MASMANAP country report: Spain

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SUMMARY – This text contains a description of seafood consumption in Spain, using both the apparent consumption approach and the Food Consumption Survey by the Spanish Ministry of Agriculture, Fisheries and Food.

Key words: Spain, fishery, aquaculture, seafood, supply, consumption.

RESUME – *"Rapport national dans le cadre de MASMANAP : Espagne". Ce texte présente la description de la consommation de produits de la pêche dans l'Espagne, par la méthodologie de la consommation apparente, et par l'Enquête de la Consommation Alimentaire du Ministère pour l'Agriculture, la Pêche et l'Alimentation.*

Mots-clés : *Espagne, pêche, aquaculture, produits de la mer, offre, consommation.*

Statistical methodology evaluation

Critical assessment and methodological description of statistical sources of information

The first objective of this report is the collection of data in order to evaluate national seafood human consumption, using the apparent consumption approach (Production + Imports – Exports). There are very important difficulties in the availability of production data for Spain.

Traditionally, the length of the Spanish coast, the large working fishing fleet and the range of potential landing points all constitute considerable structural problems for establishing an efficient system of fishery statistics. Moreover, three different peripheral agencies of central government have collected landing data. Despite the former difficulties, the system has been working for many years. However, according to the opinion of officers of the Spanish Bureau of Fisheries Statistics in MAPA (Ministry of Agriculture, Fisheries and Food), an informal analysis suggests that the very detailed older series of Spanish landed fish until 1986 are underestimated, probably. More recently, the existence of separate institutions for fisheries in the Spanish regions (Autonomous Communities) has exacerbated the problems of collecting production data. As a result, there are not official statistics of catch data from Spain about production (catches or landings), since 1993.

In a not-official way, and not available, there are some elaboration of catches and series of landed fish for 1992-1995. There is some work in progress in order to fill the deficiencies of the Spanish fisheries statistics. Statistics on the catches and values for the more recent years are being prepared currently according to EUROSTAT methodology. The main consequence is that there is not any data of official Spanish origin. EUROSTAT and the other international fishery organisations have not received catch data from the Spanish authorities for 1994 and subsequent years. Due to this situation, there is currently a sanction procedure towards Spain. In order to complete tables in the EUROSTAT Yearbooks in the first years, FAO estimates for these missing data have been used. Although his practice seems discontinuous in the more recent years, it suggests a practical way to handle coherent production data.

The Spanish situation is entirely different with respect to aquaculture data. There are collected and available data on production and value since mid-80s. Spain provides data for aquaculture to the

several international organisations. In general, the agreement between the original Spanish data and the FAO data is almost perfect. However, some differences appear in the EUROSTAT statistics (in the CRONOS database in electronic format). In some cases we have observed some discrepancies with respect to the Spanish original sources that are errors (mussels production, particularly in 1994).

The Spanish Bureau of Fisheries Statistics in MAPA disposes of trade statistics provided by the Spanish Office on Trade in the Ministry of Economy. The task consists of the harmonisation of fisheries trade statistics with the catches or landed statistics. For this reason, it seems better the use of trade data recorded in a coherent way with the production data. This leads again to the FAO database. Fisheries statistics in FAO are usually obtained from national reporting offices and, when possible, verified from other sources. Estimates are produced when data are lacking or are considered unreliable. The statistics are stored in databases and disseminated through publications and electronic media and are also available through the FAO Internet site. As a result of our discussion of the Spanish official statistics in MAPA, the conclusion is that the statistics presented by FAO are own estimations of the Statisticians and Fisheries Data Officers in FAO (FIDI), since 1989, in general. This point is confirmed in our analysis of data in the following Section.

There are three main ways of reading the FAO statistics. First, it is FAOSTAT of WAICENT, in a second place the elaborated data in the FOOD BALANCE SHEETS, and, finally more powerful and detailed system of downloadable fisheries statistics in FISHSTAT (FISHPLUS). However, we have observed that the first two systems and the third one are not equivalent immediately. FAOSTAT (WAICENT) is oriented towards food balance sheets, although at a very aggregate level, and including aquaculture production. The database on fishery commodities – production and trade – in FISHPLUS contains statistics on the annual production of fishery commodities and imports and exports (including re-exports) of fishery commodities and commodity description (including processing method) in terms of volume and value from 1976. Data for aquaculture production appears in a separate database.

Justification of selected sources

As the only practical choice, the approach followed in this report is relying on FAO data. FAOSTAT presents complete aggregate data until 1997. FISHPLUS covers a wider variety of species and presentations. This seems an advantage, but it is misleading. When analysing the statistics for a particular species, it is noted that an unknown proportion of the catches for that species have been reported under a generic or order name, or even more roughly as "marine fishes not elsewhere reported". This is valid even for the main species of interest in Spain (as hakes). In these circumstances the catch data presented by individual species items are likely to be underestimated. The data from FISHPLUS, even revised, corrected, and filtered, are highly unreliable.

Thus it seems more reliable the grouping in WAICENT, despite data since 1990 is estimate (see the following Section). Data relates to nominal catch of fish, crustaceans and molluscs. Catches of fish, crustaceans and molluscs are expressed in live weight. Moreover, using WAICENT data for the calculation of apparent consumption presents the advantage of previous filtering for internal consistency with trade data. For the same reason, trade data are from FAO. In addition, using in a systematic way the FAO data, we do not have to further complicate the issue of converting factors, because catches of fish, crustaceans and molluscs are expressed in live weight (although using several conversion factors).

On the other hand, it is not possible the identification of fish with food consumption as final destination or for feed or other uses, using the data in WAICENT (both primary and processed). Given that the main objective is the identification of apparent consumption, both the domestic supply and the "apparent food consumption" are presented. First, we adopt the apparent consumption methodology to the data. In the second approach, "feed" and "other uses" in the FOOD BALANCE SHEETS are subtracted of the domestic supply. Other elements, as "waste", "stock changes" or "food processing", are discarded. Thus, the final data present both "domestic supply" and "apparent food consumption".

Production and total supply of aquatic food

Total production by capture fisheries

Shortages in stocks of fish in traditional fisheries, the reduced area of fisheries in Spanish waters, and the very important fish consumption in Spain force to the Spanish fleet to operate in long-distance waters. Cod, hake and frozen fish in South Africa and South America (Atlantic); factory-ships in United Kingdom and Ireland, the Caribbean, South America and Central Africa (Atlantic Ocean); frozen crustaceans in Central Africa and South Africa, and cephalopods in North Africa; tuna from the Atlantic and Indian Oceans and some from the Pacific. However, many vessels still fish (fresh fish) in domestic waters: (i) whitefish, such as hake, megrim, monk, seabream and wedge sole; (ii) shellfish, such as shrimp; (iii) cephalopods, such as squid, cuttlefish and octopus; and (iv) bluefish, such as sardine, anchovy, mackerel and tuna.

We use data from FAO WAICENT, as justified in the previous section. Thus, production statistics include aquaculture. This kind of data is for *Total production of aquatic food*. However, we can analyse some results because FAO fisheries statistics also offer the possibility of a more detailed analysis of production by several species groups, including data for 1998, and taking into account that aquaculture production in Spain is important only for few species.

Due to the fact that these statistics are estimated following a different methodology than those for the supply sheets in FAO WAICENT, we can compare several differences in the sub totals since 1989, the last year of official data from the Spanish Government. The data for main species groups are presented in Table 1. The data from FAO WAICENT used in Table 1 are presented in italics, for comparison. In the 90s the subtotals differ from those of FAO WAICENT, in some case by a large extent. It is difficult the identification of the different results. Errors in classification could be the explanation in some cases, because the difference in total marine fish or total production is lesser than for some subcategories. However, it seems that it is not a reasonable explanation for the differences in crustaceans, as an example. With these limitations in mind, Table 1 shows the evolution of fresh fish species at a more detailed level.

No value or price data is available. It is very probable that economic value has risen for two basic reasons: firstly, much of the catch is made up of species of high quality or in great demand and, secondly, fishery product prices are moving continuously upwards. Premium species such as hake, cephalopods and shellfish help raise the overall catch value. However, it is unclear whether this growth has happened in constant prices, too.

