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Girard S.

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S. Girard
IFREMER, Service d'Economie Maritime
Centre de Brest, BP 70, 29280 Plouzané, France

SUMMARY – The dynamics and comparative analysis of aquatic food consumption in European countries have been studied using the food balance sheet method in the framework of the MASMANAP EU concerted action. The first part of the presentation is devoted to the review and assessment of the statistical databases used in the evaluation of apparent consumption for 8 countries. Following on this expertise and the setting up of relevant data series of primary production and foreign trade over the period 1988-1998, the main trends in aquatic food supply and the striking features of consumption per country have been analysed. This provided a first set of information on typology among the EU15 countries with regard to their respective dependence on domestic production and imports of fisheries and aquaculture resources, their export capacities, the indicators of domestic market size and the level of apparent consumption per capita expressed in equivalent landed weight.

Key words: Seafood market, apparent consumption, Europe, aquaculture.

RESUME – *"Principales tendances de l'offre de produits aquatiques et typologie des marchés européens". Dans le cadre de l'Action Concertée* MASMANAP*, la dynamique des marchés des produits aquatiques dans les pays de l'Union Européenne a été étudiée en utilisant la méthode de calcul de la consommation apparente. A l'issue d'une première phase de recensement et d'expertise des données disponibles, des séries de données de production et de commerce extérieur sur la période 1988-1998 ont été constituées pour 8 pays européens. Ce travail préliminaire a permis de mesurer les principales tendances de l'offre de produits aquatiques et de souligner les caractéristiques majeures de la consommation par pays. Il fournit également des éléments de typologie du marché européen sur la base de différents indicateurs : les taux d'approvisionnement en produits de pêche et d'aquaculture à partir de la production nationale et des importations, la capacité d'exportation, la taille du marché domestique et le niveau de consommation apparente par habitant, en poissons et en coquillages/crustacés.*

Mots-clés : *Consommation apparente, produits de la mer, marché, Europe, aquaculture.*

Introduction

During the 1990s the European seafood market was confronted with significant changes in terms of supply, in relation to the context of the liberalisation of seafood external trade and of its further opening to extra-EU trade. Evolution of seafood supply was also a consequence of the diversification of production sources, intensive aquaculture becoming a real alternative to make up for the shortage of fishery resources. The dynamics of the European aquatic food consumption in the 1988-1998 period is considered in this paper through the contribution of MASMANAP participant countries, including the biggest seafood markets of EU15, such as Spain, France, Italy, Germany, UK, etc. and one of its main seafood suppliers, Norway.

One of the objectives of the MASMANAP concerted action was to analyse the main trends in aquatic food consumption and to compare the resulting level and structure of consumption between the European countries. While emphasizing the interest of applying the food balance sheet method in the field of aquatic food, as the unique means to approach the overall domestic consumption, this paper aims at pointing out the main statistical shortcomings of the apparent consumption evaluation. Its dependence on the reliability of primary data will be highlighted throughout the evaluation exercise, from production to foreign trade processing data. Beyond the calculation of reliable indicators of consumption level per country which represents a prerequisite for economic research in the field of aquatic food market, the second purpose was to highlight the limitation of the current databases in

providing the detailed indicators of volume and prices required by the on-going survey of aquatic food markets, from fishing and aquaculture industries as well.

Assessment of the primary databases (production and foreign trade)

This first part of the assessment focuses on the existing databases in the field of aquatic food production, with the aim of describing as accurately as possible the recent trends and the structure of production per country, from fisheries and aquaculture. The expertise of available production statistics attempts to go beyond the use of international databases (FAO, EUROSTAT) in order to trace back to the source of the primary data.

The main feature regarding the statistical systems of seafood production data is the heterogeneity of the diverse compiled data sources, in terms of anteriority, accuracy, output frequency, etc. The difference in data processing according to the production industry (fishing/farming) and to the environment (fresh water/marine exploitation) is a common characteristic of all countries, which have been allocated statistical means with respect to the resource management constraints and to the economic weight of each industry. As a result, the collation of the different production databases within a centralising department (in the Ministry of Agriculture, in most cases), mainly aims at providing a global estimation of the overall aquatic food production, while the setting up of a statistical on-going survey of all aquatic primary products market, based on harmonised indicators of volume and price, is just at an early stage.

