

Legislation, standardisation, bottlenecks and market trends in relation to safe and high quality food systems and networks in Denmark

SAFEACC WP 3
Assignment 2

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Contents

1. Introduction	3
1.1 Method	3
2. Food safety and food quality legislation	4
2.1 Law no. 471 on foods	4
2.1.1 Order no. 26 on authorisation	5
2.1.2 Order no. 352 on self-monitoring	5
2.2 Additional legislation	6
2.2.1 Law no. 402 on food quality	6
2.2.2 Law no. 421 on innovation, research and development	6
2.2.3 Law no. 364 on product safety	7
2.3 Specific legislation on food safety and quality	7
2.3.1 Order on transfatty acids	7
2.3.2 Marking and tracking	7
2.3.4 Hygiene and quality control	8
2.3.5 Genetically modified organisms (GMO)	8
2.4 Specific legislation in relation to fruit	8
2.5 Specific legislation in relation to beef	8
2.5.1 Law no. 343 on meat	8
2.6 Specific legislation in relation to fish	9
2.6.1 Law no. 281 on fishing	9
2.6.2 Law no. 649 on quality control with fish and fish products	9
3. Overview of standards and standardisation	10
3.1 Other standards	11
4. Bottlenecks	12
4.1 Food safety and food quality	12
4.2 Market-based understanding	14
5. Market trends	14
5.1 National overview	14
5.2 Beef and fish	16
5.3 Fish	18
5.4 Market demands	20
5.5 Potential future scenarios	20
5.5.1 Scenario 1: Naturalness	20
5.5.2 Scenario 2: Technology-driven health	22
5.5.3 Scenario 3: Tight spending	22
6. Niche: organic food	22
References	24
Appendix: List of informants	25

1. Introduction

The present report presents information about the important topics in relation to food safety and food quality to be answered on a national level as part of assignment 2 of work package 3. Specifically, this report attempts to cover the following topics:

- Current legislation and regulation
- Important standards in relation to food safety
- Bottlenecks
- Market trends
- Organic food as an important niche

Hopefully, this report will provide readers with insight into the current state of affairs in relation to food safety and food quality in Denmark.

1.1 Method

This report is based on a combination of primary and secondary sources. In order to get an overview of the status quo regarding food safety and food quality in Denmark, interviews were conducted in person and over the telephone with several regulatory bodies and some interest groups. Time constraints have prevented us from talking to food producers and retailers, but hopefully, they will be able to provide us with input during the national workshop. Personal interviews were tape-recorded while extensive notes were taken, when interviewing informants over the telephone. A list of informants is provided in the appendix.

Documentary information regarding legislation and regulation was abundant. In particular, the official Danish on-line legal information system, “Retsinformation” (www.retsinfo.dk), was a valuable source of documentary information concerning laws and orders. Additional regulatory information was available from the various homepages of departments under the Ministry of Food, Agriculture and Fisheries (www.fvm.dk).

Information concerning market trends was found in publications from Statistics Denmark (www.danmarksstatistik.dk) and published reports. Unfortunately, it has only been possible to find limited information about market opportunities and niches.

The participants at the national workshop held in September 2003 provided useful feedback for this report. The findings reported here were supported and additional information was provided regarding perceived bottlenecks.

2. Food safety and food quality legislation

Danish legislation in relation to food safety and food quality reflects that Denmark has been a member of the European Economic Community (EEC) and more recently the European Union since 1972. From that time Danish legislation has been harmonised with EU directives and regulations in many areas, mainly to fulfil the ambition of free movement of products. In order to attain free movement of foodstuff products within the EU, these must be produced under the same terms of safety and quality. Consequently, the legislation in this area does not differ much from the rest of the EU and has been subject to continuous harmonisation.

The harmonisation, however, is not complete due to special interests in Denmark that precede the goal of harmonisation. So to understand and get an overview of national legislation in the field of food safety and food quality, it is first necessary to look at the broad legislation covering the field in general, and then at the specific legislation, which applies to each of the three featured product groups; fish, beef and fruit.

With regard to specific legislation relating to the three product groups, it should be noted that these seldom are in use because food-producing companies, by and large, adopt standards that set higher demands for safety and quality. Sometimes they adopt these standards voluntarily, or because retail customers demand it, and at other times due to the fact that standards are elevated to law.

Most legislation that applies to foodstuff safety and quality in Denmark is logically found under the Ministry of Food, Agriculture and Fisheries. The most important law in connection with food products is law no. 471, which is known as the food law.

2.1 Law no. 471 on foods

The purpose of this law is to secure consumers healthy food products of high quality, to protect consumers against misguidance in connection with the marketing of food products, to further a healthy diet and thereby contribute to secure food production as well as trading under fair and equal terms, and finally to further Danish export of food products.

The law applies to:

1. Food safety and composition
2. Marketing and marking of food products
3. Primary production of food products
4. Arranging and running of companies
5. Diet and nourishment
6. Authorities and control

Several informants have stressed the importance of the law on foods because it provides simpler and more transparent legislation. Prior to this law, legislation on food safety was “vertical” as separate legislation applied to each product area. Now legislation is “horizontal” as the same rules and regulations apply to all products.

A good indication of how used this law is can be seen in the amount of orders that have been applied since the law was approved on July 1, 1998. About 90 orders have been issued since then concerning corrections and explanations of how the law should be interpreted. This is also expresses the rapid development that legislation is undergoing to keep up with new research and market standards.

Two orders stand out from the rest in regards to foodstuff safety and quality. This is order no. 26 of January 18, 2002, with the title: “*Order on authorization of treatment, sales and control marking of foodstuffs*”, and order no. 352 of May 30, 2002, with the title: “*Order on self-control in food businesses etc*”. Order no. 26 is based on a large number of EU directives from 1991 to 2001, which among other things imply specific regulations for the three product groups; fish, beef and fruit.

2.1.1 Order no. 26 on authorisation

This order sets rules for authorization, acceptance, registration or notification of primary production treatment and sale of food products, food businesses and companies that import, produce or sell materials and objects meant to get in touch with food products as well as control marking of animal foodstuffs. Thereby it applies to:

1. Primary production
2. Companies
 - a. Wholesale businesses
 - b. Retail businesses
 - c. Trading norms for fresh fruit and vegetables
 - d. Import of food products
 - e. Businesses that import, produce or are involved in wholesaling of certain materials and objects meant to come in touch with foodstuffs
 - f. Authorised, approved, registered or declared businesses
3. Procedures concerning authorization, acceptance, registration or notification
4. Control marking of animal foodstuffs
5. Public control

2.1.2 Order no. 352 on self-monitoring

This order sets rules for own-control of primary production, food businesses and businesses that import, produce or sell materials that are meant for contact with foodstuffs. This order does not concern rules about self-monitoring laid down elsewhere. The order also applies for additives.

In regard to the exact contents of this order only the large paragraphs will be referred to here, in a summarized form. A deeper account of, which companies the order applies for will not be elaborated further than the above. According to paragraph 4 and 5 the own-control of production processes shall primarily be conducted after the principles of HACCP (see Section 3 below). Paragraph 6 extends HACCP with 17 areas that must be included in order to get approval of procedures regarding own-control.