Total production by aquaculture

Spain is well conditioned for aquaculture developments based on potential in coasts and seas (supply factors) and the preference of the Spanish consumer for seafood products (demand factors). However, it seems that Spain is not developing its potential for aquaculture production. In 1990, in live weight, the Spanish aquaculture production is 18.6% of Western Europe aquaculture (European Union, Norway and Iceland), with 4.6% for fish and 28.4% for molluscs, given the importance of mussels. In 1997, the figures are 15.4% in total (4.5% for fish, 27.8% for molluscs). In value (€), in 1990, the Spanish aquaculture is 12.3% of Western Europe aquaculture (4.4% for fish, 27.5% for molluscs); in 1997, 7.1% in total (4.5% for fish, 16.2% for molluscs). It is remarkable the impact of the low price of mussels. Thus, although still among the main aquaculture producers in Europe, the Spanish share is declining.

Spanish aquaculture is highly concentrated in few species. Ten species account for 99.5% of total aquaculture production in Spain: mussel, rainbow trout, oyster, grooved carpet shell, common edible cockle, gilthead seabream, red crayfish, turbot, European seabass, and salmon. Moreover, mussel and rainbow trout jointly share more than 80% of total production. Excluding mussel, marine aquaculture is 60% molluscs, 30% fish, and 10% crustaceans. Today, Spanish aquaculture is best framed within three main activities:

(i) Great volume traditional aquaculture, firmly established in mussel farming. This activity is increasing with other molluscs, with modern techniques but in the same geographical area.

(ii) Continental aquaculture, mainly rainbow trout.

(iii) Modern industrial aquaculture, in coexistence with more traditional practices, in elder high-valued species: gilthead seabream, European seabass, and turbot.

Table 1. Production – volume (1000 t) (FAO FISHSTAT)

	1988	1989	1990	1996	1997	1998
Flounders, soles	38.5	36.2	21.3	39.4	50.9	49.9
Cods, hakes, haddocks	362.6	328.3	207.7	183.2	173.8	176.2
Redfishes	39.6	54.2	52.7	40.6	50.5	51.9
Sharks, rays, etc.	16.7	21.4	14.2	19.0	96.9	90.0
Total	457.3	440.2	295.9	282.2	372.1	368.0
Demersal marine fish	*457.3*	*440.2*	*296.5*	*251.6*	*264.1*	
Jacks, mullets	76.1	68.6	56.4	50.6	65.1	61.3
Sardines, anchovies	302.5	293.1	268.6	268.8	235.6	237.0
Tunas, bonitos	263.0	272.2	262.8	268.5	253.8	210.4
Mackerels	32.1	25.0	27.7	22.6	23.5	21.9
Total	673.8	658.8	615.5	610.4	578.0	530.7
Pelagic marine fish	*673.2*	*658.5*	*621.2*	*645.7*	*639.2*	
Miscell. marine fish	53.7	32.3	42.7	69.7	45.5	75.8
Other marine fish	*53.7*	*32.3*	*37.1*	*72.2*	*78.3*	
Total marine fish	1184.7	1131.4	954.1	962.3	995.6	974.5
Total marine fish	*1184.2*	*1131.1*	*954.8*	*969.5*	*981.5*	
Freshwater fishes	5.5	4.5	5.7	4.2	4.2	4.2
Diadromous fishes	19.4	21.2	21.6	28.3	32.5	33.5
Trouts	19.2	21.1	21.3	28.0	32.1	33.0
Total	24.9	25.8	27.3	32.4	36.7	37.6
Freshwater diadromous	*24.9*	*25.5*	*24.1*	*31.9*	*36.5*	
Freshwater crustaceans	5.4	3.5	5.1	2.5	2.5	2.5
Crabs	1.5	1.0	1.1	4.6	11.9	11.5
Lobsters	3.2	2.7	2.2	1.9	2.0	2.0
Shrimps, prawns	12.9	20.1	19.0	25.3	27.9	27.8
Miscell. marine crustaceans	12.3	4.2	4.8	1.6	1.4	1.5
Total	35.4	31.5	32.3	35.9	45.7	45.3
Crustaceans	*35.4*	*34.0*	*33.2*	*30.8*	*33.9*	
Squids, cuttlefish, octopus	90.6	124.6	103.5	115.1	84.9	72.7
Cephalopods	*90.6*	*124.6*	*104.0*	*93.5*	*78.6*	
Oysters	3.3	3.3	2.9	4.0	3.8	4.0
Mussels	245.9	194.5	173.3	188.5	189.0	261.3
Scallops, pectens	0.7	0.4	0.5	1.0	0.7	0.6
Clams, cockles	8.0	9.3	7.9	16.9	23.2	22.0
Miscell. marine molluscs	0.6	0.1	0.7	1.7	2.1	1.5
Total	258.5	207.5	185.3	212.0	218.8	289.3
Other molluscs	*258.5*	*207.5*	*184.3*	*206.5*	*210.7*	
Total fish	1594.1	1520.8	1302.5	1357.8	1381.7	1419.4
Total fish catch	*1593.5*	*1522.7*	*1300.4*	*1332.2*	*1341.3*	

For aquaculture data, there are two important sources: Spanish official statistics and FAO (FISHPLUS). Although not identical, there is a close similarity between the sources. Unexpectedly, EUROSTAT data present several errors. We use the Spanish data. Table 2 presents production data

for selected years, including the more recent available, in order to appreciate the evolution of fish crops.

Table 2. Aquaculture production – volume (t) (MAPA)

Marine	1988	1993	1997	1998
Fish	514	4737	7807	10826
Seabass	29	370	511	936
Turbot	97	1584	2125	1969
Gilthead seabream	160	2015	3969	4933
Sole	0	12	19	12
Tuna	47	19	173	1959
Eel	31	175	159	217
Salmon	150	562	851	798
Other fish	22	113	155	142
Crustaceans	55	185	247	185
Molluscs	249794	99957	201610	273457
Mussel	243010	90481	188793	261062
Clams	3514	3581	5591	5831
Oysters	3269	2710	3387	3626
Cockle	0	3185	3839	2937
Other molluscs	213	115	382	469
Freshwater	**1988**	**1993**	**1997**	**1998**
Rainbow trout	17500	19689	29000	30000
Tench	455	400	168.2	167.6
Eel	0	0	160	130
Other	0	0	33.4	101.4

Production of fish, crustaceans and molluscs is expressed in live weight, which is the nominal weight of the aquatic organisms at the time of capture. Among the main results, it is remarkable the recovery in mussels production, after a large decline at the beginning of the 90s. Seabass and gilthead seabream are increasing, but turbot seems stable in the last years. Some new species have grown very quickly (tuna).

The value of aquaculture, converted from Spanish peseta, is reported in millions € using appropriate exchange rates in current (nominal) terms, in Table 3. The evolution of values is the combined effect of variation in production and in prices. For the most important species, prices are decreasing, with the only exception of the relatively recent cockle. This can be caused both for technical progress and for the effect of larger quantities on stable demands.

There are a couple of facts of interest to aquaculture production concerning new species: (i) larger increases for several species (tuna or sole) at decreasing although still very high prices; and (ii) there is not an increasing trend in production for those species of relatively low production and increasing prices.

Total production of aquatic food

We use data from FAO WAICENT. Thus, production statistics refer to the quantities of fresh, preserved and processed fishery commodities, utilising catches from commercial fisheries and aquaculture production. Figure 1 shows the evolution in the period 88-97 and Table 4 shows data for 1997. The general trend is stable in the 90s. However, the decline at the end of the 80s is clear.

