

FUTURE PROSPECTS FOR FISH AND FISHERY PRODUCTS

4. Fish consumption in the European Union in 2015 and 2030

Part 1. European overview



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FUTURE PROSPECTS FOR FISH AND FISHERY PRODUCTS
4. Fish consumption in the European Union in 2015 and 2030
Part 1. European Overview

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PREPARATION OF THIS DOCUMENT

At the end of the 1990s, the FAO Fisheries Department (now Fisheries and Aquaculture Department) initiated a project aimed at projecting world fish consumption by 2015/2020. A number of component studies were initiated. They included geographically limited studies (North America, Europe, Japan, China) and a review of analytical work undertaken on fish consumption and demand for fish. However, it was not feasible to integrate these studies because of difficulties encountered in reconciling assumptions and methodologies. It has therefore been decided to publish the completed component studies.

The present study *Fish consumption in the European Union in 2015 and 2030. Part 1. European overview* is the fourth of a series of papers (still in preparation) intended to be published under the main title *Future prospects for fish and fishery products*. This document was written by Mr Pierre Faille in December 2003 and will be followed by its companion study *Fish consumption in the European Union in 2015 and 2030. Part 2. Country projections* by the same author.

These two studies are published in the series titled FAO Fisheries Circulars and are available on the FAO Web site only.

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ABSTRACT

This report presents the major results for fish consumption (consumption per capita and apparent consumption), production (captures, aquaculture and commodities) and fish trade (exports and imports) estimations and projections for 28 countries in Europe from 1989 to 2030.

The projections show an increase in the demand for seafood products to 2030. The average per capita consumption by the 28 countries will move from 22 kg/caput/year in 1998 to 24 kg/caput/year in 2030. The two additional kilograms per capita signify that the net supply will have to increase by 1.6 million tonnes (Mt) (respectively 1.1 Mt for the 2 extra kilos per person and 550 000 tonnes due to the 22 million population growth over the period). Aquaculture growth will not be able to meet the increasing demand; therefore, imports are projected to rise to 11 Mt (+15 percent from 1998), increasing the dependency of Europe on the rest of the world for its fish and fish products.

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FOREWORD

In 2000, when this study was launched, the European Union was made up of 15 Member States: Germany, Austria, Belgium, Denmark, Spain, Finland, France, Greece, Italy, Ireland, Luxembourg, Netherlands, Portugal, United Kingdom of Great Britain and Northern Ireland, and Sweden. At that time, the prospects for European Union (EU) enlargement in the coming years was of concern to several countries that were due to join, some of which were likely to become EU Members in 2004. The first wave would likely consist of Cyprus, the Czech Republic, Estonia, Hungary, and Poland. The second wave, in 2008, would add seven others: Bulgaria, Lithuania, Latvia, Malta, Slovakia, Slovenia and Romania. In addition to these countries, Norway, a Member State of the European Economic Area¹ (EEA) might become a Member of the European Union before 2010. On the whole, within the framework of this work, there were 13 additional countries that could be considered future Members of the European Union alongside the 15 States already Members in 2000.

The choice and timing of membership of the EU for these countries has been made according to the prospects indicated by the European Commission at the end of 2000. However, they do not constitute anything like a formal engagement on behalf of the Commission or of any other institution like FAO. The present work, and in fact the membership or not of certain countries, remains an exercise in futurology with all the risks that that comprises. Thus, certain countries not mentioned in this work may just as easily become Members whereas others pre-identified may not yet be Members in 2030².

The possible date of adhesion does not affect the presentation of the results since data and results are presented for the set of 28 countries from 1989 to 2030 (except for some countries when data starts in 1991 or 1992).

The term EU-15 in the text refers to the European Union in its current 15-member form. EUR-21 and EUR-28 refer to the possible 21-member and thereafter 28-member union of the future, following the adhesion of first six new countries (EUR-6 NC) and then a further seven (EUR-7 NC). The terminology “Europe” was selected in the place of “European Union” in order to avoid any misunderstandings on the political direction of the term.

¹ Together with Liechtenstein and Iceland. The EEA and the EU are bound through several agreements and cooperations generally relating to trade, environmental protection, social security, education, research and public statistics.

² In fact, at the time this work is going to print, the enlargement process concerns 10 countries that will join the EU in May 2004. The countries are Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia and Slovakia.

EXECUTIVE SUMMARY

Introduction

The progressive enlargement of Europe since its creation in 1957 by the Treaty of Rome means that the European Union (EU) in 2003 is one of most important markets for aquatic products in the world, with 370 million consumers among the 15 Member States and a potential market of more than 480 million with the inclusion of future Member States. Over the last decade, fisheries production has been characterized by stagnation in landings but strong growth in aquaculture production. There is strong intraregional trade in products because of the wide range of tastes between the Member States. In addition, the European Union has become the largest importer of aquatic products alongside Japan and the United States of America.

In 2000, the prospects for European Union enlargement in the coming years were of concern to several countries that were due to join, some of which were likely to become Members in 2004. The first wave would likely consist of Cyprus, the Czech Republic, Estonia, Hungary, and Poland. The second wave, in 2008, would add seven others: Bulgaria, Lithuania, Latvia, Malta, Slovakia, Slovenia, and Romania. In addition to these countries Norway, a Member State of the European Economic Area³ (EEA) might become a Member of the European Union before 2010. On the whole, within the framework of this work, there are 13 additional countries that could be considered future Members of the European Union alongside the 15 States already Members in 2000. Within this framework of the size of the EU is thus: 15 Member States in 2000 (EU-15), 21 in 2005 (EUR-21) and 28 in 2010 (EUR-28). The process of EU enlargement after 2010 is not taken in the account because of the absence of other countries within the process of negotiation⁴ at the time of the realization of this study.

The summary presents the major results for fish consumption (consumption per capita and apparent consumption), production (captures and aquaculture and commodities) and fish trade (exports and imports). This study uses commodity production instead of capture and aquaculture production to define the net supply⁵ (using the common imports and exports categories). Estimation of future demand is done through the analysis of the past and recent trends of the commodities consumption and also based on experts' knowledge and literature review. Price and household revenues information are integrated into the consumer's present and future preferences. The aim of the model used in this study is to project up to 2030 the future net supply and the subsequent fish consumption per capita. To achieve this, a simple model was built. This model was applied to define both food use and non-food use consumption. It was also applied at a country level to define for each group of commodities the net supply.

³ Together with Liechtenstein and Iceland. The EEA and the EU are bound through several agreements and cooperations generally relating to trade, environmental protection, social security, education, research and public statistics.

⁴ Among other petitioning countries, Turkey does not currently fulfil the adherence criteria.

⁵ For a more detailed methodology, see the Methodology Chapter hereafter.