The limits of national statistical systems of fishery production

As far as fishery statistical systems are concerned, significant means are expected to be implemented on a national scale to fulfil the European Fisheries Policy requirements. In all likelihood, the nature of the underlying purpose (the regulation of resource access), may induce statistical bias. However, the efficiency of the management tool at first relies on the ability of the EU members to supply the European database with harmonised data, issued from relevant networks of fish landings registration.

For all countries, the main source of statistical bias identified is linked to the lack of exhaustiveness of the data collected. The systems of capture monitoring are mainly orientated towards the survey of first hand sales in auctions, which play a major role in concentrating and recording the landings. In some countries, the state of progress of computerisation and of interconnection of all the auctions present on the territory, actually provides an efficient statistical tool (in terms of reliability, harmonisation and detail level of the available information, output frequency, short time delivering). On the other hand, the organisation of captures data collection from small scale fishery landing in scattered areas is more tricky, for lack, or at least deficiency, of Authority landings control. Accordingly, the trust put in each national statistical system seems to be closely linked to: (i) the importance of non auction sales compared to whole landings; and (ii) the additional means devoted to estimating this part of the fisheries production; both items affect the reliability of the primary data. It appeared from the MASMANAP statistical expertise that the "official" fisheries production databases in the Mediterranean countries were generally credited with a lower degree of confidence. Alternative sources will be considered for Greece and Italy later.

Furthermore, specific attention has to be paid to Spain. It is worth mentioning that in the main aquatic food producer country of the EU15, national fisheries production data are no longer available, since 1994, as a consequence of the strengthening of the regions' political autonomy. This halt in the publication of official statistics at a national level for Spain, inevitably makes the analysis of seafood consumption trends less accessible for that part of the European market.

The limits of national statistical systems of aquaculture production

In the field of aquaculture, the consistency of the available information about production is even more questionable, due to the lack of first-hand sale markets, such as fish auctions, and to a lesser involvement of institutions in the field of aquaculture statistics, compared with fisheries. Production

data are generally provided by the professional sector evaluations, and are judged more or less unreliable by the users. They also provide much less information than capture fisheries, from the periodicity point of view and regarding farm-gate price monitoring. As far as the most established industries are concerned, namely bivalve and trout farming, the reliability of production data is questionable, especially when the geographical dispersion of small-scale production units is coupled with a low level of collective organisation. The stability of long-term data series is uncertain and can affect the production trend analysis. In contrast, the result of the MASMANAP statistical expertise seems more favourable in the field of the "new" intensive fish farming industry. The rapid growth of salmon production in Northern countries, as well as the development of Mediterranean species (seabass, seabream), have demanded a strict monitoring of both production and trade, especially with the increase of international competitiveness and the implementation of marketing rules to access the European market in the frame of the CFP. The high level of concentration of the salmon industry, and the different issues raised by the management of intensive farming (in terms of environment, commercial outlets, quality and consumer concerns) have created the breeding ground for setting up an efficient statistical tool. Actually, the Norwegian seafood export council provides continuous information about salmon export flows and prices, on a monthly basis (and at short notice), which gives on-going indicators about the salmon industry production. As regards sea-bass and sea-bream farming, Greece shows another example of booming and export-based industry, which has given rise to the setting up of data-recording network (including some indications about different grade sizes).

The limits of the foreign trade databases

The review and assessment of import and export data in the field of seafood raised different issues compared to the production statistical system. Actually, national customs authorities which are entrusted with the registration of import and export flows, supply the international database COMEXT with harmonised data. In terms of output, the access to monthly information on quantity and prices is likely to provide a real contribution to on-going market surveys.

However, several reservations have to be made. From the "consistency of data" point of view, gaps between national customs and COMEXT data have been identified and have to be mentioned. Although they are generally marginal at the aggregate level, and consequently not likely to affect the relevance of trend analysis, they prove to be more significant at the detailed product level, hampering in-depth market analysis. Another criticism one can express about import and exportn data is related to the shortcomings of the product itemisation which limits the accuracy of on-going surveys. As a result of a compromise taking into account the main commodity flows involved in international trade, the combined nomenclature inevitably does not meet all national and/or specialised market concerns. The updating of the itemisation, to integrate new exchange of products is also questionable, especially in the case of the rapid growth of new farmed fish. Finally, the flaws of the itemisation coupled with the lack of accuracy of the importers and exporters declarations, limit the characterisation of the external seafood supply.