Table 3. Aquaculture production – value (million €) (from original MAPA values in pesetas)

Marine	1988	1993	1997	1998
Fish	3.44	33.83	55.50	98.95
Seabass	0.12	3.62	6.29	6.27
Turbot	1.38	11.27	17.18	17.40
Gilthead seabream	1.61	14.95	23.53	30.69
Sole	0.00	0.10	0.16	0.13
Tuna	0.00	0.42	4.16	40.27
Eel	0.22	1.37	1.22	1.51
Salmon	0.00	1.84	2.53	2.28
Other fish	0.12	0.25	0.43	0.41
Crustaceans	0.90	1.25	1.76	0.87
Molluscs	119.43	69.80	105.62	148.48
Mussel	78.49	33.21	52.72	92.20
Clams	30.38	25.03	36.94	39.24
Oysters	9.96	6.67	8.38	9.44
Cockle	0.00	4.31	6.59	6.14
Other molluscs	0.60	0.58	1.40	1.11
Total	123.76	104.89	162.88	248.30
Freshwater	**1988**	**1993**	**1997**	**1998**
Rainbow trout	38.15	39.61	55.77	61.30
Tench	2.65	1.73	1.01	1.00
Eel	0.00	0.00	1.15	0.90
Other	0.00	0.00	0.21	1.22
Total	40.80	41.34	58.15	64.43

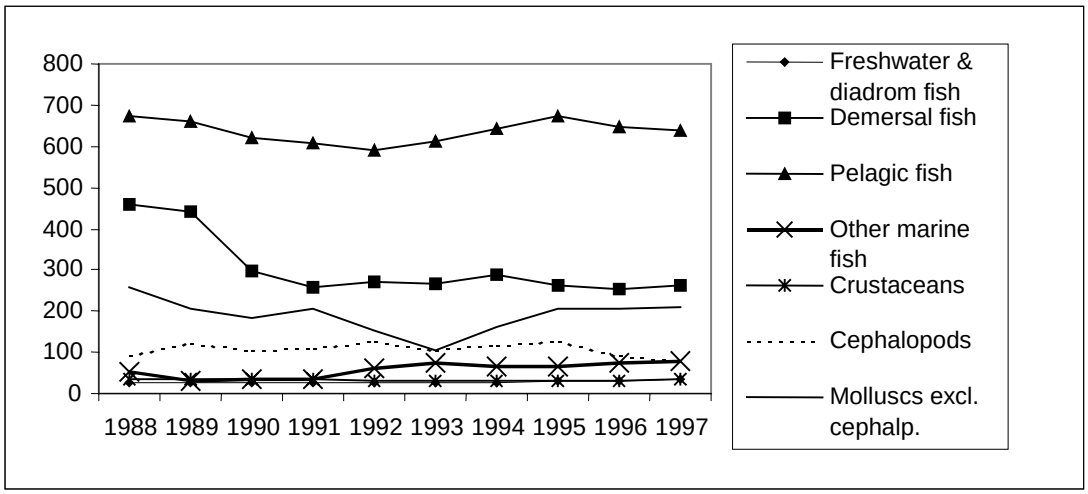

Fig. 1. Production – volume (1000 t) (FAO WAICENT).

Total imports-exports of aquatic food

International trade statistics refer to the quantities and values of annual imports and exports (including re-exports when applicable) of fish and fishery products. FAO data are used. For processed foods, the same conversion factors used in FAO are used for each category. Figure 2 show the evolution of imports in volume and Table 5 presents the FAO-WAICENT data for 1997 for the selected groups.

Table 4. Production – volume, 1997 (1000 t) (FAO WAICENT)

	Volume	Trend
Freshwater and diadromous fishes	36.531	Up
Demersal marine fish	264.118	Stable (90s)
Pelagic marine fish	639.150	Stable
Other marine fish	78.275	Slightly up
Total marine fish	981.543	Stable (90s)
Crustaceans	33.888	Stable
Cephalopods	78.624	Down
Other molluscs	210.725	Down
Crustaceans and molluscs	323.237	Down
Total fish	1341.311	Stable (90s)

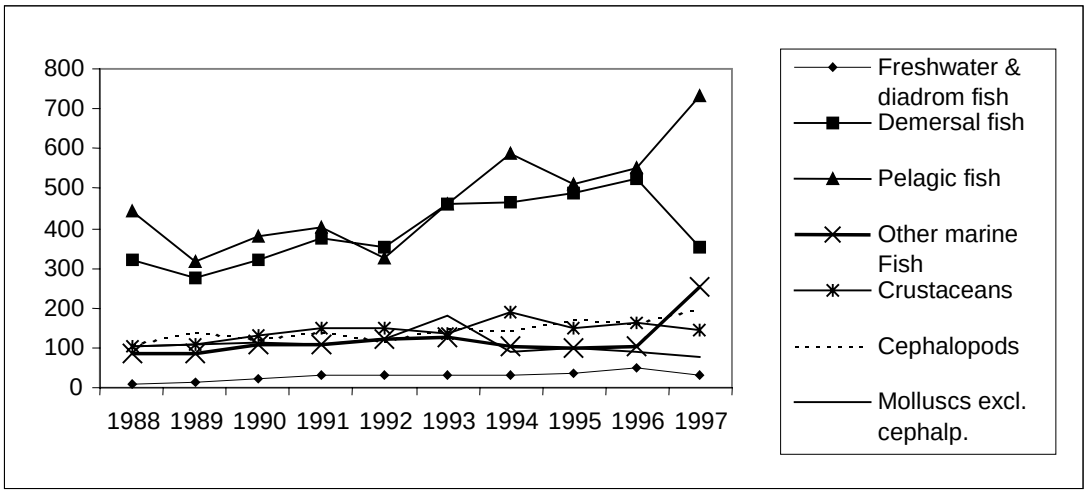

Fig. 2. Imports – volume (1000 t) (FAO WAICENT).

Table 5. Imports – volume, 1997 (1000 t) (FAO WAICENT)

	Volume	Trend
Freshwater and diadromous fishes	33.813	Slightly up
Demersal marine fish	352.772	Up, sharp decline 97
Pelagic marine fish	730.440	Up
Other marine fish	253.298	Stable, strong up 97
Total marine fish	1336.510	Up
Crustaceans	146.296	Stable 90s
Cephalopods	197.948	Slightly up
Other molluscs	75.877	Slightly down
Crustaceans and molluscs	420.121	Slightly down
Total fish	1790.443	Up, stable mid 90s

Exports are in Table 6 and Fig. 3. Spanish exports are of minor importance. The break in the marine fish (pelagic and other) series in 1993 suggests the possibility of misclassifications. It is remarkable the importance of imports with respect to exports in a majority of items. Only for the period 89-91 and the category "other marine fish" are export volumes larger than import volumes. Spain is a

net importer of fish products, mostly for the processing industry, and this explain the stability of the total fish volume in net trade in the 90s, between 143 and 175 thousand tons of net imports, in 1990 and 1992, respectively.

Table 6. Exports – volume, 1997 (1000 t) (FAO WAICENT)

	Volume	Trend
Freshwater and diadromous fishes	8.976	Slightly up
Demersal marine fish	123.579	Up, but 97
Pelagic marine fish	415.711	Slightly up
Other marine fish	99.912	Up
Total marine fish	639.202	Up
Crustaceans	18.143	Slightly up
Cephalopods	89.975	Slightly up
Other molluscs	70.209	Slightly up
Crustaceans and molluscs	178.327	Up
Total fish	826.504	Up

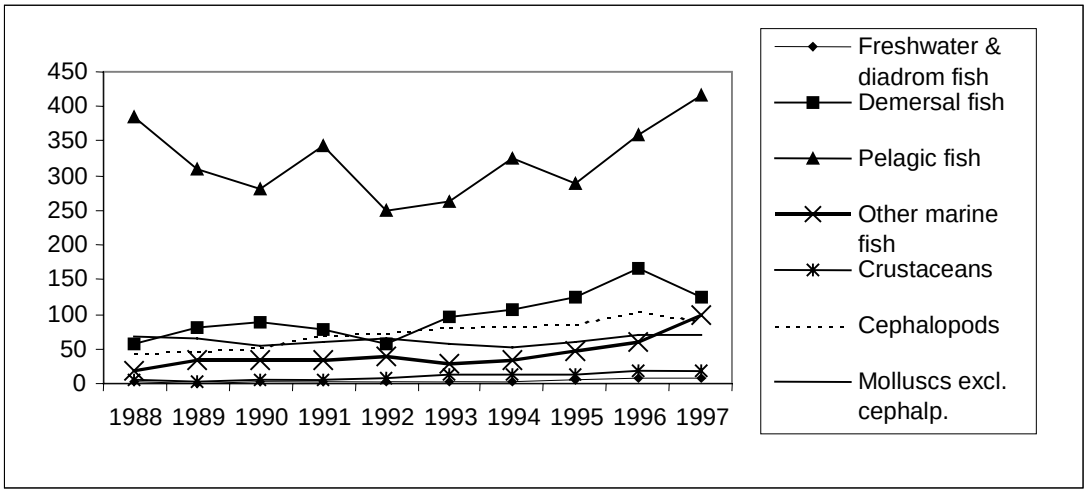

Fig. 3. Exports – volume (1000 t) (FAO WAICENT).

