

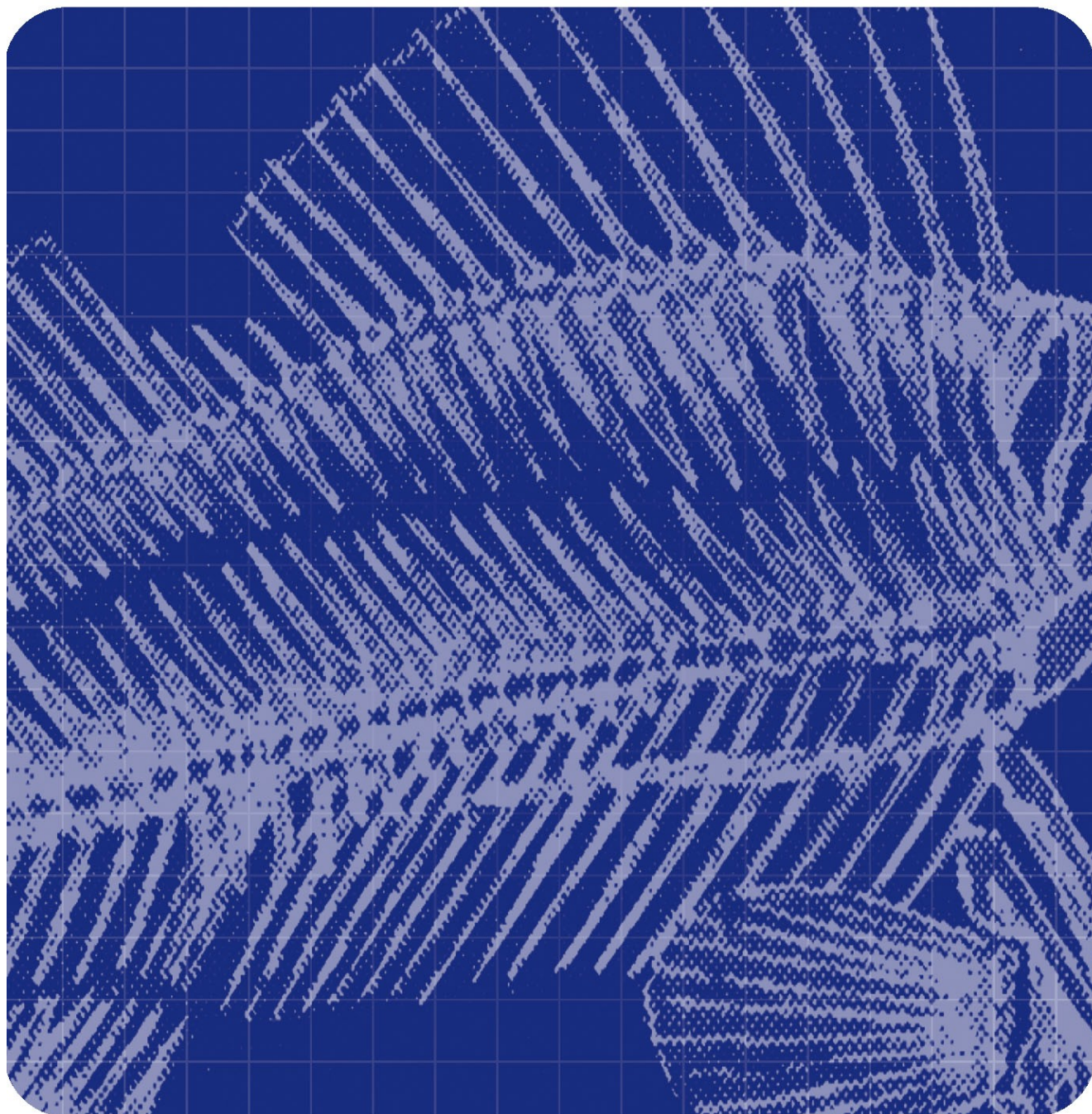


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The Future for Salmon in Germany

Oddrun Johnsen and Frode Nilssen





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REPORT


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<i>Summary:</i> <p>The purpose of this report is to describe and analyse the potential development in one of the prime markets for farmed salmon, namely Germany. The report focus on issues that primarily are perceived as important for industrial buyers when they consider buying salmon for processing and/or sales further downstream in the marketing channel.</p> <p>During the last decade there has been a significant increasing dominance of the super- and hypermarket chains in German food retailing. Notwithstanding, the fish marketing channels in Germany is still quite fragmented, which reduces the extreme bargaining power of the large retail organisations slightly.</p> <p>Farmed salmon is one of the few seafood species that show signs of stable growth in the German market. Although the German industry have bought both Pacific wild and Atlantic farmed salmon, the pacific salmon does not seem to represent a big threat to the suppliers of Atlantic farmed salmon. A main reason for this is the potential for stability in both quality and delivery that the suppliers can provide with.</p> <p>The main usage of farmed salmon in Germany is smoked salmon. The main growth potential in the future seems to be in the main course segments fresh and/or frozen. Although the perspectives of the German market for farmed salmon might seem "rosy" there are potential problems that might even cause long-term damages for the development. The main threats or potential problems are related to negatively charged media focus that pursue the perspective of large-scale breeding or "live-stock farming" on farmed salmon. The Germans indicated that the question of "animal" welfare on salmon breeding is of great importance for the future market development.</p> <p>Another potential problem area is the question of genetically modified salmon and the use of genetically modified organisms as an ingredient in the fish fodder. The German industrial buyers revealed strong resistance or reluctance to buy farmed salmon where either of the two dimensions of GMO was present.</p>			

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1 PREFACE

This report is one of two from the research project at hand, funded by the Nordic Council of Ministers. The present report on findings from a survey among German actors in the marketing channel for seafood. The main goal is to reveal and discuss aspects related to farmed salmon that have potential influence on the future market development in Germany.

We would like to thank all the respondents that have kindly taken the time to answer our questions. We would also like to thank Sabine Wedell, Pauline Berniere and Peter Koch-Bodes for their assistance in the collection of data to the project. Thanks also to Mathias Keller for supplying us with the latest statistics on the German seafood market.

Tromsø 17. July 2001

Frode Nilssen

Project leader

2 INTRODUCTION AND OBJECTIVE

Commercial production of farmed salmon has, through the last twenty years, developed from small-scale for local innovators to one of the most important commercial species for the Nordic fishing industry. In the year 2000, Norway exported almost 400 thousand tonnes of farmed salmon, of which approximately 67% were exported to the European Union. The largest single markets for Norwegian salmon in Europe are Denmark, France, Germany, Sweden and Spain. While Norway is the biggest producer and exporter of farmed salmon, Denmark appears to be the market, where a substantial amount of the import of farmed salmon to the country is re-exported, slightly processed. The re-exported salmon is basically sold to other European markets amongst others Germany. The perhaps most common means of processing is production of fillets, fresh or frozen, but also some smoked salmon are produced and exported. In 2000 the German salmon import totalled almost 90 000 tonnes. The fish were mainly imported from Norway and Denmark.

The purpose of this report is to describe and analyse the potential development in one of the prime markets for farmed salmon, namely Germany. The report focus on issues that primarily are perceived as important for industrial buyers when they consider buying salmon for processing and/or sales further downstream in the marketing channel.

The basis for the work draw on two main sources of information, secondary data that pertain mainly to the structure of the industry and trade and over-all consumer patterns and developments. In addition we draw on primary data collected among a selection of industrial actors in the German seafood industry.

The primary data stems from two consecutive surveys carried out in Germany in 1998/99 and 2001 respectively. The first survey forms the basis for the general market considerations and perspectives for farmed salmon, while the latter provides for some more specific aspects of importance for the actors operating in the middle-market for farmed salmon.