Main trends in aquatic food supply in MASMANAP countries

As a result of the review and assessment of the national statistical sources, production data series have been set out for all the countries involved in MASMANAP. Except for Spain, where FAO figures are presented by default, all other production estimations come from national sources and are directly based on the compilation of aquatic species production dedicated to human consumption (excluding feed outlets). In almost all cases, official statistics have been selected to comply with this purpose, even while reporting their limits. Nevertheless, the situation of Greece and Italy has to be considered apart. In the former, the production reported relies on AGB (Agriculture Bank of Greece) data, instead of the official ones, because AGB is assumed to be the more reliable and the more complete database covering both fisheries and aquaculture industries. In Italy, the under-evaluation of Italian official production statistics (ISTAT) is pointed out, and even the redressed FAO data series are considered to be inaccurate. ISMEA, an Italian institute of Agricultural markets, has been supplying alternative estimations for several years, by cross-checking information from research and professional sources, in order to set up more realistic indicators of primary aquatic food production. Although these estimations do not enable us to build a continuous data series over the 1988-1998 period, they have been retained in the framework of MASMANAP. On the other hand, as far as

foreign trade data are concerned, the official sources, i.e. mainly national customs, have been retained.

Total production from aquaculture

In order to emphasize the specific contribution of aquaculture in the total aquatic food production, the structural changes to this industry during the 1990s are briefly reported. The traditional industries of bivalve and freshwater fish farming showed an irregular upward trend, whereas the marine fish farming presented a steady and high rate of expansion (Table 1).

Table 1. Overview of European aquaculture in MASMANAP countries (1998 versus 1990) in thousand tonnes (source: MASMANAP, SELAM)

	UK	Germany	France	Spain	Portugal	Italy	Greece	Total 7 EU countries	Norway
Marine fish	35	0	1	2	0	5	2	46	151
Bivalves + fresh waterfish	15	64	254	198	4	143	6	685	0
Total aquaculture 1990	50	64	256	200	4	149	7	730	151
Marine fish	115	0	6	11	2	14	35	183	390
Bivalves + fresh waterfish	16	61	259	304	6	195	31	871	48
Total aquaculture 1998	131	61	266	315	8	208	65	1054	438

In 1990, the main production in volume relied on bivalve culture in France, Spain and Italy (around 500,000 tonnes as a whole) even while the Norwegian salmon industry already reached a 150,000 tonnes production and the leading position in value. In 1998, the overview of the European aquaculture showed considerable changes, with the twofold increase of Norwegian salmon production, and the coming of the United Kingdom as an additional player in the salmon farming industry (it tripled its former output, from 1988 to 1998). In the Mediterranean region, intensive farming also underwent significant growth. In Greece, the production of sea-bass and sea-bream increased from 2000 tonnes in 1990 to 35,000 tonnes in 1998. The extension of the production of these species to Italy (reaching 14,000 tonnes in 1998), and to a lesser extent to France and Spain is worth mentioning, as well as the development of other marine farmed fish such as turbot.

Bearing in mind the real impact of marine fish farming in the development of aquaculture production during the nineties, its expansion appears to be mainly related to the Norwegian salmon culture industry, the outputs of which reached around 400,000 tonnes by 1998, nearly twice as much as the intra-EU15 production of marine farmed fish.

Total production from capture fisheries and aquaculture

In addition to all the shortcomings and statistical discrepancies of primary production statistics already mentioned, the processing of total production data series came across another major stumbling block. In the case of Norway, the ratio of pelagic fish dedicated to fishmeal reduction could not be accurately estimated, which induced a significant bias in the calculation of the required production indicator (for food uses only).