In Table 7, value data for trade complements some interesting information. Although imports are larger than exports in volume for pelagic fish, the converse is true in value. This fact reflects the higher quality of the Spanish exports for some species.

In Table 8, the shares of the different presentations are presented for imports. In general, frozen is the most important presentation for imports in quantity, but not necessarily in volume. However, molluscs (not cephalopods) imports are more valuable frozen. Freshwater fish, is presented mostly fresh and highly valuable.

The shares of the different exports presentations are in Table 9. Frozen is also the most important presentation for imports in quantity, but not necessarily in volume. Cephalopods are exported frozen almost always. Crustaceans exports are mainly conserve, and never frozen.

Apparent consumption of aquatic food

The evolution of the domestic supply is presented in Figs 4 and 5, without comments.

However, the former figures (Domestic supply = Production + Imports – Exports) present seafood consumption including not for food consumption. In the next tables and figures, "feed" and "other uses", have been subtracted, thus giving a measure of apparent consumption for the Concerted Action purposes. Other elements in the food supply data (waste, processing) have been discarded, in spirit with the apparent consumption approach.

Table 7. Imports, exports and net trade (million €) (adapted from values in FAO WAICENT)

	1988	1992	1996	1997
Imports				
Freshwater and diadromous fishes	63.13	136.17	148.85	126.91
Demersal marine fish	421.28	657.29	764.79	487.74
Pelagic marine fish	176.43	198.50	285.18	322.48
Other marine fish	132.31	249.14	216.89	416.72
Total marine fish	730.02	1104.93	1266.86	1226.94
Crustaceans	343.08	551.42	648.74	589.87
Cephalopods	178.36	232.76	349.02	415.69
Other molluscs	950.76	1305.32	1596.81	1633.44
Crustaceans and molluscs	1472.19	2089.50	2594.57	2638.99
Total fish	2265.34	3330.60	4010.27	3992.85
Exports				
Freshwater and diadromous fishes	5.19	8.39	39.48	55.62
Demersal marine fish	57.76	78.75	226.19	165.59
Pelagic marine fish	243.79	167.86	399.29	479.64
Other marine fish	46.38	72.13	117.46	138.96
Total marine fish	347.94	318.75	742.94	784.18
Crustaceans	21.46	29.61	89.36	72.06
Cephalopods	106.71	121.93	251.28	233.54
Other molluscs	234.99	254.09	476.04	427.19
Crustaceans and molluscs	363.16	405.63	816.68	732.79
Total fish	716.29	732.76	1599.09	1572.59
Exports-imports				
Freshwater and diadromous fishes	–57.94	–127.78	–109.37	–71.30
Demersal marine fish	–363.52	–578.54	–538.60	–322.15
Pelagic marine fish	67.37	–30.64	114.11	157.16
Other marine fish	–85.93	–177.01	–99.43	–277.77
Total marine fish	–382.08	–786.18	–523.92	–442.76
Crustaceans	–321.61	–521.81	–559.39	–517.81
Cephalopods	–71.65	–110.83	–97.74	–182.15
Other molluscs	–715.77	–1051.24	–1120.77	–1206.25
Crustaceans and molluscs	–1109.03	–1683.88	–1777.89	–1906.20
Total fish	–1549.04	–2597.84	–2411.18	–2420.25

Figure 6 shows the evolution of total apparent seafood consumption by categories. It is remarkable the changing ranks for demersal and pelagic. A large quantity of pelagic fish is used for seed. The trends are similar than those for domestic supply, in general, indicating that an increasing or stable pattern of consumption follows a decline in the 80s until the beginning of the 90s for the main fish groups. Crustaceans and molluscs seem stable.

Figure 7 presents the evolutions of the apparent seafood consumption per capita, for the two main groups of "fish" and "crustaceans and molluscs". It is remarkable the increasing trend of fish consumption per capita. It is due to a growing consumption of fish products and a stable consumption of crustaceans and molluscs in the 90s, after a decline for all categories at the end of the 80s.

Table 8. Imports – presentation shares (%) in volume and value (adapted from values in FAO WAICENT)

	Quantities			Values		
	Fresh	Frozen	Conserve	Fresh	Frozen	Conserve
Demersal						
1988	15.9	66.5	17.7	36.7	45.1	18.2
1992	19.3	62.1	18.7	46.9	36.4	16.7
1996	17.5	65.0	17.5	40.1	44.2	15.7
1997	11.7	65.0	23.4	28.2	51.1	20.8
Pelagic						
1988	20.4	71.4	8.2	16.6	67.8	15.7
1992	25.7	56.1	18.1	30.0	46.6	23.4
1996	21.0	59.7	19.3	30.4	44.6	25.0
1997	19.1	62.5	18.3	26.8	51.4	21.8
Other marine						
1988	15.7	54.4	30.0	26.0	38.8	35.2
1992	21.0	41.4	37.6	31.2	33.1	35.7
1996	27.0	41.2	31.8	34.2	31.8	33.9
1997	30.6	56.1	13.3	47.9	34.4	17.7
Freshwater						
1988	74.9	16.3	8.8	89.1	5.3	5.5
1992	66.8	29.0	4.2	84.2	10.8	4.9
1996	48.0	47.7	4.3	68.5	26.4	5.2
1997	62.1	31.4	6.5	80.3	15.0	4.7
Crustaceans						
1988	14.1	81.7	4.2	10.8	87.2	1.9
1992	10.1	84.3	5.5	11.5	86.1	2.5
1996	9.4	82.0	8.6	11.5	84.1	4.4
1997	9.8	86.8	3.5	12.1	86.7	1.2
Cephalopods						
1988	4.3	95.7	0.0	7.7	92.3	0.0
1992	8.1	91.9	0.0	11.9	88.1	0.0
1996	6.8	93.2	0.0	10.6	89.4	0.0
1997	4.2	95.8	0.0	7.1	92.9	0.0
Other molluscs						
1988	17.1	25.3	57.6	5.5	77.8	16.7
1992	14.1	42.9	43.0	5.7	78.2	16.1
1996	10.5	57.3	32.2	3.7	85.8	10.5
1997	9.6	63.6	26.8	3.4	88.3	8.3

National seafood market information

Description of the national aquatic food market from landings or farming production to consumer

Traditional retailing is the most important channel of fish distribution in Spain. However, there is evidence of increasing shares of modern forms. Another important fact is the introduction of new technologies. The main wholesalers know that the Spanish aquaculture sector has not enough size to face the Spanish demand continuously. Thus, many Spanish firms prefer to invest abroad rather than in Spain. Many products are from distant countries, and delivered by plane in fillet form or in other

presentations, being fresh fish the ideal pattern. In any case, marketing channels have evolved as developments in traditional institutions, or, in hyper and supermarkets, imitating traditional retailers as closely as they can. This situation is changing, and traditional retailers are using some of the developments in modern sellers (frozen, pre-cooked, etc.).