Authorization of the own-control, as stated in paragraph 11 to 13, is ensured by trade codes or approval from an authorized laboratory under The Danish Veterinary and

Food Administration. For instance, DSK (the Danish grocers' association) in co-operation with COOP Danmark and Dansk Supermarked, the leading Danish retail multiples, has developed a trade code for retail business.

2.2 Additional legislation

There are two additional laws under the Ministry of Food, Agriculture and Fisheries, which apply to this area. The first law, no. 310, dates back to 1973. This law sets the overall maximum use of additives in foodstuffs, which companies can only differ from with more strict rules, not less strict. The law also sets rules for marking, naming of additives meant for production, sales or import. Furthermore it shows the formal structure behind conduction of additives investigation. The second law, no. 402 from 1997, only applies to the Minister of Food, Agriculture and Fisheries' privileges regarding marking arrangements of certain products.

2.2.1 Law no. 402 on food quality

The Minister of Food, Agriculture and Fisheries is authorized to commence a voluntarily marking arrangement to further production of a given product or service. Under the previous centre-left government the attempt was made to institute such a marking arrangement under the name "*Den Blå Lup*", literally "*The Blue Magnifying Glass*". This initiative was not, however, crowned with success and has been discontinued.

2.2.2 Law no. 421 on innovation, research and development

Under the present centre-right government the position taken by the Danish Veterinary and Food Administration (FødevareDirektoratet) is that offering high quality food products and generating demand for these products are the responsibilities of food producers and resellers.

However, under the so-called Law on Innovation (*Law no. 421 on grants for furthering innovation, research and development in the food, agricultural and fisheries sector*) the Directorate for Food, Fisheries and Agri Business (Direktoratet for FødevareErhverv) can subsidise product development and research in the food sector. According to the Directorate for Food, Fisheries and Agri Business the objective of the law is to enhance and contribute to the innovation process within the food, agricultural- and the fishery sectors in order to:¹

1. Ensure, that the food products are nutritious and of a high quality
2. Strengthen the competitive status
3. Promote the development of new products, hereunder non-food products characterised by a large degree of innovation
4. Preserve the agricultural- and fishing industry resource foundation and secure the environment and animal-welfare along with good working conditions
5. Improve the consumer's possibilities to obtain relevant and reliable information on the products and on the conditions, under which the products are produced

¹ Source: http://www.dffe.dk/in_english/the%20law%20of%20innovation.htm

The law is aimed at small and medium-sized companies, research, organic products, non-food, animal welfare, export, work environment and documentation of food safety.

2.2.3 Law no. 364 on product safety

Product safety is regulated by common national legislation, which applies to every product being sold and services offered in conjunction with the product. There are, however, some exceptions to this:

- The legislation stands, whether the product or service is offered with or without payment
- The legislation does not apply to products and services exchanged among private households, nor does it apply to products and/or services manufactured distinctively for use within the industry itself
- The legislation does not apply to used movable property
- Any other legislation from union regulations or security aspects, which applies to product safety precedes this law

This legislation can be used on all products and services that are produced, offered, sold, imported in Denmark, or exported to another country within the European Union. As a last remark, law no. 364 can be used where there is no other legislation about product safety. Generally, however, this is not the case wherefore this law can seldom find any use in regard to food products.

2.3 Specific legislation on food safety and quality

When it comes to new legislation, the earlier statement about Denmark's dependence on EU becomes very clear. Almost every new proposal comes from EU and only very few from own initiative. Therefore, it will be specified for each new approach from where it originates, what it covers, and whether it has been implemented into current legislation or not.

2.3.1 Order on transfatty acids

The Danish government has with effect from March 31, 2003, set rules for transfatty acids in foodstuffs. Denmark is the first country in the world with legislation on this area. The order applies to oils and fats, including emulsions with fat as the most important ingredient, which, either alone or as part of processed foodstuffs, are intended, or are likely, to be consumed by humans. It is prohibited to sell the oils and fats covered by the order to consumers if they contain a high level of transfatty acids. In products, which are claimed to be "free from transfatty acids" the content of transfatty acids in the finished product must be less than 1 gram per 100 grams of the individual oil or fat.

2.3.2 Marking and tracking

Marking rules are regulated by EU directive 2000/13/EC and are implemented in Danish legislation. During 2002 changes have been to this directive, among other things removal of the 25%-rule² and more strict demands to declaration of ingredients

² This rule made it possible for producers not to list ingredients, which comprised 25% or less of the finished good.

that can cause allergies. This proposal has of today not been implemented, but is in process.

2.3.4 Hygiene and quality control

The European Commission is currently revisiting the union's rules about foodstuff hygiene and plan to presents a proposal to statutory instruments, which places the primary responsibility for foodstuff safety on all the food chain links. With the new statutory instruments, all former foodstuff hygiene from the council's directive 93/43/EEC is gathered, harmonised and simplified. This should lead to a transparent hygiene policy applying to everyone in the foodstuff industry. However, it remains to be seen, as the outcome of the revisiting process has not yet been presented.

2.3.5 Genetically modified organisms (GMO)

On May 29, 2003, the Danish government approved a change to the law concerning environment and genetic engineering. On account of this, The Minister of Food, Agriculture and Fisheries took initiative to develop a strategy for co-existences between genetically modified crops, conventional crops and organic crops. When the work is done, it should clarify how GMO crops are produced alongside non-GMO crops, without mixing the two. Furthermore, The Minister of Food, Agriculture and Fisheries would like to clarify whether it is possible to approve such legislation within the given EU-legislation or not.

2.4 Specific legislation in relation to fruit

No specific legislation exists in this area, which means that the general legislation applies here.

2.5 Specific legislation in relation to beef

Regarding the product group of beef, there is a more specific legislation than general. The specific legislation does not cover every aspect, but only partially substitutes the general legislation.

2.5.1 Law no. 343 on meat

This law applies to:

1. Production of animals for slaughtering
2. Slaughter
3. Cutting, boning and other mechanical treatment of meat and offal
4. Manufacturing of meat products
5. Wholesale storing and wholesale trading with meat, meat products and offal
6. Export of meat, meat products and offal
7. Import of meat, meat products and offal
8. Investigation and judgement of animals before slaughtering, and of carcase, meat, meat products and offal

These 8 areas and underlying paragraphs set the scope within which The Minister of Food, Agriculture and Fisheries can make use of legislation to regulate quality and safety of meat production. This has been done to a wide extent resulting in quite a few

orders and regulations for such a specific area. The orders might not be made specific to the area of meat, but they apply here anyway. Some of these have been listed below only including title:

- *Order no. 537 of 16/07/1998 on change of the Order on issuing of certificates for animals and animalistic products*
- *Order no. 155 of 19/02/1997 on health control among other things on certain foodstuff businesses*
- *Order no. 609 of 19/09/1989 on foreign meat etc.*

Of these three orders only no. 609 is specific for law no. 343. This order mainly determines the exact rules for import and export of foreign meat, poultry, and products made from meat determined for human digestion. In summarized form these rules state the following:

- Import can only take place if authorized by the Danish Veterinary Institute
- Import must be done through control stations authorized by the Danish Veterinary Institute
- Special rules state 12 specific product groups that can never be imported to Denmark
- Imported products must be correctly certified according to EU directives 64/433/EEC, 72/461/EEC, 72/462/EEC, 77/99/EEC, 80/215/EEC or 71/118/EEC
- Inspection and samples of imported foods must be taken by the official veterinary inspector at the control station, at expense of the exporter

Please note that there are many more details and exceptions to this than stated here.