Fish consumption per capita 1989–2030

Consumption per capita represents the total apparent consumption divided by the number of inhabitants of a country. Consumption can be within the home or outside, mainly through the catering. The consumption per capita is an indicator of the overall consumption, but it does not reflect internal changes in fish consumption. For example, in Spain, the consumption per capita is decreasing due to the diminishment of frozen fish while the consumption of prepared/preserved is going up. Compared to the consumption in 1998, the trends for the period 2005-2030 will be as follow for the EUR-28 countries:

- Increasing: Austria, Belgium-Luxembourg, Denmark, Finland, France, Germany, Greece, Italy, Netherlands, United Kingdom, Czech Republic, Hungary, Poland, Slovenia, Bulgaria, Latvia, Lithuania, Malta, Romania and Slovakia.
- Decreasing: Ireland, Portugal, Spain, Sweden, Cyprus, Estonia and Norway.

General consumption trends for the EU-15 countries reflect an increase in consumption of seafood products. This rise is supported by a rise in consumption of convenience products as consumers have less and less time to spare for meal preparation. Frozen products tend to be on a downward trend whilst the consumption of fresh fish stagnates or decreases. The rising share of supermarkets in the retail of seafood products also increases their availability, which leads to increased consumption. Healthy eating, triggered by various food crises (e.g. BSE, dioxin, etc.) is another determinant of the positive trend of seafood consumption.

As a rule, former communist countries of this group see their consumption per capita increase (except Estonia), mostly thanks to improvement of their economic situation. Consumption shifts away from traditional freshwater species towards marine products. Within marine products, frozen fish consumption tends to increase slower than during the period 1989-1998 and small pelagic species are increasingly being replaced by higher value species such as diadromous, large pelagic or demersal fish. Cyprus's consumption pattern follows more the pattern of Mediterranean countries such as Spain or Portugal, which also experience a decrease in consumption per capita.

Improvement of economic conditions is the main force behind the increased consumption per capita in the former communist countries of the EUR-7 NC group. Frozen fish still represents the bulk of fish consumption but the variety of species in this group increases with small pelagic species losing ground to demersal or other more exotic species such as crustaceans, molluscs or cephalopods. Freshwater fish are gradually replaced by marine species, as the latter are often easier to prepare, offer a wider variety of taste and are made increasingly available thanks to the spread of supermarkets throughout these countries. Baltic countries are the main consumers within the group, while Slovakia, Romania and Bulgaria remain small seafood consumers due to a lack of seafood tradition. Maltese and Norwegian consumption reflect the southern and northern EU-15 patterns respectively.

Table ES-1: Consumption per capita for all EUR-28 countries from 1989 to 2030

(kg/capita/year)

	1989	1994	1998	2005	2010	2015	2020	2025	2030
Austria	9	12	11	11	11	12	12	12	13
Belgium-Luxembourg	21	23	22	22	22	23	23	23	24
Denmark	20	25	23	24	25	26	27	28	29
Finland	33	34	34	34	35	35	36	36	37
France	30	30	32	32	32	32	32	33	33
Germany	11	13	15	15	15	16	16	17	18
Greece	20	26	26	26	26	26	27	27	27
Ireland	22	19	21	21	21	21	21	21	20
Italy	21	22	23	24	25	26	27	28	29
Netherlands	14	16	15	15	15	15	15	16	16
Portugal	59	60	61	60	59	59	58	58	57
Spain	39	40	41	40	39	39	39	39	39
Sweden	22	27	29	28	28	27	27	27	27
United Kingdom	22	20	24	24	24	25	25	25	25
EU-15 average	23	24	25	26	26	26	26	27	27
Cyprus	18	20	25	25	24	24	23	23	23
Czech Republic		9	9	10	10	11	11	12	13
Estonia		37	15	14	14	14	14	14	14
Hungary		4	4	5	5	5	5	6	6
Poland	15	13	11	12	13	13	14	15	16
Slovenia		6	7	7	7	8	8	8	9
EUR-6 NC average	15	11	10	10	11	12	12	13	14
Bulgaria		2	4	5	5	6	6	7	7
Latvia		43	37	37	37	38	38	38	39
Lithuania		21	15	17	19	21	23	25	27
Malta	23	22	29	30	31	32	33	34	36
Norway	45	47	46	46	45	45	45	45	45
Romania	9	3	3	3	4	4	4	5	5
Slovakia		7	5	6	6	7	7	8	8
EUR-7 NC average	42	37	40	11	11	12	12	13	13
EUR-28 average	22	21	22	22	22	23	23	24	24

Source: database⁶

⁶ The data for all the tables and figures in this report come from the database built from the various data collected from the agricultural and fishery bodies of the 28 countries and international organization like the EC, FAO and

Species consumed in 2030 will be more or less the same as today since all the important stocks of fish in the world are already exploited. Some marine species may be produced by aquaculture, for example cod or other demersal species, but it will be more a shift in the production system than an introduction of new species. Deep-sea fishing, where a lot of hopes resided, has already shown its limitations.

Overall, the main group of species consumed in 2030 will be the same as in 1998. Furthermore, these groups will compose about the same share of the total species consumed. Demersal marine fish such as cod, Alaska pollock and hake will dominate white fish consumption. Groundfish will represent about 40 percent of the total fish consumed in EUR-28 (taking into account other marine fish, which are mainly demersal fish used as raw material in prepared commodities). EUR-28 consumers will eat about 9 kg/c/yr* of demersal fish in 2030. Tuna and small pelagic species will account respectively for 15 and 14 percent, (compared to 14 and 14 percent in 1998) which corresponds to a consumption rate of 3.6 and 3.4 kg/c/yr in 2030. The majority of tuna and small pelagic species consumed will be either canned, or in the latter's case in Northern European countries, pickled.

Crustaceans, cephalopods and molluscs will represent respectively 7, 4 and 7 percent of the total species consumed in 2030 (about the same share as in 1998), which will be a consumption of about 1.7 kg/c/yr of shrimp, crab and lobster, 1 kg/c/yr of squids, cuttlefish and octopus, and another 1.7 kg/c/yr of mussels, oysters, scallops, and other molluscs. The consumption of these three groups of species will increase over the period respectively by 25, 17, and 17 percent.

The consumption of freshwater and diadromous fish will increase by 6 and 12 percent from 1998 to 2030. The annual consumption per capita of carp, eel, perch and pike will be around 400 kg/c/yr, and of salmon and trout about 1.7 kg/c/yr. Landlocked European countries will continue to consume freshwater fish but more in the form of prepared dishes rather than fresh and whole as before. Salmon and trout will pursue their market penetration but Norwegian and Scottish fish farmers will have to change their strategy, based up to now on comparative price advantages compared to white fish, because of a selling price that corresponds nearly to the cost of production, indicating that there is no room for further price reduction (Asche *et al.*, 1994; Asche and Sebulonsen, 1998; Asche *et al.*, 2002). Fish farmers will have to innovate in order to add some further value to their product.

Net supply of fish for human consumption 1989–2030

Net supply of fish represents what is left from the addition of the production and the imports less the exports. From 1989 to 2030 the apparent consumption of fish by the EUR-28, or net supply of fish, will move from 9.3 Mt to 12.2 Mt over the period 1998-2030, the net supply of fish commodities for human consumption at the EUR-28 level will show three tendencies:

- Cured and fresh/chilled fish will remain more or less stable;
- Crustaceans, molluscs and other prepared aquatic products, filleted and prepared/preserved fish, molluscs, crustaceans and cephalopods will increase;
- Frozen fish will decrease.