Table 9. Exports – presentation shares (%) in volume and value (adapted from values in FAO WAICENT)

	Quantities			Values		
	Fresh	Frozen	Conserve	Fresh	Frozen	Conserve
Demersal						
1988	3.1	67.2	29.8	10.6	45.7	43.7
1992	3.1	83.9	13.0	8.3	73.3	18.4
1996	5.3	84.8	9.9	16.7	71.2	12.1
1997	3.2	79.4	17.4	9.8	71.6	18.6
Pelagic						
1988	10.8	71.8	17.4	11.9	47.6	40.5
1992	10.4	64.3	25.3	23.7	29.9	46.4
1996	19.8	51.1	29.1	24.0	30.3	45.7
1997	13.9	60.9	25.2	22.1	35.3	42.6
Other marine						
1988	33.5	28.9	37.6	59.5	13.5	27.0
1992	55.4	31.7	12.9	42.6	35.9	21.6
1996	12.9	61.6	25.5	19.7	60.4	19.9
1997	10.7	78.1	11.2	25.2	57.4	17.4
Freshwater						
1988	17.7	32.8	49.5	50.7	33.5	15.8
1992	31.7	64.4	4.0	64.8	29.4	5.9
1995	37.2	57.8	5.0	59.3	36.9	3.8
1996	55.7	39.8	4.5	73.6	23.9	2.5
1997	46.6	50.1	3.3	80.3	17.7	2.0
Crustaceans						
1988	1.0	0.0	99.0	7.8	0.0	92.2
1992	0.9	0.0	99.1	2.5	0.0	97.5
1996	1.3	0.0	98.7	4.3	0.0	95.7
1997	1.1	0.0	98.9	3.9	0.0	96.1
Cephalopods						
1988	2.0	98.0	0.0	2.3	97.7	0.0
1992	0.2	99.8	0.0	0.1	99.9	0.0
1996	2.4	97.6	0.0	3.0	97.0	0.0
1997	3.4	96.6	0.0	3.8	96.2	0.0
Other molluscs						
1988	26.1	15.3	58.6	7.0	64.1	28.9
1992	13.0	30.9	56.1	4.0	66.5	29.5
1996	12.4	34.1	53.5	2.6	77.5	19.9
1997	13.6	33.8	52.7	2.9	78.5	18.6

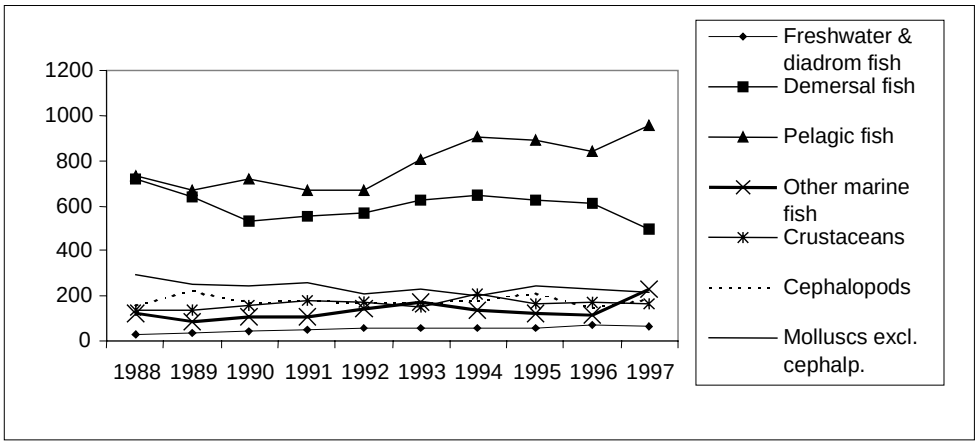

Fig. 4. Domestic supply – volume (1000 t) (following FAO FOOD SUPPLY DATA).

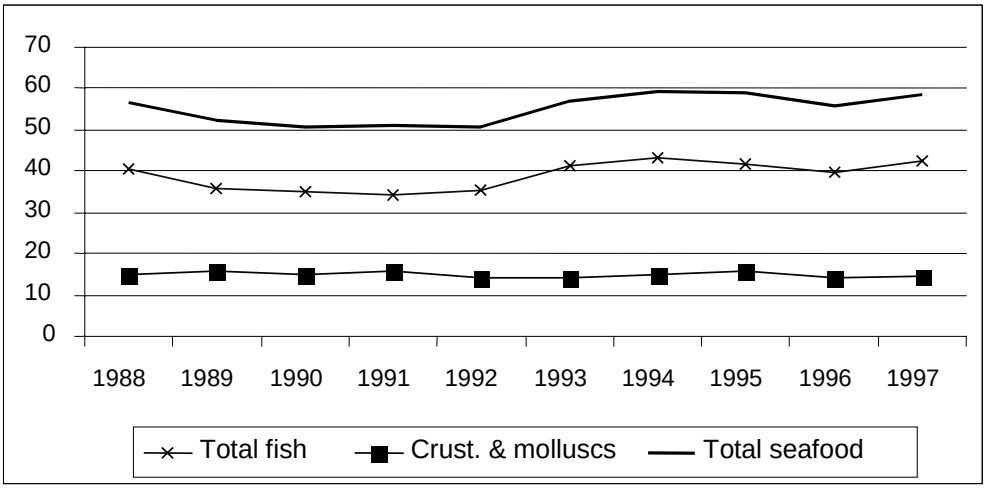

Fig. 5. Domestic supply per capita (kg/person) (following FOOD SUPPLY DATA and INE).

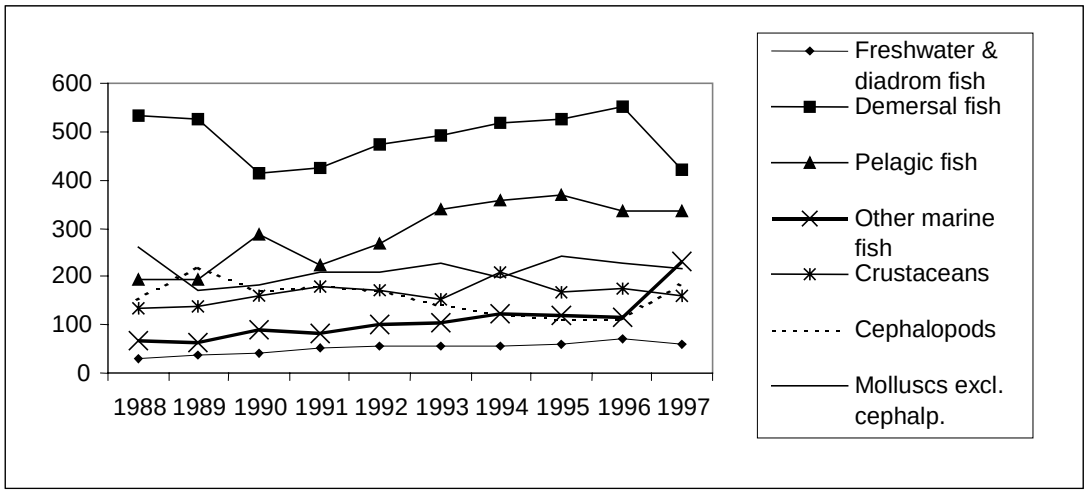

Fig. 6. Apparent consumption – volume (1000 t) (following FAO FOOD SUPPLY DATA).

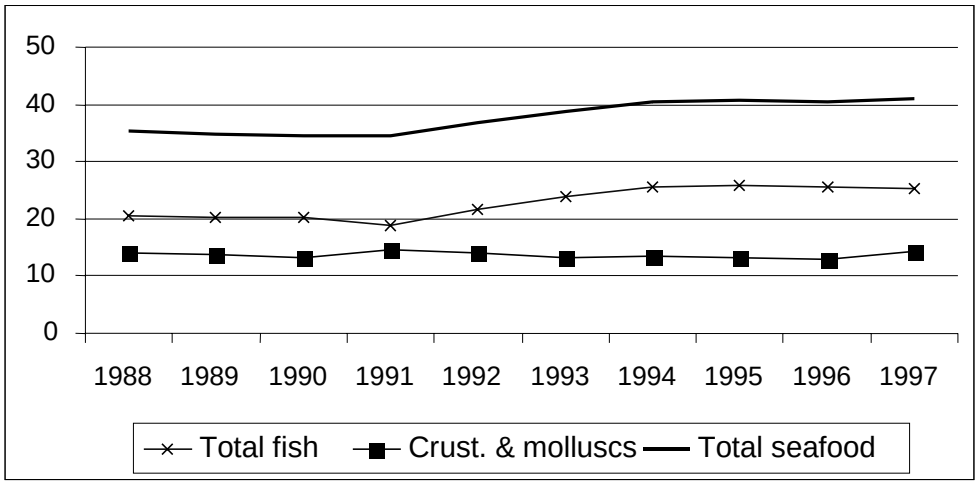

Fig. 7. Apparent consumption per capita of seafood products (kg/person) (following FOOD SUPPLY DATA and INE).