2.6 Specific legislation in relation to fish

As for beef, there is special legislation that only applies to the product group fish. The specific legislation for this area consists of two laws: law no. 281 and 649. The former one mainly applies to the primary production of fishing, whereas the latter mainly applies to secondary production. However, the new modern fishing vessels, where both processes are done in extension of each other, break down this distinction.

2.6.1 Law no. 281 on fishing

The purpose of this law is to ensure protection and fostering of living resources in salt and fresh water, protection of other wildlife, and to ensure a long lasting foundation for commercial fishing. The law applies to fishing in salt and fresh water, breeding and sale of fish. The Minister of Food, Agriculture and Fisheries can decide whether this law, or part of this law, applies to alga as well.

2.6.2 Law no. 649 on quality control with fish and fish goods

This law applies to sale, catching, breeding, containment, transport, freezing, conserving, and other treatment of fish or fish goods meant for sale. The purpose of this law is to legislate on the areas of quality demands, registry, authorisation, import, export, and feeding stuff for fish.

In extension of both laws there has been made numerous orders and regulations to keep up with the development and research within the area. Law no. 649 is, as law no. 471, subject to order no. 352 concerning own-control of foodstuff businesses.

3. Overview of standards and standardisation³

No mandatory quality or safety standards exist, which companies that produce, handle, sell or supply foodstuffs must conform to. However, according to EU regulations food companies *must* have an approved own-control system that follows the internationally recognised HACCP (Hazard Analysis and Critical Control Points) principles. The idea behind HACCP is to help food companies to focus on these process - and production conditions, which are critical for food safety.

Different countries have developed different HACCP standards. Danish Standards Association (DS), Denmark's national standardisation body, certifies food companies according to the Danish HACCP standard, DS 3027. Whereas, e.g., the British HACCP standard focuses just on critical control points, the Danish HACCP standard incorporates the entire management information system.

DS 3027 has six main sections, which describe the requirements for an effective HACCP system (DS 1998):

1. Management responsibilities. Management must define a food safety policy, allocate resources for implementing and managing the system, establish a HACCP-team with a team leader, and ensure that employees have the necessary skills and training. Finally, management must evaluate the HACCP system at regular intervals.
2. System requirements. Plans and procedures for the HACCP system must be designed. The plan must incorporate relevant risk factors, critical control points, critical limits not to be exceeded, monitoring methods, responsible persons, rectifying measures, and how the management/monitoring is to be documented.
3. Document management. All relevant documents must be available for personnel working within the boundaries of the HACCP system and use of invalid or obsolete documents must be avoided.
4. HACCP examination and planning. An HACCP examination includes the following elements: Product descriptions, descriptions of raw materials, descriptions of possible users of the product, descriptions of storage and cooking of the products. Flow diagrams must be made for all products and risk factors must be described and evaluated.
5. Operating the HACCP system. This section explains the registrations of information, management of deviating products, information and recall, as well as management of measurement equipment and methods.
6. Maintenance of the HACCP system. The final section describes how the system is updated and maintained on an ongoing basis in order to ensure that the HACCP team is provided with information about e.g.

³ The following is based on documentary information available on the homepage of Danish Standards Association (DS) and from Pia Ibsen, who is a consultant at DS.

changes in packaging, regulatory requirements, or in cleaning and disinfection's programmes.

DS 3027 has been designed in such a way that it is easily integrated with existing quality management systems following ISO 9001:2000 guidelines, which according to DS is very process-oriented and therefore useful for the food industry. Thus, DS claims that companies using an ISO 9001:2000 quality management system just have to expand their existing system with the HACCP-elements.

DS 3027 poses demands to food producing companies and their suppliers. The standard is presented as a standard that gives food companies an effective management tool for managing food safety issues. According to DS, using a management system based on HACCP will help companies:

- Manage their entire production process
- Minimise waste
- Fewer faulty deliveries
- Gain greater assurance against producing health threatening products

DS are trying to convert DS 3027 to an international standard. Thus, DS have submitted the initiative to harmonise relevant national standards on the international level. For this purpose the International Standardisation Organisation (ISO) have subsequently established a working group, ISO/TC 34/WG 8 *Food safety management systems*, under Danish leadership. ISO has charged upon the working group, the establishment of a new standard for the management of food safety. The point of departure for this work is the Danish HACCP-standard, DS 3027, and other relevant standards and guidelines from, e.g., Holland, Australia, BRC, Global Food Safety Initiative and Codex Alimentarius. In addition, relevant elements of ISO 9001:2000 will be included in the new standard, which will be known as ISO 22000 *Food safety management systems – Requirements*.

ISO 22000 is intended to assist food manufacturers in the appropriate use of the HACCP principles (Petro-Turza 2003). It is to be hoped that the new standard and ISO 15161:2001, *Guidelines on the application of ISO 9001:2000 for the food and drink industry*, will complement each other well. The scope of ISO 15161 is wider than that of ISO 22000 as the former deals with all aspects of food quality, whereas the latter concentrates exclusively on food safety.

3.1 Other standards

Other standards identified as important for Danish food producers by DS and the Confederation of the Danish Food Industry are the so-called BRC-standards and the Global Food Safety Initiative (GFSI).

The British Retail Consortium (BRC) have developed three standards:

- BRC Food Technical Standard – for the food industry
- BRC/IOP Packaging Standard – for the packaging industry
- BRC/FDF IP Standard – about food ingredients

According to BRC, the development of these standards was initially driven by the need to meet legislative requirements, but was quickly seen as having significant benefits to suppliers of products to UK retailers.⁴ The food standard requires the adoption and implementation of HACCP, a documented and effective quality management system and control of factory environment standards, product, processes and personnel.

The Global Food Safety Initiative is a retail-led network of food safety experts and trade associations worldwide that, using the BRC-standards as a role model, want to introduce identical standards for the control and safety of private label and fresh produce products worldwide (FødevareIndustrien 2001)

The objectives are to enhance food safety, ensure consumer protection, strengthen consumer confidence, benchmark requirements of food safety systems, and improve cost efficiency throughout the food supply chains (GFSI 2002). According to the Confederation of the Danish Food Industry (FødevareIndustrien 2001), the European food industry organisation CIAA has reacted sharply to the initiative, as the CIAA does not want a retail-led international organisation to define what food products are considered to be safe.