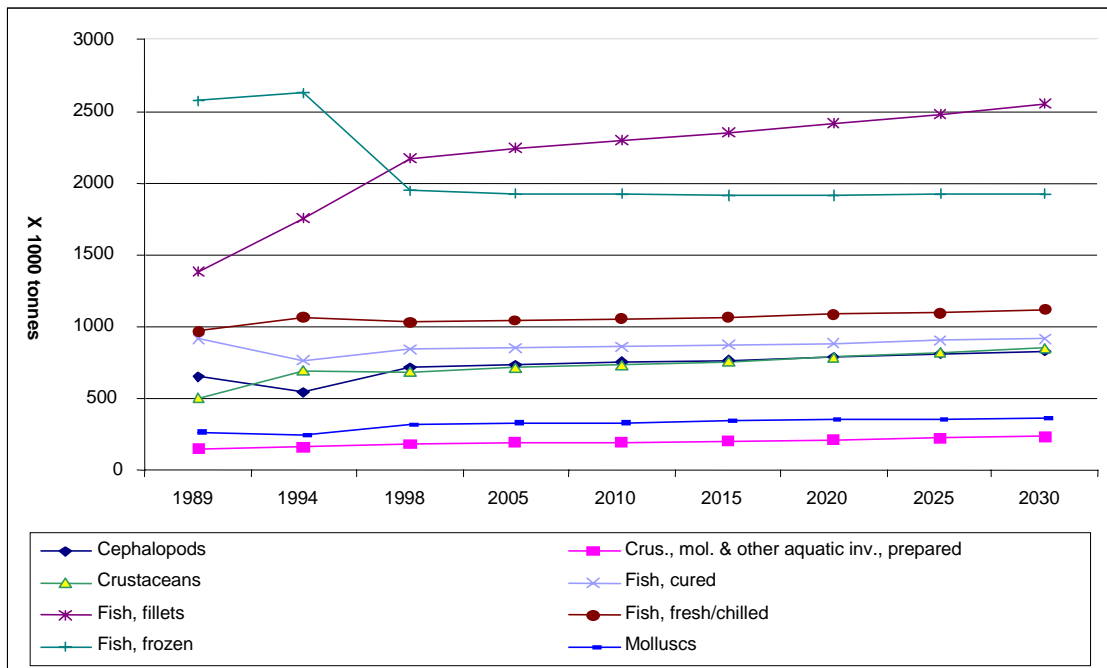


Figure ES-1: Net supply of fish for human consumption by the EU-15 countries from 1989 to 2030

Regarding groups of species, the overall tendency will be an increase of all major groups of species. Demersal species will benefit the most, in terms of volume, from this augmentation since they enter into the composition of ready to eat dishes and fish fillets that are subject to an important augmentation (see Appendix, Tables 6.2 and 6.3).

The increase of the net supply will be possible because of: 1-the rise of imports from third countries (mainly Asia, Africa and South America); and 2-the increase of the aquaculture production in some countries (Norway, UK, Greece, Spain).

Production: captures, aquaculture and commodities 1989-2030

Captures and aquaculture

Overall, at the EUR-28 level capture production is more or less stable over the period 1989-1998. The current difficulties of maintaining the level of exploitation of the main stocks argue in favour of a stabilisation of capture fish catches over the next 30 years, while aquaculture will experience an overall increase, although some species will encounter some decrease in terms of farm production (mainly inland freshwater species). So, capture will stay at around 10 Mt, the 1994–98 average, and aquaculture will increase from 1.8 Mt in 1998 to 2.5 Mt in 2030, which represents a global production of fish of 13 Mt in 2030.

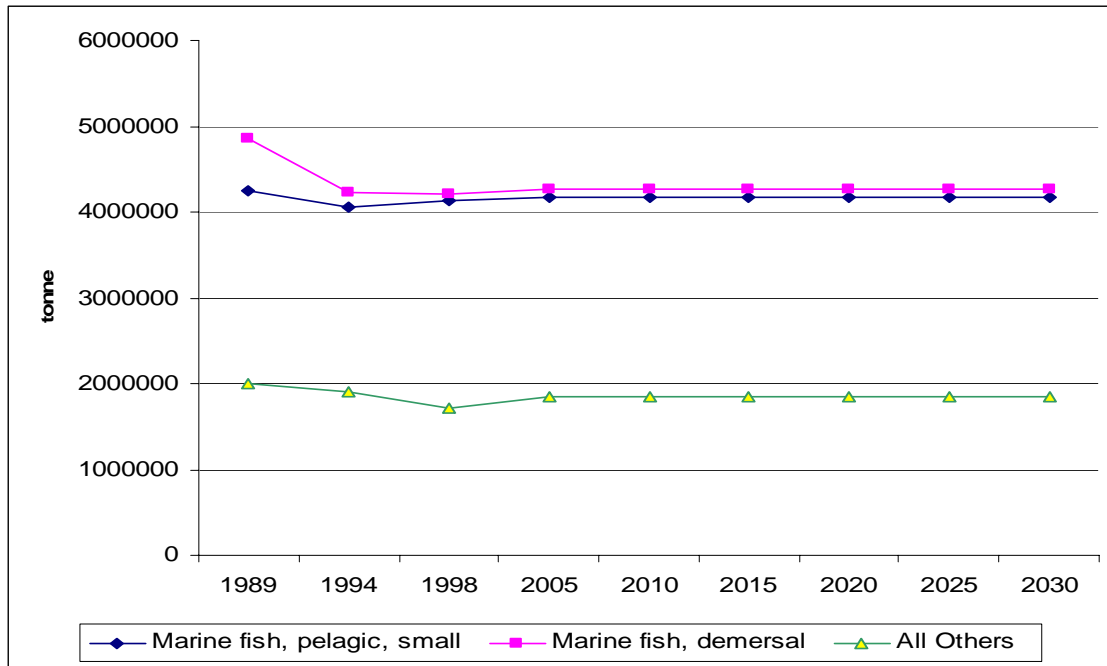


Figure ES-2: Captures by FAO groups of species from 1989 to 1998

Some countries, like Norway or UK, are making a significant contribution to the growth, with salmon production for example. At a lower level, southern European countries like Greece, Italy and Spain should also contribute to the augmentation of the aquaculture volume until 2030, with the production of sea bream and sea bass.

