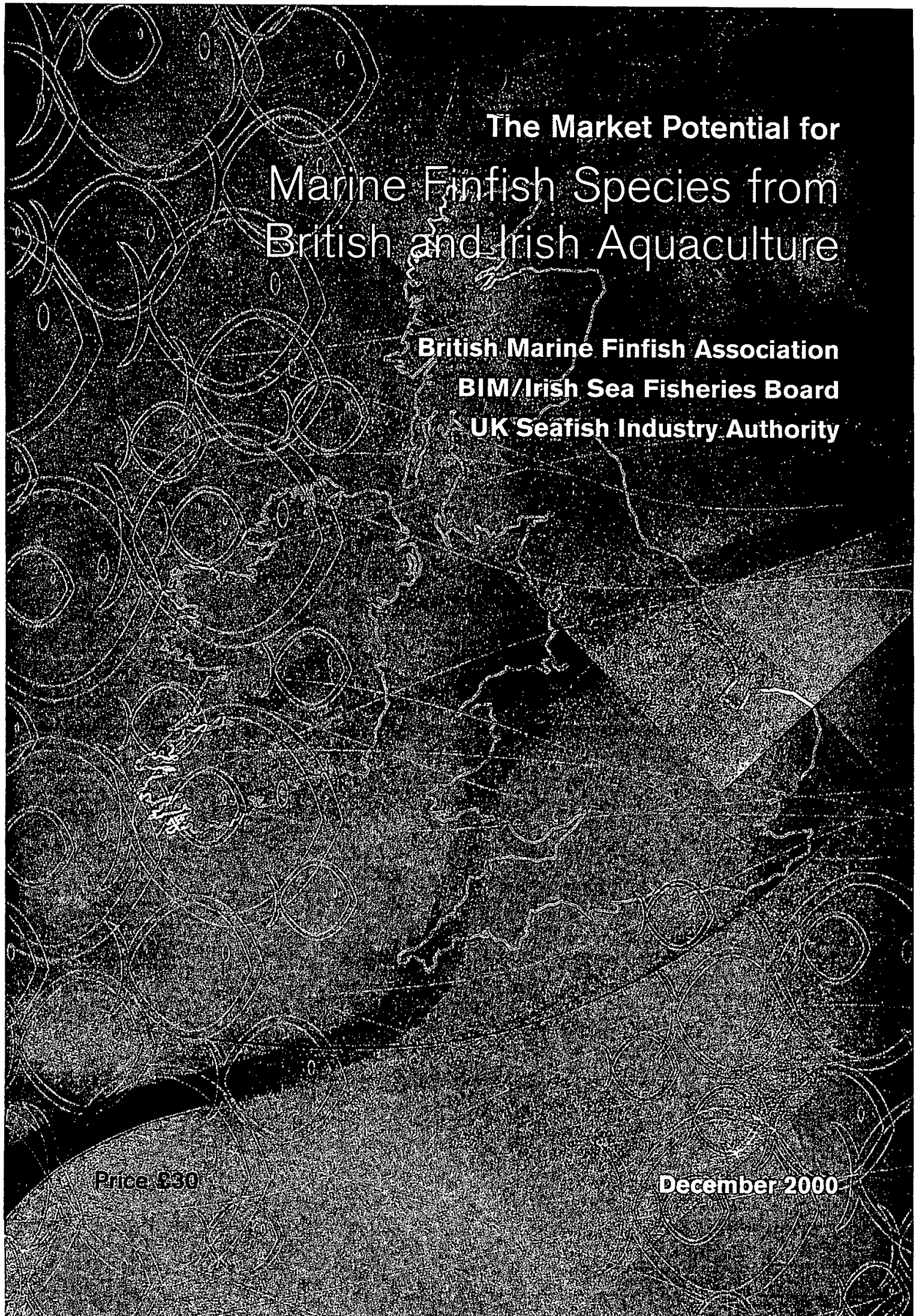


The Market Potential for Marine Finfish Species from British and Irish Aquaculture

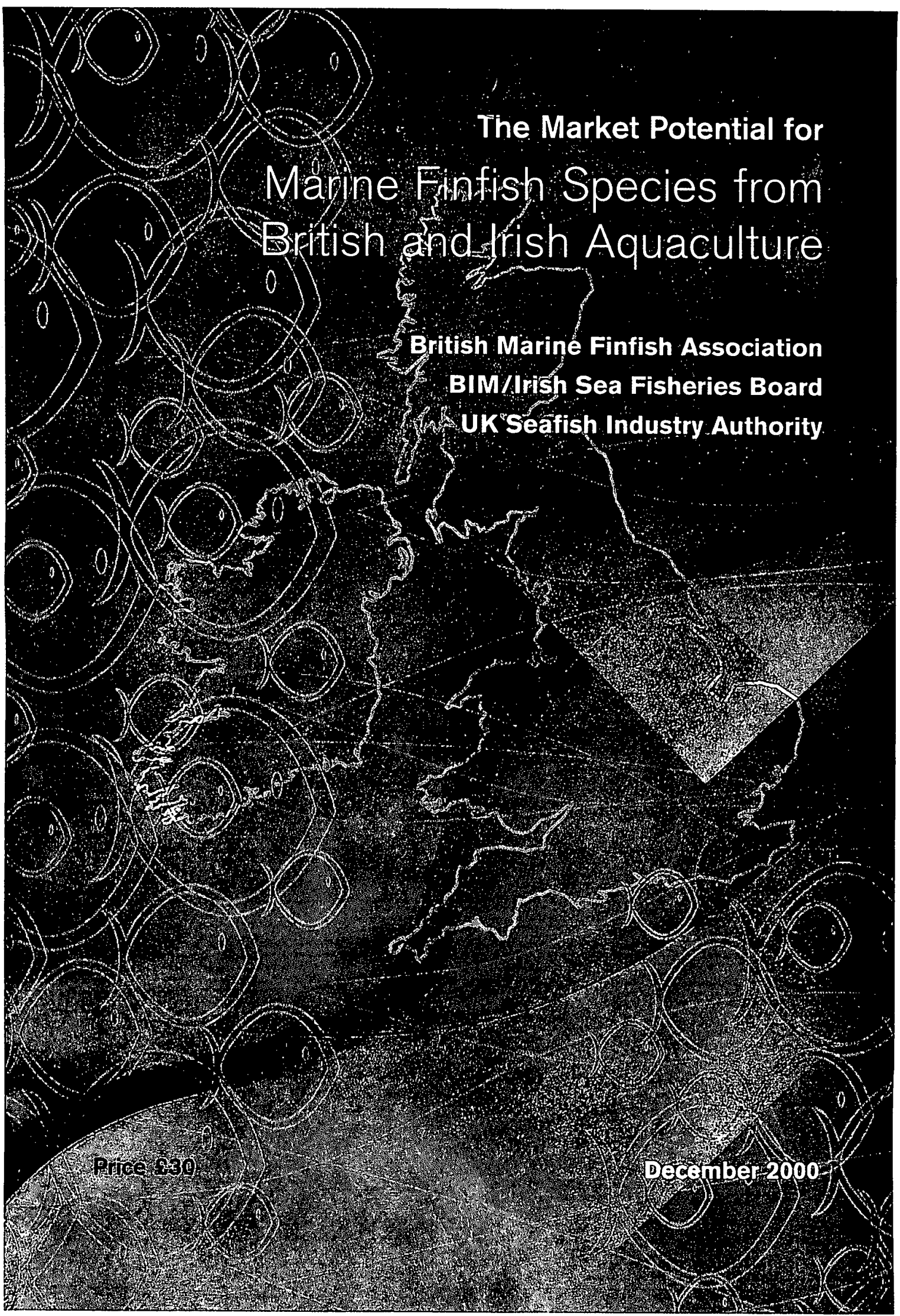
British Marine Finfish Association

BIM/Irish Sea Fisheries Board

UK Seafish Industry Authority

Price £30

December 2000



The Market Potential for Marine Finfish Species from British and Irish Aquaculture

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Price £30

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A study commissioned and undertaken by

The British Marine Finfish Association (BMFA),

BIM/Irish Sea Fisheries Board and

The UK Sea Fish Industry Authority (SFIA)

British Marine Finfish Association

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CONTENTS

EXECUTIVE SUMMARY

E1 The Current Importance of Aquaculture in Europe

Aquaculture is already playing a major part in supplying seafood into the European market – some 420,000 tonnes per annum out of a fleet landing total of c. 6,700,000 tonnes, or 6-7% of the total by weight. If all the member states of the Federation of European Aquaculture Producers are included, the tonnage rises to some 1,000,000 tonnes per annum, with a total value of **£1,984 million in 1999** – compared, for example, with a combined total first sale value of fisheries landings of some £452 million in the UK and Ireland.

E2 The Study

This study focuses on the potential market opportunity for marine fin fish species which might be cultured in the UK and Ireland: **turbot, Atlantic halibut** and **lemon sole**. The study also considers the current impact of farmed **seabass** on the same markets, and examines the potential for confusion and/or competition because of European imports of **Pacific halibut** and Greenland or Black halibut.

The study takes three approaches: a detailed face-to-face field interview with over **150** key industry players in **5** European countries (United Kingdom, Ireland, France, Spain and Germany), an analysis of data available from existing market surveys and other sources, a specially commissioned report from the market analysis company Taylor Nelson Sofres.

The study presents large amounts of information, and this executive summary should be viewed as an interpretation of the key issues covered: further insights may be gained by individual consideration of the other elements of the full report.

E3 The Survey

Statistical analysis of the survey results is problematic owing to the variable and uncorroborated nature of the information gathered. Choice of a single currency conversion (GBP, £ Sterling) for ease of comparison, whilst useful to those in GB and Ireland, might give a skewed picture of the real inherent values of products in their own economies. Nevertheless, the survey provided hard numerical data and much information concerning the future aquaculture potential of the species investigated.

E3.1 Atlantic Halibut

- The UK market is considered the most significant one for this species
- Wild halibut sells into the mid-range of the market for some £6.50-7.50per kg, with some seasonal variation – the winter prices are generally higher
- Farmed halibut from Norway, at some 100 tonnes per annum, is being sold into the market at £5.50-6.00 per kg
- Halibut sells into the restaurant/good food pub sector at some £9.00 per kg for whole gutted fish
- Most UK interviewees were very positive about the concept of increased supplies of halibut from aquaculture – the fish produces thick fillets, has a good fillet yield and is generally well-viewed by consumers
- Desirable attributes would be: fish of 3-5 kg, a lipid content similar to wild fish, 52 week per year availability **and particularly** winter season availability, a stable and fair price, ethical and chemical-free production, sustainable feed sources, traceability and processing control

E3.2 Atlantic Turbot

- This species is consumed in all the countries surveyed, with the UK and Irish markets being the least significant in volume terms
- Turbot sells into the mid–range of the market for:
  - United Kingdom £5.00 - £6.50 per kg (commonly £6.00)
  - Republic of Ireland £6.60 per kg
  - Spain £3.70 - £5.56 per kg (commonly £4.44)

- France £5.68 per kg
- Germany £5.35 - £5.91 per kg

- Turbot is perceived as too expensive for large volume utilisation in the UK market on the basis of whole fish cost and low fillet yield, and farmed product is seen as producing a relatively thin fillet
- There was very broad support from almost all the interviewees for further turbot production from aquaculture, with similar requests to those noted above for halibut. The need possibly to lower prices in order to sell significantly more turbot was highlighted by many respondents

E3.3 Lemon Sole

- Lemon sole appears to be mainly utilised in the UK and German markets (although it may be more widely used in other countries not included in the survey)
- There are mixed views about its suitability for aquaculture - there is sometimes oversupply in the market, with very low prices
- However, respondents who use the species were very interested in a reliable and constant supply, provided the quality is good and the price falls into the range of "no more than £3.00 per kg"

E3.4 Seabass

- This species is now widely used throughout all the countries and market segments, and is becoming almost an essential item in the restaurant trade
- The quality of farmed seabass is sometimes criticised, but respondents were generally rather positive about this aspect
- Prices have been falling, and the species is more commonly used by some respondents because it has become "more affordable". UK restaurants appear to still be paying up to £8.00 per kg, but prices in this sector elsewhere are reported at around £6.50 per kg

E3.5 Pacific Halibut

- As with Atlantic halibut, this species is mainly used in the UK. Data for it are sometimes mixed with those for Atlantic halibut
- Reported consumption is low compared with Atlantic halibut, but market prices are similar or higher
- It is viewed as a competing product by one large Norwegian Atlantic halibut farmer, but the exporting countries for Pacific halibut feel that the prices will have to remain high due to transport costs and EU tariffs

E3.6 Restaurant Trade

- The real "inherent value" of a species such as turbot in different countries is probably more similar than a simple numeric currency calculation suggests, on the basis of restaurant prices in each country
- The margins and expectations in the restaurant trade are discussed, using the UK as an example – a 65-70% gross margin is desired by chefs, and this is calculated on the basis of a full meal cost being 30-35% of the final selling price (and then with the further addition of VAT)
- The (UK) trend is increasingly for use of skinless boneless fish flesh
- On this basis, the restaurant is unlikely to pay more than £16-20 per kg for the fish flesh – which translates to £8-10 per kg of whole fish for species with 50% fillet yield (halibut, seabass) and £4.80 to £6.00 for a species such as turbot
- This is only one analysis – there is clearly also still a good market in Europe for either higher portion prices or use of whole fish, as confirmed by total sales of wild and farmed turbot of some 11,000 tonnes per annum

E4 Other Reports and Data

A large amount of information is presented from other market reports and from other data sources. Some of the key points include:

- An excellent study of the processing, handling and likely market characteristics of farmed halibut (Section 10.10) – a study which should serve as a model for future work on other species
- A history of production volumes and market prices for several farmed species – generally showing more stable prices at the level of "real inherent worth" of the species once a certain volume of production from aquaculture has been established, and then a tendency for decline in market prices as production continues to grow. The "plateau level" of price varies between species, as does the volume point at which prices begin to decline – however, in 1999 there was some 83,000 tonnes of farmed seabass, gilthead bream and turbot combined, with an average first-sale value in the region of £4.00-£4.50 per kg
- Very recent price data for species such as turbot and seabass in several major European markets are presented
- Total world wild landings of several key species are considered:
  - Turbot is relatively stable at around 8,000 tonnes per annum currently
  - Atlantic halibut is declining, and may now be less than 4,000 tonnes per annum globally
  - Pacific halibut landings are carefully controlled and are tending to be lower, but are still in the range of 28,000 tonnes per annum
  - Lemon sole landings fluctuate somewhat, but the fishery appears to be fairly sustainable at around 12,000 tonnes per annum
  - Wild seabass landings are relatively stable at around 4,800 tonnes per annum

E5 Taylor Nelson Sofres Report

The report includes data from this market research company, and particularly a tailored report for the UK specifically for this study. According to this data source, fresh halibut use in 1999 was around 1270 tonnes – approximately 37% in retail and 63% in food service (catering). Data for the other target species were not available for both sectors, although are reported for one or the other.

Halibut is the more important high-value species for the UK food service sector in terms of volume, representing some 0.5% of the total fish purchased by that sector (150,000 tonnes per annum). The use of halibut and turbot predominate in the hotels, restaurants and pubs sub-sectors, for which the total combined fish purchase is some 44,500 tonnes per annum.

There are 338 million seafood "meal occasions" per annum in UK food service outlets – some 16% of the total number of meal occasions. Of these seafood meals, around 77 million p.a. fall into the price bands of £8 - £17+, i.e. the price bands in which species such as Atlantic halibut, turbot and seabass might be sold.

Another study reports on the likely 2% p.a. growth in food service at the moment, and this might give an immediate annual increase in demand for fish in those higher price bands of some 600-700 tonnes each year.

E6 Conclusions

The study provides considerable numeric data, but also reports on a significant amount of subjective observation within the seafood industry in several European countries. For this reason the interpretation of the findings of the report must be viewed as equally subjective on the part of the author, and treated accordingly.

The overwhelming opportunity for aquaculture to supply marine fish species into the European market is identified, based on the comments of the vast majority of the survey respondents. Negative views in this regard relate to segments of the market which feel they will be excluded from the aquaculture supply chain, and the more "purist" of the respondents who believed that poor quality would prevail.

Quality, reliability of supply, value for money, portion control, processing care and ecological sustainability are issues which the market highlights for future aquaculture products. Value for money to the consumer can be maintained ensuring efficient use of the seafood supply chain in the UK. Further work on fish feeds and flesh quality are suggested, in order to ensure the production sector maintains the desired characteristics and niche attributes of the species.

Atlantic halibut is considered to be a potentially important aquaculture species for the UK and Ireland, on the basis of good quality characteristics, good fillet yield and fillet shape, the ability to be grown in cost-effective cage systems and the suitability of local ambient water temperatures. At the very low current levels of production, there is considerable scope for individual farmers to sell into the upper market segments at values approaching those of wild halibut (£6.50-7.00 per kg). The market for the species will be predominantly the UK initially, supplying product into the "£13-15 meal" food service bracket. This should ensure farm gate selling prices in the region of the original BHA target price, £5.00-5.50 per kg, can be maintained. If the product does begin to fill that expected niche in the UK, the potential for exports may also increase.

Turbot remains the most aspirational and high value farmed marine species in Europe, but there may be a need to reduce prices somewhat in order to sell higher volumes. At the moment the whole fish price and the low fillet yield tend to put this species into the most upmarket categories – with a possible limit on the capacity of the market to absorb ever-increasing volumes. Nevertheless, this is a species which is being successfully farmed at a level of 3,000 tonnes per annum, and for which the market price has actually been **increasing** at a rate of 7% per annum until 1999 – good opportunities for entrepreneurial producers probably still exist for turbot.

Lemon sole might be farmed in the UK and Ireland, and there is certainly some demand for reliable and regular supplies. The occasional very low prices due to seasonal "gluts" of fishery landings must be addressed, and even with increased efficiency in the supply chain, it will probably be essential to consider farm production costs of less than £3.00 per kg if this species is to succeed in aquaculture. As with Atlantic halibut, the market opportunity for lemon sole in big fish-consuming nations such as France and Spain does not appear to be promising at the present time, since the species is either unknown or not well perceived.

Overall the market opportunity for the species surveyed is clear, but many of the very positive responses from the survey come from people with little idea just how difficult (and expensive) the production of "new species" can be. The challenge for the aquaculture industry is to meet the expectation of quality and value as much as possible – and ensure that products are efficiently moved through the supply chain, from "farm to fork".

1 INTRODUCTION

1.1 Aquaculture as part of the European Seafood Market

The European finfish aquaculture industry is now making a significant contribution to the general seafood sector. The industry has been dominated by salmon and trout production, but there is now significant production of seabass, seabream and turbot. Also taking into account carp and eels (not shown in Table 1), the total contribution from aquaculture amounted to a value of some **£1,984 million** in 1999.

Table 1 Principal European Aquaculture Production

SPECIES	PRODUCTION (1999) (Tonnes '000)	VALUE (1999) (€M)
Atlantic Salmon	580	1856
Rainbow Trout	318	700
Seabass	39	207
Gilthead Seabream	67	274
Atlantic turbot	3.4	28

Source: Federation of European Aquaculture Producers (FEAP)

For future aquaculture diversification and development, **Atlantic halibut** *(Hippoglossuss hippoglossuss)*, **cod** *(Gadus morhua)* and **turbot** *(Pseta maxima)* are considered to be the most promising species for aquaculture in the cooler ambient seawater conditions around the coasts of the UK and Ireland. The growth rate of these species, under the prevailing temperature conditions, is likely to be fast enough to ensure profitable operations. Other species which are being considered for aquaculture include **lemon sole** *(Microstomus kitt)*, and **haddock** *(Merlanogrammus aeglefinus)*.

1.2 The Aquaculture Development Effort

The industrial effort which is underway to develop aquaculture for these species in UK and Ireland is well supported by a range of public and private bodies, including (although not exclusively) the following:

- British Marine Finfish Association (BMFA)
- Sea Fish Industry Authority (SFIA)
- Highlands and Islands Enterprise (HIE)
- Highland Council
- Irish Sea Fisheries Board (BIM)
- Udaras na Gaeltachta
- Ministry of Agriculture Fisheries and Food (MAFF)
- Scottish Executive Rural Affairs Department (SERAD)

The activities of these groups are varied, and encompass: technical R&D, structural funding support, market development, political representation and commissioned market and economic analysis

1.3 The Importance of Market Planning for Future Aquaculture Development

The aquaculture industry has traditionally farmed species of fish which were perceived as being valuable in the market - thus offering a higher potential for economic return. The industry has also focused so far on species which are technically amenable to production with relative ease - thus with the prospect of achieving relatively low production costs. This straightforward approach has served to enable the development of the successful species such as salmon and trout, but is perhaps rather limiting in terms of future development of aquaculture, and particularly diversification into new species, because:

1.3.1

The economic principles of supply/demand/price relationships apply to fish as they do to most other products, and become particularly relevant once production of farmed fish increases. The production level at which they begin to impact on market values of fish may vary from species to species, but there does appear to be an inevitability to the process - as production increases, selling price of the fish declines.

1.3.2

The species most amenable to intensive farming are already being farmed, and have demonstrated a capacity for production cost reduction to meet changing circumstance in terms of market values.

1.3.3

The "new species" which are being considered for aquaculture in the UK and Ireland are technically more difficult to produce, and in some cases (e.g. halibut) a long development lead-time has been encountered. Such species will have potentially high production costs, and there is thus a need to sell them at a high price in order to achieve pay back.

1.3.4

The challenge is to develop a marketing and selling strategy for "new species" aquaculture at an early point, in parallel with the technical developments. The goal is to match the likely market values at increasing volumes with the likely production costs of the species as the industry matures - and ultimately demonstrate a long-term profitable production sector.

1.4 The Aquaculture Species Market Survey

As part of the overall strategy highlighted in 1.3.4, this project will attempt to obtain information about the market prospects for key marine fin fish species which are considered to be prospective candidates for aquaculture in the United Kingdom and the Republic of Ireland. The specific objectives of the project include:

Obtain official **and** anecdotal information about:

- Volumes of product moving through market – by market segment and season (if possible)
- Values of product moving through market – by season and market segment, having regard to the price chain from producer to consumer
- Origins of the product
- Trends in product format, specification & processing – by market segment
- Perceptions of the volume growth potential of the product – by market segment, and in relation to value/specification/availability

The broader objectives take account of the view that "new species" aquaculture must learn from the experience of the salmon and trout farming sectors, and must be subject to market pull rather than technology push. It is expected that such an approach will create a sustainable demand for high value products derived from aquaculture.