4. Bottlenecks

From informal conversations with various informants working with food safety and food quality in Denmark, only a few potential bottlenecks have been identified in the area of food safety and food quality. These are presented in the next section. Then, an important market-based bottleneck regarding the competences in terms of market understanding and product development is presented.

4.1 Food safety and food quality

One informant suggested that Europe is lagging behind the United States in connection with food safety and food quality. According to the informant, this was in part due to the inability or unwillingness of European legislators to harmonise legislation and standards between countries as well as unwillingness to agree on guidelines and codes of conduct. Furthermore, the informant argued that it takes too long to get new control technologies and test principles approved by the Food and Drug Administration (FDA) or the EU. This obstructs innovation and product development.

Furthermore, the same informant suggested that a bottleneck was lack of sharing of knowledge across disciplinary boundaries. According to the informant, a substantial body of relevant knowledge had been established in different disciplines. What was needed in order to benefit from these pools of knowledge was a new cross-disciplinary research agenda focusing on concrete, practical solutions, which can increase the food-safety perceptions of consumers.

Another informant argued that increasing knowledge of issues related to food safety meant that researchers continuously became aware of new safety issues in need of

⁴ Source: <http://www.brc.org.uk/Techstds.asp>

consideration, but that it was sometimes difficult to get the funding needed to conduct relevant research. This informant was also concerned about the increasing influence that business interests have on research. Under the present government, public sector research is being restructured and sector institutions have to attract research funding in competition with universities. Furthermore, getting public research funding is often contingent on the participation of companies. Thus, because sector institutions have different purposes than universities and there is a need to research issues that might not be in the immediate interest of business, the informant was concerned that basic knowledge about certain food safety related issues might not be available in the future.

A number of informants suggested that the high degree of retail concentration in Denmark and the common demand from retailers, which requires of suppliers that they are able to deliver to all stores in a retail chain in order to be listed, was another bottleneck because it makes it difficult for products from small suppliers to get onto retail shelves. Although many products can be found on the shelves of food retailers, one informant suggested that the actual diversity was not that great, as most products are more or less identical. Because consumers can only choose between the products on shelves, it was therefore suggested that the ability of consumers to exert influence on what products are offered is limited. In this connection, it was suggested that small specialist retailers might be less risk averse than large retail chains or that specialist retailers might react faster to changes in consumer demands, although it was acknowledged that the retail multiples are very professional.

With regards to the own-control programmes, which all food companies must have, a number of informants suggested that the large producers and retailers had no problems doing so, but that smaller producers or retailers might not have the resources or skills needed and that sometimes they would have difficulty understanding, why they had to have an own-control programme. However, it was also stressed that various trade organisations have developed trade codes providing retailers, restaurants and food producers with guidelines to follow, although, it can be difficult to reach companies that are not members. In addition, the Danish Veterinary and Food Administration have issued various leaflets on the matter.

A bottleneck, or perhaps rather a problem, in connection with the administration of the legislation regarding own-control was that one informant mentioned that the different food regions did not administer the law the same way. An informant from the Danish Veterinary and Food Administration argued that suggestions of different administrative practices were taken very seriously and that several measures had been instituted in order to ensure identical administrative practices. For example, different forums for sharing experiences across food regions exist and all people monitoring the own-control programmes of companies have to follow the same monitoring principles.

Another problem identified in relation to food safety and food quality, are unhealthy eating habits leading to obesity and diabetes. In this connection, it is also considered problematic that regulations regarding health claims are becoming less strict, as some companies are deemed to have questionable ethics regarding the claims they make concerning their products. A bottleneck in connection with unhealthy eating habits is the lack of fundamental knowledge consumers and retail staffers have about the properties of basic products such as fruits and vegetables.

Among the bottlenecks identified by participants at the national workshop were: The goods reception at retail outlets, food safety regulation, and personnel lacking basic statistical skills (cf. the report on the national workshop). Furthermore, several bottlenecks were identified in relation to consumers, whose shopping behaviour was argued to be habitualised and who are in a hurry when they shop for food. Therefore, new products offering higher quality or food safety are difficult to launch successfully. Consumers were constituted as unwilling to pay for food safety. Furthermore consumers were argued to lack basic skills and knowledge necessary for cooking high quality meals and ensuring that food safety is not compromised in the home.

4.2 Market-based understanding

The bottlenecks in terms of food safety identified in the previous section appear to assume some objective definition of food quality and food safety. However, it is important to emphasise that these concepts can also be interpreted as highly subjective. From a market-based perspective, an important bottleneck regarding market oriented food quality lies in the competencies companies have in product development and market analysis. These competencies have been identified as central for companies wanting to meet market demands (Jensen & Harmsen 1999). Product development competences and market analysis competencies are very complex (Jensen & Harmsen 2000). Therefore, companies can have difficulties developing strong competencies in the areas of product development and market analysis, which can be considered potential bottlenecks for individual companies.

Research at MAPP has identified a number of barriers to market oriented activity, which can be interpreted as bottleneck. Bisp (2000) found that being driven by optimisation of production efficiency and effectiveness is detrimental to increasing market oriented activity, as does having a narrow market connection, which refers to upstream and/or downstream relationships that lock the company in constraining dependencies. Other barriers identified are operating within a short time horizon, having a strong focus on maximising sales and basing planning and decision-making on intuition and experience. Furthermore, managers and subordinates may lack the competencies necessary to understand and use market information, because they have a non-marketing background.

5. Market trends

This section presents an overview of trends in Danish food consumption, with special emphasis given to consumption of beef, fruit and fish. Furthermore, opportunities and niches are considered. The discussion builds on secondary data, in particular the study by Smed (2003), who analysed overall developments in food consumption in Denmark over the past 20 years based on data from Statistics Denmark and GfK Danmark.