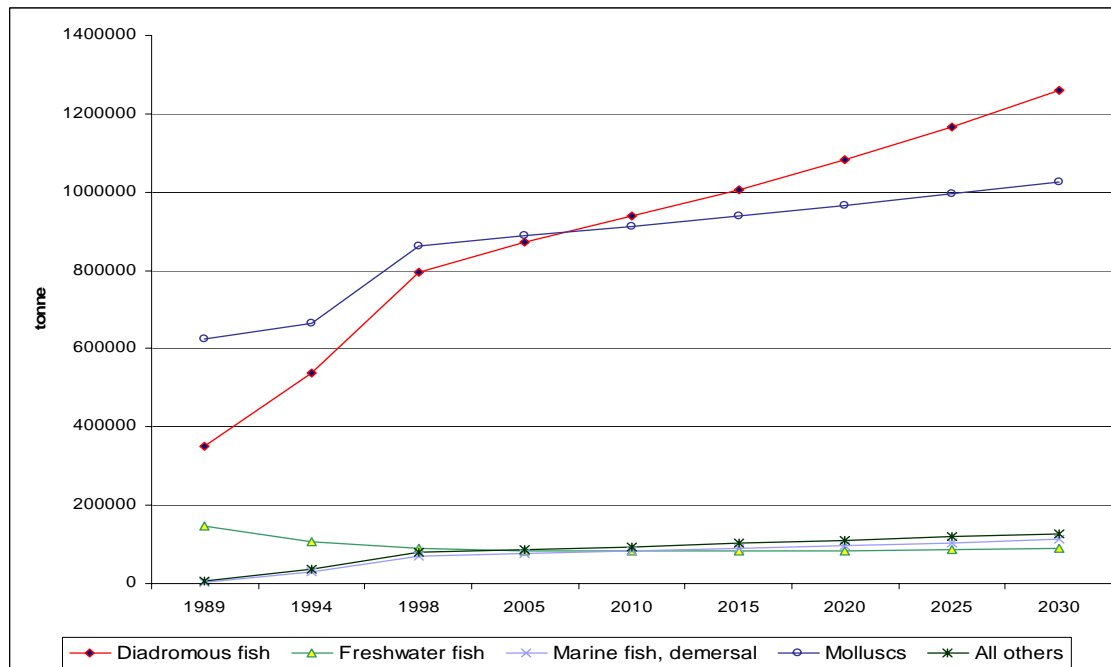


Figure ES-3: Aquaculture production by FAO groups of species from 1989 to 2030

The total production of capture and aquaculture should increase from more than 12 Mt in 1998 to nearly 13 Mt in 2030. Countries that will benefit the most from the total production are the ones in which aquaculture will go up. Diadromous species and molluscs are the two

main groups of species that will underlie the growth of the total production until 2030 (see Appendix, Table 6.4).

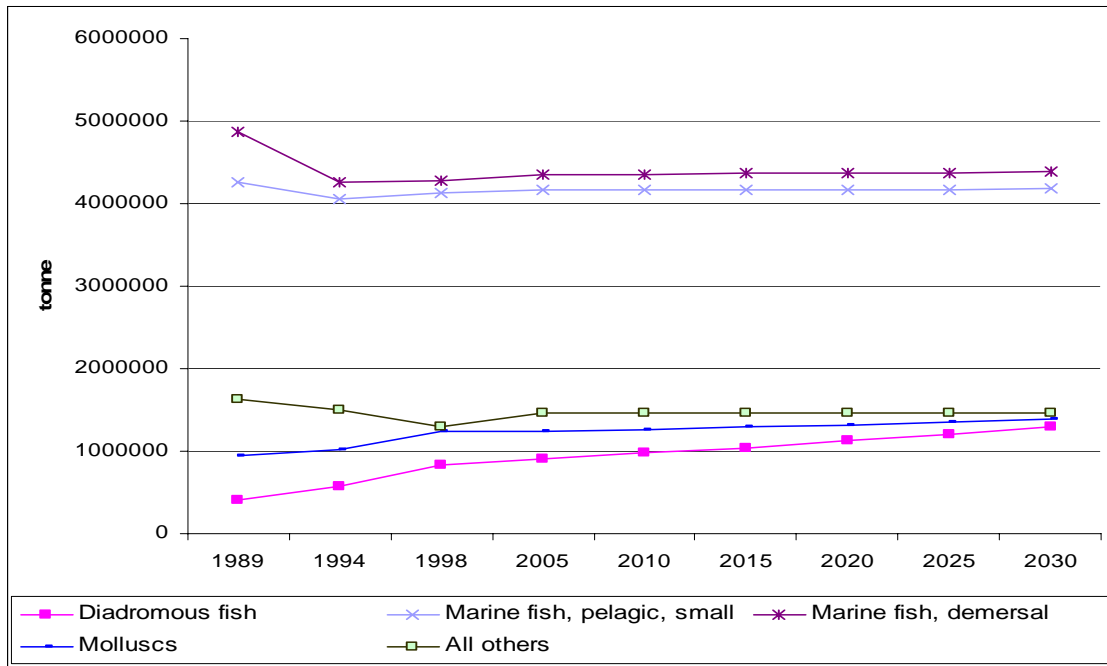


Figure ES-4: Total production by FAO groups of species from 1989 to 2030

Commodity production⁷

The commodity production of the EUR-28 was about 8 Mt in 1989 and 9 Mt in 1998. The EU-15 countries, particularly France, Germany, Italy, Spain and UK, are the main producer of fish products in EUR-28 with 6.7 Mt in 1998. Norway on its own has produced on average 1.6 Mt since 1995. The collapse of the Eastern Europe coastal and distant water fleet had an impact on commodity production in 1998 since the reorganization of industry was just starting, notably beginning with the process of joining the EU.

The relative stability of the EU-15 during the last decade contrasts with the important increase of the Norwegian production of salmon, small pelagic and demersal species. The increasing difficulties in obtaining traditional processed species and the decline of the EU fleet are the main factors that have affected the ashore industry. In 1999, the non-renewing of the fishing agreement with Morocco⁸ created a new crisis for the Spanish industry that was dependent on its distant water fleet to provide 400 000 t of demersal species (hake mainly), shrimp, tuna and cephalopods (through the European fishing agreements).

⁷ Commodity production is the production of fish (processed or fresh/chilled) for human consumption and of fish reduction for animal feed. At a country level, there is no “bridge” between capture and aquaculture production and commodity production since: 1) the production of commodities is based on both national capture and aquaculture production and imports (and the national production of raw material can be exported) and 2) the capture production is used for human food production or fish reduction. For small pelagic species like herring or sprat it is impossible from the capture statistics to know if the production will be used for human consumption or fishmeal. For these reasons, the tables of commodity production cannot be compared to the tables that show the capture and aquaculture production.

⁸ Slightly compensated by the increasing number of vessels in Mauritania for cephalopods (Failler, 2002).

