Danish Research Centre for Organic Farming

Final Report

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The Directorate for Food, Fisheries and Agro Business
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1. Research program

Research in organic farming 2000-2005 (DARCOF II)

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2. Project title and number

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Consumer Demand for Organic Foods – Domestic and Foreign Market Perspectives

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Slutrapporten vedlægges et dansk resumé.

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6. Project period (month, year)

Start of project: 2000
End of project: 2004

7. Final report

A. Project summary

In ***Work Package 1***, we study household demand for organic foods. The Danish market for organic foods is relatively mature, meaning that it does not suffer seriously from the supply shortages and barriers, which dominate most of the markets outside Denmark. The well-functioning Danish market makes it possible to collect and analyse reliable data on purchases. Our study distinguishes itself by being based on observations of stated as well as actual purchasing behaviour. The project applies information at the individual household level (utilising panel data of 2000 households' daily purchases of a large number of organic as well as conventional foods during 1997-2001), which makes a detailed and informative approach possible. In addition, the purchase data are supported by a questionnaire, surveying households in the very same panel (response rate 77%) for information on attitudes, stated values and food habits. Thus, we utilize a household level panel data set with daily registration of food purchases combined with preference information elicited from panel members through a questionnaire.

Background variables make it possible to model demand dependence on household characteristics such as income, geographic location, occupation, age, number of children, etc. Furthermore by combining the detailed registration of consumption behavior with elicited information on underlying attitudes and valued attributes, we hope to be able to shed new light on the structure and relative importance of various motives for purchasing organic foods within various consumer segments. We intend to focus specifically on (1) purchasing motives (personal health, animal welfare, environmental effects, etc.), (2) attitudes towards organic convenience food and underlying processing technology, and (3) attitudes towards conventional versus alternative sales channels.

An estimated demand system including explicit representation of valued good attributes and underlying attitudes makes it possible to evaluate different information and labeling strategies in addition to more traditional evaluation of the demand effects of prices and demography. We also exploit the possibility of confronting willingness to pay information elicited through a CV-design with revealed demand behavior of the same group of households.

In the work package we conduct similar analyses in one or two neighboring countries, for the following reasons: first, it is highly relevant to explore export markets for Danish organic producers, i.e. identification of foreign consumer preferences and market barriers; second, the importance of specific market factors such as sales channels or labeling of organic products, can be analyzed through comparison between countries that differ with respect to these factors. We have access to British TNS household panel purchase data of almost as good quality as the Danish GfK data.

In the project, we have particularly focused on:

- Identification of differences in purchasing motives, attitudes towards convenience food and towards alternative sales channels and processing technology and in the demand (and in its price sensitivity) between different consumer groups dependent on age, number and age of children, income, education, number of preschool children and place of residence.

- Examination of differences in purchasing motives, willingness to pay, store choice and the importance of socio-demographic variables for different types of organic products.

- Analyzing the effect of policy instruments such as levies, subsidies, information campaigns and different types of labeling depending on both market conditions like sales channels as well as on consumers' socio-demographic characteristics and purchasing motives.

- Examining differences in people's confidence in organic product labeling among different consumer groups.

- Elaborating and analysing household panel purchase data from TNS for a selected export market (UK).

- Analyzing differences in food consumption, consumer preferences and confidence in organic product labeling from country to country, and identification of key factors behind the differences. Of particular interest is differences in food culture (favorite types of food, attitudes towards imported goods, preferences of prepared/unprepared products etc.), and differences in sales channels (whether the products are sold in supermarkets, through alternative sales channels like health-food shops, food co-ops, farm shops or markets).

In ***Work Package 2****,* we focus on alternative production, distribution and sales channels. The expansion of organic farming has resulted in a number of organic producers establishing alternative processing and distribution networks, in a search for interested consumers. There can also be identified cases, where consumers have established alternative food networks, in a search for interested producers, who will participate in a closer and more obligating cooperation for both parties. There can also be found cases, where development of producer-consumer relations in organic farming aims at creating local or regional development. The purpose of WP2 is to describe and analyse the possibilities and barriers, these innovative initiatives encounter, and to investigate their potential for reformulating the role and function of existing institutions and policies, aimed at enhancing sustainable development on a local or regional scale.

The project is comprised of three main elements. First, a historical description of the development of the relations between organic farming and its societal context (consumers, other nodes in the agro-food network, local communities etc.). Secondly, case studies will be conducted, where a number of relevant examples among recent pioneer initiatives, aiming at developing producer-consumer relations, are selected for a detailed study. Thirdly, an analytical part, where the selected cases are compared and related to general development trajectories of contemporary society.

Four cases have been selected for conducting the case studies, including the organic food terminal at Tinglev, Aarstiderne.com, Spidsroden and Landbrugslauget.

The activities in 2003 were mainly focused on producing data on these cases. Various types of data have been collected on the selected cases, such as qualitative interview data with selected actors from various activity areas in the selected food networks, company accounts, telephone interviews, participants observation and various written documentation (popular articles, homepages, etc.).

The activities in 2004 were mainly focused on writing the Ph.D. thesis. The last part of the analysis of the data collected in the field studies were carried out in early 2004, using the software package Transana, a tool for digital transcription and analysis of qualitative data. The thesis was completed during summer 2004 and delivered to Aalborg University.

In the project, we have
- completed case studies of the selected cases
- collected further quantitative data on the market for organic products on an aggregated level
- prepared working papers for presentation at conferences
- prepared drafts for journal articles
- presented and discussed the project with researchers from University of Cardiff
- written and defended the PhD dissertation (defence takes place at April 11th, 2005)

Table A.1: Work package list (from application)

No.	Work package title	Participants*	Budget (1,000 DKK)	Start	End	Deliverable No:
1	Consumer preferences and demand: potentials and barriers for market expansion	AKF/FOI, KU, CIRED, GfK	3,730	2000	2004	1,2,3,5,6,7,8,9,10,11,13, 14,15,16,17, 21,22,23,24, 25,26,27,28
2	Alternative distribution channels: driving forces and potentials	AAU	500	2001	2003	4,12,18, 19, 20

* Responsible participants are underlined.

B. Objectives and expected achievements

The overall goal is to assess the long-term potential of demand for organic food from Danish agriculture. Thus, we will attempt to identify the market potential at home and abroad and identify the conditions of utilizing this potential - including the effects of various policy instruments, sales channels and information strategies. In order to accomplish these objectives, the project is divided into 2 work-packages:

Goals for WP1 (Consumer preferences and demand: potentials and barriers for market expansion):
To analyze consumer demand for organic foods, including estimation of a system of household demand functions for organic foods with explicit representation of valued good attributes and underlying attitudes. Domestic as well as foreign demand is considered. Special attention is given to
- Evaluation of the effect of policy instruments, such as levies, subsidies, labeling and consumer evaluation,
- Identification of the relations between purchasing motives and willingness to pay
- Examination of consumer attitudes towards industrially manufactured organic food, specifically convenience food/prepared meals versus alternative small-scale manufacturing and distribution.

Goals for WP2 (Alternative distribution channels: driving forces and potentials):
- To identify driving forces behind “alternative” and “small-scale” market initiatives, their opportunities, including institutional and structural limits for further innovations.

C. Progress and results

C.1 Description (summary) of main results and conclusions

Main results in the project are as follows:

Work Package 1:

In WP1, we have accomplished the following:

- Surveyed previous studies on consumption of organic foods
- Identified main prerequisites for growth in consumption of organic foods
- Carried out focus group interviews
- Designed and tested the questionnaire on 400 households
- Redesigned and submitted final questionnaire to the GfK household panel (2000 households)
- Received, documented and elaborated data from the GfK household panel (response rate 79%)
- Analyzed the Danish organic market, based on data from the GfK household panel
- Compared actual and stated willingness to pay for various products
- Estimated a nonparametric characteristics model of the demand for milk
- Analysed the British organic market, based on TNS household panel data
- Estimated a model determining willingness to pay for organic foods
- Carried out macro- and micro-estimations to estimate price-and budget sensitivity, and the importance of household characteristics
- Carried out estimations of consumer valuation of milk characteristics (organic/non-organic, fat content, taste)
- Estimated a model to evaluate the importance of environmental and animal welfare labeling on the egg market
- Received, documented and elaborated data from the British TNS household panel (15.000 households)
- Conducted a two-day workshop and meetings in the coordination group on a regular basis.

In more details, we have achieved the following results:

Elaboration and documentation of purchase data

The project focuses on the organic market in two selected countries: Denmark and Great Britain. These countries are especially interesting in the European context, since Britain has the most rapidly growing market, while Denmark has the highest consumption of organic food per capita in Europe.

The primary data source in this project is “GfK – ConsumerScan (Dansk HusstandsPanel)”. Each week households in the panel report their shopping to GfK, and state whether each good purchased is organic or conventional. The working paper explains the nature and contents of the panel data. It gives a general overview of the information available in the data, and as well as examples of the data recorded by GfK. In addition to data on household purchases, GfK has the following background information on households: demographic and socio-economic characteristics, attitudes to food and shopping patterns, eating patterns and media habits. We have access to these data at their most detailed level starting in 1997. The very detailed observation level provides a wealth of information, but, on the other hand, it implies a considerably amount of time to elaborate the data.