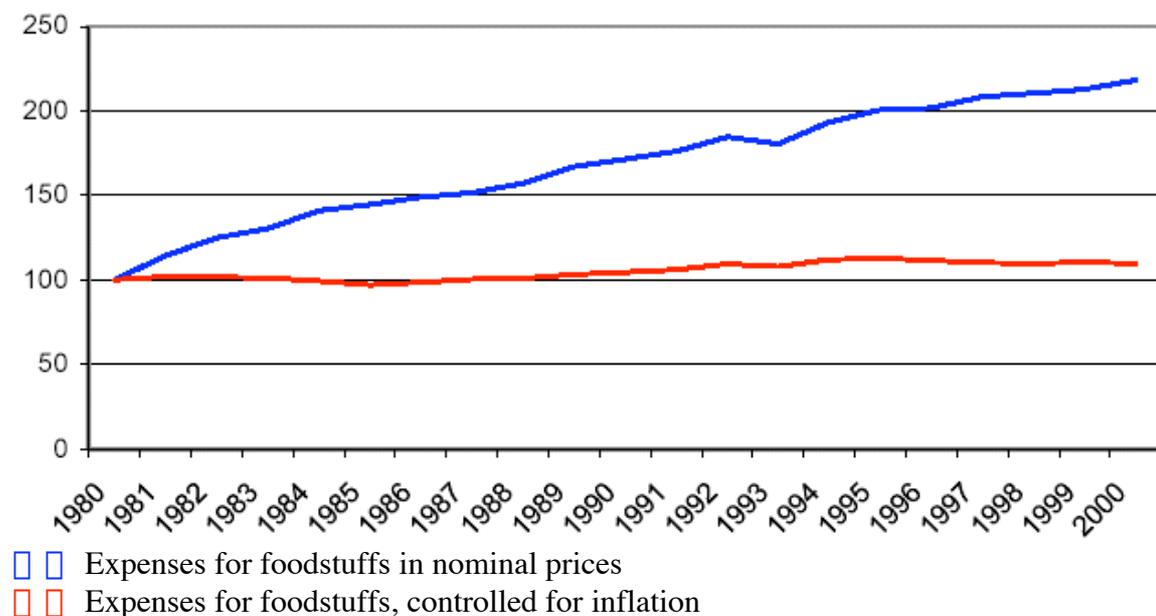
5.1 National overview

In 1999, around 17% of consumer spending was on food, drink and tobacco (Statistics Denmark 2002). The share of total consumer spending on food, drink and tobacco has

been declining for many years, from 24.3% in 1976 to 19.8% in 1987 (Statistics Denmark 1997).

While the relative share of consumer spending on food, drinking and tobacco has fallen, the total expenditure for food in Denmark has been relatively stable for many years, as shown in Figure 1. On average, the nominal expenditure for food products has grown by 3.5% per year in the period from 1980 to 2000, with slightly slower growth in the last part of the period (Smed 2003). Thus, the total nominal expenditure on food grew by 2.5% per year in the period from 1997 to 2000 (Smed 2003).

Figure 1 Total food expenditure from 1980 to 2000 (1980 = 100)



Source: Smed (2003, p. 26)

As shown in Figure 1, controlling for general inflation in order to determine the increase in food expenditure in real terms results in a much smaller annual growth rate. When corrected for general inflation, the average annual increase in total food expenditure is only 0.5% (Smed 2003).

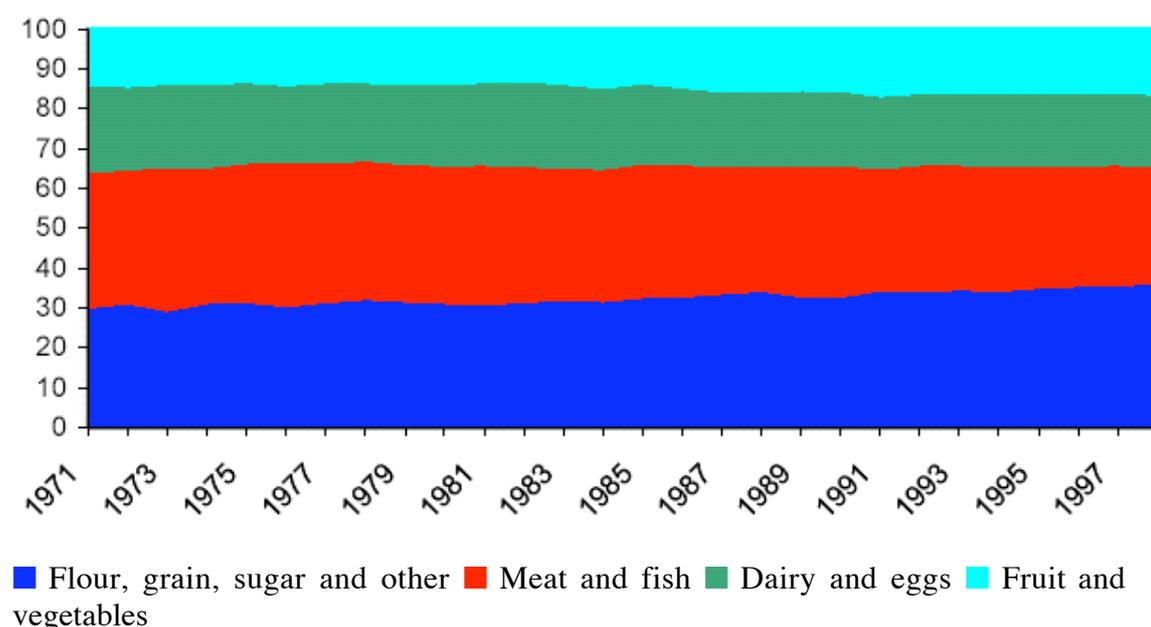
Whether considered in nominal or real terms, the conclusion thus remains the same: The total expenditure on foods has shown small and stable growth in the period from 1980 to 2000 (Smed 2003). This is consistent with econometric analyses that have shown food expenditure in Denmark to be relatively income inelastic (Jensen & Toftkær 2002).

Taking a closer look at the expenditure on the four main product groups defined by Statistics Denmark reveals that overall the relative composition of food expenditures has changed only marginally over the past 30 years (see Figure 2). The relative expenditure on the product group “meat and fish” has experienced a decline from 34% to 29% and the product group “dairy and eggs” has also declined over the period, whereas the product group “fruit and vegetables” has grown marginally from 14% to 16% (Smed 2003). The product group “flour, grain, sugar and other foods”

has experienced the largest increase, growing from 30% to 37% of the total food expenditure (Smed 2003).

However, when looking at total expenses it cannot be determined whether changes in relative budget shares have occurred because of changes in the quantities consumed or in relative prices. For example an increase in the budget share of cheese can reflect that more cheese has been bought or that cheap cheese has been substituted for more expensive cheese or that prices for cheese have increased relative to the prices for other goods (Smed 2003). Furthermore, the product group “flour, grain, sugar and other foods” contain all of the products that are not represented in the other categories, such as bread, pasta and ready-meals (as defined by Statistics Denmark).

Figure 2 Composition of Danish food budgets, divided by main product groups (1971-1998, %)



Source: Smed (2003, p. 27).