The project partners are: British Marine Finfish Association **(BMFA)**; Sea Fish Industry Authority **(SFIA)**; Irish Sea Fisheries Board **(BIM)**.

2 PROJECT SCOPE AND METHODOLOGY

2.1 Species Scope

The study focuses on the following species for investigation, broken into two broad categories:

- **Atlantic halibut** and **Atlantic turbot** - study market trends and opportunities in detail
- **Pacific halibut, lemon sole** and **seabass** - study market trends and opportunities in general

The rationale for this choice and grouping of species is as follows:

- Atlantic halibut and turbot are the most promising likely high-value candidates for intensive aquaculture in the UK and Ireland, given the prevailing temperature conditions for ongrowing found in both countries
- Cod would also be an appropriate species from a farming point of view, but the recent HIE/Wood survey has covered the prospects for this species in some detail
- Lemon sole from aquaculture is being requested by large processors and retail multiples in the UK. One farming company has responded by rearing lemon sole in its hatchery, although there is as yet little indication of the duration and effectiveness of the growout phase for this species. In addition, with the exception of the stated interest by the processor and multiple, there is little understanding of the market opportunity for farmed lemon sole in the UK and Europe. This study will attempt to address some of this lack of information
- Seabass is unlikely to be farmed in the UK in ambient temperatures (although there is now one recirculation farm in Wales), but is now being regularly imported from farms in the Mediterranean. As a high value species, seabass is probably reaching the plates of the same types of consumers one would be targeting for farmed halibut and turbot, and consequently an understanding of how this species is performing in the market would be of interest to this study
- Pacific halibut, whilst not currently a farmed species, is an almost direct substitute for Atlantic halibut in the market. Anecdotal evidence of increased availability of fresh/chilled product in UK markets is of interest to prospective halibut farmers, and thus a study of this trend will be informative for this report

2.2 Geographic Scope

The study considers the markets for these high value marine fish species in a number of European countries. The geographic spread of the project includes: United Kingdom, Republic of Ireland, France, Spain and Germany.

2.3 Market Segments

The study considers some of the following market segments within the overall seafood supply chain in each country: processors/importers, inland markets, retail multiples, pub groups, food service suppliers, contract caterers, fishmongers, national hotels, good restaurants and pubs, aquaculture companies.

2.4 Information Gathering Methods

The project has obtained information in the following ways:

- Field Interviews - by market segment and by country. The survey was undertaken by the field officers provided by the project partners, and took the form of face to face interviews using a standard format questionnaire (See APPENDIX 1). Appointments were made in advance with respondents, and they were then sent a brief introductory letter explaining the background to the project. During the interview, the respondent was given a copy of a blank questionnaire so that he/she would understand the "shape" of the interview as it was progressing. Not every part of a single-format questionnaire might be appropriate to the market segment being interviewed, but in practice this did not prove to be a major problem for the interviewers or the respondents. The questionnaire had been carefully designed, piloted by all the field officers, and then refined into the final format during a team meeting
- Summary of findings from existing reports commissioned by the aquaculture sector

- Analysis of trends in other aquaculture sub-sectors (FAO & FEAP data)
- Up to date information from current statistical databases - presentation, analysis and interpretation
- Specific discussions with key industry players
- Other sources of data on seafood or specific sector trends

2.5 Scale of Sampling

The study carefully considered the number of contacts and interviews which might be undertaken in each country, and related this to the availability of resources (manpower) within the Team. Over 150 interviews were conducted across the countries identified in Section 2.2.

2.6 Currency and Weight Units

This study has elected to convert all currencies, quoted in the individual responses, into Sterling (£). It was felt that conversion into a single familiar currency would facilitate rapid comparison of the relative values of product in different countries and positions in the seafood supply chain. The conversions used were based on the **http://www.x-rates.com/calculator.html** web page on 29 July 2000:

- £1 = 1.28 Irish Punts
- £1 = 10.66 French Francs
- £1 = 3.18 German Marks
- £1 = 270 Spanish Pesetas
- £1 = 1.63 Euro, 3.58 Dutch Guilders, 13.31 Norwegian Kroner, 1.50 US$

Care ought to be exercised in interpretation of the values of the various products. Straight currency conversion may facilitate comparison, and may be a useful indicator of export values at current exchange rates, but it does not necessarily reflect the real inherent "value" of the products within the respective foreign countries. Where appropriate, data has been converted from pounds (lb) to kilograms (kg).

3 INTRODUCTION TO FIELD SURVEY DATA

The field survey undertaken for this project has provided a considerable amount of information, both numerical and in terms of subjective comments. A number of broad assumptions have been made during the correlation of the returned questionnaires, and there are a number of areas in which caution should be exercised in relation to the statistical or other validity of the information.

3.1 Statistical Validity of Numerical Data

All of the numbers presented in Sections 4-9 must be treated as **indicative only**, for the following reasons:

- The numerical data has originated from individual in face-to-face discussions, and corroborating data is not necessarily available
- The amount of numerical data, within market segments varied depending upon a number of factors, and any attempt to assess totals, means or averages has been rather subjective on the part of the authors

3.2 Non-Attribution

The names of the interviewee companies and organisations are **excluded** from this report in order to preserve the non-attribution undertaking which was fundamental to the field survey work. In each country and market segment, considerable effort has been made to identify and interview the key companies involved, and the overall validity of the information gathered is considered to be high.

3.3 Presentation of the Results of the Field Survey

The raw questionnaire data have been both converted into Microsoft Word format, and further correlated into numerical summaries using Microsoft Excel. Neither the raw data nor the first and second-level data analyses are presented in this report, since they occupy considerable space. The survey results are presented in overall summary form in Sections 4 to 9.

3.4 Interpretation of the Results of the Field Survey

Whilst the survey has provided considerable information, the variations in quality and coverage of the numerical data is such that any attempt at direct statistical interpretation might be potentially misleading. Consequently the information provided in Sections 4 to 9 must be considered as interesting and indicative, but the study has relied upon subjective judgements on the part of the author in arriving at overall conclusions or highlighting trends.

Any opinions offered in this report must be treated as those of the author alone, based upon interpretation of the survey results, and no liability will be accepted for commercial judgements derived from those opinions.

3.5 Guidelines on Interpretation of Data Presented Below

- Volumes quoted do not necessarily include information from all the respondents
- The respondents do not cover the whole market segments – volumes are thus indicative only
- Volumes, prices or specifications in italics mean there is a chance that Pacific halibut data is included in with Atlantic Halibut
- Short Codes Used:
  - NA = not applicable, W = wild, F = farmed, FE = fresh, FO = frozen, P = portions, tpa = tonnes per annum, tpw = tonnes per week
  - Numbers (followed by "kg") relate to preferred size ranges of the fish in question

4 UNITED KINGDOM - FIELD SURVEY

4.1 Background on UK Seafood Sector

The UK is a major producer of seafood, but is also heavily dependent on imports. 1999 UK seafood production (excluding freshwater species) amount to 466,427 tonnes, while imports total 484,418 tonnes. With UK exports equal to 269,475 tonnes in 1999, the balance of trade is overall negative.

In terms of demand, two separate markets need to be addressed: retail and catering.

The GB retail market has passed the one billion pounds mark according to Taylor Nelson Sofres data (year to August 2000). This was achieved through 204,821 tonnes of seafood (including freshwater species) being bought in grocery.

The nineties were characterised by fluctuating volumes of seafood being purchased in the retail market, ultimately resulting in slightly higher volumes in 2000 than in the early nineties. This does however mask slumping sales throughout 1998 and 1999 when total seafood purchases declined by –3.5 % and –5.6% respectively. One of the reasons put forward to explain the poor performance suggests that consumers were increasing their purchases of beef and other meats, partly because of the increased price of fish but also through re-entering the meat market after the BSE crisis.

Since 1999 though, the recovery for seafood is well under way. In the latest year, total volume was up 2.4%, and value 4.3%.

The retail market as a whole is traditionally divided into three sectors: wet/smoked (also referred to as fresh or chilled), frozen, and 'defined chilled', which consists of chilled value-added products, most of them in the form of ready-made meals. All sectors encompass both finfish and shellfish.

Consumption data to August 2000 highlights a very positive performance for the wet/smoked sector (with year on year volumes up +4.5% and value up +7.4%). The frozen market volumes remain static year on year, whilst associated income grows by 1%. The best performing sector in terms of growth is 'defined chilled'. This sector is thriving, as consumers increasingly demand quick and convenient products that require no or little preparation. This is true of seafood and other protein sources.

Whilst it is an area with undeniable potential, the 'defined chilled' category remains the smallest sector in the retail fish market, accounting for 5.4% of expenditure on seafood in the year to August 2000. In comparison, the more traditional sector of wet/smoked fish accounts for 36.4% of value for fish and 8.1% for shellfish. The retail market is still dominated by frozen products (half of all seafood income is generated by frozen products).

It is worth underlining the good recent performance for wet/smoked fish. In this sector, the top three species are salmon, cod and haddock. Spend on salmon is still growing (+3 % year on year) albeit slower than last year. Cod and haddock sales are decreasing slightly, but not as severely as a year ago.

Whilst 56% of total fish and fish products in the UK are bought by households, the remainder is accounted for by the catering market. Food Intelligence figures for 1999 show the sector undergoing a slight decrease in volume of seafood throughout the nineties. However, fish has held its share of total protein throughout the entire period.

An additional positive element is the ever-growing demand of the catering sector for innovative ready-prepared, added value seafood meals. These are particularly suited to pubs, which continually focus their strategy towards pushing up food sales through improved menus.

As far as source of supply is concerned, UK aquaculture contributes a significant amount of fish and shellfish to the total national production. In 1998, aquaculture yielded as much as 111,000 tonnes of Atlantic salmon and around 16,000 tonnes of rainbow trout. The most recent developments include the first ever production of farmed cod earlier this year. This represents a significant step in aquaculture production and is anticipated to become more and more prominent as it addresses issues like low stocks and dependence on imports.

4.2 UK Survey - Overview

4.2.1 Atlantic Halibut

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	12	108	£7.53 (Farmed £5.50)	W, FE, 1-5 kg
Inland Markets	3	29	£7.00	W, FE, 1-5, 15-30 kg
Retail Multiples	5	45	£7.75	W, F, FE, 0.5-1.5, 7-9 kg
Food Service Supply	2	11	£6.40	W, F, FE, FO, 5-9 kg
Fishmongers	5	5	£9.90 (Farmed £6.00)	W, F, 5-10, 14-16 kg
Fish & Chip Shops	9	0	NA	
Restaurants & Pubs	6	NA	£9.00	W, FE, P

Comments:

Volumes shown are indicative only, but not apparently very large with respect to the possible aspirations for a new aquaculture sector. Almost all respondents were positive about the idea of farmed halibut, but they highlighted issues of price and quality (not too fatty, good flavour).

Price transfer down the supply chain is not particularly evident from the interviews, although the buying-in prices for retail multiples (but mixed with Pacific halibut) and restaurants are shown. We can speculate a final price to the consumer of some **£64** per kg for skinless/boneless halibut flesh in a restaurant (based on £13 per cover for the fish alone, serving 200g of flesh).

Note the quoted prices of existing farmed (Norwegian) halibut in the market - £5.50 to £6.00 per kg, and corroborated by other information presented in Section 9.2.

4.2.2 Pacific Halibut

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	12	14	£6.50-7.50	W, FE, 1-5, 3-15 kg
Inland Markets	3	7	£7.83	W, FE, 10-30 kg
Retail Multiples	5	*See 4.2.1*		
Food Service Supply	2	*See 4.2.1*	And £8.05	W, FE & FO, 5-9 kg
Fishmongers	5	*See 4.2.1*		
Fish & Chip Shops	9	0	NA	
Restaurants & Pubs	6	NA	NA	NA

Comments:

Volumes are indicative only, but apparently not large compared with Atlantic halibut. Prices are quite similar to Atlantic halibut, or perhaps even higher in some cases. One respondent commented on a thicker fat layer in a fish sourced from Alaska. Anecdotally, but not overtly confirmed within the survey, there can be a trend for some merchants to buy frozen Pacific halibut, thaw and portion it, and sell it on as fresh Atlantic halibut.

4.2.3 Atlantic Turbot

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	12	112	£6.45 (Farmed £6.00)	W, F, FE, var. sizes kg
Inland Markets	3	14	£4.00-7.00 (Farmed £6.21)	W, F, FE, 0.5-1 & 1-3 kg
Retail Multiples	5	23	Farmed £6.45	W, F, FE, 0.8-1.2 & 2-4
Food Service Supply	2	25	Farmed £5-6.50	W, F, FE, 1-2 & 2-4
Fishmongers	5		£6.00-8.00 Farmed £6.50	W, F, FE, 1-2 & 2-4
Fish & Chip Shops	9	0	NA	
Restaurants & Pubs	6	NA	£9.99 £16 for portions	W, F, FE, 8oz portions bigger fish

Comments:

Volumes are indicative only, but not large in relation to overall EU turbot aquaculture. Note that prices are generally similar to or slightly lower than halibut – yet turbot is perceived as **"too expensive"** by many catering outlets. This is partly confirmed by the high buying-in price to pubs/restaurants – perhaps implying higher margins being taken elsewhere in the chain. Also, the fillet yield is lower than for halibut, and thus the final product is **indeed** more expensive in terms of fish flesh. Aquaculture was quite positively viewed, but normal concerns about lowering price and improving quality were expressed, also about the thin nature of farmed turbot re. final portion specification.

4.2.4 Seabass

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	12	Not quoted	£4.70 farmed	Commonly 400-600g
Inland Markets	3	"A must have"	Not quoted	French farmed is best
Retail Multiples	5	Mixed	Not quoted	More popular in SE
Food Service Supply	2	A lot	Not quoted	Farmed better than wild
Fishmongers	5	All use	Not quoted	Very positive
Fish & Chip Shops	9	NA	NA	
Restaurants & Pubs	6	Most use quite a lot	£8.00-8.50 £14 for portions	2 x 4oz fillets makes 1 portion

Comments:

Volumes are not quoted, but seem to be quite significant now. Good availability and lower prices have apparently made farmed seabass almost "an essential" in most cases. **NOTE:** as with turbot, fillets from farmed seabass are not large, yet the product still appears to sell well – perhaps lower price and consistent supply have encouraged retailers & caterers to develop and promote methods of presenting or serving.

4.2.5 Lemon Sole

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	12	Very mixed	£2.00-4.50 £2.50-3.00 is maximum	
Inland Markets	3	Mixed	Not quoted	Plenty available, prices can drop very low
Retail Multiples	5	Positive	Not quoted	Caution on fat levels
Food Service Supply	2	Not quoted	Not quoted	200g - a lot of wild available
Fishmongers	5	Most positive	Not quoted	Want bigger, year round, not fatty
Fish & Chip Shops	9	NA	NA	
Restaurants & Pubs	6	Half-used quite a lot	£5-70	500g fish

Comments:

Volumes are not quoted, but this is clearly an important species for some sectors, although not all. There is apparently quite a seasonal fluctuation in supply, which users would like to smooth out. However, there are also glut periods when prices drop very low.

The species is not "robust" in cooking – good for starters in restaurants, rather than main courses.

4.2.6 Comments on Aquaculture in General

There is a general consensus, amongst almost all the market segments and respondents, that farming of true marine species is **inevitable and important** for the future of the seafood industry.

The desires of the respondents appear to encompass the following broad areas:

- Produce good quality fish – not fatty, good taste, no food scares or use of chemicals, sustainable in terms of fish feeds used, welfare-friendly, environmentally friendly
- Produce fish with year-round reliability of supply
- Produce cheaper fish
- Produce bigger fish (particularly in the case of existing farmed turbot, and in the possible addition of farmed lemon sole)
- Pay attention to current trends in traceability, portion control, processing standards (HACCP), etc

4.2.7 Interpretation of UK Survey Results

Some respondents have commented on aquaculture products by-passing their niche in the seafood supply chain. If marine aquaculture in the UK is to succeed it will indeed have to find the most efficient "farm to fork" routes – but it is important to remember that aquaculture in the near and medium future is only going to represent a small percentage of total UK seafood supplies.

Restaurants and pubs which consider small volumes of Atlantic halibut and turbot "expensive" at £9-10 per kg or £16-18 per kg of pre-portioned material, seem inclined to now consider farmed seabass a "staple" at prices around £8 per kg. Price is clearly an issue, but as some respondents commented, simply offering large volumes of farmed fish at low prices effectively "downgrades" the perceived value/quality of the

product in the minds of consumers. Importance is therefore given to the following attributes: high quality, good farming image, regularity of supply, product size for which a compromise of feasibility with customer acceptability has been developed, sensible and stable pricing.

Atlantic halibut does seem to be an ideal potential species for the UK market: quite familiar, already used by many, capable of producing "thick portions". There are still apparently good opportunities for selling fish in the winter when wild supplies are scarce. In addition, there is the opportunity to develop a new 52-week per year business for the cultivated product. Attention should be paid to fat levels in current Atlantic halibut farming – diets with 26% lipid may offer some growth/food cost benefits, but might not produce a good quality product.

Atlantic turbot could be sold in greater volumes if:

- Prices were actually slightly lower ***and*** **perceived** to be lower by end users, particularly in relation to the lower fillet yield
- A compromise could be found on the acceptability of the thin fillets which result from farmed turbot.

Lemon sole would certainly be of interest to many in the seafood market, but care should be taken over the seasonal gluts of wild supply and the low nature of prices at some times of the year. Possible opportunities for "close-season selling" and more direct supplies to final users, in order to improve margins to farms. Ability to grow larger fish would help.

Other species mentioned by respondents included **cod** and **haddock** for the wider volume markets, and species such as **monkfish**, **seabass** and **Dover sole** in the more upmarket segments.

5 REPUBLIC OF IRELAND – FIELD SURVEY

5.1 Background on Irish Seafood Sector

The most recent figures available from the Department of the Marine and Natural Resources show that total seafish landings including wild salmon were valued at £152 million at first point of sale in 1998. Some 6,000 fishermen were engaged on board fishing vessels to harvest the 319,200 tonnes of fish, with 71% landed into Irish ports and the remainder sold directly when Irish vessels docked into Scotland, Norway and Spain. The landings brought ashore in Ireland are sold at fish auctions, through fishing co-operatives or directly to processors and exporters located around the coast.

The growing aquaculture sector reached an output level of 46,600 tonnes, valued at £71.6 million in 1999. Salmon and trout account for the bulk of aquaculture production. There were some 2,600 people involved in farming finfish and shellfish species in remote locations around the coast in 1999. There are now 300 units cultivating Pacific oysters, which find ready acceptance on the French market. Bottom mussels are exported in fresh form while rope cultivated mussels are a supply source for thriving processing operations mainly in the south west of Ireland.

The Irish seafood industry provides employment for 14,700 people around the coast from Donegal to Louth. It is a significant source of income in peripheral and disadvantaged coastal regions.

Consumption of seafood here is below average EU levels but has nevertheless been growing steadily to its present level of 8.8kg per person. This increase has been due mainly to growth in the catering sector and in the market for convenience foods. The Irish seafood market is estimated to be worth some £170 million per annum at final point of sale.

The major export markets for top quality Irish seafish and shellfish are France, Spain, UK, Germany and Belgium. In 1999, Irish seafood exports are estimated at £208 million.

The fish processing sector provides direct employment for 4,100 people. Most of the activity is geared to the export market, particularly for herring and mackerel where products are sold to Europe, South-east Asia and Africa. Irish processors are successfully producing and marketing a wide range of branded consumer products based on whitefish, shellfish and salmon.

The seafishing industry and its various sub sectors also generate indirect employment for 2,000 people in a range of activities from marketing to equipment supplies, chandlery and transport.

5.2 Irish Survey - Overview

5.2.1 Atlantic Halibut

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	6	Several tonnes	£6 (Sell at £9)	W, FE, 3-4 & 20-40 kg
Retail Multiples	3	No data		
Contract Caterer	1	No data		
Fishmongers	2	Small amount	£13	W, FE
National Hotels	3	Small amount	£11-20	For frozen 8-10 oz (probably Pacific)
Inland Markets	2	No data		
Restaurants & Pubs	7	1 uses 3 tpa	£8.60-11 (450g fillets £14.61)	W, FE, fillets or 7 kg+ whole fish

Comments:

Volumes are indicative only – but not large with respect to aspirations for a new aquaculture sector and domestic market.

Almost all of the respondents were positive about the idea of farmed halibut, but at cheaper prices e.g. if was £4.00 to £4.50 per kg "could sell a lot more".

Price transfer down the supply chain is rather more available for this data set.

5.2.2 Pacific Halibut

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	6	One used c. 5 tpa	£5.86-6.05	W, FE/FO, 20 kg
Retail Multiples	3	No data		
Contract Caterer	1	No data		
Fishmongers	2	No data		
National Hotels	3	*See above*	*See above*	*See above*
Inland Markets	2	Small amount	£5.15-9 whole	
Restaurants & Pubs	7	No data		

Comments:

Volumes are quite low. Prices are quite similar to Atlantic halibut.

5.2.3 Atlantic Turbot

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	6	3 used c. 36 tpa	£5.20-7.20 (sell at £10.65) Farmed £6.60	W, F, FE, 1-2 & 4-6 kg
Retail Multiples	3	< 5 tpa	Whole £8.00, 4-8 oz fillets £7.70	W, FE, 2-4
Contract Caterer	1	No data		
Fishmongers	2	c. 9 tpa	£5.15-6	W, FE, 0.5-1, 1+ and 4-7kgs
National Hotels	3	< .5 tpa	Frozen fillets £12, fresh £13.15	W, FE & FO fillets of 120g & 450g
Inland Markets	2	c. 13 tpa	£5.15-8.60	W, FE. 0.5-1, 1+
Restaurants & Pubs	7	c. 6 tpa	Buy 200g fillets £14.60 Sell portion £12-18	W, FE

Comments:

Volumes are indicative only – not large in relation to overall EU, but all segments in Ireland seem relatively quite knowledgeable about turbot. Note that prices are generally similar to those in UK (whole fish and portions), and on-balance rather cheaper than Atlantic halibut in Ireland – but rather more commonly consumed, perhaps.