In 2003, we received and elaborated British GfK/TNS purchase panel data. The panel consists of daily registrations 15000 households’ purchase behaviour during 2001-2003 (two years of weekly purchase information). Selected grocery goods are (organic as well as conventional) vegetables, fruit, milk, yogurt, and eggs. These are the most important organic good categories, which all together constitute almost half (47%) of all organic foods sold, and are purchased by 60% of the British population. Socio-demographic variables are social class, household size, housewife age, child presence and geographic region. In addition, we have comprehensive information on store choice.

The organic market in Denmark and Great Britain

In the British market, the average household organic budget share has expanded rapidly, especially between 2001 and 2002 during which it increased from 2.4% to 2.8% – in 2003, the budget share stagnated at the 2.8% level. Non-users and light users accounted for almost equally large shares at the beginning of the observation period, but in 2003, non-users had increased their share to 45% (of all households in the panel), while light users decreased their share to 38% (of all households in the panel). Around 13% of households are medium users, while around 4.5% are heavy users – and both groups (in particular medium users) have increased their share of all households during the observation period.

Danish organic budget shares are generally much higher than those of the British – on average 60% higher. The average Danish organic budget share increased continuously until 1999, after which it fluctuated for a couple of years and then settled back at the 1998 level. In 2001, almost every other Danish household (48%) was a light user and 28% were medium users. Only 10% never purchased organic foods, and 14% had a very high consumption (heavy users). The share of non-users decreased continuously during 1997-2001, alongside a corresponding rise in the number of medium and heavy users.

The most important organic product groups in Great Britain are vegetables and fruit, which together constitute almost one third of total organic sales. The most important groups in Denmark are milk and cereals, accounting for almost half of total organic consumption. Table 1 reveals interesting differences across user types and product types. For British households, the highest average budget share is observed for eggs (5.8%), with heavy users having an organic budget share of 48% for this product. For Danish households, highest budget share is observed for milk (on average 27.5%), where heavy users have a budget share of 85%. Note that light and medium users spend approximately the same average organic budget share in both countries (all products, bottom row). However, British heavy users display a considerably higher average organic budget share than their Danish counterparts. This is, however, partly due to the fact that the British purchase data cover the five highest selling organic products, while the Danish data cover the whole consumer basket.

Further analysis reveals that in Britain, organic milk is primarily purchased by heavy users, while in Denmark, organic milk is a product purchased by all types of users. This is partly reflected in the fact that the average price premium for organic milk is considerably higher in Britain than in Denmark. Generally, heavy users are willing to pay higher absolute prices for organic as well as conventional goods and, furthermore, higher price premiums in comparison with medium and light users. For fruit, vegetables, eggs, and yoghurt, British medium and light users are responsible for between 39% (vegetables) and 48% (yoghurt) of total organic consumption. The highest British price premiums for organic products are observed for eggs, vegetables and milk; the lowest are observed for fruit and yoghurt. British light users are generally responsible for a higher share of total consumption than Danish light users, and this especially holds true for fruit and vegetables.

In Denmark, the highest premiums are observed for organic fruit – a product group purchased primarily by heavy users. In contrast, medium and light users contribute altogether more than half of total organic consumption of milk, eggs, bread and vegetables in Denmark. Although they have lower average organic budget shares when compared with heavy users, they constitute a large overall fraction of all consumers and so contribute greatly to total consumption. Conversely, organic fruit, vegetables, yoghurt and other dairy products and meat are primarily purchased by Danish heavy users.

Dynamics in consumption

Underlying headline trends, considerable differences across product and user types can be observed. In Denmark, the reduction in overall organic share during 1999 was primarily due to decreasing demand for organic meat, bread and cereal products, plus dairy products such as butter, yoghurt and cheese. In contrast, the consumption of organic milk and coffee increased, while demand for organic eggs, fruit and vegetables remained rather stable during the period. In Great Britain, the organic budget share increased continuously for all products: highest growth rates were observed for organic milk, eggs, and yoghurt (in that order), while there was lower relative growth in the consumption of organic fruit and vegetables.

Changes in the consumption of various organic products can be broken down by changes in the behaviour of specific user groups. The distribution of user groups has developed as described above. Average organic budget shares have been mostly stable within each user group during the whole observation period in Denmark. For Great Britain, average organic budget shares increased within each user group. This holds especially for heavy users, where the budget share increased from 23.4% to 25.3% during 2001-2003.

However, very interestingly, each group does not consist of the same families during the period: a significant number of families move from one group to another. Thus, for Great Britain, purchase data tell us that one fourth of those who were heavy users in 2001 have become medium users, 7% have become light users and, most surprisingly, one fifth became non-users. However, the turnover of heavy users to include new members means that its share of all consumers has modestly increased and, furthermore, the group experienced increasing overall average organic budget share, as mentioned above. Correspondingly, around one fifth of those who were non-users in 2001 had become light, medium or heavy users by 2003. Considerable movement can also be observed in the other two groups.

Turning to the Danish households, our estimates reveal that around one third of those who were heavy users in 1997 had turned into medium users by 2001, and even (although to a lesser extent) light users. Essentially, these households that left the heavy user group were responsible for a considerable part of the decrease in organic demand during 1999. However, continuous turnover, incorporating new heavy users, means that the group experienced a stable overall average organic budget share between 1997 and 2001.

Similarly, Danish households who were non-users in 1997 have increased their demand for organic foods considerably. Accordingly, more than half of these households had already become light or even medium users by 1999, although between 1999 and 2001 such major shifts did not occur. In addition, the households who were light or medium users in 1997 increased their demand for organic products continuously up to 1999, such that a significant fraction became new heavy users. But again, new households were introduced into the light and medium groups, so that average organic budget share has remained rather stable in these categories.

Thus, a large share of the households in each user group move from one group to another: generally, most households have increased their propensity to buy organic foods during the period, but a considerable number of movements have also gone in the other direction. The results suggest that values and concerns may be temporary and consumers may engage in food issues in an erratic way.

Sales channels

In Great Britain, as in Denmark, most organic foods are sold through conventional retail stores. Moreover, organic sales are concentrated within a few large multiples. According to our purchase data set, three multiples (Tesco, Sainsbury and Waitrose) are responsible for 70% of the total organic sales in Great Britain. In Denmark, two multiples (Coop Denmark and Dansk Supermarked) are responsible for 64% of total organic sales. Our purchase data show that 95% of British organic foods are sold in supermarkets.[1] In Denmark, on average 58% of all organic products are sold primarily in supermarkets. Very interestingly (and in an international context exceptionally), the second most important sales channel is discounters, selling 25% of all organic products. Finally, 15% are purchased through direct sales (at the farm gate, box schemes, markets, etc) or specialist stores (for example, bakers, butchers, greengrocers, health stores). The remaining 2% are purchased in other sales channels such as kiosks, petrol stations, small general stores, and miscellaneous outlets. For Denmark, considerable differences can be observed across product types: some products are solely or almost entirely sold

[1] Note that the estimated share of supermarkets sales is much higher than estimates from other sources. In Hamm *et al*. (2002) this estimate is 79%. Soil Association (www.soilassociation.org) estimates total direct sales as 10% of total organic sales value during 2002. Thus, direct sales/specialists shops sales may be underestimated in the TNS purchase data. One possible explanation is that panel members record items purchased from every shopping trip using a barcode laser scanner, which may not be available for items purchased at, for example, markets.

in supermarkets (including discounters) – this holds for milk and yoghurt, and most cereals. In contrast, eggs, bread, vegetables, fruits and in particular various types of meat are, to a large extent, sold through direct sales channels and specialist shops.[2]

For Danish consumers, our survey results indicate that a considerable fraction of respondents state that their confidence becomes stronger when a food product is bought at a specialist store, at the farm gate, at a market or delivered directly from the producer – but so do a substantial proportion of consumers when the product is bought in the supermarket. Our results also suggest that for the majority of those consumers who do most of their shopping in supermarkets (particularly light and medium users), the concentrated sales and distribution structure have not reduced consumer trust drastically in the past.