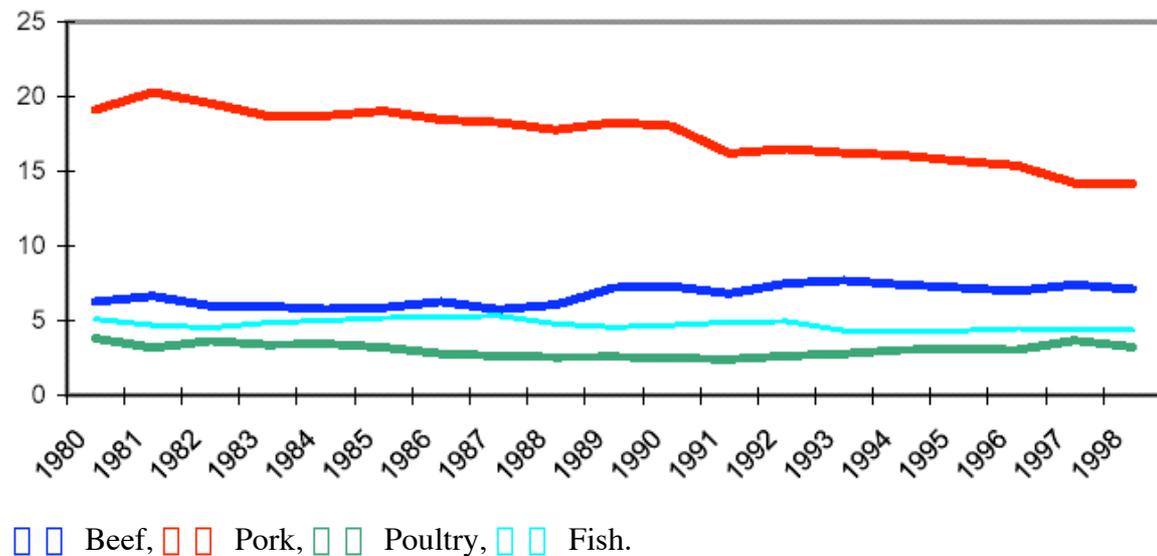
Therefore, it is necessary to take a more detailed look at the specific product groups, before exact statements can be made on the development of the products of interest.

5.2 Beef and fish

Because beef and fish are covered in the same statistic material from Statistics Denmark used by Smed (2003), the development of these products will be described together, rather than posting the same material twice.

As shown in Figure 3, the percentages of food expenditure spend on poultry and fish have been quite stable, at about 4% and 5% respectively (Smed 2003). However, this is not the case with the two other categories, as pork has declined from 20% to just below 15% and beef has increased from 6% to around 7%.

Figure 3 The percentage of beef, pork, poultry and fish from total foodstuff expenses (1980 - 1998)



Source: Smed (2003, p. 31).

As noted earlier, the total share of expenses spent on meat has fallen over the period. Table 1 reveals that even though the share of expenses has fallen, the total amount of meat consumed per capita has risen in the period from 1990 to 2000. Given that total food expenditure has been relatively stable over the period, this indicates that prices relative to other food products have been declining.

It is noteworthy that over the last ten years, the consumption of beef and poultry per capita has increased significantly, but that this has not affected the consumption of pork, which is, by far, the type of meat, which Danes eat most of. Consequently, the total amount of meat consumed has increased over the period.

Unfortunately, similar statistics for fish are not available in this aggregated form.⁵ Also, please note that not all meat categories are represented in Table 1 and therefore the amounts do not add up to the total.

⁵ All fish statistics are divided into species and based upon how many are caught, for more info cf. Statistics Denmark at www.dst.dk under industry.

Table 1 Amount of meat consumed per capita in kg

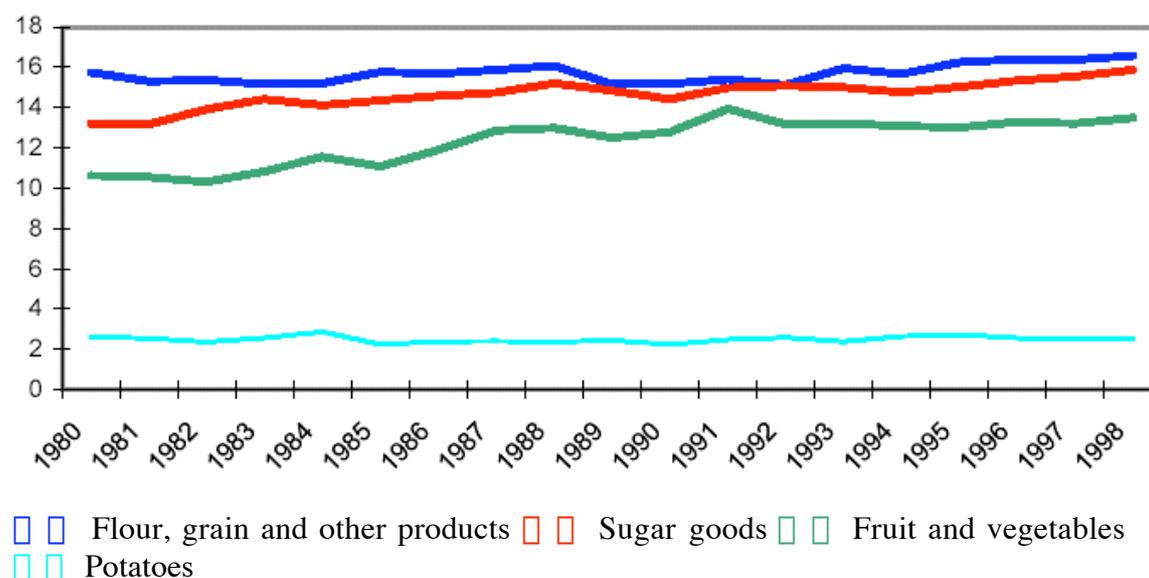
	1990	1992	1994	1996	1998	2000
Beef	18.8	20.4	18.9	18.2	20.2	22.2
Pork	64.2	64.6	63.3	64.7	67.9	64.4
Poultry	11.6	13.6	14.8	15.1	17.6	19.2
Total amount of meat	105.2	108.5	105.8	106.1	114.2	113.5

Source: Statistics Denmark, Agriculture

5.3 Fruit

The statistics regarding fruit are slightly more specified, which allows a more in-depth analysis of the changes that have taken place. Figure 3 shows how the share of the total food expenditure that is spent on fruit and vegetables has increased over the period from 1980 to 1998 from about 11% to 13% (Smed 2003). This is the largest increase of the four product groups represented here, although narrowly follow by sugar goods.

Figure 4 The percentage of flour, grain and other products, sugar goods, potatoes, and fruit and vegetables from total foodstuff expenses (1980 – 1998)

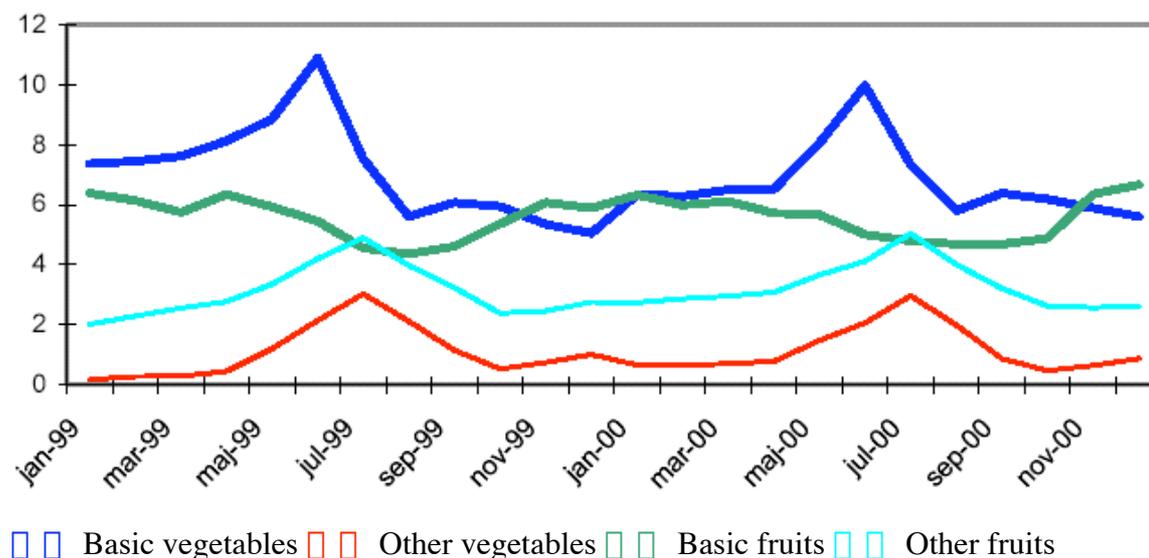


Source: Smed (2003, p. 36).