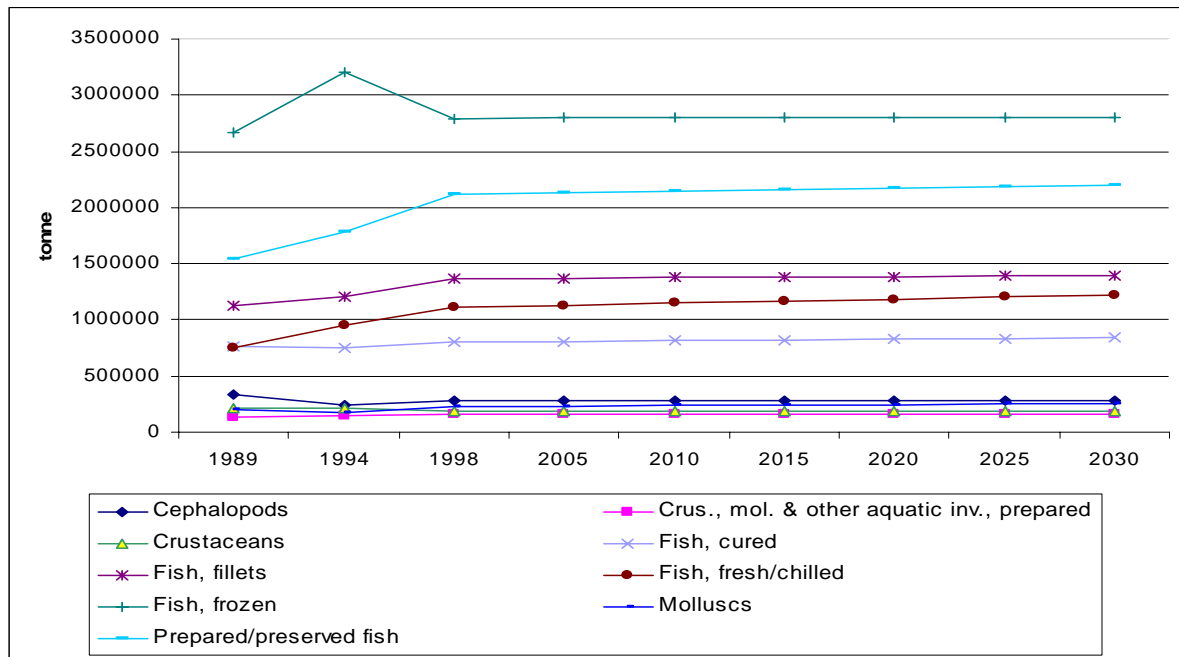


Figure ES-5: Commodity production by OECD groups of commodities from 1989 to 2030

In the light of these assumptions, commodity production will stay stable over the next three decades due to the fact that capture production will stay at the 1998 level and imports will fill the gap between the increasing demand and the national or EU supply. There is here an implicit hypothesis that raw material imports will not be used by the EUR-28 processing industry to increase their production quantities. One of the main reasons for this is that third countries (especially Asian ones) increasingly export to Europe more and more elaborated products. Only the group of Africa-Caribbean-Pacific (ACP) countries will continue to export unprocessed fish to the EU due to their barrier and tariff preferences (that end in 2008) (Failler and Dieng, 2001).

Commodity production follows the total production pattern in the sense that its evolution depends mainly on the aquaculture trends. EUR-28 production will go up by 3 percent reaching 9.3 Mt in 2030. The main part of the growth can be attributed to cured and preserved/prepared commodities in relation with the processing of aquaculture species (see Appendix, Tables 6.5 and 6.6).

Non food use production

Non-food use production is essentially the manufacture of fishmeal and fish oil as an ingredient of feed for livestock and carnivorous aquaculture species. In the EU, the main producer is Denmark, which exports 90 percent of its production (1.3 Mt on average during the period 1989-98) to Norway and other EU countries. Norway is simultaneously producer (1 Mt on average), consumer (1.3 Mt on average) since the aquaculture production of salmon requires a substantial amount of small pelagic meal to feed it, and exporter (0.5 Mt on average) (Anon., 2001i). Overall, the production of fish oil and fishmeal has been quite stable during the period 1989-1998 at around 3.3 Mt for the EUR-28 and 2.0 Mt for the EU-15. Consequently, projections for 2030 give a production which stagnates at 3.3 Mt for the EUR-28 and imports also stagnate at around 3 Mt. Because production is maintained at its former level (1998), exports will also remain the same until 2030 (2.3 Mt).

Foreign trade

Foreign trade during the 1990s was characterized by strong growth in exports, together with more moderate growth in imports as intra-regional trade continued to increase. In the future, it is likely that increased consumption, linked with declining national resources, will lead to Europe's growing dependence on foreign suppliers. Since EUR-28 production will not be sufficient to cover the needs of the 500 million inhabitants in 2030, imports of raw material and commodities will help to fill the gap between EUR-28 production (less exports) and EUR-28 consumer demand.

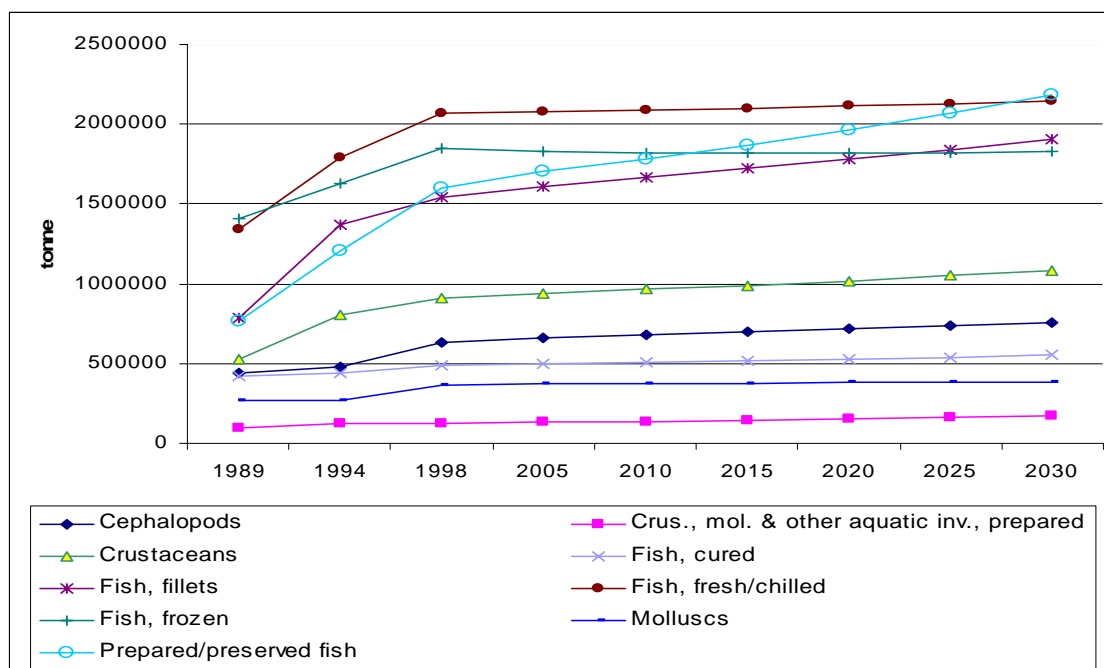


Figure ES-6: Imports by OECD groups of commodities from 1989 to 2030

Imports will rise for prepared products made from crustacean, molluscs and other aquatic invertebrates and fish. EU industry will face serious competition from abroad because a large part of the products imported will be ready for consumption and will not need further processing as is the case in 2003 (see Appendix, Tables 6.7 and 6.8).