Nonetheless, the main evolution of production which occurred over the 1988-1998 period are shown in Table 2. Compared to the substantial increase in aquatic food production in Norway (from one million to around two million tonnes), the evolution of the 7 EU countries appeared little marked and discontinuous. Their aggregate production reached between 4.2 and 4.6 million tonnes over the decade, whilst showing a slightly downward trend at the end of the period. Actually, trends in production per country resulted from concurrent factors of evolution: (i) the yearly variability of global catches, mainly issued from pelagic fish landings and bivalve farming outputs; (ii) the general decline of demersal fish captures; and (iii) the effort of production diversification carried out via aquaculture.

Table 2. Evolution of total production of aquatic species for human consumption (1988-1998) in thousand tonnes (synthesis of MASMANAP partners contributions)

	France†	Germany††	Greece	Italy†††	Portugal	Spain††	UK	7 EU countries††††	Norway
1988	794	212	*128*		325	1594	778	4486	1302
1989	763	237	128		313	1521	714	4331	1211
1990	834	263	157	656	314	1303	658	4186	1132
1991	822	294	148		312	1282	655	4204	1197
1992	823	315	156		284	1239	655	4198	1327
1993	876	298	156		275	1196	746	4309	1617
1994	908	258	170		253	1262	768	4415	1959
1995	870	279	166	830	249	1365	809	4569	2130
1996	854	296	174		222	1358	734	4427	2142
1997	857	300	179	747	209	1382	718	4393	2317
1998	835	*300*	185	764	220	1420	635	4358	2226

†Overseas territories included since 1997.
††FAO production data.
†††ISMEA estimations.
††††Total 7 countries including extrapolations of Italian production data for the missing years.

In Spain, the main EU15 producer country, the yearly production of mussel cultivation which is very sensitive to environmental conditions, recorded high variations during the 1990s, leading to a discontinuous trend in global production. However, it is worth mentioning that, despite high production indicators of mussels in 1997 and 1998, the overall production from fisheries and aquaculture did not recover the 1988 peak reached ten years before.

In France, the high variability of pelagic fish landings masked the decrease in demersal fish captures for a while. Nevertheless, a downward trend in global aquatic food production was observed from 1994 to 1998, which reduced the production from around 900 to 800 thousands tonnes.

In the United Kingdom, the overall production trend was unsteady and reached successively a trough (650,000 tonnes) and a peak (800,000 tonnes) followed by a new decrease up to 600,000 tonnes, due to significant fluctuations of both pelagic and non-pelagic fish landings. The growth of salmon farming partly lessened the fall in captures at the end of the 1990s.

Interestingly, for the biggest producers of the 7EU countries, and even the UK, the impact of the development of marine fish farming on global production trends is still little apparent. In some respects, the comparison of the two smallest producers of MASMANAP, Greece and Portugal, is more conclusive. The former showed a slightly upward trend in global production, which was maintained during the 1988-1998 period thanks to a significant involvement in an alternative production mode, such as marine fish farming. The latter, a quasi-exclusive fishing producer, showed a significant downward trend in primary aquatic species production which was clearly related to the decline of demersal fish captures.

Evolution of total foreign trade

Statistics from national customs have been mainly retained at this step to give an overview of the dynamics of aquatic food foreign trade over the 1988-1998 period (Table 3). The use and processing of import and export figures of aquatic food (all product codes beginning by 03, 1604 and 1605), expressed in net weight, provide first indications about the breakdown of seafood demand and export capacities between European countries.

An increasing dependence on imports was registered in the EU in the 1990s. The upward trend was almost steady, although the change in customs declarations occurred in 1993 (with the

implementation of the Single Market) introduced a break in the progression movement of most countries. Nevertheless, the aggregated imports of the 7EU countries of MASMANAP rose substantially, from 2.9 to 4.4 million tonnes (in net weight) over the decade. The current leading seafood customers, Spain, France, Germany and Italy, accounted for 80% of the 7 EU countries imports in 1998 (60% with respect to EU15 imports). From 1988 to 1998, Spanish imports increased nearly twofold, from 600,000 to around 1.2 million tonnes. The German demand rose substantially after the reunification and the decline in the former East German fishing sector. In France and Italy, the upward trends were shown to be significant as well, reaching +33% and +36% respectively over the period.

