviour and wishes about contracts from the growers is measured to make recommendations. Also these questions are necessary to test the influences of the other different topics that are measured in the survey and interviews. The questions are used from a PhD thesis (Wever, 2012) and an academic article (Janssens *et al.*, 2012) to underpin the questions academically.

4. Results and analysis

4.1 Characteristics

4.1.1 Characteristics respondents

The first step in analysing the database is giving a description of characteristics of the respondents, in this case of 77 respondents. Below these characteristics are given.

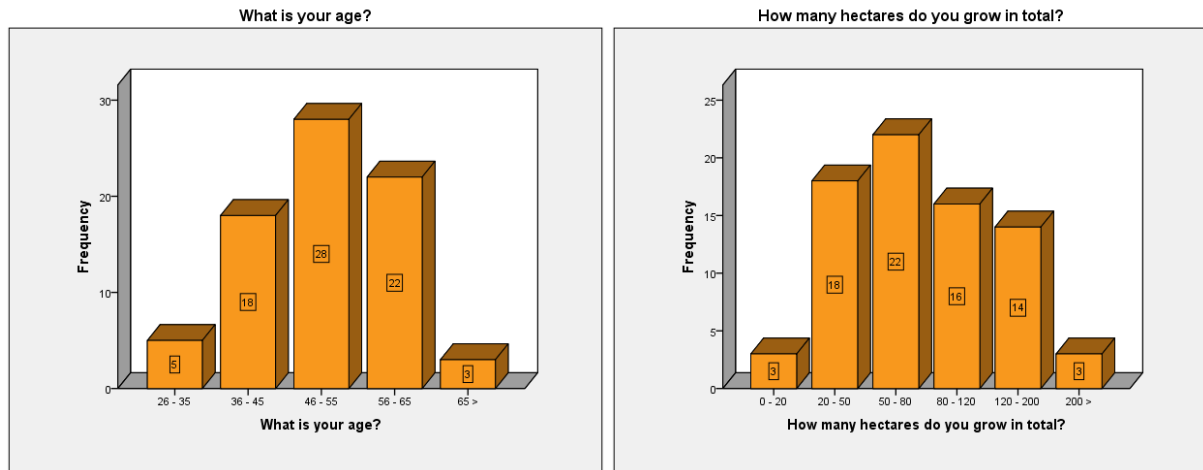


Figure 8 Age of growers and hectares grown in total

The most respondents are in the range of 46-55 years old. The second largest group is 56-65 years old. The division as can be seen in the graph of age of growers, is a representative reflection of the age of arable farmers in the Netherlands, about 5% of the growers in the Netherlands is younger than 35 years old, about 25% is between 35 and 45 years old, about 30% is between 45 and 55 years old and 40% of the growers in the Netherlands is older than 55 years old (Leguijt & Pons, 2010).

The average area grown by arable farmers is 41.3 hectares in the Netherlands (Leguijt & Pons, 2010). The average of hectares grown by the respondents is a bit higher than these 41.3 hectares, the mean in the survey lies between 50 and 80 hectares. A possible reason for this can be that the arable farmers have grown more hectares since 2010. This classification is based on an earlier research in ware potatoes that is executed during an academic consultancy project, course number ECS-66200 at Wageningen University.

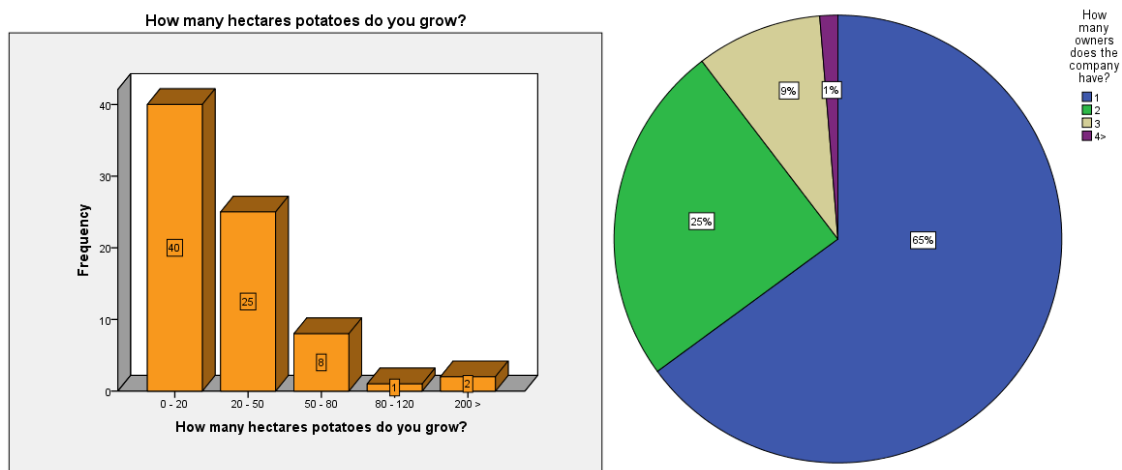


Figure 9 Hectares potatoes grown and number of owners per farm

The average hectares potatoes per grower in the Netherlands is 11 (CBS & LEI, 2012). The sample is representative, the biggest group falls between the 0-20 hectares, the number of respondents in the other ranges decreases gradually as can be seen in the graph of hectares potatoes that are grown. This classification is based on an earlier research that I did for a processor during an academic consultancy project, course number ECS-66200 at Wageningen University, to represent all sizes in groups this classification is chosen.

The numbers of owners per farm given in the pie chart are percentages. This means that about 66% of the respondents are growers that own the farm by themselves. This is good reflection of the reality in the Netherlands. About 60% of the growers are just owned by one person and 20% by two persons (Leguijt & Pons, 2010).

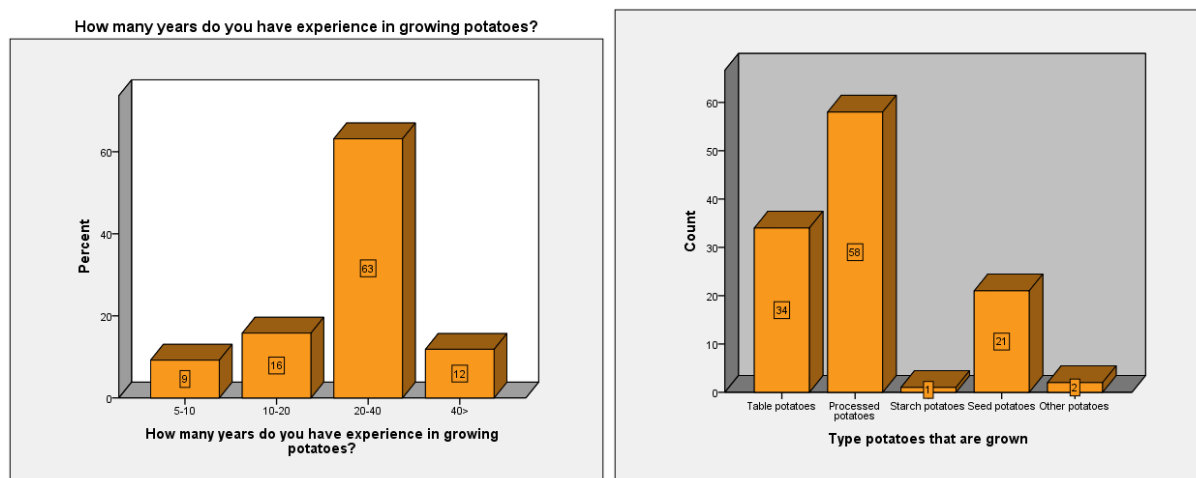


Figure 10 Years' experience in growing potatoes and type of potatoes that are grown

As can be seen in Figure 10 is that the biggest group of growers (63%) have already between 20-40 years' experience in growing potatoes. Comparing this information with the age of the growers, there can be concluded that the most growers started growing potatoes before their 25th birthday.

There are different type of potatoes, table processed, starch and seed potatoes. Table potatoes are the fresh potatoes that are only packed and/or washed but not processed, the processed potatoes are processed in products like for example French fries or chips, starch potatoes are processed in starch products and seed potatoes are grown for ware potatoes, processed and starch potatoes as seed. In the graph type of potatoes, also a category 'other potatoes is shown' these can be feed potatoes for example, used for cattle. This research focuses only on ware potatoes, these are the table and processed potatoes, but because a lot of growers also grow other types of potatoes, an indication of all types of potatoes is given in the graph.

Table and processed are the two biggest types of potatoes that are grown by the respondents. The reason for this is because the selection of the respondents is made on growers that grow these kinds of potatoes. More answers were possible, so growers selected different types of potatoes that they grow. For example some processed potato growers, grow their own seed potatoes.

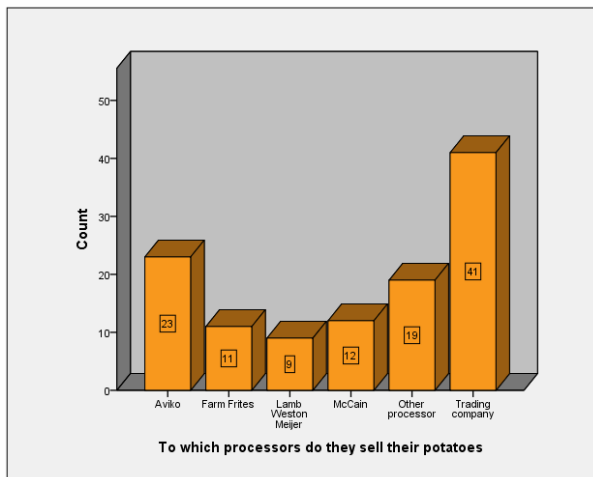


Figure 11 Processors or trading companies to who they sell their potatoes

Aviko, FarmFrites, LambWeston and McCain have about the same size as processors and are the four biggest potato processors in the Netherlands; they process 80% of the processed potatoes Dutch potatoes (Kimman, 2013). Next to them, there are about 12 other smaller processors that process 20% of the processed potatoes, there are also trading companies that deliver to the processor or retailers.

The graph above presents the processor or trading company to which the respondents deliver. Most of the respondents deliver to trading companies. Secondly, 23 respondents deliver to Aviko, which is also the biggest of the four processors in the Netherlands, but all four of the biggest processors are represented by the respondents.

Correlations

	How many hectares do you grow in total?	How many hectares potatoes do you grow?	How many owners does the farm have?	How many years experience do you have in growing potatoes?
	Correlation coefficient Significance	Correlation coefficient Significance	Correlation coefficient Significance	Correlation coefficient Significance
What is your age?	-0.394 .000	-0.301 .003	x x	0.552 0.000
How many hectares do you grow in total?	x x	0.764 0.000	0.351 0.000	x x
How many hectares potatoes do you grow?	x x	x x	0.304 0.004	x x

All tested with Kendall's tau correlation
All measured with a significance of $p < 0.1$
X = no significance

Table 4 Correlations Characteristics respondents

The age of the potato growers is negatively correlated to the hectare potatoes a grower grows. This with a correlation coefficient of -.394 and -.301 and a significance of .000 and .003. So the older the growers the fewer hectares are grown. The younger the growers the more hectares are grown. A possible explanation can be that only younger growers take over a farm that has more hectares, so they can earn enough money in the future. The amount of hectares grown in total is very strongly correlated to the amount of hectares potatoes grown with a correlation coefficient of .764 and a significance of .000. An explanation for this can be that the selection for respondents is made on potato growers.

A farm is mostly owned in a partnership by family members or just by one person. The amount of hectares in total and potatoes is positively correlated to number of owners per farm with a correlation coefficient of .351 and .304 and a significance of .000 and .004. So the more hectares are grown, the more owners a farm has. A possible explanation for this can be that the farms with more owners have more money available to grow more hectares. The age of the potato growers is positively strongly correlated to the years' experience with a correlation coefficient of .552 and a significance of .000. So the older the growers the more years' experience they have, pretty logical.

Summary

Findings:

The older the growers, the fewer hectares in total and potatoes are grown.

Older growers have more years experience in growing potatoes.

The more hectares a grower has in total, the more hectares potatoes that he grows relatively.

The more hectares potatoes that a grower has, the more owners the farm has.

Possible explanations:

Younger growers have more ambition to create a better good income and survive as entrepreneur, so want to grow in hectares.

Older growers started mostly at a young age with growing potatoes and so have more years experience than younger growers.

Potatoes are more attractive for larger growers so relatively they grow more hectares potatoes than small growers.

To get an income for more owners of a farm bigger farms are needed.

4.1.2 Risk and control

Score survey questions

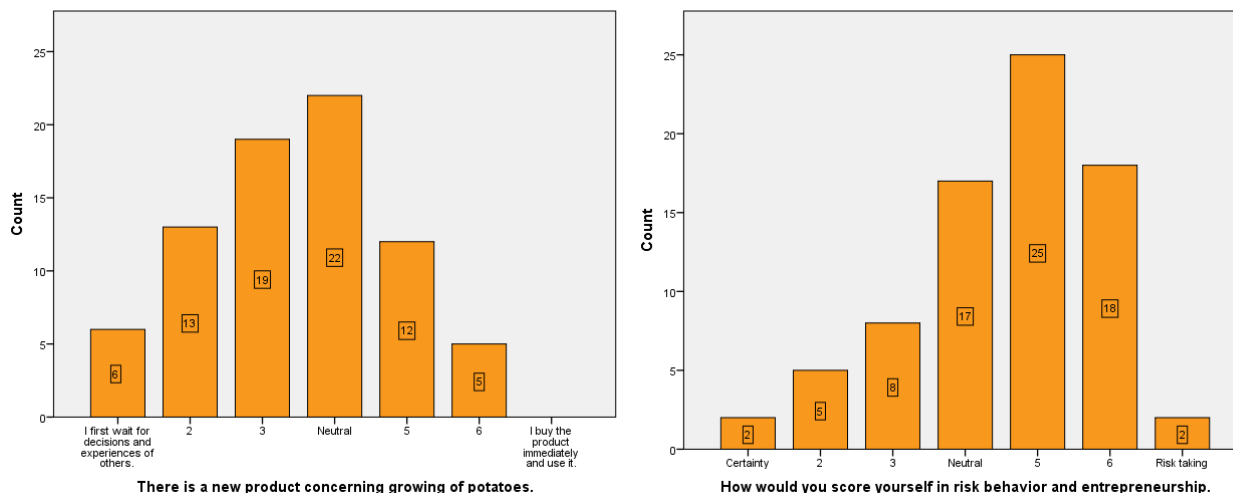


Figure 12 Score risk and control questions

In the graphs above the scores of the two risk and control questions are showed. In choosing a new product on the market concerning growing and storing, the most growers take a neutral risk position, slightly carefully waiting for decisions and experiences of others instead of buying the innovative product, like for example precision farming tools immediately. But the graph is quite normally distributed.

The score in risk behaviour and entrepreneurship that the growers rated themselves as more risk taking than the buying behaviour in new products, the top of the graph lays one step more to the right than risk neutral. So in risk behaviour like selling potatoes, the growers are more risk taking than in buying innovative products.

Correlations

	There is a new product concerning growing of potatoes; I buy it immediately or wait for decisions of others.		How would you score yourself in risk behaviour and entrepreneurship	
	Correlation coefficient	Significance	Correlation coefficient	Significance
How many years do you have experience in growing potatoes?	-0.234	0.016	-0.207	0.034
How many hectares do you grow in total?	x	x	0.216	0.020
How many hectares potatoes do you grow?	x	x	0.210	0.033
How many owners does the farm have?	x	x	0.255	0.010

All tested with Kendall's tau correlation
All measured with a significance of $p < 0.1$
X = no significance

Table 5 Correlations risk and control

In Table 5 the different significant correlations in risk and control are shown.

The years of experience in growing that the potato growers have are negatively correlated with the risk taking behaviour in new products of the growers with a correlation coefficient of $-.234$ and a significance of $.016$. This means that, when growers have more years' experience in growing potatoes they first wait for decisions and experiences of other growers before they buy a new product concerning growing of potatoes. Contrary if the growers have less years' experience in growing potatoes they sooner buy and use a new product concerning growing of potatoes. A possible reason can be that experienced growers have experienced innovative products that were not that successful and have chosen now for a more careful approach concerning buying new products. As discussed in the interviews with the growers, the experienced growers talked about their experience with new breeds, that were not that successful and that they take now more carefully decisions about new breeds.

The years' experience in growing that the potato growers have are also negatively correlated with the risk behaviour and entrepreneurship with a correlation coefficient of $-.207$ and a significance of $.034$. This means, when growers have less years' experience in growing potatoes they take more risks in entrepreneurship. Contrary if the growers have more years' experience in growing potatoes they choose more for a certain risk behaviour and entrepreneurship. A possible reason for this can be that the less experienced growers are not afraid to take risks and the more experienced growers are less ambitious.

The size of the potato growers in total and in potatoes are positively correlated to the risk behaviour and entrepreneurship of the potato growers, with a correlation coefficient of $.216$ and $.210$ and a significance of $.020$ and $.033$. So the more hectares a potato grower has in total or in potatoes, the more risk taking he is. Contrary smaller growers will take less risk and choose for a certain risk behaviour and entrepreneurship. As an outcome of the interviews, a possible reason for this can be that larger growers think they have more trading power than smaller growers and smaller growers think have less trading power. With this trading power the larger growers dare to take more risk than the smaller growers.

The number of owners per farm is positively correlated with the risk behaviour and entrepreneurship with a correlation coefficient of $.255$ and a significance of $.010$. This means if a farm is owned by more owners the growers are more risk taking. Farms with just one owner are more risk averse and choose for a certain risk behaviour and entrepreneurship. A possible reason for this can be that the farms with more owners can share the risk more than farm that are owned by just one owner.

Summary

Findings:

The less experienced growers take more risks than the experienced growers.

The larger growers are more risk taking than the small growers.

The more owners a farm has, the more risk taking they are.

Possible explanations:

Experienced growers have tried before innovative products that weren't that successful and have now chosen for a more careful approach concerning buying new products.

Larger growers think they have more trading power than smaller growers and can easier handle (small) risks than smaller growers.

