

# **Increase in organic consumption and dietary health – a dynamic approach**

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## **Abstract:**

### **Purpose**

The paper investigated whether an increase in the consumption of organic food was related to an improvement in diet composition of individual households.

### **Background**

In Denmark as well as in many other western countries there has been an increase in the demand for organically produced food. According to Willer and Lernoud (2018), the per capita organic consumption in Denmark was the highest in the world in 2016, with 9.7% of food budgets being spent on organic food. A study by Denver et al. (2017) found that less than 4% of the Danish consumers never bought any organic food which suggested that the organic consumption has spread to the majority of the consumers.

There is a considerable literature on consumer perceptions of organic food as well as of factors that affect organic food consumption. Aertens et al. (2009) found that health, which is related to the universal value security, was the strongest argument for purchasing organic food. Despite the importance of health motives as a driver of organic consumption, it seems to be difficult to scientifically prove unambiguously that organic products contain more beneficial nutrients than their non-organic counterparts (see e.g. Huber et al. 2011).

Qualitative as well as quantitative studies have demonstrated a relation between organic purchases and healthy diet composition (Lund and Jensen, 2008; Pelletier et al., 2013). In particular, a study by Denver and Christensen (2015) found the diets of Danish households with higher organic consumption to be more in accordance with the official Danish Dietary Recommendations of a nutritionally well-balanced diet (Danish Veterinary and Food Administration, 2018) involving more vegetables and fruits but less meat and fat/confectionary. While the relation between organic consumption and healthy eating patterns seems to be well

established there are very few studies concerning the link between *changes* in organic consumption and *changes* in diet.

## **Methodology**

The study was based on 1) observed purchase data at household level and 2) stated behaviour data from a quantitative survey.

Actual food purchasing behaviour of Danish consumers was observed through purchase data for the period 2006-2014. Data were obtained from the market research institute GfK Consumer Tracking Scandinavia and consisted of daily registrations of purchases of daily commodities made by a panel of around 2,300 Danish households. For each purchased item, the data provided information about product type, price, quantity, and whether the product was organic or not. Once a year, detailed background information on socio-demographic characteristics was updated for all panel members.

Stated behaviour data were based on an online survey among Danish respondents. The survey addressed consumption of fruit/vegetables and meat as well as organic purchase habits. Prior to the survey, a pilot study involving 100 panel members was used to test, and subsequently refine, the questionnaire. The main survey was carried out in August 2017 among a sample that was representative for the Danish population according to gender, region, age and education. In total 1,519 respondents participated in the survey and the response rate was 21%.

By using both observed and stated behavioural data about the consumers' food habits we could investigate the research question from different angles. The purchase data enabled us to analyse the actual relation between organic consumption and observance of official dietary recommendations. In particular, the data made it possible to observe changes in consumption patterns of individual households over a long time period. Further, using a consumer survey, we could obtain information on a broad spectre of consumers' own perception of their behaviour and reasonings that were not addressed in the purchase data. By combining these data, our conclusions may be considered more robust. However, fundamental differences between the two data sets necessitated slightly different analytical approaches.

In order to examine whether there was a correlation between increased organic consumption and dietary improvements, we focused on two major product groups: 1) Fruits and vegetables which are product groups that the dietary recommendations want to promote the intake of, 2) Meat which is a product group that dietary recommendations want to limit intake of. Dietary improvements were defined as a higher consumption of fruits and vegetables or a lower consumption of meat.

In both data sets, households that had increased their organic consumption were categorized as *increasers*. In the purchase data the categorization was based on the presence of a substantial increase in actual purchases of organics. The dietary composition of the segment of *increasers* was in the purchase data compared with two control groups 1) the group of households that had a constant low organic consumption and 2) the group of households that had a constant high organic

consumption. The comparisons between the *increasers* and the two control groups were made using the non-parametric Wilcoxon signed-rank tests.

In the stated preference the categorization as *increasers* was based on self-reported increase in the purchases of organics. In the survey the dietary improvements of the *increasers* were compared with the segment of respondents that reported no increase the organic consumption. These comparisons were made using chi-square tests. All statistical analyses were performed using the software SAS 9.4.