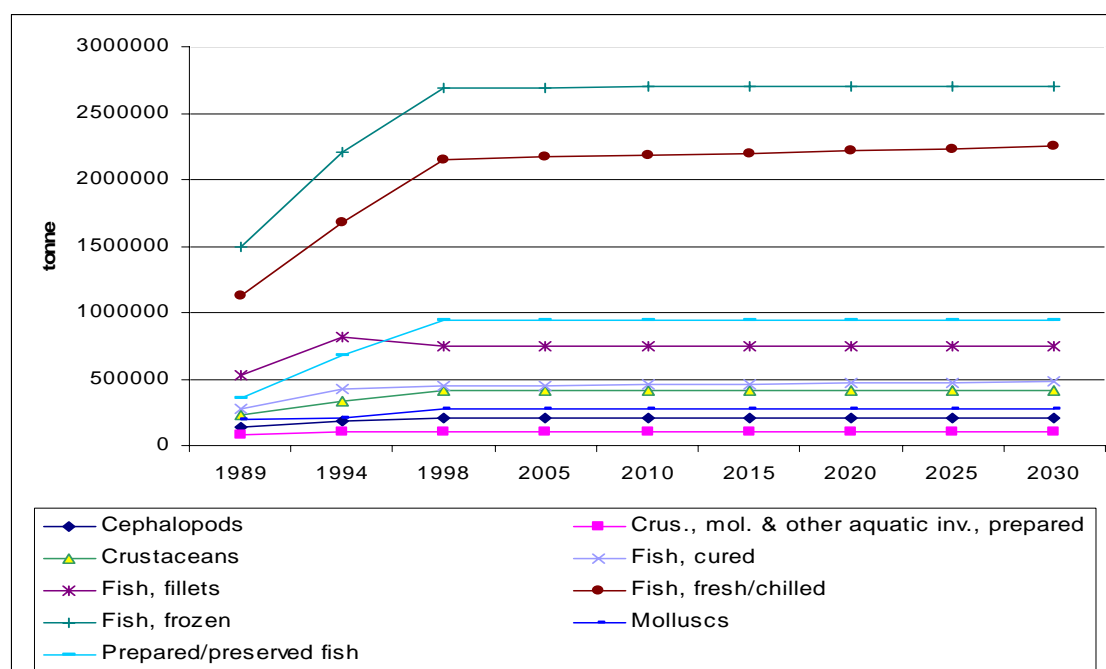


Figure ES-7: Exports by OECD groups of commodities from 1989 to 2030

The main exports will involve demersal and small pelagic species, and to a lesser extent tunas, crustaceans and marine fish in general. As mentioned earlier, exports will be stable over the next 30 years. Export levels will be affected only where there is aquaculture production surplus at a country level. Cured and fresh/chilled fish from the aquaculture production of salmon, trout, sea bass and sea bream will increase while other types of commodities will remain stable (see Appendix, Tables 6.9 and 6.10).

Intra-European trade

The main trade flows within the EU-15 are directed north to south. As the major centres of primary production, the UK, Denmark and the Netherlands export large quantities of primary and processed products to southern states within the EU-15 where consumption rates and demand are particularly high. France performs a similar function but often acts as an intermediary, importing products from northern European countries such as the UK and Denmark, processing them and exporting them to southern European customers such as Spain or Italy. Trade flows between the southern EU-15 countries are less significant, the most important being exports of tuna products from Spain to Italy. Whereas trade between EU-15 and non-EU states may reflect political links and historic trade flows, new trading relationships that have evolved within the EU-15 may reflect contemporary trends in production, processing and demand between states.

Several key bilateral trading links have evolved in this way over the last decade. In general, analysis of bilateral trade within the EU-15 in the 1990s shows France, Spain and, to a lesser extent, Italy to be the major recipients of products from the major exporters in the EU-15 (France, Spain, the UK and Norway). Overall, intra-EU trade represents 60 percent of total EU-15 trade, which means that only 40 percent of what is exported or imported is going out of or coming into the EU-15 (Boude and Guillotreau, 1992). The intra-country trade within the former Soviet countries is also important and accounts for more than 80 percent of their trade flows. The trade route from the Baltic States and, at a lower level, from Poland to Russia

is still the one that drains 80 percent of the products. For the coming years, intra-EU trade will significantly increase as:

- Norway will provide the majority of the intra-EUR-28 trade in salmon (Asche *et al.*, 1998);
- New Eastern countries will absorb an increasing part of the processing products made in the former EU-15;
- The Far Eastern market, mainly with Russia and newly independent states, will be channelled through the states that were part of the former USSR and that have borders with it. This kind of trade should result in the addition of little value added to the products since it will be mainly some straight transportation process without processing (or depending on the labour and tax advantages it could result in some delocalisation of the processing activities toward the Eastern countries).

The development of intra-EUR-28 trade will depend mainly on the possible reduction of marginal costs resulting from the development of new infrastructures and communications between new and old member states.

Discussion and conclusion

The projected future fish consumption is based on assumptions derived from past trends, literature review and expert consultation. An important number of assumptions were made for projecting consumption, captures, aquaculture, commodity production, imports and exports of commodities. For captures, it is likely that European vessels will face zero growth in production up to 2030. Recent regulations by the European Commission on cod and haddock in the North Sea have confirmed the high level of stock exploitation and the difficulties for some stock rebuilding in the short or mid term. Aquaculture is growing at some substantial rates for salmon, sea bass and sea bream, but environmental constraints, coastal zone occupation choices by the civil society, and health regulations will not allow fish farming to continue its exponential trends in the future.

The European fish processing industry will face a major challenge in the near future with imports from developing countries of competitively processed fish that are of a high standard of quality and safety. Considering that the European industry will be more and more dependent on third countries for its supply of raw material, it is likely that apart from the regrouping of companies under some consortium umbrella, the fishing industry will suffer from this competition and consequently decline. Imports from third countries will also benefit from the progressive elimination of trade barriers and the disappearance of preferences accorded to ACP countries (ECDPM, 2001). For Asian countries this should lead to a reinforcement of their competitive position in the world market.

The question of supplying of the growing European market is not raised in the report as a constraint to the increasing consumption of different products. The main reason for this is that the average fish price in European markets is slightly higher than the international price (except in Japan) and the one that occurs in other high-demand countries like USA. Consequently, there will have to be a shift in trade products from other countries to Europe. That already happens with African countries that are part of the ACP group. North West African countries have experienced a decline of their net supply in demersal fish over the last ten years to the profit of European countries, mainly Spain, France and Italy. There is still

some potential for further export growth from these countries but with the subsequent negative impact for their fish supply.

Fish prices trends are mentioned in the report but are not used to adjust the level of supply with that demand. The main reason for this is that the price series over the period 1989-1998 do not show any major changes and deflated international prices for the main species since 1950 have been stable. The second reason for not taking price as an adjustor is that aquaculture production is holding down the price of groundfish species: salmon prices are increasingly taking on the role of price reference for the other aquaculture and wild species. In other words, farmed species are playing the role of price regulator with a tendency to go down each time there is an improvement in feeding technology. This leads salmon producers, for example, from time to time to dump their products on the European market.

The projections show an increase in the demand for seafood products to 2030. The average per capita consumption by the EUR-28 will move from 22 kg/c/yr in 1998 to 24 kg/c/yr. The two additional kilograms per capita signify that the net supply will have to increase by 1.6 Mt (respectively 1.1 Mt for the 2 extra kg per person and 550 000 tonnes due to the 22 M extra inhabitants). Aquaculture growth will not be able to meet the increasing demand so imports will rise up to 11 Mt (+15 percent from 1998), increasing the dependency of Europe on the rest of the world.