Results from combining purchase data and questionnaire data

The uniqueness of our study is the availability of detailed self-reported consumption diaries and the opportunity of connecting questionnaire answers with these at family/person level. This allow us to construct a demand model for the individual consumer based on a richer/deeper utility function specification including underlying consumer attitudes, perceived good attributes and information gathering skills/attitudes. Compared to simple statistics, such as the average market share of different egg types, econometric estimations make it possible to disentangle the effect of labels from the effects of e.g. differences in prices. Main results are as follows;

Are organic buyers different?
In the study, we compare organic buyers with non-buyers, to identify main differences between the two groups. We define buyers as consumers holding an organic budget share (all food types) higher than 2.5%, following the definition of “medium- and heavy users” applied in other Danish studies. Heavy users hold organic budget share higher than 10%, and constitute 13% of all households. Medium users hold organic budget share between 2.5% and 10%, and constitute 28% of all households. Light users hold organic budget share lower than 2.5%, and constitute almost half of all households. Finally non-users have no organic consumption at all and constitute 10% of all households

Not surprisingly, organic buyers are more health concerned, more focussed on residues, animal welfare, and environmental attributes, less focussed on low prices, and more often they prefer domestic products, compared to non-buyers. Origin is important to most consumers, and 72% would rather buy conventional domestic fruit and vegetables than organic foreign fruit and vegetables. Thus, the origin attribute commonly overrules the organic attributes – this holds to a higher degree for non-buyers, though. Buyers are more often members of organizations protecting nature and organizations protection animal welfare, and they recognize and notice the Nordic Swan Label (an environmental label) more often than non-buyers. In the main, we find that organic buyers also behave (and think) more environmentally friendly in other areas. Finally, fruit and vegetables (conventional as well as organic) constitute a higher share in their diet – and meat (conventional as well as organic) constitutes a lower share.

Perception and valuation of organic attributes

In the Danish survey, we found that (besides basic food attributes such as freshness and taste) being free from medicine- and pesticide-residues are generally ranked as most important food product attribute (for conventional as well as organic foods). Of subsequent importance were low fat content, animal welfare and environmental considerations, and origin. These were then followed by attributes such as nutritional value (vitamins and minerals), brand, ease of preparation, being delivered from specific farms, markets or processors, and being organic (in that or-

2 Looking at differences across user types reveals interesting differences for Danish households. Heavy users exhibit the highest propensity to purchase organic through direct sales, doing 12% of their shopping this way – in fact, 77% of organic goods sold directly are purchased by heavy users. However, heavy users do most (57%) of their shopping in supermarkets and 20% in discount stores. Medium users and light users spend around two thirds of their organic budget in supermarkets and around one third in discount stores.

der).[3] By and large, the same attributes ranking is found in Weatherell *et al*. (2003) suggesting that British and Danish consumers are comparable.

In the project, we distinguish between private and public goods. *Private goods* can only be consumed by one household (for example, an organic potato can only be eaten once, in one household). In contrast, *public goods* can be shared, and the utility of the consumption in any one household is independent of (and not excluding) consumption in other households. Second, consumers actually purchasing organic foods (buyers) may have *use values*, such as utility from taste, health and freshness, that is, *private good attributes*, which can only be enjoyed by actually consuming (eating) the product. In this study, n*on-use values* are *public good* values related to improved environment and/or animal welfare.

In the Danish survey, we identify stated valued organic good attributes. Quite remarkably, most respondents state that improved animal welfare and environmental protection are the two most important features of organic production. Health attributes[4] are third most important, while taste and freshness are ranked as the least important. Aggregating all organic attributes into either private good attributes (health, taste, freshness) or public good attributes (animal welfare, environmental attributes) yields interesting results: non-use values are assigned around twice as much weight (importance) on the Likert scale than are use values. This result holds across product types, as well as for organic goods in general. 82% of all Danish households assign public good attributes to organic goods. Of these, 80% (66% of all households) hold both types of values (private as well as public), while households having private good values only constitute a negligible share (1%). Finally, households acknowledging no organic goods' values whatsoever constitute 16% of all households.[5]

Before jumping to the conclusion that people primarily purchase organic foods because of environmental and animal welfare concerns, it may be useful to do some additional analyses. To find out what stated values mean for actual behaviour in the real market, we combine information on stated values for organic goods (revealed from the questionnaire surveying Danish panel members) with actual purchase behaviour (revealed from the purchase data set for Danish panel members). Three different modelling approaches,[6] each using individual household's stated importance (from a 5-point Likert scale) of various private and public good attributes for organic goods, are used to explain the household's average organic budget share for all food types.

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3 A large number of significant differences in stated values, concerns and perceptions between organic buyers and non-buyers are observable. For reasons of brevity, these results are not reported in this paper.

4 Most respondents who perceive organic products as healthier believe this is because of the absence of pesticide and medicine residues. Other (minor) reasons are absence of synthetic additives, colouring agents and GMO application. Least emphasis is given to the possibility of organic products having fewer bacteria or having a higher vitamin and mineral content. Thus, the health attribute appears to be primarily related to the product being free from pesticide and medicine residues (and consequently expected to be healthier).

5 Results from Brennan and Kuri (2002) suggest that a similar pattern can be observed in Great Britain. According to their survey, around two thirds of the respondents believe that organic farming is better for the environment, while only 55% believe that organic food is healthier. Much fewer (around 20%) perceive that taste and appearance of organic foods are better – significantly more among buyers, though.

6 Almost identical results are found when using all three modelling approaches. The first approach is regression modelling. More specifically, the model explains average weekly organic budget share for each household during 1997-2001, using stated values, a variable measuring health risk perception in relation to pesticide residues and stated purchasing barriers as explanatory variables. Barriers are introduced to measure the importance of lack of trust and lack of interest: some consumers, assigning values to organic product attributes, may at the same time be unresponsive and uninterested when it comes to actual shopping behaviour, because they are not really committed, or because they do not, after all, really trust organic goods. Finally, we control for the effect of household characteristics, such as income (approximated by total food expenditure), geography, age of the oldest person in the household, presence and age of children, and the education level of most educated person in the household. In the study, we also apply Logit modelling, where we estimate the probability of being in a specific buyer group using the same explanatory variables. The main results are also confirmed when using a third modelling approach, taking full account of the effects of differences in relative prices: in this approach, we apply a micro-econometric demand model explaining organic budget shares, where each household's deviation from the average demand for organic foods is estimated as a household specific constant term. These constant terms are, in principle, capturing all differences due to variations in e.g. socio-economic characteristics, attitudes and values across households and are ultimately explained by the variables mentioned above.

The results reveal that stated private good attributes alone have a significant effect on the organic budget share; very interestingly, the contribution from stated public good attributes values is not significant. The effect from private good values is significant even when controlling for various household characteristics, health risk concern and main stated purchasing barriers. We find that lack of trust in control, lack of interest in organic goods (that is, the feeling there are many other things to spend money on), (stated) lack of knowledge about organic goods, and lack of trust in any health effect from eating organic goods (due to the existence of many other risk factors in every day life), are all factors significantly reducing organic shares. Concern about the health risk of eating foods with pesticide residues increases organic budget share significantly.[7]

Consequently, at least for Danish households[8], we can conclude that even though households more often assign value to (and additionally assign highest values to) the public good attributes, it is the valued *private good attributes* that make them buy organic foods. Fewer consumers acknowledge private good attributes (compared to public), but those who do, have the highest propensity to purchase organic food. It is worth noticing, however, that the public good attributes are in fact widely recognised and valued. Consequently, assigning values to the public good attributes may work as a necessary (but not sufficient) precondition for buying – in this case, purchasing organic food is possible. However, assigning values to *private good attributes* appear to be a necessary *and* sufficient condition, determining *to what degree* consumers purchase organic foods.

Socio-demographic factors

Previous research has identified a number of socio-economic and demographic variables which significantly influence demand, or willingness to pay for, organic goods. However, almost all of these studies apply stated (not observed) behaviour. In this project, we examine to what extent these findings can be supported using Danish and British data for observed behaviour. Please note that we apply multivariate modelling, hereby identifying the variation due to each explanatory variable as well as controlling for the influence from other variables in the model.

Using various econometric modelling analyses (see footnote 6) on Danish purchase data, we find that higher disposable household income, age and education level all significantly increase organic budget share. Geography significantly influences organic shares too. Household organic shares are higher in urban areas, especially in the capital area – lowest shares are observed in western rural areas.

For British households, a similar pattern can be observed for most of the socio-demographic characteristics. Households in the metropolitan (London) area have significantly higher organic

7 Quite interestingly, repeating the regression analysis for specific product groups reveals that these effects from stated values and concerns are similar across product types. Some important exceptions are observable, however: acknowledgement of non-use values, in fact, significantly increases propensity to purchase one product group, organic cereals and bread. Moreover, for this food type, concern about pesticide residues does not significantly influence propensity to buy. Finally, in contrast to all other organic product types, propensity to purchase organic dairy goods does not significantly increase with age.

8 Unfortunately, we cannot do the same useful analysis for Britain, as information on stated values is not available at household level, preventing us from combining this information with purchasing behaviour at household level. However, looking at the Top-20 statements that are most frequently (strongly) agreed with among organic buyers in the British household panel, compared to the average household shopper in the panel, suggests that British organic buyers may share some values with Danish organic buyers. Thus, the statements most over-indexed (16% more often agreed with among organic buyers compared to the average shopper) concern organic foods tasting better and having better texture – both relating to private good attributes. Statements on public values such as organic foods having animal welfare and environmental attributes are also over-indexed among buyers, but to a lesser extent though (12% over-indexed). Very interesting, the health related statement ‘organic foods are safer for children’ is the least over-indexed (9%), indicating that health concern is less prevalent among British, rather than Danish, organic buyers. Note, however, that we have no information on standard deviations for these index estimates, unfortunately prohibiting us from testing significance of difference between buyers and non buyers among British households.

budget shares, and the highest in whole of Britain. Significantly higher shares are also observed in southern regions of England, and Wales, while households in the regions of Northern England and Scotland display the lowest propensity to purchase.