Aquaculture was quite positively viewed, but normal concerns about lowering price and improving quality were expressed. The limited demand in Ireland was mentioned, but so too was the export potential of turbot

5.2.4 Seabass

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	6	2 used c. 8-20 tpa	£5.00-8.00 (sell at £7.00-8.50)	
Retail Multiples	8	1 used 2.5 tpa	£7.70 for 8-12oz fillets	
Contract Caterer	1	No data		
Fishmongers	2	1 used 1 tpa	£6.70	F, FE
National Hotels	3	Small amount used regularly	£6 for 7-9 oz steaks	
Inland Markets	2	1 used 2 tpa		
Restaurants & Pubs	7	5 used it rarely	Max would be £6.80 for farmed £7.70 wild	WI, FE

Comments:

Volumes are not quoted, but the species is quite well used. Restaurant would pay in region of £6-6.80 per kg for whole farmed seabass (compare with £8.60-11.00 for wild Atlantic halibut)

5.2.5 Lemon sole

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	6	4 used reasonable quantity	£1-2 (sell at £5)	
Retail Multiples	9	All used, 1 at 300 kg per week	£5.84 for 4oz portions (Sell £10)	
Contract Caterer	1	No data		
Fishmongers	2	1 used 15.5 tpa	Can buy at £0.56 (sell fillets £4.55)	
National Hotels	3	Small amount	£3.35 for fillets £1.70 whole fish	FE, FO
Inland Markets	2	No data		
Restaurants & Pubs	7	2 used reasonable quantity	(Sell main course for £11.31)	Some prefer Dover or black sole

Comments:

Clearly some use, but rather more comment about alternative preferences (megrim, witch, Dover and black sole) than in UK survey. Stated purchase prices were perhaps slightly lower than UK survey. Not too much interest in aquaculture of this species was expressed.

5.2.6 Comments on Aquaculture in General

General comments about aquaculture mirror those seen for the UK survey, across all the market segments (see 4.2.6).

5.2.7 Interpretation of Irish Survey Results

The scale of the Irish domestic market for high value fish species is somewhat more limited than the UK (and other European countries), but the economy of the country is reported to be performing well, and the selling opportunity for "aspirational" seafood products should not be overlooked.

On balance it appears that turbot is rather more appreciated than halibut in the Irish market. The export potential of aquaculture production in Ireland is flagged-up as an opportunity, and with the experience of the Irish salmon farming sector this should be entirely practical.

In the author's experience the production "opportunity" remains very positive in Ireland – sea water temperatures in different parts of the coast would tend to suit production of both **Atlantic halibut** and **turbot**.

6 SPAIN - FIELD SURVEY

6.1 Background on Spanish Seafood Sector

Spain's total production of edible fishery items in 1997 was estimated at 1.2 million tonnes (940,000 fresh/frozen, 235,000 canned and 44,000 cured). Imports were estimated at 957,000 tonnes, while exports were about 460,000 tonnes, mainly as fresh/frozen.

Domestic consumption was 1.7 million tonnes, with a per capita consumption of 48 kg per person (the highest in EU, and second-highest in world). 50% of seafood is consumed as fresh fish, 30% as shellfish, 15% as frozen fish and 8% as canned products.

Hake dominates the Spanish fish market, and the country absorbs about 50% of the total EU supply of this species. There is increased dependence upon hake imports from S. Africa, Namibia and S. America (Chile and Argentina).

NOTE: Atlantic halibut is not well known in Spain, but there is a considerable usage of Greenland halibut, landed by Spanish boats. Much of the information provided for this survey, under the heading of Atlantic or Pacific halibut, probably relates to Greenland halibut. Commentary on the various species will be made where appropriate.

6.2 Spanish Survey - Overview

6.2.1 Atlantic Halibut

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	10	Quite small	£4.07 - £4.63	No details
Retail Multiples	3	> 500 tpa Greenland	£4.00 for fillets	Could sell more if price lower. Mainly fillets
Food Service Supply	1	18 tpa Greenland	£2.59 for fillets	No comment
Fishmongers	3	Little - Greenland	£2.87 for fillets	No comment
Restaurants & Pubs	2	One uses 100kg pa (Greenland)	£4.44 for fillets	No comment

Comments:

Atlantic halibut appears to be virtually unknown in Spain, across all market segments. Greenland halibut, as a relatively cheap product, does appear to have good utilisation in Spain. Frozen fillets would be the main way of using halibut, and they can be sold as "sole" fillets.

6.2.2 Pacific Halibut

See above (6.2.1), since Pacific halibut appears to have no more presence in the Spanish market than Atlantic halibut.

6.2.3 Atlantic Turbot

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	9	>170 tpa	£7.00-8.00 wild £4.36 farmed	0.5-1 for one person, then grades up to 3-4 kg
Retail Multiples	4	≥329 tpa	£4.44 farmed	See above
Food Service Supply	1	>100 tpa	£4.44 farmed (range £3.70-£5.56)	All sizes available, but prefers 2-3 kg
Fishmongers	3	>0.6 tpa	£5.19 farmed	Prefer fish 1 & 2 kg
Restaurants & Pubs	2	One uses 150kg pa	£4.44 farmed FE, £3.33 for FO fillets	

Comments:

Volumes are indicative only. Respondents were quite positive about further aquaculture supply, but many are now making a distinction between 2 "types" of turbot – wild and farmed. Lower prices would help to move more farmed turbot. Also, better availability of "portions" directly to the user would help to move more. Note the lower prices for turbot, compared with the UK & Ireland (but caution on exchange rate relevance in terms of domestic economy). Note the rather consistent and stable prices quoted by most parties for farmed turbot – significant local aquaculture has now set a more-or-less standard price for the product. Farmed turbot is very appropriate for the restaurant trade – consistent size and availability. There are peak seasons for turbot – summer and Christmas.

6.2.4 Seabass

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	9	No details, but very positive	400-600g @ £3.15, 600-800g @ £4.44	"Quality and value is good"
Retail Multiples	4	No details, but use	No details	Prefer 500-600g. Some concern re. quality
Food Service Supply	1	Use	No details	"Farmed is too fatty"
Fishmongers	3	Positive	No details	Farmed is better than wild (no muddy taste, better shelf life)
Restaurants & Pubs	2	One likes, other thinks is too expensive	No details	Inshore wild bass can have a "petrol" taste – farmed is better

Comments:

Volumes are not quoted, but quite well used. Mixed views on quality.

6.2.5 Lemon Sole

Comments:

Most Spanish respondents either did not know this species, or had no opinion about it. In two cases they commented that it had a poor image, and one respondent said he virtually gave it away if he received any.

6.2.6 Comments on Aquaculture in Genera

General comments about aquaculture were exceptionally positive across almost all of the market segments, and quite well thought-out by the respondents. See 4.2.6. (UK summary) for some of the more common requests for quality, size, prices etc – very much mirrored by Spanish respondents. Unique and interesting additional comments included:

- A plea for further national investment by state and private organisations in this sector
- Aquaculture has helped to maintain protein supplies to the general public, even at recent levels of production, and this positive trend will be increasingly important in the future
- More aquaculture is needed in order to let wild stocks recover – an **environmental**, **bio-diversity** and **sustainability** issue

6.2.7 Interpretation of Spanish Survey Results

The Spanish market is large and important, and clearly values the concept of increased aquaculture. From the UK and Irish producer perspective, several points emerge:

- There is not an inherently good market for Atlantic halibut in Spain at the moment – the broad species image is rather overwhelmed by the Greenland halibut situation
- A demand could perhaps be created, but might require considerable promotional effort
- There is clearly good utilisation of turbot, although the local aquaculture production has resulted in a rather stable supply and "value perception" situation for this species – further expansion of volume is likely to be price-driven
- Current exchange rates are such that the value of farmed turbot in the Spanish market is rather lower than would-be exporters from the UK or Ireland might prefer

7 FRANCE FIELD - SURVEY

7.1 Background on French Seafood Sector

Total French seafood consumption is estimated at 1,150,000 tonnes, which represents 21 kg per person. This includes household consumption, for which detailed data are available from the consumer survey agency SECODIP, and institutional use, for which there is no such information available.

Seafood production and demand in France remained stable in 1998, although fish stocks are declining and prices are rising. Total French seafood production in 1998 (including wild catch and aquaculture) amounted to 819,869 MT. Imports amounted to 892,004 MT and exports 361,790 MT. It is likely that the wild catch will slowly decline and that aquaculture will make some progress. Total French demand is expected to be unchanged, with some gradual shifts in product categories over the next two years.

French consumers are increasingly turning to fresh fish and consumer-ready products, which offer product diversity and are benefiting from improvements in quality. In particular, it is likely that these products will increasingly be consumed year-round rather than on a holiday-season basis. Total seafood products sales in French market are quite stable, except for consumer-ready products whose sales rose sharply in 1998 (39.5 per cent more than last year). These products benefit from growing diversification and good advertising. French consumption of consumer-ready products was more than 20,000 MT in 1998.

Species	1997	1998
Lepidhorombus	3,645	3,500
Halibut	685	263
Plaice	5,170	5,209
Sole	7,869	7,823
Total	17,269	16,795

Note: *It is assumed Lepidhorombus means turbot.*

Aquaculture in France has not had the success expected when it started around 30 years ago. This seems not to be due to production costs, as is frequently heard, because French companies are competitive. The reason seems to be the lack of entrepreneurship and reduced access to production sites. French legislation covering aquaculture is also very complicated. Shellfish farming employs 18,500 people and production, mainly oyster and mussels, reached 150,000 MT in 1998. Fish farming employs 4,500 people and produced 65,000 MT in 1998. The main species farmed are trout, bass, sea-bream and turbot.

Quality standards are improving, with some producers using the "Red Label" standard for bass. Current development of French aquaculture is slow and competition from other countries (in particular Greece and Turkey) is feared.

NOTE: Atlantic halibut is not particularly well known in France, and commentary on the various halibut species will be made where appropriate.

7.2 French Survey - Overview

7.2.1 Halibut in General

Comments:

Atlantic halibut is commonly not distinguished from Pacific halibut amongst the respondents, although unlike the Spanish situation, there does appear to be differentiation from the black halibut (Greenland halibut). Very little numeric data about halibut was gleaned from the survey, but the following points were made:

- One processor/importer welcomed the concept of farmed halibut because the price for wild fish was "very high"
- One retail multiple was using **black halibut** 400g fillets, bought fresh for £4.22 per kg on average

- One retail multiple apparently purchases about 250 tonnes of Atlantic halibut each year, and is mainly interested in portions
- One food service supplier used a little of the **same product** (fillet sizes 300-500g and 500-600g), at quoted prices of £4.22 per kg. Rungis prices for the filleted product are quoted at £5.63 per kg

7.2.2 Atlantic Turbot

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	3	One used 7.5 tpa	£7.79 wild	Prefer 4-5kg
Inland Markets	2	No firm data	No data	No comments
Retail Multiples	2	>31 tpa	£5.68 (farmed)	1-2 kg
Food Service Supply	3	>55 tpa	£5.25-5.72 (wild)	1-2 & 2-3kg
Fishmongers	1	10 kg pw		Prefer fish 1-2 kg
Restaurants & Pubs	4	One uses c.10 tpa	Rungis price wild £8.63	Would use more if could buy for £5.63 for 1 kg fish

Comments:

Volumes are indicative only. Respondents were fairly positive about further aquaculture supply, but some comments were made about delicate flesh which "bursts" on cooking, and about small sizes of fillets from farmed turbot. Lower prices would help to move more farmed turbot – "a drop in £1.40 per kg would move product into considerably greater volume niche". Offering more product at times of peak demand (Christmas & Easter) was viewed as a positive option. Retail multiples would be interested in portions of turbot, and there is apparently a strong demand reaction to price promotions.

Note the prices for turbot appear to be about £1.00 per kg lower than those pertaining in the UK & Ireland, compared with the even lower prices in Spain (but caution on exchange rate relevance in terms of domestic economy)

7.2.3 Seabass

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	3	Not much comment		
Inland Markets	2	No data		
Retail Multiples	2	One used 2 tpw	£2.84-£9.38	300-400g fish, mainly in summer
Food Service Supply	3	One used 2 tpw	No data	Uses French farmed – cheaper than Greek
Fishmongers	1	No data		
Restaurants & Pubs	4	Two use & like farmed	No data	

Comments:

One large retail multiple chain sells about 70% of its seabass in the smaller size range – 300-400g. The larger fish (400-600g) are apparently in demand for barbecuing. The prices quoted above are generally for wild seabass, and can fluctuate considerably depending upon supply.

7.2.4 Lemon Sole

Comments:

There was little information given about lemon sole. Some respondents stated they preferred Dover sole, but others used lemon sole in size grades 400-600g and 600g+.

7.2.5 Comments on Aquaculture in General

General comments about aquaculture were generally quite positive across most of the market segments. See 4.2.5. (UK summary) for some of the more common requests for quality, size, prices etc – generally mirrored by French respondents. Unique and interesting additional comments included:

- Two of the market segments clearly saw a threat to their business from aquaculture, and were thus rather cautious on that account
- There has been some rather negative TV coverage of Greek bass and bream farming recently, so great care is needed on the "image" of future aquaculture
- The industry will need much more effort to promote high value species
- There is a tendency for current flat fish farmers to sell their product too soon after harvesting – leave it for a few days
- Quality and good grading will be the key for the restaurant trade

7.2.6 Interpretation of French Survey Results

The French seafood market, like the Spanish, is relatively large and quite important in European terms. Several points appear to emerge from the survey:

- Although once again being cautious about the use of a single currency exchange value, prices for turbot appear to be more in line with the UK and Ireland than is the case in Spain. On that basis, France would tend to be a better export market than Spain
- Atlantic halibut is clearly not valued or appreciated to any great extent amongst the respondents, and some effort would be required to develop a market opportunity
- Lemon sole is being used by some respondents, but there was not much information provided in the survey

8 GERMANY - FIELD SURVEY

8.1 Background on German Seafood Sector

Total sales of German fish products rose to £1.2 billion in 1998. Domestic sales that year were £984 million, which reflects a 2.8 percent increase from the previous year. Export sales increased by 12.5 percent to £198 million. Production of fish and fishery products in 1998 dropped by 3.7 percent to 393,000 MT product weight, and off-factory sales increased from £786 million to £849 million. (However, current numbers are not comparable with past numbers because salmon products, except smoked salmon, are no longer included in official production statistics. These product ranges made up for 14,000 MT of fish products in 1997 at a value of 72.5 million.) Major fish products sold are frozen products (fillet, fish sticks), herring, smoked fish and fish preparations.

The German fish industry and wholesalers successfully increased market prices for certain fish products (in response to higher world market prices for raw fish). Additionally, an increased demand for fish convenience products (plus 12.8 percent) and export demand boosted total turnover. Nevertheless, restructuring in the German fish industry continues amidst fierce domestic (retail) and foreign (fish industries) competition. The total number of fish companies declined from 103 in 1997 to 97 in 1998 and employment from 11,281 to 10,709. However, productivity increased further as total turnover rose from £1.13 billion to £1.18 billion.

Strong domestic and foreign landings by German fish vessels with catch for domestic consumption, and fish imports resulted in a stable supply in 1998. Germany is only 24 percent self-sufficient in fish and fishery products. Per capita consumption of fish amounted to 14.9 kg in 1998. Generally, German imports determine over 70 percent of total consumption of raw fish and fish products. In 1998, 67 percent of German fish imports in product weight and on a volume basis were delivered by non-EU countries, and 65 percent on a value basis. Total imports in 1998 amounted to £1.348 billion, but only £470 million of raw fish and fish products originated from EU countries whereas imports from third countries accounted for £879 million. In terms of sales, Norway was Germany's biggest supplier of fish with £250 million in 1998, followed by Russia with £125 million and the Peoples Republic of China with £48 million. In terms of quantity, imports from Norway and Denmark were the most significant in 1998, followed by those of Russia, China and Poland (in product weight). However, converted from product weight to catch weight, as expressed in the trade matrices, imports from Russia and China soared, which had to do with an upswing in imports of groundfish fillets, and imports from Russia and Poland dominated total imports of all edible fishery products.

Consumer preference is for convenient, prepared or easy to prepare high-quality products or specialities like caviar, live lobsters or frozen crayfish. These products include frozen or fresh fillets, fish marinades and fish salads but also pre-sliced smoked salmon. They are sold increasingly in supermarkets and large discounters and distributors and, to a lesser extent, in speciality shops, farmers' markets and restaurants. For several years the traditional distribution channel of fish and fishery products in Germany through specialised fish retail shops has been losing market share to other distributors. Particularly, food retail shops are more and more successful and competitive in selling fish products in Germany.

8.2 German Survey - Overview

8.2.1 Atlantic Halibut

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	4	Quite small e.g. 1 tpa	Not much data £2.20 (?)	Buying steak/fillets - via Bremerhaven or Rungis
Inland Markets	2	Almost none	No data	
Retail Multiples	4	V little, "can not obtain"		Would use steaks/fillets from 3-4, 4-5, 5-6 kg fish
Food Service Supply	2	No data		
Fishmonger/Food Service supplier	1	Almost none		Tried farmed Norwegian - quality unsatisfactory

Comments:

Despite anecdotal evidence that some parts of Germany do apparently consume halibut (see Section 9 and 10), this small survey did not seem to indicate a particular interest in Atlantic halibut amongst the respondents.

8.2.2 Pacific Halibut

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	4	500 tpa from one	1-2 kg £1.57 2-3 kg £1.89	Buying frozen steak fillets from USA, Norway and Greenland?
Inland Markets	2	One uses 3 tpa	No data	? USA, whole and steaks/fillets, frozen
Retail Multiples	4	23 tpa between all	No data	Would use steaks/fillets from 5-6 kg fish
Food Service Supply	2	No data		
Fishmonger/Food Service supplier	1	Never used		

8.2.3 Atlantic Turbot

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	4	3 use 34 tpa between them	£4.25-£6.29 Farmed at: £5.35 for 0.6-1 £5.91 for 2-3	Sources – Spain & Norway 0.6-1 kg, 2-3, 3-4 kg
Inland Markets	2	Both use total 13 tpa	£2.52 (??)	4-5 & 5-6 farmed Spanish
Retail Multiples	4	2 use 13 tpa	No data	Pan sized fish (3-4 & 5-6 kg??)
Food Service Supply	2	No data		
Fishmonger/Food Service supplier	1	6 tpa	Lot of data. Commonly £5.35 for 0.5-1	Spain & Holland. Prefer sizes up to 3 kg

Comments:

Volumes are indicative only. Those respondents who expressed a view were rather positive about further aquaculture supply – there is "a continuous good demand" The quality and size of current farmed appeared to be acceptable.

More promotion would help to sell more turbot, and some reduction in price would help – but one respondent thought current prices "about right". There was quite a lot of interest in hearing more about farmed turbot. Note the prices for turbot appear to be about £1 per kg lower than those quoted for UK & Ireland (but caution on exchange rate relevance in terms of domestic economy).

8.2.4 Seabass

MARKET SECTOR	NUMBER INTERVIEWED	VOLUME (Tonne pa)	COST PRICE (£ per kg)	SPECIFICATION or COMMENTS
Processor/Importer	4	One quotes 25 tpa	Getting quite cheap	Sources – Spain, Greece, Italy
Inland Markets	2	Quite a lot	No data	
Retail Multiples	4	No data	No data	
Food Service Supply	2	No data		
Fishmonger/Food Service supplier	1	Important	No data	Spain, Greece, Holland, Turkey

Comments:

Although there was not much numerical data, there is clearly quite a large (and growing) utilisation of seabass in Germany. One respondent suggested bass farmed in cooler waters might be of better quality. Another suggested that care is required to ensure price does not drop "too low".

8.2.5 Lemon Sole

Comments:

There was some interest in lemon sole amongst some of the respondents – it seems to be a popular fish in the Bremen area. One respondent was buying 10 tonnes of fresh (400-700g) and 8-10 tonnes of frozen fillets per annum. Another quoted a price of £4.87 per kg for 60-80g frozen boneless fillets.

8.2.6 Comments on Aquaculture in General

Discussion on this issue was only reported for 4 of the German interviews, but provided quite interesting information. All four were **very supportive** of the concept of aquaculture. However, the industry should avoid creating a "mass market" image (avoid the "Norwegian mistakes"). Continuity, price and the other normal concerns were expressed about future farmed production. Interest was expressed in:

- Species grown in cooler waters (presumably on quality basis)
- "Less bones" for modern consumers
- Other species: lemon sole, tilapia, catfish, Victoria perch, tuna

8.2.7 Interpretation of German Survey Results

A number of interesting points arose from the German survey:

- There was not too much (apparent) interest in Atlantic halibut
- There was quite a good interest in turbot, with a potential for probably increased supplies, but keeping in mind the current values in DM for would-be exporters from UK and Ireland
- There was quite a lot of interest in lemon sole from aquaculture
- The interest expressed in a range of freshwater species perhaps reflects some of the differences in fish preferences between coastal and central European countries – but does indicate a broad market opportunity
- Some respondents were very open-minded about entering into dialogue with aquaculture producers

9 ADDITIONAL FIELD DATA, INTERVIEWS and ANALYSES

9.1 Interview with Large French Turbot Farming Company

The company produces some 3.8 million juvenile turbot and 600 tonnes of ongrown turbot per annum.

Ongrown turbot prices have been lower over the last few months – the Spanish farmers have been flooding the market on an opportunistic basis (although this phenomenon has been reported several times in past years).

He sees three markets for farmed turbot (in France):

- Restaurants, for which the finite selling opportunity is reaching saturation, but which still has some remaining capacity
- Housewives for the fresh basic product – via different types of retail outlet
- Industrial, by which he means catering and ready meals etc - which he concedes is a more developed sector in UK

He feels there is a clear need to **reduce prices in order to achieve higher volumes.**

He is achieving good sales of dry-packed live fish into Hong Kong. He has stopped live sales into the USA at the moment because the importer was not really pushing the opportunity **and** because import permission was temporary (live fish come under fish health regulations).