Table 3. Evolution of aquatic food imports in MASMANAP countries from 1988 to 1998, in thousand tonnes (source : National customs and Eurostat-COMEXT for Spain)

	France	Germany	Greece	Italy	Portugal	Spain	UK	7 EU countries	Norway
1988	616	473	49	510	197	615	441	2902	
1989	664	527	61	538	184	603	483	3059	
1990	737	615	60	586	219	645	497	3358	13
1991	740	669	56	632	256	704	481	3538	19
1992	753	684	55	597	243	758	485	3575	142
1993	693	641	54	578	247	765	442	3419	200
1994	724	734	57	577	281	838	458	3668	166
1995	742	707	65	595	289	890	484	3772	193
1996	804	763	84	614	308	970	525	4070	116
1997	779	766	92	626	298	1020	522	4104	119
1998	838	828	96	678	303	1181	532	4455	105
Evol 98/88	36%	75%	96%	33%	54%	92%	21%	54%	

The steady increase of imports in Portugal could be related to the above-mentioned decline in production this country endured. In 1998, the volume of Portuguese imports represented the level of 1988 production, and inversely.

Concurrently, the growth of seafood exchanges also affected the export flows, reflecting the specialisation increase in new production industries (aquaculture, for instance) as well as the development of intra-industry trade (through the re-exportation of imported primary products after processing). The capacity of the Norwegian export sector tripled, until reaching a potential of export of around 1.8-1.9 million tonnes in 1997-1998, thanks to the trade of pelagic fish, non-pelagic fish and farmed salmonids (value-wise, the contribution of salmonids overtook the demersal fish such as leading export resources at the end of the 1990s). The export capacities of the 7EU countries exports also grew, to a lesser extent, from 1.1 to 1.9 million tonnes (+75%). Even while exhibiting a higher increase rate than that of imports, their export capacities stayed steady at around 40% of the amount of imports over the period, ending up with an increasing deficit of seafood balance trade for most of the EU countries. The main providers within the MASMANAP EU countries were Spain, followed by UK, France and Germany.

Total seafood supply (seafood balance sheet without conversion of import and export weight units)

The building of seafood supply data-series (production minus imports plus exports) provided primary indicators to characterise the European seafood consumption, by measuring the importance of each market and the corresponding self supply rate (the share of domestic production in the whole consumption). Bearing in mind that the compilation of production data, expressed in landed weight, and aquatic food balance data (expressed in net weight) tends to underestimate the market size of

countries showing a deficit balance, and inversely, this straightforward evaluation was expected to provide first elements for both a dynamic and comparative approach to seafood consumption.

In the case of Norway, erratic trends resulting from the seafood supply evaluation (varying by three-fold as much from the maximum to minimum year) undeniably showed the inadequacy of the figures used in the calculation. The difficulty in getting an accurate feed outlets ratio for pelagic fish captures, and in accounting for the stocks, clearly affected the coherence of yearly evaluations.

For other countries, as a result of a slightly downward trend in global production and more pronounced increase in seafood trade deficit, the aggregate aquatic food supplies exhibited a moderate upward trend. Taking into account the remaining uncertainties attached to Italian production, the seafood supply of the 7EU countries is estimated to have evolved from around 6.3 million tonnes to 6.9 million tonnes from 1988 to 1998, which indicates a progression rate equal to 10%. At this stage of the evaluation, we must bear in mind that this tendency is dependent on the stability of the long term data series. And, it could be advisable to recall the identified break in foreign trade registration, as a potential source of underevaluation of import flows since 1993, and accordingly of reducing the extent of the seafood supply upward trend. Nevertheless, it is apparent from the evaluation carried out, that the stagnation, and even decline in production, which could not compensate for the growth of aquaculture, very likely curbed the upward trend in domestic consumption.

From the point of view of a comparative analysis, the MASMANAP countries are classified in Table 4 by decreasing order of domestic market size, distinguishing big markets (Spain, France and Italy), intermediate markets (UK, Germany) and small markets (Portugal and Greece). In terms of outlook, the interpretation of the previous trends, although dependent on the stability of the data series, would provide different patterns: stagnant/steady supplying (France, Portugal, Greece); fluctuating/a slight increase (Spain, UK). On the other hand, the indicators of self-supply rate show a common evolution among the MASMANAP countries, i.e. a more or less significant decrease. As a non-producing country, Germany displays the lowest seafood self supply rate, lower than 10%. The decrease in self-sufficiency is most impressive in Spain and Portugal which lost around 25 points over ten years, to reach respectively 40% and 30% in 1998, which in the end was similar to the corresponding ratio for France. The situation remains less acute in the Mediterranean countries, especially in Greece, due to low export flows, and in the United Kingdom where the production growth from aquaculture could slow down the general decrease in the domestic supply share.