Figure 5 provides a more detailed picture of the expenditure on fruits and vegetables in 1999 and 2000. This makes it possible to determine season variations that undetectable in the otherwise very stable graph from Figure 4. Season variations are very characteristic for fruits in general (Smed 2003, Jensen & Toftkær 2002), but it is necessary to explain what the product group basic fruits and other fruits cover, before these are commented upon. Covered by the label “basic fruits” are grape fruit, apple, banana and oranges, whereas the label “other fruits” simply contains all fruits not considered basic fruits by Statistics Denmark.

The amount spent on basic fruits declines from about 6% in January to 4% during summer and then increases again. Other fruits show the opposite development, growing from 2% during winter to about 5% during summer, which means that consumers spend more on other fruits than basic fruits during the summer period (Smed 2003).

Figure 5 The percentage of vegetables and fruits from the total foodstuff expenses, on a detailed level (Jan. 1999 – Dec. 2000)



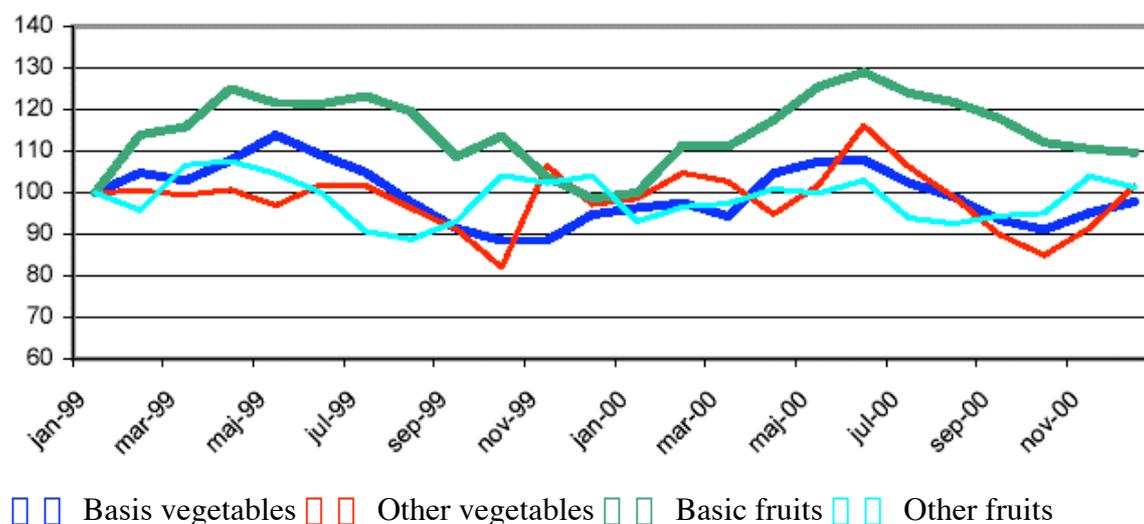
Source: Smed (2003, p. 37).

Holding this up against the development of the price index for the same time period, shown in Figure 6, reveals for basic fruits that when the price goes up, the amount spent goes down and the other way around. This could indicate a substitution for products in the group other fruits (Smed 2003). For other fruits there seems to be no direct connection between the price of the product and the amount spent (Smed 2003).

5.4 Market demands

Jensen and Harmsen (1999, Harmsen & Jensen Forthcoming) have identified 27 market demands facing food producers based on a review of 147 MAPP publications and three workshops with experienced managers from the food sector. 13 demands from consumers and 14 demands from retailers were identified. These are listed in Table 2.

Figure 6 Price index for vegetables and fruit on the basis of a monthly and detailed level (January 1999 = 100)



Source: Smed (2003, p. 38).

5.5 Potential future scenarios

Researchers at MAPP and the Department of Manufacturing Engineering and Management (IPL) at the Technical University of Denmark (DTU) have constructed three scenarios about the Danish food industry in 2010 (Jensen, Sonne & Harmsen 2002). The aim was to identify, which demands the food industry in Denmark can expect to meet in the future, and also what research areas should be given priority in order to support the development of competencies within the food industry.

As a first step in the scenario construction process, Danish and international food researchers were asked to offer their expert opinion of what the future would bring. This resulted in the construction of 65 vignettes, which described possible developments in terms of both technological and market forces.

The second step in the construction process was to conduct separate workshops with industry representatives from four sectors of the Danish food industry (dairy, meat, fish and fruits & vegetables) in order to determine which factors industry considered to be most uncertain in terms of future development. Six key factors were identified: convenience, primary production, functional foods, genetically modified organisms (GMO), retailing, and work environment. By grouping these factors in relation to common denominators as well as by investigating the internal dynamics between these factors, a number of key driving forces of the future development of the Danish food industry were identified.

The third step was to develop scenarios based on the key driving forces. The three scenarios that were constructed should be considered possible futures. In practise, the future development of the food industry is likely to be a combination of the different tendencies within the scenarios (Jensen, Sonne & Harmsen 2002).

Table 2 Market demands

Consumer demands	Retailer demands
<ol style="list-style-type: none"> 1. When exporting to several countries similarities with regards to habits and attitudes in relation to food can hide differences at the product level. 2. Consumers in a given country can differ with regards to habits and attitudes in relation to food. 3. There are large differences between Northern and Southern Europe in terms of buying motives, shopping, use situations and desired product attributes. 4. Quality increasingly refers to “soft” quality dimensions like ecology, animal welfare or production form. 5. Political, animal welfare and ecological concerns are not important in all countries. 6. It is difficult for consumers to evaluate the quality of food products. 7. The place of purchase can be a quality indicator if it has history of consistent quality. 8. Packaging can influence perceived product quality. 9. Consumers have difficulty evaluating the environmental properties of packaging. 10. Country of origin can influence perceived quality. 11. Consumer attitudes towards food are dynamic. 12. Lack of perceived control over a product can influence the decision to buy or not despite knowledge about the health/quality of the product. 13. Disposable income and time influence the consumption of convenience products. 	<ol style="list-style-type: none"> 1. The retail structure is undergoing constant change. 2. The vertical structure is undergoing constant change. 3. There are national and regional differences in retail structure and vertical structure. 4. Increasing tendency of retailers to differentiate with the help of unique retail concepts/profiles. 5. Increasing tendency of retail internationalisation through acquisitions, new investments and especially through buying co-operations. 6. Fewer and fewer retail decision makers. 7. Use of own labels varies, but is on the whole increasing. 8. Retailers often have substantial information about the concrete buying behaviour of consumers but not of its causes. 9. Stability is paramount for retailers, i.e., minimisation of variation in the quality of products rather than in the level of quality. 10. Retailers often have a relatively stable set of suppliers but are often not interested in mutually binding co-operation. 11. The quality evaluation of suppliers transcends product and co-operation to include production processes. 12. National boundaries imply differences in terms of product types, quality and co-operation. In addition, regional differences can be more important for the demands chain members pose regarding products and co-operation. 13. Store loyalty is greater than product loyalty. 14. In connection with new product introductions some chains demand training of personnel, in-store promotions and similar activities.