He is now thinking about strategic encouragement of turbot farming in USA. He would seek another permission to import, and then send dry-packed juveniles to supply a recirculation-based ongrowing business.

9.2 Interview with Marketing Manager of Spanish/Norwegian Halibut/Turbot Producer

Turbot

- Selling about 1,850 - 2,150 tonnes of turbot this year
- Aiming for 2,400 t in 2001
- One site (near Mugia, Galicia) produces some 1,200 tpa
- They sell at size grades from 400g to 4 kg
- For wholesalers and caterers the larger sizes are preferred
- For retailers they sell 0.8-1.5 kg fish

Halibut

- They are producing about 250 T total, and that level appears to be relatively stable. Their halibut production "had a bad few years until recently"
- Selling about 100 tpa into the UK, at some **£5.50 per kg** delivered
- He has real concerns about the size of the market for halibut
- Because of cage ongrowing, he thinks that farmed volumes could grow quickly.
- He believes that the European market for halibut is a lot smaller than one might imagine (e.g. **not** Spain, France, Italy, and only the northern coastal regions of Germany)
- He is not too convinced about the export potential of halibut to the USA
- He is very worried about the Pacific halibut situation. When the fishery was limited to a few days a year, there was lots of poor quality frozen fish on the market, at poor prices. The small volumes of fresh fish therefore commanded a "scarcity" high price

- Now with the wider opening times he thinks there is a lot more (he says c. 60%) of good quality fresh fish available for much of the year, at a consequently lower price - e.g. smalls of 3-5 kg for £3.00 per kg
- He also says the frozen product is now of better quality, and also commands a better price than the previous frozen did
- He sells his extra 150 tonnes in Norway, Sweden, Benelux, Germany etc
- The 100 tonnes into UK he sells in the fishing close season - winter e.g. Nov-Mar. There is NO PROBLEM with moving that kind of quantity, and he thinks there is capacity for a lot more
- But prices are much poorer in the fishing season
- He says that if we feel the UK is getting saturated, the company can always sell their fish in USA and Asia - they have already been seeding those markets, but at the moment they do not need to use them. **He is therefore opening the door for some degree of dialogue and co-operation between his company and UK/Irish halibut farmers**
- His company is almost the only producer of halibut in Norway worth considering - so the total probably is not much more than 300 tpa total

9.3 Interview With Alaskan Halibut Producers

- Season is March 15 - November 15
- About 80% fresh at the start, c. 60% fresh in mid season, about 80% fresh at the end again
- Quota is now per boat - the fishermen "own the resource"
- He thinks there is still a market for farmed halibut in Europe because his fish is too expensive - he quoted $3.85 per US lb FOB Alaska, plus 15% tariff plus shipping at 1$
- Discussion – this equates to a delivered Europe price of some **£8.18** per kg, which is perhaps a little higher than some of the prices quoted for the UK survey (see Section 4.2.2)

9.4 Restaurant Prices in Europe

Although the food service sector, and specifically the restaurant trade, is only one of the options for consumers to access aquaculture products, it is considered to be a growing sector (see Section 11 and 12). Consequently this study will focus on some detailed analysis of the pub and restaurant trade. This does not imply lack of opportunity in the independent and multiple retail sectors, but simply reflects a prioritisation of the study analysis and resources.

In addition to the responses received to the structured questionnaire, the experienced field staff were asked to suggest a range of "normal" restaurant cover prices for a good seafood dish (e.g. halibut, turbot or seabass) in the mid-upper market establishments in their country. Clearly such information is highly subjective, but the responses provided the basis for an interesting analysis of the relative values of target species **(particularly turbot)** in each country. Table 3 below illustrates the type of calculation which can be undertaken.

TABLE 3	UK	IR	SP	FR	GE
Meal Price Range (Local currency)	10.00-15.00	12.00-18.00	2000-2500	100-150	28-38
Meal Price Average	12.50	15.00	2250	125	33
Convert at £1 =	1	1.28	270	10.66	3.18
A Meal Price Average (£ Sterling)	12.50	11.72	8.33	11.73	10.38
B Food Service Sector Buy-in Price for **turbot** (£ Sterling – from survey data)	5.75	6.02	4.44	5.50	5.65
A/B Relationship	2.17	1.95	1.88	2.13	1.84

The data presented above is highly speculative and should be treated with some caution. Nevertheless, it does serve to illustrate the respective "inherent values" of **turbot** within each of the countries surveyed for this study. In effect, whilst the single currency conversion to Sterling may seem to indicate quite different values of turbot in the various countries, the actual values to consumers (as typified by restaurant-goers) is actually relatively consistent for each country.

9.5 Flesh Yields and Product Value in Restaurants

There are two important "unknowns" with respect to the calculation shown in Table 3 – whether the restaurant cover price is for a portion of fish containing skin and bone, or a portion of flesh-only, and the weight of either type which might be served.

The UK part of the survey has yielded some considerable information about trends in pubs and restaurants, and will serve as the basis for the following discussion. Care should be taken in assumptions about similar trends in other European countries, at least at the present time.

9.5.1 Restaurant Margins

Individual restaurants or independent pubs will each have their own business objectives, but there is a common theme to the question of margin in such operations:

- A chef would expect to make at least 65%-70% gross margin on the core protein ingredient in a dish
- In addition, the "rule of thumb" at the moment is that the vegetables, sauces etc which accompany the protein have a further cost of roughly £0.50-1.00 per dish

It is important to understand the definition of the gross margin in this trade. The chef is concerned with the meal cost, and what he can then sell it for. Typically if the protein ingredient is, for example, £2.50 per portion, the chef will add the extra £0.50 to make the final meal "cost" - £3.00 in this case. He then expects that meal cost to be 30-35% of his final cover price –and he must add VAT to that. In this example (using a 70% gross margin), the meal will have to cost £3.00/30% + VAT, i.e. somewhere in the region of £11.75. There is quite a lot of discretion exercised by individual chefs on certain types of food, in terms of margin. Nevertheless, the overall guiding principle is as described above.

9.5.2 Fish Presentation Trends

Modern consumers in the UK are increasingly requesting fish dishes without skin, bones etc. Fish dishes made from fillets or portions of fillets are thus becoming more prevalent, and this trend looks set to continue. It is unclear how much of the restaurant market in the UK is still dealing with steaks and whole fish, nor to what extent this shift is occurring in different European countries.

NOTE: that this trend would also probably be true in the retail trade. A fishmonger may sell a whole fish at a certain price, but the customer will now commonly request him to fillet the product, with the result that the

customer is ultimately paying for "flesh-only". Similarly in retail multiples, the contents of the chilled seafood cabinets will either be fish flesh only, or recipe/added-value products containing no skin and bones.

9.5.3 Fillet Yields of Aquaculture Products

If the fish flesh is now, increasingly, the consumer's final purchase, then fillet yield and "value-per-kg-of-flesh" must be considered important parameters for aquaculturists. Based on the author's experience with turbot, the Aquascot halibut report (ref Section 10.10) and advice from an experienced seabass producer, the following fillet yields might be expected:

- Atlantic turbot 30%
- Atlantic halibut 50%
- Seabass 45%

On the basis of the figures quoted above and the expected margins in a restaurant or good-food pub, it is possible to demonstrate, for the UK, why turbot is viewed as "very expensive", halibut is quite frequently used when available, and seabass is becoming widely used:

Atlantic turbot bought for	£10.00 per kg	produces a fillet "cover price" of	£24.91
Atlantic halibut bought for	£9.00 per kg	produces a fillet "cover price" of	£14.60
Seabass bought for	£8.00 per kg	produces a fillet "cover price" of	£14.46

These calculations are based on a whole fish purchase price, trimmed fillet yields as shown above, a portion weight of 200g, a gross margin of 65% on the core fillet price and an additional £0.75 per meal cost for vegetables etc, and the addition of VAT.

Note: this is a very theoretical calculation. In the case of one UK restaurant establishment interviewed, this calculation actually held up rather well – the gross margin for seabass was exactly 65%, but the chef was willing to take a gross margin of only 59% on his halibut at that time.

When considering a regular family outing to a good-food establishment, it is relatively clear as to which of the three species are more likely to be purchased, more frequently. For a more up-market restaurant, and one selling more traditional steaks, this "yield problem" would not be so manifest.

9.6 The Seafood Supply Chain

To generalise about the seafood supply chain for all of the countries surveyed, or even for one of them, would be potentially misleading. Nevertheless, there are certain "truisms" about the value of luxury seafood items, once again taking the UK as an example:

- A high-aspiration product, in catering outlets with the potential to sell reasonable volumes, probably represents a core flesh value to the consumer in the region of **£62-63 per kg** (based on a cover price of £14.00 for c.200 g, with £0.75 vegetables cost)
- Given the minimum acceptable margin for a restaurant of some 65%, the maximum buying-in (delivered) price to that sector for the fish flesh would be some **£17 per kg**
- An aquaculture producer of one of these species (e.g. turbot or halibut) might wish to sell their product at the farm gate for some **£6.00 per kg**:
  - For turbot this would equate to a flesh value of some £20 per kg
  - For halibut this would equate to a flesh value of some £12 per kg
  - We can see that there is reasonable potential to provide cost for services rendered within the supply chain (farm to restaurant) with halibut, but not apparently any prospect of selling filleted turbot under the assumptions made above

Once again caution is urged with interpretation of these calculations. Although the survey has provided some insights into the costs required in the supply chain, these will depend upon the route the individual aquaculture producer uses.

9.7 Strategy Issues for UK and Irish Producers

Although the UK has featured heavily in the analysis so far, the relevance is believed to be equal for both UK and Irish aquaculturists. In effect, in order for aquaculture production from either country to achieve small but **significant** volumes of production, it will be necessary to consider the following points:

9.7.1 Turbot

- Concentrate marketing efforts on the smaller "high value" end of the market, where restaurant cover prices exceed £18 each, and the use of steaks and whole fish is still fashionable
- Concentrate on upmarket retail outlets where the fish is still acceptably sold at "on the bone" prices
- Look for maximum efficiencies in the supply chain
- Concentrate on the export market potential, to countries which consume quite high volumes of turbot at quite high values, and where the "whole fish" cachet in still more acceptable than the UK
- Reduce farm-gate selling price expectations (and thus production costs) to somewhere in the region of £4-4.50 per kg, for any significant volume of UK sales

9.7.2 Halibut

- Maintain or improve production and size specification qualities
- Maintain production efficiencies
- Expect to maintain farm-gate selling prices in the region of £5.50 per kg
- Look for efficiencies in the use of the supply chain to the end user
- Assist in the promotion of "aspirational" farmed halibut
- Expect there to be a potential for reasonable volume of sales of the product at the £10-15-per-meal level, but restricted mainly to the UK in the short term (and see Section 12.3)
- In the longer term, consider the wider European and global market – Atlantic halibut fillet yields, growing conditions and likely production and selling values place it in the same category as seabass, a product which is now selling 40,000 tonnes per annum in Europe

9.7.3 Lemon Sole

With UK restaurants prepared to pay some £5.50 per kg for whole lemon sole, there must be some opportunity for consistent production and supply into this niche. Efficient production and then efficient use of the supply chain would assist with making lemon sole cultivation possible – although the business plan would also have to address the seasonal fluctuations in wild availability and price.

10 COMMISSIONED AQUACULTURE MARKET REPORTS

10.1 Introduction

There have been several market studies undertaken over the last 10 years which are relevant to the present project. These include:

- BHA and HIE — IMES Report 1992
- BIM — Colin McIver Report on turbot 1993
- SFIA — EU Concerted Action Report 1994
- SFIA — Halibut Data Analysis 1994
- BIM — Galway Aqua Consulting Report on Halibut 1995
- BHA — Mannin Seafarms Report 1996
- MRC — Retail Multiple Report 1996
- BIM — Status Review of turbot Culture 1997
- BHA and HIE — Aquascot Report 1999
- DoM&NR — Irish Aquaculture Future Strategies 1999
- SAC — Dixon Report 1999

The following sections will describe the main findings of each report, which are presented in bullet-point format in order to allow quick identification of important findings of the studies.

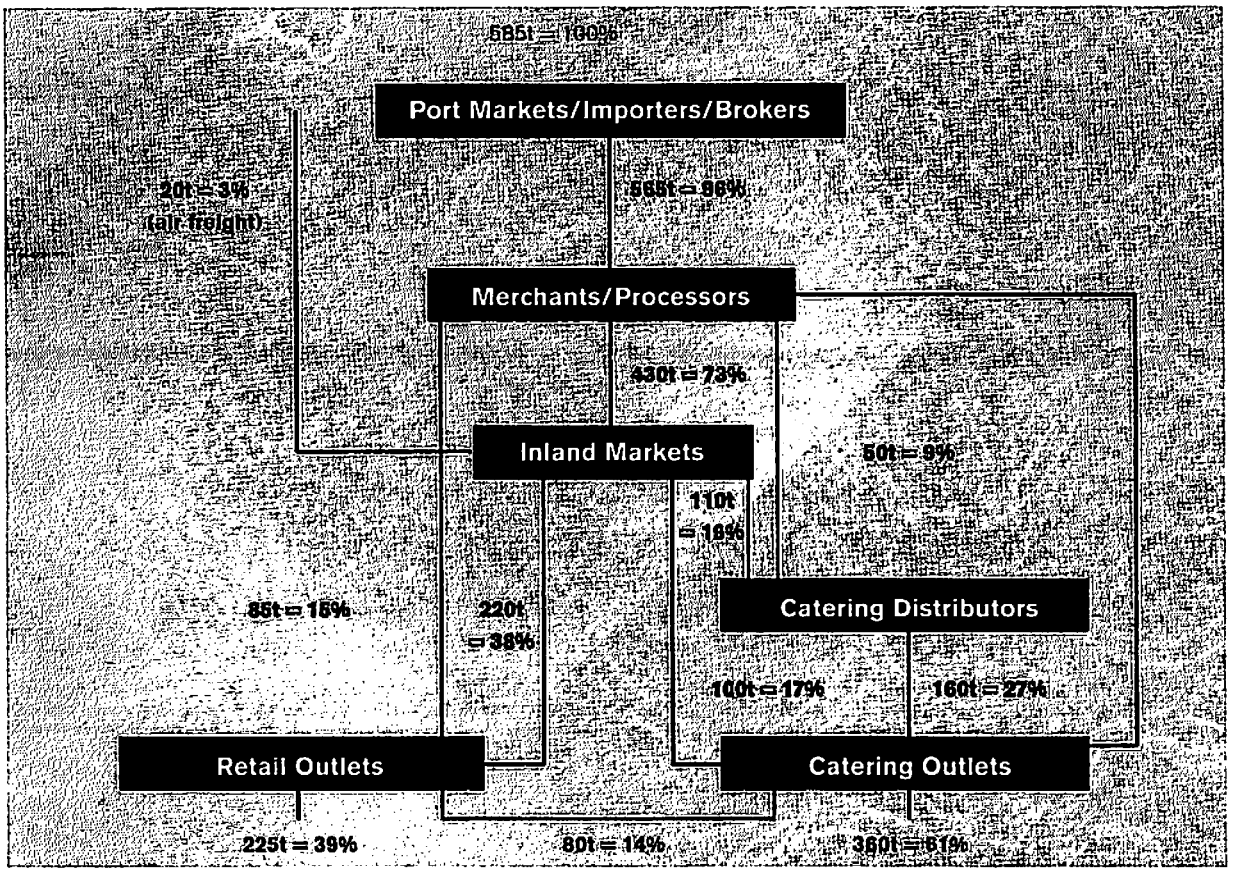
10.2 BHA and HIE IMES Report 1992

TITLE: A Marketing Strategy for Farmed Halibut in the UK
AUTHOR: International Marketing and Economic Services (UK) Ltd

Key Findings:

- Methods – analysis of published data and telephone and face-to-face interviews (100 respondents)
- Typical consumers are: older people, "young professionals"
- Consumer perception of halibut: firm texture, distinct balanced flavour, lack of bones, low oil content
- Caterers prefer fresh rather than frozen halibut, and catering outlets account for 61% of fresh halibut usage and 88% of frozen
- Catering outlets source 44% of fresh halibut supplies from catering distributors, 28% from inland markets, 22% from fishmongers and 6% from merchants/processors
- There is a geographic preference for halibut in UK – Midlands and SE England
- Versatile in terms of preparation – several "cuts"
- >9 lb fish = steaks, <5 lb fish = fillets
- Standard portion size for steaks 6-8 oz and 8-10 oz, fillets 6-7 oz, "starters" 4-5 oz
- Distribution pattern of fresh halibut (see Figure 1 over page)
- Retail multiples – "a price barrier of £4.99 per lb (£10.98 per kg) in the mind of the consumers"
- Strategy Recommendations:
  - (By implication) BHA should organise and control marketing of farmed halibut

- Sell as prime whole fish to top income consumers in UK via a restricted number of licensed suppliers into the retail and catering sectors
- In addition, develop branded smoked halibut and pate products
- Any promotional launch in Autumn of any year
- Initial retail outlets should be e.g. Harrods and Selfridges, and top 50-100 independent fishmongers
- Initial catering outlets should be 30-50 top hotels and restaurants
- Initial direct deliveries – avoid wholesalers and intermediaries
- Develop appropriate packaging
- Develop promotional material
- BHA should employ market development manager as soon as sales > 20 outlets



Source: IMES research

Figure 1 IMES Representation of Fresh Halibut Distribution Chain

10.3 BIM Colin McIver Report on Turbot 1993

TITLE: An Economic and Market Assessment of the Potential for turbot Farming in Ireland
AUTHOR: Colin McIver Associates

Key Findings:

- Good background analysis of current wild and farmed supplies and values at that time

- Interesting analysis of "price elasticity" and "price flexibility" – concluding that turbot is a luxury species with high price elasticity, and meaning that there could be quite large increases in demand, as supplies increase, with relatively low drop in real market value

- Much of the report discussed technical and economic production models
- The "core" selling price chosen for modelling was IR£8.79 per kg

10.4 SFIA EU Concerted Action Report 1994

AUTHOR: SFIA

Key Findings:

- Methods – analysis of fishery trade information and market data, and interpretation of likely aquaculture growth
- Steadily declining wild availability of Atlantic halibut, c. 5,500 tonnes
- UK, Germany and Spain were principal EU importers
- UK demand exceeds supply
- Early farmed Norwegian selling well in UK market at £8-9 per kg
- Expect decrease in price to £5-6 per kg as farmed production reaches 10,000 tonnes per annum

10.5 SFIA Halibut Data Analysis 1994

AUTHOR: SFIA

Key findings:

- Method – analysis of current halibut statistics (landings, markets, imports), several countries, information presented in tabular form
- Good historical (now) reference to data – but see this report for more current data

10.6 BIM Galway Aqua Consulting Report on Halibut 1995

TITLE: A Desk Study on Assessment of Technical Feasibility of Halibut Cultivation in Ireland
AUTHOR: Galway Aqua Consulting Ltd

Key findings:

- Methods – use of published market and technical data
- Strategies for marketing farmed halibut:
- Place product on market on a regular basis
- Consistency of product, continuity of supply, good grading and quality standards
- Product development – pan-size halibut, fillets, smoked, breaded and portioned

10.7 BHA Mannin Seafarms Report 1996

TITLE: The Structure, Economics and Perceptions of the Halibut Production Cycle in the UK
AUTHOR: R J Slaski

Key Findings:

- Methods (market section) – analysis of published data and previous reports, fax questionnaire to seafood sector in UK

- Fillet yield of halibut good, reported at c. 60%
- Discussion about farm product selling price expectation v. apparent port landing values – port landing price are not a good indicator of actual selling price of farmed marine species such as turbot
- First sale value for farmed halibut, average response from questionnaire - **£5.61 per kg for 1-2 and 2-3 kg fish**
- Questionnaire:
  - 27% response
  - 100% perceived halibut as high-value and desirable
  - Asked about general desire for marine species from aquaculture in UK:
    - ▲ Halibut 100% agreed
    - ▲ Turbot 92% agreed
    - ▲ Dover sole 67% agreed
    - ▲ Cod 67% agreed
    - ▲ Haddock 40% agreed
    - ▲ Hake 50% agreed
    - ▲ Seabass 29% agreed
    - ▲ Bream 0% agreed

10.8 MRC Retail Multiple Report 1996

TITLE: The Multiple Retail Sector and UK Aquaculture: Current Concerns and Future Developments
AUTHOR: Marine Resource Consultants Limited

Key Findings:

- Method – structured survey with questionnaire and face-to-face interviews, followed up by telephone
- 56% of total fish and fish products in UK are bought by households, and retail multiples account for 58% of this for fresh/chilled/smoked products, and 75% of frozen products
- Positive aspects of aquaculture: consistency (volume, size, quality, price), convenience (whole fish, steaks, fillets, ready dishes), portionability and value
- Concerns about aquaculture: welfare, use of chemicals, quality aspects, health and hygiene issues, sustainability re. wild fish for feed – but positive aspect is that aquaculture "takes the pressure off the wild fishery"
- Species of interest: plaice, sole (Dover and lemon), skate, monkfish and hake
- For larger groups: cod and haddock
- Some willingness for retail multiples to participate in aquaculture R&D

10.9 BIM Status Review of Turbot Culture 1997

TITLE: Status Review of turbot Culture – Implications for the Development of this Industry in Ireland
AUTHOR: Aquatask Enterprises

- An update of the 1993 Colin McIver Report
- Highlights that turbot production in Europe had not grown as fast as expected, and projected total farmed output of some 4000 tonnes by year 2000
- Revised likely sales price down to £5.00 to £6.00 per kg
- Considered other geographic market opportunities e.g. USA and Far East
- Discussed some technical and economic implications of recirculation systems in turbot production – concluding that production units would require to be > 150 tonnes per annum to give good viability

10.10 BHA/HIE Aquascot Report 1999

TITLE: Assessment Programme for Farmed Atlantic Halibut
AUTHOR: Hazel MacPherson, Aquascot Group

Key Findings:

- Methods – product handling, processing, cooking, taste-panel testing, responses from selected market segments
- **Farmed Halibut and the Fish Processor**
  - Pre-harvest starvation of 2.1 days acceptable
  - Kill by percussive stunning (plastic tool), bleed by cutting one set of gill arches
  - Transport well iced, but avoid pressure damage from excess layering
  - Gutting within 12 hours of harvesting
  - Gutting by hand – average gutting loss of weight 5.1%
  - Secondary process products:
    - Whole trimmed – main body yield 65-70%
    - Steaks, complete or half, aiming for final portion of 100-200g, yield 65-70%, prefer to steak with a machine for neater result
    - Fillets, yield 55-60% skin-on, 50-55% skin-off, hand filleting is best, good thick portions can be made from fillets taken from 3-4 kg fish
    - Quality standards – care about: colour of skin, eye damage, "hook" fish
- **Farmed Halibut and the Commercial Buyer**
  - Catering (small chains, independents etc) – fresh whole fish
  - Food Service (national chains) – fillets and portions, fresh and frozen. De-skilling in kitchens, and importance of strict portion/cost control. Need year-round availability. Might purchase a frozen secondary processed halibut product for £11-13 per kg. Important sector – 35% of total food consumption outside the home is made within the food service sector, and expected to rise to 50% in next 10 years
  - Fishmonger/wholesale – general good perception of farmed halibut, but some "traditional" negative views. Would pay £6.50 to £7.50 per kg for gutted farmed halibut (but can sometimes buy wild at £5.00 to £8.50 per kg). Quote: "As the aquaculture industries have increased supply

levels, the price setting of the species within the marketplace has changed from being based on the wild catch price to being determined across the board by the farmed fish price. As the halibut farming industry strengthens therefore, there is the potential for current pricing issues to be overcome"

- Supermarkets – appreciated quality, preferred UK farmed to farmed from out-with UK. Products requested: whole, fully trimmed, steaks and fillets. Buy secondary processed products at £11 to £13 per kg, sell at £15.50 to £17.50 per kg
- Packaging – increasing need for smaller packs (by 2016, 36% of UK households will only have one occupant). Lidding films and trays, new developments emerging. Ease of opening for older consumers. Suitability for oven/microwave cooking
- Shelf life. Under ice, 10 days total for processed product, 2-3 days more for whole fish. Under atmosphere modification product OK 6 days after packing: 2-3 days transit from processor through distribution chain, then 3-4 days on chilled counter. "Farmed halibut is likely to be accepted in the market as fresh fish at least one week longer than other white fish species, e.g. cod"
- Food Safety. Detailed HACCP plan guidelines in the report

■ **Farmed Halibut and the Consumer**

- Cooking – bake, fry shallow, grill, microwave, poach, steam
- Recipe suggestions – (emphasis on easy to prepare) with sauce, stew or soups, stock, pies, roasts, with stuffing, with vegetables
- Taste panel testing – based on appearance, flavour, colour and texture. Scored well against wild halibut (same median overall score, but slightly higher standard deviation). Perfectly acceptable to consumers
- Nutritional benefits: farmed halibut compared with wild and other protein sources. Compares very favourably – high in protein, low in fat, high omega3 fatty acid content

10.11 Department of the Marine and Natural Resources Irish Aquaculture Future Strategies 1999

TITLE: Irish Aquaculture – The Future Strategies for Meeting the Global Seafood Challenge
AUTHOR: The Circa Group Europe Ltd

■ Considerable SWOT analysis of Irish aquaculture opportunity

■ Highlighted opportunity for farming of eels, turbot & halibut with little new technical R&D needs. Cod farming would require rather more effort in this regard, and haddock farming would require substantial R&D

■ Focus on projection for year 2015, based on more-or-less current technologies:

- Heavy dependence on salmon, mussels, trout
- But projecting 4000 tpa of halibut and turbot culture, at market values of **£5.00 per kg**

10.12 SAC Dixon Report 1999

TITLE: An analysis of the Potential Market for Farmed Atlantic Halibut in the United Kingdom with a Focus on Shetland
AUTHOR: Helen Dixon, Scottish Agricultural College, Aberdeen

Key Findings:

■ Methods – analysis of published date, postal questionnaires and face-to-face discussions

- Norwegians estimate that Northern European market for Atlantic halibut is 10-20,000 tonnes per annum, with UK market being some 5,000 tonnes, compared with the Norwegian market of only 200 tonnes
- Norwegian strategy for their farmed halibut into the UK market has been to identify key importers and market companies with the best reputation for supplying halibut
- The 1992 IMES "price barrier" of £11 per kg in retail multiples is challenged/updated – farmed salmon is currently selling in the retail multiples, at good volumes, for £7.69-£17.63 for fillets and £7.55-£23.49 for steaks
- Survey of UK Wholesale, Distribution and Processing Industry
  - 28.8% response rate (72 ex 250) from questionnaires
  - 70.3% of halibut is traded frozen, 26% chilled
  - 86% of respondents **source** their halibut from wholesalers, 50% from importers, 36% from farmers, 31% from quayside auctions, 22% from processors
  - 95% of respondents **sell** their halibut to the catering industry, 46% to the retail industry, 41% to catering wholesalers. The importance of **catering** is stressed
  - Resistance to consider buying farmed halibut if already dealing in the wild product, but positive interest if companies already dealing in salmonids and other flatfish species
  - Companies which supply the catering industry show the most interest in buying farmed halibut
  - At £8.00 per kg, 25% of respondents would buy farmed halibut
  - At £7.00 per kg, 42% of respondents would buy farmed halibut
  - At £5.50 per kg, 83% of respondents would buy farmed halibut
  - At £4.50 per kg, 100% of respondents would buy farmed halibut
  - Thus there is good scope for prices >£6.00 per kg when farmed supply is limited, and good potential at original BHA "sustainable price" of £5.50 per kg – with little additional volume potential at £4.50 per kg
  - Characteristics which are important to buyers: consistent quality, continuous supply and price (followed by freshness compared to wild, size specification and constancy). However, regular steak shapes/size considered important in portion control for the catering sector
  - Preferred sizes: 3-5 kg (63%), 5-8 kg (43%), >8 kg (37%), <3 kg (23%)
  - Fat layer under skin and soft texture of farmed is mentioned as a negative (see also Aquascot report – farmed halibut 3.0% fat, wild 1.9% fat)
  - Survey of UK Hotel & Pub Chains
  - Poor survey response – preference for halibut <3 kg, continuity of supply and constancy of quality important. Price is clearly an issue.
  - Survey of Shetland Catering and Fishmongers
  - Discussion and Strategy Recommendations
  - Utilise existing farmed salmon supply chains
  - Expect prices of £6-7 per kg while farmed quantity low
  - nitial marketing drive at catering sector and its suppliers
  - Emphasise year-round supply and consistent quality
  - Most sought-after size range is 3-5 kg

11 PUBLISHED DATA SOURCES

11.1 Introduction

There are several numerical or statistical data sources which can provide valuable information for this project. In some cases the information is freely available in the public domain, and in others it can be accessed by subscription. The sources provide information in several different categories, but notably for the purpose of this project these could be classed as:

- Recent or current information on fish supplies (quantity and value) from aquaculture and fisheries
- Trends in supply from aquaculture and fisheries
- Information about consumption or utilisation within the seafood supply chain

Data sources accessed and analysed for this project include:

- FAO fisheries and aquaculture information
- FEAP data on European aquaculture production
- UK Customs and Excise data on fisheries supplies

11.2 FAO Aquaculture Data

The FAO database on fisheries and aquaculture is extensive, providing annual data on landings/production and value for many species of fish, and covering every relevant country for the species. The data can be accessed from the Web, at:

http://www.fao.org/WAICENT/FAOINFO/FISHERY/FISHERY.HTM.

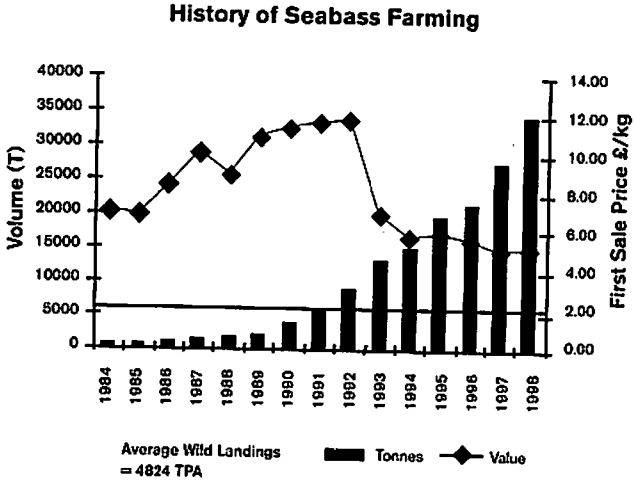
For the purpose of this project, a consistent approach has been taken to the interpretation of this database. For improved ease of interpretation, values have been converted to GBP (£ Sterling) at a constant rate of **£0.68 = 1$US**, with no attempt to allow for exchange variations on an annual or geographic basis.

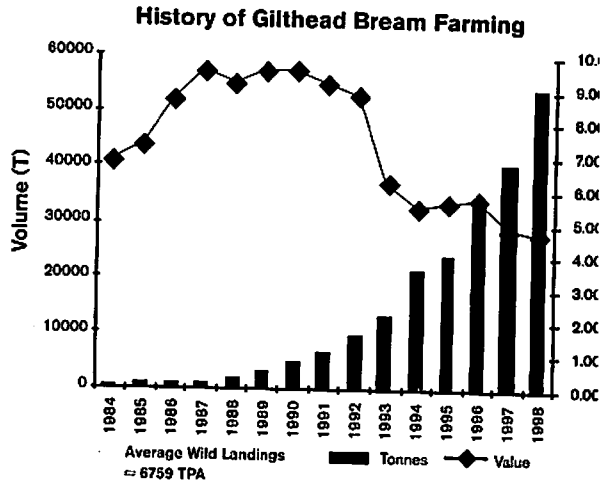
11.2.1 Main European Marine Aquaculture Species

Figure 2 illustrates the production and first sale prices of 3 of the main marine aquaculture species in Europe – seabass, gilthead bream and turbot

An analysis of some of the trends illustrated in Figure 2 highlights the following points:

- The history of aquaculture production of all three species goes back to the mid 1980's, with the main significant levels of production commencing in the early 1990s
- The shape of the value-v-volume relationship is similar for all three species, characterised by a steady rise in value once production was established at real but modest levels, followed by a relatively rapid drop in value as production increased rapidly, followed then by a "plateau period" for value as production continued to rise further (although with a slow and steady decline in values for bass and bream)
- There are differences between the species:
  - the rapid drop in bass and bream values only occurred when aquaculture production had equalled or begun to exceed the wild supplies of the species, i.e. there were still high prices when the total supply had more than doubled
  - the rapid drop in turbot values occurred when aquaculture production had only reached a few hundred tonnes (less than 10% of total supply) – but this took place at around the same period that bass and bream values were falling fast
  - Although turbot values reached their plateau at a lower level of aquaculture supply, that plateau is more stable and at a higher level of value than that seen for bass and bream – and aquaculture production has continued to rise, amounting to some 30% of total supply currently





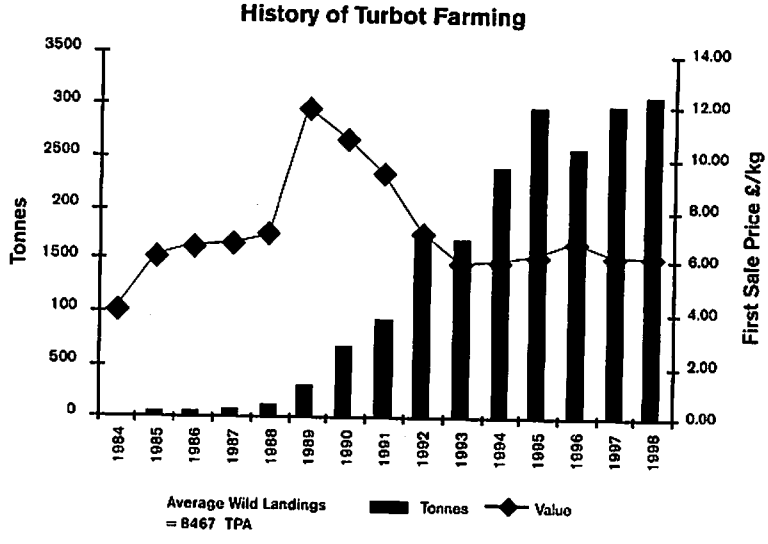


Figure 2 FAO Data for Seabass, Gilthead Bream and Turbot

The level of value of the species in the "plateau" phase is of particular interest to this survey, apparently representing the "real" value of the product to consumers in Europe at a particular (but not insignificant) level of supply.

11.2.2 Other Aquaculture Species

The history of development of other aquaculture species, as derived from the FAO database, is illustrated in Figure 3 (2nd Y axes definition – Value means First Sale Price).

It should be noted that the value-v-volume relationship for these species does not follow quite the dramatic rise and fall as that seen for bass, bream and turbot in Europe. However, it is important to stress that some of these species were already well-established in aquaculture when the dataset commenced.

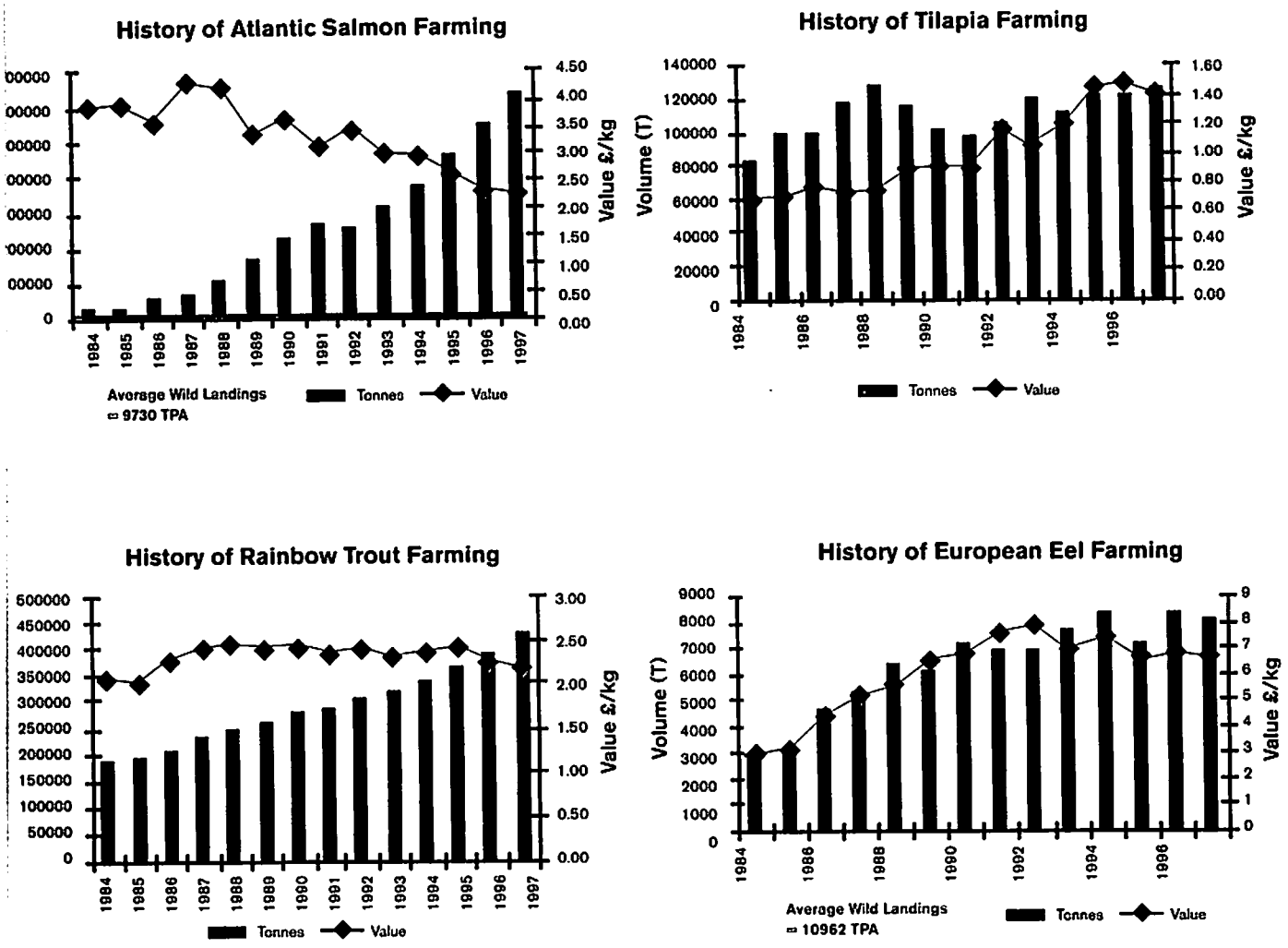


Figure 3 FAO Data for other Farmed Fish Species

The comparison between salmon and European eels is interesting:

- The value of eels continued to rise as production increased – or the production of eels matched an increased demand at higher prices in the market. This trend may have been changed in the last year or so, but comparative data is not available
- The value of salmon has largely continued on a downward slope as production has increased – but in this case the volumes are huge in comparison to all the other aquaculture species

11.3 FEAP Data

The Federation of European Aquaculture Producers has been collecting production and value data from individual aquaculture trade associations in Europe since 1994, and a summary of the seabass, bream and turbot data is presented in Figure 4. The FEAP Web site can be found at: **http://www.feap.org.**

FEAP value data is quoted in Euro, and as with the FAO data analysis, a single currency conversion of **£0.68 = 1 EURO** has been made for all data in Figure 4, with no attempt to allow for temporal currency fluctuations.

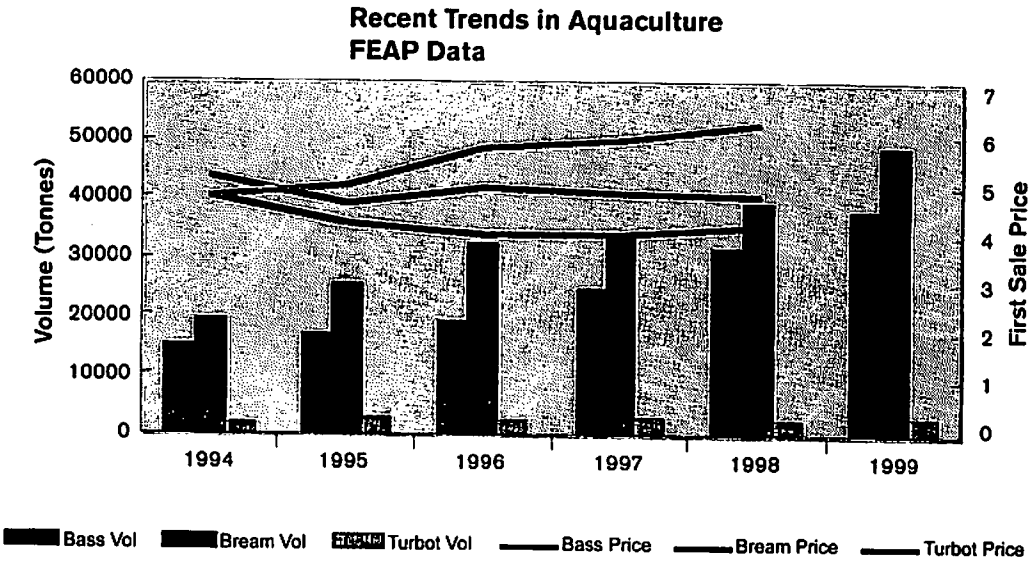


Figure 4 FEAP Aquaculture Data

It should be noted that although production volume data is available for 1999, no value data for that year has been presented by FEAP.

There is broad agreement between the FAO and FEAP data in terms of volumes and values of these three aquaculture species. The FEAP data illustrates the "plateau" phase of the value-v-volume relationship for the species, and once again we can make an interpretation of the "real" value of these marine aquaculture species in the European marketplace:

- Using 1998 data, the combined production of bass, bream and turbot in Europe was some 73,000 tonnes, with a first-sale value of £328 million and a unit first-sale value of £4.46 per kg
- Turbot, with an aquaculture production only amounting to some 30% of the total supply of the species, had a unit first-sale value of £6.13 per kg - a value trend which had been **increasing** at an average rate of 7% per annum over the previous four years

11.4 UK Customs and Excise Data

The official UK government statistics for fish landings and imports is a valuable guideline for volumes and prices. The statistics are broken into several categories, and for the purpose of this report species significant data have been extracted and complied in a consistent format.

11.4.1 UK Supply and Value of Key Species

The data available at the time of preparation of this report was rather limited, and Table 4 below is an amalgamation of UK landings data from 1998 and UK imports data from 1999. Whilst this analysis is objectively rather unsatisfactory, the table does serve to illustrate the approximate relative volumes and values of the species in question.

Table 4 UK Government Data

	Fresh Atlantic Halibut	Frozen Atlantic Halibut	Fresh Pacific Halibut	Frozen Pacific Halibut	Fresh Turbot	Fresh Seabass
Volume (T)	470	451	398	288	570	1525
Unit Value (£ per kg)	3.84	2.90	4.34	3.16	6.09	4.06

There a number of points which should be noted in relation to Table 4 and other sections of this report:

- UK consumption of Atlantic halibut is in the order of **920 tonnes per annum** – this is probably close to 25% of total world supply (see Section 11.7 below)
- UK consumption of Pacific halibut is around **680 tonnes per annum** – a rather larger quantity in relation to Atlantic halibut than the responses from the survey seemed to indicate (see Section 4)
- The port-landing or import values quoted in Table 4 are quite interesting in relation to the survey responses. There seems to be **broad agreement** between the values for **turbot** and **seabass** in Table 3 and the values quoted across the market segments within the survey. There is **not** quite such good correlation between the apparent port-landing or import value of either type of halibut, and the overall trend of values quoted in the survey. This apparent discrepancy between values of halibut may be due to a number of factors:
  - Certainly 2 out of 12 Processors/Importers questioned did quote "high and low" ranges of prices, the lower end of which reflected the values seen in Table 4
  - There is clearly some degree of seasonality with prevailing values of halibut, and perhaps the time at which the survey was conducted has "skewed" the data received
  - It may be that the survey interviewees were not themselves the primary purchasers or importers of halibut, and margins had already been taken in the supply chain
  - Other explanations might be found

11.4.2 UK Atlantic Halibut Value in Relation to Total Supply

The total landings of Atlantic halibut are declining. Given the increasing scarcity of such a high-value product, it is interesting to consider the value of that product in a single important market – such as the UK.