Table 4. Indicators of aquatic food markets in 7EU countries (net weight) (source: synthesis of MASMANAP contributions)

	Indicator of the market size	Trend over the 1988-1998 period	Evolution of the self supply rate
Spain	1.7-2 million tonnes	Fluctuating, upward trend over the last five years	Decreasing, from two thirds to 40%
France	1.2-1.3 million tonnes	Slightly increasing	Decreasing, from 45% to 38%
Italy	1.2-1.3 million tonnes	Undetermined	Around 50% in 1997 and 1998
United-Kingdom	700,000-950,000 tonnes	Fluctuating	Decreasing, from 50% to 40%
Germany	600,000-800,000 tonnes	General upward trend due to the East-West reunification	Less than 10% at the end of the period
Portugal	400,000-450,000 tonnes	Levelling off	Decreasing, from 55% to 30%
Greece	Around 200,000 tonnes	Steady	Decreasing, from 70% to 60%

Apparent consumption calculation

More accurate evaluation of the aquatic food apparent consumption requires further processing of import and export data in order to convert the unit of the exchanges, from net weight to landed weight. With the aim of applying a common methodology to the different countries involved in MASMANAP, a conversion method has been performed from common data source (COMEXT) through the application of harmonised ratios to product items, in so far as the required information on the species or presentation is available. Table 5 presents a synthesis of the ratios applied, at aggregated items level (four digits code) or more detailed level (eight digits code), when necessary.

Table 5. Synthesis of the conversion rate applied

Aggregate product items	Code products	Conversion rate applied
Alive whole fish	*0301	1
Fresh whole fish	*0302	1
Frozen whole fish	*0303	1
Fish fillets (fresh or frozen)	*0304	2.5
Cured fish (whole or fillet)	*0305	1.5 to 3
Crustaceans	*0306	1
Molluscs	*0307	1 to 7
Preserved fish	*1604	1.8 to 2.5
Preserved shellfish	*1605	1 to 4.5

The estimation of apparent consumption in landed weight has been made using 1998 figures. Intermediary findings, issued from the evaluation of import and export flows in equivalent landed weight, are worth examining because they indicate to which extent the conversion affects the consumption analysis, in relation to the structure of external exchanges per country.

On the import side, the conversion process mainly affected the analysis of German, French and British trade in volume, as they integrate a significant share of plain fish fillets (for the processing industry outlets). In France, an additional source of increase was provided by the purchases of bivalves (unshelled frozen or preserved). In Italy and Spain, the imports include less elaborated products, the differential landed weight/net weight was proved to be lower.

On the export side, the transformation of primary data obviously had a great incidence on the evaluation of Norwegian exports, as a big supplier of seafood. The 30% rise in volume obtained from the conversion of fillets and cured fish, however did not modify the prevalence of whole fish in Norwegian trade. Among EU countries, the main calculation gaps in export flows resulted from Germany and the United Kingdom (Table 6).

Table 6. Apparent consumption calculation from 1998 data, in thousand tonnes net weight (synthesis of MASMASNAP concerted action)

	France	Germany	Greece	Italy	Portugal	Spain	UK	7 EU countries	Norway
Production (for food uses only)									
Landed weight	835	300	185	764	220	1420	635	4358	NA[†]
Imports									
Net weight	874	828	105	670	303	1181	538	4455	338
Landed weight	1321	1527	139	927	365	1435	793	6507	360
Gap	51%	85%	32%	38%	21%	22%	47%	46%	7%
Exports									
Net weight	352	274	56	114	84	648	353	1871	1582
Landed weight	393	468	61	133	106	723	489	2374	2049
Gap	12%	71%	9%	16%	27%	11%	39%	27%	30%
Deficit									
Net weight	523	554	49	556	219	532	185	2584	-1244
Landed weight	928	1059	77	794	259	712	304	4133	-1690
Gap	78%	91%	58%	43%	18%	34%	64%	60%	36%
Seafood balance sheet									
Net weight	1357	854	234	1320	439	1952	820	6943	NA
Landed weight	1762	1359	262	1559	479	2132	939	8492	NA
Gap	30%	59%	12%	18%	9%	9%	14%	22%	NA

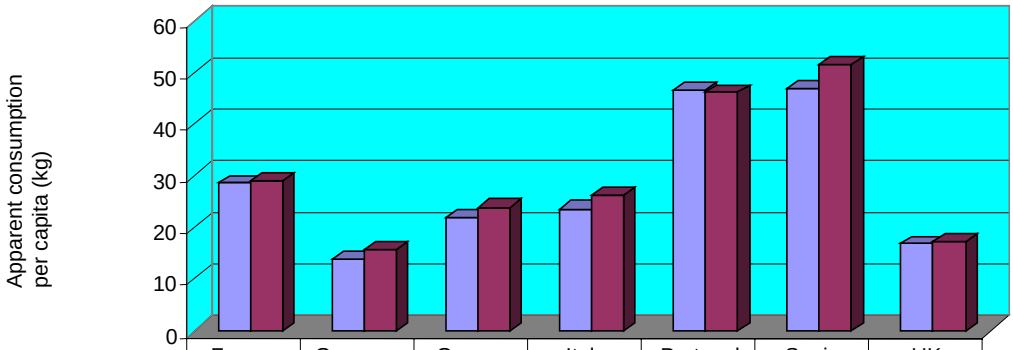
[†]NA: not available.

In terms of seafood balance trade, the intra-EU comparative analysis turned out to be modified as well, introducing further differentiation between the main countries showing a deficit. In this way, Germany and France were seen to present the highest shortage in seafood supply (amounting to 0.9 and 1 million tonnes respectively) compared to Italy and Spain (0.8 and 0.7 million tonnes).

Finally, the calculation of seafood apparent consumption in landed weight led to an extra-estimation reaching from +10% (Spain, Portugal) to +60% (Germany). Although, the classification of leading seafood markets was not modified, with the top 5 still comprising Spain, France, Italy, Germany and UK, these results introduced a gap between French/Italian and German/British whole consumption which did not previously exist.

The indicators of apparent consumption per capita

The resulting evaluations of average consumption per capita presented in Fig. 1 clearly divide European countries into three categories of consumers as regards seafood.



	France	Germany	Greece	Italy	Portugal	Spain	UK
Landed weight 90	29	14	22	24	47	47	17
Landed weight 97/98	29	16	24	26	46	52	17

Fig. 1. Apparent consumption per capita of aquatic food in 7EU countries (Source: MASMANAP estimations).

The Spanish and Portuguese came out as the biggest aquatic food consumers, with a total of 45-50 kg of aquatic food per capita. Then, intermediate consumers included the French, Italian and Greeks with a level of consumption of 25-30 kg per head. Finally, the British and the Germans took the last place, eating less than 20 kg per capita/year.

The comparison of the levels of seafood consumption in the most recent years (average 1998/1997) with the 1990s ones is in keeping with the aquatic food supply trends emphasized beforehand, except for the variable of population growth rate (around 4%), which partly used up the slight rise in global supply (+10%). Bearing in mind the discontinuous evolution that occurred between 1990 and 1997/1998, the interpretation of the general consumption trend over the period is questionable. Nevertheless, it is evident from this, that the apparent consumption per capita only rose slightly over the period, and even levelled off in the latter years of the study (except for a few countries), in relation to the slowing down of the overall aquatic food supply.

In other respects, the intra-European comparison highlights the prevalence of regional and cultural disparities, in relation to the extent of the fishing and aquaculture industries in national economies, and with their respective propensity to consume or export their production. Actually, in spite of an increasing recourse to imports over the 1990s, no significant convergence of consumer habits between the different countries could be observed. The differential of consumption level per inhabitant remained nearly unchanged, reflecting the slow evolution of national food preferences.

As the growth of the Spanish consumption indicator between 1990 and 1997/1998 was mainly related to high fluctuations in mussel farming production, it is essential to share out the apparent consumption indicators among fish and shellfish. The breakdown which has been attempted from the available data, emphasized additional distinctive features of the seafood consumption per country (Table 7). As far as fish consumption is concerned the Portuguese overtook the Spanish, who in turn exhibited the highest level of consumption of shellfish. Food eating habits of shellfish are also noteworthy regarding the French and Italian consumption. As a result, the differential of fish consumption per capita has become less marked among the intermediate and the smallest consumers, from 15 kg per head (German, British) to 18-20 kg (Italian, French, Greek).

Table 7. The breakdown of apparent consumption per capita between fish and shellfish in kg (MASMANAP calculations in equivalent landed weight from average data 1997/1998)

	France	Germany†	Greece†	Italy	Portugal	Spain	UK
Fish	19	15	20	18	40	35	15
Shellfish	10	1	4	8	6	16	2
Total	29	16	24	26	46	52	17

†Breakdown fish/shellfish only known for aquaculture production.

Conclusion and prospects

This study highlighted clear indications of the need to expertise statistical databases, as a prerequisite to interpret accurately the aquatic food consumption trends, resulting from both fisheries and aquaculture supplies. That required to identify the right data sources, to take into account the main statistical breaks in data-series, and to emphasize the main statistical bias which could limit the final evaluations, and their harmonisation at European level.

The "step by step" approach involved in the balance food sheet method, undeniably provided essential material to square the general consumption analysis of aquatic food in the context of the overall supply constraints. On the other hand, a further approach of the main consumption trends and prospects on the "reference" market for farmed fish could not be developed as far as it was initially expected, due to the statistical database shortcomings. Among the main restrictive factors, the inaccuracy of the data with regard to species identification, especially for import and export figures, has to be pointed out. The disparity of the production statistical outputs between European countries, from the representativeness and detail level point of view, also resulted in limiting the extent of European comparative analysis. However, in spite of all these reservations, the application of the food balance sheet method to species or group of species potentially offers a real contribution to further analysis of market fish segmentation and, hence, to get on with the typology of the European consumption.

Concurrently, the need to enhance the on-going surveys of aquatic product supply, has been sharply emphasized throughout the MASMANAP EU concerted action. Further improvement of the current fishery and aquaculture databases in order to provide the required indicators of volume and prices by species (and even by grade size), on a monthly basis, and at short notice, constitutes the prior recommendation. Above and beyond this essential goal, the following phase must be setting up a reliable information network to collate harmonised market indicators of both farmed and wild fish, for the main species involved in European markets.

Further reading

Bjorndal, T. and Tveteras, S. (2001). *Final Norwegian report on aquatic food consumption and general trends in demand*. MASMANAP EU concerted action, report prepared for the Commission of the European Communities, Brussels.

Girard, S. (2001). *Final French report on aquatic food consumption and general trends in demand*. MASMANAP EU concerted action, report prepared for the Commission of the European Communities, Brussels.

Iandoli, C. and Cozzolino, M. (2001). *Final Italian report on aquatic food consumption and general trends in demand*. MASMANAP EU concerted action, report prepared for the Commission of the European Communities, Brussels.

Junqueira Lopes, R. (2001). *Final Portuguese report on aquatic food consumption and general trends in demand*. MASMANAP EU concerted action, report prepared for the Commission of the European Communities, Brussels.

Millan, J.A. (2001). *Final Spanish report on aquatic food consumption and general trends in demand*. MASMANAP EU concerted action, report prepared for the Commission of the European Communities, Brussels.

Papageorgiou, P. (2001). *Final Greek report on aquatic food consumption and general trends in demand.* MASMANAP EU concerted action, report prepared for the Commission of the European Communities, Brussels

Straussler, J. and Langer, J. (2000). *Preliminary German report on aquatic food consumption and general trends in demand*. MASMANAP EU concerted action, report prepared for the Commission of the European Communities, Brussels.

Young, J.A. and Smith, A.P. (2001) *Final British report on aquatic food consumption and general trends in demand*. MASMANAP EU concerted action, report prepared for the Commission of the European Communities, Brussels.