For British households, social group is applied as an indicator of education and income brackets. The highest organic budget shares are observed for middle class households. Second highest propensity to purchase organic foods is observed in the upper middle class. A similar pattern can be observed in Denmark: We find that households in the middle and upper middle classes display higher purchasing propensity. Furthermore, those with medium to long periods in education have increased propensity to purchase organic foods, especially in the case of the former educational group.

In Denmark, the presence of children younger than 15 years increases propensity to purchase organic foods significantly. Remarkably, the presence of children aged 15 to 20 years (living at home) has the opposite effect, reducing propensity to purchase organic. The presence of children (regardless of age) in the household does *not* significantly influence organic budget shares in Denmark. Furthermore, when breaking the 'presence of children' variable down by number of children, instead of age brackets, we find that the presence of one or two children increases buying propensity, while the presence of three or more children decreases it – in both cases, however, not significantly. In Great Britain, a somewhat similar pattern can be observed. The presence of children is also important, and lowers the organic budget share significantly. For each additional child in household, the propensity to purchase organic foods decreases.

Thus, propensity to purchase organic appears not to be related to the presence of children per se, but rather to the presence of younger children. One possible explanation may be related to food expenses constituting a relatively heavier economic burden in larger households, leaving less extra money for organic goods. Thus, at early ages of children, parents care more about food safety and then, in adolescence, the increasing cost-of-living/family size effect takes over.[9]

Age significantly influences British household organic budget share, with middle-aged households having the highest propensity to purchase organic, and the youngest and elderly shoppers most reluctant to purchase organic. For Danish households, a parallel pattern cannot be observed. Instead, propensity to purchase organic foods generally increases with age, with a local peak for households in the 40-49 years age bracket.[10]

Demand modelling

Macro demand, assuming separability

In the project, we apply several modelling approaches. First we applied demand modelling aggregated across household types and assuming separability. Separability in our demand modelling implies that relative price changes – and the associated changes in organic share – between organic and conventional goods within one group of goods (e.g. dairy goods) do not influence the organic share in another groups of goods (e.g. bread). Assuming separability, results from demand modelling suggest that price sensitivity in demand for organic products is high, compared to other food demand studies. An important reason for the high elasticities is that the organic and conventional products are close substitutes, and that the model approach exclusively focuses on substitution between these close substitutes – disregarding changes in demand for other good types. Fur-

[9] It is possible that a similar pattern might be observed for British households, but data restrictions do not allow this analysis: unfortunately, we have no information on age of children in the household.

[10] Repeating the regression analysis for Danish and British households for specific product groups reveals that these effects from stated values and concerns are relatively stable across product types. Some interesting exceptions are visible however: organic fruit, milk and eggs are primarily purchased by younger consumers, organic yoghurt by elder consumers, while organic vegetables are purchased by households at all ages. Households in Wales, western and south-western regions of England generally display a relatively high propensity to purchase organic, but looking at product groups reveals that this does not hold for organic eggs and vegetables – most probably because farm gate sales and home production are prevalent in these areas. Middle class and upper middle class households display higher propensity to purchase organic eggs, milk and yoghurt, while organic fruit and vegetables are primarily purchased by the middle and lower middle classes.

thermore, it appears that organic products respond much more to price changes than conventionally produced products do. This is partly due to the high budget share of conventional products, and partly indicating that organic products, often newly introduced on the market, may be subject to more price comparison. Similar results can be found in other studies on demand for organic foods in United States (cf. Glaser, L.K. and G.D. Thompson (1998), Demand for Organic and Conventional Frozen Vegetables. Paper presented at the American Agricultural Economics Association Annual Meeting, August 8-11, Nashville, Tennessee, or Glaser, L.K. and G.D. Thompson (2000), Demand for Organic and Conventional Beverage Milk. Paper presented at the Western Agricultural Economics Association Annual Meeting, June 29-July 1, Vancouver, British Columbia.

In the preferred model specification, the budget elasticity was set to unity. However, if this restriction is relaxed, the budget elasticity for organic products is larger than 1. This indicates that organic foods are luxury goods, as the budget share increases with the budget.

Micro demand, not assuming separability
When testing for separability, we found that this assumption does not hold. Leaving the assumption of separability and estimating a new, total demand system, resulted in interesting findings. Thus, our research suggests that an increase in the organic share in one group of goods is partly outweighted by a decrease in the organic shares in other good groups. This means that some of the attributes of organic goods are to some extent general and can be supplied by any organic good type. Hence, households will partly compensate a decrease in consumption of organic carrots with an increase in consumption of e.g. organic milk. An interesting policy conclusion can be drawn from this: Information/promotion targeting one specific product group can possibly be outweighted by reverse effects in other organic product groups. Instead, promotion of general organic attributes will be more effective, possible increasing organic demand in all product groups.

The general organic attributes are environmentally friendly production and improvement of animal welfare. These attributes are – to some extent – offered by all types of organic goods (animal welfare only by lifestock products, however). In contrary, freshness and especially taste attributes are product specific. The health attribute is most possible prevalent in both groups: Our research reveals (cf. above) that consumer perception of health effects from organic goods are primarily associated with the absence of pesticide residues in products – and this characteristic is – more of less – offered by all types of organic products. Thus, in the main, the health attribute is general. It may, however, also be product specific in some cases: If the health matter relates to a specific household member (e.g. an infant child), this attribute can only be enjoyed through the products this infant child is actually eating (e.g. milk) and cannot be substituted by organic products the infant is not eating (e.g. organic coffee). In this case, the health attribute is product specific.

Furthermore, doing micro-econometric (household level) estimation of demand for aggregated food groups, taking in the total food system (all food groups within one system/no separability) reveals interesting results. First, price elasticities are lower than in the case of separability, This is partly due to application of more aggregated groups (i.e. less closer substitutes), and partly due to interaction with other product groups, which has now been taken into account. Finally, we previously found that organic goods are luxury goods across households (high income households hold higher organic shares). However, looking at income changes within each household, this pattern was not clear. Thus, within each household, increasing income will not necessarily result in increasing organic share – at least not in the short run.

Information and labelling

There appear to be basically two ways for producers to increase trustworthiness (and for consumers to ensure authenticity): the first way is direct personal contact between the producer/seller and the consumer, which is achieved when purchasing foods at farm gates, markets or specialist stores. Direct personal contact makes it possible for the consumer to receive detailed information on specific producers and products. The second method involves labelling or other standardised information provision on product attributes. For organic goods sold in supermarkets, which are most often produced at large scale industrial food production units, information such as labelling is the only way for consumers to identify authenticity. For this type of organic market, well-known, unmistakable and trustworthy labelling is a precondition for sustaining and developing high organic market shares.

Our survey results tell us that the national Danish organic label is well known[11], and in general, people have a good understanding of organic inspection and certification rules. However, in the main, respondents believe that the label is more comprehensive than it actually is. Surprisingly, there are almost no significant differences in knowledge of the rules behind the organic label between buyers and non-buyers. Most consumers (59%) have general confidence in Danish products with the Danish organic label (significantly more buyers than non-buyers). However, only 29% have general confidence in foreign products carrying the same label, though. Trust in organic products without the label is low – especially, for foreign products. Around half of the consumers believe that the rules are good enough to ensure animal welfare, nature and health. Only few consumers (12-13%) disagree in these statements. Generally, however, respondents would prefer organic rules to be stricter than today, especially in relation to pesticide/medicine application compared to e.g fertilizer application. Significantly more buyers than non-buyers prefer stricter rules. Finally, significantly mores buyers than non-buyers trust other labels such as "guaranteed salmonella free", "ensuring animal welfare", etc.

Furthermore, our results suggest that the organic production rules are commonly perceived as ensuring enhanced food safety, even in relation to food safety risks that are not handled directly in organic farming rules (such as salmonella, campylobacter and BSE). This is quite interesting and suggests that the organic label is working in two ways: first as a distinct label, ensuring specific benefits for organic products; and second, as a broader, vaguer label which is interpreted as signifying more universally benign outcomes such as generally enhanced food safety.

The purpose of this part was to estimate marginal willingness to pay for eggs carrying different labels. Among other things these labels indicate environmental features and different levels of animal welfare for the hens that produce the eggs.

The eggs were divided into battery eggs ('buræg'), barn eggs ('skrabe æg'), free-range eggs ('fritgående') and organic eggs ('økologiske') and the marginal willingness to pay for the three last types relative to battery eggs are estimated. The marginal willingness to pay for different types of eggs turned out to vary with the chain of stores in which the purchase is made. Econometric estimations using store-level data reveals that customers in some stores (e.g. Superbrugsen) are generally willing to pay for labels indicating environmental and animal friendly production methods, while customers in other stores (e.g. Bilka) are reluctant to do so.