## **Findings**

A little less than 20 % of the sample was categorized as *increasers* in the purchase data. The non-parametric tests suggested that the diets of *increasers* included more fruits and vegetables but less meat than the diets of consumers with a constant low organic consumption – a tendency that applied before as well as after the increase in organic consumption. Before the increase in purchases of organics, the segment of *increasers* had a diet which corresponded to the diet of consumers with a constant high organic consumption. After the increase in purchases of organics, the *increasers* in average had a slightly healthier diet composition. Hence, the segment of *increasers* had a healthy diet composition before they increased purchases of organic and improved it slightly as the purchases of organic rose.

Overall, 20% of the respondents in the survey considered organic food to be healthier than non-organic food. The specific health characteristic of organic products attracting the largest share of consumers was absence of chemicals and artificial additives. Only few respondents perceived organic products to be better in terms of ‘containing more useful ingredients (e.g. vitamins)’ or ‘containing less saturated fatty acids’ which represented nutritional viewpoints.

Approximately 40% of the respondents in the survey were categorized as *increasers* as they stated that they had increased their organic consumption over the last two years. Consumers in this segment were asked to state the reasons for their increased consumption of organics. Most respondents stated that it was due to increased availability of organic products on the market. Relatively few respondents stated that the higher intake of organic food was caused by an overall higher interest in healthy food.

With respect to dietary improvements, almost 45% of the respondents stated to have increased the consumption of fruit and vegetables while approximately half as many had decreased the consumption of meat. Most respondents stated that the reason for the decreased meat consumption was an overall higher interest in healthy food or due to concerns of climate changes. A relatively little share stated that the reason for the decreased meat consumption was a higher interest in organics.

The survey also indicated a positive relation between increased organic consumption and dietary improvements. Hence, the results suggested that the segment of *increasers* were significantly more likely to have increased the intake of fruits/vegetables than respondents who had not increased the organic

consumption. In particular, almost twice as many in the segment of *increasers* had decreased the consumption of meat compared to other respondents.

Respondents who both increased the organic consumption and decreased the consumption of meat were asked to specify the order of the behavioural changes. Two groups of respondents on roughly the same size claimed either that 'I started eating less meat and buying more organics at the same time' or that 'I started buying more organics before they started eating less meat'. A smaller group of respondents said that 'I started eating less meat before I started buying more organics'. The remaining 20% of the respondents confirmed to the statement 'I did not fit in any of the categories'.

### **Contribution to Theory and Practice**

The present paper took a dynamic approach and investigated the relation between increase in organic consumption and improvements in dietary habits. Analysis of observed purchase data and stated preference data suggested that consumers who increased the purchases of organics were more likely to have a healthy diet involving many fruits and vegetables but little meat. The purchase data indicated relatively healthy dietary habits before the increase in purchases of organics and suggested an improvement in dietary composition during the increase. The stated preference data supported these results and thereby indicated a correlation between perceived and actual changes in purchasing behaviour.

Overall, our study supported earlier findings but also added new details to the understanding of organic consumption and dietary preferences. The focus on *changes* in consumption and the novel approach of combining long time series of observed behaviour and stated behaviour revealed new trends. However, the approach also emphasized the complexity of this area.

While the results provided clear indications of a relation between organic consumption and dietary composition they gave only vague suggestions of the causal relationship between dietary habits and changes. This issue was addressed in the survey, where the respondents were asked to indicate whether they increased the organic consumption before or after they decreased the consumption of meat. Only relatively few respondents stated that the decreased meat consumption took place before the increase in purchases of organics. However, before making firm conclusions based on this question, it is important to note that there was public focus on eating organic food before it became politicized to eat less meat (due to e.g. health, animal welfare, climate challenges, culture etc.). Hence, the stated order may reflect societal trends rather than an individual choice based on a specific causality between eating healthy and having a high organic consumption. It is our hope that the generalisation and robustness of these new results on dynamics in organic consumption and healthy eating habits will be tested in future studies.

The survey indicated that organic products only to a limited extent were perceived as being better from a nutritional perspective. Hence, respondents do in general not perceive organic products as beneficial from a nutritional perspective when compared to non-organic products at product level. This result may indicate that the relationship between organic consumption and being more likely to adhere to

official dietary guidelines emerged from a general interest in food and health rather than from a perception of organic products as being nutritionally healthier. Knowledge of the relation between increase in organic consumption and changes in dietary preferences is important input to e.g. the development and marketing of new organic products. This is not less relevant as organic consumption spreads to more and more consumer segments and new generations of organic consumers are established.

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