The main institution in seafood distribution in Spain is MERCASA. MERCASA was established as a state owned joint-stock company held by the Ministry of Agriculture, Fisheries and Food (MAPA) and by the Ministry of Finance, and acts as a part of the Spanish Government Food Policy. The MERCAS network develops the wholesale commercial function: to concentrate a complete offer of products and guaranty complementary transport functions, storage, grading, labelling, presentation, logistics, etc. The total produce traded in the MERCAS network is 50% of fish and seafood consumed in Spain (60% of fruits and vegetables), increasing to more than 90% when we consider the influence areas near the Food Distribution Centres. MERCASA has promoted and managed with the Municipalities, a nation-wide network of 22 food distribution and logistical centres known as MERCAS. The MERCAS network covers the national territory and develops wholesale trade, with new and modern formulas. The main MERCA are MERCAMADRID (about 34% of the volume of the network activity), MERCABARNA (Barcelona, 19.5%) and MERCAVALENCIA (14.5%). MERCAMADRID, the wholesale market in Madrid with more than 150 firms operating in, distributes 14% of fish consumption in Spain and 15.5% of fresh fish in Spain. The area of influence of MERCAMADRID is by far larger than the city and metropolitan area, affecting even to certain areas in Portugal, and being equivalent to a "sea port" in inner Spain.

In the retail sector, MERCASA has developed and manages 16 shopping centres and collaborates with Municipalities in the modernising of Municipal Retail Markets. In Spain, municipal retail markets channel 50% of perishable goods. The municipal retail market is a traditional form of trade in Spain and there is the agreement that they have a promising future by adapting their structures to current shopping and consumer demand.

Fish consumption: The MAPA food consumption survey

The main source of information on seafood consumption surveys is by MAPA. The Food Consumption Survey of MAPA is not a task of MAPA itself, but of private companies. This Survey begins in 1987 and the methodology has changed several times, because of changing companies. However, there is an effort by MAPA in showing homogeneous information as if there is not any break in series. The results are available monthly with a small delay of a few months. An important point with this survey is the detailed demographic information. The annual results of the Consumption Panel of MAPA are used both for analysis of trends in fish consumption and the identification of regional and demographic seafood consumption patterns, later in this report.

The general evolution of total fish consumption is shown in Fig. 8 (in per capita terms the graph is similar in trends). There is a clear decreasing trend with frozen fish, although there is a recovery in the last years, and an increase in fish conserves. The consumption of fresh fish and the consumption of shellfish seem stable, after growth and decline in mid-90s and early 90s, respectively.

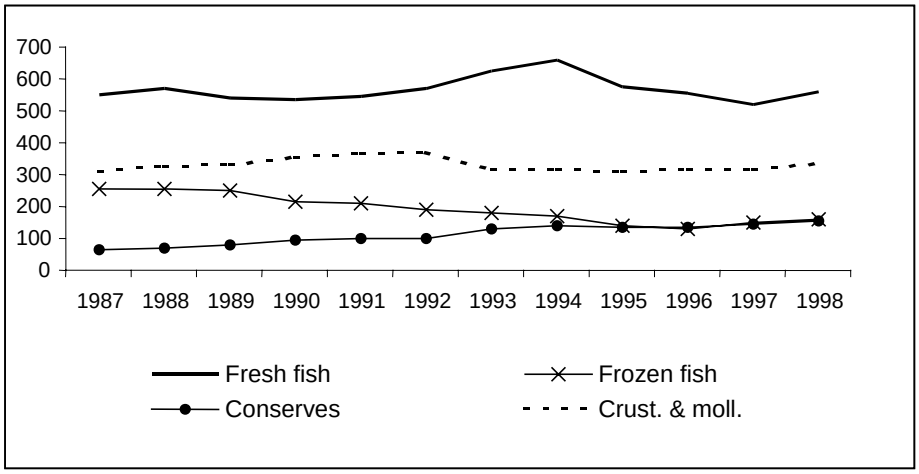

Fig. 8. Evolution of total fish consumption (1000 t) (MAPA).

Figure 9 shows the evolution of the consumption of the main species and presentations. It is remarkable the fall in hake consumption, the main group of the Spanish fish consumption, both fresh and frozen, and the small decline of fresh sardines in the last years. Given a stable total consumption, this fact suggests species substitution in consumption. It is very important the increase in the consumption of tuna conserves.

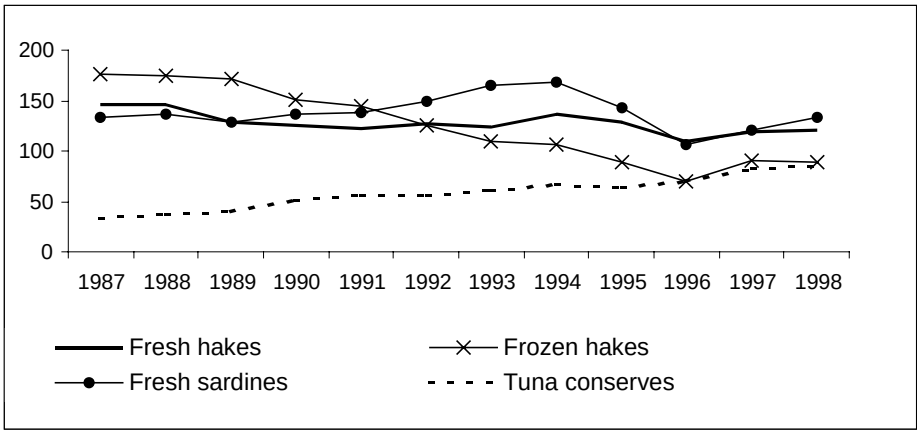

Fig. 9. Evolution of consumption. Main species and presentations (1000 t) (MAPA).

The consumption of seafood in Spain is 1998 is shown in Table 10 in total volume. The table gives a detailed presentation of consumption in-home and out-of-home (restoration and institutions) and by type of preservation and species. These characteristics are explained later, showing the evolution of the main groups.

Perhaps, the importance of the consumption is better shown per capita and in share form, as in Table 11. Seafood consumption per capita in Spain is 30.3 kg: 14 kg of fresh fish, 4 kg of frozen fish, 3.9 kg of fish conserves, and 8.4 kg of crustaceans and molluscs.

As Table 11 indicates, Fish consumption is very diversified by species in Spain, but sardines and anchovies (24% of total fresh fish consumption) and hakes (21%) dominate. Hakes clearly are also the main consumption in frozen form (56% of frozen consumption). 54% of fish conserves is tuna. The consumption of crustaceans and molluscs is mainly in fresh form (64%) followed by frozen form (33%), being other presentations less than 3% of crustaceans and molluscs consumption.

Table 10. Seafood consumption – quantity, 1998 (million kg) (MAPA)

	Home	Restoration	Institutions	Total
Total	895.4	273.6	37.0	1206.0
Fish	553.3	133.5	30.0	716.7
Fresh fish	446.7	101.9	9.5	558.1
Hakes	98.4	20.4	1.6	120.3
Sardines and anchovies	100.8	30.2	1.6	132.6
Sole	40.7	6.8	0.3	47.8
Salmon	23.0	5.8	0.5	29.2
Cod	15.6	3.5	0.3	19.4
Tuna	18.6	3.7	1.3	23.6
Trout	15.4	4.2	0.6	20.2
Other	134.3	27.3	3.4	164.9
Frozen fish	106.5	31.6	20.5	158.6
Hakes	61.6	14.9	13.1	89.6
Sole	8.5	4.5	1.5	14.5
Salmon	0.9	0.8	0.3	2.0
Cod	2.4	2.5	0.8	5.7
Other	33.1	8.9	4.8	46.8
Preserves	122.5	31.5	2.2	156.1
Sardines and anchovies	11.2	4.4	0.3	16.0
Tuna	66.8	16.3	1.4	84.4
Other	44.5	10.8	0.4	55.7
Crustaceans and molluscs	219.6	108.7	4.8	333.1
Fresh	159.7	53.8	0.7	214.2
Cooked	6.4	1.6	0.2	8.2
Frozen	53.5	53.3	3.4	110.2

Home consumption vs. catering sector

Total consumption of seafood at home goes down at a higher rate than total seafood consumption. The decline is particularly important for frozen fish, because the other three groups increase since 1990 until mid-90s. However, the share of home consumption remains at the same level than a decade earlier for fish conserves only. The evolution of fish consumption in home is shown in Fig. 10, for the main groups.