The labels 'barn eggs' and 'free-range eggs' mainly indicates increased animal welfare, whereas the 'organic' label indicates a more environmentally friendly production as well as a higher level of animal welfare. Some households may also perceive the organic eggs as being healthier than other egg types because the hens are fed with organic feed. The heterogeneity of marginal willingness to pay for organic eggs can therefore be induced by differences in the perception and evaluation of at least three different attributes, whereas the heterogeneity of marginal willingness to pay for barn and free-range eggs is expected to arise only from differences in perception and evaluation of animal welfare. Data supports this hypothesis as the estimated heterogeneity of marginal willingness to pay is generally higher for organic eggs than for the two other egg types.

If consumers are willing to pay more for specific attributes, there may be a *societal value* associated with providing reliable labelling. Labelling gives consumers the possibility of distinguishing organic goods from other goods and ensures freedom of choice among different goods at different prices. Using econometric (mixed logit) modelling, we have estimated a positive willingness to pay for organic goods. Very interestingly, this willingness to pay turns out to be highly dependent on sales channels.

Estimating revealed preferences

[11] The situation in Britain is a little different. There are a total of five approved national inspection bodies and corresponding labels. Of these, the Soil Association logo is the most widely recognised, certifying more than 70% of the organic foods in Britain.

We present a characteristics based analysis of the demand for milk in Denmark. Such an approach models the demand for a wide variety of milk types (such as organic (‘oko’) regular 3.5% milk) as being motivated by preferences over a small number of attributes. In this case the attributes are fat content, taste and whether the milk has been produced under environmentally friendly conditions (oko). Such an approach is particularly appropriate for analysis of the value of the latter to consumers.

The basic idea of the approach is that consumers’ preferences can be recovered from their individual choices of goods, their budget constraint and the prices of the goods. When a consumer buys a bundle of goods (say $(x_1,x_2,\ldots,x_g)$), we know, that $(x_1,x_2,\ldots,x_g)$ is affordable and that $(x_1,x_2,\ldots,x_g)$ is at least as good as any other affordable bundle given the consumers preferences, the prices and the budget. By observing more choices made by the consumer, for instance at different times, we can learn more about the consumer’s preferences and when having several observations we can trap the consumer’s indifference curve. We can also test a simple rule for whether the consumer’s choices are consistent with utility maximisation. The rule is called the General Axiom of Revealed Preference (GARP).

Compared with parametric methods the combination of revealed preference theory and non parametric methods is appealing, because no assumptions about the functional form of the consumer’s utility functions are made. For instance, if the integrability conditions are rejected in the parametric model we can not access, whether this rejection is driven by the ‘wrong’ functional form or there exist no well-behaved form of preferences, which can rationalise the data. Non parametric analysis allows us to check this. Further, when using parametric demand estimates for policy analysis there will always be uncertainty to which extent the welfare conclusions are driven by the chosen functional form. With Non parametric analysis we can obtain bounds on welfare effects and use these bounds to judge the importance of functional form on welfare conclusions.

The GfK-Denmark’s household grocery consumption panel data set is particularly well suited for non parametric revealed preference analysis, because it contains plenty of observations for each household. The tightness of the bounds on the consumers’ preferences depends on the number of observations for each household. More observations give tighter bounds.

The major technical innovation in the paper is the development of revealed preference (RP) conditions for characteristics models. This means that we do not have to assume a functional form for the utility function. As a side benefit, RP conditions do not have any especial problem with particular households not buying many types of milk in a particular week. By contrast, there are not currently available multivariate censored models for panel data that do not impose strong assumptions. We derive two sorts of restrictions from the characteristics structure. First, we have restrictions on how the prices of the different types of milk evolve over time. These restrictions can be modelled using state space representation models from time series analysis. In the paper we develop a series of dynamic factor models that allow us to address some of the issues discussed above. The second set of restrictions apply RP conditions to the time series of demands and prices for individual households. In doing this we extend current RP tests to allow for linear characteristics models and we also propose methods for allowing for measurement error on the prices.

The idea that consumers have preferences over the characteristics of market goods has turned out to be an extremely fruitful one. However, the empirical implementation of characteristics models tends to rely heavily on functional form assumptions. In this paper we develop a revealed preference (nonparametric) approach to the empirical analysis of characteristics models. We derive the necessary and sufficient conditions under which data on the market behaviour of heterogeneous and price-taking consumers are nonparametrically consistent with the consumer characteristics model. Where the conditions fail we highlight the role which the introduction of unobserved product attributes can play in rationalising the data. Where these conditions hold, we show how information may be recovered on individual consumer’s marginal valuations of product attributes. In some cases marginal valuations are point identified and in other cases we can only recover bounds.

We apply the revealed preference techniques we develop to consumer panel data on the Danish milk market. The two major characteristics that vary across different types of milk are fat content and whether it is produced under “organic” conditions. Both aspects are important for substantive issues. Given the concern over increasing obesity in all high income countries there is interest in identifying the marginal valuation of fat and how this is distributed across the population. Our techniques allow us to identify the distribution of these valuations. As regards the second characteristic, “organic”, interest hare centres on how much extra consumers are willing to pay for milk that is arguably more healthy (for example, because cows that produce organic milk are never treated with antibiotics) and increases animal welfare. Given that organic milk is more expensive to produce it is important to establish the demand so that farmers or milk marketing boards can gauge how much to organic milk to produce. In this analysis we use data which allows us to follow individual households over very long periods so that we can deal with heterogeneity in a fully nonparametric way by treating each household as an individual time series.

Whatever the organic characteristic represents (perhaps a warm glow, perhaps the absence of antibiotic residues in the milk) this specification of the technology says that twice as much of it is produced by buying 2 litres of milk, than is produced by 1 litre; which is not to say, however, that the consumer then values it twice as much since the utility function is concave in attributes.

On average, milkiness has a valuation of 5.10 DKK per litre with each additional cl of fat content increasing the valuation by 0.43 DKK and organic attracting a premium of about 1 DKK . The valuation of the milkiness and the organic characteristic are evidently highly heterogeneous, whilst the valuations of fat are less so. Milkiness always has a positive marginal valuation but there are some negative valuations for the other characteristics: just under 10% of valuations of fat recovered are negative and nearly 17% of organic are negative. These negative marginal valuations do not conflict with the theory and are not inconsistent with the idea that the consumption of market goods has non-negative marginal utility overall. For some households which buy a sufficiently wide range of goods we are able simultaneously to recover their valuation of all of the characteristics.

Comparison of stated and revealed preferences

For this part fo the study, questionnaire data was not available yet. Instead, we use pre-test data from a sample of 400 respondents. The pilot study was mailed to 400 households, representatively distributed across geographical regions and within each region, randomly chosen. The response rate was 31 per cent. The questionnaire consisted of four sets of questions: questions on purchase habits and food culture (choice of store, important product characteristics, statements on risks from eating certain foods), questions on organic food production (identification of the Danish O-label, statements on organic production and its effects), questions on habits and environmental attitudes (use of recycled toilet paper, aluminium foil, membership of environmental associations, statements on the consumer's role in environmental protection), and finally questions on willingness to pay for organic milk. The respondent had to indicate whether (s)he agreed with the attitudinal questions on a scale from 1 to 5. The respondents who stated a positive willingness to pay were asked a follow-up question asking them to rate whether different characteristics of the organic product were more or less important in their decision to pay more for the organic product (taste, absence of pesticide residue, environmental concerns, good conscience).

A large part (59%) of the pilot sample are willing to pay more than the stated conventional market price for milk. Average stated willingness to pay is a price premium of 32% for a litre of milk. In comparison, purchase data during June 1st 1999-May 31st 2000 shows that on the market, 55% of all consumers in the household panel are willing to pay more for organic milk. The average price premium (revealed willingness to pay) - estimated from purchase data - is 24% for organic milk. Thus, the consumers are on average actually paying less for organic milk than they state they are willing to pay. This may indicate two things: First, consumers may state they are willing to pay more than they actually are, suggesting that contingent valuation may be associated with uncertainty. Alternatively, the results may indicate a considerable consumer surplus, as consumers would be willing to pay more than they actually are.

As part of the analysis of the pilot study, we performed logistic maximum likelihood estimates on the probability of being a “buyer”, defined as willing to pay more for organic milk in the survey. We used the attitudinal information in the questionnaire to construct indicator variables for environmental behaviour and awareness, health risk concern, nutrition concern, good conscience from buying organic products, price sensibility, and the attitude towards the statement that `environmental problems are exaggerated´. We also constructed an indicator variable based on attitudes towards three statements on the impact of consumer behaviour on the environment.

The estimated model seems to generate good predictions of buyer behaviour, with the model correctly predicting buyer rate for 82% of the sample. Among the significant variables, price consciousness and the belief that “environmental problems are exaggerated” decrease the probability of being willing to pay for the four products by about 100%. The presence of small children in the household has a positive significant influence on the probability of being willing to pay more. However, based on this limited sample, we did not find any significant impact of the indicator variables on health, nutrition and environmental awareness.