Source: Adapted from Jensen and Harmsen (1999, pp. 8-9) and Harmsen and Jensen (In press)

The scenarios place different demands on the development of competencies and offer a variety of directions. In the following we will look at the challenges pointed out by practitioners in relation to the scenarios (Jensen, Sonne & Harmsen 2002).

5.5.1 Scenario 1: Naturalness

The first scenario is called “Naturalness”. It focuses on sustainability from farm to fork, and organic foods are considered to be more wholesome. The consumers feel a growing need for protecting the nature and living a healthy life, and they reject genetically modified foods. The driving force behind this scenario is the suspicion with which consumers view conventional food production, and their opposition to the use of genetic engineering.

The scenario “Naturalness” requires a change of attitude among food producers and society in general. A big challenge for the Danish food industry is that they must accept that its primary role will change from being an important exporting industry to an industry mainly supplying the home market. From a social point of view, this will require further growth of other industries to replace the important place of the food industry. Another challenge is to define sustainability and “naturalness” in relation to food production as well as to simplify and standardise rules and regulations (Jensen, Sonne & Harmsen 2002).

5.5.2 Scenario 2: Technology-driven health

The second scenario is very different. The driving forces behind this scenario are, firstly, that consumers have accepted both functional foods and genetically modified foods. They have confidence in modern food production, and believe they are well informed and have a realistic picture of how to produce modern foods. Another important driving force is more liberal legislation, especially regarding research and what claims producers can make regarding their market offerings. The biggest challenges in the second scenario are the accumulation of knowledge that has to take place in order to develop and produce “high-tech foods”. The scenario calls for research and development, and it is questionable whether individual companies will be able to finance this. More research collaboration between industry and government is needed if Danish food companies are to compete against multinational food companies in this future (Jensen, Sonne & Harmsen 2002).

5.5.3 Scenario 3: Tight spending

The last scenario is based on a lower disposable income and extensive internationalisation, which has increased competition substantially. Price is the most important choice criteria for consumers in Denmark, as well as internationally. The competitive situation of the Danish food industry, at home and abroad, is made difficult by intensified price competition, as producers in Eastern Europe have lower labour costs and have to meet lower environmental standards than Danish producers, although they satisfy the minimum standards set by the EU.

The spending power of the consumers and the focus on value for money are the central driving forces in this scenario, and it is therefore important that the perception and attitudes to price of the consumers are followed. Since international retailers are central in this future, it will be important that the food companies choose the right retail chain(s) as partners for future relations (Jensen, Sonne & Harmsen 2002).

6. Niche: Organic foods

Organic foods represent an important niche on the Danish food market. Denmark is regarded a pioneer in promoting organic agriculture and in producing and marketing organic food and beverages by FAO in promoting organic agriculture and in producing and marketing organic food and beverages.⁶ The organic sector grew rapidly throughout most of the 1990s as a result of the combined efforts of retailing, agriculture and government.

Impetus for the growth of the organic sector was a policy decision by COOP Denmark (then FDB) in 1993 to drastically lower retail prices on organic products. This stimulated sales of organic products. The organic sector also benefited from being a project of high priority on the political agenda of the centre-left government of the 1990s. In 1995, the government thus issued an Action Plan for the Advancement of Organic Food Production in Denmark. Most of the recommendations included in this plan have been implemented, and it was followed by Action Plan II in 1999.

By the year 2000 organic foods accounted for about 2.5-3% of the total food market. For fruits and vegetables, the market share is somewhat higher, about 5-6%, while it is lower for pork and beef. In the area of fruits and vegetables, a number of alternative distribution arrangements are successful. For example, farm gate sales are increasing in importance, and *aarstiderne* (www.aarstiderne.com) is successfully offering consumers a weekly delivery of boxes of fresh organic fruits and vegetables on a subscription basis.

In recent years, growth has slowed or even stagnated. An important reason is that the market has reached a more mature stage. As the novelty has worn off, organic foods are being treated as normal products by retail decision makers, who increasingly insist on similar profit margins on organic products as for conventional items.⁷ According to FAO, there are, nevertheless, a number of indications that sales of organic foods will increase further. Firstly, major supermarkets are refocusing their activities, concentrating and targeting their marketing efforts on specific consumer segments and specific retail outlets. Secondly, alternative distribution channels appear to be growing rapidly, notably *aarstiderne*. Thirdly, the market share of organic foods remains small; currently it is around 3%. Finally, the new centre-right government continues to support organic production, although not as strongly as the previous government.

However, Scholderer, Brunsø, Grunert, Poulsen and Thøgersen (In press) question the continued growth of sales of organic food. Five scales from the Food-related Lifestyle instrument (FRL) that measure the importance of health, price/quality relation, novelty, organic products, and freshness to consumers' food choices in replication surveys in Germany in 1993 and 1996, France in 1994 and 1998, and the UK in 1994 and 1998. Results indicate that, contrary to widespread expectations, the importance of healthy/unprocessed foods, organic foods, and fresh foods has been declining in all three countries since the early 1990s. The pattern suggests that the actual consumer trend to organic foods already peaked several years ago, and that the current boom is likely to be a mere short-term consequence of changes in pricing and distribution.

⁶ <http://www.fao.org/DOCREP/004/Y1669E/y1669e07.htm#bm07>

⁷ Ibid.

Although, similar replications are not available for Denmark, there is evidence suggesting that the green segment is also decreasing in demand, and coverage by the trade press also indicates that demand for organic foods is declining.

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Appendix: List of informants

Personal interviews

- Gitte Gross, The Danish Consumer Council (Forbrugerrådet)
- Mads Kolte-Olsen, Office for Control – Coordination, Food Department, Danish Veterinary and Food Administration

Telephone interviews

- Palle Andersen, Food Region Århus
- Pia Ibsen, Danish Standards Association
- Kirsten Jakobsen, De Samvirkende Købmænd
- Henrik G. Jensen, Danish Veterinary and Food Administration
- Jan Mousing, Foss Electric and Øresund Food Network
- Per Rathman, Danish Veterinary and Food Administration
- Alice Sørensen, Office for Organic products and quality, Food Department, Danish Veterinary and Food Administration