Pie-charts for total seafood consumption by destination in 1987 and 1998 is presented in Fig. 11. Fish consumption per capita has decreased only slightly, but restoration consumption is substituted for home consumption remarkably.

In summary, consumption increases for all main groups in restoration, lesser for fish conserves. The largest growth is for crustaceans and molluscs. Consumption in institutions grows in the aggregate at a similar rate than for restoration, but the components of growth are very different. Institutions consumption increases for all categories except for crustaceans and molluscs (decreasing), being particularly important for frozen fish. A more detailed picture of destinations by types of presentation is presented in the next Subsection.

Breakdown of household seafood consumption by type of preservation

The evolution of the different preservations, and the main species or presentations appear in the previous Figs 8 to 10 and Tables 10 and 11. In this Section, the distribution of each group of preservation is presented according to consumption destinations in 1987 and 1998. First, the pie

charts for the different groups by destination type are presented. However, it must be taken into account that the evolution is not monotonic, as shown in Fig. 10 for in-home consumption, and that focus in 1987 and 1988 hides several patterns of evolution in the period (see the paper by Millán about out-of-home consumption, in this volume).

Table 11. Seafood consumption per capita (kg) and location (%) – 1998 (MAPA)

	Per capita	Home	Restoration	Institutions
Total	30.31	74.24	22.69	3.07
Fish	18.01	77.19	18.62	4.19
Fresh fish	14.03	80.04	18.26	1.71
Hakes	3.02	81.74	16.95	1.30
Sardines and anchovies	3.33	76.04	22.78	1.18
Sole	1.20	85.08	14.21	0.70
Salmon	0.73	78.61	19.85	1.53
Cod	0.49	80.26	18.01	1.73
Tuna	0.59	78.64	15.67	5.69
Trout	0.51	76.42	20.81	2.77
Other	4.15	81.41	16.55	2.04
Frozen fish	3.99	67.18	19.90	12.93
Hakes	2.25	68.75	16.62	14.62
Sole	0.36	58.89	31.06	10.05
Salmon	0.05	43.89	39.51	16.60
Cod	0.14	42.09	44.09	13.83
Other	1.18	70.78	18.92	10.30
Fish conserves	3.92	78.47	20.15	1.38
Sardines and anchovies	0.40	70.44	27.43	2.14
Tuna	2.12	79.11	19.27	1.63
Other	1.40	79.80	19.41	0.79
Crustaceans and molluscs	8.37	65.92	32.63	1.45
Fresh	5.38	74.56	25.11	0.33
Cooked	0.21	78.06	19.50	2.44
Frozen	2.77	48.53	1.45	3.09

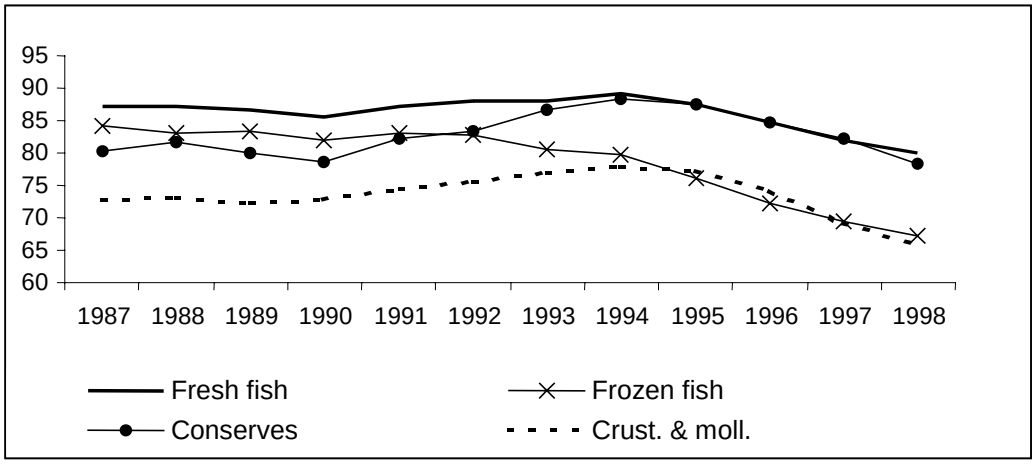

Fig. 10. Evolution of in-home consumption – share (%) (MAPA).

Fig. 11. Total fish consumption – 1998 and 1987. Share (%) by destination (MAPA).

Fresh fish consumption per capita and by destination follows a similar evolution than total seafood, as shown in Fig. 12. The more remarkable fact is that fresh fish is particularly preferred in home.

Fig. 12. Fresh fish consumption, 1987 and 19987. Share (%) by destination (MAPA).

Figure 13 clearly indicates the large decline for frozen fish, and mainly in-home consumption. The consumption per capita rises in restoration and institutions.

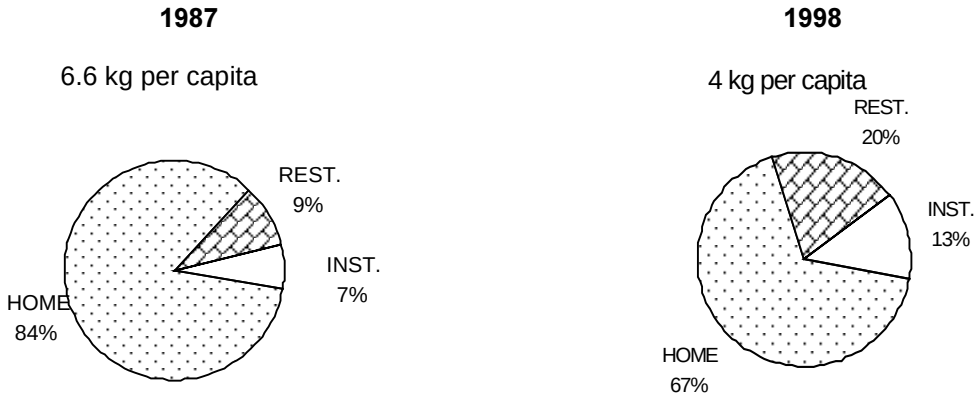

Fig. 13. Frozen fish consumption, 1998 and 1987. Share (%) by destination (MAPA).

The pattern is completely different for fish conserves, as Fig. 14 shows. The more remarkable fact is the increase of conserves per capita. Home consumption decreases slightly in share, but is more than double per capita in 1998 than in 1987. The main decline is in institutions.

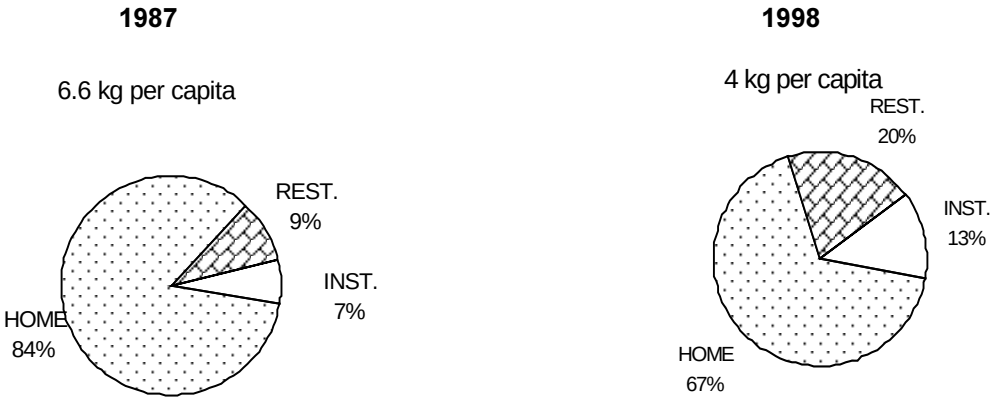

Fig. 14. Fish conserves, 1987 and 1998. Share (%) by destination (MAPA).