Work Package 2:

There has been made a selection of cases for WP2. The following cases have been studied in detail, using various modes of inquiry, as listed below. Interviews have been carried out during spring and summer of 2003. Actors from production and distribution/retailing, as well as consumers have been interviewed. In the original project description, six cases were proposed for the case studies. Due to limited resources in terms of time and manpower, it was decided to limit the number of cases to four cases in all. The two cases which were not included in the final project design, was the organic dairy Thiese and Aurion Bakery. The reason for their exclusion from the design was that these cases were less obvious examples of the development of alternative food networks and more obvious examples on sectorial business development.

Case	Description	Contact initiated
Økoterminalen i Tinglev (The organic freshware terminal in Tinglev)	Organic freshware terminal, based in Southern Denmark; producer owned; went bankrupt in 2001	Company accounts, scientific reports, various written documentation, semi-structured qualitative interviews
Årstiderne.com	Web-based vegetable box scheme; private ownership (stocks)	Company accounts, scientific reports, various written documentation, semi-structured qualitative interviews, participant observation
Spidsroden	Cooperative farm outlet in downtown Copenhagen; consumer controlled	Company accounts, scientific reports, telephone interviews
Landbrugslauget	Danish CSA (community supported agriculture); consumer owned and collectively organised	Various written documentation, semi-structured qualitative interviews

The last part of 2003 and early 2004 was partly used for interpreting interview data, as well as developing the theoretical framework of the project.

C.2 Fulfilment of deliverables and milestones

WP1 Consumer preferences and demand: potentials and barriers for market expansion	Time schedule according to application	Deviations, if any*
Task		
T1 Specification of the theoretical model taking outset in literature and focus group interviews	2001-2002	
T2 Design of questionnaire through use of focus groups and tests	2001	
T3 Surveying the questionnaire	2001	
T4 Estimation of price and income elasticities of various products	2001-2002	
T5 Investigation of alternative model approaches Implementing relevant socio-economic and demographic variables, plus underlying attitudes	2002	
T6 Evaluation of the implications of the estimated price sensitivity of demand for organic foods, including evaluation of the effect of economic policy instruments such as levies and subsidies	2002	
T7 Examination of difference between postulated and observed willingness to pay	2002	
T8 Identification of differences in purchasing motives, attitudes towards convenience food and towards alternative sales channels and processing technology and in the demand across consumer groups.	2002-2003	
T9 Examination of consumers' confidence in labeling	2003	
T10 Analysis of differences in food consumption and prefeerence across countries	2003	
T11 Examination of differences in purchasing motives, etc	2003	
T12 Analysis of the effects of policy instruments	2003-2004	
T13 Scenario calculations	2003-2004	
Deliverables		
D1 Working paper with literature review	12.2000	
D2 Time table version 2	11.2000	
D3 First annual status report	11.2000	
D5 Working paper on Modeling and Estimation Approach	06.2001	
D6 Working paper on Interviews and Questionnaire	06.2001	
D7 Time table version 3	10.2001	
D8 Second annual status report	10.2001	
D9 Working paper documenting results from questionnaire	01.2002	
D10 Int. paper on the importance of prices and income for different types of organic products	12.2002	
D11 Int. paper on the importance of sociodemographics	12.2002	
D13 Int. paper with examination of difference between stated and observed willingness to pay	06.2002	
D14 Int. paper on differences in purchasing motives, willingness to pay and socio-demographic variables	02.2003	
D15 Int. paper with differences in attitudes towards convenience food and alternative sales channels	02.2003	

D16 Time table version 4	10.2002	
D17 Third annual status report	10.2002	
D21 Int. paper, with examination of differences in consumers confidence in organic products	11.2003	
D22 Int. paper, with analysis of differences in food cons. And cons. preferences across countris	11.2003	
D23 Time Table version 5	10.2003	
D24 Fourth annual status report	10.2003	
D25 Int. paper on policy instruments	11.2004	
D26 Int. paper on scenario calculations	11.2004	
D27 Time table version 6	03.2005	
D28 Fifth annual status report	03.2005	
Additional deliveries, not in application	11.2003	
IFOAM Conference paper	08.2000 (not planned, additional work)	
EAERE Conference paper	06.2001 (not planned, additional work)	
Article in British Food Journal	06.2001 (not planned, additional work)	
Working paper documenting Household Panel Data	09.2001 (not planned, additional work)	
Working paper on Modeling Demand for Organic Products – Implications for the Questionnaire.	06.2001 (not planned, additional work)	
Contribution to SJFI report	06.2001 (not planned, additional work)	
An oral presentation on preliminary results at a Seminar on Animal Welfare at the Swedish University of Agricultural Sciences	11.2001 (not planned, additional work)	
9 popular articles	2000-2003 (not planned, additional work)	
Various oral presentations at meetings	2001-2005 (not planned, additional work)	
CAM presentation	06.2002 (not planned, additional work)	
OECD paper	09.2002 (not planned, additional work)	
Article in Nationaløkonomisk Tidsskrift	2002 (not planned, additional work)	
Working paper on environmental and animal welfare labelling	10.2002 (not planned, additional work)	
Oral presentation at a workshop at Institute of Fiscal Studies, UK.	10.2002(not planned, additional work)	
Int. paper on price and budget sensitivity in demand for organic foods	12.2002 (not planned, additional work)	
Int. paper on revealed preferences (characteristics model) for milk	12.2002 (not planned, additional work)	
Int. paper on revealed preferences	03.2005 (not planned, additional work)	
Int. conference paper (EAERE, Budapest)	O6.2004 (not planned, additional work)	
Int. conference paper (IFOAM, Adelaide)	09.2005 (not planned, additional work)	
Proceedings from OECD Workshop	06.2003 (not planned, additional work)	
Book chapter (FOI report)	12.2004 (not planned, additional work)	
Oral presentation at Aarhus Business School	11.2003 (not planned, additional work)	

Oral presentation at a workshop at Terence Gorman Memorial Lectures, UK.	06.2004 (not planned, additional work)	
Oral presentation at Økologikongress	11.2004 (not planned, additional work)	
Book chapter (Miljøøkonomisk debatbog)	03.2005 (not planned, additional work)	
Article in FOEJOenyt	10.2004 (not planned, additional work)	
Milestones		
M1 Decision of modeling approach	06.2001	
M2 Completion of analysis of the importance of prices and income	11.2002	
M3 Completion of the analysis of socio-demographic variables	12.2002	
M4 Results from final questionnaire collected	09.2002	
M5 Comparison of stated and observed willingness to pay	06.2002	
M6 Completion of analysis of differences in purchasing motives etc	11.2003	
M7 Completion of analysis of consumers' confidence	11.2003	
M8 Completion of analysis of differences in food cons. and preferences across countries	11.2003	
M9 Completion of analysis of policy instruments	11.2004	
M10 Completion of scenario calculations	11.2004	

WP2 Alternative distribution channels: driving forces and potentials	Time schedule according to application	Deviations, if any*
Task		
T1 Final description of PhD Scholarship for advertising	2000	
T2 Appointment	2001	
T3 Final description of educational program for appointed scholar	2001	
T4 Preparing historical review	2001-2002	
T5 Selection of adequate cases	2001-2002	
T6 Selection of adequate evolutionary theories	2001-2002	
T7 Preparing case studies	2002-2004	
T8 Preparing outlook	2003-2004	
T9 Preparing PhD Thesis	2003-2004	
Deliverables		
D4. Working paper: Historical Review	04.2002	11.2002
D12 Working paper: Theoretical foundation	09.2002	
D18 Working paper: Case studies	10.2003	
D19 Working paper: Outlook	06.2004	
D20 Dissertation	07.2004	
Additional deliveries, not in application		
1 popular article	06.2002 (not planned, additional work)	
2 oral seminar presentations	2002 (not planned, additional work)	
1 oral seminar summer school presentation	09.2004	
Milestones		
M1 Final appointment	12.2001	
M2 Final selection of cases	06.2002	
M3 Presentation of D4	07.2002	12.2002
M4 Presentation of D12	09.2002	
M5 Presentation of D18	10.2003	

M6 Presentation of D19	06.2004	
M7 Presentation of D20	07.2004	

Description of deviations and subsequent adjustments of plans

No deviations

Project publications and other products

1. Products from Organic Eprints archive

Andersen, Laura M.; Blow, Laura; Browning, Martin and Crawford, Ian (2005) A nonparametric characteristics model of the demand for milk. *in preparation*.

Andersen, Laura Mørch (2005) Animal welfare - cheap talk or money on the counter?. [preprint]

Andersen, Laura Mørch (2002) Consumer Evaluation of Environmental and Animal Welfare Labelling: An Econometric Analysis on Panel Data Using Mixed Multinomial Logit. Working Paper.

Andersen, Laura Mørch (2001) Documentation of household panel data. Working Paper.