Farms with more owners are often bigger and so can easier handle (small) risks than smaller growers.

4.1.3 Performance

Score survey questions

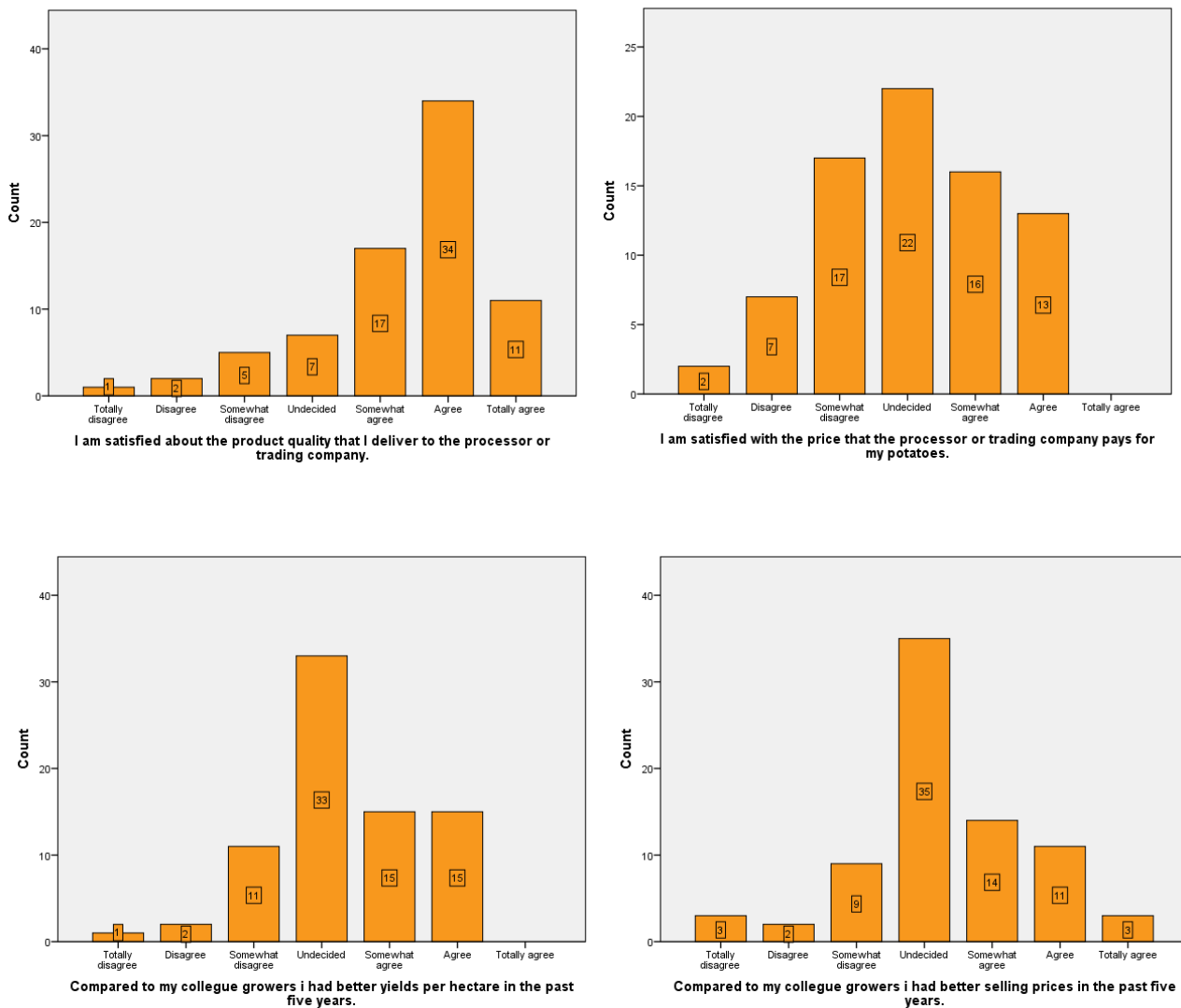


Figure 13 Score performance questions

In the graphs above the scores of the four performance questions are shown.

The growers are quite satisfied with the quality that they deliver to the processor or trading company, just a few growers aren't. About the satisfaction about the price paid by the processor or trading company, the most growers are undecided, normally distributed but more unsatisfied than about the quality.

Also in comparison with colleague growers about yields per hectare in the past five years, the most answered is undecided, with a light tendency to the right.

The same applies for the comparison with colleague growers about selling prices in the past five years. The most growers give an undecided score with also a light tendency to the right.

Correlations

	I am satisfied with the price that the processor or trading company pays for my potatoes.		Compared to my colleague growers I had better yields per hectare in the past five years.		Compared to my colleague growers I had better selling prices in the past five years.	
	Correlation coefficient	Significance	Correlation coefficient	Significance	Correlation coefficient	Significance
How many owners does the farm have?	0.182	0.067	x	x	0.172	0.088
How many years do you have experience in growing potatoes?	x	x	-0.205	0.039	x	x
What is your age?	x	x	x	x	-0.162	0.090
How many hectares do you grow in total?	x	x	x	x	0.234	0.013
How many hectares potatoes do you grow?	x	x	x	x	0.195	0.049
How would you score yourself in risk behaviour and entrepreneurship?	x	x	x	x	0.310	0.001

All tested with Kendall's tau correlation
 All measured with a significance of $p < 0.1$
 X = no significance

Table 6 Correlations performance

The number of owners per farm is positively correlated with the satisfaction of the price paid by the processor or trading company with a correlation coefficient of .182 and a significance of .067. This means if a farm is owned by more owners, the growers are more satisfied with the paid price by the processor or trading company. Farms with just one owner are less satisfied with the price paid by the processor or trading company. A possible reason for this can be that farms with more owners have more chance for discussion than farms owned by just one owner.

The number of owners is also positively correlated with the score growers give themselves in comparing the selling prices in the past five years, with a correlation coefficient of .172 and a significance of .088. This means that when a farm is owned by one person, he thinks he gets worse selling prices compared to colleague growers in the past five years. For farms that are owned by more people, it is the other way around. A possible reason for this can be the same as the satisfaction of the paid price, namely that farms with more owners have more chance for discussion with each other than farms owned by just one owner.

The years' experience in growing that the potato growers have are negatively correlated with the score growers give themselves in comparing their yield per hectare with colleague growers, with a correlation coefficient of $-.205$ and a significance of $.039$. This means, when growers have more years' experience in growing potatoes they think that they have worse yields per hectare compared to colleague growers in the past five years. Contrary if the growers have less years' experience in growing potatoes they think that they have better yields per hectare compared to colleague growers in the past five years. A possible explanation for this can be that less experienced growers think that they are better and experienced growers are more humble. The age of the potato growers is negatively correlated with the score growers give themselves in comparing the selling prices in the past five years, with a correlation coefficient of $-.162$ and a significance of $.090$. So older growers think that they get worse selling prices compared to colleague growers in the past five years. Contrary, younger growers think that they get better selling prices compared to colleague growers. A possible explanation for this can be the same as for the experienced growers and yields per hectare, namely that less experienced growers think that they are better traders and experienced growers are more humble.

The amount of hectares in total and amount of hectares potatoes is positively correlated with the score growers give themselves in comparing the selling prices in the past five years, with a correlation coefficient of $.234$ and $.195$ and a significance of $.013$ and $.049$. The more hectares that are grown, the better the growers score them on selling price compared to colleague growers in the past five years. A possible reason for this can be as said by growers in the interviews that that larger growers think that they have more power and small growers think they have less power regarding processors or trading companies.

The risk behaviour and entrepreneurship is positively correlated with the score growers give themselves in comparing the selling prices in the past five years, with a correlation coefficient of $.310$ and a significance of $.001$. So, risk taking growers think that they get better selling prices compared to colleague growers in the past five years. For small growers it is the other way around. A possible reason for this can be that risk taking growers store their potatoes for longer time than others, what is more risky but will give often a better price. The longer potatoes are stored, the more the quality can decrease, but often the better the prices are.

Summary

Findings:

Growers are more satisfied with the quality that they deliver than the price they get for their products.

The farms with more than one owner are more satisfied with the selling prices of their potatoes.

The less experienced growers think they had better yields per hectare in the last five years.

The larger growers think that they had better selling prices in the last five years

The risk taking growers think that they had better selling prices

Possible explanations:

The growers have less influence on the price, quality can be tuned more.

Farms with more owners have more chance for discussion and reflection than farms owned by just one owner and so being less critical to themselves.

Less experienced growers think that they are better and experienced growers are more humble.

Large growers have more power than smaller growers because of their size.

Risk taking growers store their potatoes longer than other growers to get a better price because of a price increase during the season.

4.1.4 Social capital

Score survey questions

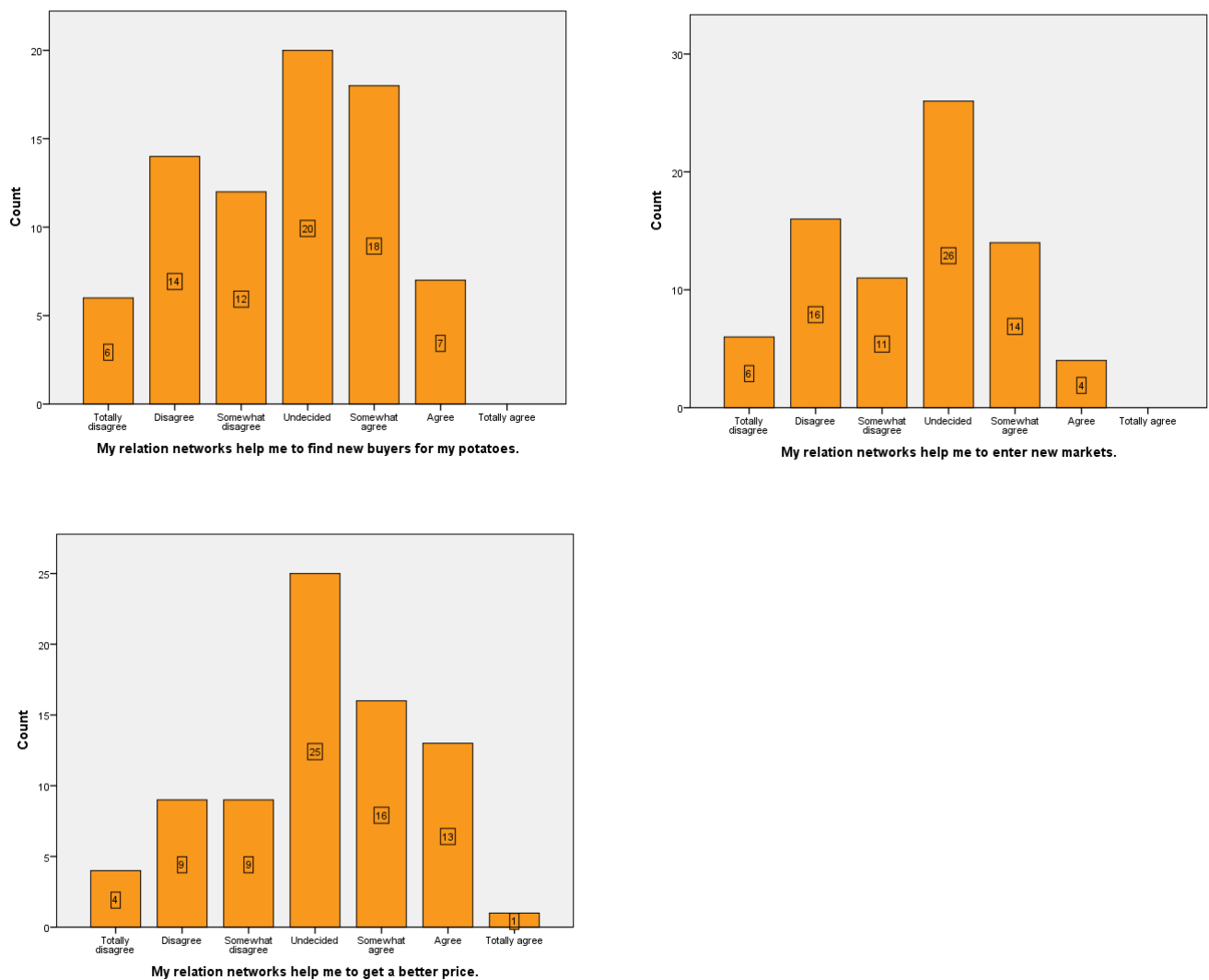


Figure 14 Score social capital questions

The graphs above show the scores of the three social capital questions. The relation networks for growers are mostly other growers, purchasing persons of processors or trading companies, agriculture federations, banks or local governments.

The most growers score the relation networks that help to find new buyers for their potatoes, to enter new markets and to get a better price, undecided. The graph to find new buyers and enter new markets has a light tendency to the left, the graph to get a better price has this tendency to the right.

Correlations

	My relation networks help me to find new buyers for my potatoes.		My relation networks help me to enter new markets.		My relation networks help me to get a better price.	
	Correlation coefficient	Significance	Correlation coefficient	Significance	Correlation coefficient	Significance
How many hectares do you grow in total?	0.252	0.006	0.215	0.020	0.23	0.013
How many hectares potatoes do you grow?	0.283	0.004	0.237	0.016	0.226	0.021
What is your age?	x	x	x	x	-0.156	0.099

All tested with Kendall's tau correlation
All measured with a significance of $p < 0.1$
X = no significance

Table 7 Correlations social capital

The amount of hectares in total and potatoes is positively correlated with how relation networks help growers to find new buyers for their potatoes with a correlation coefficient of .252 and .283 and a significance of .006 and .004. This means that large farms have relation networks that help them more to find new buyers for their potatoes, small farms have less of these contacts. A possible explanation for this can be that large farms have bigger networks. They are more interesting business relationships for stakeholders instead of small growers because with those growers they can cover more demand for their plants. They also have more efficiency in transport because of filling up trucks at one grower instead of filling a truck at two different locations.

The amount of hectares in total and potatoes is positively correlated with how relation networks help growers to enter new markets with a correlation coefficient of .215 and .237 and a significance of .020 and .016. Relation networks help larger farms more to enter new markets in contrary to small farms. A possible reason for this can be the same as above, namely that they have bigger networks.

The amount of hectares in total or potatoes is positively correlated with how relation networks help growers to get a better price, with a correlation coefficient of .230 and .226 and a significance of .013 and .021. This means that large farms have relation networks that help them to find get better prices and small farms have this less. A possible explanation for this can be that the larger growers have more trading power because of their larger volumes what are necessary to collect for processors.

The age of the potato growers are negatively correlated with how relation networks help them to get a better price with a correlation coefficient of $-.156$ and a significance of $.099$. This means that older growers have less help from relation networks to get better prices in comparison with younger growers. A possible reason for this that younger growers are more from a network generation also due to the social media like for example LinkedIn, which can create value for them in selling their potatoes.

Summary

Findings:

The larger farms have more support in their relation networks to find new buyers, enter new markets or to get better prices.

Younger growers have more support from their relation networks than the older growers

Possible explanations:

Larger growers have more trading power than the small growers because of their size. They are not only more attractive to processors or trading companies because they are harder to replace. But they can also be more attractive to fertilizer suppliers what can be part of their relation networks. Because of this power they will get more support because processors and trading companies will also have benefits from them and contacts are closer.

Younger growers are mostly better educated than older growers.

4.2 Vertical relationships

4.2.1 Information sharing

Score survey questions

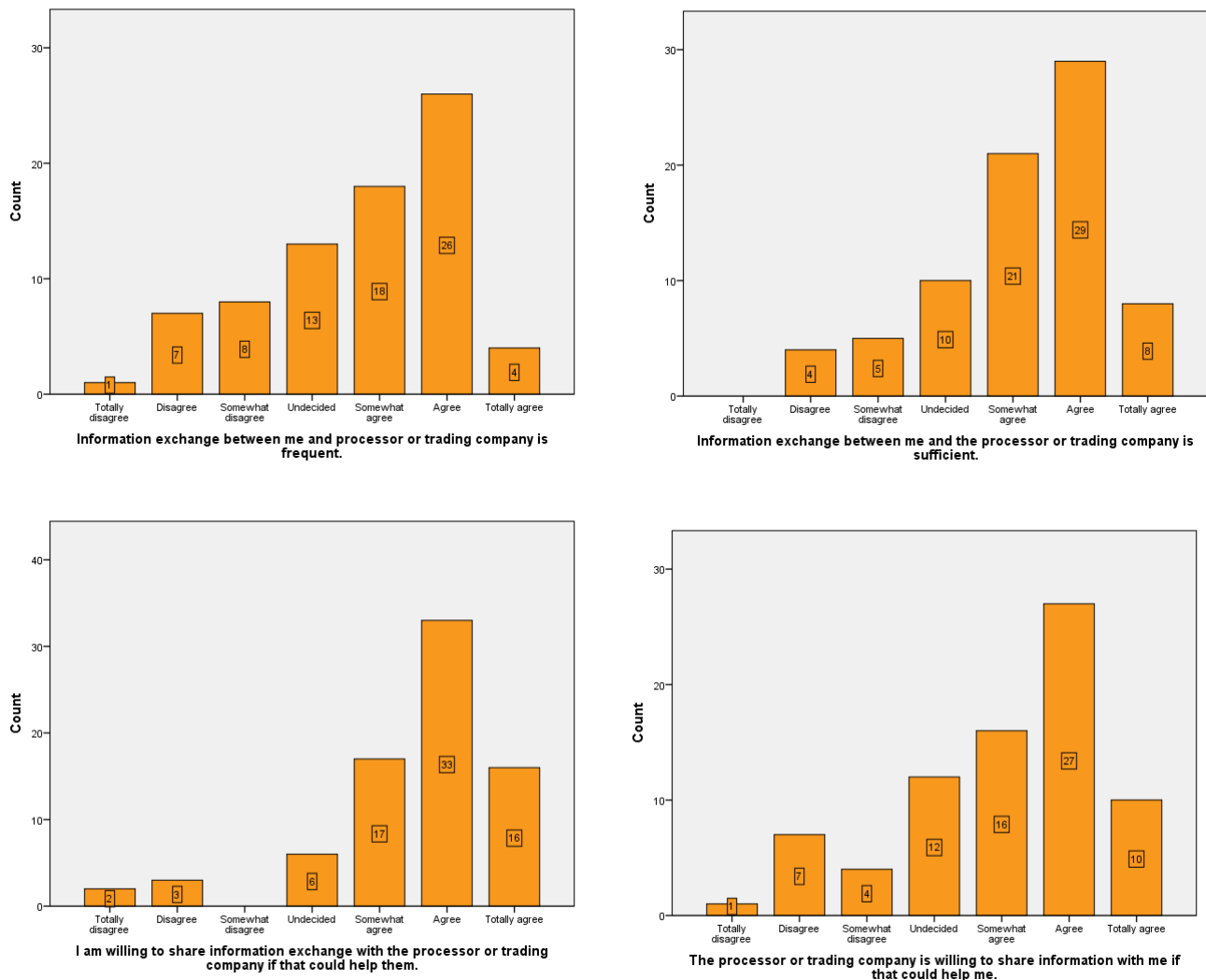


Figure 15 Score information sharing questions

In the graphs above the scores of the four vertical relationships questions are showed. In all the four graphs the most growers agree about the information sharing between the growers and processor or trading company. A rising score from left to the right can be seen. Nevertheless not all growers agree, so for the processors there is still improvement to make, in information sharing about process or market conditions with the potato growers. But as said by several processors in the interviews, there will always be growers that switch and don't want to build a sustainable business relationship and as written in the literature study: 'Information sharing and trust, create often a relationship and involves a higher degree of interdependency between supply chain partners.' (Kwon & Taewon, 2005) So if processors or growers want to build a sustainable business relationship, they have to give their business parties more trust by sharing more information and being more transparent.

Correlations

	I am willing to share information with the processor or trading company if that could help them.	
	Correlation coefficient	Significance
What is your age?	0.201	0.037

All tested with Kendall's tau correlation
 All measured with a significance of $p < 0.1$
 X = no significance

Table 8 Correlations information sharing

The age of the potato growers is positively correlated with how the growers are willing to share information with the processor or trading company if that could help them, with a correlation coefficient of .201 and a significance of .037. So, older growers are more willing to share information with the processor or trading company, in comparison with younger growers. A possible reason for this can be that the older growers have longer relationships with processors or trading companies so that they are more willing to share information. As some growers said in the interviews that they have been delivering for several years to the same processor or trading company, because they were happy with the good relationship and that is good for both parties.

Summary

Findings:

Older growers are more willing to share information with the processor or trading companies than younger growers.

Possible explanations:

Older growers have longer relationships and stay more loyal to the processor or trading companies, as concluded from the interviews with the growers.

4.2.2 Trust

Score survey questions

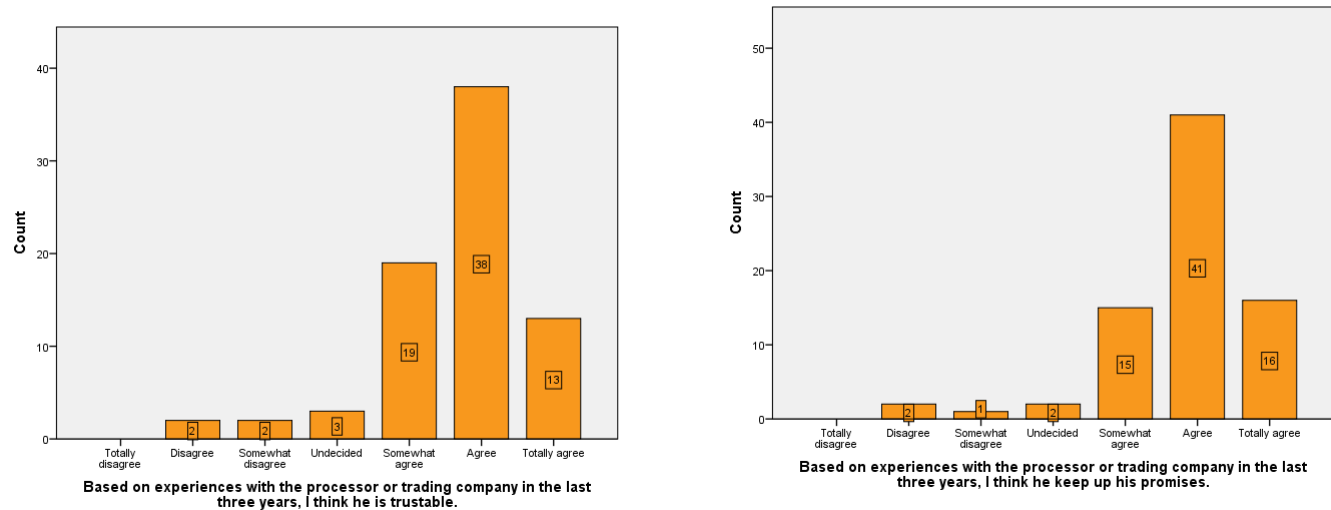


Figure 16 Score trust questions

The biggest group of growers think that the processor or trading company is trustable and keeps promises, but the question about keeping promises scores slightly better. To reach sustainable business relationships, trust is a fundamental aspect, so these score gives a positive perspective to the future. As said in the interviews with the processors, there will be always a few growers that don't trust the processors. But still the processors or trading companies can make improvements to get more growers so far that they give the score totally agree instead of somewhat agree in the future. Because as said in the literature study: 'Trust can be defined as a partner's ability to perform according intentions and expectations of a relationship or not to defect his or her intentions.' (Nooteboom *et al*, 1997) This corresponds with the interviews with the growers, because they indicated that trust in the processor or trading company is very important to build sustainable business relationships.

Correlations

	Based on experiences with the processor or trading company in the last three years, I think he is trustable.		Based on experiences with the processor or trading company in the last three years, I think he keep up his promises.	
	Correlation coefficient	Significance	Correlation coefficient	Significance
How would you score yourself in risk behaviour and entrepreneurship?	-0.164	0.088	x	x
Information exchange between me and processor or trading company is frequent.	0.388	0.000	0.302	0.002
Information exchange between me and the processor or trading company is sufficient.	0.284	0.003	0.330	0.001
I am willing to share information with the processor or trading company if that could help them.	0.435	0.000	0.256	0.009
The processor or trading company is willing to share information with me if that could help me.	0.481	0.000	0.351	0.000
How many years do you have experience in growing potatoes?	x	x	0.189	0.062
My relation networks help me to find new buyers for my potatoes.	x	x	-0.167	0.082
My relation networks help me to enter new markets.	x	x	-0.195	0.043

All tested with Kendall's tau correlation
 All measured with a significance of $p < 0.1$
 X = no significance

Table 9 Correlations trust

The risk behaviour and entrepreneurship is negatively correlated to how trustable growers score the processors or trading company based on experiences in the last three years with a correlation coefficient of -.164 and a significance of .088. This means that the more risk taking growers have less trust in the processors or trading companies and the more certain growers have more trust in the processors or trading companies. A possible reason for this can be that the risk taking growers have less trust in the processors or trading companies because they change more from processor or trading company and do not build a sustainable business relationship. In the interviews with the processors, they indicated that the more risk taking growers are never happy and do not trust all the different processors and trading companies.

Remarkable is that the relation networks that help to find new buyers are not correlated to how trustable a processor or trading company is scored. Here would be expected that the growers that don't trust the processor, have larger relation networks because they switch more from processor.

The frequency and sufficiency of information exchange between grower en processor or trading company are positively correlated to the score of trust the growers gave the processors or trading company, based on experiences in the last three years with a correlation coefficient of .388 and .284 and a significance .000 and .003. So if growers feel that the information exchange is frequent or sufficient they also score the processors or trading companies as trustable. A possible explanation can be that growers are only satisfied with the frequency and sufficiency of information if they trust the processor or trading company.

How much the growers are willing to share information with the processor or trading company if that could help them, is strong positively correlated to the score of trust the growers gave the processors or trading company, based on experiences in the last three years with a correlation coefficient of .435 and a significance of .000. This means when growers are willing to share information with the processor or trading company, that they trust them. Also here a possible reason can be that growers only are willing to share information if they trust the processor or trading company.

The opinion from growers about how much processors or trading companies are willing to share information is strong positively correlated to how trustable growers score the processors or trading company based on experiences in the last three years with a correlation coefficient of .481 and a significance of .000. So the growers that think the processors or trading companies are willing to share information also think they are trustable.

The frequency and sufficiency of information exchange are positively correlated with how growers score the processors or trading companies on keeping promises based on experiences in the last three years with a correlation coefficient of .302 and .330 and a significance of .002 and .001. So the growers that think the information exchange is sufficient and frequent, also think that processors or trading companies keep promises based on experiences in the last three years.

The willingness from processor or trading company and grower are positively correlated to how growers score the processors or trading companies on keeping promises based on experiences in the last three years with a correlation coefficient of .256 and .351 and a significance of .009 and .000. This means that the growers that think they are willing to share information or think that the processor is willing to share information also think that the processors keep promises more than others. Again a possible reason for this can be that the willingness to share information only exists if the growers trust the processors or trading companies.

The years' experience in growing potatoes are positively correlated to how growers score the processors or trading companies on keeping promises based on experiences in the last three years with a correlation coefficient of .189 and a significance of .062. So, experienced growers think that processors or trading companies keep up promises more than less experienced growers. A possible reason for this can be that the experienced growers have had positive experiences with promises of processors or trading companies.

The relation networks that help to find new buyers or enter new markets are negatively correlated with how growers score the processors or trading companies on keeping promises based on experiences in the last three years with a correlation coefficient of $-.167$ and $-.195$ and a significance of $.082$ and $.043$. So the growers that have relation networks that help them to find new buyers or enter new markets, think that processors keep up less to promises. A possible reason for this can be that growers stay loyal to processors or trading companies and the growers that are seeking for new buyers or markets do not think that a processor or trading company keep promises.

Summary

Findings:

The more risk taking growers have lower trust in the processing or trading companies.

The more experienced growers think more that the processors or trading companies keep promises than the inexperienced growers.

The growers that have good experiences in information sharing with the processor or trading company think more that they are trustable and keep promises.

Possible explanations:

These think that they can get better prices than the processor or trading company normally give by taking more risk. They think that the processing or trading companies have too much influence on the prices

The experienced growers may had positive experiences about it in the past.

Experiences in information sharing create trust at the potato growers.

4.2.3 Transaction costs

Score survey questions

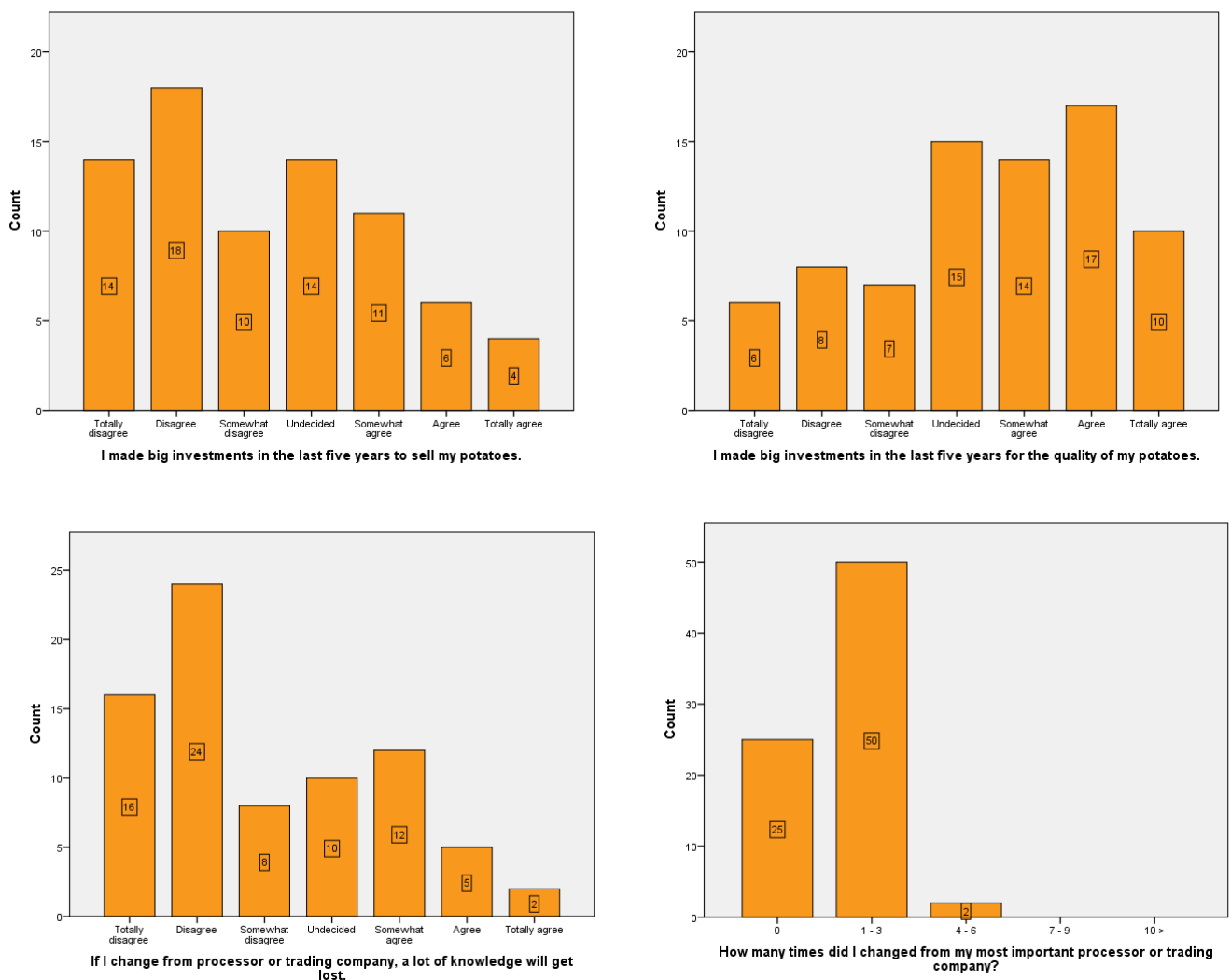


Figure 17 Score transaction costs

In the two upper graphs you can see the big investments made by the potato growers in the past five years. In the graph of investments concerning selling of potatoes the score is quite distributed, but the biggest part of the growers did not made big investments to sell their potatoes. For the graph of investments concerning quality of potatoes it is the other way around. The biggest part here did make investments in the last five years for the quality of their potatoes. A reason for this difference in score is probably because the quality of potatoes encloses the whole process (growing and storage) and to sell their potatoes is encloses more storage, like storages and means of transport. Examples of investments for quality can be better machinery, production input or sheds. Examples of investments to sell the potatoes are mostly (better) sheds, because then they can store their potatoes longer and have more time to sell their potatoes, what can result in a better price.

The biggest part of the growers disagrees about the fact that if there is switched from processor or trading company, a lot of knowledge will be lost. This in contrast with the needs for a sustainable business relationship as said in the information sharing analysis.

Most growers changed 1-3 times from most important processor or trading company in the past 10 years, the second biggest group did not change in the past 10 years. So to create more sustainable business relationships, an improvement for the processors or trading companies can be made in trying to get the growers more loyal to them.

As said in the interviews, the price and quality are the most important for the growers, if that is not good enough, they switch. So if the processors or trading companies focus on the aspects they probably can get the growers more loyal.

Correlations

	I made big investments in the last five years to sell my potatoes.		I made big investments in the last five years for the quality of my potatoes.		If I change from processor or trading company, a lot of knowledge will get lost.		How many times did I changed from my most important processor or trading company?	
	Correlation coefficient	Significance	Correlation coefficient	Significance	Correlation coefficient	Significance	Correlation coefficient	Significance
What is your age?	-0.205	0.028	-0.312	0.001	0.223	0.017	x	x
How many hectares do you grow in total?	0.182	0.045	0.281	0.002	x	x	x	x
How many hectares potatoes do you grow?	0.323	0.001	0.379	0.000	x	x	x	x
How many years do you have experience in growing potatoes?	x	x	-0.158	0.097	0.198	0.041	x	x
My relation networks help me to enter new markets.	x	x	x	x	x	x	0.224	0.027
My relation networks help me to get a better price.	x	x	x	x	x	x	0.196	0.053
Information exchange between me and processor or trading company is frequent.	x	x	x	x	x	x	-0.203	0.046
Information exchange between me and the processor or trading company is sufficient.	x	x	x	x	x	x	-0.210	0.041
I am willing to share information with the processor or trading company if that could help them.	x	x	x	x	x	x	-0.219	0.035

All tested with Kendall's tau correlation
All measured with a significance of $p < 0.1$
X = no significance

Table 10 Correlations Transaction costs

The age of the potato growers is negatively correlated with the big investments made by the growers in the past five years to sell their potatoes, with a correlation coefficient of $-.205$ and a significance of $.028$. So, younger growers made more big investments instead of older growers to sell their potatoes, pretty logical. A possible reason for this can be that younger growers want to invest in their own future by building new sheds or means of transport and the older grower think more about finishing their career or retirement.

The amount of hectares in total and potatoes are positively correlated with big investments made in the last five years to sell their potatoes with a correlation coefficient of $.182$ and $.323$ and a significance of $.045$ and $.001$. This means that the bigger farms have made more big investments the past five years to sell their potatoes instead of small farms. As can be seen in the introduction, the amount of hectares per hectare is increasing, so farms are becoming bigger and bigger. So a possible explanation can be that the growers that are bigger in size need more investments and smaller farms don't invest because they have for example also another job, want to sell the farm, are almost retired or other reasons.

The age and years' experience of the potato growers are negatively correlated with big investments made in the last five years for the quality of their potatoes with a correlation coefficient of $-.312$ and $-.158$ and a significance of $.001$ and $.097$. So the older the grower and the more experienced, the less big investments for quality are made. The other way around, the younger and inexperienced growers made more big investments. A same possible reason for this can be that younger growers want to invest in their own future by building new sheds, buying machinery or specific quality goods and the older grower think more about finishing their career or retirement.

The amount of hectares in total and potatoes are positively correlated with big investments made in the last five years for the quality of the potatoes with a correlation coefficient of $.281$ and $.379$ and a significance of $.002$ and $.000$. This means that the bigger farms have made more big investments the past five for the quality of their potatoes instead of small farms. Here the same possible explanation can be given as above about the investments concerning the selling of potatoes.

The age and years' experience of the potato growers are positively correlated with the score growers gave if knowledge is lost when they switch from processor or trading company with a correlation coefficient of $.223$ and $.198$ and a significance of $.017$ and $.041$. So the younger and inexperienced growers think less knowledge is wasted if you switch from processor or trading company, the older and experienced growers think the other way around. A possible reason for this can be that the more experienced growers have switched already several times, less experienced growers not and the more experienced growers experienced that a lot of knowledge is wasted.

The relation networks that help to enter new markets and get a better price are positively correlated to the times that the growers changed from most important processor or trading company in the last 10 years with a correlation of $.224$ and $.196$ and a significance of $.027$ and $.053$. So the growers that have more help from relation networks have changed more from processor or trading company than others. A reason for the switching can be that these growers are more trading growers and use more relation networks.

The frequency and sufficiency of information exchange is negatively correlated with the times that the growers changed from most important processor or trading company in the last 10 years with a correlation coefficient of $-.203$ and $-.210$ and a significance of $.046$ and $.041$. This means that growers that think that the information exchange is sufficient and frequent, changed less than the others. So the growers that are satisfied with the information exchange stay more loyal.

The willingness to share information with the processor or trading company if that could help them is negatively correlated to the times that the growers changed from most important processor or trading company in the last 10 years with a correlation coefficient of -.219 and a significance of .035. The growers that are willing to share information with the growers stay more loyal to the processors or trading companies than other growers. So to create a sustainable business relationship the processors and trading companies have to get their growers more loyal and then they will probably also share more information.

Summary

Findings:

Younger growers made more big investments compared to older growers to sell their potatoes the past five years.

The larger and younger growers invested more in the past five years.

The younger and inexperienced growers think less knowledge is wasted if you switch from processor or trading company, the older and experienced growers think the other way around.

The grower with more relation networks changes more from processor or trading company.

The growers that share more information switched less than the other growers.

Possible explanations:

Younger growers want to invest in their own future by building new sheds or means of transport and the older grower think more about retirement.

The smaller and older growers have also another job, are going to retire, made big investments before this 5 year border or want to sell their farm. Larger growers invest more often to keep growing.

A possible reason for this can be that the more experienced growers have switched already several times, less experienced growers not and the more experienced growers experienced that a lot of knowledge is wasted.

They use their networks more and switch more easily because of their relation networks that help them to find new buyers.

If more information is shared, growers will stay more loyal or the other way around. Growers maybe only share information if they want a long-term relationship.

4.3 Horizontal cooperation

Score survey questions

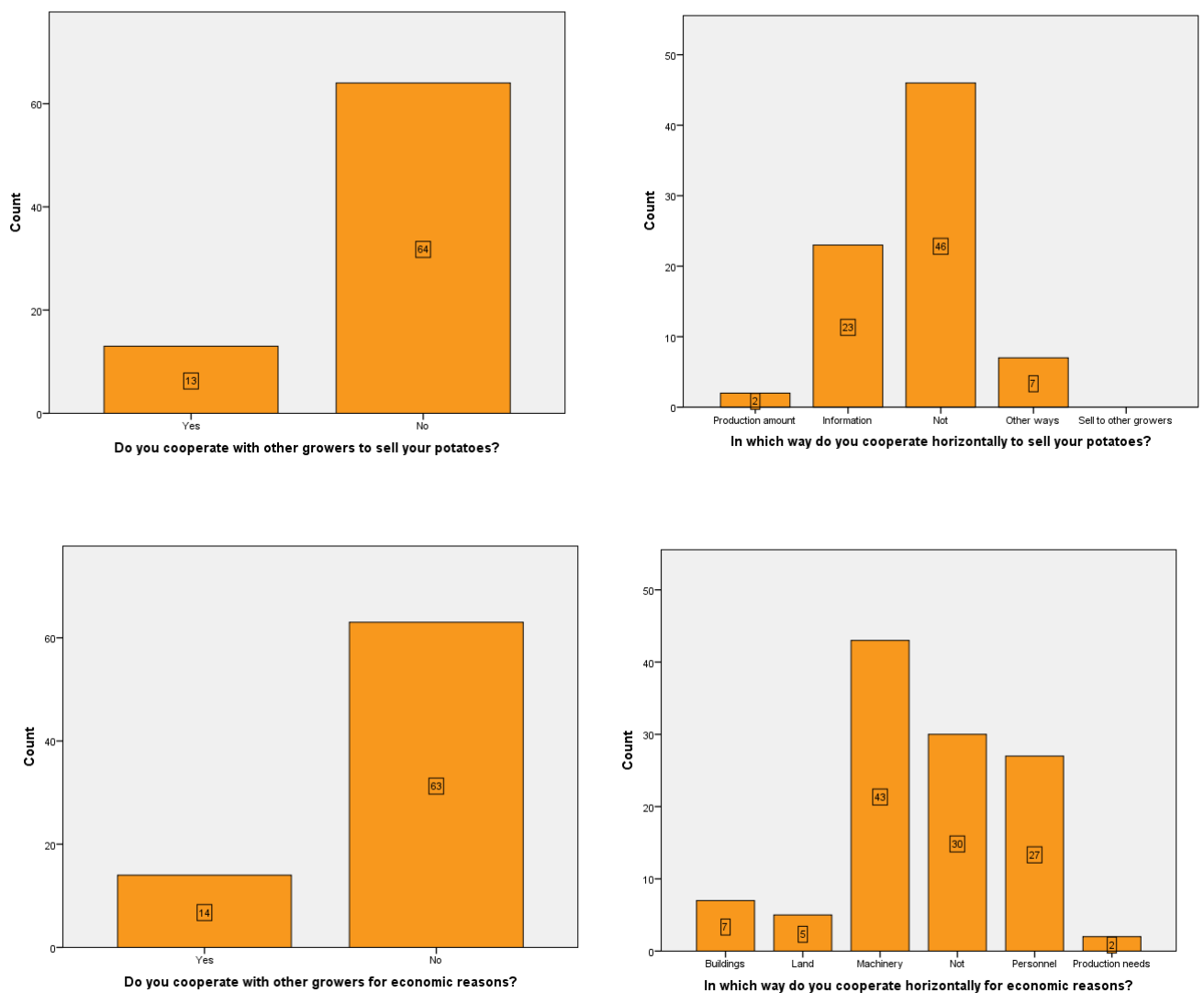


Figure 18 Score horizontal cooperation

Most of the growers do not cooperate to sell their potatoes or for economic reasons. If they do cooperate to sell their potatoes they mostly share information. As said by different growers in the interviews, it is hard to cooperate in selling potatoes because you have to trust the cooperating partner and have the same opinion, especially if it concerns your income. If they do cooperate for economic reasons they do this mostly in machinery and personnel. Also said in the interviews with the growers that is hard to cooperate for economic reasons because for example a machine is mostly needed at both places at the same time. The difference in the two graphs above about cooperation to sell the potatoes is because the first question is understood in another way as the second, because some growers may interpret sharing information as form of horizontal cooperation.

Frequency graph

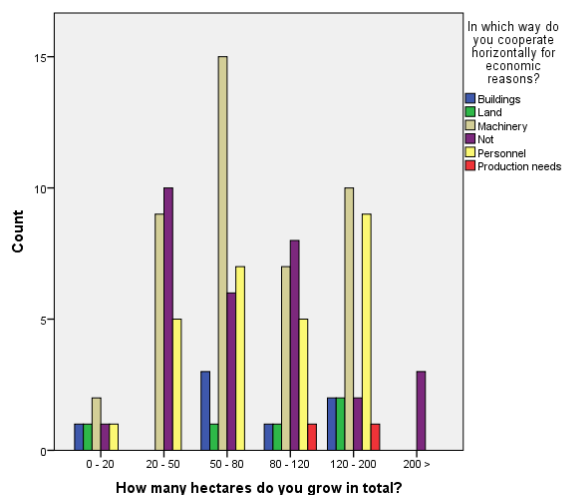


Figure 19 Frequency graph horizontal cooperation

The horizontal cooperation over the different sizes of growers is quite equal. Only horizontal cooperation in production input takes place at large growers. A possible explanation for this can be that these big growers cooperate in production input to create even more power to get more discounts.

Summary

Findings:

The most growers do not cooperate to sell their potatoes or for economic reasons, but if they do it is in sharing information for selling their potatoes and in machinery or personnel for economic reasons.

Only the larger growers are cooperating in production input.

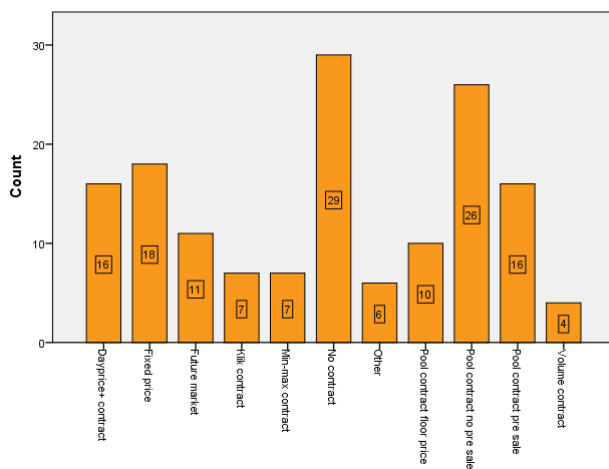
Possible explanations:

The machinery and personnel are often needed at the same time. For example if the potatoes need to be yield, colleague growers also need a yielding machine and personnel (Zuidhof, 2014).

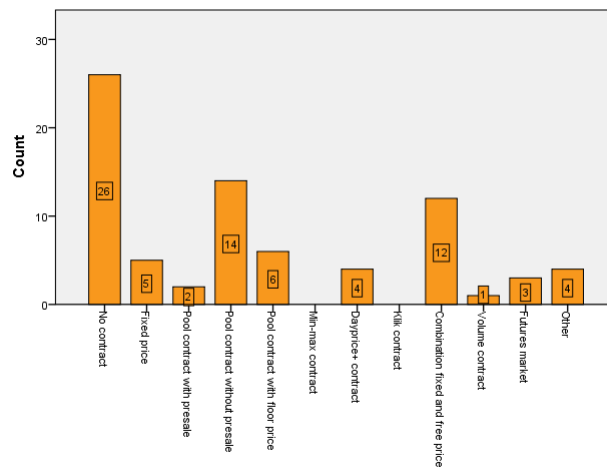
They can create in this way even more power for discounts.

4.4 Contract

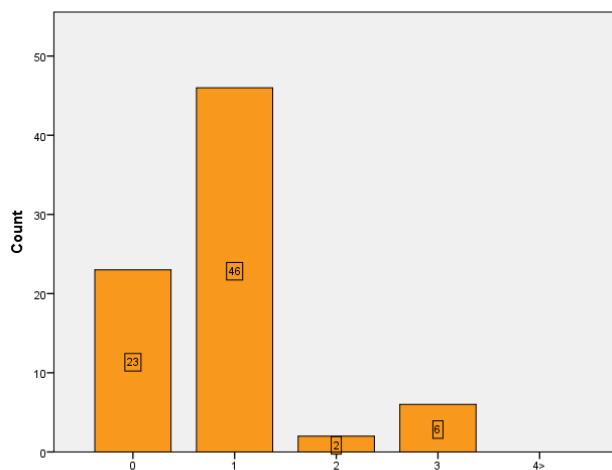
Score survey questions



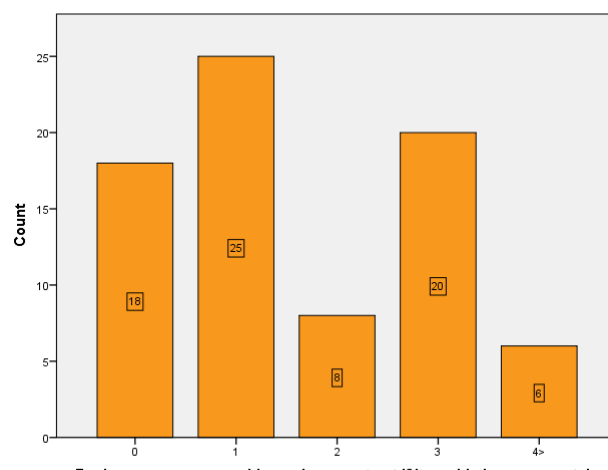
Which type of contract do you use?



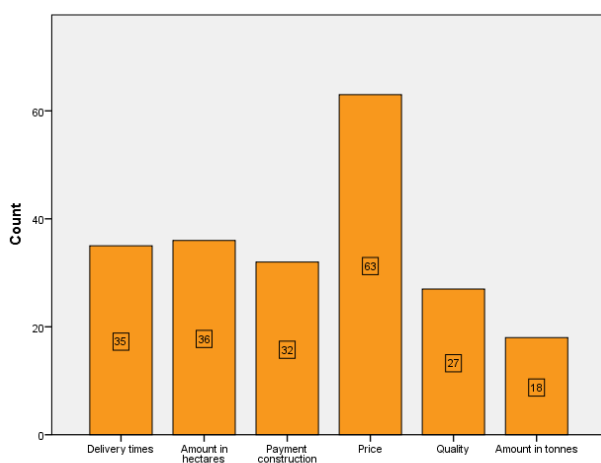
Which type of contract do you prefer?



For how many years do you sign a contract?



For how many years would you sign a contract if it would give you a certain future?



Which aspects would you freeze in a contract for several years?

Figure 20 Score contract

Contract	Short description
Pool contract	Growers combine their sales volume what is sold mostly by a pool comission (growers from the pool) that determine when the potatoes are sold, mostly several times in a season to create a average price over the season. All growers that join the pool get the same average price. Within pool contracts there are several options to sell: in advance, not in advance or with floor prices.
Klik contract	Grower can click the price when he wants to sell the potatoes to the processor. The price is based on the price of the future market when is clicked.
Future contract	Growers sells the potatoes on a stock market in standard contracts for a delivery in the future. Here the grower need to pay a broker contribution and has got the duty to deliver the sold prices.
Dayprice contract/volume contract	Only the volume and month is fixed, the price is determined by the dayprice at delivery.
Fixed price contract	The volume, sales period and price are all three determined in advance by the grower and processor in hectares, tonnes or a combination of both.
Min/max	Grower and processor determine a price, the difference between this price and the stock prices are shared by the grower and processor.

Table 11 Contract types (Janssens et al, 2012)

To understand the contract types that are given in Figure 20, in Figure 21 the contract types are elaborated.

The most used contracts are the pool contracts and no contracts, followed by the fixed price and day price+ contracts. Less used are the future market, klik contracts, min-max contracts and the volume contracts. In the interviews with the processors it was said that about 90% of the potato growers were contracted, this means that in this sample pretty much non contracted growers filled in, this can be pitfall for the results. This is also described in the discussion chapter.

Then if you compare the contracts that they use with what they prefer, there can be seen that here the most choose for no contract followed by pool contracts and a combination of free and fixed price. This difference can be explained because the growers use different kind of contracts, so also maybe some for small parts of their total amount and in preferring they just choose one type of contract.

The most growers sign a contract for one year, followed by no contract (zero years). Just a few sign for two or three years. If this score is compared with the years they sign a contract if it would give them a more certain future, a big positive difference can be seen. Much more two and three years are signed and even some growers sign contracts then for 4 or more years.

Even though the most growers prefer no contract, they want to freeze the price in a contract for several years. The other aspects are scored more or less the same, only the amount in tonnes is not that attractive for growers to freeze, probably because it is hard to predict what the amount of tonnes yield is.

Correlations

	For how many years do you sign a contract?		For how many years would you sign a contract if it would give you a certain future?	
	Correlation coefficient	Significance	Correlation coefficient	Significance
How many owners does the farm have?	-0.185	0.080	-0.241	0.016
How would you score yourself in risk behaviour and entrepreneurship?	-0.422	0.000	-0.374	0.000
Compared to my colleague growers I had better selling prices in the past five years.	-0.272	0.007	-0.193	0.042
My relation networks help me to find new buyers for my potatoes.	-0.171	0.081	x	x
The processor or trading company is willing to share information with me if that could help me.	0.264	0.007	x	x
Based on experiences with the processor or trading company in the last three years, I think he is trustable.	0.302	0.003	x	x
Based on experiences with the processor or trading company in the last three years, I think he keep up his promises.	0.240	0.020	x	x

All tested with Kendall's tau correlation
All measured with a significance of $p < 0.1$
X = no significance

Table 112 Correlations contract

The number of owners is negatively correlated with the years that a contract is signed and will be signed in a certain future with a correlation coefficient of $-.185$ and $-.241$ and a significance $.080$ and $.016$. So the more owners a farm has, the less years of contract are signed and also will be signed in a more certain future. A possible reason for this can be that the more owners a farm has, the more risk can be shared and so they dare to choose for no contracts for example.

The risk behaviour and entrepreneurship is strongly negatively correlated with the years of contracts that are signed and signed in certain future with a correlation coefficient of $-.422$ and $-.374$ and a significance of both $.000$. So this means the growers that score themselves as risk takers are signing less years of contracts, also in a certain future instead of growers that score themselves more certain, pretty logical because with no contract the grower has a higher risk level.

The comparison with colleague growers in selling prices is negatively correlated to the years that a contract is signed and will be signed in a certain future, with a correlation coefficient of $-.272$ and $-.193$ and a significance of $.007$ and $.042$. So The better growers compare themselves with colleague growers in selling prices the less years of contract are signed. So the growers that sign for less years think that they get better prices. A possible reason for this can be that growers that have no contracts and try to sell later in the season and that there will be less contracted that time and so the price will be higher.

The relation networks that help the growers to find buyers is negatively correlated with the years a contract will be signed with a correlation coefficient of $-.171$ and a significance of $.081$. So the more relation networks help growers to find new buyers the fewer years a contract is signed. A possible explanation is that growers with more networks need less years contract because of their network, they will more easily find a buyer or get a good price.

The score that growers give processors or trading companies about willingness to share information with growers if that could help them is positively correlated to the years a contract is signed with a correlation coefficient of $.264$ and a significance of $.007$. This means the better the processor or trading company is scored the more years a contract is signed. As said before, the more trust there is in a relationship the more information will be shared and the more growers will be loyal to processors or trading companies.

The score how trustable processors or trading companies are and if they keep promises is positively correlated with the years of contract signed with a correlation coefficient of $.302$ and $.240$ and a significance of $.003$ and $.020$. This means the more trustable and keeping promises the growers score them, the more growers decide to sign a contract for one, two or three year instead of signing no contract.

Frequency graphs

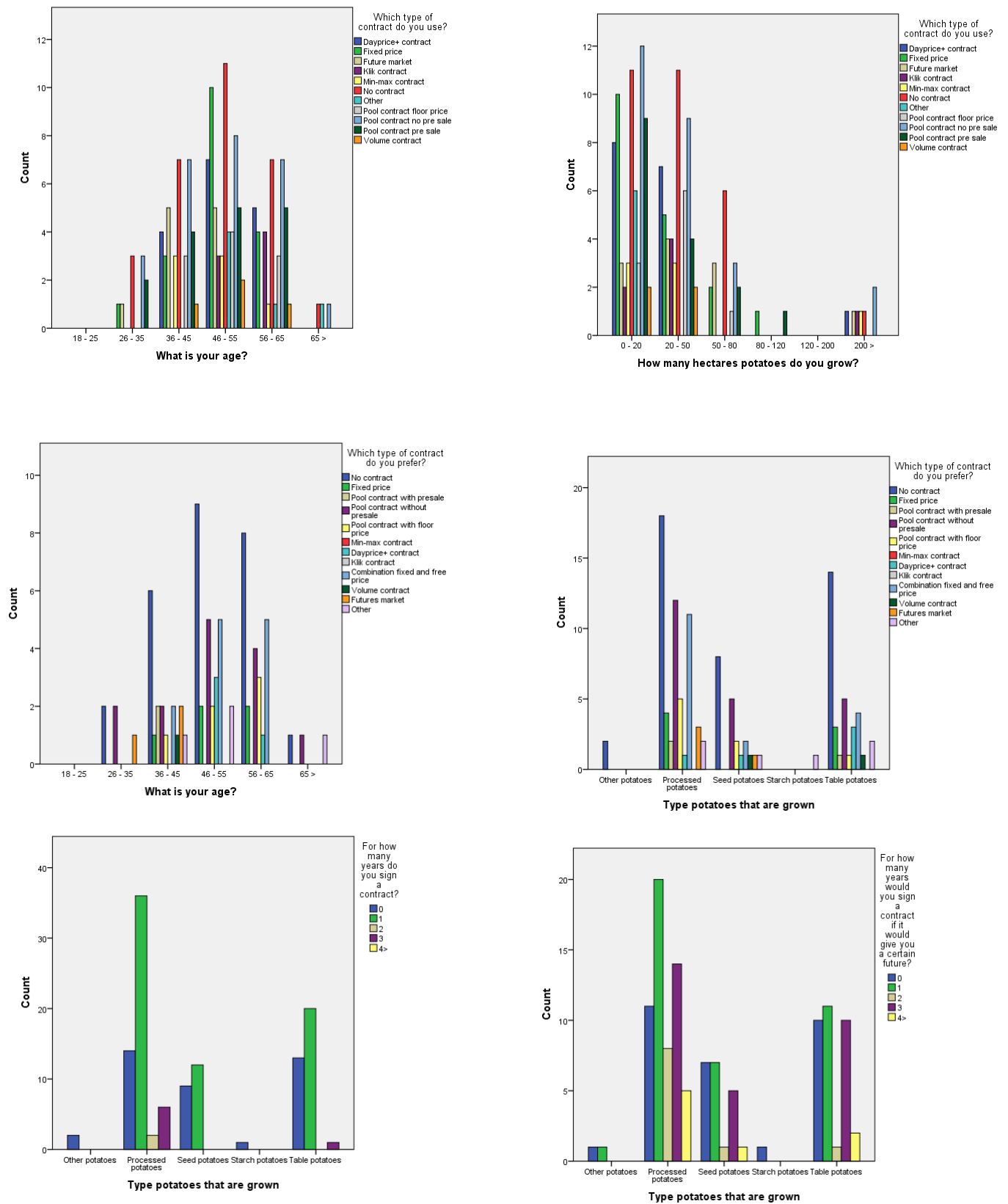


Figure 21 Frequency graphs contract

The division of types of contracts used over the age groups are nearly equal. Remarkable is that pool contracts, fixed contracts and no contracts are used by all ages and future contracts just by the youngest three groups of ages, probably because the future contracts are more for market oriented growers, these are mostly younger. As said in the interviews with the processors, it doesn't matter that much for a processor which contract a grower wants, the most important is that he can deliver good quality and stays loyal. In the division of contracts used compared to the hectares potatoes grown not many remarkable aspects can be found. The most remarkable here is the bigger the area of potatoes are grown, the less fixed contracts are used. A possible explanation for this, as said in the interviews with the growers can be that the bigger growers think they have more power and so a better trading position for the price and use less fixed contracts.

Also in the graph about the division of different ages over the contracts that are preferred not many strange conclusions can be made. The pool contracts, fixed priced and no contracts are used by all ages. Future contracts are preferred by the youngest two age categories, this because future contracts are more for market oriented growers, these are mostly younger.

The division of contracts preferred in the types of potatoes grown reveals nothing striking. Only the future market is not used by table potatoes.

There is a big difference in the number of years that a contract is signed for currently and the number of years a contract would be signed for if it would give them a certain future. The contracts in a certain future will be signed for more years, for processed as well as table potatoes. This means that if the growers miss a certainty. As also said in the interviews, if the profit was guaranteed for the coming years with a contract they would sign it.

Ideas of growers what should be included in ideal contracts:

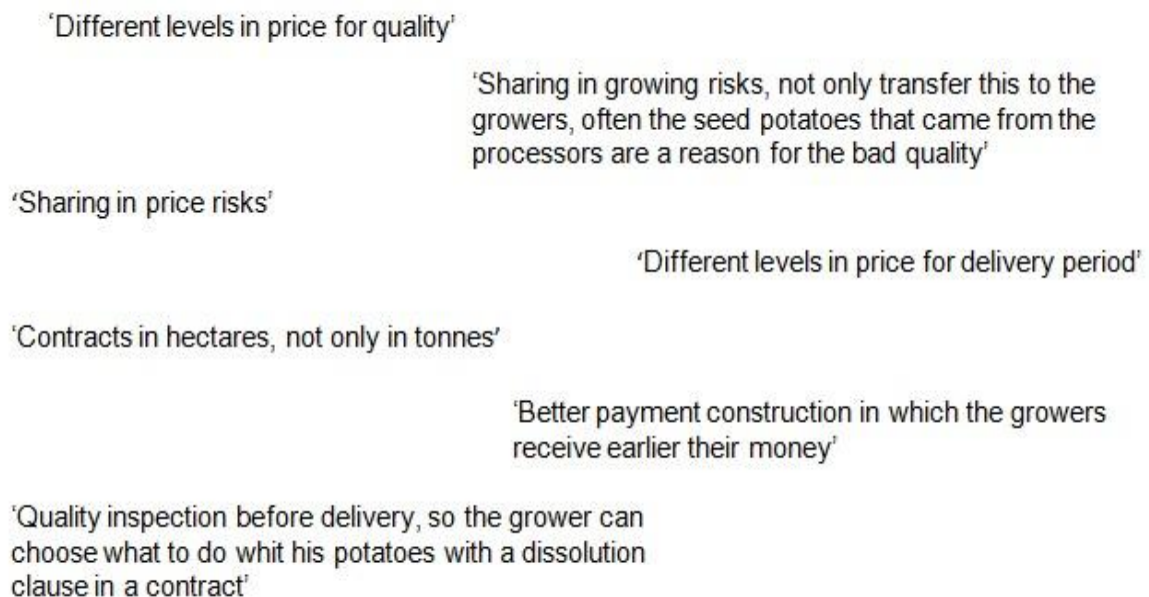


Figure 22 Most occurring citations growers about ideal contract

Also a question in the survey was: How should an ideal contract look like? Above in Figure 20, the most occurring answers are stated. To serve the viewpoints of the growers, the processors can check whether they included this already in their contracts. If not, they can decide how to include it or to ignore these viewpoints.

Summary

Findings:

The more risk taking growers are signing no contract or just for one year. Also the growers that think that they had better selling prices sign no contract or just for one year.

The growers with more relation networks also sign no contract or just for one year.

The growers that are willing to share information and trust the processors or trading company sign a contract for a longer time.

The bigger growers use less fixed contracts.

A lot of growers miss certainty in selling their potatoes, because in a certain future, the contracts will be signed for a longer time, as well for processed as for table potatoes.

Possible explanations:

These growers try to store their potatoes longer so they can sell them later on the spot market for a higher price.

These growers are not afraid to that they will not sell their potatoes because of their relation network.

Growers only are willing to share information in long-term relationships.

They think that they have more trading power and don't need fixed contracts

Growers may not always be sure that their selling price will be above costs price, so they miss a certain income.

4.5 Interviews processors

4.5.1 Interview Aviko – Willem van Tilburg potato purchasing manager Netherlands

Characteristics

Aviko BV is the biggest processor in the Netherlands and processes about 1.2 million tonnes of potatoes a year. From these products, frozen potato products, flakes and fresh or frozen end products are made. To purchase all these tonnes, they purchase their potatoes at about 800 growers.

Risk and control

The biggest risk for Aviko Potato is the price volatility because the prices of the potato changes often in a season. This is a risk because Aviko works a lot with fixed price contracts and it can be that the day prices are lower than the prices signed in a fixed price contract.

Performance

Aviko performs only in the highest segment of frozen potato products and is market leader in the Netherlands. So they think they purchase good quality and also deliver excellent quality that is better than the quality of competitors. Aviko has also lots of end products what they sell directly to retail concerns, what gives them higher profits than competitors.

Social capital

The growers are the most important for Aviko Potato. To get more insight into the wishes of the growers, they have founded a grower commission. From every region one grower represents the region. Once a month these growers come to Aviko to discuss actualities. In this way they can get insight in how they perform through the eyes of the growers. Also once a year, all growers are invited to come to Aviko and discuss about their business experiences and then also workshops are given.

Information sharing

Sharing information with growers is very important for Aviko but also for the growers. Having a transparent relationship makes it easy to bind growers. Most growers think the same about this. Aviko Potato has 8 purchasers for the growers and one purchaser to buy at trading companies. Those purchases visit the growers about 4 to 5 times a year. About 95% of these potatoes are bought in the Netherlands, but also potatoes are bought in Germany and France.

Trust

Trust is very important for Aviko Potato, because without it you can't do good business for several years.

Transaction costs

The only investment Aviko Potato made in the past five years was a machine to better be able to check the samples that are taken from the growers. About 90% stays loyal to Aviko potato every year. To build better relationships, Aviko can improve this.

Horizontal cooperation

Aviko Potato doesn't cooperate with other processors, but if they don't have enough or too much potatoes, then they buy or sell end products from others.

Contract

The contracts that Aviko is using are fixed price, future market, day price+, min-max, klik, pool and combination of contracts. About 80% of the purchased potatoes are contracted. An ideal contract can be signed for several years (2 or 3) and needs to include the size of the specifications of a potato, the amount of potatoes and the price.

4.5.2 Interview Farm Frites – Leon Boer potato purchasing manager Netherlands

Characteristics

Farm Frites is a holding and processes about 800.000 tonnes of potatoes in the Netherlands and Belgium. These potatoes are bought for about 75% at growers and 25% is bought at trading companies. These are about 550 growers and 30 traders. The fresh potato products that are produced in the Netherlands and Belgium are exported for about 90%. The assortment consists for 90% out of frozen and cooled products and for 10% out of flakes.

Risk and control

The biggest risks that Farm Frites encounter are price volatility, currency problems and balancing the purchasing and selling department. The potato price often fluctuates a lot what makes it difficult for the purchasing department to create a profit margin. Because Farm Frites exports a lot to countries with other currencies, the profit can get lost because they lose money because of changing currency prices. The third risk for Farm Frites is to balance the purchasing department with the selling department. They always try to keep a stock of three weeks but a year in advance they need to know what they are going to sell because the potatoes need to be planted.

Performance

The purchased quality is very good because they have a transparent relationship with the growers and if they have good purchasing quality, the sold product is also good. Further Farm Frites doesn't differ a lot from competitors.

Social capital

The fast food companies are the most important relation networks to find new countries or markets to enter. To find new growers or trading companies, their purchasing department is essential.

Information sharing

The purchasing department counts ten purchasers that visit the growers between 6 and 12 times a year. So each purchaser has about 50 to 80 growers. Further ways of communication that Farm Frites has to communicate with the growers are a newsletter, extranet, delivery and sample information and the contract.

Trust

Farm Frites trusts their growers because they often work several years with them and then you will find out if they are trustable on the long term.

Transaction costs

Big investments were not necessary for Farm Frites purchasing department in the past five years for the quality or to sell their products.

Losing growers is not good if you want to create a sustainable relationship. So Farm Frites tries to bind their growers for the long term. About 95% of the growers stays loyal and only 5% changed to another processor a year. Over ten years, about 60% of the growers stays loyal to Farm Frites.

Horizontal cooperation

Farm Frites only buys the fresh potato products as an end product because they don't process this by themselves.

Contract

Farm Frites contracts about 80% off their purchases and about 20% is bought on the spot market. They work with fixed price contracts, min/max, day price+ and hectares and volume contracts. In an ideal world Farm Frites thinks that in contract the price discussion needs to be removed. The potatoes need to be traded one to one to create a good relationship, a lot of money is wasted by intermediate trade. They need to secure these activities because they competition also does the same. In this way they can more easily cover the demand of their customers.

4.5.3 Interview Lamb Weston Meijer – Tom van der Meer potato purchasing manager Netherlands

Characteristics

Lamb Weston Meijer is semi owned (50%) by Lamb Weston Meijer America which is a subsidiary of Con Agro and for 50% owned by the family Meijer. They process 1.1 million tonnes of potatoes per year in Europe. These are processed in three different countries; 100.000 tonnes are processed in Austria, divided over 250 growers
150.000 tonnes are processed in England, divided over 25 growers
850.000 tonnes are processed in the Netherlands, divided over 400 growers

Dutch growers cultivate 30 hectares on average and these potatoes are processed by three processing plants and are processed into 800 different product varieties in a cycle of 14 days; 12 days processing and two days cleaning.

Risk and control

The most important risk that Lamb Weston Meijer has is the planning of the production process. This planning depends on the purchases and sales made. The potatoes that are sold by the sales department always are already bought by the purchasing department. The purchasing department need to order a certain amount in advance to keep the stock on a certain level. To adjust these amounts, the sales and purchasing department discuss every month about the stock level. So for the sales Lamb Weston Meijer chooses a certain strategy.

In de production process, the strategy is innovative. They are always looking for new processing techniques or products and are willing to take risks for this.

Performance

On average Lamb Weston Meijer is happy with their quality; they deliver their products to the highest standards. Because more than 95% of the growers stay loyal to Lamb Weston Meijer, they know what the competences of their growers are. Growers that can't reach their standards will be rejected. With 1,5% of disapproval they are still not satisfied. But they think that they can distinguish themselves against the other processors because they always mix the potatoes from three different growers to reach a more consistent quality. To track and trace it, all loads need to be sampled carefully.

Social capital

The most important contacts are the customers and growers. The growers are reached by the purchasing department and agronomic department; these contact current and new growers. To enter new markets, the sales department and R&D preserve the customers and try to enter new markets.

Information sharing

Information between grower and Lamb Weston Meijer is shared by the purchasing department and extranet. All information about loads and samples are shared on extranet. The purchasing department is visiting the growers 5 – 20 times per year depending on the size of the grower. Another point in which Lamb Weston Meijer thinks they distinguish themselves is that they are a very transparent company. All information that is useful will be shared with the growers and they think that growers do the same for them.

Trust

Because of their loyal growers they trust them and believe that they keep promises very well. If it turns out that the grower not can be trusted, they will be rejected.

Transaction costs

Loyal growers are important for Lamb Weston Meijer so that there are almost no switching costs and transaction costs are low for the specific growers.

Horizontal cooperation

Lamb Weston Meijer does no horizontal cooperation to buy or process their potatoes.

Contract

About 80% of the sales are fixed price contracts (70% hectares and 10% tonnes), 15% are participation contracts and 5% is spot market. Within the contracts for example hectare contract you can choose for a certain % fixed price and the other part day price or other ways that the grower prefers.

The only issue in contracts that Lamb Weston Meijer wants to change in the future is the quality system needs to be more clarifying.

4.5.4 Interview McCain – Mark Zuidhof potato purchasing manager Netherlands

Characteristics

McCain is biggest potato processing company in the world; they cover 35% of the market. In Europe they process about 2,2 million. They have three processing locations in the Netherlands, three in Belgium, also three in France and one in Poland. Their main product is frozen potato products, but also they produce flakes. In the Netherlands they do business with about 500 growers and for this they work with 7 purchasing employees.

Risk and control

The biggest risk for McCain Potato is that they can't supply the processing plants in potatoes. The potatoes they are purchasing do not always fulfil the specification wishes of the processing plant. In that case they need to collect other potatoes that fulfil these wishes. In difficult potato seasons, this synchronisation is very hard.

Performance

McCain is processing in the highest segment of frozen potato products so on quality they perform very well in comparison with others but their costs are also higher than others.

Social capital

The growers are the most important relation networks for McCain Potato, they need to deliver the required quality for McCain Potato. To serve these growers well, McCain works with 7 purchasers that conduct the whole process. These purchasers also try to find new growers.

Information sharing

The purchasing department is the communicating part of McCain with the growers and trading company. They try to visit the growers and trading companies 4-8 times a year, depending on the grower or trading company. In sharing information they try to be very transparent, because in this way you will have the most chance to have successful business.

Trust

The same counts for trust, without trust it is hard to do business, because in this business you have to be sure that everything is going to be all right, from signing a contract till the delivery.

Transaction costs

McCain Potato didn't need to make big investments in the past five years for the quality of their potatoes or to sell them. About 90% of the growers stay loyal to McCain and 10% is switching to other or stops with potato activities.

Horizontal cooperation

McCain Potato does no horizontal cooperation to buy or process their potatoes. Only end products are bought or fresh potatoes are sold if needed.

Contract

McCain Potato uses fixed price, min-max, participation, future contract, PPS and day price contracts. Because the potato market is changing, the contracts also need to change. For example McCain is trying to use a kind of future market contract that keeps the relationship with the growers. Because the customers of McCain are making contracts from 1 to 5 years, the contracts with the growers or trading companies need also to be longer than one year to be secured that the potatoes can be delivered. In an ideal contract the price is fixed, the delivery is stated and a minimum volume construction is made to secure the amount for McCain Potato. To improve the relationships contracts can be signed for two or three years.

4.5.5 Summary interviews

Findings:

The biggest risk for potato processors is the uncertain supply of potatoes and the price volatility in the potato market.

The growers are the most important social networks for the purchasing department of potato processors.

The processors mostly have several purchasers that work all in a different region to buy the potatoes.

Having trust in growers is very important for all the processors.

Between 80 and 90 percent of the growers stays loyal to their processor.

The most processors don't horizontally cooperate with other processors; only end products are sold or purchased in cases needed. Nevertheless all four growers are member of VAVI in which they share information about contract prices that are made.

All processors have different kind of contracts and are positive about contracts for more than one year.

Possible explanations:

The yield of potatoes per hectare differs every year. This influences the variety position of the processors what can lead to a processing stop. The price volatility can lead to high purchasing prices that are above the selling prices. As well a processing stop as high purchasing prices can lead to bankruptcy.

The growers deliver the complete raw materials that are needed for processors to make their end products. To secure their position in the market good relation with growers are needed.

To secure the quality and certainty of supply, the processors not focus only on one area to collect their potatoes because for example yields can fail in a specific area because of weather conditions.

To secure the demand of the customers of a processor, a certain supply of potatoes is needed. Trust can improve the relationship and so increase the certainty of a supply.

A lot of growers also see relationship as an important factor and so stay loyal to the processors.

Because of the strong competition between the four largest processors they are afraid that growers will be stolen by other processors if they cooperate horizontally.

The way how potatoes are sold differs per grower. To use different kind of contracts processors can attract all kind of growers by fulfilling their wishes. By using contracts for more than one year processors secure their potato supply position better for the future regarding competitors or substitutes.

4.6 End analysis

In the end analysis the most remarkable results of data analysis are elaborated.

As well, the potato growers as the processors experience uncertainty problems. These are uncertainties like market and yield uncertainties like described in the literature study. The growers are not sure if they plant the potatoes at the beginning of the season that they will make profit at the end of the season. The processors are not sure that they will collect enough quantities to fulfil the demand of their customers and that the purchasing prices will arise their selling prices.

This uncertainty can be decreased by production contracts as stated in the literature study. Both parties are willing to sign contracts for more than just one year if it takes the uncertainty away. This makes possibilities towards a more certain future.

Not only market/price risks and yield risks are a big issue for growers, also quality risks are a big issue. If they plant in the beginning of the season the potatoes they are not sure that the potatoes fulfil all quality requirements. An aspect as baking colour is essential for the processors to use it for their high product segments. An aspect as baking colour is not used in the pay off for the grower. If processors want to prevent costs for purchased products that can't be processed, they can take the baking colour as a variable into their pay off system. Decline in baking colour happens mostly during the time the potatoes are kept in the storages. In the storage process, the growers don't get much advice how to storage them. During the growing season the growers get a lot of technical advice how to grow the potatoes. Because the growers are the most important relation networks, they can give the growers more advice in how to storage the potatoes to secure the baking colour.

The large growers are the more risk taking growers in selling of potatoes. Processors want to have a secure market position and want as much as possible fixed contracts. But because of the large volumes, the large growers are needed and difficult to replace for the processors. The smaller growers are less risk taking what is attractive to processors. These growers will sign easier fixed price contracts what secures the position of the processors to fulfil their customer demand. The smaller growers cooperate less than the large growers. This makes their trading position weaker. By horizontal cooperation the growers can increase their trading position or reduce costs.

5. Conclusion

5.1 Conclusions

The objective of the research is to make recommendations for potato growers and processors in order to build more sustainable business relationships between the growers and processors. In this conclusion the outcomes of the research questions, which included literature studies, interviews and a survey, will be presented.

1. What actors are involved in the Dutch ware potato chain and what are their activities?

The most important actors in contracting in the Dutch ware potato chain are the potato growers, trading companies and the processors. The potato grower is the selling actor and the processor is the purchasing actor in potato contracts. The trading companies can be an intermediate actor.

2. What are characteristics of vertical relationships in the Dutch ware potato chain?

The characteristics of the growers and processors have influence on the relationships. Large growers are attractive for processors because of large volumes but are mostly risk taker in selling potatoes. Small growers are less attractive in volumes to deliver but easier to contract because of less risk taking in selling because of a weaker trading position. The four largest processors in the Netherlands differ not that much because they use about all the same contracts, produce for the highest segments and have the same size.

The most important risks for growers are the quality risk and the price risk. They are going to plant the potatoes in the beginning of the season, but are not totally sure that the yield will be successful or that the selling price will be above the cost price. Larger growers take more risks than the smaller growers, because they have a better trading position because of their size. The most important risks for the processors are the price risks and planning risks to supply the demand of the processing plants, because of specific quality wishes. The size of the risks shows that the relationships between grower and processors are important.

Growers are mostly more satisfied with the quality they deliver than the price that they get for it. Here the large growers think that they will get higher prices because of their trading power. All processors are mostly satisfied with the quality and purchasing price because of their long term relationship with most growers.

Larger and younger growers have more relation networks because of their size and generation. With these relation networks they can easier find new buyers, enter new markets or get better prices. But remarkable is that older growers are more willing to share information with processors than younger growers. So the younger growers are having more relation networks but are not willing to share as much information as older growers want to. A possible explanation for this can be that the older growers have longer relationships and stay more loyal to the processor or trading companies, as concluded from the interviews with the growers.

The more risk taking growers, are the growers that have less trust in the processors or trading companies. These growers can be seen as the more trading growers that haven't long relationships with processors or trading companies but switch more often.

The more experienced growers think more that the processors or trading companies keep promises than the inexperienced growers. This can be because of positive experiences with keeping promises in the past. The growers that have good experiences in information sharing with the processor or trading company think more that they are trustable and keep promises. So this means that trust is an essential factor in sharing information. The processors experience trust also as essential because the processors are depending on the potatoes that the growers deliver, they better invest in a long term relationship so that they know what product they can expect. The processors are pretty satisfied with this trust, because it is translated into a loyalty of growers of 80-90% on average.

The younger and larger growers made more big investments instead of older growers to sell their potatoes the past five years. Younger growers want to invest in their own future by building new sheds or means of transport and the older grower think more about finishing their career or retirement. The smaller and older growers have often also another job, are going to retire, made big investments before this 5 year border or want to sell their farm. The growers with more relation networks switched more from processor or trading company than the other growers. They use their networks more and switch more easily by support of their networks. The growers that

shared more information with the processor or trading company switched less from processor or trading company. Growers maybe only share information if in a long-term relationship.

3. What are characteristics of horizontal relationships in the Dutch ware potato chain?

Growers, but also processors or trading companies don't cooperate much horizontally. Most growers do not cooperate to sell their potatoes or for economic reasons, but if they do it is in sharing information for selling their potatoes and in machinery or personnel for economic reasons. It is hard to cooperate with other growers because you have to get the same opinion about how to plan or handle your income, machinery or personnel often are needed at the same place at the same time. Only the larger growers are cooperating in production input. In this way they can create in this way even more power for discounts. The processors and trading companies don't cooperate horizontally because of strong competition between them. Only end products are traded between processors in case of shortages or surpluses.

4. What barriers and opportunities exist for the establishment of vertical relationships among potato growers and processors?

The biggest barriers for the establishment of vertical relationships are price related. Because of a strong competition between the processors, a difference in price can make that a growers chooses for another processor. Also substitutes can be a barrier for the establishment of vertical relationships because when growers have earned nothing or too less money in growing potatoes they can choose for other crops what earns more.

The biggest opportunities for the establishment of vertical relationships are to invest in long term relationships by signing contracts for two or three years to exclude price risks for both and improve the market position for the processors. Another important opportunity is to make a quality construction that is included in the contract and includes for example the baking colour. If the processors give advice in how to storage, they can make their relationships closer and improve for example their baking colour quality.

5. What are the wishes of potato growers and processors in arrangements?

The more risk taking growers are signing no contract or just for one year. Also the growers that think that they had better selling prices sign no contract or just for one year. These growers try to store their potatoes longer so they can sell them on the spot market. The growers with more relation networks also sign no contract or just for one year. These growers are not afraid to that they will not sell their potatoes because of their relation network. The growers that are willing to share information and trust the processors or trading company sign a contract for a longer time. Growers only are willing to share information in long-term relationships. The bigger growers use less fixed contracts. They think that they have more trading power and don't need fixed contracts. A lot of growers miss certainty in selling their potatoes, because in a certain future, the contracts will be signed for a longer time, as well for processed as for table potatoes. The growers have had bad experiences in receiving selling prices below cost price. All processors have different kind of contracts and are positive about contracts for more than one year. In this way they can adapt to the wishes and wishes of the growers and so create a sustainable business relationship which secures their potato supply better in the future.

What arrangements are needed among potato growers and processors in the Dutch ware potato chain to build more sustainable business, and which factors determine the feasibility of the different possible arrangements?

Growers and processors have different wishes concerning arrangements. So to serve all wishes all existing contracts need to be used. Pool contracts, combination of fixed and free contract en no contracts are the most preferred arrangements by growers. Fixed price contracts are the most preferred contracts by the processors, but to serve the wishes of the growers they have to use also the other contract types. The factors that determine the feasibility of the different possible arrangements in order of importance are the price construction, yield construction, quality scoring, and payment construction and delivery time. These aspects need to be determined in a arrangement to come to an agreement between grower and processor.

5.2 Recommendations

From the conclusion the following recommendations can be given:

- In a sustainable business relationship the processors can share more risks of the growers if they plant their potatoes for them and decide to grow for specific quality wishes, so they demand of the processing plants can be fulfilled. Nowadays, processors give a premium based only on the quality points like diseases or damages, but not for baking colour or length. These two aspects are very important for the processing plants to fulfil the demand of their customers. So if processors include a risk sharing specification for a length for example of 100mm and a specific baking colour in a contract, the growers get a premium if they are above this specification and if they are below they get a penalty. So to take away the price and quality risks, both actors should include more detailed information about risk sharing in the contract. There are already contracts at some processors for risk sharing in price but not used that much, for quality risk sharing there aren't yet any specifications.
- Relation networks are helpful for growers as well potato processors, but to get a more sustainable business relationship more information concerning the potatoes needs to be shared, this creates trust for both actors. By giving advice to growers about how to storage the potatoes, they make the relationship closer and will provide less quality problems with for example baking colour.
- The smaller growers can cooperate horizontally more to get a better trading position. This can be done for example by combining their volumes to get a better trading position. Or they can cooperate more in for economic reasons to lower their cost price. In both cases they will have a bigger chance to get a better selling price.
- Uncertainty in has to be captured in the contracts, so the contracts can be signed for several years and more sustainable business relationships can be reached. The best option is then to use fixed price contracts because then both parties know their revenues. In this case the position of the processors is safer to fulfil their customer demand and the growers now before they start making costs that they will get specific revenue. These contracts are most preferred then to sign for two or three years.
- To attract as many growers as possible, processors need to use all different types of contracts to serve all wishes of potential growers. These are dayprice contracts, combined free/fixed contracts, fixed price contracts, future market contracts, klik contracts, min/max contracts, pool contracts and volume contracts.

5.3 Discussion

In this chapter the interpretation of results, limitations of the research and recommendations for further research are described.

Managerial implications

Results show how the growers think and act in the selling of potatoes and how the processors think and act about the purchasing of the potatoes. Both actors have their own opinions about contracts but don't always act the same. This is mostly because of a lack of trust and certainty. With this research the grower can get more insight how the processors think about the topic and the processors get more insight how growers think about it. Also the growers and processors see how colleagues or competitors think and act about potato contracts. With these perspectives the growers, processors and trading companies know more about the aspects that are important in business relationships, so if they want they can anticipate on this in their business activities so they will get for example more sustainable business relationships.

Research implications

In research there is a lot information available about potatoes and about contracting, but not specific about the viewpoints of growers and processors in The Netherlands. Researchers can use the practical information given in the report to test or compare with theories and with other industries. The potato industry differs for example from the milk industry because potatoes are only sold once a year. It can be very interesting for researchers to investigate the differences with others to get more insight on the implications on the variables.

Theoretical reflection

The theoretical framework is based on the supply chain model of Pilbeam *et al.* This model determines how governance secures specific outcomes. The variables from this model are placed in the theoretical framework. There are different kinds of models which include variables that influence a relationship, but there is chosen for this model because in the model is a division made in formal and informal governance instruments. These variables are implemented in the survey that is kept.

As said in the interviews with the processors, about 80 to 90 percent of the growers use potato contracts. In the survey about 35% of the respondents use no potato contract. This can give a invalid view of the results. Other characteristics of growers give a good reflection of the reality what makes the information in the survey more valid. Because of anonymous survey the growers have no incentives to give untrue information what makes the information of the survey very reliable.

Because of the strong competition, the processors don't want to give too much information, so it can be that the interviewed processors have given untrue information in the interviews. Overall the information that the processors gave is quite similar so the influence on the reliability is probably low.

Limitations of the research

To get enough respondents I called 500 growers if they would fill in my survey. At the end 77 growers filled in the survey, which is quite a small sample, what makes it difficult to get a lot of significant outcomes. So a larger sample would have led to more significance.

Another limitation of the survey can be that you will never know if the growers filled out the questions honestly, to check this I included from each topic comparable questions.

Recommendations for further research

This research gives recommendations for the growers and processors and viewpoints of them about contracting potatoes but doesn't really design arrangements to improve the relationships. So it is interesting to investigate how the viewpoints and conclusions can be translated in the design of new arrangements. To come to this information, inside information about quality, prices and payment constructions is needed. This was not possible to get from the respondents and processors, because they were not willing to share this information. With help from a Dutch potato organization more information can be available.

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Appendixes

Appendix 1 Topic lists interviews

Appendix 2 Summary interview growers

Appendix 3 Questions survey

Appendix 4 Significant correlations survey

Appendix 5 Results survey

Appendix 1 Topic lists interviews

Topic list interviews potato processors

Processor characteristics

- Yearly revenue of processed potatoes in the Netherlands
- Tonnes potatoes what you process yearly in the Netherlands
- Division import vs. export
- Locations in the Netherlands
- Types of potato products
- Market share ware potatoes in The Netherlands
- Number of growers
- Type of company (BV, Holding , NV, CV, Soci tas Europa)

Risk and control

- Which risks do you have
- There comes a new product on the market concerning processing potatoes. Below you find two statements. Choose one of the options:
Company 1: I immediately buy and use the product
Company 2: I will wait for decisions and experiences of other users
None of the companies
- Risk taking or certain in risk behaviour and entrepreneurship

Performance

- Happy with purchased quality
- Happy with delivered quality
- Quality compared to competitors/colleagues
- Price paid for potatoes compared to competitors/colleagues
- Profitability compared to competitors/colleagues

Social capital

- Who are the most important contacts; governments, banks, commissions etc.
- Networks help to find new growers
- Networks help to enter new markets
- Networks help to get better purchasing prices

Information sharing

- Frequency of information with growers
- Credible information from growers
- Willing to provide information to growers
- Growers are willing to provide information

Trust

- Growers are credible
- Growers keep promises

Transaction costs

- Large investments for purchasing potatoes the last five years
- Large investments for quality of potatoes the last five years
- Switching to other growers, a lot of knowledge is wasted
- How many years do growers stay loyal

Horizontal cooperation

- Cooperate to purchase your potatoes
- Cooperate to process your potatoes

Contract

- How does a contract look like
- Types of contracts used
- Types of contracts preferred
- For how many years contract signed (%)
- For how many years would you sign a contract if it gives you a certain future
- What aspects should be fixed in a contract
- If you change a contract how will it look like

Topic list interviews potato growers

Grower characteristics

- Age
- Acreage in total
- Acreage potatoes
- Full owner/ others
- Experience in growing potatoes
- Types of potatoes
- Processors to who your sell

Risk and control

- There comes a new product on the market concerning growing and storing.
Below you find two statements. Choose one of the options:
Entrepreneur 1: I immediately buy and use the product
Entrepreneur 2: I will wait for decisions and experiences of other users
None of the entrepreneurs
- Risk taking or certain in risk behaviour and entrepreneurship

Performance

- Happy with purchased quality
- Happy with delivered quality
- Quality compared to competitors/colleagues
- Price sold for potatoes compared to competitors/colleagues
- Profitability compared to competitors/colleagues

Social capital

- Networks help to find new buyers
- Networks help to enter new markets
- Networks help to get better selling prices

Information sharing

- Frequency of information with processors
- Credible information from processors
- Willing to provide information to processors
- Processors are willing to provide information

Trust

- Processors are credible
- Processors keep promises

Transaction costs

- Large investments for selling potatoes the last five years
- Large investments for quality of potatoes the last five years
- Switching to other processors, a lot of knowledge is wasted
- How many times switched from processors the last ten years

Horizontal cooperation

- Cooperate to sell your potatoes
- Cooperate to produce your potatoes

Contract

- Types of contracts used
- Types of contracts preferred
- For how many years contract signed (%)
- For how many years would you sign a contract if it gives you a certain future
- What aspects should be fixed in a contract
- If you could design a contract how would it look like

Appendix 2 Interviews growers

Interview grower Padmos Scharendijke

Characteristics

The corporation is owned by three people, the father (52), mother (50) and the son. They cultivate a total of 75 hectares fully owned from which 15 hectares potatoes. They grow potato as long as they live, in the last years they grow only Fontane for Farm Frites.

Risk and control

The risks that they experience are the quality risks; these are the most important for them. In using innovative equipment mts. Padmos is risk averse, they first wait for experiences of others.

Performance

They receive their seed potatoes from Farm Frites and never had any problems with the quality of it. Also with the quality that they deliver they have had almost never problems. Compared to other growers they think they receive the same price, reach the same quality and have the same gains.

Social capital

The most important contacts are the buyers from the processors for the selling of the potatoes. They have a good connection with the contact person of Farm Frites, but this does not implicate that they have new buyers, markets or prices.

Information sharing

Because they have a good connection with the contact person they share all useful information from both sides. This person visits them about five times per year.

Trust

Only the Farm Frites contact person is trust by mts. Padmos. The experience with other processors is that they give nice promises but not fulfil these.

Transaction costs

In 2006 they built a new potato shed and since then they didn't made any large investments for growing potatoes. They think staying loyal to the processing is good for building a relationship to both benefit from it.

Horizontal cooperation

They don't cooperate with other growers to sell or produce their potatoes, they only help others in emergencies.

Contract

They sell their potatoes in tonnes contracts per hectare; 10 tons min/max, 20 tons fixed price and the remaining tons on the day price. They sign contracts only for one year because every year is different. They will not sign contracts for more than one year because they are not afraid that the potatoes will not be sold.

If they could change a contract they would use percentages instead of tonnes, like used in a hectare contract.

Interview potato grower Simons

Characteristics

Simon VOF is an arable farm located in the south of the Netherlands. The farm is owned by two brothers 52 and 56 years old. The farm cultivates about 85 hectares, from this they have 42 hectares potatoes from which 8 hectares seed potatoes. These seed potatoes are used for the growth of own consumption potatoes. They have 35 year experience in growing potatoes. The two varieties are Innovater and Challenger. Their most important customer is Lamb Weston Meijer already for 7 years, next to them they also sell a bit to Agristo.

Risk and control

The biggest risk in growing potatoes for Simons are glassy potatoes. For the selling of the potatoes he does not see much risks, he has always sold them in 35 years. In risk behaviour he chooses for 50/50 strategy. In some cases he chooses for a certain option but in some cases he takes a risk. This depends on the case.

Performance

To be satisfied with the quality of their seed potatoes they decided for about 5 years ago to start with growing their own seed potatoes. In performance of quality Simons thinks that he is one of the better growers, they had never delivered a batch that was disapproved. In financial performance he thinks also that they perform better in comparison with other growers. Because they work together in machinery and personnel with another large potato grower which reduces their costs about 25%.

Social capital

The most important relation networks are big customers or suppliers. Simons likes to have short lines, for example if he wants to buy a machine he does not contact a dealer but the producer to get more information about a machine. For their potatoes the purchasing person of the processor is their most important relation.

Information sharing

About three times a year the purchasing person of Lamb Weston Meijer visits Simons. On time during. The information he receives from them is valuable and transparent. That is also the reason why Simons is also willing to share information with them, it has to come from both sides.

Trust

Because Simons trust Lamb Weston Meijer, he already his potatoes to them for seven years. Till now, they always kept up to promises.

Transaction costs

Simons has not made big investments in the last five years for selling or producing their potatoes. Switching of processor is losing knowledge because you have to have a good relation with each other to have a sustainable business relationship. They switched two times in the last 10 years but are now already for seven years delivering to Lamb Weston Meijer.

Horizontal cooperation

Simons cooperate to produce and sell their potatoes together with another potato grower.

Contract

The most part of the contracts what Simons uses are the klik contracts for the other part he does a fixed price contract. The advantage of klik contracts for Simons is that he can participate in the changing market. If he would sign a contract for several years he would do this for the maximum of three years. He would think that the potatoes best can be sold free in the future. Because otherwise you will get again lower prices if you are bound to a processor.

Interview potato grower Simons

Characteristics

Topper is an arable farm located in Dronten, Flevoland. The farm is fully owned by one person of 41 years old. The farm cultivates about 49 hectares, from which 8.2 potatoes. Topper has about 25 years experience in grower table potatoes, since four years he switched to French Fries, because the costs were higher and the selling prices were lower. Now he grows the varieties Innovator and Agria, all for Aviko.

Risk and control

The biggest risk for Topper is that if he plants potatoes, he is not sure that he is going to earn enough on it. He is just a small player in comparison with the large growers. If his yield fails because of the wetter, only he experiences the costs.

Performance

Topper focuses more on other products to get better prices and quality. He grows the potatoes on a certain way (pool) because he is too small to make big profits in potatoes. Because he always had table potatoes, he knows how to create quality in growing and storage.

Social capital

The most important relation networks are study clubs, Aviko and banks. These parties help to sell the potatoes.

Information sharing

The contact person of Aviko visits Topper about 5 till 6 times a year. Aviko is good in being transparent and in sharing information otherwise Topper will not deliver to them. He has no experiences until now with other processors but he is satisfied with Aviko.

Trust

Because Topper already delivers for four years to Aviko he has built a good relationship with the purchasing person of them and he trust him in his actions and until now he keeps up to promises.

Transaction costs

Topper has not made big investments in the last five years for selling or producing their potatoes. Switching of processor is losing knowledge because you have to have a good relation with each other to have a sustainable business relationship. Topper didn't switched since he started in French Fries potatoes.

Horizontal cooperation

Topper doesn't cooperate to produce and sell their potatoes together with another potato grower.

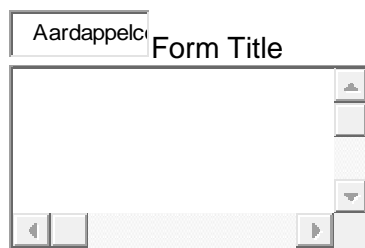
Contract

For his potatoes, Topper uses Pool contracts without floor prices, because in his region the potatoes can be stored for a long time. In pool contracts you share your prices with other and the average is paid, so in this the risk is spread. He would prefer a future market but he doesn't do this because it costs a lot of time to follow all actualities and for his he is too small.

Appendix 3 Questions survey

Aardappelc

Form Title



1. Wat is uw leeftijd?* _

- ☐ 18 - 25
- ☐ 26 - 35
- ☐ 36 - 45
- ☐ 46 - 55
- ☐ 55 - 65
- ☐ 65 >

2. Hoeveel hectare bewerkt u in totaal?* _

- ☐ 0 - 20
- ☐ 20 - 50
- ☐ 50 - 80
- ☐ 80 - 120
- ☐ 120 - 200
- ☐ 200 >

3. Hoeveel hectare aardappelen bewerkt u in totaal?* _

- ☐ 0 - 20
- ☐ 20 - 50
- ☐ 50 - 80
- ☐ 80 - 120
- ☐ 120 - 200
- ☐ 200 >

4. Hoeveel eigenaren telt het bedrijf?* _

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4 >

5. Hoeveel jaren ervaring heeft u in het telen van aardappelen?* _

- ☐ 0 - 5
- ☐ 5 - 10
- ☐ 10 - 20
- ☐ 20 - 40

- ☐ 40 >
- **6. Welke soort aardappelen teelt u?*** _Meerdere antwoorden mogelijk.

- ☐ Tafelaardappelen
- ☐ Verwerkte aardappelen (bijv. frites of chips)
- ☐ Zetmeelaardappelen
- ☐ Pootaardappelen
- ☐ Anders

7. Aan welke verwerker(s) verkoopt u uw aardappelen?* _Meerdere antwoorden mogelijk.

- ☐ Aviko
- ☐ Farm Frites
- ☐ Lamb Weston Meijer
- ☐ McCain
- ☐ Andere verwerker
- ☐ Handelaar

Add item

After page 1

Continue to next page

Page 2 of 4

8. Er komt een nieuw product op de markt met betrekking tot het telen van aardappelen. * _

1 2 3 4 5 6 7

Ik wacht eerst op
beslissingen en ervaringen
van anderen.

☐
☐
☐
☐
☐
☐
☐

Ik koop het product
onmiddellijk en gebruik het
meteen.

9. Hoe zou u zichzelf positioneren op het gebied van risicogedrag in ondernemerschap?* _

1 2 3 4 5 6 7

Zekerheid ☐ ☐ ☐ ☐ ☐ ☐ ☐ Risiconemend

10. Ik ben tevreden over de product kwaliteit die ik lever aan de verwerker / handelsonderneming.* _

1 2 3 4 5 6 7

Helemaal mee oneens ☐ ☐ ☐ ☐ ☐ ☐ ☐ Helemaal mee eens

11. Ik ben tevreden met de prijs die de verwerker / handelsonderneming voor mijn aardappelen betaalt.* _

1 2 3 4 5 6 7

Helemaal mee oneens ☐ ☐ ☐ ☐ ☐ ☐ ☐ Helemaal mee eens

12. Vergeleken met collega telers heb ik betere opbrengsten per hectare gehad de afgelopen vijf jaar.* _

1 2 3 4 5 6 7

Helemaal mee oneens ☐ ☐ ☐ ☐ ☐ ☐ ☐ Helemaal mee eens

13. Vergeleken met collega telers heb ik betere verkoopprijzen gehad de afgelopen vijf jaar.* _

1 2 3 4 5 6 7

Helemaal mee oneens ☐ ☐ ☐ ☐ ☐ ☐ ☐ Helemaal mee eens

14. Mijn relatienetwerken helpen me om nieuwe kopers voor mijn aardappelen te vinden.* _

1 2 3 4 5 6 7

Helemaal mee oneens ☐ ☐ ☐ ☐ ☐ ☐ ☐ Helemaal mee eens

15. Mijn relatienetwerken helpen me om nieuwe markten te betreden.* _

1 2 3 4 5 6 7

Helemaal mee oneens ☐ ☐ ☐ ☐ ☐ ☐ ☐ Helemaals mee eens

16. Mijn relatienetwerken helpen me om een betere prijs te krijgen.* _

1 2 3 4 5 6 7

Helemaal mee oneens ☐ ☐ ☐ ☐ ☐ ☐ ☐ Helemaal mee eens

Add item

After page 2

Continue to next page

Page 3 of 4

17. Informatie uitwisseling tussen mij en de verwerker / handelsonderneming is frequent.* _

1 2 3 4 5 6 7

Helemaal mee oneens ☐ ☐ ☐ ☐ ☐ ☐ ☐ Helemaal mee eens

18. Informatie uitwisseling tussen mij en de verwerker / handelsonderneming is voldoende.* _

1 2 3 4 5 6 7

Helemaal mee oneens ☐ ☐ ☐ ☐ ☐ ☐ ☐ Helemaal mee eens

19. Ik ben bereid om informatie uit te wisselen met de verwerker / handelsonderneming als dat hen kan helpen.* _

1 2 3 4 5 6 7

Helemaal mee oneens ☐ ☐ ☐ ☐ ☐ ☐ ☐ Helemaal mee eens

20. De verwerker / handelsonderneming is bereid informatie uit te wisselen als dat mij kan helpen.* _

1 2 3 4 5 6 7

Helemaal mee oneens ☐ ☐ ☐ ☐ ☐ ☐ ☐ Helemaal mee eens

21. Gebaseerd op ervaringen met de verwerker / handelsonderneming in de laatste drie jaar denk ik dat hij te vertrouwen is.* _

1 2 3 4 5 6 7

Helemaal mee oneens ☐ ☐ ☐ ☐ ☐ ☐ ☐ Helemaal mee eens

22. Gebaseerd op ervaringen met de verwerker / handelsonderneming in de laatste drie jaar denk ik dat hij zich aan beloftes houdt.* _

1 2 3 4 5 6 7

Helemaal mee oneens ☐ ☐ ☐ ☐ ☐ ☐ ☐ Helemaal mee eens

23. Ik heb grote investeringen gedaan voor de verkoop van aardappelen in de laatste vijf jaar.* _

1 2 3 4 5 6 7

Helemaal mee oneens ☐ ☐ ☐ ☐ ☐ ☐ ☐ Helemaal mee eens

24. Ik heb grote investeringen gedaan voor de kwaliteit van aardappelen in de laatste vijf jaar.* _

1 2 3 4 5 6 7

Helemaal mee oneens ☐ ☐ ☐ ☐ ☐ ☐ ☐ Helemaal mee eens

25. Als ik wissel van verwerker / handelsonderneming, gaat er veel kennis verloren.* _

1 2 3 4 5 6 7

Helemaal mee oneens ☐ ☐ ☐ ☐ ☐ ☐ ☐ Helemaal mee eens

26. Hoe vaak ben ik gewisseld van mijn belangrijkste verwerker / handelsonderneming in de afgelopen tien jaar?* _

- ☐ 0
- ☐ 1 - 3
- ☐ 4 - 6
- ☐ 7 - 9
- ☐ 10 >

Add item

After page 3

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Page 4 of 4

27. Welk type contract gebruikt u?* _Meerdere antwoorden mogelijk.

- ☐ Geen contract

- ☐ Vaste prijs
- ☐ Pool contract met voorverkoop
- ☐ Pool contract zonder voorverkoop
- ☐ Pool contract met bodemprijs
- ☐ Min-max contract
- ☐ Dagprijs+ contract
- ☐ Klik contract
- ☐ Volume contract
- ☐ Termijnmarkt
- ☐ Ander

28. Naar welk type contract gaat u voorkeur uit?* _Kies hierbij één type contract.

- ☐ Geen contract
- ☐ Vaste prijs
- ☐ Pool contract met voorverkoop
- ☐ Pool contract zonder voorverkoop
- ☐ Poolcontract met bodemprijs
- ☐ Min-max contract
- ☐ Dagprijs+ contract
- ☐ Klik contract
- ☐ Combinatie vast en vrije prijs
- ☐ Volume contract
- ☐ Termijnmarkt
- ☐ Ander

29. Voor hoeveel jaar sluit u een contract af met uw verwerker / handelsonderneming?* _

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4 >

30. Voor hoeveel jaar zou u een contract afsluiten met uw verwerker / handelsnonderneming als u dit een zekere toekomst zou geven?* _

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3

- ☐ 4 >
- **31. Welke aspecten in een contract zou u willen vastzetten als u een contract voor meerdere jaren zou tekenen?*** _Meerdere antwoorden mogelijk.

- ☐ Prijs
- ☐ Hoeveelheid in tonnen
- ☐ Hoeveelheid in hectares
- ☐ Leveringstijdstippen
- ☐ Betalingsconstructie (datum van betalingen)
- ☐ Kwaliteit

32. Werkt u samen met andere telers om u aardappelen te verkopen?* _.

- ☐ Ja
- ☐ Nee

33. Op welke manier werkt u samen met andere telers om uw aardappelen te verkopen?* _Meerdere antwoorden mogelijk.

- ☐ Ik deel informatie met andere teler(s)
- ☐ Ik deel mijn productie hoeveelheid met een andere teler(s)
- ☐ Ik verkoop mijn aardappelen aan een andere teler(s)
- ☐ Andere manier
- ☐ Niet

34. Werkt u samen met andere telers om economische redenen?* _.

- ☐ Ja
- ☐ Nee

35. Op welke manier werkt u samen met andere telers om economische redenen?* _Meerdere antwoorden mogelijk.

- ☐ Gebouwen
- ☐ Grond
- ☐ Machines
- ☐ Personeel
- ☐ Productie benodigdheden zoals gewasbeschermingsmiddelen, kunstmest of pootgoed
- ☐ Niet

36. Als u een aardappelcontract zou mogen ontwerpen, wat moet dan hierin volgens u worden vastgelegd? Typ hierbij al uw wensen die u in een aardappelcontract zou willen zien.