The adhesion of new countries to the current EU-15 will increase the intra-European trade: firstly because a large part of the external European trade is currently between Western countries and Eastern and Northern countries; secondly because of a delocalisation of Western processing plants to former Soviet Union countries like Poland or the Baltic States, and thirdly because of a reduction of the re-exports between Western countries. The last point will lead to the suppression of some established fish distribution chains in order to cut down costs, which are more or less transaction costs. Overall, there will be some direct connection between world producers and the European processing industry.

The increasing demand of ready to eat products will be observed everywhere in Europe in 2030 but with a more marked trend in the EU-15 because of the high purchase power. Changes in consumption are mainly changes in commodities rather than species: the same species will be consumed in 2030 but in a different form. Eastern countries will progressively catch up and conform to the consumption pattern of the EU-15 countries. The improvement of their economy and changing consumption habits will slowly allow Eastern countries to develop a demand driven market rather than the current supply driven one. But behind the apparent standardization of consumption, regional differences will still exist: a Spanish consumer will not have the same consumption pattern as a Swedish or a Romanian one. National preferences will be exacerbated through the net supply of commodities that respect historical tastes and habits but also integrate modern living conditions.

Executive Summary Appendix

Table ESA-1: Food use net supply by FAO groups of species from 1989 to 2030

(X 1000 tonnes live weight)

FAO Group of species	1989	1994	1998	2005	2010	2015	2020	2025	2030	% 98-30
Freshwater fish	39	98	150	152	152	154	156	157	159	6.0
Diadromous fish	474	592	723	736	747	760	773	788	804	11.2
Marine fish, pelagic, tunas	1418	1403	1617	1641	1659	1682	1706	1733	1762	9.0
Marine fish, pelagic, small	1527	1887	1512	1553	1589	1629	1675	1727	1784	18.0
Marine fish, demersal	2141	2352	2529	2584	2628	2676	2728	2785	2844	12.5
Marine fish, others	2182	2194	2235	2298	2348	2403	2463	2529	2602	16.4
Crustaceans	524	718	715	746	769	796	825	856	892	24.8
Molluscs	374	359	443	457	467	479	492	507	521	17.6
Cephalopods	649	539	710	735	753	771	791	812	833	17.3
Aquatic animals	15	14	21	22	24	25	27	29	31	46.9
Total EUR-28	9342	10158	10655	10923	11139	11376	11636	11920	12230	14.8

Source: database

Table ESA-2: Food use net supply by OECD groups of commodities from 1989 to 2030

(X 1000 tonnes live weight)

OECD group of commodities	1989	1994	1998	2005	2010	2015	2020	2025	2030	% 98-30
Cephalopods	649	539	710	735	753	771	791	812	833	17.3
Crus., mol. & other aquatic inv., prepared	149	161	181	189	196	204	212	221	231	27.6
Crustaceans	503	689	681	710	733	758	786	818	851	25.0
Fish, cured	914	771	842	853	862	873	886	899	915	8.7
Fish, fillets	1385	1757	2165	2240	2296	2356	2418	2483	2551	17.8
Fish, fresh/chilled	967	1067	1031	1044	1055	1067	1081	1098	1117	8.3
Fish, frozen	2571	2632	1950	1930	1921	1917	1917	1922	1928	1.1
Molluscs	262	240	319	326	333	339	346	353	362	13.5
Prepared/preserved fish	1941	2301	2778	2897	2990	3090	3197	3315	3442	23.9
Total EUR-28	9342	10158	10655	10923	11139	11376	11636	11920	12230	14.8

Source: database

Table ESA-3: Total production by country from 1989 to 2030

(tonnes)									
Country	1989	1994	1998	2005	2010	2015	2020	2025	2030
Austria	5000	3491	3312	2516	2139	1867	1675	1545	1461
Belgium	40368	35100	31679	33203	33190	33190	33202	33225	33258
Denmark	1929355	1920642	1599567	1835414	1837862	1840453	1843197	1846101	1849177
Finland	169015	180951	197328	188878	187844	186890	186009	185198	184451
France	940408	983912	877113	939243	946709	954902	963777	973311	983491
Germany	407776	272502	333597	312964	313809	315372	317484	320027	322923
Greece	140132	224142	188153	228941	233271	237941	242975	248401	254253
Ireland	241098	355997	401165	405477	408903	412630	416686	421102	425912
Italy	551924	604652	567225	622515	629115	636245	643914	652144	660965
Netherlands	530162	529549	656662	577053	581199	585529	590052	594781	599727
Portugal	339564	274243	236283	256689	256589	256762	257151	257719	258451
Spain	1526134	1270206	1422528	1452214	1462823	1474079	1486011	1498687	1512215
Sweden	257778	394257	416398	391218	390971	390774	390623	390518	390456
United Kingdom	914939	970186	1065322	1046347	1053201	1060505	1068287	1076581	1085419
Total EU-15	7993653	8019830	7996331	8292672	8337626	8387138	8441043	8499339	8562159
Cyprus	2642	3085	3668	3966	4143	4350	4592	4878	5218
Czech Republic	na	22604	21179	23525	25585	27859	30370	33143	36204
Estonia	406162	124505	121854	122845	122845	122845	122845	122845	122845
Hungary	35471	18202	17391	14861	13610	12806	12311	12031	11902
Poland	564483	460229	276757	391508	391147	390884	390719	390653	390686
Slovenia	na	3084	3061	3269	3375	3491	3620	3762	3920
Total EUR-6 NC	1008758	631709	443910	559975	560705	562236	564458	567312	570775
Bulgaria	102829	12505	14958	13915	14451	15101	15890	16848	18014
Latvia	551506	138727	102742	128014	128014	128014	128014	128014	128014
Lithuania	421270	51024	22283	39757	39757	39757	39757	39757	39757
Malta	916	1793	2907	3109	3342	3600	3884	4198	4544
Norway	2105337	2787949	3448641	3310400	3356241	3406716	3462303	3523524	3590959
Romania	224635	42615	18428	30920	30989	31066	31152	31249	31356
Slovakia	na	3477	1984	2268	2344	2428	2520	2623	2736
Total EUR-7 NC	3406493	3038090	3611943	3528383	3575138	3626682	3683520	3746212	3815379
Total EUR-28	12408904	11689629	12052184	12381030	12473469	12576056	12689021	12812864	12948314

Source: database

Table ESA-4: Food use production by OECD groups of commodities from 2005 to 2030

(tonnes live weight)

OECD gp	1989	1994	1998	2005	2010	2015	2020	2025	2030
Cephalopods	340285	243970	284430	284430	284430	284430	284430	284430	284430
Crus., mol.& other aquatic inv., prepared	134218	143191	161274	161760	162112	162469	162831	163197	163569
Crustaceans	209425	213407	183723	183724	183725	183726	183727	183728	183729
Fish, cured	766757	753697	803002	810592	816287	822202	828338	834693	841271
Fish, fillets	1129771	1201520	1366362	1372579	1377143	1381814	1386594	1391486	1396494
Fish, fresh/chilled	753297	946780	1110220	1132643	1149149	1166074	1183433	1201234	1219493
Fish, frozen	2662294	3209251	2794765	2797011	2798630	2800262	2801906	2803563	2805232
Molluscs	196657	175357	229200	234493	238390	242388	246487	250692	255005
Prepared/preserved fish	1536251	1779058	2120646	2137266	2149321	2161533	2173901	2186431	2199122
Total FU Production EUR-28	7728956	8666231	9053621	9114498	9159187	9204897	9251646	9299454	9348344