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Hansen, Lars Gårn (2004) Organic Food Demand– evidence from a Danish micro panel . *American Journal of Agricultural Economics*.

Hansen, Lars Gårn (2001) Demand for Organic Products – Specification of Functions to be Estimated. Working Paper.

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Kjeldsen, Chris (2004) *Modernitet, tid, rum og økologiske fødevarenetværk [Modernity, time, space and organic food networks]*. Ph.D. thesis, Institut for Økonomi, Politik og Forvaltning, Aalborg Universitet.

Kjeldsen, Chris (2002) Bæredygtige producent-forbruger netværk? [Sustainable producer-consumer networks?]. In *Forskningsnytt om økologisk landbruk i Norden*, May.*

Kjeldsen, Chris (2002) Samfundsvidenskabelig bæredygtighedsteori [Social science theories on sustainability]. Working Paper, Landbrugsøkonomi, Institut for Økonomi, Politik og Forvaltning.*

Millock, Katrin; Hansen, Lars Gårn; Wier, Mette and Mørch Andersen, Laura (2002) Willingness to Pay for Organic Foods: A Comparison between Survey Data and Panel Data from Denmark. Paper presented at The 12th Annual EAERE Conference, Monterey, USA, June 2002.

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2. Other products (oral presentations, public meetings, field days, etc.)

Scientific conference presentations with no paper:

Andersen, L.M. (2003): Consumer Evaluation of Environmental and Animal Welfare Labelling: Estimating the Willingness to Pay for Different Types of Eggs. SEE Workshop on Environment, Information, and Consumer Behaviour, Frederiksdal, April 28-29th, 2003.

Browning, M. (2003): Revealed Preference Tests for Characteristics Models. SEE Workshop on Environment, Information, and Consumer Behaviour, Frederiksdal, April

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Browning, M. (2002): Revealed Preferences for Milk. Presentation at the *CAM* (Centre for Applied Microeconometrics) *Workshop on Characteristics Models*. University of Copenhagen, June, 2002

Crawford, Ian (2004): Nonparametric methods for characteristics models, presented at: Bureau of Labor Statistics, Washington DC, 18th November, 2004; Manchester University, 11th November 2004; University of British Columbia, Vancouver, July 1st, 2004; CHILD Conference, Verona, Italy, 14th May, 2004 and LSE, 12th March, 2004.

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Hansen, L.G. (2003): Danish Organic Food Demand – Separability and Substitution Patterns, SEE Workshop on Environment, Information, and Consumer Behaviour, Frederiksdal, April 28-29th, 2003.

Kjeldsen, C. (2005): Alternative organic food networks in Denmark - a case of social and ecological reembedding? Paper submitted to the RGS-IBG Annual Conference 2005: "Flows and Spaces in a globalised world", London, 31 August – 2nd September 2005. Hosted by the Royal Geographical Society with Institute of British Geographers.

Wier, M., L.M. Andersen and K. Millock (2003): Consumer Demand for Organic Foods – Stated Attitudes and Actual Behaviour. SEE Workshop on Environment, Information, and Consumer Behaviour, Frederiksdal, April 28-29th, 2003.

Other presentations (oral presentations, public meetings):

Browning, M (2004): Revealed preferences analysis of demand for organic milk. Presentation at the Terence Gorman Memorial Lectures, London, June 11th, 2004

Hansen, L.G (2003): Is there organic crowding out? Presentation at Aarhus Business School, November 2003.

Kjeldsen, C. (2004): *Sustainability: values and dilemmas*. Presentation at SOAR Summer School 2004: “Is organic agriculture the key to sustainability?”, September 20-24, Middelfart, Denmark (international PhD course)

Kjeldsen, C. (2003): *Økologiske fødevarenetværk, modernisering og bæredygtig udvikling. (Organic food networks, modernisation and sustainable development)* Presentation at Center for Forskning og Udvikling i Landdistrikter, Esbjerg, Denmark June 4th 2003

Kjeldsen, C. (2002): *Tendenser i økologisk jordbrug og fødevareproduktion*. (Tendencies in organic farming and food production) Presentation at SOAR (Research School for Organic Farming) biannual seminar 8th of may 2002 at Roskilde University.

Kjeldsen, C. (2002): *Økologiske producent- forbruger netværk i et bæredygtighedsperspektiv. (Organic producer-consumer networks in a sustainability perspective)* Presentation for researchers at Danish Institute of Agricultural Sciences, Department of Agricultural Systems, the 22th of february 2002.

Wier, M (2004): Staten som kunde og protector. Presentation at Økologikongress, 16-17 Nov. Odense, 2004.

Wier, M. (2003): Kompleksiteten i det økologiske forbrug. Presentation on Nordic Workshop on “Magten i den økologiske fødevarekæde”, Danish Consumer Council, Copenhagen 30-31 October, 2003.

Wier, M. (2003) *Forbrugerne*. Presentation on Det Økologiske Fødevareråds 2-day-meeting, Hillerød 29-30 September 2003.

Wier, M (2001): "Relationer mellem forbrugere og producenter". Presentation at Summer Meeting on “Principles and Goals for Organic Farming” at Askov Højskole, June 21st, 2001.

Wier, M (2001): “Markedspotentiale og merpriser“. Presentation at SJFI Seminar on “Economic Perspectives for Organic Farming” at Falconer Conference Center, June 7th, 2001.

Wier, M (2000):Troløse eller trofaste forbrugere – hvad er det reelle indkøbsmønster for økologiske varer? Økologi Kongress, November, Horsens, 2000

Wier, M. (2000): Consumers and organic foods. Presentation at Aarhus Business School, November 2003.

* 25-75% financed by DARCOF
** 5-25% financed by DARCOF

F. Scientific education

In Work package 2, Chris Kjeldsen has completed a PhD scholarship. Besides ordinary PhD education, he has attended the following

- In April 2002 the course ”The Craft of Making Social and Political Science” at Department of Economics, Politics and Public Administration, Aalborg University, was completed. The course was about social scientific methodology and the project was presented and critiqued among the participants in relation to the methodological principles presented in the course.
- In early October 2002 (from 7th through 11th october 2002) he participated in the SOAR (Research School for Organic Farming) summer school, entitled ”Research Methodologies in relation to Principles and Practice of Organic Agriculture”.
- In late October 2002 (from the 21st through the 24th of october 2002) he participated in the Ph.D.-course ”Sustainability and Empirical Research”, which is being held at Roskilde University. The lecturer of the course will be Wolfgang Sachs from the Wuppertal Institute, Germany.
- In January 2003 he participated in the PhD course “Theory Construction” at Institute of Political Science at Aarhus University. The course dealt with the dialectical relationship between theory and empirical observation, investigated via contributions from classical, as well as contemporary social theory.
- In August 2003 he participated in the course “modern Sociological Theory” at Department of Management, Politics and Philosophy, Copenhagne Business School.
- In january 2004 he co-arranged and participated in the course “Modernisation processes in food networks”, hosted by SOAR (Research School for Organic Farming). Lecturers at the course included researchers from University of Pisa, University of Cardiff, Roskilde University, University of Southern Denmark, Aalborg University and Copenhagen Business School.

We have raised funding (through Danish Social Science Research Council) for a PhD scholarship for Laura Mørch Andersen. The scholarship is on the issues of consumer preferences, information and althruistic behaviour.

G. National and international cooperation

National co-operation
We have appointed a coordination group, in which we gather contact persons from other related ongoing projects, and discuss our research results. The group meets twice a year. Mette Wier is responsible for arranging, planning and chairing all meetings. The purpose is to

- exchange ideas,
- disseminate preliminary and final findings from the projects to other researchers,
- discuss methods,
- elaborate on results from the projects, and finally
- coordinate the projects, to ensure we base our research on previous findings.

The coordination group has the following members:

- Suzanne Beckmann, Copenhagen Business School
- Helle Bossen, The Organic Service Center
- Thomas Roland, The Danish Consumer Council
- Tino Bech-Larsen and John Thøgersen, Aarhus Business School
- Katherine O'Doherty Jensen, KVL - The Royal Veterinary and Agricultural University
- Niels Heine Kristensen and Martin Harring Boll, DTU - Technical University of Denmark
- Dorthe Ilsøe, RUC - Roskilde University
- Jan Holm Ingemann and Chris Kjeldsen, Aalborg University
- Lars Gårn Hansen, and Laura Mørch Andersen, AKF - Institute of Local Government Studies
- Mette Wier ,Søren Frandsen, Sinne Smed and Jørgen Deigaard Jensen, FOI - Danish Research Institute of Food Economics

International co-operation

The French institute CIRED is a partner in the project.

GfK, another partner in the project, is an international institute having departments in several European countries. Data from one of these countries, Great Britain, is applied in the project.