Figure 5 below is a combination of FAO global fisheries data and UK official first-sale price data. It appears to illustrate that increasing scarcity of Atlantic halibut can be positively correlated with a **declining** rather than increasing unit value of the species in the UK market. It is interesting to speculate on the reasons for this decline. One explanation is that scarcity removes the product from the awareness of the broader consumer, and effectively devalues it in overall terms. Another explanation might be that there has been an overall trend of increasingly "affordable and available" luxury foods in the UK over many years. Modern consumers are perhaps less willing to pay exorbitantly high prices for supposed luxuries, when there are a range of competing "aspirational" products which offer better value for money.

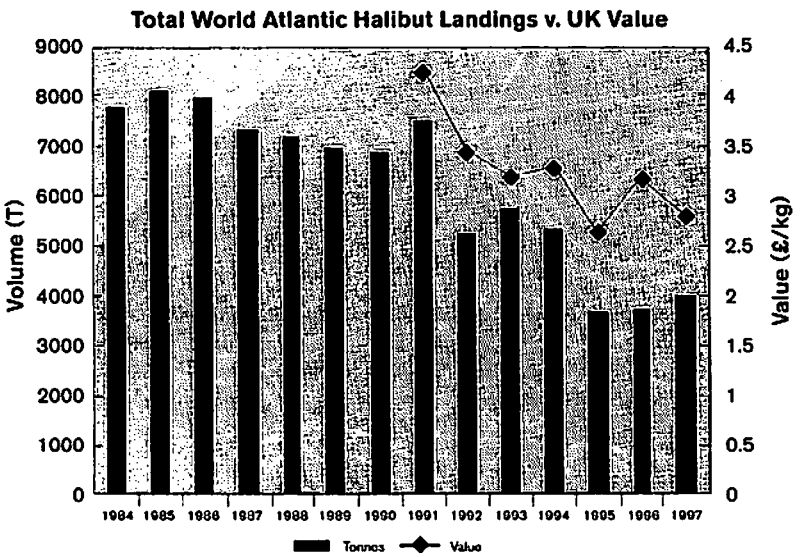


Figure 5 FAO and UK Data on World Halibut Supply & UK Values

11.4.3 Cod

Although cod is not a specific target species for this project, the perception of declining supply of this major staple of the UK seafood market is one of the driving forces behind the general interest in farming marine species. Recent data from UK government statistics shows that 1998 landings from UK vessels was 65,000 tonnes, with an average port-landing price of £1.18 per kg. Imports were 108,489 tonnes in 1998 and 105,183 tonnes in 1999, with an average first sale price of £2.51 per kg in 1999. Anecdotal information in late August 2000 suggests that the wholesale price of fresh gutted cod in the market was some £3.50 per kg.

11.5 Rungis Data

The Paris RUNGIS fish market is one of the largest inland fish markets in the world, and data from the market are an important indicator of the value of seafood products in one of Europe's most important seafood-consuming member states, France.

The French do not value Atlantic halibut highly, and consumption is low. However, turbot is an important species in the French market, and the following graphics give some indication of values of turbot in RUNGIS over recent years. Data was provided by BIM. Volume data were not available from the source. For comparative purposes, values are presented in GBP (£ Sterling) per kg, based upon a single conversion factor of **1 French Franc = £0.096**. As with previous data sets, care should be taken in interpreting the import or export valuations of turbot over an extended time frame.

There are several points to note about the 1998 turbot data from RUNGIS:

- The average RUNGIS selling price for farmed turbot in 1998 was £7.38 per kg. This compares with the stated French turbot aquaculture first-sale value of £6.03 per kg in the same year (FEAP data). Price mark-up through RUNGIS would thus appear to be in the region of 22% for farmed turbot
- Farmed turbot commands a lower value than wild in the Rungis market: farmed French turbot is likely to be predominantly 1-2 kg in grade, and the average 1998 price for domestic wild 1-2kg turbot is £7.90 per kg, with imported wild 1-2 kg fish selling at £7.72 per kg. As a general average, the farmed product is selling for some 5-6% less than the wild equivalent
- The differential values of different size grades of (wild) turbot on an annual average basis should be noted (see Table 5 below)

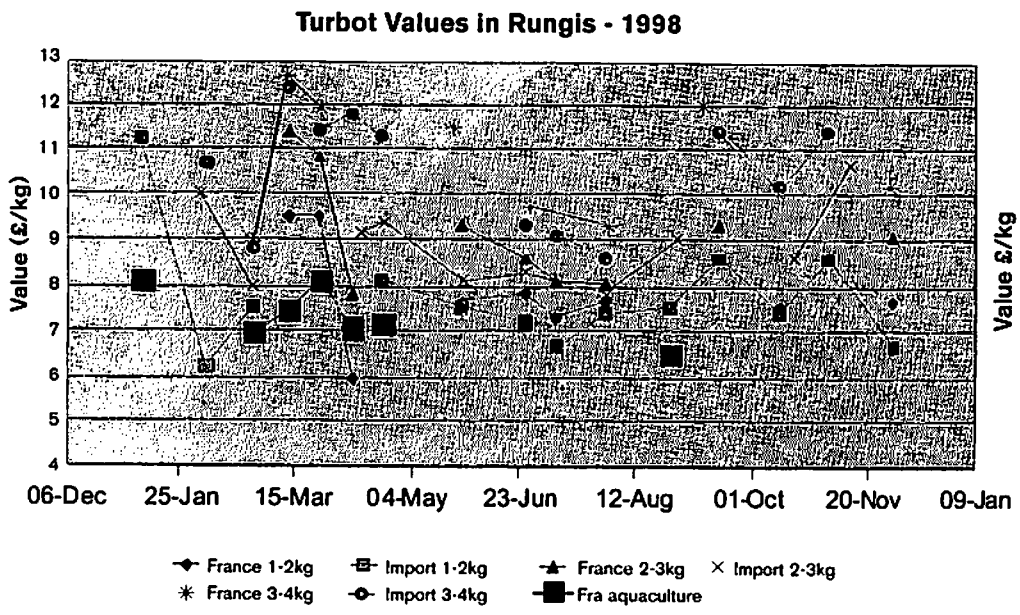


Figure 6 Rungis Turbot Data

Preliminary 1999 and early 2000 data for turbot prices at RUNGIS as available, and can be summarised as shown in Table 5.

Table 5 Rungis Turbot Data for 1999/2000

Grade of Turbot	1999/2000 Price £ per kg	Percentage Change 1998 - 1999/2000	1998 Price £ per kg
Import wild 1-2 kg	8.46	+ 9.6	7.72
French wild 2-3 kg	10.86	+ 17.4	9.25
Import wild 2-3 kg	9.78	+ 9.5	8.93
French wild 3-4 kg	12.39	+ 14.9	10.78
Farmed	7.41	+ 0.04	7.38

It is interesting to note the general rise in the value of turbot on the RUNGIS market over one year, but this is largely confined to wild fish, and notably turbot of French origin.

11.6 Spanish Data

The MERCAMADRID and MARCABARNA fish markets in Spain are large and influential, and provide a useful indication of seafood values in Spain. The per capita seafood consumption in Spain is the second highest in the world, at some 48 kg per person per annum.

Data from both markets have been provided by BIM. As with other data sets, values have been converted to GBP (£ Sterling) at a constant rate, **265.7 Pesetas = £1.00**.

11.6.1 MERCAMADRID

Figures 7 and 8 present data for seabass and turbot in the market. The data provides a "snapshot" of both volumes and values of the species, but there is no information about size grades or any distinction between wild and farmed product.

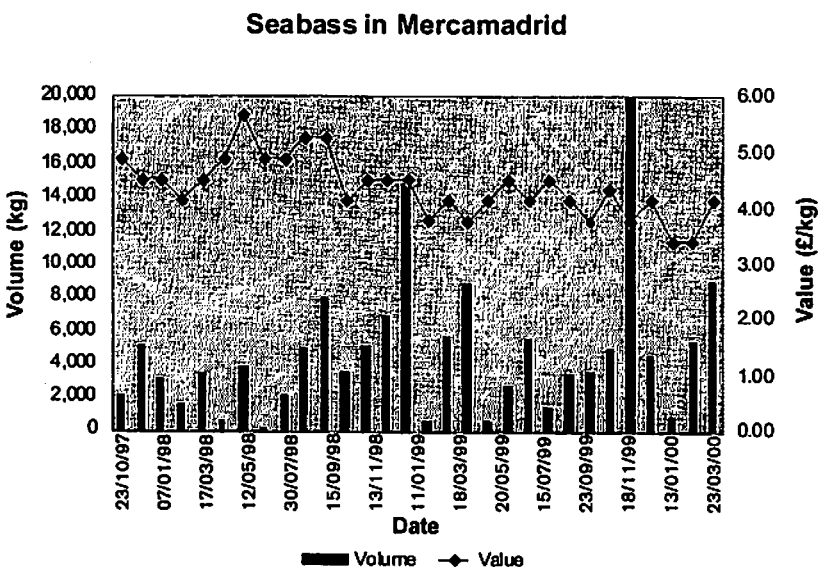


Figure 7 Seabass in Mercamadrid

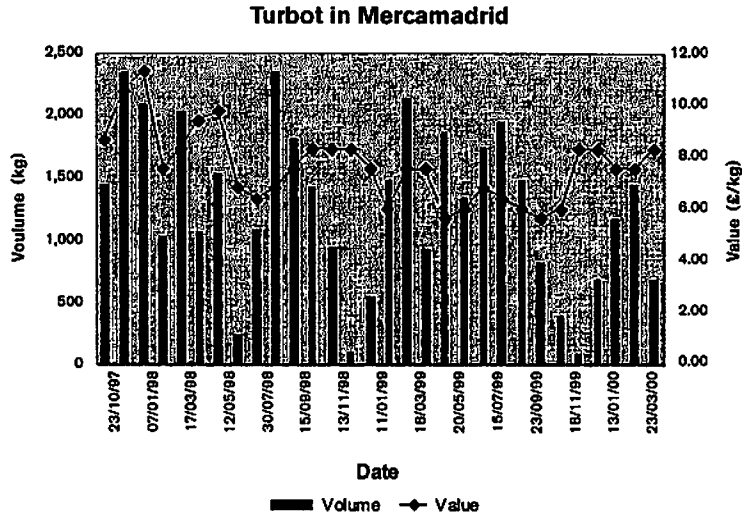


Figure 8 Turbot in Mercamadrid

11.6.2 MERCABARNA

Figures 9 & 10 provide information about seabass and turbot trends in the market. In this case there is no information available about volumes of product, but there is some distinction between the wild and the farmed product.

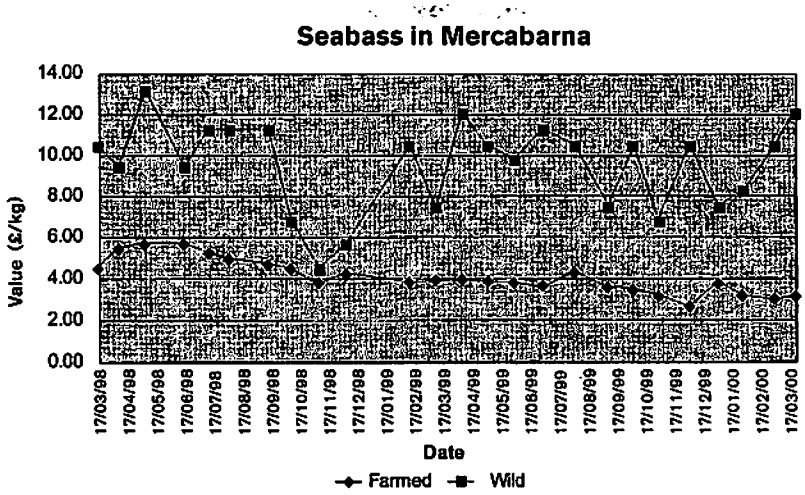


Figure 9 Seabass in Mercabarna

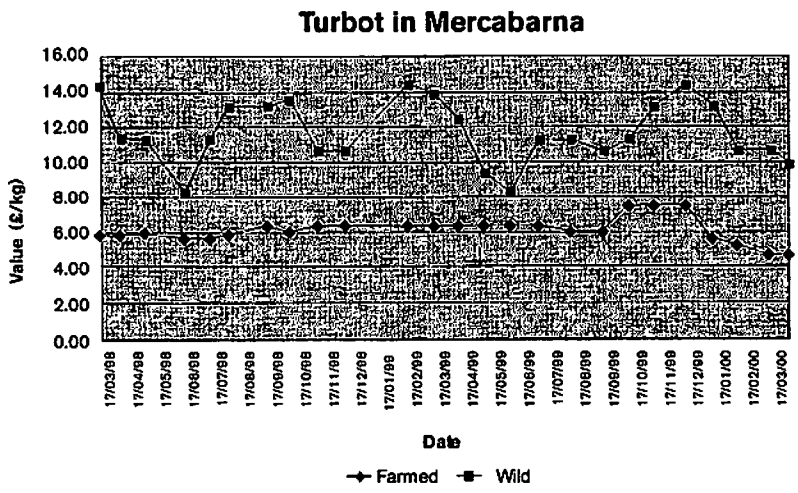


Figure 10 Turbot in Mercabarna

The information presented in Figs 7-10 can be compared with individual prices of bass and turbot quoted by respondents in the survey. In general the Mercabarna data seems to reflect the prevailing values for these species rather better than the Mercamadrid data. The rise in farmed turbot values during last Christmas in Mercabarna is noteworthy, as is the trend for an apparent "step down" in turbot values into year 2000 (see also comments by French turbot producer, Section 9.1).

11.7 FAO Capture Fisheries Data

11.7.1 Introduction to Wild Capture Data

Although Section 11.2 has presented information from the aquaculture statistics available from the FAO, it would also be important to consider the overall supply of the "target" species from the **wild**. There are a number of considerations in taking this approach:

- If the species is a "small volume – high value" niche market product, a decline in the wild fishery might promote the concept of an increased market opportunity for the species to come from aquaculture
- On the other hand, if the global wild supply of the species has been declining steadily for many years, there might be a risk of consumers becoming accustomed to a shortage, and substituting with other products – and thus effectively diminishing the overall market for the species
- In the case of halibut, there is the possibility of substitution or confusion in the market because of:
  - Pacific halibut – a very similar and potentially high-value product
  - Greenland halibut – a lesser-quality species, but one sharing a name and thus presenting the risk of consumer confusion
- In all cases, a study of the trends in the wild supply would be useful for this project

11.7.2 Halibut Supplies

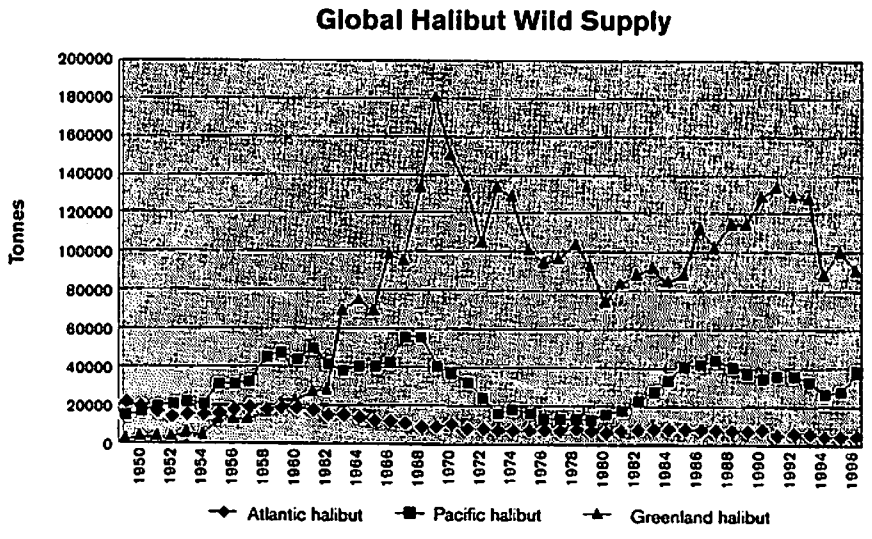


Figure 11 Global Halibut Supplies

Figure 11 clearly shows the trend with halibut supplies:

- Atlantic halibut (the main farming target species) has been steadily declining in the wild since the 1950's – from some 20,000 tonnes per annum down to the current figure of less than 4,000 tonnes per annum
- The similar-quality Pacific halibut has maintained a higher level of supply, albeit with some fluctuations over periods of several years. Controlled by the International Pacific Halibut Commission, current quotas for this species in 2000 amount to some 28,000 tonnes
- The much inferior Greenland (or "black" or "mock") halibut was not utilised until the early 1960's, but reached a production peak of almost 180,000 tonnes (in 1971), and is still available at a level of some 80,000 tonnes per annum

11.7.3 Turbot Supplies

The landings of turbot in Europe actually comprise two species of fish: Atlantic turbot which is caught in the Atlantic and Mediterranean, and the Black Sea turbot *(Pseta maeotica)*. Although there are differences in morphology between the two species, they are closely related and both equally valued in the market. Figure 12 shows the FAO landings data for recent years. There has been some fluctuation in the supply, but turbot seems to be more consistently available than species such as Atlantic halibut, with some **8000 tonnes per annum** over the last few years.

11.7.4 Lemon Sole Supplies

Figure 13 shows the wild supply of lemon sole. Although fish stocks may in general tend to be under pressure from commercial fishing, the availability of lemon sole appears to be relatively robust at some **12,000 tonnes per annum**. This is reflected in some of the values quoted in the survey.

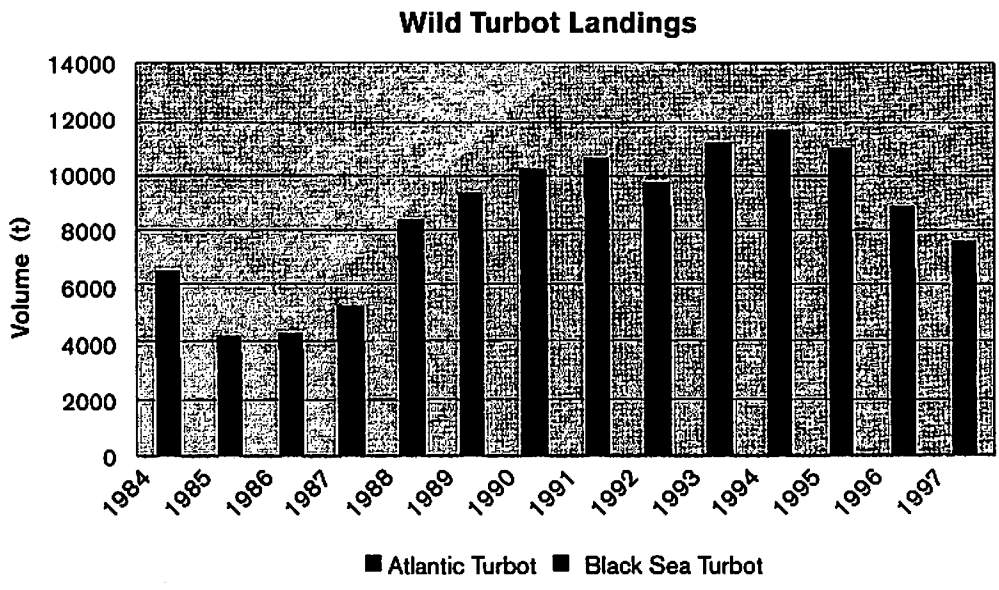


Figure 12 Wild Turbot Capture

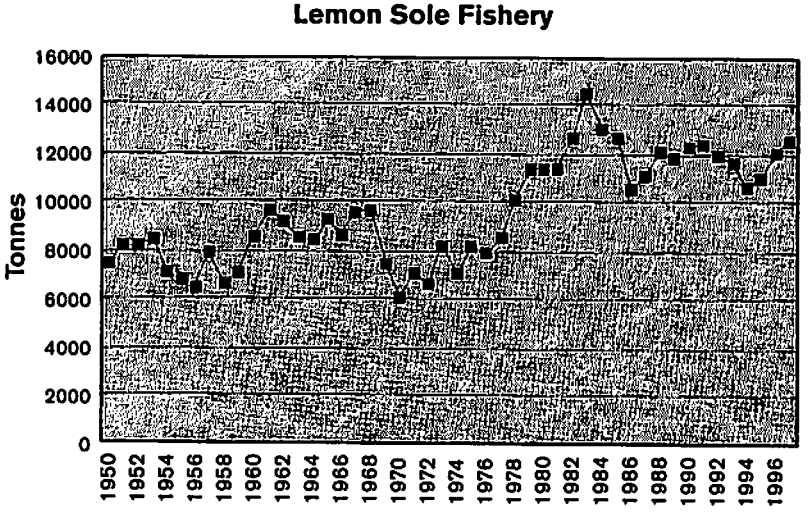


Figure 13 Lemon Sole Capture

11.8 EUROSTAT

The European Union "EUROSTAT" web site provides another useful source of statistical data, and can be located at: **http://europa.eu.int/comm/eurostat/research/**. Currently one of the more useful documents which can be obtained from the site is: **Fisheries research organisations and research programmes in the European Union, Iceland, Israel and Norway**. This 346 page document can be downloaded as an Adobe Acrobat file (file name **orgres.pdf**). In addition to considerable commentary about research organisations and activities, there is a very useful overview of the fisheries and aquaculture statistics for each country.

11.9 USDA – Europe Report 2000

The United States Department of Agriculture operates a Foreign Agricultural Service reporting system to benefit potential American exporters. Reports are compiled by commercial departments of US embassies in a variety of countries, and posted on the Web at **http://www.fas.usda.gov/**. In many cases these reports cover the seafood sector, and can provide a very useful source of information. The database has been used to provide some of the introductory sections to each country covered by the survey (see Sections 4 - 8).