2.1 Structure of the report

The next chapter describes our methodological approach. Research design, preparation of questionnaire and the process collecting first hand information. Chapter 3 and 4 describes the German market in general, with a particular focus on seafood and salmon. With focus on consumption, factors determine consumption, trends and trade in the market this report gives an overview of the market situation for salmon in Germany. This information is mainly secondary.

In chapter 5 we present the results of our study and answering the questions above. Positive and negative attributes of salmon, obstacles for future purchase and prospective salmon products in the German market are thoroughly described. Chapter 6 concludes our report.

3 METHODOLOGY

The information that has contributed to the result in this report is collected from two sources. First we have examined secondary data. Literature on future trends in general and future market trends for foodstuffs in particular have been given attention. The economic-structural factors presented here has been drawn from these kinds of sources. In addition, a survey was designed to collect primary data from importers, processors and retailers who are dealing with salmon and salmon products in Germany.

3.1 Research design

An interview guide developed by Nilssen and Monfort (2000) were adopted, since they carried out a similar study among salmon purchasers in France. The interview guide/questionnaire were modified prior to the data collection to fit the German market.

The main objective of the questionnaire was to develop an understanding of the future trends for foodstuff, and how they may affect the demand for farmed salmon in Germany. Our goal was to identify areas in the future consumption where the farmed salmon market was expected to grow. A secondary goal was to establish whether the German market for salmon is expected to grow within the following years.

Some questions were open-ended and some were closed. In the first part, the questionnaire consist of open ended questions dealing with general perception of the future trends in existing and new segments and new product categories. Briefly, the questions were focused on attributes, consumer needs/wants, and quality aspects. This part also include a more specific analysis of the retail market; opportunities for growth for different products, which product are expected to grow most rapidly etc. In the second part the respondent was exposed to a set of statements, where they were asked to report on their stance. Some questions asked the respondents to assess their perceived importance, while others asked to report on to what extent he/she agreed to a statement or not. We used a scale from 1 to 7. 1=not important/strongly disagree, 7=very important/strongly agree.

3.2 Data collection

The survey was carried out through February to April 2001. A total of 63 organisations was selected, so that different parts of the salmon industry were represented. The categories of business organisations include supermarket chains, processors, wholesalers, and smoking houses. The companies varied in size in terms of amount of salmon purchased. In total, the respondents included in the survey are handling a significant share of the salmon that flows through Germany.

The questionnaire was faxed to 63 companies. A reminder fax was sent to several companies to get as high response rate as possible. Several of the respondents were also contacted by phone. The initial response rate was relatively low, 36% (23 responses), but after going through the answers only 15 was possible to include into the survey. This gives us a final response rate of 23,8%. In order to compensate slightly for the relatively low response rate, we have discussed the initial findings with a selection of industry representatives who are currently working within the German market.

The main explanation to the low rate of responses is that many companies did not, due to business policy, respond to such inquiries, and others wanted to protect their competitive advantage by not responding.

4 GERMANY – GENERAL MARKET OVERVIEW

Germany is the largest economy in Europe with approximately 82 million people, and is hence also one of the largest European markets for food products. Germany has one of the “healthiest” economies both within Europe and on a global basis. The country is considered as the most stable economy in Europe, and has the second highest gross domestic product (GDP) pr. capita in the European Union¹ (20,406 ECU). On a global basis Germany is ranked as number three in the world economy (Norwegian Bureau of Statistics, 2000).

A recent country survey on Germany, carried out by the Financial Times, shows that the economic prospects in the years to come is characterised by economic recovery, low inflation and falling unemployment (Financial Times, 2000). The average German is ranked as one of the most affluent consumers in the world. An indicator of this, aside from the general economic well being of the economy, is the high average disposable income.

The average German purchasing power² in the year 2000 was 1,94 billion Deutsche marks (DM). The average disposable income was estimated to 31.000DM in 1997. In this year the average expenditures on food and beverages was estimated to 5.900DM, which is approximately 19% of the total average expenditures (GfK, 1997).

A similar measure compiled by the German consumer ministry for 1998 indicate that an average 4-person household in West Germany spends approximately 20,4% foodstuffs (Verbrauchministerium. 2000)³.

Despite of the superior purchasing power, the average German consumer spends his money carefully. One indication of this is his tendency to prefer discount stores when shopping for food. In the following we will give a brief presentation of the German food market, and the food-related consumer behaviour in Germany, with special emphasis on fish and farmed salmon.

¹ Only passed by Denmark (GDP pr. capita: 22,275 ECU).

² Purchasing power is defined as gross income minus taxes (the part of the income that the consumers can dispose freely).

³ By introducing different economic measures one allows for speculation for the existence of a difference in spending and level of income across several dimensions. Two such factors are the difference between former East Germany and the former West-Germany, and variation across different household sizes and characteristics. These subtleties will, however, not be considered in this report.

4.1 Food Consumption

The consumption of food in Germany has been fairly stable the last 40 years, although some product groups have seen substantial changes. For instance, the consumption of potatoes has declined with 50%, while the consumption of vegetables has almost doubled. Meat and fish has on the other hand declined slightly. The table below shows the consumption of a selection of the main food products in 1997. The consumption of salads, tomatoes and vegetables have increased, while the consumption of root vegetables and cabbage has decreased. Bread consumption in Germany is the highest in Europe, and the demand for bread and bakery products has grown rapidly during the last years. (Sources: Deutsches Tiefkühlinstitut, Fisch Informations Zentrum (FIZ)).

Table 1 Food consumption per capita in 1997 (kg round weight)

Product	Consumption
Dairy products	124,5 kg
Fruit	120,0 kg
Meat (total)	90,0 kg
Vegetables	88,0 kg
Bread and bakery	85,0 kg
Potatoes	73,0 kg
Sugar	34,0 kg
Frozen products (inclusive ice-cream)	23,4 kg
Poultry	14,5 kg
Fish	13,0 kg
Eggs (pieces)	230

As illustrated in table 1, fish and fish products represent a fairly modest part of the German diet with a relative share of almost 2% of the annual per capita consumption of foodstuffs. In general the German food intake is divided in three main meals: breakfast, lunch and supper, whereof meat represents an important component in the latter two. Table 2 gives an overview of the development in German consumption of fish and meat during the last years.

Table 2 Average consumption of fish and meat (kg). (Source: Kristoffersen, 1999; FIZ, 2000; Salmon Summit, Nutreco, 2000)

	1993	1994	1995	1996	1997	1999
Total meat consumption	56,8	55,0	53,8	52,8	51,5	
- Pork*	40,4	40,0	39,6	39,4	38,5	
- Cattle*	13,5	12,0	11,4	10,5	10,4	
Other (lamb, goat, sausage)	2,9	3,0	2,8	2,9	2,6	
Chicken	6,7	7,0	7,1	7,3	7,6	
Turkey	3,4	3,6	4,0	4,4	4,7	
Total fish consumption ⁴	13,6	14,2	13,5	13,3	13,0	12,6
- Salmon	0,4	0,5	0,6	0,7	0,8	0,95

* Consumption products; processed.

The consumption of meat has declined with about 10%. The main reason for the decline is related to the reduction in consumption of red meat with approximately 25% over the last 5 years. The most plausible explanation for the relatively strong reduction is the media focus on outbreaks of animal diseases, the questioning of animal welfare issues in farming and also problems related to genetically modified food, toxic products and ethics in relation to husbandry and slaughtering.

The concerns related to health issues have changed eating habits, resulting in increased consumption of white meat, fruits and vegetables and a decrease in red meat consumption. Interestingly, the total fish consumption in Germany has seen a modest decline over the six-year period from 1993-1999. The consumption of salmon has, however, more than doubled over the same period from 0,4 to 0,95 kilograms per capita. Notwithstanding the salmon consumption represents an extremely modest part of the average German diet.