Source: database

Table ESA-5: Food use production by FAO groups of species and OECD group of commodities from 1989 to 2030

(tonnes live weight)

Gp Species	1989	1994	1998	2005	2010	2015	2020	2025	2030
Freshwater fish	11349	56979	59978	59413	59100	58851	58655	58505	58394
Diadromous fish	354781	416707	671968	684828	694331	704107	714164	724509	735152
Marine fish, pelagic, tunas	1032920	988626	1087170	1097419	1104853	1112383	1120009	1127734	1135558
Marine fish, pelagic, small	2052831	2820195	2963254	2972392	2979120	2986026	2993116	3000400	3007887
Marine fish, demersal	1376121	1305924	1233348	1239150	1243386	1247700	1252093	1256567	1261125
Marine fish, others	2020370	2301874	2179278	2196889	2209739	2222818	2236134	2249692	2263497
Crustaceans	243654	247857	222917	222919	222920	222920	222921	222922	222923
Molluscs	293110	281768	348566	354288	358496	362806	367223	371749	376386
Cephalopods	340285	243970	284430	284430	284430	284430	284430	284430	284430
Aquatic animals	3537	2331	2713	2770	2812	2856	2900	2946	2993
Total FU Production EUR-28	7728956	8666231	9053621	9114498	9159187	9204897	9251646	9299454	9348344

Source: database

Table ESA-6: Food use imports by FAO groups of species from 1989 to 2030

(tonnes live weight)

Gp Species	1989	1994	1998	2005	2010	2015	2020	2025	2030	% 98-30
Freshwater fish	38835	94231	163421	165188	166641	168263	170062	172051	174245	6.6
Diadromous fish	379925	632090	823965	832194	839482	847969	857696	868719	881116	6.9
Marine fish, pelagic, tunas	571923	710222	906275	920010	932351	946824	963466	982329	1003483	10.7
Marine fish, pelagic, small	992131	1609487	1742240	1788278	1826557	1869721	1918174	1972395	2032940	16.7
Marine fish, demersal	1914687	2603574	2870923	2929607	2976048	3026350	3080617	3138976	3201577	11.5
Marine fish, others	814233	786789	1037038	1083098	1120853	1163148	1210496	1263483	1322781	27.6
Crustaceans	535746	822194	932923	963222	987475	1014142	1043453	1075666	1111063	19.1
Molluscs	334392	356328	432136	441628	449216	457560	466740	476846	487981	12.9
Cephalopods	441598	476067	634519	658756	676847	695616	715091	735301	756277	19.2
Aquatic animals	17626	24634	34099	35972	37437	39020	40733	42588	44599	30.8
Total FU Imports EUR-28	6041095	8115616	9577539	9817953	10012909	10228612	10466526	10728352	11016063	15.0

Source: database

Table ESA-7: Food use imports by OECD groups of commodities from 1989 to 2030

(tonnes live weight)

OECD gp	1989	1994	1998	2005	2010	2015	2020	2025	2030	% 98-30
Cephalopods	441598	476067	634519	658756	676847	695616	715091	735301	756277	19.2
Crus., mol. & other aquatic inv., prepared	96162	124760	122476	130816	137525	144936	153128	162189	172215	40.6
Crustaceans	527308	807376	911427	940889	964441	990306	1018697	1049857	1084049	18.9
Fish, cured	419055	442609	486030	496237	504753	514421	525380	537787	551820	13.5
Fish, fillets	784977	1366850	1544890	1613693	1665773	1720459	1777907	1838283	1901769	23.1
Fish, fresh/chilled	1336267	1795306	2067885	2079591	2089762	2101576	2115170	2130703	2148360	3.9
Fish, frozen	1405893	1627389	1845032	1826726	1818934	1815342	1815824	1820287	1828675	0.9
Molluscs	264295	271019	365255	369116	372163	375482	379100	383054	387378	6.1
Prepared/preserved fish	765543	1204239	1600026	1702127	1782711	1870475	1966229	2070892	2185517	36.6
Total FU Imports EUR-28	6041095	8115616	9577539	9817953	10012909	10228612	10466526	10728352	11016063	15.0

Source: database

Table ESA-8: Food use exports by FAO groups of species from 1989 to 2030

(tonnes live weight)

Gp Species	1989	1994	1998	2005	2010	2015	2020	2025	2030	% 98-30
Freshwater fish	11473	52706	73154	73181	73201	73221	73242	73263	73284	0.2
Diadromous fish	261736	457029	772018	780312	786369	792538	798822	805224	811747	5.1
Marine fish, pelagic, tunas	186383	294551	377069	377120	377157	377196	377235	377276	377317	0.1
Marine fish, pelagic, small	1518591	2542078	3194655	3207333	3216697	3226330	3236247	3246459	3256983	2.0
Marine fish, demersal	1149935	1557804	1575762	1584788	1591360	1598038	1604824	1611718	1618725	2.7
Marine fish, others	653481	894757	981142	981888	982438	982999	983574	984162	984766	0.4
Crustaceans	254851	352155	439926	440373	440698	441029	441364	441704	442049	0.5
Molluscs	253541	279364	337566	338823	339743	340682	341640	342618	343617	1.8
Cephalopods	132274	180578	208392	208392	208392	208392	208392	208392	208392	0.0
Aquatic animals	6110	12430	16134	16244	16327	16413	16503	16597	16695	3.5
Total FU Exports EUR-28	4428373	6623451	7975816	8008455	8032381	8056836	8081841	8107413	8133575	2.0

Source: database

Table ESA-9: Food use exports by OECD groups of commodities from 1989 to 2030

(tonnes live weight)

OECD gp	1989	1994	1998	2005	2010	2015	2020	2025	2030	% 98-30
Cephalopods	132274	180578	208392	208392	208392	208392	208392	208392	208392	0.0
Crus., mol. & other aquatic inv., prepared	81456	106634	103323	103665	103923	104192	104475	104771	105081	1.7
Crustaceans	233508	331276	414502	414949	415274	415604	415939	416279	416625	0.5
Fish, cured	271528	425476	447344	453487	458045	462757	467633	472681	477915	6.8
Fish, fillets	528479	811664	746524	746524	746524	746524	746524	746524	746524	0.0
Fish, fresh/chilled	1122663	1675661	2146729	2168416	2184232	2200324	2216700	2233362	2250318	4.8
Fish, frozen	1498183	2203935	2690676	2693669	2695892	2698188	2700560	2703009	2705539	0.6
Molluscs	199537	206038	275801	276827	277572	278327	279093	279869	280656	1.8
Prepared/preserved fish	360746	682189	942529	942529	942529	942529	942529	942529	942529	0.0
Total FU Exports EUR-28	4428373	6623451	7975816	8008455	8032381	8056836	8081841	8107413	8133575	2.0

Source: database