The recent EU seafood sector report is of some interest, and some key data from that report is presented below.

EU fish catch during 1997 amounted to 6.75 million tonnes, unchanged from 1996, and again in the 6.4 -7.4 million tonne range recorded over the last ten years. Relatively stable production, combined with gradually rising domestic consumption, has resulted in a growing import dependency for fishery products. In 1998, the net trade deficit for fishery products equalled 3 million tonnes, valued at EUR 9.3 billion (£570 million). Table 6 below shows the relative quantities of landings by Member State for 3 years (units are '000 tonnes), and although this data set does not include export and import statistics, we might consider it a useful indicator of the relative importance of the seafood sector in each country.

Table 6 USDA Data on European State Seafood Landings

	1995	1996	1997
Belgium	36	31	31
Denmark	1,999	1,681	1,827
Germany	239	237	260
Greece	167	164	171
Spain	1,214	1,129	1,110
Finland	166	165	166
France	676	633	572
Ireland	407	368	330
Italy	489	428	351
Netherlands	438	411	461
Austria	0.4	0.4	0.4
Portugal	262	261	222
Sweden	405	371	357
U.K.	914	870	896
Total Eu-15	7,430	6,748	6753

Source: EUROSTAT

In order to give a more balanced view of importance of seafood in each country, the consumption data can be compared. Fish availabilities for food purposes are defined as the sum of fish catches (excluding fish meal) and imports, minus exports. Data for 1995-1997 are as follows (in kg/head/year):

- **EU Average** **23.9**
- Belgium/Luxembourg 20
- Denmark 26.2
- Germany 15.6
- Greece 25.5
- Spain 37.3
- France 28
- Ireland 20
- Italy 23
- Netherlands 14.5
- Austria 11.6
- Portugal 58.5
- Finland 34.7
- Sweden 30.7
- U.K. 20

Compared to FAO food balance sheets for 1993, fish consumption in the EU has **risen** in all EU member states except Spain. Promotion campaigns, increased awareness of the nutritional aspects of fishery products, and the effects of the BSE-crisis in Europe, have supported this development. Fishery products are expected to continue to gain in importance in the near future. In 1999, EU consumers were once more given a fright when dioxin contamination were recorded in the animal feed and meat sectors.

12 CONSUMER AND FOOD TRENDS

The market research group **Taylor Nelson Sofres** (TNS) started continuous panel research on 1946, and is now active in 31 countries and has a turnover of US$ 545 million. This study has been able to take advantage of two sets of access to the TNS database.

12.1 TNS - Aquaculture Europe 99

TNS presented an analysis of some trends in British consumer's attitude to food and seafood at a recent aquaculture conference. The focus was primarily at looking forward to opportunities for farmed salmon, but many of the points made would be relevant to this project. Key points include:

- British Consumers (23 million homes and 57 million individuals):
  - An ageing population
  - More single parent families
  - More single men
  - Increased divorce rates
  - More working women
  - Smaller households
- Rapid growth in "single person meal occasions" in recent years – from 36% of total in 1996 to 39% in 1998
- Food selection criteria – taste, freshness, healthy, convenience, minimum preparation, smaller portions
- Changes in consumer purchasing of Total Fish (1996 to 1998) in terms of value:

Frozen	£536 mill	No Change
Fresh	£414 mill	- 5%
Chilled meals	**£77 mill**	**+ 26%**
Canned	£255 mill	+ 4%

- Rapid growth in all food classes of Chilled Ready Meals – now £606 mill and increased by 37% from 1997 to 1999
- Age groups – 45+ category eat disproportionately higher % of seafood
- Social classes – AB and DE eat disproportionately higher % of seafood
- Housewives of 45-64 years and 65+ years purchase more fish – housewives of 35-44 purchase more poultry – housewives below 35 years purchase much less fish
- Households of 2 people purchase much more fish – all other numbers purchase less fish
- Households with children purchase more poultry than fish
- Summary:
  - Large demographic change taking place in GB market
  - Salmon is outperforming the market
  - Huge growth in retail multiple sales – need partnerships
  - Even salmon is still a "new" consumer product – big untapped potential

12.2 SFIA TNS Report

SFIA maintain a contract with TNS, and undertook a focused search of the UK database for this project. There was not sufficient resource to undertake such a report from the TNS database for other European countries, on the basis of high cost, but it is hoped the UK report will provide a good "model" for other countries.

12.2.1 The Retail Market - GB

Taylor Nelson Sofres has only recently begun to separate out retail sales data on fresh halibut and seabass, that is, since November 1998. While on the positive side this implies that sales of these species have risen sufficiently to warrant individual recording, the absence of data from previous years negates any possibility of either verifying or quantifying this inferred growth. Fresh and frozen lemon sole, on the other hand, has been tracked for a number of years, allowing time trends to be examined in this report. Finally, the fourth species under consideration – turbot – is still not tracked as a separate species, suggesting again by implication, that sales remain too small.

Chilled Halibut in Retail - 1999

	Tonnes			£000s			Average £ per Kg		
	Natural	Smoked	Total	Natural	Smoked	Total	Natural	Smoked	Total
Total	459	10	469	3356	101	3457	7.31	10.37	7.36
Of which:									
Packaging									
Loose	409	2	411	3009	12	3021	7.37	5.56	7.36
Prepacked	50	8	58	347	89	436	6.89	11.71	7.53
Branding									
Branded									
Private La	247	10	256	1470	101	1571	6.03	8.64	6.49
No Brand	212	-	212	1886	-	1886	9.20	-	9.20
Type									
Natural	459	-	459	3356	-	3356	7.62	-	7.62
Coated	-	-	-	-	-	-	-	-	-
Smoked	-	10	10	-	101	101	-	8.64	8.64
Cut									
Fillet	358	10	367	2447	101	2548	7.68	8.64	8.00
Stk/Portion	92	-	92	878	-	878	8.49	-	8.49
Whole	9	-	9	30	-	30	3.20	-	3.20

In 1999 wet/smoked halibut sales totalled 469 tonnes, with a retail value of £3.5 million. Unsmoked halibut make up the majority of these sales, a typical purchase being a natural fillet sold in loose form under a private label, and retailing at an average price of £5.82 per Kg. Having said that, independent fishmongers are the primary source of sales, accounting for a greater proportion of halibut than would be expected based on their share of sales of all wet/smoked species. This is despite the fact that at £8.35 per Kg, an equivalent piece of halibut would cost the customer more from an independent outlet than from a supermarket. Other multiples grocers, most likely Morrison's, and Asda also over-index on halibut sales, but neither do to quite the extent as do the independents.

In terms of end consumers, those most likely to be buying fresh halibut tend to be living in the Midlands, Yorkshire or the east of England, are over 65 years of age, in social class AB and living in 1 or two person households with no children present.

The remaining two percent (10 tonnes) of halibut sales are derived from higher value smoked halibut. At an average price of £10.37 per Kg, the income generated topped £100 thousand – around 3% of total income from all halibut. In contrast to unsmoked forms, only a fifth of the smoked halibut was sold in loose form,

despite loose being the cheaper option – its average price being £5.56 per Kg versus that for prepacked at £11.71 per Kg. Irrespective of presentation, all were sold as fillets and under private label, from multiple grocers other than the major five. Given the northern regional bias of smoked halibut consumers, Morrison's would again appear to be the major contender here.

Indeed looking at the customer profile in more detail, smoked halibut consumers were exclusive to Yorkshire, Lancashire and the Midlands. Within these areas, those most likely to be making these purchases were individuals of 65+ years of age, ABC1, living in 1-2 person households with no children present. While again there are strong similarities between this profile and that for wet/smoked fish in general, the over-representation of purchasers in these demographic categories is really quite marked.

Chilled Seabass in Retail - 1999

	Tonnes	£000s	£ per Kg
Total	71	807	11.32
Of which:			
Packaging			
Loose	59	661	11.22
Prepacked	12	146	11.79
Branding			
Branded	-	-	-
Private Label	36	424	11.68
No Brand Name	35	384	10.99
Type			
Natural	71	807	11.45
Coated			
Smoked			
Cut			
Fillet	14	139	9.38
Steak/Portion	4	58	13.75
Whole	53	610	11.71

With an average retail price of £11.32 per Kg, seabass is a comparatively high value species, with 71 tonnes of sales yielding £807 thousand in retail revenue in 1999. As with halibut, most is purchased in loose, natural form. Whole fish are preferred over fillets – indeed prepacked seabass is only available as whole fish.

Again independent mongers are more likely than any other individual supermarket to offer seabass, the former accounting for nearly 39% of all retail purchases. Market stalls also perform well, selling twice as much seabass as their typical share of wet/smoked fish sales would predict. In keeping with the higher value of this species, of the multiple retailers it is Sainsbury, Marks & Spencer and Waitrose who over-index on sales. The only other outlet to offer seabass is Asda – which probably has more to do with the fact that among the multiples Asda has the widest range of fresh fish species, rather than being a reflection of its customer profile. And certainly demographic data confirm the upmarket profile – AB, 45+ year olds living in London. Indeed Londoners were responsible for over 57% of all sales of seabass last year.

Frozen Lemon Sole

Consumers of frozen lemon sole products give the impression of being quite price-sensitive, as the table below shows. For example, over the intervening years of 1997 and 1998 average prices rose fairly steeply – by around 44% all in – causing sales to more than halve in volume. Since then though, as average price has decreased, lemon sole has experienced something of a resurgence in popularity.

		52 weeks ending early December . . .				
		1995	1996	1997	1998	1999
Tonnes	Total	669	567	273	261	642
	*Fish Main Meals**	363	322	80	43	116
	Other Speciality	283	214	185	215	514
	Other Fish Products	0	0	0	0	2
	Fish Ready Meals+	23	31	7	4	10
£000s	Total	3477	3264	2409	2165	4168
	Fish Main Meals	932	905	243	113	357
	Other Speciality	2343	2091	1841	2033	3661
	Other Fish Products	0	0	0	0	25
	Fish Ready Meals	202	268	25	19	125
£ per Kg	Total	5.20	5.76	7.73	8.29	6.49
	Fish Main Meals	2.57	2.81	3.02	2.64	3.08
	Other Speciality	8.28	9.78	9.95	9.47	7.12
	Other Fish Products	-	-	-	-	12.52
	Fish Ready Meals	8.78	8.75	3.49	5.25	12.46

*** Main meals = a complete meal where no accompaniments are required to complete the dish**
+ Ready meals = a meal where potatoes or vegetables must be added to complete the dish

While all four sectors of product have recorded year on year growth since 1998, of particular interest are the 'other speciality' forms. Only these have shown a long term growth in volume sales, and as a consequence their share of volume has nearly doubled since 1995 to stand at just over 80%. The main drivers behind this strong performance have been Private Label products, but that said, branded speciality fish appears to be growing albeit from a small base. Of the other sectors, Fish Ready Meals and Other Fish Products are exclusively Private Label, whereas Fish Main Meals are all Branded.

The major freezer centres have gradually come to dominate this market, accounting for some 50% of volume share in 1999, compared with only 6% in 1995. The primary losers have been the smaller freezer centres and the multiples. Currently only Asda and Marks & Spencer continue to enjoy a higher than expected share of the market – Sainsbury's share has nearly halved since 1995, but nevertheless remains more or less consistent with what would be expected given its overall share of the total frozen fish sector.

Though the 65+ year olds are again highlighted within the consumer profile for frozen lemon sole, the class profile is more downmarket, in keeping with the typical frozen sector consumer. Thus customers are over-represented within the DE social classes. A bias towards 1-2 person households with no children present is again apparent but to a decidedly less marked degree. That said, there are some signs of increasing uptake amongst younger (16-27 yrs), more upmarket (AB) households.

12.2.2 The Food service Market

Considerably less information is available for the food service sector, from Food service Intelligence Ltd. Only halibut and turbot are recorded, suggesting that the other species are purchased in quantities too small to be picked up. Even those volumes of halibut and turbot purchased by caterers are relatively small, representing only 0.5% and 0.1% respectively of total fish purchases in 1999. Of the 800 tonnes of halibut, these are shared equally between fresh and frozen forms, with no apparent usage of smoked forms. On the other hand, all but a very small percentage of the 100 tonnes of turbot are sold in fresh form. The following two tables summarise the relevant data currently available to Seafish.

Volume Purchases (000 tonnes) Penetration of Outlets per UK Region

	Fresh		Frozen		Total	
	Halibut	Turbot	Halibut	Turbot	Halibut	Turbot
South						
Volume	0.1	neg	0.2		0.3	neg
% penetration	0.4	0.2	1.6		2.0	0.2
Midlands						
Volume	0.2	0.1	0.1		0.3	0.1
% penetration	2.3	1.3	0.8	0.6	2.6	1.9
North						
Volume	0.1	neg	0.1		0.2	neg
% penetration	2.0	0.8	1.1		2.9	0.8
N Ireland						
Volume	neg	neg	neg		neg	neg
% penetration	1.6	0.8	0.5		0.5	0.8
Total						
Volume	0.4	0.1	0.4		0.8	0.1
% penetration	1.5	0.7	1.1	0.2	2.4	0.7

Volume Purchases (in 000 tonnes) & Penetration by UK Outlet – 1999

Outlet (share of total fish purchases)	Fresh		Frozen		Total	
	Halibut	Turbot	Halibut	Turbot	Halibut	Turbot
Hotels (11.3%)						
Volume	0.2	0.03	0.06	-	0.26	0.03
% penetration	1.6	1.1	0.5	-	1.9	1.1
Restaurants (8.0%)						
Volume	0.18	0.02	0.07	-	0.25	0.02
% penetration	8.0	2.5	3.3	-	10.7	2.5
Pubs (10.1%)						
Volume	0.04	0.02	0.23	-	0.27	0.02
% penetration	3.9	2.2	4.4	1.1	7.2	2.2
Cafes (3.3%)						
Volume	-		-	-	-	
% penetration	-	neg	-	-	-	neg
Fish/Chips (30.5%)						
Volume	neg	0.02	-	-	neg	0.02
% penetration	neg	0.0	-	-	neg	
Club/Leisure (6.5%)						
Volume	-	-	-	-	-	
% penetration	-	-	-	-	-	
Canteens (10.4%)						
Volume	0.01	-	-	-	0.01	
% penetration	0.4	-	-	-	0.4	
Health (9.4%)						
Volume	-	0.01	0.01	-	0.01	0.01
% penetration	-	-	0.5	-	0.5	-
Education (9.6%)						
Volume	-	-	neg	-	neg	-
% penetration	-	-	0.1	-	0.1	-
Services (0.8%)						
Volume	-	-	0.01	-	0.01	-
% penetration	-	-	7.6	-	7.6	-
TOTAL (100.0%)						
Volume	0.43	0.10	0.38	-	0.81	0.10
% penetration	1.5	0.7	1.1	0.2	2.4	0.7

The numbers here really are too small to draw any definitive conclusions.

The regional shares of halibut and turbot volumes show no surprises, given that there is very little to differentiate regions in terms of Total Fish Purchases by region – that is, South = 31.6%, Midlands = 33.3%, North = 30.1%, Northern Ireland = 5%.

Looking at outlet type, Pubs, Hotels and Restaurants are the main purchasers of both halibut and turbot, while on the whole, penetration within each outlet category remains low. The best penetration rate can be seen for restaurants, with just over one in ten UK restaurants buying halibut – although this seems quite high considering this category includes ethnic, motorway/roadside and in-store restaurants as well as European Food/Steak Houses. Interestingly around one fifth of all turbot is purchased by fish and chip shops outlets – similar to the proportions passing through restaurants and pubs.

12.3 Further Consideration of the TNS Report

The TNS report quoted above (12.2), in combination with data from the 1999 Seafish Annual Statistics booklet, raises some interesting points. Taking the entire catering or food service sector into consideration, there is a consumption of some 150,000 tonnes of fish per annum. This breaks down into a number of categories (restaurants, pubs, hotels etc), and these are illustrated in Fig 14 below. The use of species such as halibut and turbot is largely confined to the hotels, restaurants and pubs categories – and this is a grouping which consumes some 44,500 tonnes of fish per annum.

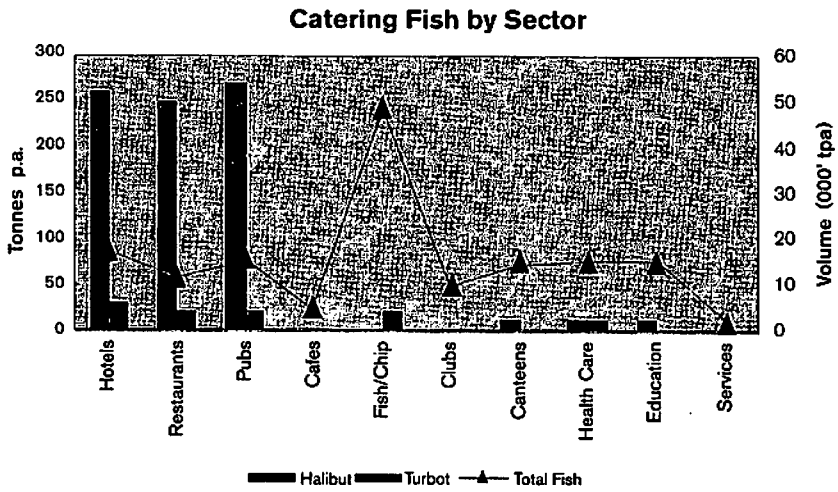


Figure 14 Catering (Food service) Use of Total Fish by Sector – and Target Species

According to the PROMAR report for the BTA in 1999, the food service sector is set to grow at 2% per annum for the foreseeable future (and also see Section 12.4 below). On this basis one could expect the consumption of fish to rise by some **900 tonnes** or more per year – provided fish maintains its market share in relation to other competing proteins. This will be achieved by perceived quality, "health issues", reliability of supply and good value-for-money. There is no reason why farmed fish species should not dominate this opportunity. Cod would probably be one of the most likely species to contribute to this success, on the basis of current consumption patterns within the sector (see Fig 16 below).

The current consumption of halibut and turbot in this sector is low - 0.5 and 0.1 % respectively. Farmed turbot is perhaps too expensive to impact on anything but a small proportion of the sector, at the upper end of the price brackets. Farmed halibut has not yet really had an opportunity, but with the excellent quality characteristics and potential "affordability" of the flesh from aquaculture, one could expect it to have a significant potential in the £10-15 meal bracket within the food service sector.

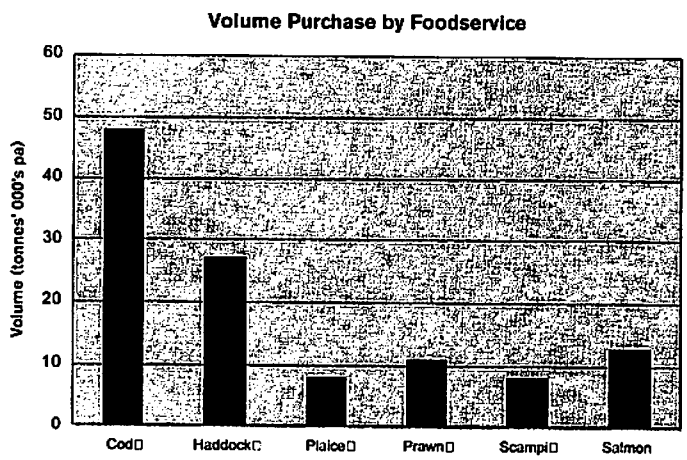


Figure 15 Food service Purchases by Seafood Type

Information which would be useful to this study, on a statistical basis, includes:

- The current consumption of farmed seabass within the sector – clearly becoming a "staple", but with no firm idea of total volumes
- The number of meal opportunities which fall within the £10-15 class (for halibut or bass) and the £17 + class (for turbot) – all as a percentage of the total fish consumption of the food service sector (see Section 12.4 below)

Cod is anecdotally fetching some £3.50 per kg on wholesale markets at the time of writing (late August 2000), and this would translate to a fillet price of some £8.33 per kg. Cod consumption within the quoted seafood products in Fig 16 is some 42% or 48,000 tonnes per year.

The "take home" message from consideration of the food service sector in the UK, and by extension for the rest of Europe, is that the sector already consumes a lot of fish, and that this is potentially set to rise by some 2% per annum. There is an unknown proportion which is covered by the £10-15 meal category – and this must be the target for volume growth for species such as farmed halibut. Farmed turbot will be more properly looking at the higher price brackets within the sector, which will also continue to grow. Farmed cod will probably tend to occupy the lower-middle ground in the sector, with **species** such as lemon sole falling somewhere in between halibut and cod.

There should be a good opportunity for UK aquaculture production to take an increasing "market share" of the 44,500 tonnes per annum which is currently consumed within the "hotels, restaurants and pubs" categories – and see Section 12.4 below.

12.4 Additional TNS Report

The original TNS tailored report for this survey (12.3 above) has provided some useful information about sales of target species. However, in combination with the restaurant "fork to farm" price calculations discussed earlier and the general analysis of the UK food service opportunity for fish in certain "cover price" categories, it was decided to follow this up with a new report from TNS. In this case the agency was asked to list the number of meal occasions for seafood in different types of food service outlet, and by price bracket. Once again budgetary constraints limited this report to the UK market only, but it is hoped this will serve as an indicator for other markets. The results are displayed in the following tables and figures.