4.1.1 Consumption of seafood

In 1999 the total seafood consumption in Germany reached 1,03 mill metric tonnes (FIZ, 2000). More than half of the seafood consumed in Germany is either canned and/or marinated products (29%), or frozen fish (25%). Molluscs and crustaceans (fresh, frozen or prepared), account for 15%, 13 per cent is consumed fresh, and lastly, fish salads and smoked fish account for 4% and 3% respectively.

⁴ Before 1993 the EU statistics was adjusted, and therefor are not comparable.

As indicated above only just a third of the seafood consumption is canned products and/or marinades. 18 percent of the canned and marinated products are herring products, 8% tuna and 2 % sardines (FIZ, 2000). Producers of canned products continue to develop new canned products, new recipes and use new fish species, for instance salmon (Kristoffersen 1999, Keller 1998).

The market for marinated products has also experienced growth in terms of product development. During the last year businesses have initiated product development, whereas several companies have tried to exploit the convenience trend and add value to their production, e.g. production of modified atmosphere packaged fish. Norway has exported 1 ton of pre-packed (air-tight) salmon during the last years (The Norwegian Seafood Export Council, 2000).

Table 3 The top six species in the German fish consumption (FIZ, 2000, 1998)

	1996	1997	1998	1999
Herring	23,3%	24,8%	18,2%	22,6%
Alaska pollack	22,7%	23,4%	27,5%	19,8%
Salmon	6,5%	7,8%	8,5%	10,4%
Tuna	9,5%	7,4%	8,0%	13,2%
Trout	4,9%	4,4%	4,1%	5,1%
Cod	5,9%	9,3%	8,8%	7,0%

The figures are relative to the annual per capita consumption.

Herring is a major component in marinated/canned products, and is also the most popular fish among German consumers. It must be emphasised, though, that herring is a unique product in the German market, and therefore sees little competition from other fish products. Although, the salmon consumption is significantly lower than for herring, the species also merit a relatively high rank on the popularity scale amongst the German consumers. What is particularly interesting here is the steady growth in market share of salmon as compared to other fish species.

Table 4 The relative market share of fish products distributed on product category (FIZ, 2000, 1998)

	1996	1997	1998	1999
Canned fish	30%	32%	29%	29%
<i>Hereof Herring</i>	19%	22%	18%	17%
Frozen fish	21%	21%	26%	25%
Fresh fish	15%	13%	13%	13%
Shellfish	14%	14%	14%	15%
Other preserved	11%	11%	10%	10%
Smoked fish	6%	5%	3%	3%
Fish salads	3%	4%	5%	4%

Another aspect of the German fish consumption that calls for attention is the high relative growth of frozen fish compared with other product categories. Over a four-year period from 1996 and till 1999 the frozen fish segment has increased its relative market share from 21 to 25%.

5 THE GERMAN SALMON MARKET

In 1997 Germany had 103 companies with more than 10 employees within the fish sector. These companies are relatively specialised and produce processed products, such as smoked, fillets, salads etc. (Kristoffersen, 1999). In 1999 approximately 46 500 people were working in the fishing industry, and the total revenue was 14 billion DM. The market was dominated by salt-water fish, which accounted for 76%, followed by fresh-water fish (14,8%) and crustaceans (9,2%) (Fisch Informationszentrum⁵, 2000).

The German seafood market is heavily dependent on imports of seafood products in order to meet the demand. A clear indication of this is the relationship between German landings and total supply, where the landings represent approximately 16% ($\pm 1\%$) of the total supply over the last six years.

The most important suppliers (in terms of volume) in 1999 was Denmark and Norway with a share of 18% and 16% of the total German seafood import respectively.

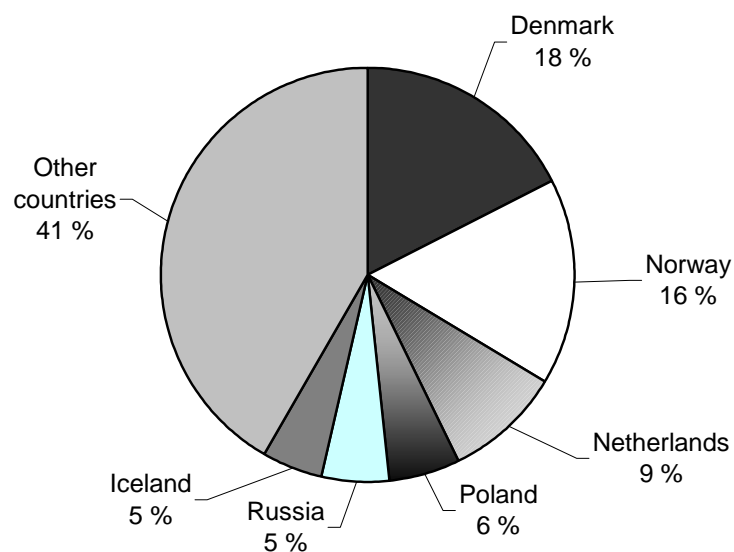


Figure 1 The most important supply nations for fish in Germany 1999 (source; FIZ, 2000)

⁵ Fisch Informationszentrum is a organisation that specialises on the questions related to the seafood sector in Germany. Abbreviation from here is FIZ

The supply of salmon to the German market is almost solely dependent on imports. The main salmon species consumed is farmed Atlantic salmon, where the bulk of the supplies comes from Norway, Denmark and the UK. As illustrated in figure 2 below Norway holds a place as the prime supplier with approximately 65%, while Denmark and the UK represent 14% and 7,4% respectively. It is worth mentioning that both Denmark and the UK have increased their share of the total German import of salmon from 12,1% and 5,4% to 14,3% and 7,4% respectively from 1998 to 1999⁶ on the expense of Norway and the USA.

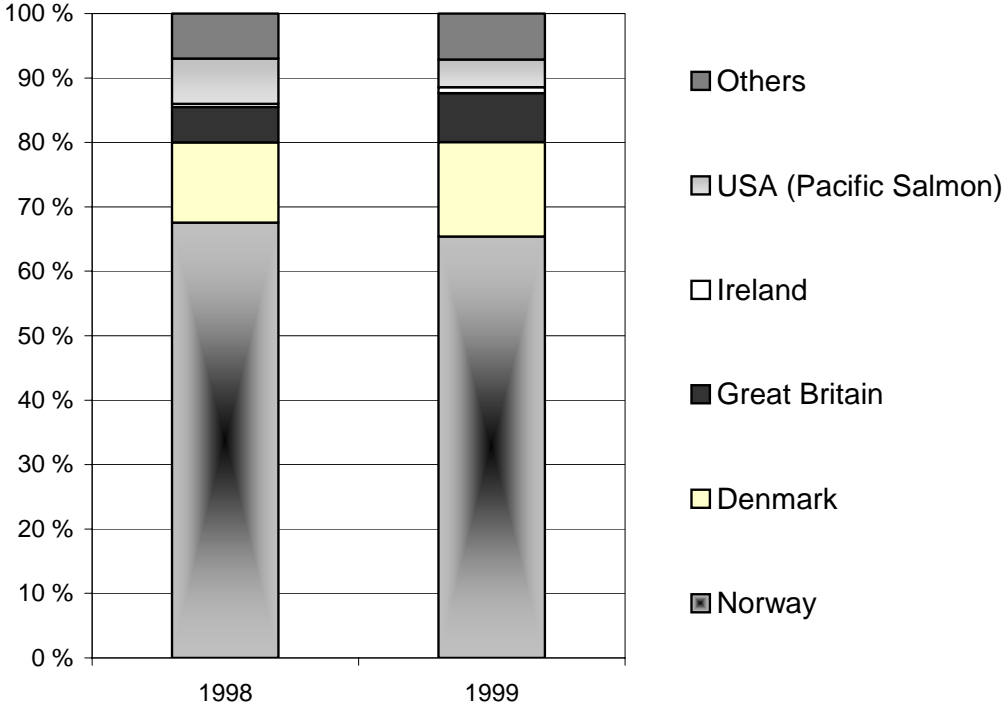


Figure 2 German import of salmon in 1998 and 1999 distributed on the main suppliers. Kilde: Bundesministerium für Ernährung, Landwirtschaft und Forsten

The import of salmon is distributed on three main product categories: round gutted fish, fillets, and smoked fillets. The most important category is whole gutted fish. According to official EU statistics approximately about 75% of the imports consists of whole gutted fish, while 15% of the import is fillets (equally distributed between fresh and frozen), and a bit in excess of 75% is fresh round in 1999.

⁶ Since the data hardly represents any time series, it is not possible to draw any conclusions on the potential future development based on this short-time variation.

It is, however interesting to note that the relative amount of fillets have increased significantly over the past ten years of the expense of both of the other two product categories (round, gutted, and smoked/other processed salmon).

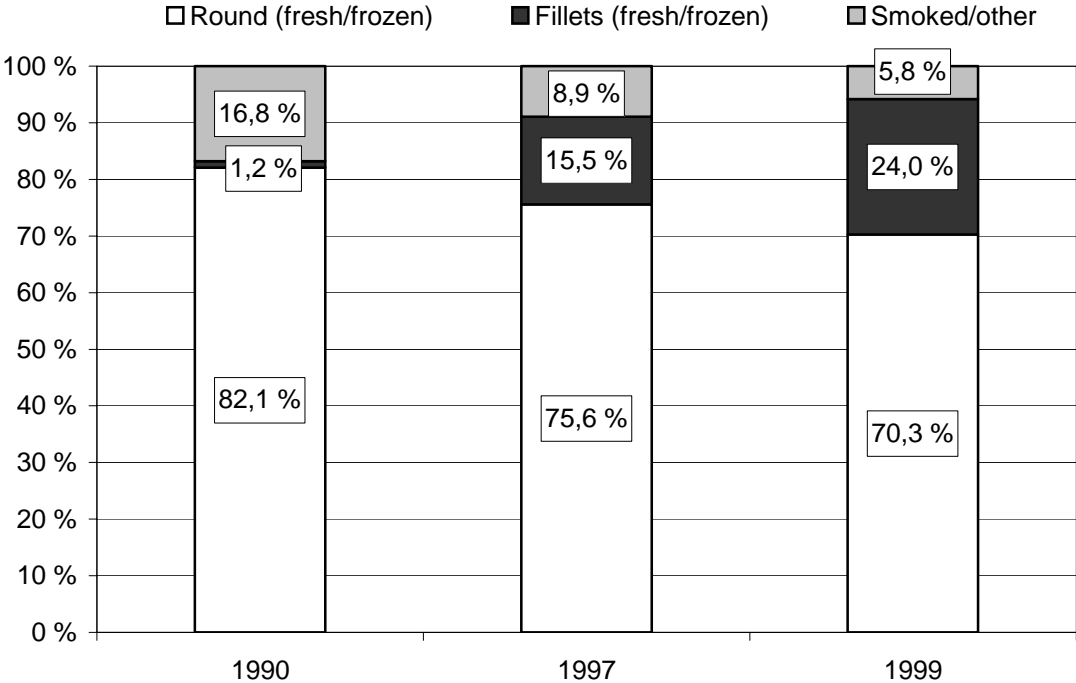


Figure 3 The relative share of the three main product categories of salmon products imported to Germany 1990-1999 Sources: Kristoffersen 1999, Eurostat

If we bring a bit more of nuance to the picture as described above we find that fresh whole salmon is the predominant product. This point is illustrated in table 4 below, showing the various product categories of imported salmon (Atlantic and Pacific) to Germany in 1999.

Table 5 Imported salmon products in 1999 (product weight)

Products	Quantity (tonnes)	Value (ECU)
Fresh/chilled	59.845	216.567
Fresh/chilled fillet	3.969	23.361
Frozen	5.312	13.870
Frozen fillet		
Frozen fillet	8.043	52.881
Salted or in brine only	15	88
Smoked	6.617	66.212
Prepared or preserved	2.884	21.461
Total	86.685	390.440

Source: Norwegian Export Council, 2001.

5.1 Marketing channels

Like in most western economies there are two main marketing channels – or sectors - for food products in Germany:

- The catering sector
- The retail sector

The retail sector is primarily concerned with the dine-at-home market. In Western Europe this generic market segment represent approximately 80% of the total food sales, in volumes (Gordon, 1998). The two main outlet types are hypermarkets and supermarkets at the one hand, and independent grocers and open consumer market outlets at the other hand.

The German seafood-marketing channel consists of a wide variety and a high number of actors performing different functions from importers, agents, traders, wholesalers, processors, retailers, restaurants etc. The retail sector is highly concentrated where the market is dominated by a few large companies (retail chains) and the top five accounted for 63% of the market value (Lahidji et al., 1998).

According to Euromonitor the total number of independent food retailers declined by around 9% from 165.660 in 1993 to 151.521 in 1998. Much of the reduction is explained by the increased competition from the multiple food retailers. These retail outlets grew in number from 21.264 in 1993 to 24.398. Although the numbers of retail outlets are relatively high, many of these belong to retail chains, and do hence represent a few companies.

The strong concentration at the retail level has put a squeeze on the suppliers in general, and on the wholesalers in particular. A general response to this trend in Europe has been a development of home-delivery. While the home delivery E-commerce with foodstuffs has been relatively stable, an estimate of the development over the next 10 years has been set to around 10-15% increase for packaged groceries (Gordon, 1998).

During the 1990s the German food retail market has seen considerable consolidation (Roehse, 2000; Wagner, 1996; Larsen and Jensen, 1994). A typical feature is that the local shops are giving way to the chain stores (hypermarkets, supermarkets/discount stores). The convenience stores are also growing relatively fast in Germany. Table 5 below gives an indication of the concentration in the German food retail sector.

Table 6 Number of food retail outlets and their relative market share (value) in Germany 1993-1998

Category	1993	1994	1995	1996	1997	1998
Share of top 5 retailers	60,9%	61,6%	61,2%	61,1%	61,7%	63,5%
Share of top 10 retailers	75,4%	77,3%	78,6%	80,8%	81,3%	83,6%
Number of food retail outlets (1000)	84	80	78	76	75	74

Sources: A.C. Nielsen, M+M Eurodata, Lebensmittel Zeitung (in Roehse, 2000)

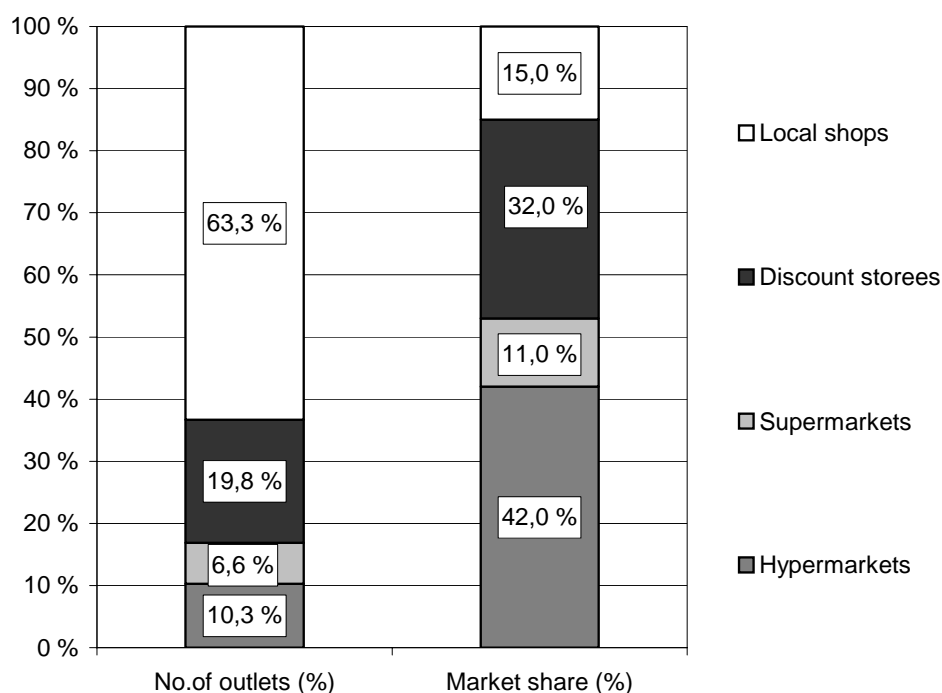


Figure 4 A profile of the structure in the German food retailing industry 1999 Source: A.C. Nielsen (in Roehse, 2000)

As illustrated the chain stores, including the discount stores holds a significant market position. It is interesting to note that the largest discount food retailing chain, Aldi, has a strong position in the German food market with 10,8% of the sales in 2000 (GfK, 2000). One explanation for this success is the general preference for discount shops among German consumers.

The catering sector can be divided in four generic segments: Social, workplace, commercial and transport segments. The largest are the commercial catering segments representing cafés, bars and restaurants. Contrary to many other West-European countries the German restaurant and café market has seen a decline over the last five years - with approximately 9% (Euromonitor, 2000).

Table 7 The relative importance of social versus commercial catering the segments in Germany in 1995

	Meals/year	% of meals served in 1995		Estimated Trend 1995/2000
	(millions)	<i>Social</i>	<i>Commercial</i>	% yearly increase in no. of meals
1995	7800	48%	52%	1,4

Source: GIRA Sic Europe (in OECD 1998)

Company canteens are one of the important segments in the non-commercial catering sector. Contrary to many other European countries German school canteens does not serve hot meals. Company canteens do at the other hand often serve hot meals. According to Hansen (2000) these outlets normally offer fish at the menu no more than twice a week, which reflects the preferences of their customers. The main criteria when purchasing fish is (low) price, but stability and reliability when it comes to ability to deliver on time is also perceived as important.

Despite of the trend amongst Germans to dine out more often, there has been a decline in value in the commercial catering sector. One explanation for this is that the “value for money” concept has been established over the last couple of years. A consequence of this is that people prefer fast-food establishments to the more expensive restaurants.

Burgers are the far largest product category in the fast-food sector accounting for 70% of the value in 1999, with pizza as the product category showing strongest growth. (Euromonitor, 2000). McDonalds is the leading fast food company with a market share of just below 70%. Interestingly the seafood chain Nordsee Deutsche Hochseefisherei possesses a 7% market share with their fish fast food outlets (Nordsee Quick, Nordsee Snack Food, and Meeresbuffet/La Mer).

Germany has for the last decade been the fastest growing market for farmed salmon in Europe. During the last three years the growth has been about 15-20% per year (Abbors, 2000). Notwithstanding, the German market is relatively conservative in terms of usage of the fish, as the most common use of farmed salmon still is smoked (and marinated) salmon.

As the research bureau GIRA expressed it in a recent contract research report on consumer attitudes to farmed salmon:

“Fresh and frozen salmon in the German market still has to democratise: it is essentially reserved for meals where there is a certain pleasure element, i.e. it is not yet an every day product”.

A survey of seafood consumption in Germany carried out during 1997 showed that 51% of the population normally consume some kind of salmon product per month, and the majority (45%) eat smoked salmon, and 36% and 18,8% eat fresh and frozen salmon respectively.

The same survey revealed two other aspects related to consumption of salmon. First, the consumption of salmon proved to be related to income and education level. 71% of the respondents with an income above DM 5000 per month did normally include salmon in their diet, while 36% of the respondents with an income level below DM 2.500 per month include salmon in their diet (M+W Test, Institut Für Markt und Werbeforschung).

In yet another survey carried out during 1998 (reported in Kristoffersen, 1999) it is indicated that the choice of types of retail outlets when are related to product categories when purchasing salmon. Fresh salmon is mainly purchased in the fishmonger, while smoked and also frozen salmon products are mainly bought at super- and or hypermarkets.

We have shown that the majority of the imports of salmon is fresh gutted salmon. Looking into the use of the salmon and how it is prepared and sold within the German market we find a strong dominance of smoked (and graved) salmon. The distribution between the different product categories of salmon in the German market is shown in table 7 below.

Table 8 The volumes (tonnes) of salmon in consumer markets in Germany distributed on different product categories in 1997 (The volumes are based on official import statistics in Germany)

Product category	Product weight	Relative amount	Round weight
Smoked /graved	21.000	44,7 %	35.800
Fresh fillets, pieces, cutlets	7.000	14,9 %	10.600
Frozen fillets, portions	6.250	13,3 %	10.300
Whole fresh salmon	4.445	9,5 %	5.100
Whole frozen salmon	4.300	9,1 %	4.900
Other prepared salmon	4.000	8,5 %	5.200
Grand total	46.995	100,0%	71.900

Source: Kristoffersen 1999

In the above discussion we have tried to draw a sketch of the German market for foodstuffs in general and seafood and salmon in particular. In order to try to clarify the perhaps rather confusing picture of the flow of salmon in the German marketing channels we have developed flowchart of the distribution system.

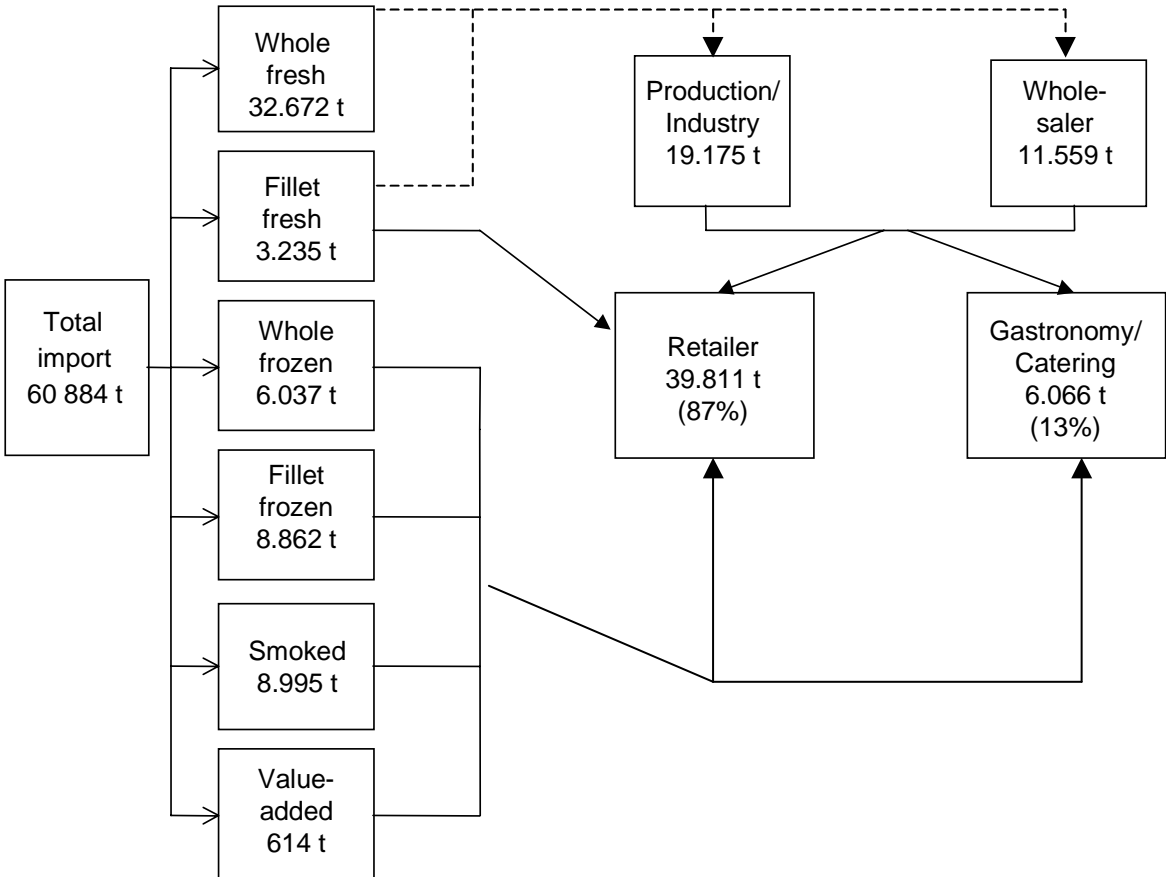


Figure 5 Outline of the product flow of salmon in the German marketing channels. (Quantities in product weight)

6 PRESENTATION OF THE RESULTS

Farmed salmon has gained acceptance on a wide range of markets and in segments, which seemed unattainable just a decade ago. One example is France, where, traditionally, the most important salmon product was smoked salmon. Today, and for the years to come salmon is establishing in the large mass markets, in a wide variety of product forms, both fresh and frozen. Some of the main reasons for this is the stability in delivery and relatively low price, together with the unique consumer perception and also the functional values of the fish (Nilssen and Monfort, 2000).

As indicated earlier in this report, the main usage of salmon in Germany is still as smoked salmon. In order to investigate the future potential market development, a selection of wholesalers, processors and retailers were asked to respond to three dimensions related to salmon. These are:

- Their perception of farmed salmon and its most positive and discouraging attributes
- Their beliefs about the future market for farmed salmon in Germany
- Their own use of farmed salmon as a part of their product range

In a recent study carried out in Germany we found that the following factors was important for the industrial buyers (Kristoffersen, 1999):

Table 9 Summary of the main requirements to suppliers of farmed salmon (as a raw material/input to production) among German industrial customers

Product related Buyer criteria	Supplier related criteria
- Low fat content	- Ethical production/less intensive breeding
- Good colour (not to pale)	- Good/decent treatment of complaints
- Freshness	- Ability to deliver small consignments
- Coherent size&sorting	- Reliability of delivery
- No trace of antibiotics	- Quality documentation/traceability
- Competitive price	- Stable temperature in the transportation chain
- No melanin/blood spots	
- Firm texture	
- Low bacteria count	

In the piece of research from which the above table 8 is drawn, it was distinguished between different types of buyers, such as traditional and high quality smoking houses, producers of fillets and finished products etc. The sample in this particular research does not allow for distinction between so many subgroups of buyers.

When the respondents were asked to state the most *positive* attributes that immediately comes to mind related to farmed salmon, availability (stable deliveries), stable product quality, stands out as the main variables. The respondents is free to mention whatever comes to mind related to farmed salmon, and there are no restrictions on the number of items/attributes. As shown in table 3, most attributes were related to the technical quality of the farmed salmon as a product.

Table 10 Frequency count of the most positive attributes related to farmed salmon (n=15)

Most frequently mentioned attributes	
Availability/Stable deliveries	9
Stable product quality	8
Price (affordable)	4
Appearance	3

The reported results seem relatively consistent with earlier findings, and also the similar study in France. It is interesting to note, though, that “stability of deliveries” received the highest score, before "product quality" and "price". It should be noted that “stability of deliveries” might be seen both as a supplier-related attribute and/or a product-related attribute. The supplier-related aspect may be seen as a measure primarily of the suppliers’ ability or interest in supplying stable deliveries. The product-related aspect pertains to the fact that farming of salmon allows for, and has evidenced that the supply of the fish does not tend to suffer from cyclical variations, which certainly is the case for wild-caught fish. Looking into the more detailed responses in the questionnaires it is evident that the respondents are thinking of the product-related value of farmed salmon, and not the ability and/or commitment of delivery of the suppliers.

When the respondents were asked to state the most discouraging attribute(s) that immediately comes to mind related to farmed salmon, it was mainly factors related to the technical product quality that was brought up. The two most frequently mentioned factors were too high fat content and the (potential) problems related to use of antibiotics in the breeding. Other factors mentioned was environmental concern related to fish farming, large-scale production, and appearance. The problems of negative appearance might be seen as a dimension of high fat content, and in this instance the score would be even more pronounced (10 out of 15). The two other factors: large-scale production and environmental concern may also be treated as two dimensions of one factor, namely environmental concern. The results are shown in table 4 below.

Table 11 The most discouraging attributes related to farmed salmon (n=15)

<i>Most frequently mentioned attributes</i>		
Too high fat content (6+1)		7
Use of antibiotics (5+1)		6
Environmental concern	} 3 3	6
Large scale production		
Appearance		3

It is interesting to note that none of the respondents have mentioned hygiene risk, which was one of the most frequently mentioned negative aspects among the respondents in the study of the French salmon market carried out during 1999/2000. At the other hand the concern about the negative image of large-scale fish farming (production) and environmental problems related to fish farming was frequently mentioned.

Some of the statements related to concern about the environmental and large-scale production in salmon farming:

- "...Large-scale farming and use of medicine is bad..."
- "...Use of antibiotics can cause environmental problems..."
- "... treatment with medicine and chemicals are against life..."

In Table 4 above we indicated that these two factors might well be merged since they virtually are capturing the same problem. The most frequently mentioned negative attribute of farmed salmon is; "the problem of too high fat content". The problem of high fat content did also have the highest frequency of the so-called "first-in-mind" item among the respondents.

Attributes that are reported on appearance are both mentioned as positive and negative. The different dimensions of the notion of “appearance” explain this apparent contradiction. The positive attributes mainly refer to consistency in freshness due to good availability and logistics.

- “...farmed salmon is always very fresh, which is not the case for all fish species...”
- “...farmed salmon is “regular” over time”...

After having developed a status of farmed salmon amongst the industrial actors in Germany, the respondents were asked to report on their belief on the main obstacles and advantages of farmed salmon, in general, in relation to the future consumption. The questions are focusing on the view of the industrial actors, since this is the task of the project at hand. Although the actors in the intermediate market are likely to mirror the main preferences of their target customers (the consumers), we presume that the business organisations would tend to emphasise slightly different values, i.e. stability of deliveries, and technical quality than the consumers. Notwithstanding, we presuppose that the industrial actors do have a more thoroughly consideration about both the present and also the future development than the consumers. This is amongst others necessary due to strategic decisions on investments, positioning and customer and supplier selection.

In the following we will present some of the main findings on the future perspectives.

6.1 Opportunities for growth or market saturation in the retail sector?

The respondents were asked to indicate to what extent they see opportunities for growth or not for different product categories based on farmed salmon in the retail market segments. The reported evaluation includes a range of different product categories such as smoked, fresh, whole, fillets, steaks, cutlets, etc.

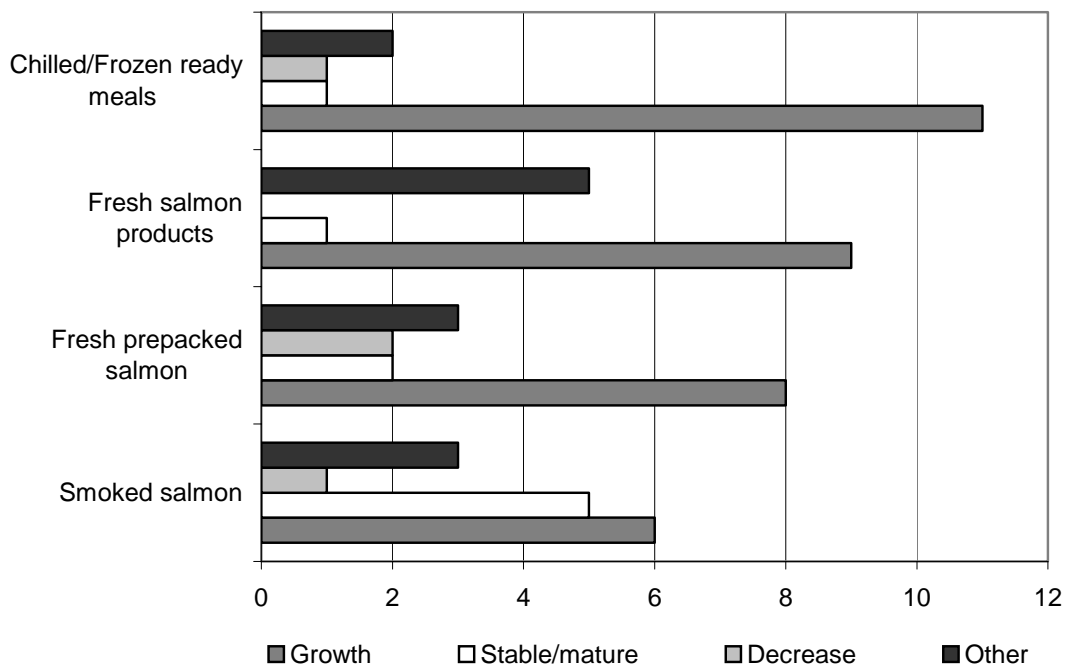


Figure 6 Expected market development for different salmon-based product categories in Germany

A general impression is that the German salmon industry are expecting further growth across all product categories based on farmed salmon – including the segments for smoked salmon. Although many of the respondents feel that the smoked salmon market is close to satisfied, quite a few indicate that there is potential for increased sales, especially in the high-end of the market.

The quality aspect that is hinted at implicitly might prove to be somewhat important for the further market development. Several of the respondents have explicitly noted that the quality tends to vary - especially the fat content. As illustrated in figure 9 the expectations for growth is most pronounced within the ready meal segments (chilled/frozen).

6.1.1 Frozen food

Considering the development over the last few years the expected growth for frozen ready-meals and other processed salmon products is not very surprising. Many producers have been looking into the frozen convenience food sector, which have led to a general increase of production of 8% for frozen fish fillet products during 1997 (Keller, 1997). Over the last few years we have seen an increasing tendency to use farmed salmon in a wide variety of ready meals. One example is the dominating producer of canned seafood, Hawesta, who introduced a range of salmon-based canned dishes.

Other examples are the innovative salmon products Salmon fillet in puff pastry, salmon lasagne, salmon and spinach pizza, and salmon carpaccio, recently launched by the frozen food producers Iglo, Costa and, Frosta. The launch of these latter products should perhaps be seen in light of the fact that frozen foods in general are one of the fastest growing segments in the German food market. Several respondents also supported this:

- *“... Retailers and consumers both like the convenience of these products”*
- *“... The convenience effect”*
- *“... The preparation is very consumer friendly”*

Despite of the apparent drive toward sophisticated processed salmon-based products, there is also substantial interest and expectation for the future development for “natural” salmon products in Germany. Ten out of twelve respondents regard the prospects for plain natural salmon products as a growth area within the salmon-based products. The notion of “natural” (“unbehandelte Lachsprodukte” in German) denotes plain fish packed in portions for single or family use.

6.1.2 Fresh salmon products

Although the main expectations for the future development is found within the frozen food segments there are significant expectations to the fresh salmon segments as well. A majority of the respondents were confident that these segments would see significant growth in the years to come. One major argument that explains the slightly more modest expectation for growth in the fresh segments is the structural peculiarities of the German food market.

“...The super/hypermarkets haven’t got the competence to work with fresh salmon products (short shelf life). The cold storage-chain is not complete.”

Despite of these kinds of statements, there have actually been some improvements of the fresh fish distribution in Germany lately. High quality, fresh food products tend to attract consumers, and are therefore considered as interesting products to carry for many retailers. A factor that might inhibit the most optimistic growth scenario for fresh fish in general and fresh salmon in particular is that the majority of the German population live in areas where there is little tradition for preparing and eating fresh fish dishes. One could therefore expect that fresh salmon represent an interesting new product within specific life-style segments especially within the central and southern part of Germany, but also along the coastline in North Germany.

When the respondents were asked to indicate what products they consider as the ones with highest potential for growth we received a wide variety of product types and variants (more than 12). Among these, salmon fillets, portions and steaks was far the most frequently mentioned.

6.1.3 Farmed salmon in the future product range

After having recorded some more general perception of the current and future market for farmed salmon the respondents were asked to report to what extent farmed salmon will be an important part of their future product range.

Three of the respondents said that farmed salmon would be an important, yet, small part of their product range. The majority maintained that farmed salmon would be an important and/or large component of their future product range. Although most of the respondents expressed their confidence that salmon is important for their organisation they did not give any specific argument for this aside from the arguments already given earlier in the interview. Many did, however, stress the relative importance of salmon sales.

When asked whether or not farmed salmon possess qualities that make the fish preferable to other species the majority of the respondents (8) confirmed that salmon possess unique qualities that sets it aside from other species. Three respondents disagreed, while four were neutral to the question.

Among the respondents that agreed that salmon possess unique qualities, many different attributes was brought forward:

- *“...Salmon is still, despite of the price fall, considered as a noble fish”*
- *“...Salmon is now a inexpensive (affordable) fish”*
- *“...Salmon is always available”*
- *“... Its unique quality is mainly the short “cooking time” ”*

Among the respondents that disagree, the main argument was simply that:

- *“other fish have good attributes, and are in high demand”*

6.2 Issues related to the future market for salmon in Germany

The issues raised here related to future market trends draw on previous studies made by Nilssen (1999) and Nilssen and Monfort (2000). The main influential forces found items found were related mainly to a demographic factor (age, household size). In addition the food safety issue was identified as an important factor that are expected to influence on future consumer behaviour related to food choice. A brief literature review related to the German food market show that the food safety issue (in a broad sense) is of relatively great concern for the average German consumer, and might affect the future consumption of food in general and farmed salmon in particular.

6.2.1 Demographic issues

The demographic factors considered in this survey are related to family size, age composition of the consumers in general, and are measured in terms of one variable (“omnibus item”).

The questions on the respondent’s beliefs about the future trends for farmed salmon are mainly related to new product development. The reason for this is simply grounded in the appreciation of the increasing focus on new product development (NPD) within the food industry. When confronted with statements on the issues of age composition and household size, the respondents reported that alterations in the age composition among German consumers was a bit mixed. Two out of twelve did not consider the demographic factors as important for what qualities new salmon products should hold. The majority did believe that the question of household size and age composition is important.

Some comments related to the demographic issue was:

- *“...Persons older than 55 years are the biggest consumers of fish (and justify focus on smaller packages)*
- *“...With the older people increasing in numbers, which have time for preparation of food, it is only somewhat important to develop ready meals*

Others respondents emphasised other aspects of smaller households

- *“...singles are seen as buyers and smaller portions will be developed”*
- *“...smaller packages – smaller prices”*

An underlying dimension of the demographic issue that relates to new product development of salmon-based products is the question of whether the time required for preparing a meal based on a product purchased is considered as an important value or not. The majority of the respondents (10 out of twelve) reported that they found it important.

6.2.2 Ethics, “animal” welfare and ecological breeding

The increased attention to food safety issues has been increasingly pronounced in Germany during the last two decades. Some of the explanation for this phenomenon can be ascribed to the increased media attention to animal diseases (BSE, hog cholera etc.), and bacteriological contamination incidences. While bacteriological diseases are quite objective measures of food safety issues, the increasing focus on the problems related to intensive farming is also has proved to give rise to the question of “animal welfare” issues and the question of ecological farming.

Another problem that also seems to have caught attention during the last years is the question of genetically modification and genetically modified organisms (GM and GMOs respectively) of animals, fish, and plants and hence also the fish fodder.

Drawn from this we confronted the respondents with questions related to both ecological production of salmon, welfare concerns related to fish farming, and use of GMO directly on the fish and also in GMO products in the fish fodder. The problem is raised along three dimensions.

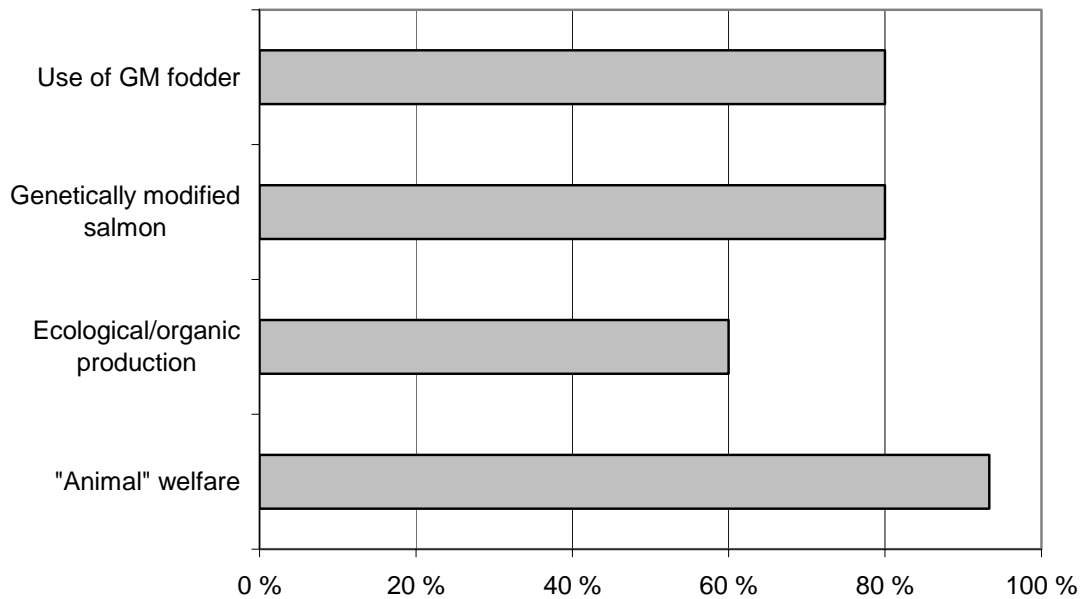


Figure 7 The perceived importance of “animal” welfare, ecological breeding, and GMO issues for the future acceptance of farmed salmon in Germany

6.2.3 Welfare issue

First, the respondent’s is asked to what extent they believe that the concern about the “welfare” of the farmed salmon in the fish farm is an important factor for whether or not consumers will use farmed salmon products in the future. All but one of the respondents (14 out of 15) reported that they believe that the question of the “welfare” of the salmon is important for the future market development for farmed salmon products. The respondents’ engagement in the topic may also be illustrated by their use of the scale when reporting on the question. Eight out of 15 did tick the extreme end of the scale (very important).

This finding is interesting considering the results from a similar study in France only one year ago. In France the concern about animal welfare was considered to be not very relevant for the future use and acceptance of farmed salmon. On the whole, most respondents in France said that the taste, the healthiness and the price of food and little by animal welfare primarily concern French consumers.

In the survey on the German market, reported here, the results are indicating the extreme opposite, namely that German consumers are likely to be discouraged from using farmed salmon if the issue of large-scale breeding in salmon production is brought up.

Some statements from a selection of the respondents might illustrate this point:

- *“...the salmon should have much place to live to have arguments against the large-scale livestock farming g . The attitude to large-scale livestock farming is very bad – and is something media could pick upon”.*
- *“... if the salmon comes into the media due to a catastrophe large-scale livestock farming, lke beef, pork, or chicken – then good night!”*
- *“...it is important to keep distance to the notion of large-scale livestock farming”*
- *“... Very important – look at BSE”*

Yet another aspect that was emphasised when discussing this question is related to the health and environmental concern amongst consumers:

- *“...The consumer needs the total feeling of buying a healthy product”*
- *“...This is very important du to the increasing health- and environmental awareness of the consumer”*

6.2.4 Ecologically/organic produced salmon?

To the questions of to what extent respondents believe that the issue of “ecologically produced” salmon will be an important factor for whether or not consumers will use farmed salmon products in the future, the main opinion towards that this is an important issue (9 out of 15). Contrary to the response to the question of “animal” welfare, the question of ecological/organic production evoked some polarisation. Five respondents reported that this would not be important at all.

There is no simple explanation for the polarised opinion on this phenomenon, but a plausible explanation may be the increasingly strong focus on the “food scandals” during the past few years, combined with the increased attention to “healthy eating”.

- *“... the consumers will be quality oriented. It should be documented and proved that no meat flour is used”*
- *“...Consumers asre increasingly concerned about healthiness and environmental questions”*

6.2.5 GMO issue

The third dimension of food safety as regarded from the consumer perspective, is the GMO issue. From a strictly technical/technological perspective the GMO's may be seen as a means of enhancing the productivity of food production. A main concern of commercial utilisation of genetically modification is related closely to two sides of the problem:

1. The emotional and uncertainty related to extensive use of GMO
2. The potential for irrevocable large-scale damages on living species as a result unsuccessful manipulation with the genetic coding.

Various aspects of the issue has been raised and extensively discussed in media. Drawn from this one could expect that the consumers and the industry alike have an active opinion about the effect on future use of farmed salmon (Wendt et al., 1999; Wendt, 1999).

In the questionnaire the respondents is asked to report their opinion on two dimensions of this problem:

To what extent do you believe that the genetically modified fish and genetic modified ingredients in the fish fodder will affect the future consumption of salmon?

The response to the first question is quite clear. The vast majority of the respondents (12 out of 15) believe that supplying genetically modified salmon to the German market would have a negative impact on sales. Likewise 12 out of 15 respondents reported that use of GMO-based fodder would have negative impact on the future acceptance and use of farmed salmon in Germany.

The beliefs about a lack of consumer acceptance of products manufactured from farmed GMO salmon is widely spread among salmon actors. This proves to have an impact on their purchasing attitudes. This finding also corresponds with the findings from the French market. In France, the retail/wholesalers said unanimously that they will not introduced GM animals in their range of products as long as they perceive the strong reluctance of consumers. The manufacturers said that they would not process GM animals as long as retailers/consumers don't want it. It appears that the reasons for the lack of acceptance of consumers in GMO products (ethical/emotional aspects pertaining to genetic engineering and the tampering with nature, potential risks on human health, etc.) are not argued neither considered in-depth. No one wants to go against the consumers' and media stream.

7 CONCLUDING REMARKS

The investigation has mainly focused on the importance of a set of key factors related to the product and the supplier as perceived by a selection of industrial buyers of salmon in Germany.

During the last decade there has been a significant increasing dominance of the super- and hypermarket chains in German food retailing. Notwithstanding, the fish marketing channels in Germany is still quite fragmented, which reduces the extreme bargaining power of the large retail organisations slightly.

Farmed salmon is one of the few seafood species that show signs of stable growth in the German market. Although the German industry have bought both Pacific wild and Atlantic farmed salmon, the pacific salmon does not seem to represent a big threat to the suppliers of Atlantic farmed salmon. A main reason for this is the potential for stability in both quality and delivery that the suppliers can provide with.

The main usage of farmed salmon in Germany is smoked salmon. The main growth potential in the future seems to be in the main course segments fresh and/or frozen. Although the perspectives of the German market for farmed salmon might seem “rosy” there are potential problems that might even cause long-term damages for the development. The main threats or potential problems are related to negatively charged media focus that pursue the perspective of large-scale breeding or “live-stock farming” on farmed salmon. The Germans indicated that the question of “animal” welfare on salmon breeding is of great importance for the future market development.

Another potential problem area is the question of genetically modified salmon and the use of genetically modified organisms as an ingredient in the fish fodder. The German industrial buyers revealed strong resistance or reluctance to buy farmed salmon where either of the two dimensions of GMO was present.

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