Our questionnaire was kindly commented by Per-Olof Johansson, Stockholm School of Economics, Peter Frykblom, Appalachian State University, NC. Nancy Bockstael, University of Maryland, and Alain Carpentier, INRA, France

We have established close contact with Dr. Ian Crawford, who has visited us for two days in October 2001, and we have begun writing papers with him. Ian Crawford is Director at Institute for Fiscal Studies (Consumption and Savings Research), Deputy Director at Centre for Microdata Methods and Practice, and Research Fellow at Department of Economics, University College London, UK.

We have contact with Professor Gary Thompson, University of Arizona, Department of Agricultural and Resource Economics. Gary Thompson works with micro-estimations on demand for organic foods himself.

We are participating in a project under the EU Commision's Framework 6: Food quality and Safety in the European Organic Supply Chain.

Critical reflection on the project

WP1:
Organic farming is pesticide free and is attributed a number of other environmental advantages as well. This is why increasing the proportion of cultivated area that is organically farmed is an important element of Danish environmental policy.

Accurate estimates of current organic food demand functions are important steps towards assessing the feasibility of large increases in Danish organic food production. However, understanding and quantifying the underlying motives for organic food demand is also important for at least three reasons.

- First, the organic food market is an emerging market where development of products in new areas and consumer learning of product attributes may cause substantial shifts in demand functions. A good understanding of motives and valued attributes is essential if meaningful predictions of such shifts are to be attempted.

- Second, such an understanding is also essential for assessing the future role of alternative versus conventional sales channels, different types of information and labeling strategies and, ultimately, alternative development strategies for organic farming practices.

- Third, such an understanding is important for assessing potential sales on export markets. A good understanding of the importance of differences in supply channels, labeling, price premiums and consumer demand across countries is a prerequisite for exploiting potential demand abroad.

In our project, we have access to a unique panel data set (Danish as well as British households), in combination with elicited information from interviews on underlying attitudes and valued attributes. Thus, we are able to shed new light on the structure and relative importance of various motives for purchasing organic foods within various consumer segments. However, it requires considerable time to handle, organize, elaborate and utilize the very extensive and detailed data set, encompassing more than 5 million observations of purchase acts. It turned out to be more time demanding than we expected, and this is especially due to three circumstances

- The purchase data is observed at a highly disaggregated level. To analyse, we need to aggregate. Aggregating properly, however, requires full understanding of detailed codes and specifications.
- It is not straightforward to assign proper prices for the alternative goods the consumer is facing in the shopping situation, but is not buying. In purchase data, we only have prices for goods actually purchased.
- It is not straightforward to identify problems of supply shortage, which is very common for organic products. We can see from purchase data when a certain good is not sold, but we cannot tell whether the good was not supplied, or whether it was not chosen by the consumer. This has required some time to handle.
- The purchase data was created in GfK for non-research purposes. This means that there is considerable lack of continuity and consistency across time periods. Thus, the number and meaning of codes and variables may differ from one period to another. This has required some time to straighten out.

In 2003, we turned to a selected export market (Great Britain). Consumption of organic foods at the Danish market is currently stagnating, and has been so for a couple of years. This means that future growth in consumption of Danish organic products will probably call for product development (more processed and elaborated organic products) as well as further export. For that reason, analyses of markets abroad are highly necessary – and more relevant than ever. This means that the part of our product focussing on foreign markets should not be reduced.

We have learned however – from our experience with Danish GfK data – that we need to focus on certain commodity groups and restrict the analysis in this way. Otherwise we would not have the time to analyse all the aspects we have planned in the project proposal. For that reason we have focussed on certain, carefully selected, commodity groups on the export market.

Some other issues currently discussed at home and abroad, are consumer attitudes towards organic production standards, future application of GMO's in organic production, food safety and consumer risk perception, and finally the importance of information provision to consumers, by e.g. labelling. Organic production standards are developing and changing in these years, and so is labelling strategies. These topics are encompassed in our project, but we have handled them in more detail than originally planned. Among other initiatives, we have changed the first version of the questionnaire to handle these questions in a more comprehensive way.

WP2:

The establishment of a theoretical foundation for the project has proven to be a time-consuming task. One reason is the obvious lack of truly integrative, multi- or transdisciplinary studies of organic producer-consumer networks, or organic food networks. Existing studies seem to be either discipline specific (for example studies within established disciplines as marketing, export economy, agricultural economics etc.) or sector specific. Sector specific studies include studies such as (organic) farm economy, consumer studies, studies of development in the cooperative sector and other types of studies, where one of the processes involved in the operation of the whole network is considered. But examples of studies, which include production, distribution as well as consumption in the area of study, are very rare. There can be found examples of approaches, for example actor-network theory (ANT), which at least in theory claims to embrace all of these dimensions of food networks. But one common characteristic for these approaches is the lack of a sound empirical grounding.

The approach so far developed in the project is therefore a multidisciplinary approach, drawing on insights from a diverse range of scientific disciplines such as (agricultural) political economy, rural sociology, ecological economics, systems theory, environmental sociology and evolutionary/institutional economics. This has so far meant a heavy workload in terms of accessing many different approaches and viewpoints on food networks, thereby delaying the collection of empirical data and completion of the historical review.

8. Budget

A. Account for any change in budgets

B. Budget for the whole project (1.000 DKK)

Total consumption of funds from DARCOF – all institutions

Year:	Original budget	Cons. before 2003	Cons. 2003	Cons. 2004	Total
Man-months					
Scientific personnel	64.5	38	21	2,5	61,5
Technical personnel	23	16,3	4,5	0,6	21,4

Year:	Original budget	Cons. before 2003	Cons. 2003	Cons. 2004	Total
Salaries					
Scientific personnel	2344	1382	783	71	2236
Technical personnel	474	331	87	6	424
Other operational costs	708	508	358		866
Equipment					
Others (please specify)					
Direct costs	3526	2221	1228	77	3526
Indirect costs (20% of direct costs)	704	444	245	16	704
Total	4230	2665	1473	93	4230

Comments:

9. Signatures and stamps

Name	Institute	Date	Signature
Head of project Mette Wier	akf, Institute of Local Government Studies - Denmark	18 July 2005	

Appendix I. Detailed budget

A. Budget for each participating institute (1.000 DKK)

Name of Institute: **akf (including CIRED and GfK Danmark)**

Year:	Original Budget	Consumption before 2003	Consumption 2003	Consumption 2004	Total
Man-months					
Scientific personnel	51.5	32,4	15,8	0,3	48,5
Technical personnel	23.0	16,3	4,5	0,6	21,4

Year:	Original budget	Consumption before 2003	Consumption 2003	Consumption 2004	Total
Salaries					
Scientific personnel	1947	1211	621	7	1839
Technical personnel	473	331	82	1	414
Other operational costs	688	497	358	0	855
Equipment					
Others (please specify)					
Direct costs	3109	2039	1061	8	3108
Indirect costs (20% of direct costs)	621	408	212	2	622
Total	3730	2447	1273	10	3730

Comments: Some co-financing for activities in 2004 and 2005 was necessary. akf financed these expenditures, see Appendix C.

A. Budget for each participating institute (1.000 DKK)

Name of Institute and department : **Aalborg University**

Year:	Original budget	Consumption before 2003	Consumption 2003	Consumption 2004	Total
Man-months					
Scientific personnel	13	5,6	5,2	2,2	13
Technical personnel					

Year:	Original budget	Consumption before 2003	Consumption 2003	Consumption 2004	Total
Salaries					
Scientific personnel	397	171	162	64	397
Technical personnel	20	10	5	5	20
Other operational costs					
Equipment					
Others (please specify)					
Direct costs	417	181	167	69	417
Indirect costs (20% of direct costs)	83	36	33	14	83
Total	500	217	200	83	500

Comments:

C. Budget for co-financing from each participating institute (1.000 DKK)

Name of Institute: **akf (including CIRED and GfK Danmark)**

Year:	Original Budget	Consumption before 2003	Consumption 2003	Consumption 2004	Consumption 2005	Total
Man-months						
Scientific personnel				1	2	3
Technical personnel				0,6	0	0,6

Year:	Original Budget	Consumption before 2003	Consumption 2003	Consumption 2004	Consumption 2005	Total
Salaries						
Scientific personnel				22	42	64
Technical personnel				0	0	0
Other operational costs				3		3
Equipment						
Others (please specify)						
Direct costs				25	42	67
Indirect costs (20% of direct costs)				5	8	13
Total				30	50	80

Comments: Some co-financing for activities in 2004 and 2005 was necessary. akf financed these expenditures.

C. Budget for co-financing from each participating institute (1.000 DKK)

Name of Institute: **Aalborg University**

Year:	Original budget	Consumption before 2003	Consumption 2003	Consumption 2004	Total
Man-months Scientific personnel Technical personnel	17	7,4	6,8	2,8	17

Year:	Original budget	Consumption before 2003	Consumption 2003	Consumption 2004	Total
Salaries Scientific personnel Technical personnel	472	211	193	68	472
Other operational costs					
Equipment					
Others (please specify)					
Direct costs	599	265	245	89	599
Indirect costs (20% of direct costs)	120	53	49	18	120
Total	719	318	294	107	719

Comments: