

Fødevareøkonomisk Institut

Report nr. 182

The Danish Organic Vegetable Chain

Paul R. Kledal

Copenhagen 2006

Contents:

- Preface 5

- Summary..... 7

- 1. Introduction..... 11
 - 1.1. Project background..... 11
 - 1.2. The aim of the project..... 11
 - 1.3. The organization of the report 12

- 2. Theory 15
 - 2.1. Property rights, power and the organic farmer 15
 - 2.2. Hypotheses 19

- 3. Methodology and delimitation 21

- 4. The Danish Organic vegetable chain..... 25
 - 4.1. Historical background 25
 - 4.2. The network and nodes of transactions 28
 - 4.3. The primary production base in the producer node 30
 - 4.4. Organic Food Sales and Sales Channels in Denmark..... 35
 - 4.5. Organic Food Import and Export to Denmark..... 41

- 5. Development in Producer – Retailer relations 47
 - 5.1. Primary production base..... 47
 - 5.2. Packaging – the producer node of bargain power..... 50
 - 5.3. Governance structure in Producer – Retailer transactions..... 53
 - 5.4. Declining terms of trade for organic producers..... 57
 - 5.5. Contraction between organic and conventional carrot prices..... 61
 - 5.6. Retailers’ gross profit and their cost of distributing organic..... 66

- 6. Space for Future Producer Opportunities..... 71
 - 6.1. Development in Retailing..... 71
 - 6.2. The retail basket and its power assets..... 76
 - 6.3. The organic producer basket: The case from the discount chain Netto in 2005 78

Conclusion and perspectives.....	81
References	85
Annex 1:	89
Annex II:.....	92

Preface

The purpose of the report is to analyze the development of the Danish organic vegetable chain and present possibilities for producer actions to promote further economic growth in the organic vegetable sector. Two commodities have been chosen as case studies: organic carrots and iceberg salad.

In the report emphasis is placed on identifying the economic forces and structural changes within the organic vegetable chain, focusing on power and how firms along the supply chain act or counteract as well as how market transactions are carried out.

The report is part of a research project supported by the Danish Research Centre for Organic Farming (DARCOF II), which is entitled “Future supply and marketing strategies in the Danish organic food-sector”. This total research project contains also an analysis on the development of the organic pork sector and includes the education of a Ph.D. candidate.

The work in the report has been carried out by researcher and Ph.D. student Paul Rye Kledal, while Research Director Mogens Lund and senior advisor Johannes Christensen have participated in the final editing of the report.

Institute of Food and Resource Economics, May 2006

Søren E. Frandsen

Summary

The Danish organic vegetable chain has a primary production base of 160 farms covering an arable land of 729 ha. The 160 farms accounts for 21 per cent of all Danish vegetable farms, and the 729 ha covers 11 per cent of the total land used for vegetable production in Denmark (2003).

The four most important organic vegetable crops in terms of tonnes produced and arable land employed are carrots, onions, cabbage and salads. Together these four crops account for 83 per cent of all organic vegetables produced in tonnes, and take up 58 per cent of the arable land used for organic vegetable production.

From the total sales of organic food and beverages, amounting to approximately 2 billion DKK (2004), organic vegetables accounted for 237 Mio. DKK (12 per cent). Organic vegetables were the second largest product group in retail sales in value terms (2004). Carrots were by far the largest single vegetable sold covering a sale of 88 Mio. DKK – 37 per cent of all organic vegetables sold.

Denmark imported for 59 Mio. DKK organic vegetables (11 per cent of total organic food import value), and exported for 19 Mio. DKK (7 per cent of total organic food export value) in 2004.

The organic vegetable chain is a fairly short and simple chain that can be conceived as consisting of three major nodes: the input factor suppliers, the vegetable producers and the consumers. The links where complexity starts to rise are between the nodes of producers and consumers, with a wide variety of ways organic vegetables are distributed and consumed.

For analyzing the development and changes in the Danish organic vegetable chain focus on bargain power and control over access to critical resources and residual earnings has laid the foundation for the theoretical and methodological approach.

Through qualitative interviews of key players in the nodes along the supply chain it was revealed that bargain power was exercised between producers in control of packaging and the retailers. Two commodities were chosen for more in depth analyzes on the governance structure between the node of packaging and retailing: organic carrots and iceberg salad. The choice of these two commodities was, besides carrots being the most produced and sold organic vegetable, also to examine if the differences in

durability after harvest would have any effect on the governance structure between packagers and retailers.

The qualitative analyzes revealed an increasing bargain power in favour of the retailers through their different and variable types of fees, packaging requirements towards the producers as well as an extension of the period of credit. The increasing bargain power in favour of the retailers has parallel with technological and organizational improvements along the chain led to several economic changes among the vegetable producers. However, to document this in quantitative manner only valuable data were obtainable on the organic carrots.

The economic analyzes, on both conventional and organic carrot producers, showed first of all, that there has been a concentration of the production on fewer and larger farms. Secondly, the terms of trade have been mostly negative on average for the organic carrot producers in comparison with the conventional. Thirdly, there has been a contraction between organic and conventional consumer prices on carrots, with a statistical significant decline in the organic prices, but stable for the conventional.

The reasons for these changes were explained by key players along the chain as

- 1) large scale professional conventional carrot producers started to enter the market when it was beneficial for their size of production
- 2) the entry of these newcomers broke the oligopoly held by the pioneers of the organic vegetable farmers and their producer organization, by offering lower prices. Previously, the organic vegetable producers and their producer organization negotiated price and expected total output with the retailers
- 3) retailers now negotiate price and expected sale with each individual producer typically on a weekly basis
- 4) the growth and expansion of the discount chains and their marketing of the most sold organic vegetables like carrots and onions, have raised competition in retailing in general and trickled a downwards price pressure towards the suppliers

Future possibilities for producer actions to promote further growth and sustain control over residuals were examined.

Since 80 per cent of all organic food sales go through retailing analyzes on this matter moved towards the development in retailing documenting the growth in discount

stores and large supermarkets. In this report the concept of 'the organic basket' is put forward as way for producers to cooperate, control and coordinate sales towards the retailers.

The case story from the discount chain 'Netto' is an example of how the 'organic basket concept' has been implemented in reality.

Another possible approach that could take place in the near future was revealed through the interviews of key players in the packaging node. Some of these players were planning to create a basket of variety supplying retailers through a *trans-national network* of organic producers/packagegers. In this way the increasing bargain power of the trans-national buyer organizations in retailing could be counter balanced by the packagegers. Their trans-national network could lower transaction costs towards the retailers in relation to the act of purchasing as well as secure the need for scale. The producers/packagegers themselves would appropriate control and ownership of a critical supply chain resource with relatively high utility and scarcity and thereby secure residuals and hence power.

1. Introduction

1.1. Project background

During the second half of the 1990's the Danish organic sector, like in many other countries of the North, experienced a strong and steady growth in sales, number of farms and arable land converting to organic production. However, in many countries the growth in organic food was often carried out within a few commodity groups. In the Danish case it was first and foremost the dairy sector that supported the fast growth in the 90's, reaching a market share in consumer milk of around 30 per cent.

Parallel to the economic growth in the organic sector the Institute of Food and Resource Economics was involved in a research project called the "Potential of organic farming in a sustainable development" analyzing the growth potentials for organic farming in Denmark. A part of this project was a socio-economic study interviewing conventional farmers to ascertain the characteristics of whom the potential organic farmer were, the commodities they pictured themselves producing and the various barriers they were expecting during their considerations of converting to organic (Kledal, 2000 & 2001).

Some of the conclusions were that organic dairy production would cease to grow, whereas new areas of potential growth were within pork and plant/vegetable production. The potential organic farmer was a person between 20 and 44, and would have a small to medium size farm.

Since organic vegetable production was relatively unexamined concerning various socio-economic aspects like farm types, production costs, market potentials and possible distribution channels as well as consumer preferences, this organic commodity sector was chosen for further research examining the growth potentials in the future supply of organic foods.

1.2. The aim of the project

The overall aim of this research project is to analyze the future development of the Danish organic vegetable chain with two commodities chosen as case studies:

- Organic carrots
- Organic iceberg salad

Emphasis is placed on identifying the economic forces and changes within the organic vegetable chain, focusing on power and how firms along the supply chain act or counter act upon it, as well as how market transactions is carried out.

By linking the research results of economic changes with the behaviour of various firms and nodes along the supply chain in relation to power, the aim is to

- 1) identify and explain the development of the Danish organic vegetable chain and provide with useful supply strategies stimulating growth among producers
- 2) contribute to new theoretical and methodological approaches in agro-food supply studies.

1.3. The organization of the report

This report is first of all introducing a new theoretical approach in chapter 2 analyzing the development of the organic market by focusing on power and conflicts over access to critical resources as a way to explain dynamics and changes. Methodologically, quantitative data has been utilized and compared with qualitative data gathered through interviews with key players along the organic vegetable chain, and described in chapter 3.

Chapter 4 is first a general overview of the historical development of the organic vegetable chain in Denmark identifying the changing institutional settings from 1980 up till now. Then the network of the chain with major nodes and links is described, and the import level, the national production base and sales channels as well as exports of vegetables is illustrated and compared with all organic market products.

Chapter 5 is using the case studies of organic carrots and iceberg salad to analyze more in depth the development of the governance structure in producer-retailer relations illustrating how retail bargain power is exercised and increasing. Equally, analysis has been made on terms of trade, price contractions between organic and conventional as well as calculations on retailer gross profit margins on organic carrots.

Chapter 6 examines the changes taken place in retailing and introduces the concept of a 'basket of variety' to explain why there has been this change and shift in power from food suppliers to retailers. The 'organic basket' is put forward as an example of how organic producers can lower transaction cost towards retailers as well as counter

balance their bargain power, and regain ownership and control over organic as a critical resource along the supply chain.

Chapter 7 concludes and puts the research results into a broader perspective.

2. Theory

2.1. Property rights, power and the organic farmer

In the world of economists property rights to an asset consists of three elements (Hart, 1995; Barzel, 1997):

1. The right to consume or dispose a good
2. The right to control the making or exchange of a good
3. The right to appropriate specific or residual earnings (that is the net earnings that remain after all payments to which it is contractually committed, such as wages, interest payments and other input supplies).

These three elements in property rights are also the ones that inherently hands over power to the owner of these rights.

According to Grossman and Hart (1986), Hart and Moore (1990) and Hart (1995) ownership of physical assets (machines, land, capital) gives the owner(s) residual control rights over all the attributes of the assets. The residual control makes the owner(s) residual claimant(s) to residual earnings that the assets generate. In this way specific and residual rights of control over assets automatically transfers residual powers to the claimants.

Marxian theories carry a similar approach. The capitalist (employer) who owns the *means of production* (machinery) has the right to appropriate the *surplus value* from the workers hired to generate a value using the means of production. From a Marxian point of view the relationship between capital and labour is by nature exploitive because the *specific property relations*, where the capitalist owns the physical assets, automatically hands over power to the capitalist (M.N. Ryndina & Tjernikov, 1980).

However, Rajan & Zingales (1998b) argues that the ownership of physical assets is not the only source of power within a firm, nor necessarily the most effective in promoting relationship-specific investments. Within the assumptions of the property rights literature, they identify an alternative, possible non-contractual, mechanism to allocate power: *access*. They define access as the ability to use, or work with, a critical resource. A critical resource can be a machine, an idea or a person. The agent who is given privileged access to the resource gets according to Rajan & Zingales *no new residuals rights of control*. All the agent gets: is the opportunity to specialise his/her

human capital to the resource and make him/her self valuable and hence get control over the critical resource as a source of power.

From a similar point of view Cox et al. (2002:3) define power “as the ability of a firm (or an entrepreneur) to own and control *critical assets* in markets and supply chains that allow it to sustain its ability to appropriate and accumulate value for itself by constantly leveraging its customers, competitors and suppliers”.

The concept of critical assets is based on the idea that, within any supply chain, some of the resources that are used to deliver an end product or service are highly valued in utility terms by a large number of buyers or suppliers and are relatively scarce or unique in ownership, by virtue difficult, or sometimes impossible, to copy. It is in this combination of high utility and relative scarcity that enables particular supply chain resources to become critical assets both in buyer-supplier exchange and in market context.

Both Rajan & Zingales and Cox et al. use critical resources or critical assets as a *relational* term, and both imply that there are no fundamental changes in the property relations. Hence, changes in the power structures do not occur. Cox et al. (2002:7-8) argue “that the majority of critical assets will provide the firm that possesses them with only *temporary* opportunity to earn rents. This is because other entrepreneurs or entrepreneurial firms will be constantly looking for ways in which the resources underpinning a critical asset can be imitated or substituted”. Cox et al. claim that there are essentially three main mechanisms through which firms without critical assets might seek to reconfigure the existing structure of power in any particular market or supply chain: product innovation, process innovation and supply chain innovation.

By choosing organic agriculture as a production method or idea, the farmer would, in line with Rajan & Zingales, get access to a critical asset. This access gives the organic farmer the opportunity to specialise his/her human capital to the asset and make him/her valuable, and hence get control over the critical resource. The specific and residual right of control over the critical asset generates a source of power. Following Cox et al. this power and control over organic production as a critical asset, enabling appropriation and accumulation of value or above normal profits, will only be temporary. Hence, organic producers will only be able to control their products as a critical asset as long as it is valued high in utility terms and in the same time delivers something relatively scarce or unique in ownership along the supply chain.

Appropriation of above normal profits being only temporarily would also be in line with the Treadmill theory and its claims on firm behaviour in relation to profit development (Cochrane, 1958). Cochrane showed that where farmers continuously attempt to improve their incomes by adopting new cost-reducing technologies and acquiring more land to achieve larger scale of production, the more production will go up and price go down due to the demand-supply mechanism in the market. Consequently, profits from adaptations that lower production costs are countered by a lower price of the product, and profits expected by the adaptation of new technology do not materialize.

However, the cost of securing property rights and secure critical assets will arise wherever two or more parties transact across technologically separable interface. Such technologically separable interfaces are usually called nodes or links connected to a commodity chain or a food network.

Within the framework of critical agro-food research *food filieres*, *food networks*, *systems of provision* and *commodity chains* are well established concepts and approaches unveiling the different forces acting upon the commodity flows from producer to consumer (Fine, 1994 and Fine et al. 1996; Hopkins and Wallerstein, 1986; Lockie & Kitto, 2000).

The *Global commodity chain approach* (GCC) has attracted significant attention from the early 1990's and its focal distinction introduced by Gerrefi (1994) between *producer-driven* and *buyer-driven* chains, has generated a number of case studies. The type of driver in the chain is determined by the location of market power and ability to keep up barriers of entry.

A strong point of the GCC approach is its inclusion of power in economic relations and transactions in international production and trading relations. One important aspect is that power is seen not simply as the effect of barriers of entry, but also organizational changes and more effective 'supply chain management' implemented by key agents (Raikes, Jensen & Ponte, 2000).

However, at each juncture between the nodes, trans-actors face a decision of how to govern their relationship. Their joint interest is to undertake activities that enhance total surplus. But each transaction involves a potential source of conflict, because both parties try to maximize their own surplus value. Organizations and institutions are from the transaction cost perspective the means which trans-actors attempt to

regulate this behaviour. The broad goal is to adopt governance structures that promote efficient adaptations while economizing on the costs of reaching agreements and resolving disputes (Masten, 2000).

Boehlje & Schrader (1995:15-16) argue that there are two fundamental points of control and one fundamental source of power in a negotiation based coordinated food production and distribution system. The first point of control is the end user (the consumer) and those firms that have intimate contact with the consumer (supermarkets/retailers). The second is the raw material supplier, depending on the sustainability of their contribution to the production/distribution process. Here they point out specifically the owners of genetics. The one fundamental source of power, at the two ends of the supply chain they argue, is knowledge.

The organic farmers would in line with these aspects on economic changes along a supply chain endeavour increasing market power exercised from the end nodes, and be forced to either grow in farm- and production size or find alternative ways of organizing sales to secure greater control over distribution and price along the chain.

In this regard Williamson (1985) proposed the analysis of the firm as governance structures. Given the institutional environment, the efficient governance structure is derived from the transaction's attributes. By the analysis of the specificity of the assets, the frequency and the uncertainty involved in the transactions, an efficient governance structure is expected.

When focusing on transaction costs three types of governance structures are relevant:

- simple market exchange
- contracting
- internal organization (vertical integration)

In *simple market transactions*, parties are generally free to bargain or not bargain as they prefer. Moreover, once a transaction is consummated, the parties have relatively few ongoing obligations and may, for example, use or dispose of the items procured in whatever manner they choose.

By *contracting* trans-actors can attempt to limit free riding by defining the range of acceptable behaviour. Contracts can also serve to attenuate hold-up problems by

stipulating terms of trade *ex-ante*, thereby reducing the prospect of costly repetitive bargaining.

With *internal organization* hold-up opportunities can be limited by allocating residual rights of control over the use and disposition of assets, and thereby restrict the ability of non-owners to withhold assets from production.

Klein, Crawford and Alchian (1978) and Williamson (1979) note that contracting parties with transaction-specific assets put themselves in a position of being held up at renegotiation when they use short-term contracts. The possibility of hold-up occurs because each party could potentially extract, during renegotiation, the other's quasi rents once the investments were made. The hold-up situation is one of the main economic explanations to why farmers often organize themselves in cooperatives (or down stream vertical integration).

A typical asset specificity in agriculture, that opens up for hold-up situations and asymmetric bargain positions, is 'time' or the temporal specificities within the various commodities. Agricultural commodities have a wide range of durability and perishability making simple market exchange the most hazardous in relation to farm products with a short durability.

The economic development and changing behaviour played out among the organic producers, which according to the property rights theory are trying to secure organic as a critical asset valued high in utility terms and in the same time delivering something relatively scarce or unique in ownership along the supply chain, can accordingly to the transaction cost theory, be revealed by focusing on how transactions and the governance structures are carried out at each node of the chain.

2.2. Hypotheses

On the background of the chosen theoretical framework, focusing on power and control over access to critical resources and residual earnings as well as the governance structures applied to protect the property rights of the firms along the organic vegetable chain, the following hypotheses have been formulated and are going to be tested

1. The above normal profits in organic farming are only temporary for producers operating in open competitive markets

2. Power in the food supply chain will be strongest in the first node concerning input supplies to the farm node, and at the end of the chain in the node of distribution (retailers/wholesalers) supplying consumers
3. Differences in time specificity concerning durability on the chosen agro commodities, organic carrots and organic iceberg salad, will influence the governance structure concerning market exchange to prevent eventual hold up situations

3. Methodology and delimitation

For the study of the development of the organic vegetable chain the following approach was adopted.

Firstly, the methodological approach is structured around Williamson's four levels of analysis approaches (Williamson, 2000), using the second level. This level is focusing on governance structures dealing with contracts and transactions. In this case, the supply chain and network structure in the organic vegetable sector. By delimiting the analysis to the second level in Williamson's methodological approach, the research methodology applied can be characterized as a micro analytic approach focusing on the actors along the nodes in the supply chain analyzing how transactions on the market is carried out.

Secondly, data collection was done by reviewing relevant literature, publications and studies to outline the Danish organic vegetable chain although there are few studies on that specific sector itself. During this process key players along the chain were found. Key players include producers, market operators and procurement officers among the retailers. Specific organic consumer or household studies have been delimited from this research, due to the theoretical assumptions that power along a supply chain is concentrated in the node of input factors to farms, and at the node of retailing.

The key players chosen along the supply chain were from the beginning surveyed through a combination of questionnaires, telephone interviews and face-to-face discussions. During this process a more open-ended qualitative interview form were used to let the key players themselves point out how the network of the organic vegetable chain was functioning guided by questions in terms of production flows, contracting and power structures along the chain.

Then a second round of interviews were made with a more narrow group of key players going into depth with the questions on how contracts are negotiated, how power is exercised and what prospects they saw for the future concerning the development and growth of organic vegetables. During this process a more specific questionnaire was used (included in the Annex).

Thirdly, the amount of commodities to analyze and follow along the vegetable chain was delimited to organic carrots and iceberg salad.

The choice of the two organic vegetables was made for two reasons: 1) their time specificity concerning durability is very different with carrots having a long durability and iceberg salad a short durability. The question on durability was related to the hypothesis that differences in the time specificity of agro commodities could influence the outcome of different governance structures concerning market exchange. 2) Out of the ten most sold organic vegetables in Denmark, carrots and iceberg salad are each the most sold organic vegetables in relation to their durability.

During the first round of qualitative interviews the proposition from Boehlje & Shrader (1995) on power, stating that in a negotiation based coordinated food production and distribution system power is exercised through the first and in the node of the end of the food chain, was investigated. None of the producers interviewed could relate to or agree that power was exercised from the first node concerning input factors related to genetics. One carrot producer experimenting with different strains of carrots with specific qualities like taste, sweetness, durability in relation to handling in food service products, complained that the plant breeders were often very unwilling to provide him with his requests for special strains. For him this was not a question of market power, but more the consequence of the concentration of a few big seed companies, and him being an organic producer working with a niche of little interest to the seed companies.

The question of power along the food chain was overall by the producers expressed as coming from the retailers, confirming Boehlje & Schrader that the end user and the firms with intimate contact with the consumers, are the point of power and control. The results through the qualitative interviews with the producers changed the analytic focus away from input suppliers and more specifically to the retailers, analyzing on how the governance structure between farm supplier and retail buyer is exercised. More specifically how *bargain power* from retailers is exercised, and how it has evolved towards the organic producers. In those analyzes potential future transitions in retailing were explored. The purpose was to find new spaces of growth opportunities for the organic vegetable producers, and in the same time introduce strategies to counterbalance some of the bargain power exercised by the retailers.

In relation to the hypothesis that above normal profits in organic farming would only be temporary, and connected to the qualitative results that power in the supply chain was exercised by the retailers, monthly consumer prices from 1997 to 2000 in two competing supermarket- and discount chains - respectively on organic and conventional carrots – was analyzed. A regression model was formulated to calculate if there

were any contraction between organic and conventional carrot prices respectively in supermarkets and discount stores. Food and Resource Economic Institute (FOI) do have the development in consumer prices from 2001 to 2005 in relation to the type of store, but are not allowed to publicise them yet.

Producer prices on organic and conventional carrots were collected from the Statistics department of FOI from 1998 to 2004, and *terms of trade* were calculated and compared in relation to clarify the tendency in profit development among organic carrot producers. The production of organic iceberg salad was too small to collect valid data.

In relation to the research task of introducing new growth strategies for the organic vegetable producers as a sector, the prospects of expanding through the food service node was examined both through literature, market reports and qualitative interviews. The organic food service sector has so far been driven by a public demand-pull with a market turnover of 200 – 400 Mio. DKK. However, the political discourse at the state level is dominated by the ideological foundation, that market demand should be the driver for growth in organic food service procurement. Parallel to this, a structural reform in Denmark has been implemented in 2005 reducing the number of municipalities from 275 to 98, leaving a prospect of status quo concerning expansion of the organic food service sector through public initiatives in the next couple of years (Sall & Sall, 2004:5, 15 & 37).

The private food service sector consists of hotels, restaurants, fast food outlets etc. The organic food share is small and unknown, but regarded as having growth opportunities. However, from the qualitative interviews it encounters constraints in the areas of product development, delivering- and quality assurance, which to some extent could be solved by a public demand-pull targeted with a spill-over effect to the private sector. The conclusions and perspectives in this report concerning promoting an ‘organic basket’ to the retailers offering high utility and low transaction costs could also be valuable to the organic food service sector whether the market is private or public.

The willingness to respond to interviews and to provide quantitative data differed significantly between the contacted persons and firms. But where it has been possible the data obtained has been checked against official statistics. Since organic vegetables are a rather new area for collecting official statistics, the results from interviewing the producers in this research project and checking them against the official statistics, have already made ‘Denmark Statistics’ elaborate on their data collection on vegeta-

bles. The interviews in this research project revealed a certain discrepancy between the import/export data given by the organic carrot producers and the official statistics on import/export data for organic carrots.

4. The Danish Organic vegetable chain

4.1. Historical background

The development of organic vegetable production in Denmark is very closely connected to the establishment of the Danish organic farm movement, and related to the people starting up the production collective ‘Svanholm estate’ on the main island Zealand in 1979. In 1980 the ‘farm group’ at the Svanholm estate started a study circle with people representing the various alternative farming systems prevailing at that time, trying to form common rules for what alternative farming could be.

The rise of the alternative farm movement in the late 1970’s and 80’s has to be understood in relation to its dialectic production counterpart – the conventional farming - which was causing growing environmental problems from pesticide and nitrogen residues in ground- and drinking water. Also questions on animal welfare were raised as well as problems of antibiotic immunity among humans from the heavy use of medicine in industrial farm systems. These debates and environmental topics, stemming from the problems related to conventional farm systems, were part of the discourse shaping the development path of the production methods and regulatory setting of alternative farming in the beginning of the 1980’s (Jacobsen, 2005; Guthman, 2004; Belasco, 1989).

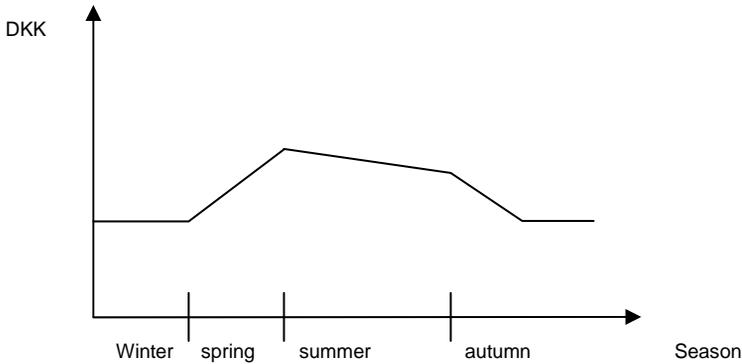
After many debates within the study group, as well as with a large group among the alternative farm movement, who felt that Biodynamic farming was too ‘religious’¹, the Danish Association of Organic Farming (LØJ) was founded in March 1981. Parallel with the foundation of LØJ, the former FDB (now Coop Denmark) invites the various alternative farm groups to an open meeting, trying to find out what the production possibilities are, after FDB have had many enquiries about sales of alternative products. FDB chooses to concentrate on farmers following the rules of LØJ, and Poul Henrik Hedeboe from Svanholm becomes the coordinator/contact person between FDB and the farmers producing under the regulatory regime of LØJ.

FDB buys what existing organic and biodynamic farmers can produce, and Svanholm gets a niche producing what FDB would like to promote. Production volume is arranged for a whole season with a fixed price following the price profile of the season (see figure 4.1). Potatoes, onions and carrots are the main crops. This ‘planned econ-

¹ Using the words of Poul Henrik Hedeboe during one of the qualitative interviews, and head of the farm group at Svanholm from the very beginning.

omy' of the organic vegetable production and sales continues till the beginning of the 90's.

Figure 4.1. Season profile of vegetable prices



From 1984 to 1986 sales doubled and FDB concentrates heavily on organic products from 1986 (See also table 4.1). Svanholm decides the same year to build a packing department. From 1988/89 sales in general begins to stagnate and the turnover of organic products starts to take the form of the S-curve or production 'Life cycle' with maturity occurring.

Table 4.1. Actual sales from FDB on organic vegetables from 1981/82 – 1988/89

Year	1981/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89
Tonnes	30	100	150	150	300	1,000	3,000	4,000

Source: The Co-committee and trade association for coordination between Organic and Biodynamical farming, 1991 (Danish: Fællesudvalget og Branchekoordineringsudvalget for Økologisk og Biodynamisk Jordbrug, 1991).

In 1987 governmental initiatives like the first nationally controlled organic brand – the red Ø – as well as various economic support schemes for organic farmers is instituted. This political acknowledgement of organic farming helped to spur new optimism within the organic movement.

In 1988 the independent supermarket chain 'Irma' starts to sell organic products. The organic vegetable producer's starts the sales organization 'Fælles Grønt', but it closes down in 1990 becoming 'Fælles Grønt Vest', a sales organization for the organic vegetable producers in Jutland. 'Fælles Grønt Vest' is later merged in 2000 becoming the present sales organization 'Dan Organic'. Sales of organic products move in general from stagnation to a decline in the period of 1988 to 1993.

In 1992 FDB buys the supermarket chain Irma and closes down a year later 52 of its shops out of 114. The same year the organic producers starts negotiating with FDB about promoting organic products close to traditional food prices on the condition that FDB will involve themselves in a heavy marketing effort – later known as the discount promotion on organic products in 1993 which helps to boost sales on all categories of organic products.

The organic producers on Zealand and Fyn organize themselves in 'Biodania' – a sales and coordination organization. Production and sales on vegetables are now organized and negotiated with FDB as a contract stating a specific supply, a specific start price and any deviation in price is determined by demand and supply during the season.

In 1997 'Netto' - the discount chain of 'Dansk Supermarked' - starts to sell organic vegetables, and overall demand increases from 1997 to 2000. The organic vegetable producer's possess, in accordance with the theory, a critical resource and an end product with a high utility and relative scarcity in the supply chain of food. Some organic vegetable producers named this period during the interview as "the golden period" where they took advantages of their market position.

The rising demand and steady market sales for organic vegetables attract professional conventional producers to convert to organic production. However, these new comers belonging to the 'early majority' are not organized in 'Biodania', so to undermine the barriers of entry they start to offer the supermarkets lower prices on organic vegetables.

FDB reacts to the previously 'hold up' situation and *ex-post opportunism* from the sales organization 'Biodania', and stops buying organic vegetables through them. Instead negotiations take place with each individual organic producer. Expected production and expected sales are negotiated, but prices are settled every week in relation to

demand and supply where producer and supermarket are ‘free’ to sell or buy. From governance structure of contracting it now moves towards simple marketing.

Some strong players in ‘Biodania’ like ‘Søris I/S’ choose not to sell its products to FDB, but instead through the discount chain Netto.

Since 2000 the pressure on the organic producers’ price and deliverable conditions has risen and a general mistrust to FDB is common. From 2003 FDB is split up so FDB only takes care of the political part of the coop, whereas the retailing is organized through ‘Coop Denmark’, which again is organized on a Nordic level within ‘Coop Nordic’. The mixture of being dependent on FDB’s large market share on organic products, knowing FDB’s code of conduct and commitment to promote organic products, and at the same time experiencing a supermarket chain operating more and more on the same premises as the ‘pure capitalistic’ supermarket chains, are a general concern and type of argument coming from some of the organic vegetable producers. The discount chain ‘Netto’ has so far kept a good reputation among the organic vegetable producers using a policy of the ‘principal-agent’ in terms of paying a little more, but in the same time securing themselves dedicated suppliers.

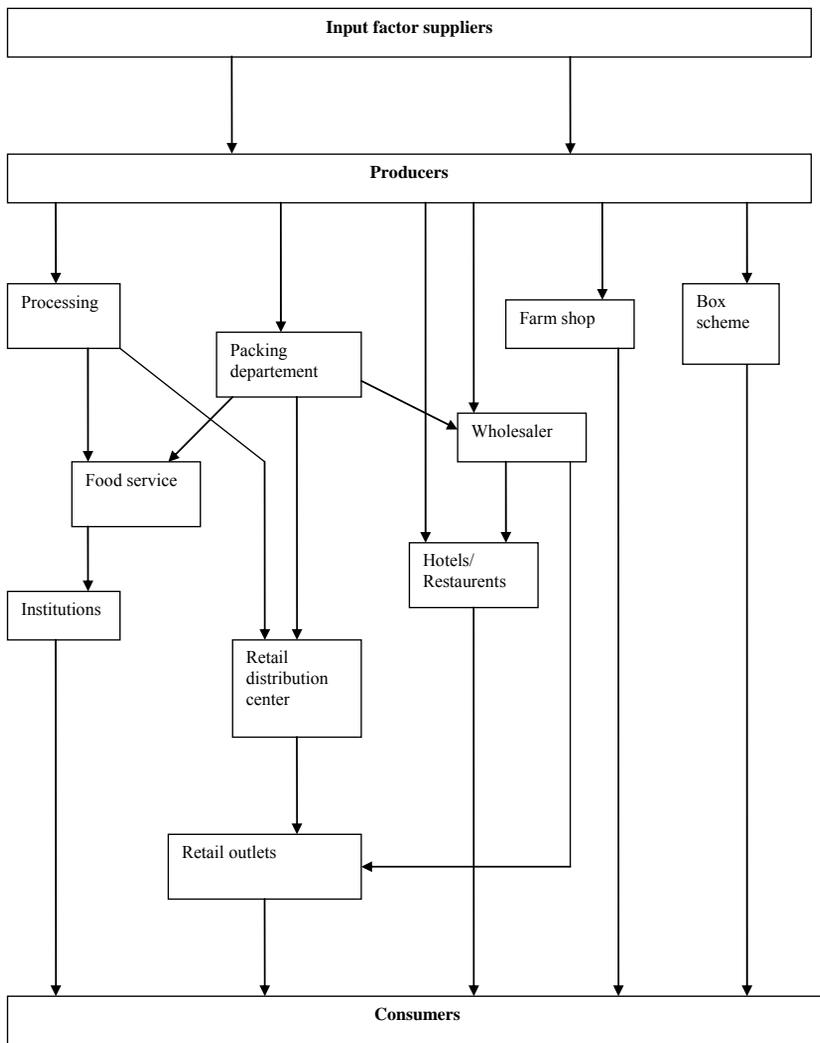
How the retailer bargain power appears and is carried out in practise will be discussed in chapter 5.3.

4.2. The network and nodes of transactions

Taking a ‘still-picture’ of today’s supply chain of organic vegetables one finds a fairly short and simple chain that can be conceived as consisting of three major nodes: the input factor suppliers (seeds, machinery etc.), the vegetable producers and the consumers. The links where complexity starts to rise are between the nodes of producers and consumers, indicating the variety of ways organic vegetables are consumed. Through the studies of the two chosen vegetables a general network of the Danish organic vegetable chain has been drawn and illustrated in figure 4.2.

Looking at the network, between producers and consumers, the key agents on producer side are a few producers who individually or as a cooperative, control the packing node. Farmers who pack and sell to retailers have the cost and duty of delivering to a retail distribution center. Retailers want to keep transaction costs low, so they are interested in only trading with as few producers as possible, but enough to secure themselves against ‘hold up’ situations.

Figure 4.2. The organic vegetable supply chain



Since retailing purchases around 80 per cent of the organic vegetables, the links between the packing node and the retail distribution center is of importance concerning economies of scale, capital accumulation and bargain power (see chapter 4.4 concerning sales channels and their size in market sales).

From the retail distribution center the retailers have their own distribution and logistic programme reaching their various types of outlets (hypermarkets, supermarkets, discount etc.).

Other producers have found an ‘alternative distribution channels’ for their products creating a farm shop and/or a box scheme where vegetable boxes are delivered directly to the consumers. This can be either once, twice or every third week. Alternative distribution channels within organic food like box schemes are economically important in Denmark. The E-trading box-scheme company ‘Aarstiderne.com’ (Season.com) has alone around 30 per cent of the market turnover on organic vegetables.

Some producers can have a deal with a local retailer delivering directly some small amount or a special vegetable, but this is becoming more rare since independent retailers are declining rapidly and instead they belong to various kinds of chains or buyer groups with restrictions on where and what to buy. The same goes for selling through wholesalers where the retailers in general have taken over this role themselves. But there are a few wholesalers who will solve some transaction costs for organic producers/packagegers concerning sales to retailers or other consumer outlets like restaurants and hotels. Other producers can have a direct link to a restaurant or a food-service company again supplying to various kinds of public institutions like day-care centers, schools etc., or private markets like restaurants and hotels.

In the real world one vegetable producer will often consist of several nodes and distributing to various nodes in the network. For example one producer can have a farm shop, own his own packing room delivering to a retail distribution center as well as an organic food service firm and a restaurant.

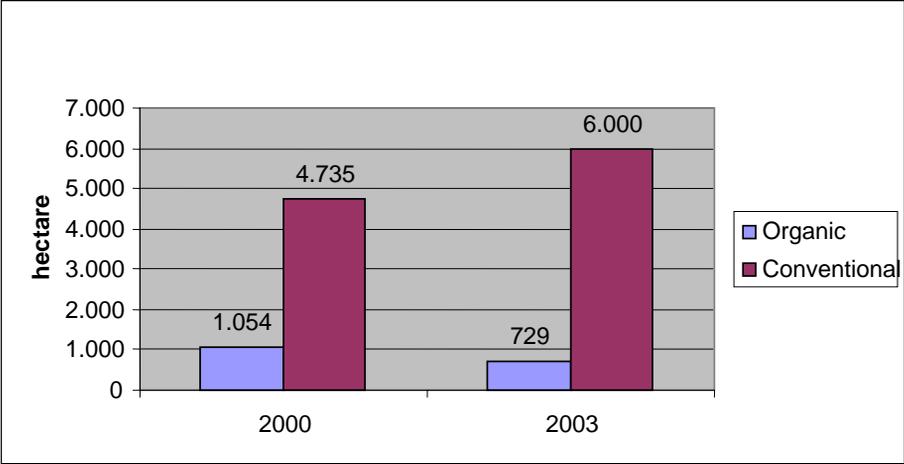
4.3. The primary production base in the producer node

In comparison with the overall picture of organic farming in Denmark, the organic vegetable production accounts for only a very small share in farms and arable land. In 2003 the arable land was 729 ha, and has dropped from 1,054 ha in 2000 following

the general trend of decline. However this decline has been mainly caused by a decline in the organic carrot production area with approximately 300 ha.

Out of the total land in Denmark used for vegetable production, the organic area with its 729 ha accounted for 11 per cent. The conventional vegetable production had risen 1,265 ha. covering 6,000 ha (Denmark Statistics, 2004). This is shown in figure 4.3.

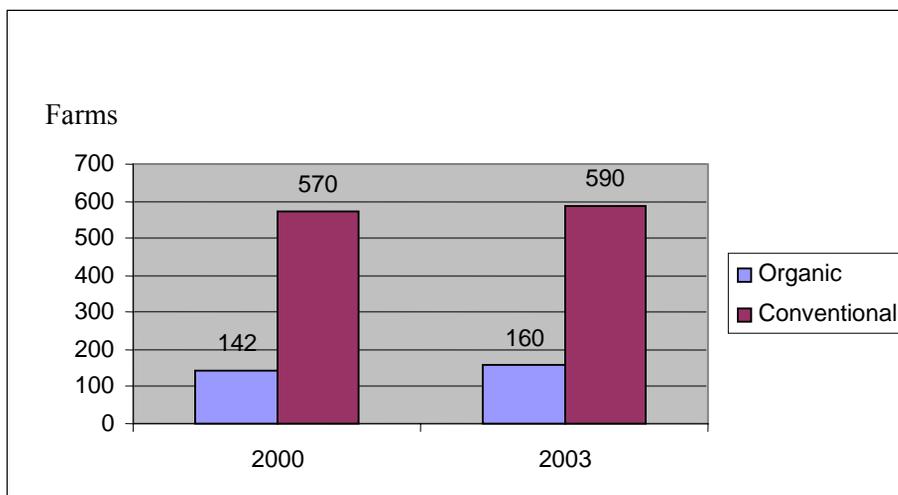
Figure 4.3. Development in organic vegetable area 2000 - 2003



Source: Denmark Statistics, 2004.

Although the arable land for organic vegetable production has declined, the number of farms has surprisingly gone up from 142 in 2000 to 160 in 2003, as shown in figure 4.4. The conventional farms have had a similar increase rising from 570 to 590. The 160 organic vegetable farms account for 21 per cent of all Danish vegetable farms.

Figure 4.4. Development in number of organic vegetable farms 2000 - 2003



Source: Denmark Statistics, 2004.

The regional location of the 160 organic vegetable farmers is illustrated in table 4.2. The organic vegetable farms are almost distributed fifty-fifty among the islands and Jutland. However, the vegetable farms in Jutland and their output in tonnes are at much larger sums. This is related to the type of crops grown. Heavier root crops suitable for the sandier soils of Jutland like carrots as well as leek and onions dominate in comparison with the lighter crops on the islands like salads, broccoli, sugar corn etc. Also the fact that organic consumption is related to greater urban areas could have an impact on the choice of production and placement of farmers who choose to produce organic vegetables, with the main capital Copenhagen being situated on the island of Zealand. Especially organic farmers, where the main income is from selling through the so called alternative market, are often placed close to a greater urban area.

Table 4.2. Organic vegetable farms and their location in Denmark (2003)

	The islands of Fyn, Zealand and Bornholm		Jutland		Total
No of org. farms	76	48 per cent	84	52 per cent	160
Hectare	252	35 per cent	477	65 per cent	729
Tonnes	4,621	29 per cent	11,327	71 per cent	15,948

Source: Denmark Statistics, 2004.

The 15,948 tonnes of organic vegetables produced in 2003 amounted approximately to 9 per cent of the total vegetable production at 179,759 tonnes.

In table 4.3 a ‘Top ten list’ of what organic vegetable farmers produce in terms of hectare used is described in comparison with conventional vegetable production.

As one can see carrots is the most produced organic vegetable in Denmark. Then onions, cabbage and various salads succeed the latter being number four. The organic vegetables compared to the conventional follow pretty much each other in terms of placement on the ‘top ten list’. The differences are salads in organic vegetable production is not on the conventional top ten list, and also more root commodities are found among the organic vegetables.

Potatoes do not in the Danish statistics figure as a vegetable, but according to FOI special statistics organic potatoes in 2003 occupied 337 ha and the output was 5.600 tonnes. If one regards potatoes as a vegetable it would be number one in terms of hectare covered for organic vegetable production and number two in terms of output.

Table 4.3. The organic and conventional vegetable 'Top ten list' 2003

Organic				Conventional		
No.	Crop	Hectares	Tonnes	Crop	Hectares	Tonnes
1	Carrot	218.1	9,036	Onion	1,196	42,941
2	Onion	85.1	2,096	Carrot	1,165	52,950
3	Cabbage	66.6	1,223	Cauliflower	415	5,531
4	Salads	57.7	872	Peas	324	1,336
5	Beetroot	28.9	616	Cabbage	305	14,103
6	Leek	27.5	410	Leek	302	4,716
7	Parsley root	27.0	261	Onion (industry)	275	10,073
8	Celeriac	22.4	330	Other cultures	274	-
9	Parsnip	21.8	339	Broccoli	249	1,127
10	Broccoli	18.9	51	Herbs	248	-

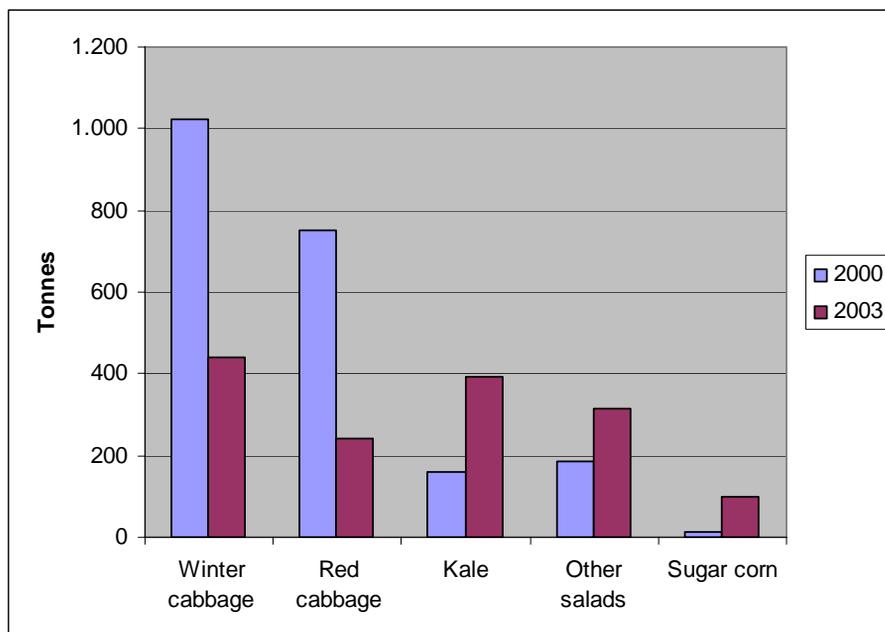
Source: Denmark Statistics, 2004.

It has been analyzed more in detail what the rising number of organic vegetable growers on a smaller amount of arable land produce in comparison with the statistics from 2000. Except for the decline of approximately 300 ha in organic carrot production, there does not seem to be a clear picture or significant trends. In general there are more growers of cabbage, sugar corn and various kinds of salads, but in the same time most cabbage production has declined. Cabbage production therefore must have been taken up by more farms, but as a small crop in arable use.

The shift in organic vegetables produced could be a sign of a general trend where high quality crops (in money value as well as consumer preferences) are replacing low quality crops. But again the time period and changes are too small to give a clear indication of possible changes in the organic vegetable production.

In figure 4.5 a couple of vegetables with the largest changes in output have been chosen. Organic carrots are left out of the figure, because the decline is so big compared to the other changes in organic vegetable output. Organic carrots dropped in output from 19,190 tonnes in 2000 to 9,036 tonnes in 2003.

Figure 4. 5. Selected Organic Vegetables and their change in output



Source: Denmark Statistics, 2004.

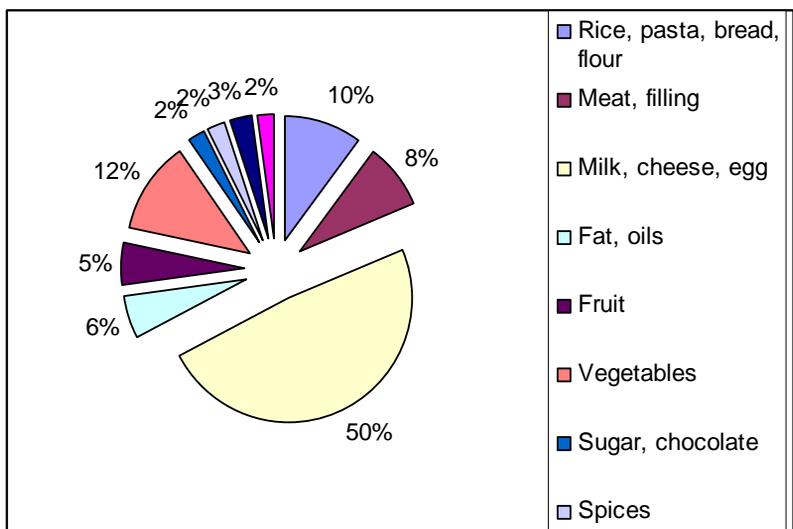
4.4. Organic Food Sales and Sales Channels in Denmark

The retail sales of organic food and beverages in 2005 amounted to a total of approximately 2.3 Billion DKK. (Euro 308 Mio.). In figure 4.7, the composition of the organic retail sale is illustrated. As figure 4.6 shows, 50 per cent came from the product group milk, cheese and eggs amounting to 1.1 Billion DKK. Most of the milk, cheese and egg sales came from milk products alone (Denmark Statistics, May 2006).

Organic vegetables amounted to a sale of 271 Mio. DKK (Euro 36 Mio.), covering 12 per cent of all organic retail sales.

Rice, bread, flour, cereals etc. amounted to a sale of 232 Mio. DKK (31 Mio. Euro), covering 11 per cent of the total organic retail sale. Meat sales made a total of 194 Mio. DKK (Euro 26 Mio.), half of it coming from beef and veal.

Figure 4.6. Product composition of organic sales in retailing 2005



Source: Denmark Statistics, May 2006.

In table 4.4 the changes in turnover in retailing has been listed. Vegetables and meat are the most significant changes in the areas of growth, but a general increase in sales are seen in all areas since 2003.

Table 4.4. Product composition of organic sales in retailing 2003 - 05 (1.000 DKK.)

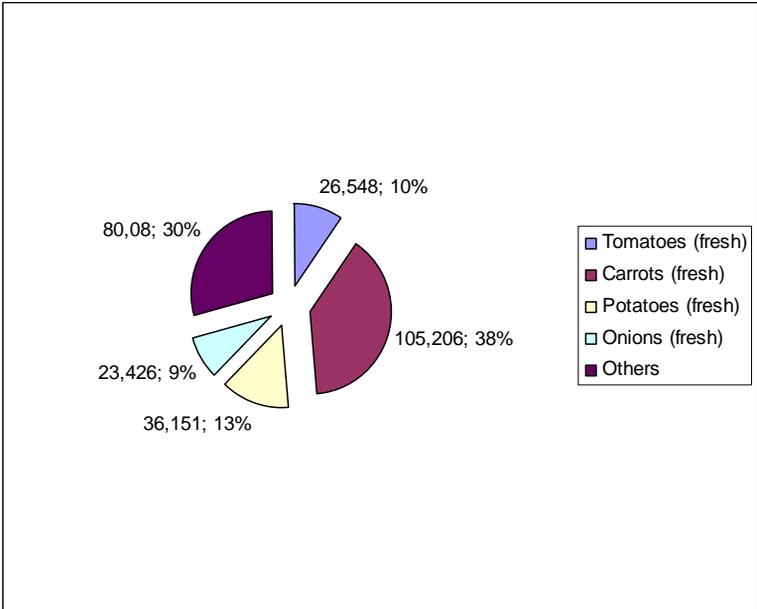
	2003	2004	2005
Rice, pasta, bread, flour	231,715	222,079	232,198
Meat, filling	115,866	148,226	193,908
Milk, cheese, egg	1,072,307	1,037,102	1,112,201
Fat, oils	89,410	94,704	127,163
Fruit	82,384	98,108	123,524
Vegetables	230,641	236,623	271,411
Sugar, chocolate	50,129	49,536	51,978
Spices	32,246	40,794	55,534
Coffee, tea, cocoa	58,619	58,086	63,330
Juice, wine	53,806	55,061	53,925
Total turnover	2,017,123	2,040,319	2,285,173

Source: Denmark Statistics, May 2006.

As mentioned above organic vegetables amounted to a total sale of approximately 271 Mio. DKK (36 Mio. Euro). In figure 4.7 the composition of the vegetable sales in more detail is illustrated.

With a sale of 105 Mio DKK. (14 Mio. Euro) organic carrots were by far the largest single vegetable sold in Denmark covering 38 per cent of total organic vegetable sales. Potatoes covered 13 per cent and onions and tomatoes covering respectively 9 and 10 per cent. The rest was made up by all kinds of other seasonal vegetables like cabbage, leeks, parsnip, salads etc. covering 30 per cent of the total organic vegetable sale.

Figure 4.7. Composition of organic vegetable sales in retailing 2005 (1.000 D.kr.)



Source: Denmark Statistics, May 2006.

In table 4.5 the five categories of organic vegetables are described in terms of the amount in tonnes sold and compared with sales in 2005 as well. As one can see organic carrots have increased with 3,000 tonnes since 2003 - an increase of 36 per cent. Potatoes have increased with 859 tonnes, onions with 298 tonnes and tomatoes 35 tonnes.

Table 4.5. Organic vegetable sales in tonnes 2003 – 2005

	2003	2004	2005
Tomatoes	445	443	480
Carrots	8,394	9,365	11,443
Potatoes	3,833	4,143	4,692
Onions	1,528	1,544	1,826
Others	2,754	2,548	2,743
Total	16,954	18,043	21,184

Source: Denmark Statistics, May 2006.

The total turnover of 2,285 Mio. DKK. in 2005, is according to ‘Denmark Statistics’ covering sales through big retailer chains and wholesalers selling to other retailer chains. The 2,285 Mio. DKK corresponds to a market share of 3,5 pct for organic food and beverages from all retail sales (Denmark Statistics, 2003:65). The statistics above does not cover sales through various alternative sales channels.

However, in 2002, *Økologisk Landsforening* (The National Organic Association), made a survey through GfK Consumer Scan 2002, on where consumers purchased organic products. In table 4.6 the type of sales channel is listed with its share for organic products in total turnover as well as its share of the total organic sales in per cent.

Table 4.6. Sales channels and their total turnover and sale of organic food (per cent) 2002

	Share of organic products in total turnover	Share of the total organic sale (per cent)
Big hypermarkets	4,3	7,0
Discount	4,5	22,5
Medium hypermarkets	4,8	15,8
Supermarkets	4,5	30,5
Mini markets	3,2	4,2
Alternative sales channels	29,7	12,6
Others	6,3	7,3
Total	5,0	100

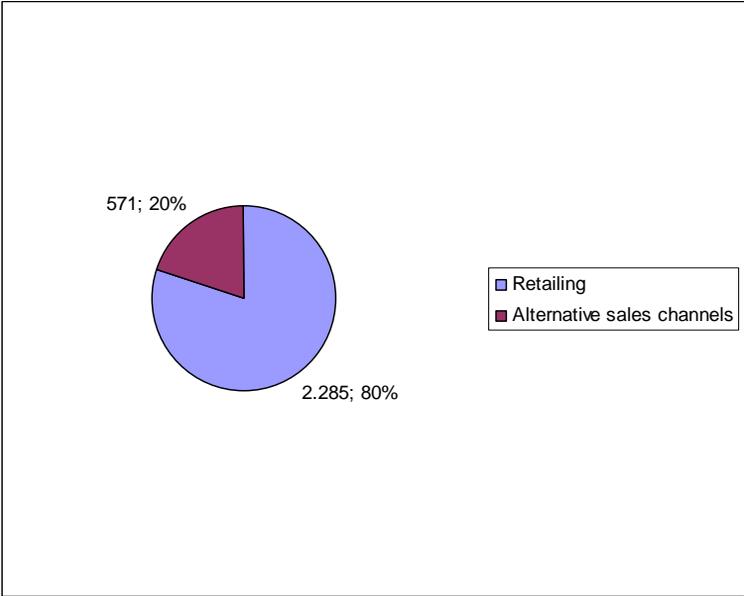
Source: National Organic Association, www.alt-om-okologi.dk/forbrug/forbrugeranalyse.

As table 4.6 shows almost one third of all organic sales in Denmark are sold through the supermarkets alone. Discount chains cover almost 23 per cent of all organic sales,

and together supermarkets and discount chains cover 53 per cent of all organic sales. Retailing covers 80 per cent of all organic sales, whereas alternative sales channels cover the last 20 per cent

In figure 4.8 an estimation of total organic sales in DKK has been made on behalf of the distribution in percentages and the turn over in retailing according to Denmark Statistics (2003:65). The total organic market in 2005 is estimated to almost 2,900 Million DKK (383 Mio. Euro), on behalf of the 2,285 Mio. DKK from Denmark statistics regarding the turn over of organic food through retailing, and the estimated 20 per cent by GFK of organic food sales coming from alternative sales channels + others.

Figure 4.8. Total organic sales in Denmark 2005 (1.000 D.kr.)



Source: Own estimation based on various sources from Denmark Statistics and the National Organic Association.

Although alternative sales channels “only” covers 12.6 per cent of all organic sales in Denmark, they constitute a market share of 29.7 per cent on organic products. One alternative sales channel, the successful box-scheme and e-commerce based company ‘Aarstiderne.com’ (Seasons.com), had a total sale in 2004 at 143 Mio. DKK (Euro

19.2 Mio.). Compared with the total organic retail sale Aarstiderne.com would then cover 7 per cent of the 12.6 per cent sold through alternative sales channels.

Aarstiderne.com claims that half of the turnover in Aarstiderne.com comes from vegetables. This would amount to approximately 70 Mio. DKK. In money terms Aarstiderne.com has a share in organic vegetable sales that amounts to 30 per cent of the total vegetable sales in retailing which was 237 Mio. DKK in 2004.

If organic vegetables are estimated to have an average market share of 20 per cent through alternative sales channels + others (based on 12 per cent in retailing and 30 per cent through Aarstiderne.com), then the turn over from vegetables through these channels would be approximately 114 Mio. DKK (15.3 Mio. Euro) - calculated by taken 20 per cent from the estimated 571 Mio. DKK).

Økologisk Landsforening (National Organic Association) views the market share for organic products to be 5 per cent of total consumer sales. *Økologisk Landsforening* claims in a consumer analysis that the market share for organic food and beverages has been stable at this level since 1999, but with variations in the products coming and leaving (www.alt-om-okologi.dk/forbrug/forbrugeranalyse).

Denmark Statistics made a special survey of the organic turnover in retailing in 2003 (Denmark statistics, 2003:65), which came to around 3.5 per cent of all food and beverage sales. All food and beverage sales were estimated to be 58 Billion DKK. With a total turn over in organic food and beverages estimated at 2.9 Billion DKK. (2005) the organic share would come to approximately 5 per cent.

Food service is also an important outlet for organic food. In table 4.7 the total turn over in food service is illustrated.

Table 4.7. The turnover of organic food through the food service sector

Food service:	Total	Organic share	Org. vegetables
Public Provisioning	2,2 Billion DKK.	200 – 400 Mio. DKK	24- 48 Mio. DKK.
Canteens (public and private)	2.8 -	unknown	Unknown
Hotel, restaurants, fast food	9.5 -	unknown	Unknown
Total turn over	14,5 Billion DKK.	unknown	Unknown

Source: Own estimation and Sall & Sall, 2004.

So far the main markets and drivers for demand of organic food service has been public provisioning. The organic share of total public provisioning has been estimated to be between 10-20 per cent leaving the organic turnover through public food service between 200 and 400 Mio. DKK (Sall & Sall, 2004). If vegetables are estimated to have the same market share in percentage in food service as in retailing (12 per cent), then organic vegetables would have a turn over in food service between 24 – 48 Mio. DKK.

In the food service market firms being purely organic as well as firms with both conventional and organic operate side by side.

4.5. Organic Food Import and Export to Denmark

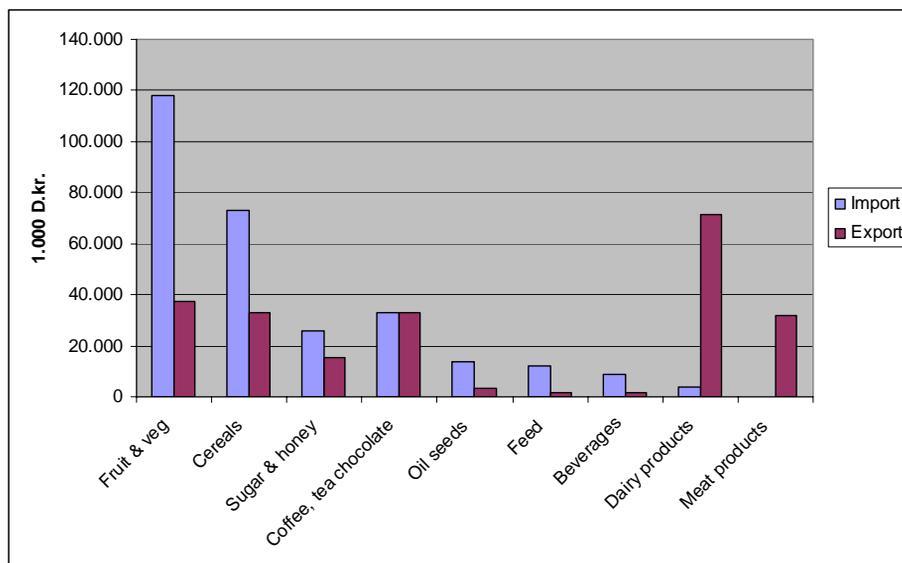
Organic farming in Denmark is not an isolated national production, but consists of both a flow in import and export. In 2004 the Danish foreign exchange with organic food commodities amounted to a total of 577 Mio DKK (Euro 77 Mio). The import amounted to 310. Mio DKK. (Euro 47 Mio), and the export was a bit less, 266. Mio DKK (Euro 36 Mio.).

In relation to the total gross output of 2,124 Mio. DKK ‘ab farm’, the organic export value accounted for approximately 13 pct (Own calculations based on FOI, 2005 account statistics for organic farming 2004).

In figure 4.9: ‘*Foreign trade with organic food (2004)*’, the most important organic products respectively being imported and exported to Denmark, are illustrated. The largest import share came from ‘fruit and vegetables’, which amounted to 38 per cent of the total import in money terms: 118 Mio DKK (Euro 15,8 Mio). Half of it, 59 Mio DKK, was coming from vegetables. The import share from vegetables, out of the total import of organic foods, amounted then to 19 per cent.

Second largest import share were cereals, followed by coffee, tea, chocolate with respectively 23 and 11 per cent of the total Danish organic import.

Figure 4.9. Foreign trade with organic food (2004)



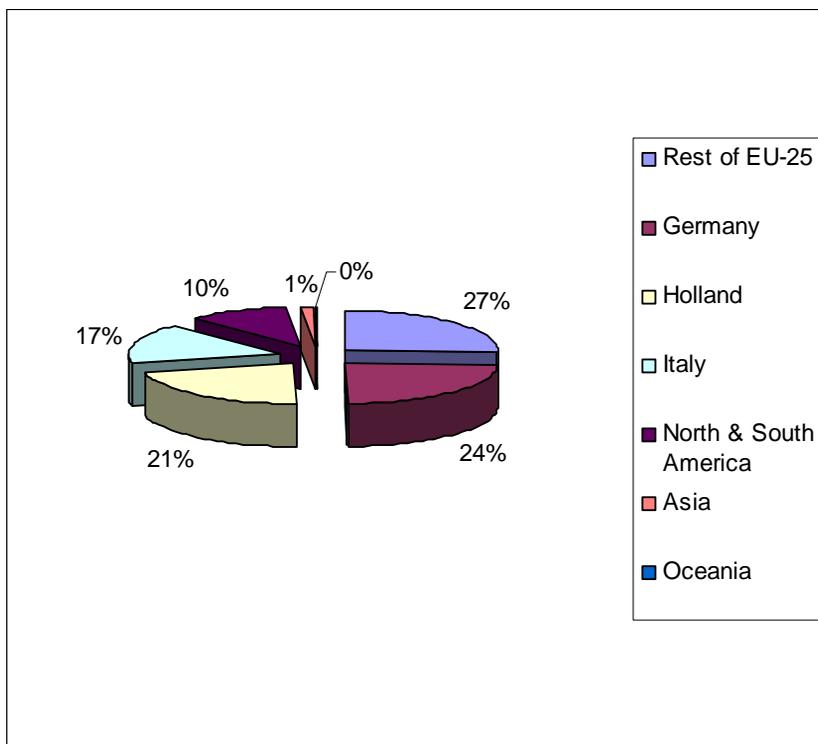
Source: Denmark Statistics, November 2005.

The largest export share from Danish organic foods was Dairy products including eggs, followed by Fruit and vegetables and Cereals. Dairy products and eggs amounted to 71,5 Mio DKK (9,6 Mio Euro), Fruits and vegetables 37 Mio. DKK. (5 Mio Euro), and Cereals approximately 33 Mio DKK (4.4 Mio Euro). Within the category of Fruit and vegetables the value of exports from vegetables alone amounted to 19 Mio DKK, and consisted of both frozen and fresh vegetables. The export value from vegetables, out of the total organic food export, amounted to 7 per cent.

In figure 4.10 and figure 4.11 the various country groups, from where Denmark respectively imports organic products from and exports to, is illustrated.

In 2004 the EU-25 contributed with 87 per cent of the total organic import to Denmark. The organic food import though is concentrated on a very few countries. Three countries, Germany, Holland and Italy alone, contributed with 62 pct of the total organic import. Ten per cent came from North- and South America, and the last 3 per cent from Asia, Africa and Oceania.

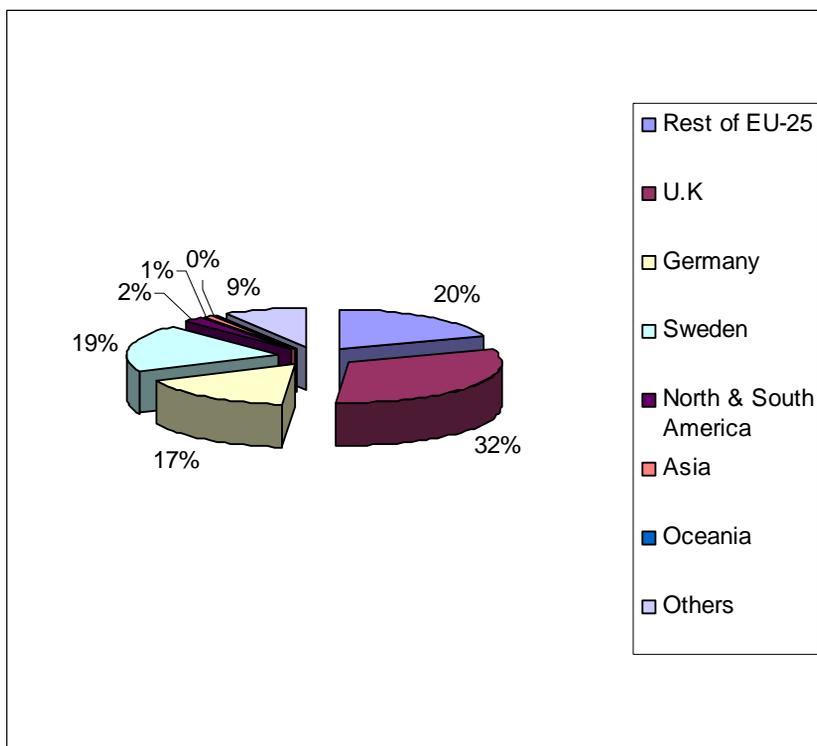
Figure 4.10. Countries/regions behind Danish organic imports (2004)



Source: Denmark Statistics, November 2005.

The countries receiving Danish organic food exports are even more concentrated. As illustrated in figure 4.11, 88 per cent of the export goes to EU-25 countries alone, and three countries, Great Britain, Sweden and Germany, accounts for 78 per cent of the total Danish organic export. Two per cent was exported to North- and South America, Asia and Oceania 1 per cent and 'other countries' accounted for the last 9 per cent

Figure 4.11. Countries/regions behind Danish organic exports (2004)



Source: Denmark Statistics, November 2005.

In figure 4.12 the turnover from all organic vegetables in 2004 in relation to import, national sales as well as export are illustrated. The share of organic vegetables in percentage as well as in money value is arranged to compare with the value of all organic food. Figure 4.12 is an overview of the many different data already mentioned in chapter 4.4 and 4.5.

Figure 4.12. Value flow of all organic food and its share of vegetables (Mio. DKK, 2004)

Organic import value

<u>All org</u>	<u>veg.</u>	<u>veg. In %</u>
310	59	11

National turnover

	<u>All org.</u>	<u>Veg.</u>	<u>Veg. In %</u>
Retail:	2,040	237	12
Food service:	200-400	24-48	12
Alternative Sales channels:	510	100	20

Organic export

<u>All org</u>	<u>Veg.</u>	<u>Veg. In %</u>
266	19	7

5. Development in Producer – Retailer relations

Case studies: Organic carrots and Iceberg salad

Analyzing the changes taken place in the organic vegetable production, focus was made in depth on the governance structures between producers and retailers. Two commodities were chosen and followed along the supply chain: Organic carrots and Iceberg salad.

The two commodities were chosen because

1. to test if differences in durability of vegetables (asset specificity) would have any impact on the governance structure and transactions between ‘producer – retailer’ to avoid various ‘hold up’ situations concerning vegetables with a short durability
2. carrots and salads were the most sold organic vegetables each in relation to having respectively a long and short durability

Getting sufficient quantitative market as well as data on iceberg salad or salads in general has proven difficult, and therefore the ability to compare or verify all of the obtained qualitative data from the producer-retailer network has not been possible regarding this commodity.

5.1. Primary production base

In chapter 4.3 a general overview of the production base for all organic vegetables was introduced illustrated by its 160 farms covering 1,054 hectare. In this chapter the specific data for organic carrots and iceberg salad will be introduced.

Table 5.1 illustrates the changes taken place from 2000 to 2003 in the organic carrot and iceberg salad production compared to changes in the conventional production.

Among organic carrots the arable land has been reduced with 320 ha – falling from 538 ha to 218 ha - and the production output has declined with 10,154 tonnes – from 19,190 to 9,036. The number of farms has declined from 73 to 64. Compared to conventional carrot production the number of farms has increased with 16 farms from 141 to 157 and the arable land has risen with 177 ha – from 770 ha to 947 ha. Produc-

tion output has risen from 29,974 tonnes to 43,036 tonnes – an increase of 47 per cent.

Organic Iceberg salad seems to be very stable in terms of number of farms and output during the period 2000 to 2003. Conventional Iceberg producers have fallen from 28 to 24, but the arable land is the same.

However, the organic vegetable producers within carrots and iceberg salad were during the qualitative interviews of the opinion, that the official statistics on vegetable production in 2000 were not all correct. Denmark statistics have confirmed this, and in their statistics for 2003 (Denmark Statistics, 2004: 2) written that some producers with conventional production have been included as organic. The data on vegetable production for 2003 are according to the producers' representative. They also state that there has been a decline in farmers producing organic carrot, and that the sector is experiencing a concentration of production on fewer but larger farms.

Table 5.1. Development in organic and conventional carrot and iceberg production 2003

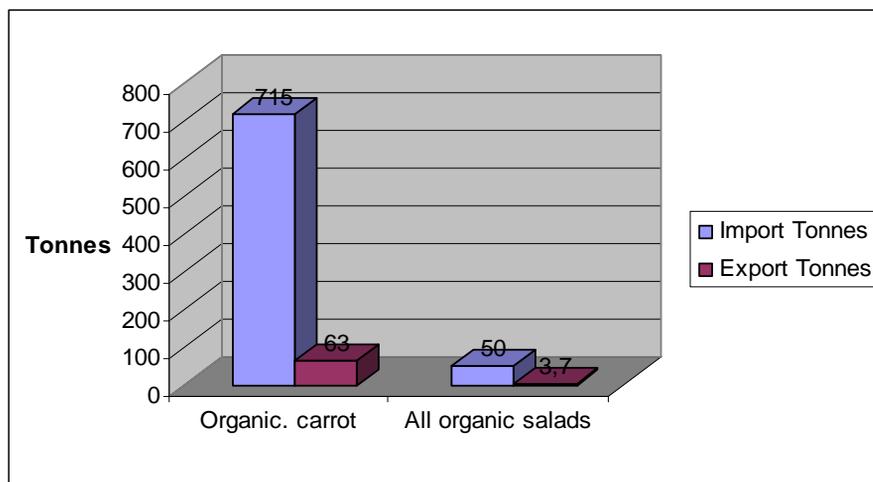
	No. of farms		No. of ha		Prod. output (tonnes)		Ha per farm	
	2000	2003	2000	2003	2000	2003	2000	2003
Org. carrot	73	64	538	218	19,190	9,036	35.7	41.5
Conv. carrot	141	157	770	947	29,974	43,914	39	46.4
Org. Iceb. salad	14	13	33	32	532	531	16.1	16.6
Conv. Iceb. salad	28	24	177	177	4,651	4,246	26	24

Source: Denmark Statistics 2004: "Outdoor vegetables 2003" "In Danish: Grøntsager på friland 2003".

From Denmark Statistics a special survey on the import and export of organic carrots and iceberg salads was requested for this report. However, Iceberg salad was too small a number to gather information on, but all organic salads could be obtained, and are therefore shown to give a picture of the import/export size.

In figure 5.1 the import/export in tonnes are illustrated. The import of organic carrots was 715 tonnes. In relation to the total production of 9,036, the import share was 8 per cent. There was a small export of 63 tonne. Salads had an import share of 50 tonnes, and just 3,7 tonnes of export.

Figure 5.1. Import/ Export (ton) of organic carrots and salad 2003

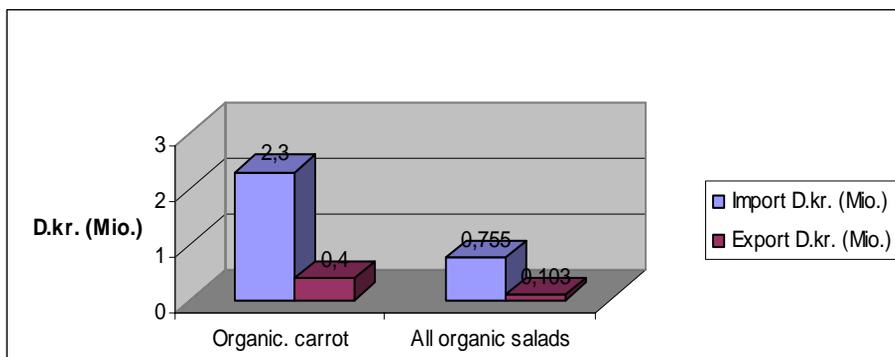


Source: Denmark Statistics 2005 (special delivery).

In figure 5.2 the import/export share in DKK (Mio) is illustrated. The organic carrot import amounted to 2,3 Mio. DKK Compared to the total organic vegetable import of 28,127 Mio. DKK, the organic carrot import share accounted for 8 per cent.

These data from Denmark Statistics did not correspond with the qualitative information obtained from the producers. The producers stated an import twice as much, and an export almost 13 times more than the official statistics claim. Pointing out these discrepancies to Denmark Statistics they have informed that the producers own statements should be followed, and that they will look into their future statistical data collection on organic import/export.

Figure 5.2. Import/Export values of organic carrot and salad 2003



Source: Denmark Statistics 2005 (special delivery).

5.2. Packaging – the producer node of bargain power

In terms of bargain power key players among organic vegetable producers are not only related to their size of production, but also their ability of controlling the packaging and distribution of other vegetables in general. The owner(s) of the packaging node are often a major producer of one or a few vegetables with a supply of other vegetables from other producers to keep costs of labour and machinery in the packaging down. Therefore, if analyses are on power relations in a food chain, the traditional approach of focusing on a specific vegetable and following it along the chain is not sufficient and could even be misleading.

The point of departure for power analysis therefore focused on the governance structure between the node of vegetable packaging and the buyers. Since retailers are the main buyers of organic vegetables, and the producers themselves claimed that power in transactions was exercised by the retailers using various control mechanisms to carry it out, analysis went into depth with the development in producer-retailer relations.

Among organic carrots producers three major suppliers out of 64 (in 2003) control the node of packaging. They are Dan Organic Ltd., Sørís I/S and Tange market garden Ltd. The three are also major packagers and distributors of other organic vegetables like onions, potatoes etc. purchased in from other producers.

Table 5.2. Key packagers/producers among organic carrot and iceberg salad

Organic carrot Producer/distributor:	Organic iceberg salad Producer/distributor:
<p>Dan Organic Ltd.: A distributor of 60 suppliers (42 are members)</p> <p>Production flow/year: 3,500 t. consumer carrots 1,800 t. industry carrots</p> <p>Import: 350- 400 t. consumer carrots Export: 800 t. consumer carrots 1,800 t. industry carrots</p> <p>Søris I/S: Farm: 100 ha. (10 ha own carrot production)</p> <p>Production flow: 3,500 t. consumer carrots</p> <p>Import: 1,000 t. consumer carrots</p> <p>Tange market garden Ltd.: Farm: 375 ha mostly rented land. (95 ha carrots)</p> <p>Production flow/year: 3.500 t. consumer carrots</p> <p>Export: 300 t. consumer carrots</p> <p>Marienlyst market garden Ltd: Market garden: 30-40 ha + rents land 70 ha own carrot production</p> <p>Production flow/year: 2,500 t. consumer carrots</p> <p>Import: 150 t. consumer carrots</p> <p>Aarstiderne.com (E-trading company) Sales flow: 420 t. consumer carrots Import: 60 t. consumer carrots</p> <p style="text-align: right;">Total number of producers in 2003</p> <p style="text-align: center;">64</p>	<p>Marienlyst market garden Ltd: Market garden: 30-40 ha + rents land 8 ha iceberg salad production</p> <p>Production flow/year: 150,000 heads</p> <p>Skytte, Lars Market garden: 17 ha (12 ha iceberg salad)</p> <p>Production flow/year: 200,000 heads</p> <p>Øko-One Aps Owner rents land: 22 ha (8 ha iceberg salad production)</p> <p>Production flow/year: 150,000 heads</p> <p>Aarstiderne.com Production/Sales flow: 600,000 heads Import: 300,000heads</p> <p style="text-align: center;">Total number of producers in 2003</p> <p style="text-align: center;">13</p>

Source: Own illustration.

In iceberg salad a similar number of producers can be considered major distributors to the retailers, and thereby in control of contracting with the retailers. The three producers (out of 13 in 2003) are Marienlyst market garden, Lars Skytte and ‘Øko-One’ by Michael Balle.

The E-trading company Aarstiderne.com is supplied partly by the producers in the node of packaging and from some farms national and internationally. The packagers and most of the carrot/iceberg salad producers supplying Aarstiderne were in general satisfied with the contracting terms and the governance structure based on a contract stating a fixed price and expected output for the season. However, this way of contracting is also possible due to the customer policy of Aarstiderne, where several of the boxes have a fixed portion of vegetables supplied. The customers do not know entirely what the box contains, but accept this as a surprise or a service in helping to try out new vegetables.

During the qualitative interviews some of the suppliers to Aarstiderne were expressing resentment to the changing conditions on how contracts were negotiated, claiming that a price pressure similar to the ones coming from the retailers were starting to be implemented.

In table 5.3 the four major producers/distributors in organic carrots and iceberg salad are listed with their total production flow, including the size of import/export in terms of tonnes, and compared to the data from Denmark Statistics (2003 & 2005). The numbers from the producers are based on their own statements for 2005.

In relation to consumer carrots the total production flow was by the producers estimated to be 13,000 tonnes. Within the total production flow 1,200 tonnes were imported, making total production of consumer carrots in Denmark 11,800 tonnes. From the 11,800 1,100 were exported leaving 10,700 tonnes for sales in Denmark. Official sales on organic carrots through retailers in 2005 (leaving out alternative sales channels) were 9,769 tonnes. In this respect producer claims and official statistics corresponded fairly close.

However the official import/export data deviated a lot from the producers own claims. As illustrated in table and table 5.2 the national production of organic carrots according to Denmark Statistics (2003) was 9,036 t. plus an import of 715 t. making the total official production flow 9,751 tonnes. The official import quota of 715 tonnes was only 65 per cent of what the producers claimed, which amounted to 1,200 t. The official data on exports of organic carrots was 63 tonnes, whereas the producers claimed they exported 1,100 tonnes. As mentioned before Denmark Statistics has been notified this deviation on the official data of organic carrot import/export and producer claims. One has to be aware though that the official data is from 2003, but the qualitative interviews have been made in 2004 and 2005. The import/export flow can in the

same time vary a lot from one year to the other in small market such as the organic market.

Table 5.3. Producer claims and official statistics on production, imports and exports – organic carrots and iceberg salad

	Production (tonnes)		Import (t)	Export (t)
	Carrots	Iceberg salad	Carrots	Carrots
Denmark Statistics	9,036	531	715	63
Producer claims	10,700	500	1,200	1,100

In relation to iceberg salad the four major suppliers claimed they had a production of 1,1 Mio. salad heads. Two salad heads amount to approximately one kilogram, making the total production of iceberg salads 575 tonnes. Denmark Statistics had an official production output of 531 tonnes, which is also very close to producer claims.

However it is important to be aware of the term ‘production flow’ running through the link of packaging, because these links have an extended supply network between each other helping out when one of them have an order they cannot fulfil sufficiently. The amount of carrots can therefore appear two times at two different packagers.

5.3. Governance structure in Producer – Retailer transactions

Since year 2000 the way ‘producer – retailer’ transactions have been conducted has changed dramatically. The changes have been listed in table 5.4.

Until 2000, when demand for organic products was increasing rapidly in a market of undersupply, transactions were in general planned and coordinated between a retailer and a producer organization with mutual bindings concerning terms of production output, determination of price before season start.

After 2000, when markets for organic products in general became more saturated, the ‘producer – retailer’ transactions have been shaped by a process moving towards a more competitive market driven environment, where demand-supply and asymmetric bargain power in favour of the retailers determines the price.

Table 5.4. Retailer-producer transactions before and after year 2000

	Before 2000	After 2000
Retailer obligations on production output	Yes	No
Producer start price negotiated before season start	Yes	No
Producer prices during season decided according to demand and supply	Yes	Yes
Various slotting fees for access to retailer space	No	Yes

Source: Own illustration based on the qualitative interviews with producers.

The way transactions take place starts with the retailers, more specific a procurement officer in the buyer organization, who negotiates with producers individually before the start of the season about their expected production budget in combination with the retailer’s sales budget. Some producers claim that they do not get any information about the retailers’ expectations on sale.

In general the producers claim that there are no written bindings or terms concerning retailer obligations buying the production output. Prices are determined during the season on a weekly basis based on demand and supply, and the retailers are free to buy from whom they want.

Since 2000 various slotting fees and other control mechanisms for selling through retailers have been institutionalized, and thereby moving the cost and risk-burden of selling organic vegetables more and more on to the producers themselves.

The qualitative interviews of the organic vegetable producers indicate an increasing bargain power at the retailer node especially through the various and variable control mechanisms concerning marketing fees, obligation fees for renting specific retailer packaging systems, time of return payment from deliverance, opening fees for having access to new retail stores, all of which the producers have to pay. In table 5.5 the various slotting fees and control mechanisms according to the producers have been listed.

Table 5.5. Retailer control mechanisms on organic vegetable suppliers

	2003	Future retail proposals
Period of credit	21 days	45 - 90 days
Specific marketing fee per. sold unit (D.kr.)	0,10	No information
A general marketing fee	2-3 per cent	5 per cent
Deposit for renting retailer boxes	30 D.kr.	No information
Rent of using packing boxes	3.80 D.kr. per box	No information
Opening fee	No information	2,500 D.kr
Written contract	None	Yes
Producer covering losses	First 6 days	No information

Source: Own illustration based on the qualitative interviews of the producers.

Concerning the *period of credit*, the interviews with the organic vegetable producers revealed that retailers have proposed to prolong the time of return on payments from originally 21 days to 45 days. One producer even claimed that they are pushing for 90 days. In other words, the retailers are reducing the cost of capital for themselves, but increasing it for the producers.

The consequences of extending the period of credit will first of all put a pressure on small farmers, who are often a major group in organic farming. Secondly, the turn over period of vegetables delivered and sold in supermarkets is usually under a week, so the discrepancy between sold at retailer and retailers paying their suppliers will grow immensely.

The '*specific marketing fee*' which the farmer pays per unit sold at the retailer is a replacement for a previous policy, where the producers had to accept a random reduction in price if the retailers had planned a certain campaign involving organic vegetables. In this way the producers have a kind of control over their contribution to sales campaigns, and what the retailers actually carry through.

The '*general marketing fee*' is a fee the producers have no control of what it goes for. Before it was a mutual agreement on helping marketing organic vegetables, but the producers pushed forward for getting a more specific marketing fee to control payments and retailer marketing efforts. In some ways it would be more correct to say that the marketing fee has become a 'space fee' the retailers collect for the producers to use space in the retailer stores. The retailers have proposed to raise the marketing fee from the previously 2-3 per cent to 5 per cent.

Deposit on packing boxes is a deposit the producers have to pay the retailers for renting their specific packing boxes. The deposit is paid back when boxes are returned to the retailers.

On top of that the producers also have to pay a *Renting fee* per packing box to cover depreciations of the boxes plus the obligation of the retailers to wash them.

Some of the large producers interviewed claim that in relation to sales agreements on organic exports the discount chain 'Netto' charges an *opening fee* from the producers for getting the advantages of access to more space in new stores the chain is opening abroad. Discount chains usually have between 1,200 and 1,400 commodities, so if this is a fee that is collected from each supplier of 1,400 commodities it amounts to 3,5 Mio DKK collected just to open a store. However, only very few of the producers have been presented for an opening fee.

A *Written contract* is being proposed more and more heavily from the retailers on the producers. They have so far rejected to sign it many of them claiming that the demands are outrages like paying a fine of 10,000 DKK if deliverables are not on time. However, the increasing push for written contracts in the governance structure between retailers and organic vegetable producers has to be seen in relation to the growing vertical integration and internationalization of the buyer organizations of the retailers. The nearness between national buyers and producers are diminishing, and so written contracts are becoming the norm to secure supplies.

The organic vegetable producers are in this regard part of trend for written contracts seen in other countries as well (Glaser et al., 2001)

Producers covering losses is for salad producers 6 days. That means if the salads start to rotten within 6 days the producer covers the loss. The producers are here left with a lot of asymmetric information concerning their products regarding handling at the retailer distribution center, distribution itself to display in the shops. If salads are not sold because the retailer claims they were starting to rot, the producers are left with only trust on this type of governance structure in transactions.

The qualitative interviews with the producers reveal that not only has the producer-retailer regime changed since 2000 from a market with certain obligations resting on the shoulders of the retailers concerning sales, to a pure market driven price setting. The retailers' have also created a 'tool box' for various ways to control and increase

their bargain power towards the suppliers, and according to the organic vegetable farmers, the pressure is increasing.

Parallel with the tool box, an increasing vertical integration in decision making among retailers is also taking place.

For example the buyer organizations among the three biggest players in Denmark, 'Coop Denmark', 'Dansk Supermarked' and 'SuperGros', have all become more vertically integrated. In relation to Coop Denmark the buyer organization within food has transformed into a buyer organization for 'Coop Nordic Food' organized along different food categories (i.e. fruit and vegetables). In this respect a common statement from the organic vegetable producers being interviewed was, that previously they could negotiate personally with the procurement officer responsible for purchasing their crop or group of crops. But now the producers claim that the procurement officers themselves have little or no influence on the terms of transactions. It is "somebody higher up in the system where decisions have been made", the producers are told.

'Netto', the discount chain under 'Dansk Supermarked', which is a major outlet for organic products, has previously negotiated sales and terms of contracting directly with the producers. From January 2005 contracts, terms of distribution, have to be negotiated with 'Dansk Supermarked Indkøb' (Dansk Supermarked buyer organization).

To combat this growing trans-national concentration of buyer power and vertical restraints, some of the organic producers predicted that their countermoves would be to buy or ally themselves with other organic farmers in Germany as well as in the Nordic countries. In this way they would still be in control of the node of packaging and distributing in relation to the buyer organisations of the retailers operating on a Scandinavian market. In the same time they would also be able to handle large amounts as well as a greater product variety, offering retailers economies of scale and scope.

5.4. Declining terms of trade for organic producers.

According to the theories applied above normal profits in the organic market will only be temporarily. Obtaining data though on profits from a group of individual farmers are difficult if not impossible, because of its sensitivity on individual performance. However, what is possible to obtain are data on prices and costs, development in pro-

duction output as well as the amount of farms and their production size. In this way one can indirectly claim how profits over time will be running.

By collecting data on costs on production factors as well as farm gate prices and turning them into an index calculation, one can show the *terms of trade* over time indicating how the profits of the vegetable producers have developed. By comparing the development in terms of trade among organic and conventional producers, the hypothesis, claiming that the above-normal profits of organic farmers is only temporary, could be tested.

Official statistical data collected yearly on the cost structure of organic farmers are very few and in relation to vegetables almost absent. Concerning organic carrots a cost structure was made in relation to a FOI report in 2001 analyzing the economic consequences of reducing pesticides in Danish horticulture (Ørum & Christensen, 2001). The Danish Agricultural Advisory Service recommended using these calculations. For salads none is made, and it was decided to leave them out from the calculations concerning terms of trade in this report.

In table 5.6 the cost structure on organic and conventional carrots is illustrated (DKK) (Ørum & Christensen, 2001):

Table 5.6. Cost structure on organic and conventional carrots (DKK)		
	Conventional	Organic
Yield	50 tonnes/ha	35 tonnes/ha
Seed	13,200	14,000
Fertilizer/manure	1,790	1,000
Pesticides	1,796	0
Energy	1,000	2,200
Machine pool	3,000	5,600
Labour	30,800	32,750
Production factors total (DKK)	51,787	55,550

Source: Ørum & Christensen, 2001.

From the cost structure one can see that the cost of pesticides in conventional carrot production is traded off with higher cost on labour, machinery and energy in weed treatment in organic carrot production

The distribution of the various production factors were then transformed into weights turning the production costs into an index using the statistic data base of FOI on agricultural prices to calculate the development on these production factors from 1998 to 2004.

The average prices ‘ab farm’ on organic and conventional carrots from 1998 to 2004 were correspondingly transformed into an index, so the terms of trade between organic and conventional carrots could be compared.

In table 5.7 the organic prices ‘ab farm’ have been listed together with the conventional carrot prices, and the organic premium in percentage has been calculated.

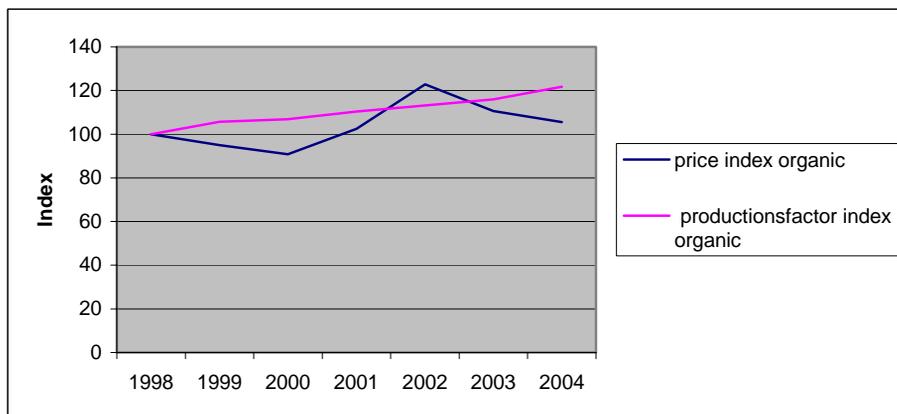
Table 5.7. Average prices ‘ab farm’ on organic and conventional carrots from 1998 to 2004

Year	1998	1999	2000	2001	2002	2003	2004
Conventional	2.15	2.42	2.32	2.60	2.66	2.53	2.61
Organic	3.59	3.41	3.26	3.68	4.41	3.97	3.79
Organic premium in percentage	67	41	41	42	66	57	45

Source: FOI price statistics 1998 to 2004.

In figure 5.3 the production factors and yearly average producer prices of organic carrots is illustrated as an index calculations starting with hundred in 1998. What figure 5.3 shows is that from 1998 to 2001 the terms of trade are negative. Then from 2001 to 2002 terms of trade are in favour of the producers, but after that, terms of trade are again reduced. Negative terms of trade do not mean that the farmers can not make a profit. It only tells that the sector as an average on this commodity will have negative terms of trade. Individual farmers can have a cost structure which enables them to have a positive term of trade. What is also typical in vegetable production is that farmers often produce several vegetables, and therefore can alleviate a decline in prices in one commodity, yet still secure an overall income through the other vegetables produced and sold.

Figure 5.3. Terms of trade organic carrot

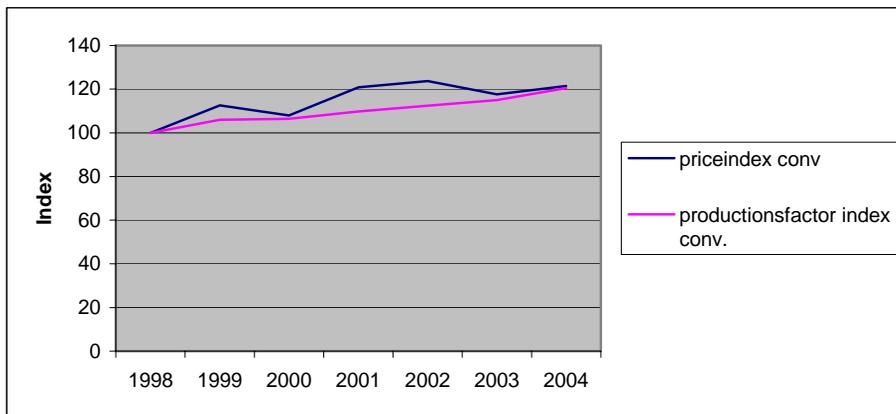


Source: Own calculations

When compared to the terms of trade for conventional farmers in figure 5.4 two things leap in the eye. First, the price index for organic carrots shows much more fluctuations indicating it is a market more sensitive to demand and supply, due to its small market size and output fluctuations. Secondly, the terms of trade for the conventional farmers have from the whole period of 1998 to 2004 been positive. The figure though indicates that the terms of trade could become negative in the years ahead by the closing gap between the price index and production factor index.

The positive terms of trade for the conventional carrot farmers could in the same time be a strong indication of why there has been in decline in organic carrot producers from 2000 to 2003 as stated by the organic producers in chapter 5.1. However, the official statistics were not totally reliable on this matter.

Figure 5.4. Terms of trade conventional carrot



Source: Own calculations

5.5. Contraction between organic and conventional carrot prices

The possibility for the organic farmers to obtain a price premium because of having ownership to organic commodities as a critical resource with high utility and relatively scarcity would accordingly to the theory on property rights and the treadmill theory only be temporary, and therefore a contraction between organic and conventional prices should be expected.

These assumptions are stated in hypothesis number one claiming that above normal profits in organic farming will be temporary for producers operating in open competitive markets.

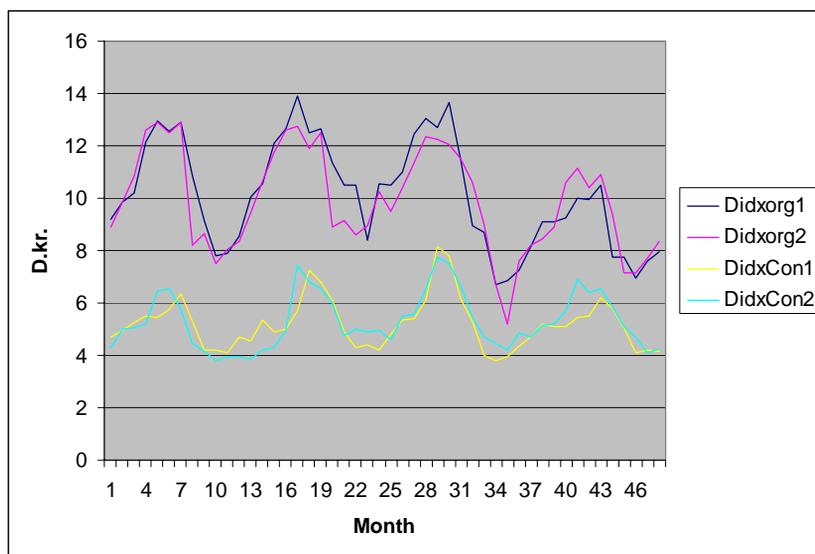
To analyze and compare the development in terms of trade the development in consumer prices for carrots were obtained and analyzed. The Food and Resource Economic Institute is in possession of monthly retailer prices for carrots in the period from 1997 to 2000 inclusive, which are also allowed to be publicised. These data have been converted into *real* prices, and analyzed to evaluate the price trend in organic and conventional carrot respectively for the discount market and the supermarkets.

In the following the 4 year price development of organic and conventional carrot prices are illustrated respectively between two competing discount stores and super-markets.

Figure 5.5 shows the price development between two competing discount chains. The fluctuations of prices are following the seasonal fluctuation with a low price during winter, increasing in spring until the supply of fresh home-market produce reaches a peak typically from May to July. Then prices start to fall, reaching a price minimum in November/December.

The upper lines illustrate the price development of organic carrots between two competing discount stores. The lower line illustrates the price development for conventional carrots in the same stores. For the organic carrots there is a clear downward trend in consumer prices whereas it seems stable for the conventional carrots indicating a contraction of prices.

Figure 5.5. Two competing discount chains and their real monthly prices from 1997 - 2000 on organic and conventional carrots



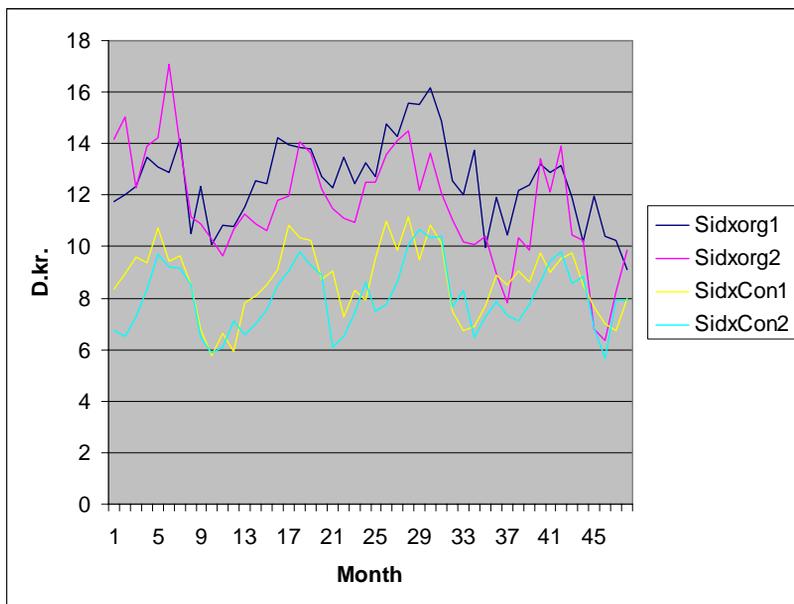
Source: GFK data consumer prices on organic and conventional carrots.

In figure 5.6. the 4 year price development between two competing supermarket chains are illustrated.

Figure 5.6 shows similarly to the discount stores a decline and contraction of organic carrot prices towards conventional prices. Secondly, there is a greater fluctuation in the supermarket prices especially among the organic carrots. From the qualitative interviews this was explained by the procurement officers that organic products have occasionally been used as a way to profile the supermarket using price differentiation in shorter periods. Since supermarkets typically have 10-15 organic vegetable products to offer in contrast to the discount chains they can more easily differentiate on organic vegetable prices. The discount chains usually only have two organic vegetables: carrots and onions (potatoes as well, but they are not registered as a vegetable). The downward trend of organic carrots was explained by the procurement officers in the supermarkets as a consequence partly of the discount chains moving into the organic segment and the producers have become better and more secure in their production and supply.

The conventional carrot prices in the supermarkets showed no significant changes either during the 4 year period.

Figure 5.6. Two competing supermarket chains and their real prices on organic and conventional carrots from 1997 - 2000



Source: GFK data on consumer prices on organic and conventional carrots.

For the price trend analysis a regression model was formulated to test if the organic and conventional carrot prices were contracting as indicated by the figures. In order to valuate the slope of the lines and if they were statistical significant the following regression model was formulated as

$$\text{Price} = f(\text{supermarket, product type, time, time} \times \text{product type}) + \varepsilon$$

Where:

Price is a monthly price from 1997 – 2000;

Supermarkets are supermarket 1 supermarket 2

Product types are organic and conventional carrots

Time is monthly time is 1.2...48 months

The error term is represented by $\varepsilon, \sim N(0, \sigma^2)$

In this specification ‘time x product type’ (slope) is of interest, since it catches the difference in the price trend for organic and conventional carrots.

A similar specification has been made for the discount market.

The results are illustrated by table 5.7

Tabel 5.7. Development on consumer prices respectively for organic and conventional carrots in competing supermarkets as well as discount stores

	DISCOUNT				SUPERMARKET			
	Estimate	SE	T-value	Significance level	Estimate	SE	T-value	Significance level
Intercept	5,1549	0,3169	16,27	***	7,9045	0,3353	23,57	**
Shop 1	0,0668	0,2142	0,31	NS	0,8059	0,2267	3,55	***
Organic	6,13379	0,4217	14,55	***	4,9552	0,4463	11,10	***
Time	0,0028	0,0109	0,26	NS	0,0024	0,0116	0,21	NS
Org x time	-0,058	0,0155	-3,74	***	-0,0519	0,0164	-3,16	**

*** = (P< 0,001) NS = Not significant
 ** = (P< 0,01) SE = Standard Even of Means

Source: Own calculation.

Compared to the price development in conventional carrots there has been a clear contraction between organic and conventional carrot prices, with a significant decline on organic carrots. This is indicated by the result of -0,058 in org x time in the discount shops illustrating the slope value for organic carrots which is a decline of approximately 0.06 DKK pr. Month pr. Kg in the four period.

For conventional carrots there are no significant (NS) changes on prices during the 4 year period of 1997-2000, indicated by the result of 0,0028 in Time (compared to conventional), which is close to zero. Similar results are found among the supermarkets.

These results confirm the ones found on the terms of trade for respectively organic and conventional carrot producers, being mostly negative for the organic carrot producers and positive for the conventional.

5.6. Retailers' gross profit and their cost of distributing organic.

In relation to the weekly retail prices on carrots from 1997 to 2000 inclusive, it was tried to collect the farm gate prices on organic carrots on a weekly or monthly basis to see if the retailers were behaving discriminatory towards producer prices and thereby obtaining any excessive profits. This has unfortunately not been possible since most farmers throw away their accounts after five years. The tax law in Denmark requires that the owner of an enterprise only has to store their accounts up to five years.

The purpose of this manoeuvre was to check producer claims stating that supermarkets and discount chains, in their bargains and transactions with producers, operate with fixed gross profit margins in relation to expected consumer prices. It would then have been possible to document the producer claims of a fixed gross profit margin on organic vegetables in discount chains at 25 per cent and in supermarkets around 40 per cent. The fixed gross profit margins of 25 and 40 per cent have neither been confirmed nor dismissed by the procurement officers interviewed.

Instead an approximation has been made using average farm prices and average consumer prices.

The prices '*ab packaging*' in the period of 1997 – 2000 had been fluctuating from a minimum of three DKK to a maximum of six DKK. Typically a minimum price in November/December reaching a maximum from May to July.

By installing the '*ab packaging*' minimum and maximum price at the top and the bottom of the retail prices during 1997 – 2000, and compared it with the producer prices '*ab farm*', the gross profit of respectively the discount stores and supermarkets have been calculated.

In table 5.8 an average consumer price in supermarkets for organic carrots at 12.08 DKK pr. kg. have been installed using the average consumer price during the four year period. From the 12.08 DKK/Kg a value added tax of 25 per cent has been deducted giving a price of 9.66 DKK/Kg. Average producer price *ab farm* have been calculated from FOI statistics, and packing charges of 1.75 DKK pr Kg have been given by the packagers.

Gross profits for supermarkets have then been calculated to be **46** per cent leaving a gross profit at 4.49 DKK/Kg and a sales price ‘ab packaging’ at 5.17 DKK/Kg.

A similar calculation has been made for the discount shops leaving a gross profit margin at **32** per cent.

Even though using one average price on carrots for the whole four year period the gross profit estimates are fairly close to producer claims on retailer profits on organic vegetables in general.

Table 5.8. Estimated calculation on gross profits in retailing			
	Supermarkets		Discount chains
Average organic consumer price pr. kg	12.8	D.kr.	9.52 - D.kr
Value added tax (25 per cent)		2.42	1.90
		9.66	7.62
Gross profit	4.49	(46 per cent)	2.45 (32 per cent)
Sales price ab packaging	5.17		5.17
Packaging charges	1.75		1.75
Average price pr. kg ab farm	3.42		3.42

In relation to the contraction between organic and conventional prices (in carrots) in retailing, it was examined if there were any *particularly costs* ‘ab packaging’ in handling and distributing organic products.

From the network and nodes of transactions illustrated in chapter 4.3, it was shown, that the links from ‘farm to fork’ in handling fresh produce like vegetables, are very short. There are only two nodes where cost of handling organic products between packagers and retailers could be appropriated:

- The retail distribution center
- The retail outlet store

The retail distribution center owned by Coop in Brøndby (Zealand) was in this case visited and the procurement officer handling vegetables there was interviewed. At the distribution center there was no extra handling or special places for storage of organic products.

The only extra cost in relation to handling and distributing organic products was transaction cost concerning documentation and traceability towards public control. The distribution center had to keep track of every single organic parcel, and be able to track whether it had been sold, where too, or if it had been registered as a loss. In contrast to conventional products parcels disappeared or lost could just be registered as a loss.

In the retail shops various procurement officers in charge of vegetables and fruits have been interviewed and asked if there were any particular cost in handling organic products. The extra cost of handling organic products for the retailer outlets were in general higher losses concerning durability due to lower shelf flow. In this regard, if the retail managers wanted to have a broader selection of organic products, they would endure higher risk in handling products with lower flows. This risk would in the same time increase, because the individual outlets were forced to buy a certain amount of parcels to cover the costs of transportation, and hence they would have organic products in surplus that would not be sold or simply stay too long on the shelf.

The problem of slow flows and thereby higher costs for the outlets handling organic products was typically found in organic fruits. This was contrary to organic vegetables which

in relation to organic carrots and organic salads problems of durability and flow were no different from the conventional ones.

The extra costs of handling and distributing organic products ‘ab packaging’ is compiled in table 5.9

Table 5.9. Extra costs handling organic products ab packaging	
Retail distribution center	Retail outlet
Transaction costs in relation to securing transparency towards public control.	<p>Slower flow (often fruits) compared to conventional products affecting durability and causes higher costs in lost sales</p> <p>Outlets are forced to buy a certain amount of parcels to cover transportation costs – even if they know they cannot sell all of them.</p> <p>The retailer outlet is therefore confronted with the dilemma of wanting to have a broad selection of organic products, but increases the risk of handling products not all being sold (higher costs).</p>

The results from examining the cost structure from handling organic products ‘ab packaging’ shows also the dilemma of distributing fresh foods to small markets like organic vegetables through retailing, demanding a certain size and flow to be cost efficient. Furthermore the results from this investigation perhaps also explains why especially organic vegetables have such a high percentage of its market sale through alternative distribution channels, because sales can be more planned through various schemes of committing consumers.

6. Space for Future Producer Opportunities

6.1. Development in Retailing

Part of this research project was to propose marketing strategies to promote further growth opportunities for the organic vegetable sector. By analyzing power relations along the supply chain, and combine it with qualitative interviews of key players along the vegetable supply chain the purpose was to discover new spaces for producer actions.

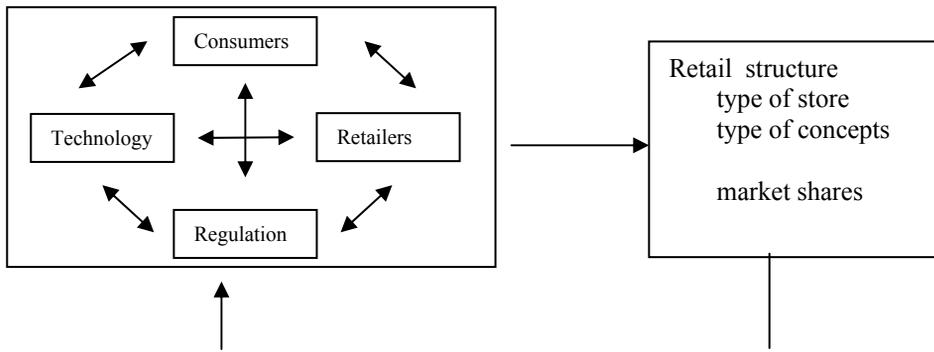
For analyzing the development in retailing, the frame of reference and point of departure, was to look at the *retail structure*.

By retail structure means (Grunert, K. 1996):

- type of stores
- store concepts
- number of outlets per store type
- market share per store type
- types of ownership/organization
- groups/alliances/partnerships
- location per store type

The retail structure is again a result of the interplay/interaction and actual values of variables within four main categories of determinants: consumers, technology, retailers and regulations. This is illustrated in figure 6.1, where changes in retail structure will occur when one or more variable within one or more of the categories change.

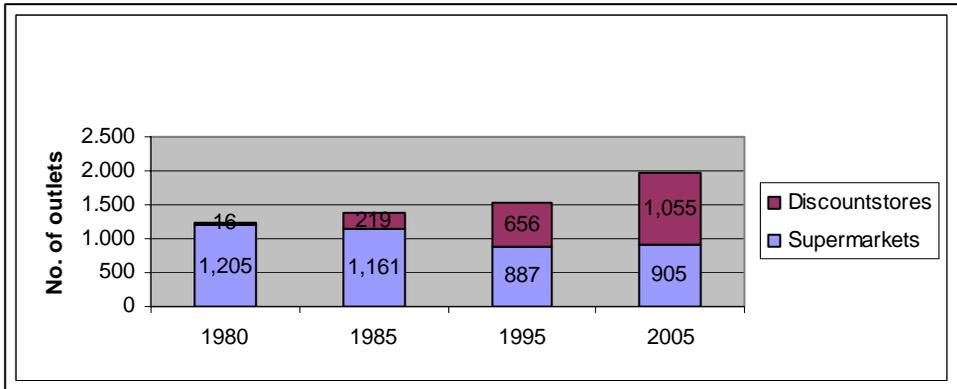
Figure 6.1. Groups of determinants of retail structure (Grunert, K., 1996:)



From various literature analyzing the retail structure decline and concentration was during the 1980's up to mid-nineties the overall picture in most European countries (Grünert, 1996). However, looking at the Danish retail scene from 1995 to 2005, an opposite trend has been emerging concerning the number of outlets (Stockmann-Gruppen, 2004).

In figure 6.2 the total number of outlets since 1995 has actually been *increasing* steadily. This increase though has mainly been carried out by a rapid growth in the number of discount outlets rising from 16 in 1980 to 1,055 in 2005. The number of supermarket has like in other European countries declined during the 1980's and up to mid 1990's, but has since 2000 risen slow but steadily.

Figure 6.2. Development in supermarkets and discountstores 1980 - 2005



Source: Stockmann-Gruppen, 2004.

Analyzing more specifically the *type of stores* within supermarkets and discount shops, changes and concentration have clearly been emerging on specific store sizes. As table 6.1 illustrates there has been a strong decline in the category of small supermarkets of 0-199 m², 200-299 m² and 300-399 m² as well as the medium sized supermarket in the category of 600-799 m². However, supermarkets competing with the discount stores in terms of size ranging from 400-599 m², and the large supermarkets in the category of 800 m² and more, are the ones that have been showing growth in the ten-year period from 1995 – 2005. The two categories in supermarkets showing growth covered in 1995 61 per cent of all supermarkets, and in 2005 they covered 77 per cent of all supermarkets.

Table 6.1. Development in shop size among discount and supermarkets (1995-2005)

Shopsize m ²	No. of Discount stores		No. of Supermarkets	
	1995	2005	1995	2005
0-199	1	0	12	7
200-299	81	22	42	11
300-399	267	145	78	5
400-599	273	807	232	300
600-799	34	81	217	189
800- >	0	0	306	393
Total	656	1.055	887	905
Total m ²	266,864	510,371	644,666	755,013
m ² /shop	407	484	727	834

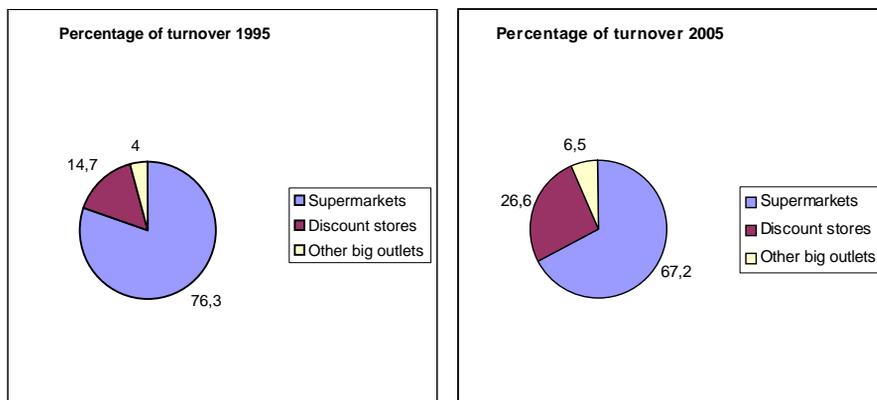
Source: Stockmann-Gruppen, 2005.

When analyzing the changes and development within the discount stores, the picture shows that they started out as smaller shops competing with small independent retailers and shop owners. Today, 77 per cent of the discount stores are dominated by the shop size ranging from 400-599 m², where in 1995 they accounted for only 42 per cent. From table 6.1 there are also clear observations that the discount stores are moving into the medium sized shops of 600-799 m², and over time could out-compete the supermarkets within this shop range.

The large increase in the number of discount stores, and the relative decline in supermarkets have also affected the market share in relation to their turnover.

In figure 6.3 one can see that the supermarkets have lost their share of the market in turnover during 1995 to 2005 declining from 76 per cent to 67 per cent. Discount stores on the other hand are the clear winners rising in terms of turnover from approximately 20 per cent in 1995 to 27 per cent in 2005. These competitive pressures from the discount stores are expected to force the supermarkets to introduce changes in the type of stores, design of stores and demand large amount of investments over the years to accomplish a successful market position.

Figure 6.3. percentage in retailing 1995 and 2005



Source: Stockmann-Gruppen, 2005.

The process of internationalization at the Danish retail market has seen several major mergers in the last couple of years. There is especially a trend towards increasing Nordic integration, helped in part by the completion of the Oresund bridge, linking Copenhagen with the Southern Swedish city of Malmö, which simplifies logistics and distribution networks throughout the region (European retail handbook 2003/04).

A number of link-ups between the countries have been established. ICA Ahold of Sweden has acquired a 50 per cent stake in ISO, a small, Copenhagen-based, supermarket chain, while the Danish cooperative, FDB has taken its grocery operations into Coop Nordic as of January 2002, a joint platform for the grocery retail activities in the cooperatives in Denmark, Sweden and Norway. Also Dansk Supermarked has established a joint venture with ICA Ahold to open Netto discount stores and Bilka hypermarkets in Sweden and Norway. The Norwegian REMA-1000 has also got a foothold on the market.

Retailers from outside the region have also begun to enter the region putting further competitive pressure on the Danish retailers. The German 'hard' discount chain 'Lidl' has started up in Denmark September 2005 with 13 stores and has now 26 stores.

After the first 6 month though Lidl has made several cutbacks on shelf space and staff is being fired (www.BerlingskeBusiness.dk., 20.03.06)

The French retail giant Carrefour, the second largest in the world, has opened 5 new supermarkets in Norway under the name 'MenyChampion'. All depending on their success Carrefour plans to expand in both Sweden and Denmark (Ritzau, 02/04).

The worlds biggest retailer, Wall-Mart, expanded into Germany in 1997 buying 74 stores from the Interspar chain, and in Great Britain in 1999 buying ASDA the country's second biggest supermarket chain with a market share of 17 per cent. This move from an American based retailer into Europe made the retail sector in Europe talk of a 'Wall-Martization', due to the big impact Wall-mart achieved on reducing costs especially through efficient logistics. However, Wall-Mart have had severe losses in Germany, where discount chains already has a market share of 33 per cent (Knorr & Arnt, 2003), so it seems more appropriate to talk of mergers and acquisitions in retailing on a *Pan-European* level (Clarke et al., 2002).

Where the overall picture on the surface concerning international competition, ownership, market share and store type, seems to illustrate diversification and horizontal spread in alliances along Pan-European partnerships, there is also a vertical concentration taking place internally among the retailer organizations so the new alliances and acquisitions can be bound together efficiently.

The consequences of this internal vertical concentration in the retailer organizations has been previously described in chapter 5.3, from the organic producer perspective in terms of growing difficulties negotiating terms of trade and growing pressures to accept written contracts describing strict exchange relations with fines for various contract violations.

6.2. The retail basket and its power assets

Why has there been this shift in bargaining power away from producers towards the retailers? When interviewing the procurement officers in retailing concerning this claim from the producers they generally push it aside and say that:

"We (the retailers) just try to make a good bargain", or "competition is very fierce – especially from the discounters", and since we are doing business we have to be tough to survive".

This type of explanation can of course be true and embedded in its own logic, but does not give an answer to why there has been this shift in bargaining power. In the literature on supply chains the shift is often explained as a shift from *producer driven chains* to *consumer driven chains* (Gerrefi, 1994). The driver in the chain is determined by the location of market power and ability to keep up barriers of entry, but again it does not explain why the shift.

However, reviewing the bargaining power shift from a property rights perspective, the key consideration becomes the nature of the implicit “contract” which exists between retailers and suppliers along the supply chain. Retailers simply clearly provide a service of relative high utility from which firms in the supply chain benefit. In addition, because retailers can discriminate between the products of low scarcity that they offer, or even become directly involved in the development and manufacture of certain products, they have effectively become backwards-integrated into the supply chain to a much greater extent than supplying firms have been able to integrate forwards. The term integration here is used in its widest context as it is clear that retailers have not taken over ownership of food suppliers, but they use formalized relationships and various slotting fees as described in chapter 5.3 to control the nature and the flow of the products involved.

It may be argued that forward integration in the food industry is limited because consumers prefer to find products in an array, which is far wider than the range of the normal food producer who often is specialized in a few products. The consumers are by the retailer offered a ‘basket of variety’, whereas the specialized producer is “only” offering a single or a few products to the retailer basket.

Thus, it is efficient and desirable from the consumer’s viewpoint to have outlets, which have a wide range of products and are not specialized.

The retailers and supermarket chains owe this position of strength in offering variety to a combination of two primary factors. The first is their site specificity, or store location, which is linked to a certain population size and transportation network that ties it to the population. The second factor is their scale in store size and spread of stores. Their size allows them to advertise heavily to bring custom into their stores. Thereafter the scale of their business allows them to negotiate aggressively to get the best possible deals from their suppliers (Cox et al., 2002).

The retail scene has been changing rapidly the last ten years with increasing concentration in terms of ownership and forms of integration and increasing internationalization. Discounters are growing in market share as well as broadening their assortments, and new supermarkets are becoming bigger and have a broader assortment with various fresh food, 'shops-in-the-shop' where employees give service to the customers, rather than just storing commodities on the shelves.

A more international competitive environment drives these changes, and retailers are searching for ways to create an image of loyalty, trust and pleasant environment for consumption.

It is a combination of these changes on the retail scene together with consumers seeking variety, that the organic producers shall develop new entrepreneurship and appropriate critical assets offering the retailers a 'basket of relative high utility and scarcity'.

6.3. The organic producer basket: The case from the discount chain Netto in 2005

To create an organic basket, that hands over critical assets to organic producers in their transactions with retailers, has to, as a starting point, acknowledge why and how the retailers get their bargain power. Secondly, it is important to acknowledge that the intensive competition among retailers is forcing them to find new ways to profile themselves on other matters than pure price and efficiency. From the theories on perfect market competition we know that emphasising price and efficiency will lead to a contested market, and in turn lead to the dissipation of the available profits. This insight on the structural forces in a market economy opens up for new opportunities to suppliers focusing on critical assets that can acquire and exploit supply chain bargain power.

Organic farming has in relation to critical assets a very strong and respected brand concerning consumer trust, ethical food procurement and various quality attributes. For retailers in a competitive environment forced to emphasize primarily on efficiency and price, employ economies of scale and scope and accumulate in size as well as become trans-national, organic products as a brand can offer some very important critical assets with high utility to the retailers.

The case from the discount chain 'Netto' is an example of how the 'organic basket concept' has been implemented in reality, and so far been a success creating new space for organic producers and suppliers in retailing.

In 2004 the 'National organic association' brought 22 organic firms and manufacturers together with the discount chain Netto to help each other understand better the requirements and specificities in production and retailing. The result of various meetings and seminars was an agreement on making an organic campaign launched by Netto and their 334 outlets during 12 weeks throughout the year 2005. The 12 weeks have different themes where different organic products connected to the themes are promoted. For example one theme is "Fair trade – make a good deal" promoting various organic products under the fair trade logo. Another is "convenience", "health" and "your farm shop" where organic products have been promoted in relation to the themes.

Besides the regular organic products that Netto has on a daily display, the customers were also presented for new products where some of them were tested as spot market products. The purpose was to give new and small organic producers and/or suppliers a chance to present and test their products for a larger consumer market.

Before and parallel with the weeks of promotion Netto's lifestyle magazine "Kiwi" had articles and recipes related to the themes and organic products sold. Press releases were sent out to various newspapers, and Netto's homepage as well as the homepage of the National organic association informed about the campaign. During the campaign the logo of Netto (a black dog on a yellow background) had the Danish organic brand (a red letter 'Ø') placed as a dog tag, and the 'organic Netto dog' was printed on a number of distribution trucks belonging to Netto.

The campaign was also being used by Netto as a test of consumer reactions, consumer tastes, and the director of the Netto discount chain have already after the third theme (week nine in 2005) announced that they would expand their organic assortment (www.okologi.dk).

The 'National organic association' is hoping that the campaign could break the stagnation in organic food sales, and create a domino effect spreading to the other retailers like in 1993, when FDB launched its discount promotion and helped boost sales in all organic products.

What is also new in this campaign is that Netto in a parallel move will try to launch organic products in their 57 discount stores in Sweden, and try to expand its sales of Danish organic products.

What the National organic Association has done is first of all to lower the transaction costs for Netto as a buyer in collecting and giving information to its organic suppliers. Secondly, the National organic association has promoted a basket of variety offering them specific ownership with relatively high utility and scarcity. The value effect will accordingly to the theories applied in this research only be temporarily, but to reconfigure the existing structure of power in producer – retailing transactions, the producers have appropriated the necessary mechanisms: product innovation, process innovation, and supply chain innovation.

Conclusion and perspectives

The analysis on the development of the Danish organic vegetable chain took its starting point from the position that organic vegetable producers will encounter some of the same economic market pressures on above normal profits as the conventional producers do. The countermoves from organic producers would then be expected to be of the same kind as found in conventional farming with growth in farm size and output per farm as well as a decline in the number of organic farms over time.

Quantitative calculations as well as qualitative interviews with comparisons among organic and conventional carrot producers as a case study regarding terms of trade and development in consumer prices all showed that the organic carrot producers on an average have been under economic pressure. Indirectly, this would have an affect on the profit margin forcing the ones with the highest production cost to leave production. Since 2000 organic vegetable farms producing carrots have declined, and the ones staying in the market have grown in size and increased output per farm. *The results hereby confirmed hypothesis number one that the above normal profits in organic farming are only temporary for producers operating in open competitive markets.*

The market power in the supply chain to exercise this economic pressure on the organic vegetable producers was revealed through the qualitative interviews as coming solely from the retailer node. *Hypothesis number two, that market power in a negotiation based coordinated food production and distribution system would be exercised from both the input factor node as well as the retailer node could not be confirmed in relation to the organic vegetable chain.*

The qualitative interviews revealed also that the bargain power at the retailer node have been increasing over the years, and is exercised especially through the various and variable control mechanisms concerning marketing fees, obligation fees for renting specific retailer packaging systems, time of return payment from deliverance and opening fees for having access to new retail stores, all of which the producers have to pay. Furthermore, the producers were claiming that the retailers were putting pressure on the producers to start accepting written contracts, whereas normally they are verbal. In this regard the organic vegetable producers seem to follow a general international trend where the governance structure between fruit and vegetable producers and retailers are moving away from verbal supply agreements to written contracts.

In relation to the governance structures between producer and retailer it was examined if there were any differences concerning agro-commodities and their different durabilities. There was found no difference in the governance structure comparing organic iceberg salad and organic carrots. *Hypothesis number three could therefore not be confirmed* in relation to the chosen commodities and governance structure of the organic vegetable chain.

However, this left the organic iceberg salad producers with a position of asymmetric information and a need to build up confidence towards the retailers. If a procurement officer claimed that a certain percentage of the salad heads supplied had to be thrown away within the first six days, then the producer has to carry the costs. After six days the responsibility for discarding any salad heads was placed at the retailer.

The future prospect for the organic vegetable producers to regain control over their products as a critical resource valued high in utility terms and in the same time delivering something relatively scarce or unique in ownership along the supply chain would be to cooperate more closely promoting the ‘organic basket’.

Organic farming has in relation to their products a very strong and respected brand concerning consumer trust, ethical food procurement and various quality attributes. For retailers in a competitive environment forced to emphasize primarily on efficiency and price, employing economies of scale and scope and accumulate in size as well as become trans-national, organic products as a brand can offer some very important critical assets with relatively high utility and scarcity to the retailers. Retailers as a market channel for organic food are important since they cover 80 per cent of all organic sales in Denmark.

The case from the discount chain ‘Netto’ is an example of how the ‘organic basket’ as a concept has been implemented in reality. What the National Organic Association (NOA) has done by coordinating an organic sales promotion with Netto and 22 organic suppliers, is first of all they have lowered search and information costs for both Netto and suppliers. Secondly, the National Organic Association has by promoting 12 themes towards the consumers on organic products created a basket of variety offering both Netto and suppliers specific ownership with relatively high utility and scarcity. The value effect will accordingly to the theories only be temporarily, but to re-configure the existing structure of power in ‘producer – retailing’ transactions, the organic producers have appropriated the necessary mechanisms: product innovation, process innovation, and supply chain innovation.

A second opportunity to promote the organic basket and expand sales of organic vegetables could also be through alternative sales channels. The most successful type up to now has been the E-trading company Aarstiderne with a combination of box schemes and the internet. The success lies primarily in that E-trading build up around selling food in a 'virtual' supermarket has endless shelf space contrary to a real supermarket. E-trading companies can therefore offer its customer access to segments of speciality products from in theory all kinds of food firms. The advantage of E-trading food companies lies in the fact that retailers today do not sell food, but space for the suppliers. Those commodities with the highest turnover in money value are the ones that get access to the shelves of the supermarket, and thereby excluding others. Although the E-trading companies have endless shelf space, they have their limitations within logistics. Where supermarkets have the advantage of offering economies of scope and scale to customers being mobile and coming to them, the virtual E-trading store has to transport real food to each of its individual customers.

A third possible approach implementing the 'organic basket' concept to change or levelling out the retailer bargain power in favour of the producers was revealed through the interviews of key players among the producers in packaging. Some of these players were planning to create a basket of variety in supply through a trans-national network of organic producers/packagegers. In this way the increasing bargain power of the trans-national buyer organizations in retailing could be counter balanced by the packagegers. The organic producer trans-national network could lower transaction costs for the retailers in relation to purchasing as well as secure their need for scale. The producers/packagegers would in the same time be able to appropriate more control and ownership of a critical supply chain resource with relatively high utility and scarcity and thereby secure residuals and hence power.

A fourth possibility would be for the National Organic Association to use the experience from the Netto case, with the organic food service companies focusing especially on the private market. Again various themes related to the characteristics of the organic food like health, local, trust, personal, handcraft, fair trade and luxury could be applied and promoted. The theme promotion should in the same time be targeted at solving some of the presently important constraints within organic food service concerning delivering, quality security and product development.

References

- Barzel, Yoram (1997): *Economic Analysis of property Rights*. Cambridge University Press, second edition.
- Belasco, Warren J, (1989): *Apetite for change: How the counterculture took on the food industry, 1966-1988*, Random House, inc. NY, USA.
- Boehlje, Michael and Shrader, Lee F. (1995): *The Industrialization of the food system: Questions of coordination*. Paper presented at the conference on Vertical Coordination in the Food System, June 5, 1995, Washington D.C.
- Clarke, Roger (2002): *Buyer power and competition in European retailing*, Edward Elgar Ltd. 2002.
- Coase, R. H. (1988): *The Firm, the Market and the Law*, University of Chicago press, 1988.
- Cochrane, W. W. (1958): *Farm Prices: Myth and Reality*, University of Minnesota Press: St. Paul.
- Cox, Andrew; Ireland, Paul; Lonsdale, Chris; Sanderson, Joe and Watson Glyn (2002): *Supply Chains, Markets and Power. Mapping buyer and supplier power regimes*. Routledge studies in Business Organization and Networks.
- Denmark Statistics (2003): *Service trade. Turnover in retail trade distributed among commodity groups*. In Danish: Serviceerhverv. Detailhandelens omsætning fordelt på varegrupper 2002, Denmark Statistics 2003:65, 13 of November 2003.
- Denmark Statistics (2004): *Agriculture. Vegetables outdoor 2003*. In Danish: Landbrug. Grøntsager på friland 2003, Denmark Statistics 2004:14, 30. of June 2004
- Denmark Statistics (2006): *Agriculture. Turnover in retail trade from organic foods 2005*. In Danish: Landbrug. Detailomsætningen af økologiske fødevarer 2005, Denmark Statistics 2006:7, 2 of May 2006.

- Denmark Statistics (2005): Agriculture. Foreign trade with organic commodities 2004. In Danish: Landbrug. *Udenrigshandel med økologiske varer 2004*, Denmark Statistics nr. 509, 29. of November 2005.
- Fine, B. (1994): Towards a Political Economy of food. *Review of International Political Economy* 1, 519-45.
- Fine, B., Heasman, M. and Wright, J. (1996): *Consumption in the age of affluence the world of food*. London Routledge.
- FOI (2005): *Account Statistics for organic farming 2004*. In Danish : Regnskabsstatistik for økologisk jordbrug 2004. FOI 2005.
- Glaser, K. Lawrence, Gary D. Thomson and Charles R. Handy (2001): *Recent changes in Marketing and Trade practices in the U.S. Lettuce and Fresh-Cut Vegetable industries*, USDA, agriculture information bulletin number 767, May 2001.
- Gereffi, G. and Miguel Korzeniewics eds. (1994): *Commodity Chains and Global Capitalism*. Praeger Publishers, London.
- Grossman, S. & Oliver Hart (1986): The Costs and Benefits of Ownership: A theory of Vertical and Lateral Integration. *Journal of Political Economy*, 94:691-719.
- Grunert, K. G.; Larsen, Hanne H.; Madsen, Tage K.; Baadsgaard, Allan (1996): *Market Orientation in Food and Agriculture*. Kluwer Academic Publications, Boston 1996.
- Guthman, Julie (2004): *Agrarian dreams. The paradox of organic farming in California*. University of California Press, Berkeley, Los Angeles, USA
- Hart, Oliver D. & John Moore (1990): *Property Rights and the Nature of the Firm*. *Journal of Political Economy*, 98: pp. 1119-1158.
- Hart, Oliver D. (1995): *Firms Contracts and Financial Structure*. Oxford: Clarendon Press.
- Hopkins, Terence K., and Wallerstein, Immanuel (1986): Commodity Chains in the World Economy prior to 1800. *Review* 10, 1: 157-70.

- Jacobsen, Nina, Kirstine Brandt (2005): *Den økologiske jordbrugsbevægelses historie – fra 1970'ernes græsrodde til 1990'ernes professionelle*, Ph.D. afhandling, Saxo instituttet – afdeling for historie, Københavns Universitet, 2002 – 2005.
- Klein, Benjamin, Robert G. Crawford, and John D. Lawrence (1978): *Vertical Integration, Appropriable Rents, and the Competitive contracting process*. Journal of Law and Economics, 21: pp. 297-236. In *The Economics of Transaction Costs (1999)*, edited by Oliver E. Williamson and Scott E. Masten, Elgar Critical Writings Reader, UK/USA.
- Knor, Andres & Andreas Arndt (2003): Why did Wal-Mart fail in Germany (so far)? Paper, University of Bremen, Department of Business Studies & Economics, Institute of world economics and international management.
- Lockie, S. and Kitto, S. (2000): Beyond the farm gate: production-consumption networks and agrifood research. *Sociologia Ruralis* 40, 3-19.
- Masten, Scott E. (2000): Transaction-cost economics and the organization of agricultural transactions. In *Industrial Organization*, edited by Michael R. Baye and Bert Elwert, Elsevier Science, New York.
- Raikes P., Friis, M. J. and Ponte, S. (2000): *Global Commodity Chain Analysis and the French Filière Approach: Comparison and Critique*, Working Paper Sub series on Globalization and Economic Restructuring in Africa No. 00.3, Centre for Development Research, Copenhagen February 2000.
- Rajan, Raghuram G. and Luigi Zingales (1998b): Power in a Theory of the Firm. *The Quarterly Journal of Economics*, Vol. 113, May 1998, pp 387-432.
- Ryndina, M. N & G. P. Tjernikov (1980): *The political Economy of capitalism*. In Danish: *Kapitalismens politiske økonomi*. Sputnik, København.
- Sall & Sall (2004): *Organic Food service – Status and possibilities for development and growth*. Project report – Analysis, conclusions and recommendations for the National Organic Association, July 2004. In Danish: Økologisk catering – Status og muligheder for udvikling og vækst. Projektrapport – Analyse, konklusioner og anbefalinger for Økologisk Landsforening, juli 2004.

Stockmann-Gruppen (2004): The supermarket handbook 2005. In Danish: Supermarkedshåndbogen 2005, Stockmann-Gruppen A/S, Tobaksvejen 21, 2860 Søborg, Denmark.

The Co-committee and trade association committee for coordinating Organic and Biodynamic farming. White book on organic farming – examinations and facts, Skejby (1991): In Danish: Fællesudvalget og Branchekoordineringsudvalget for Økologisk og Biodynamisk Jordbrug. Hvidbog om økologisk jordbrug – undersøgelser og fakta , Skejby 1991.

Williamson, Oliver E. (1979): Transaction Cost Economics. The Governance of Contractual Relations. *Journal of law and Economics*, 73 pp. 519-40.

Williamson, Oliver E. (1985): *The Economic Institutions of Capitalism*, New York: The Free Press.

Williamson, Oliver E. (1989): Transaction Cost Economics in R. Schmalenese and R.D. Willig (eds.). *Handbook for Industrial organization*. V. 1. Amsterdam: North Holland.

Williamson, I., & Cullingford, C. (1997): The uses and misuses of “alienation” in the social sciences and education. *British Journal of Educational Studies*, 45, 263-275.

Williamson, Oliver E. (2000): *The new Institutional Economics: Taking stocks, looking ahead*. *Journal of Economic Literature*, Vol. XXXVIII (September 2000) pp. 595-613.

Ørum, J. E. & Johannes Christensen (2001): *Production economic analysis of the possibilities of a reduction of the pesticide use in Danish horticulture*. In Danish: Produktionsøkonomiske analyser af mulighederne for en reduceret pesticidanvendelse i dansk gartneri. FOI Report no. 128/2001

Annex 1:

Addresses and websites:

Major producers/distributors in relation to organic carrots and iceberg salad:

Barritskov Gods
Barritskovej 34
DK-7150 Barrit
Phone: 75 69 11 17
www.barritskov.dk

Dan Organic A/S
Vesterbjergvej 1
DK-7280 Sønder Felding
Phone: 97 19 88 99
www.danorganic.dk

Marienlyst gartneri
Tåstrupvej 86
Tåstrup
DK-8462 Harlev J.
Phone: 86 94 10 43
www.marienlyst.net

Skytte, Lars
Dømmestrupvej 44
DK-5792 Årslev
Phone: 65 90 15 10

Svanholm Estate
Svanholm Allé 2
DK-4050 Skibby
Packing,
Phone: 47 56 66 50 or -51
www.svanholm.dk

Søris I/S
Sørisvej 2a
DK-3650 Ølstykke
Phone: 47 33 4017
www.soeris.dk

Tange Frilandsgartneri A/S
Tange Søvej 42
DK-8850 Bjerringbro
Phone: 86 65 87 45
www.carrot.dk

Aarstiderne.com
Adress same as Barritskov Gods
Phone: 70 26 00 66
www.aarstiderne.com

Øko-one Aps.
v/ Michael Balle
Grønvej 105
Volderslev
DK-5260 Odense S.
Phone: 66 15 27 15

Retailers:

Coop Denmark A/S
Roskildevej 65
DK-2620 Albertslund
Phone: 43 86 43 86
www.coop.dk

Dansk Supermarked Gruppen
Bjødstrupvej 18
DK-8270 Højbjerg
Phone: 89 30 30 30
www.dsg.dk

SuperGros A/S
Gammelager 11-13
DK-2605 Brøndby
Phone: 70 10 02 03
www.supergros.dk

Food service:

Flint & Hvid's
Rovsingsgade 80
DK-2200 KBH. N
Phone: 35 86 10 46

Frydenholm A/S
Ørsted Bygade 8
DK-4622 Havdrup
Phone: 46 13 46 31
www.frydenholm.dk

Solhjulet A/S
Storhedevejen 32
DK-8850 Bjerringbro
Phone: 86 68 64 44
www.solhjulet.dk

Økologiske Grønne Torv
Hvedemarken 3
DK-3520 Farum
Phone: 44 99 19 93
www.ogt.dk

Annex II:

Questionnaire.

Open Questionnaire:

Future supply of organic foods

1. Name of firm:

2. Type of firm:

Number of employees ____ Full time ____ Part time,
season _____

3. C/O:

Employer Employee

4. Suppliers:

Type₁ seed seedlings
Name of firm(s)

Type₂ farmers

c/o:
Name

Type₃

Numbers:

Type₁
Type₂
Type₃

Input from (tonnage/money):

Type₁

Type₂

Type₃

5. Buyers:

Type₁ supermarkets

Name of firm(s)

c/o:

Title:

Type₂ consumers

Type₃

Numbers:

Type₁

Type₂

Type₃

Output to (tonnage/money):

Type₁

Type₂

Type₃

6. Type of market transactions:

Upstream

Downstream

7. Why the chosen market transaction/organization?

8. Why organic production?

9. When organic production?

10. Future prospects:

Conflicts (horizontal/ vertical)

New markets

New products