Table 7 Taylor Nelson Sofres Seafood Meals Data
Fish meals prices in the Profit Sector

	Proportion of Fish meals in each Bracket				Mean Price (in £)
	Up to £7.99	£8.00 - £11.99	£12.00 - £16.99	£17.00 +	
Total Profit Sector	78%	9%	6%	8%	6.1
Total QSR	93%	4%	1%	2%	3.9
Burger House	83%	6%	7%	5%	5.2
Pizza Place	68%	19%	9%	4%	7.2
Fish and Chips	95%	3%	1%	1%	3.5
Chinese (takeaway del)	79%	14%	5%	2%	6.3
Indian (takeaway del)	76%	10%	3%	11%	6.8
Total Fried Chicken	0%	0%	0%	0%	0.0
Other QSR	89%	11%	0%	0%	3.6
Total non-QSR	48%	18%	15%	20%	10.5
Pub/Bar/Steakhouse/Carvery	54%	22%	15%	10%	9.2
P/B/S/C - restaurant	46%	25%	18%	11%	9.9
P/B/S/C - bar snack	68%	16%	8%	8%	7.9
Restaurants	21%	17%	22%	40%	15.1
Hotels	39%	24%	6%	31%	11.9
Chinese (eat in)	5%	26%	31%	38%	16.0
Indian (eat in)	17%	6%	36%	40%	15.9
Italian restaurant	8%	20%	19%	53%	17.5

Other Restaurants	23%	13%	24%	40%	15.0
Motorway services/Roadside	70%	20%	10%	0%	7.6
Motorway Services	100%	0%	0%	0%	5.5
Other Roadside	57%	28%	14%	0%	8.5
Sandwich bar/bakery	100%	0%	0%	0%	2.5
Sports club/leisure centre	75%	26%	0%	0%	6.0
Total In Store	88%	5%	0%	7%	5.0
Cafe in Department Store	78%	10%	0%	12%	6.4
Cafe in Supermarket	98%	0%	0%	2%	3.4
Other Cafe/coffee shop	75%	10%	7%	8%	6.5
Other Profit Sector	55%	22%	9%	14%	8.5
Total Chains	65%	15%	8%	12%	8.1
Total Independents	79%	8%	6%	7%	5.9

Table 7 provides a breakdown of the percentages of seafood meals sold in different price bands in UK food service outlets – and also breaks the data down to different types of outlets.

Table 8 shows the same categories of outlets, and provides the total number of seafood meals in each in a year, as well as showing the total of all meal types.

Table 8 TNS Data on Seafood and All Meals by Outlet Type
Fish meals prices in the Profit Sector

	Background info: total number of meals by outlet type		
	Total Fish Meals ('000s)	Total Meals('000s)	% of Fish Meals
Total Profit Sector	337,828	2,071,571	16.3
Total QSR	211,812	1,138,039	18.6
Burger House	6,087	240,877	2.6
Pizza Place	6,219	161,602	3.8
Fish and Chips	177,117	282,473	62.7
Chinese (takeaway del.)	16,989	247,640	6.9
Indian (takeaway del.)	3,264	111,357	2.9
Total Fried Chicken	254	44,767	0.6
Other QSR	1,882	49,320	3.8
Total non-QSR	125,746	928,338	13.5
Pub/Bar/Steakhouse/Carvery	52,630	350,596	15.0
P/B/S/C - restaurant	35,694	246,457	14.5
P/B/S/C - bar snack	16,936	104,139	16.3
Restaurants	43,801	315,346	13.9
Hotels	9,195	55,228	16.6
Chinese (eat in)	4,942	51,292	9.6
Indian (eat in)	2,962	55,692	5.3
Italian restaurant	5,127	36,641	14.0
Other Restaurants	21,574	116,494	18.5
Motorway services/Roadside	1,674	15,149	11.1
Motorway Services			
Other Roadside			
Sandwich bar/bakery	1,976	16,161	12.2
Sports club/leisure centre	1,128	6,888	16.4
Total In Store	9,300	60,394	15.4
Cafe in Department Store	4,442	25,805	17.2
Cafe in Supermarket	4,858	34,180	14.2
Other Cafe/coffee shop	9,925	107,776	9.2
Other Profit Sector			
Total Chains			
Total Independents			

Tables 7 and 8 provide a great deal of information about the market opportunity in UK food service for seafood in certain price categories, and further calculations can be undertaken on the basis of likely portion sizes and fillet yields discussed elsewhere in this report. The discussions shown below represent only one approach to interpreting the raw data – readers of this report may find other useful trends for their individual businesses within the Table 7 and 8 data.

The total number of seafood meals consumed annually in the UK in the following categories are:

- Up to £7.99 263 million
- £8.00 - £11.99 30 million
- £12.00 - £16.99 20 million
- £17.00 plus 27 million

These meals will include shellfish, crustacea and fin fish. For fin fish it is also necessary to consider that some meals will contain the "200g portion of flesh" as discussed in an earlier section of this report – but that others may be quite different in form or even portion weight.

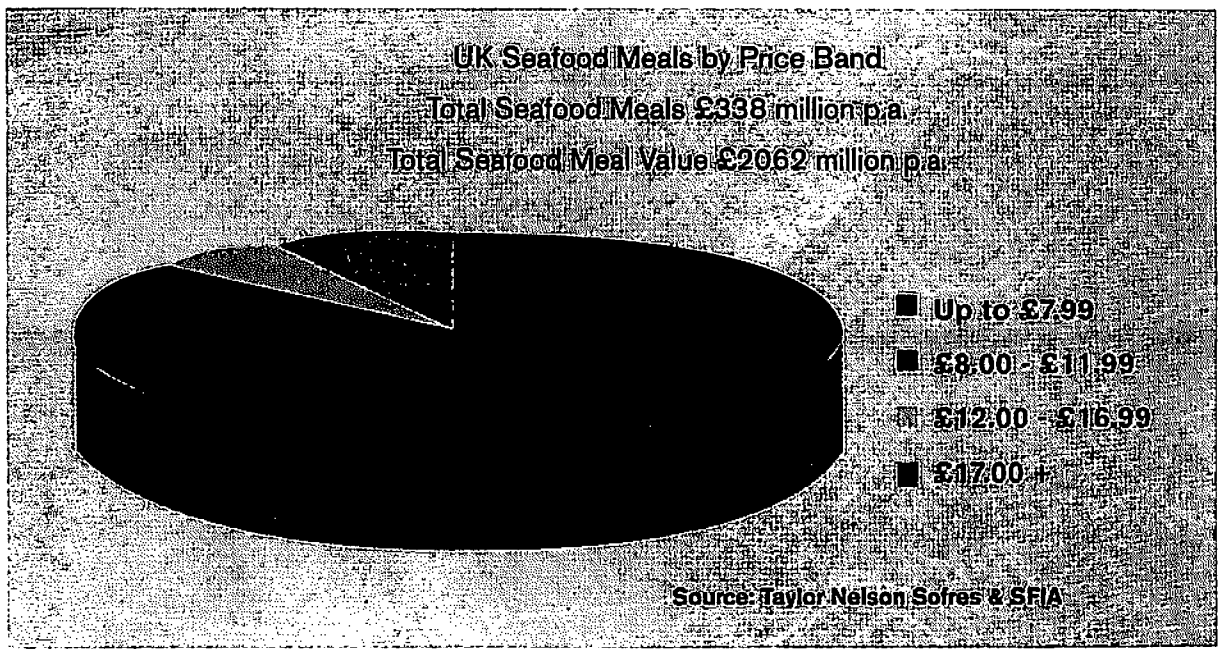


Figure 16 Graphic Representation of Seafood Meals by Value

It is most likely that the target species considered in this report (Atlantic halibut, turbot and seabass) would be appropriate for food service sales in the meal price ranges of £8.00 to £17.00 plus – a total of 77 million meal opportunities per annum according to the TNS report. Combining this number with the expected 2% p.a. growth in food service in general (and assuming seafood keeps its market share), we could predict an annual increase of something like 1.5 million seafood meals.

This report has highlighted a possible preference for flesh-only fish meals, with a 200g portion-size. If the "new" meal opportunities were fin fish alone, this might amount to 1.5 x 0.2/1000 = 300 tonnes of fish flesh each year. With an average fillet yield of, for example, 45%, this would translate to a need for **666 tonnes** of whole fish per year, and increasing by that amount **every year** while the growth trend continues. Such calculations are speculative, and do not take into account the additional opportunities for selling shellfish and crustacea, but they do serve to give some indication of growth in demand for high quality fin fish in the UK food service sector.

12.5 Trends in Restaurants in USA

Although there are clear differences in food-type preferences and eating habits between the USA and European countries in general, there is also little doubt that some of the general "lifestyle" trends which develop in the USA are later mirrored in the UK. There are a number of Web-based magazine sites for the restaurant sector in the USA, and these do provide some interesting articles about future trends in eating-out. Sites include: **http//www.restaurant.org, http//www.restaurantbiz.com**. A brief overview of some of the key emerging trends and projections are reported below.

- Restaurant industry sales are projected to show a 5% increase between 1999 and 2000, the ninth consecutive year of real sales growth
- Restaurants are increasingly having to go "online", and online ordering of takeaway and carry out meals is expected to be a growth area
- Healthy but not bland foods will be important – citrus, chilli, garlic and onion bases, ingredients such as **fish**, vegetables and grains
- Takeout foods are growing fast – 51% of all food service occasions in 1999, up from 46% in 1990. One consultant expects a value rise in this area of 55% between 1997 and 2007
- The number of restaurants is expected to grow by some 20% by 2010
- Culinary trends reflect demographics and increased travel and thus sophistication of the consumers
- The role of TV chefs is considered to be trend-setting and very influential
- Chefs are always looking for innovations – but the difference between short-lived "fads" and slowly developing but sustainable "trends" is highlighted
- Smaller and lighter meal opportunities are becoming popular – "grazing" (the trend started with increasing consumption of tapas, but has developed further)
- Considerable consumer interest in where the food originated – quality appreciation

In summary the general increase in "cooked food sourced outside the house" is a growing trend – either eaten in catering establishments or as HMR (home meal replacements, takeaways). The trend seems to be mirrored in the UK – PROMAR consultants reported on a 2% per annum rise in food consumption in the food service sector.

13 SUMMARY AND CONCLUSIONS

13.1 Summary

13.1.1 Atlantic Halibut

This species has a good market potential in the UK, but is not apparently well appreciated in the other European countries surveyed. The UK market is likely to be consuming around 900-1000 tonnes of Atlantic halibut per annum.

Several analysts in previous studies suggest a medium-term price for farmed halibut of some £5.50 per kg, at a production level of some thousands of tonnes per annum. Current wild prices (depending upon market segment) are in excess of this – for example £7.00 to 8.00 per kg, for fish of 1-5 and 15-30 kg mean weight. There is some difficulty in correlating the official UK government data on import or first-sale value of halibut with actual values quoted in the survey undertaken for this study. 100 tonnes per annum of Norwegian-produced halibut is being sold at delivered prices of around £5.50-£6.00 per kg.

Restaurants and good-food pubs commonly use fresh Atlantic halibut, for which they are currently paying about £9.00 per kg eviscerated whole fish, or the equivalent of about £18 per kg for skinless boneless portions. By the time halibut reaches the consumer, the value of the flesh can be in the region of £60+ per kg in restaurants and anything from £10-20 per kg in retail outlets.

There appears to be broad support for increased farming of Atlantic halibut, mainly in the UK. The desired attributes of farmed halibut would include: good quality, lower price, consistent availability, good farming image, size and portion control, traceability.

13.1.2 Atlantic Turbot

This species has a much broader market appeal across all the European countries surveyed, with the UK presenting the most cautious appreciation of turbot on the basis of its perceived very high cost and thin fillet yield. There is some 3000 tonnes of farmed turbot and 8000 of wild turbot entering the European market per annum.

Farmed turbot appear to have helped to stabilise the supply-demand-value situation for turbot in recent years, and until 1999 prices of turbot had been increasing by almost 7% per annum. There does seem to be a slight plateau or even downward trend in farmed turbot prices at the moment. Converted into Sterling at late-July exchange values, farmed turbot appears to be selling into mid-market segments in different countries according to the following prices:

- United Kingdom £5.00 – £6.50 per kg (commonly £6.00)
- Republic of Ireland £6.60 per kg
- Spain £3.70 - £5.56 per kg (commonly £4.44)
- France £5.68 per kg
- Germany £5.35 - £5.91 per kg

There is broad agreement on the capacity for more turbot from aquaculture to be sold, but also a consensus that some lowering of prevailing prices (in respective markets) will be needed in order to achieve this on any scale. The aspirations of buyers in terms of farmed turbot are much as quoted above for Atlantic halibut, plus bigger fish would often be appreciated. For UK pubs and restaurants, the high price, low flesh yield and thin nature of turbot fillets are all challenging features, currently creating a product with which it is difficult for them to make a margin in the volume-sales prices categories.

13.1.3 Seabass

This species is now very widely used across all the countries and market segments surveyed. Some 40,000 tonnes per annum of farmed bass is now available to the European market. The average European first-sale value was around £4.50 per kg in 1999, and indications from market data and this survey suggest that prices are continuing to drop.

There is mixed response to perceptions of farmed bass quality, but generally it is quite well viewed in the market. Farmed bass tend to be quite small (400-600 g). UK restaurants and good-food pubs consider bass almost a "staple" now, and are paying as much as £8.00 per kg for whole fish. It is available in one large UK retail multiple for around £11.20 per kg (late August 2000).

13.1.4 Lemon Sole

There is a mixed perception of this species across the countries surveyed, and even within them. In general it seems that lemon sole consumption is mainly in UK, Germany and perhaps France (and possibly other EU states not included in this survey). There appears to be a relatively robust fishery at about 12,000 tonnes per annum. There is also apparently quite a marked seasonality in the fishery, leading to "feasts and famines" in the market.

The value of lemon sole (at mid-market segments) can be anything between £2.00 and £4.50 per kg depending upon the supply at the time. There appears to be a perception that a maximum long-term stable price, for developing a new business opportunity, would be in the region of £2.50 to £3.00 per kg. Restaurants and good-food pubs in the UK and Ireland might pay £5.00-6.00 per kg for whole fish. The species is not so robust in cooking as halibut and turbot, and would often form the basis of a starter rather than a main course.

Some interest was expressed in farmed production, and the normal attributes of farmed fish were as described above for halibut and turbot. There was also some caution expressed about farming this species – respondents thought the seasonal oversupply and low prices which can occur might render this species unsuitable for farming.

13.1.5 Pacific Halibut

Official statistics suggest that some 700 tonnes of this species enter the UK market each year, but as with Atlantic halibut it does not appear to have a wider appeal in the other European countries surveyed. Changes in the catching controls in the IPHC countries have ensured a longer fishery season, and thus a much-improved supply of fresh product for much of the season, as well as an improvement in quality of frozen fish. Current fishery is some 28,000 tonnes per annum. The fishery is stable or slightly declining.

The value of this species in Europe (and mainly the UK) is still quite high. Fresh fish can fetch very similar prices to Atlantic halibut (or even higher). Sellers from Alaska quote the high EU import tariff and cost of transportation as being reasons for the high price.

13.2 Conclusions

"Aquaculture is the future of seafood supplies for European consumers" – this message was relayed by an estimated 90% of the 150 respondents in the survey. Most are enthusiastic about the business opportunity which this brings, and about the benefits to wild stocks in our seas and oceans. Some respondents were resigned to the actuality, rather then enthusiastic, stating that the quality of farmed fish would never be as good as wild. A few respondents were concerned that increased aquaculture would by-pass their business niche within the traditional and complex seafood supply chains prevailing in their country.

Based on this perception of opportunity, and on some of the details outlined in this report, this study can draw the following conclusions for aquaculturists in the UK and Ireland.

13.2.1 The High Value Seafood Market in General

An analysis of the experience of bass and turbot in the wider European context is of interest:

- The high prices of the mid-late 1980's were mainly direct sales from fish farms to local restaurants and hotels, and whilst that niche will always be available to individual farmers, these prices will not commonly be seen for large volumes of farmed marine fish
- For seabass, the original market (wild supply) was doubled by aquaculture at first-sale values of around £6.00 per kg, and this has now developed into a 700% increase in supply at values of around £4.00-£4.50 per kg

- For turbot, the aquaculture supply has so far only added about 40% to the original wild supply, and this has had the effect of **increasing** values to some £6.00 per kg. Latest trends suggest this increase is not likely to continue, and that some value reduction might be needed in order to sell greater volumes from aquaculture
- The very large supplies of farmed seabass and seabream are likely to be impacting on the finite (but growing) market for high-value fish species in Europe – with the possibility of some effect on other farmed species such as turbot and halibut

The market for "aspirational" fish species is generally **growing** perhaps for a number of reasons: increasing economic wealth, demographic changes, increasing trends in food service and home-meal-replacements. On the other hand, competition from other protein sources is also vigorous, and there has been a general trend of increased affordability of high-value foodstuffs in Europe for many years. In UK and Ireland (for which this study has the best data), high value seafood at the point of the consumer can have a flesh value anywhere in the range of £15-60 per kg. For a species with a fillet yield of 50% this could amount to a whole-fish value of anything from £7 to £30 per kg.

The traditional seafood distribution chain (or web) is fundamental – farmers do not usually have direct access to restaurants, fishmongers or supermarket distribution centres. These wholesalers, processors and distributors all provide a service to the seafood sector in general. It should be possible for aquaculture, with its reliable and consistent supply profile, to develop the most efficient ways of working with the supply chain companies.

Actual and perceived quality is another issue of great importance to future aquaculture. For example, if farmed halibut contains 3% or more lipid and has visible pink fatty margins, it will not be the product which the consumer says he wants. Farmers and the feed companies should consider the following points:

- Halibut farming is unlikely to ever achieve the volumes of farmed salmon – it should be preserved as an up-market niche, and the total protein production efficiencies necessitated by modern salmon production should not be perceived as inherently essential
- What is the cost-benefit analysis of feeds containing 20+% lipid in terms of growth rate, food cost and conversion efficiency – compared with a range of final selling prices ? Further research work is needed in this area
- These principles **apply equally** to the production of turbot, cod and other future marine species

13.2.2 Atlantic Halibut

Efforts to farm this species should continue vigorously, since its large size generates end-product specifications which meet the aspirations of modern consumers, and since it is capable of being farmed in sea cages, an affordable and well-understood technology. The market for this species, however, is currently rather restricted to the UK, Ireland and perhaps a few other regional niches in Europe. If Pacific halibut is considered as well, the total current market (i.e. supply) might amount to some 2000-2500 tonnes per annum.

Although the current selling price for 100 tonnes of farmed Norwegian halibut in the UK is apparently £5.50 to £6.00 per kg, this should not **necessarily** be considered as indicative of attainable price at the current low level of production. It should be possible to achieve prices closer to those of wild fish if the quality of the product is good and the marketing and selling strategy has been carefully planned (to take advantage of some of the opportunities which have been identified within this report).

On the other hand, medium to long term aspirations for selling price must be realistic as production volumes grow. The original BHA 1996 prediction of £5.50 per kg (delivered to first customer) has been broadly supported by other studies, but the author would stress that achievement of this price might, as above, **continue** to require considerable attention to product quality and sales and marketing strategy.

13.2.3 Atlantic Turbot

Turbot is still one of the most "aspirational" of the marine fish species in Europe, with a relatively wide market which understands and values it. As volumes from aquaculture continue to increase slowly,

consumers might begin to expect to pay a little less for it – particularly if the "flesh value" issue becomes more important.

The challenge for aquaculture of turbot is widening the scope for margin-taking (or margin-maintaining) at the retail and food service end of the supply chain – providing them with product at a price they can afford to sell in greater volumes. This could be achieved by a reduction in current first-sale values, and indeed this is probably happening at the present time. Additional or alternative strategies would involve working with the supply chain to achieve maximum efficiency.

Quality and specification are still issues which might be used as "tools" by some entrepreneurial producers. Consumers want bigger fish, thicker portions, less fat, better flavour – how can these aspirations be met by farmers?

13.2.4 Lemon Sole

Aquaculture production of this species may be possible in the UK and Ireland, although considerable research is still required – particularly on the ongrowing phase. How long does it take to grow, to what market size, in our ambient temperature conditions? Can the species be adapted to low-cost cage culture? What will the production cost be? No flatfish in Europe is currently being grown for less than, at very best, £3.50 per kg (data from reports covered in this study, and from other sources).

Opportunity may exist for the farming of lemon sole in the following areas:

- The addition of lemon sole production to a current farming operation with other species might allow savings on some overheads, and thus a reduction in unit production cost
- The margin-taking along the supply web for lemon sole can apparently be significant. Despite its medium market image, lemon sole flesh can still retail for £15 per kg in supermarkets and £15 to 30 per kg in good catering establishments. As with turbot and halibut, there may be opportunities for aquaculture to tap more directly into that part of the supply web.

13.2.5 Other Species

Although not covered in detail within the body of this report, the survey questionnaire did ask about substitution if the "target species" were not available. There were several responses, although not enough to warrant a separate section of the report. **Dover sole** was commonly a popular or indeed preferred alternative to lemon sole. **Monkfish** was one of the most common alternatives to "robust" species such as halibut and turbot, although **skate** was also mentioned in this regard. **John Dory** was seen as a good alternative to species such as turbot, and **brill** was also mentioned quite often in this regard.

The fish & chip shop sector in the UK was most interested in the prospects for farmed **cod** and **haddock**, and these "volume" species were mentioned by other parts of the market as well. The equivalent for the Spanish market would be **hake**.

13.2.6 Final Thoughts

This survey has added to an existing knowledge-base about the aquaculture species markets in Europe, and has reappraised some of the excellent studies which have gone before. The intention has been to create a "one stop shop" for data, trends and suggested strategies within this sector, for the benefit of aquaculture producers in the UK and Ireland.

The **market opportunity** is overwhelmingly clear. The challenge for the farming industry is to produce and deliver the products which the market wants at prices which the market can afford. Attention to detail on quality, efficient production with good economies of scale, an entrepreneurial approach to partnership with the supply chain – these will be the attributes of a successful and sustainable aquaculture sector in our countries in the future.

APPENDICES

Appendix 1 - Questionnaire Details

The full questionnaire covered 5 pages, and can be summarised as follows

Page 1

Identification of interviewee and interviewer, and a box to provide some overview information about the company

Pages 2-4

Each page asked identical questions, for Atlantic Halibut, Pacific Halibut and Atlantic turbot:

Questions were:

1 Volume
2 Seasonality
3 Cost Price
4/5 Purchase Form
6 Source
7 Size available
8 Size preferred
9 Transformation
10 Substitution
11 Outlook for Aquaculture of this product

Page 5

Asked for general information about:

1 Seabass
2 Lemon sole
3 Perceptions of current aquaculture products
4 Perceptions about future aquaculture production

Appendix 2 - The Project Teams

British Marine Finfish Association

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Appendix 3 Acknowledgments and Other Data Sources

Where possible the source of additional data has been fully identified in the text of the report.

The **interviewees** have contributed significantly to this study, and their assistance is gratefully acknowledged.

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