37. Heeft u verdere opmerking of vragen over deze enquête? Dan mag u deze hier typen.

Appendix 4 Significant correlations survey

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	x																									
2		x																								
3			x																							
4				x																						
5					x																					
6						x																				
7							x																			
8					-0,234			x																		
9		0,216	0,21	0,255	-0,207				x																	
10										x																
11				0,182							x															
12					-0,205							x														
13	-0,162	0,234	0,195	0,172					0,31				x													
14		0,252	0,283											x												
15		0,215	0,237												x											
16	-0,156	0,23	0,226													x										
17																	x									
18																		x								
19	0,201																		x							
20																				x						
21									-0,164								0,388	0,284	0,435	0,481	x					
22					0,189									-0,167	-0,195		0,302	0,33	0,256	0,351		x				
23	-0,205	0,182	0,323																				x			
24	-0,312	0,281	0,379		-0,158																			x		
25	0,223				0,198																				x	
26															0,224	0,196	-0,203	-0,21	-0,219							x
27																										

Appendix 5 Results survey

Age

		Value	Count	Percent
Standard Attributes	Position	1		
	Label	What is your age?		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
Valid Values	1	18 - 25	0	0,0%
	2	26 - 35	5	6,5%
	3	36 - 45	18	23,4%
	4	46 - 55	28	36,4%
	5	56 - 65	23	29,9%
	6	65 >	3	3,9%

Totalhectares

		Value	Count	Percent
Standard Attributes	Position	2		
	Label	How many hectares do you grow in total?		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
Valid Values	1	0 - 20	3	3,9%
	2	20 - 50	19	24,7%
	3	50 - 80	22	28,6%
	4	80 - 120	16	20,8%
	5	120 - 200	14	18,2%
	6	200 >	3	3,9%

Potatohectares

		Value	Count	Percent
Standard Attributes	Position	3		
	Label	How many hectares potatoes do you grow?		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
	1	0 - 20	41	53,2%
Valid Values	2	20 - 50	25	32,5%
	3	50 - 80	8	10,4%
	4	80 - 120	1	1,3%
	5	120 - 200	0	0,0%
	6	200 >	2	2,6%

Owners

		Value	Count	Percent
Standard Attributes	Position	4		
	Label	How many owners does the farm has?		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
Valid Values	1	1	50	64,9%
	2	2	19	24,7%
	3	3	7	9,1%
	4	4>	1	1,3%

Experience

		Value	Count	Percent
Standard Attributes	Position	5		
	Label	How many years do you have experience in growing potatoes?		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
	1	0-5	0	0,0%
Valid Values	2	5-10	7	9,1%
	3	10-20	12	15,6%
	4	20-40	49	63,6%
	5	40>	9	11,7%

VAR6Table

		Value	Count	Percent
Standard Attributes	Position	6		
	Label	Do you grow table potatoes?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	34	44,2%
	2	No	43	55,8%

VAR6Processed

		Value	Count	Percent
Standard Attributes	Position	7		
	Label	Do you grow processed potatoes?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	58	75,3%
	2	No	19	24,7%

VAR6Starch

		Value	Count	Percent
Standard Attributes	Position	8		
	Label	Do you grow starchpotatoes?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	1	1,3%
	2	No	76	98,7%

VAR6Seed

		Value	Count	Percent
Standard Attributes	Position	9		
	Label	Do you grow seed potatoes?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	21	27,3%
	2	No	56	72,7%

VAR6Others

		Value	Count	Percent
Standard Attributes	Position	10		
	Label	Do you grow other potatoes?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	2	2,6%
	2	No	75	97,4%

VAR7Aviko

		Value	Count	Percent
Standard Attributes	Position	11		
	Label	Do you sell your potatoes to Aviko?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	23	29,9%
	2	No	54	70,1%

VAR7FarmFrites

		Value	Count	Percent
Standard Attributes	Position	12		
	Label	Do you sell your potatoes to Farm Frites?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	11	14,3%
	2	No	66	85,7%

VAR7LWM

		Value	Count	Percent
Standard Attributes	Position	13		
	Label	Do you sell your potatoes to Lamb Weston Meijer?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	1	Yes	9	11,7%
Valid Values	2	No	68	88,3%

VAR7McC

		Value	Count	Percent
Standard Attributes	Position	14		
	Label	Do you sell your potatoes to McCain?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	1	Yes	12	15,6%
Valid Values	2	No	65	84,4%

VAR7Anderv

		Value	Count	Percent
Standard Attributes	Position	15		
	Label	Do you sell your potatoes to another processor?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	19	24,7%
	2	No	58	75,3%

VAR7Handelaar

		Value	Count	Percent
Standard Attributes	Position	16		
	Label	Do you sell your potatoes to a trading company?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	41	53,2%
	2	No	36	46,8%

Innovative

		Value	Count	Percent
Standard Attributes	Position	17		
	Label	There is a new product concerning growing of potatoes.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
	1	I first wait for decisions and experiences of others.	6	7,8%
Valid Values	2	2	13	16,9%
	3	3	19	24,7%
	4	Neutral	22	28,6%
	5	5	12	15,6%
	6	6	5	6,5%
	7	I buy the product immediately and use it.	0	0,0%

Risktaking

		Value	Count	Percent
Standard Attributes	Position	18		
	Label	How would you score yourself in risk behavior and entrepreneurship.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
	1	Certainty	2	2,6%
Valid Values	2	2	5	6,5%
	3	3	8	10,4%
	4	Neutral	17	22,1%
	5	5	25	32,5%
	6	6	18	23,4%
	7	Risk taking	2	2,6%

Qualitydeliver

		Value	Count	Percent
Standard Attributes	Position	19		
	Label	I am satisfied about the product quality that I deliver to the processor or trading company.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
Valid Values	1	Totally disagree	1	1,3%
	2	Disagree	2	2,6%
	3	Somewhat disagree	5	6,5%
	4	Undecided	7	9,1%
	5	Somewhat agree	17	22,1%
	6	Agree	34	44,2%
	7	Totally agree	11	14,3%

Pricerecieve

		Value	Count	Percent
Standard Attributes	Position	20		
	Label	I am satisfied with the price that the processor or trading company pays for my potatoes.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
Valid Values	1	Totally disagree	2	2,6%
	2	Disagree	7	9,1%
	3	Somewhat disagree	17	22,1%
	4	Undecided	22	28,6%
	5	Somewhat agree	16	20,8%
	6	Agree	13	16,9%
	7	Totally agree	0	0,0%

Compareyield

		Value	Count	Percent
Standard Attributes	Position	21		
	Label	Compared to my colleague growers i had better yields per hectare in the past five years.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
Valid Values	1	Totally disagree	1	1,3%
	2	Disagree	2	2,6%
	3	Somewhat disagree	11	14,3%
	4	Undecided	33	42,9%
	5	Somewhat agree	15	19,5%
	6	Agree	15	19,5%
	7	Totally agree	0	0,0%

Compareprice

		Value	Count	Percent
Standard Attributes	Position	22		
	Label	Compared to my colleague growers i had better selling prices in the past five years.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
	1	Totally disagree	3	3,9%
Valid Values	2	Disagree	2	2,6%
	3	Somewhat disagree	9	11,7%
	4	Undecided	35	45,5%
	5	Somewhat agree	14	18,2%
	6	Agree	11	14,3%
	7	Totally agree	3	3,9%

Relationselling

		Value	Count	Percent
Standard Attributes	Position	23		
	Label	My relation networks help me to find new buyers for my potatoes.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
Valid Values	1	Totally disagree	6	7,8%
	2	Disagree	14	18,2%
	3	Somewhat disagree	12	15,6%
	4	Undecided	20	26,0%
	5	Somewhat agree	18	23,4%
	6	Agree	7	9,1%
	7	Totally agree	0	0,0%

Relationmarket

		Value	Count	Percent
Standard Attributes	Position	24		
	Label	My relation networks help me to enter new markets.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
Valid Values	1	Totally disagree	6	7,8%
	2	Disagree	16	20,8%
	3	Somewhat disagree	11	14,3%
	4	Undecided	26	33,8%
	5	Somewhat agree	14	18,2%
	6	Agree	4	5,2%
	7	Totally agree	0	0,0%

Relationprice

		Value	Count	Percent
Standard Attributes	Position	25		
	Label	My relation networks help me to get a better price.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
Valid Values	1	Totally disagree	4	5,2%
	2	Disagree	9	11,7%
	3	Somewhat disagree	9	11,7%
	4	Undecided	25	32,5%
	5	Somewhat agree	16	20,8%
	6	Agree	13	16,9%
	7	Totally agree	1	1,3%

Informfrequent

		Value	Count	Percent
Standard Attributes	Position	26		
	Label	Information exchange between me and processor or trading company is frequent.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
Valid Values	1	Totally disagree	1	1,3%
	2	Disagree	7	9,1%
	3	Somewhat disagree	8	10,4%
	4	Undecided	13	16,9%
	5	Somewhat agree	18	23,4%
	6	Agree	26	33,8%
	7	Totally agree	4	5,2%

Informsufficient

		Value	Count	Percent
Standard Attributes	Position	27		
	Label	Information exchange between me and the processor or trading company is sufficient.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
Valid Values	1	Totally disagree	0	0,0%
	2	Disagree	4	5,2%
	3	Somewhat disagree	5	6,5%
	4	Undecided	10	13,0%
	5	Somewhat agree	21	27,3%
	6	Agree	29	37,7%
	7	Totally agree	8	10,4%

Willingtoshare

		Value	Count	Percent
Standard Attributes	Position	28		
	Label	I am willing to share information with the processor or trading company if that could help them.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
Valid Values	1	Totally disagree	2	2,6%
	2	Disagree	3	3,9%
	3	Somewhat disagree	0	0,0%
	4	Undecided	6	7,8%
	5	Somewhat agree	17	22,1%
	6	Agree	33	42,9%
	7	Totally agree	16	20,8%

Willingprocessor

		Value	Count	Percent
Standard Attributes	Position	29		
	Label	The processor or trading company is willing to share information with me if that could help me.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
Valid Values	1	Totally disagree	1	1,3%
	2	Disagree	7	9,1%
	3	Somewhat disagree	4	5,2%
	4	Undecided	12	15,6%
	5	Somewhat agree	16	20,8%
	6	Agree	27	35,1%
	7	Totally agree	10	13,0%

Processortrust

		Value	Count	Percent
Standard Attributes	Position	30		
	Label	Based on experiences with the processor or trading company in the last three years, I think he is trustable.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
	1	Totally disagree	0	0,0%
Valid Values	2	Disagree	2	2,6%
	3	Somewhat disagree	2	2,6%
	4	Undecided	3	3,9%
	5	Somewhat agree	19	24,7%
	6	Agree	38	49,4%
	7	Totally agree	13	16,9%

Processorpromis

		Value	Count	Percent
Standard Attributes	Position	31		
	Label	Based on experiences with the processor or trading company in the last three years, I think he keep up his promises.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
	1	Totally disagree	0	0,0%
Valid Values	2	Disagree	2	2,6%
	3	Somewhat disagree	1	1,3%
	4	Undecided	2	2,6%
	5	Somewhat agree	15	19,5%
	6	Agree	41	53,2%
	7	Totally agree	16	20,8%

Transsell

		Value	Count	Percent
Standard Attributes	Position	32		
	Label	I made big investments in the last five years to sell my potatoes.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
	1	Totally disagree	14	18,2%
Valid Values	2	Disagree	18	23,4%
	3	Somewhat disagree	10	13,0%
	4	Undecided	14	18,2%
	5	Somewhat agree	11	14,3%
	6	Agree	6	7,8%
	7	Totally agree	4	5,2%

Transqual

		Value	Count	Percent
Standard Attributes	Position	33		
	Label	I made big investments in the last five years for the quality of my potatoes.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
	1	Totally disagree	6	7,8%
Valid Values	2	Disagree	8	10,4%
	3	Somewhat disagree	7	9,1%
	4	Undecided	15	19,5%
	5	Somewhat agree	14	18,2%
	6	Agree	17	22,1%
	7	Totally agree	10	13,0%

Switch

		Value	Count	Percent
Standard Attributes	Position	34		
	Label	If I change from processor or trading company, a lot of knowledge will get lost.		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
	1	Totally disagree	16	20,8%
Valid Values	2	Disagree	24	31,2%
	3	Somewhat disagree	8	10,4%
	4	Undecided	10	13,0%
	5	Somewhat agree	12	15,6%
	6	Agree	5	6,5%
	7	Totally agree	2	2,6%

Switchyears

		Value	Count	Percent
Standard Attributes	Position	35		
	Label	How many times did I changed from my most important processor or trading company?		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
	1	0	25	32,5%
Valid Values	2	1 - 3	50	64,9%
	3	4 - 6	2	2,6%
	4	7 - 9	0	0,0%
	5	10 >	0	0,0%

VAR27nocontract

		Value	Count	Percent
Standard Attributes	Position	36		
	Label	Do you use no contract?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	29	37,7%
	2	No	48	62,3%

VAR27fixedprice

		Value	Count	Percent
Standard Attributes	Position	37		
	Label	Do you use a fixed priced contract?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	18	23,4%
	2	No	58	75,3%

VAR27poolpresal

		Value	Count	Percent
Standard Attributes	Position	38		
	Label	Do you use a pool contract with presale?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	16	20,8%
	2	No	60	77,9%

VAR27poolnopresale

		Value	Count	Percent
Standard Attributes	Position	39		
	Label	Do you use a pool contract without presale?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	26	33,8%
	2	No	50	64,9%

VAR27poolfloorprice

		Value	Count	Percent
Standard Attributes	Position	40		
	Label	Do you use a pool contract with floor price?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	10	13,0%
	2	No	66	85,7%

VAR27minmax

		Value	Count	Percent
Standard Attributes	Position	41		
	Label	Do you use a min-max contract?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	0		1	1,3%
	1	Yes	7	9,1%
	2	No	69	89,6%

VAR27dayprice

		Value	Count	Percent
Standard Attributes	Position	42		
	Label	Do you use a dayprice contract?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	0		1	1,3%
	1	Yes	16	20,8%
	2	No	60	77,9%

VAR27klik

		Value	Count	Percent
Standard Attributes	Position	43		
	Label	Do you use a klik contract?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	0		1	1,3%
	1	Yes	7	9,1%
	2	No	69	89,6%

VAR27volume

		Value	Count	Percent
Standard Attributes	Position	44		
	Label	Do you use a volume contract?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	0		1	1,3%
	1	Yes	4	5,2%
	2	No	72	93,5%

VAR27futuremarket

		Value	Count	Percent
Standard Attributes	Position	45		
	Label	Do you use a future market contract?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	11	14,3%
	2	No	65	84,4%

VAR27other

		Value	Count	Percent
Standard Attributes	Position	46		
	Label	Do you use another contract?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	0		1	1,3%
	1	Yes	6	7,8%
	2	No	70	90,9%

Contractprefer

		Value	Count	Percent
Standard Attributes	Position	47		
	Label	Which type of contract do you prefer?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	1	No contract	26	33,8%
	2	Fixed price	5	6,5%
	3	Pool contract with presale	2	2,6%
	4	Pool contract without presale	14	18,2%
Valid Values	5	Pool contract with floor price	6	7,8%
	6	Min-max contract	0	0,0%
	7	Dayprice+ contract	4	5,2%
	8	Klik contract	0	0,0%
	9	Combination fixed and free price	12	15,6%
	10	Volume contract	1	1,3%
	11	Futures market	3	3,9%

12	Other	4	5,2%
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Yearscontract

		Value	Count	Percent
Standard Attributes	Position	48		
	Label	For how many years do you sign a contract?		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
Valid Values	1	0	23	29,9%
	2	1	46	59,7%
	3	2	2	2,6%
	4	3	6	7,8%
	5	4>	0	0,0%

Yearscertain

		Value	Count	Percent
Standard Attributes	Position	49		
	Label	For how many years would you sign a contract if it would give you a certain future?		
	Type	Numeric		
	Format	F8		
	Measurement	Ordinal		
	Role	Input		
	1	0	18	23,4%
Valid Values	2	1	25	32,5%
	3	2	8	10,4%
	4	3	20	26,0%
	5	4>	6	7,8%

VAR31Price

		Value	Count	Percent
Standard Attributes	Position	50		
	Label	Would you freeze the prize in a contract for several years?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	63	81,8%
	2	No	13	16,9%
	11		1	1,3%

VAR31Tonnes

		Value	Count	Percent
Standard Attributes	Position	51		
	Label	Would you freeze the amount in tonnes in a contract for several years?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	18	23,4%
	2	No	58	75,3%

VAR31hectares

		Value	Count	Percent
Standard Attributes	Position	52		
	Label	Would you freeze the amount in hectares in a contract for several years?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	36	46,8%
	2	No	40	51,9%

VAR31Delivery

		Value	Count	Percent
Standard Attributes	Position	53		
	Label	Would you freeze the delivery time in a contract for several years?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	35	45,5%
	2	No	41	53,2%

VAR31Payment

		Value	Count	Percent
Standard Attributes	Position	54		
	Label	Would you freeze the payment construction in a contract for several years?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	32	41,6%
	2	No	44	57,1%

VAR31Qualtiy

		Value	Count	Percent
Standard Attributes	Position	55		
	Label	Would you freeze the quality in a contract for several years?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	27	35,1%
	2	No	49	63,6%

Cooperatesellyn

		Value	Count	Percent
Standard Attributes	Position	56		
	Label	Do you cooperate with other growers to sell your potatoes?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	13	16,9%
	2	No	64	83,1%

VAR33info

		Value	Count	Percent
Standard Attributes	Position	57		
	Label	Do you share information with other growers to sell your potatoes?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	23	29,9%
	2	No	54	70,1%

VAR33amount

		Value	Count	Percent
Standard Attributes	Position	58		
	Label	Do you share production amountwith other growers to sell your potatoes?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	2	2,6%
	2	No	74	96,1%

VAR33sellto

		Value	Count	Percent
Standard Attributes	Position	59		
	Label	Do you sell your potatoes to other growers?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	0	0,0%
	2	No	76	98,7%

VAR33other

		Value	Count	Percent
Standard Attributes	Position	60		
	Label	Do you use other ways to cooperate with other growers to sell your potatoes?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	7	9,1%
	2	No	69	89,6%

VAR33not

		Value	Count	Percent
Standard Attributes	Position	61		
	Label	Do you not cooperate with other growers to sell your potatoes?		

Valid Values	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
	1	Yes	46	59,7%
	2	No	30	39,0%

Cooperatteeconomyn

		Value	Count	Percent
Standard Attributes	Position	62		
	Label	Do you cooperate with other growers for economic reasons?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	14	18,2%
	2	No	63	81,8%

VAR35buildings

		Value	Count	Percent
Standard Attributes	Position	63		
	Label	Do you cooperate in buildings with other growers for economic reasons?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	7	9,1%
	2	No	69	89,6%

VAR35land

		Value	Count	Percent
Standard Attributes	Position	64		
	Label	Do you cooperate in land with other growers for economic reasons?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	5	6,5%
	2	No	71	92,2%

VAR35machinery

		Value	Count	Percent
Standard Attributes	Position	65		
	Label	Do you cooperate in personnel with other growers for economic reasons?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	43	55,8%
	2	No	33	42,9%

VAR35personnel

		Value	Count	Percent
Standard Attributes	Position	66		
	Label	Do you cooperate in machinery with other growers for economic reasons?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	27	35,1%
	2	No	49	63,6%

VAR35productionneeds

		Value	Count	Percent
Standard Attributes	Position	67		
	Label	Do you cooperate in production input like for example fertilizer and seeds with other growers for economic reasons?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
	0		1	1,3%
Valid Values	1	Yes	2	2,6%
	2	No	74	96,1%

VAR35not

		Value	Count	Percent
Standard Attributes	Position	68		
	Label	Do you not cooperate with other growers for economic reasons?		
	Type	Numeric		
	Format	F8		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	30	39,0%
	2	No	47	61,0%

Designcontract

	Value
Position	69
Label	If you would design a contract, what should be secured in this?
Type	Numeric
Format	F8
Measurement	Nominal
Role	Input

Remarks

		Value
Standard Attributes	Position	70
	Label	Do you have other remarks or questions about this survey?
	Type	Numeric
	Format	F8
	Measurement	Nominal
	Role	Input