Figure 15 presents the charts for crustaceans and molluscs in 1998 and 1987. In total, small increase in per capita consumption, but it is due to increase in restoration only. Crustaceans and molluscs consumption decreases in home and institutions. However, it is very important distinguishing between fresh and frozen crustaceans and molluscs. Figures 16 and 17 illustrate the differences. There is a large increase in per capita consumption for fresh crustaceans and molluscs as Fig. 16 indicates. Even more remarkable, there is an important increase of home consumption, with a decrease in the share of restoration, and the practical disappearance of consumption by institutions. On the contrary, Fig. 17 shows the remarkable decline in the home consumption of frozen crustaceans and molluscs, and the very important increase in the consumption (almost double) and share of restoration.

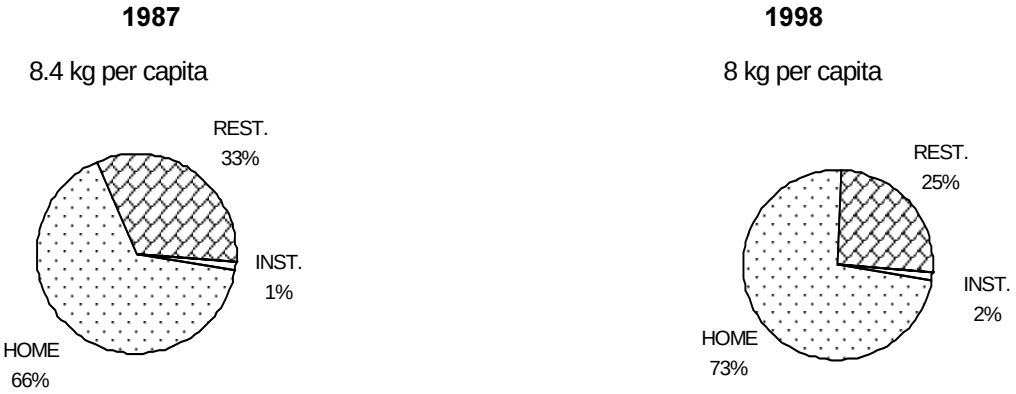

Fig. 15. Crustaceans and molluscs, 1998 and 1987. Share (%) by destination (MAPA).

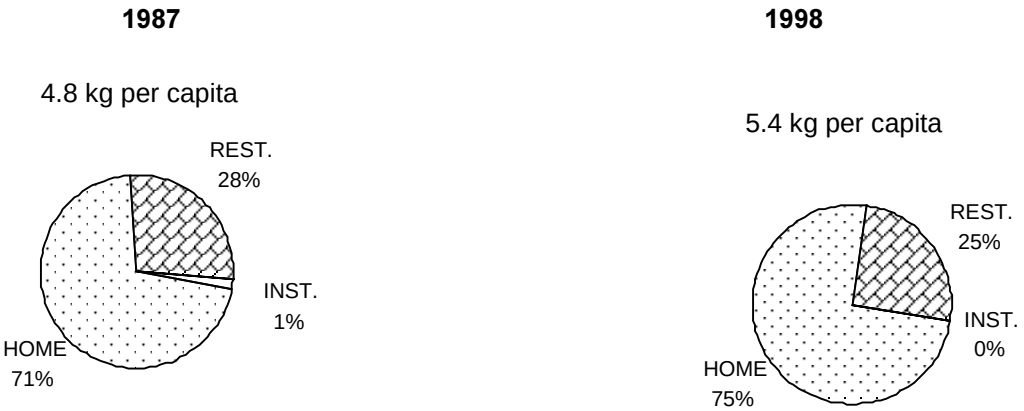

Fig. 16. Fresh crustaceans and molluscs, 1998 and 1987. Share (%) by destination (MAPA).

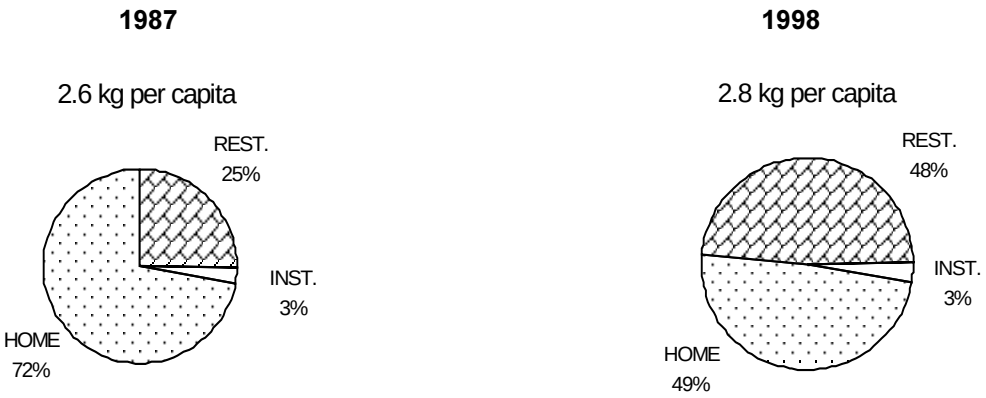

Fig. 17. Frozen crustaceans and molluscs, 1998 and 1987. Share (%) by destination (MAPA).

Breakdown of household seafood consumption by household characteristics

There are some interesting socio-demographic factors explaining characteristics of household consumption of seafood, particularly with respect to woman job and age, the presence of children and household size. The fall in seafood consumption in households with children is very pronounced (more than for meat products, as an example). Table 12 indicates that the difference of seafood consumption per capita is more than 11 kg in households with no children than in households with children younger than 6.

Table 12. Households seafood consumption per capita (kg) – children (MAPA)

	No children	Younger than 6	6 to 15 years old
Seafood	27.57	16.48	18.21
Fish	17.52	9.76	10.71
Fresh fish	14.21	7.84	8.56
Frozen fish	3.31	1.92	2.15
Fish conserves	3.5	2.53	2.77
Molluscs and crustaceans	6.55	4.19	4.73

Fish consumption is also negatively related with woman job and age, being the differences more important in fresh fish. These facts are shown in Tables 13 and 14.

Table 13. Households seafood consumption per capita (kg) – housewife activity (MAPA)

	Working	Not working
Seafood	18.8	23.6
Fish	10.5	14.9
Fresh fish	8.2	12.1
Frozen fish	2.3	2.8
Fish conserves	3.3	3.0
Molluscs and crustaceans	5.0	5.7

Seafood consumption per capita is also inversely related to household size, as Table 15 shows, and to economic status, as Table 16 illustrates.

Table 14. Household seafood consumption per capita (kg) – housewife age (MAPA)

	< 35	35 to 49	50 to 64	> 65
Seafood	17.1	19.3	26.6	31.2
Fish	9.7	11.2	17.0	21.0
Fresh fish	7.5	9.0	14.1	17.1
Frozen fish	2.2	2.2	3.0	4.0
Fish conserves	3.0	3.0	3.2	3.3
Molluscs and crustaceans	4.5	5.0	6.4	6.9

Table 15. Household seafood consumption per capita (kg) – household size (MAPA)

	1	2	3	4	5 +
Seafood	33.34	28.82	23.5	20.57	18.98
Fish	21.6	18.07	14.26	12.7	11.63
Fresh fish	17.43	14.29	11.54	10.34	9.44
Frozen fish	4.17	3.77	2.72	2.35	2.19
Fish conserves	4.22	3.88	3.17	2.87	2.66
Molluscs and crustaceans	7.52	6.87	6.07	5.01	4.69

Table 16. Household seafood consumption per capita (kg) – household status (MAPA)

	Low	Middle-low	Middle	Middle-high +
Seafood	26.41	22.24	21.62	22.13
Fish	17.89	14.05	12.93	13.14
Fresh fish	14.33	11.23	10.51	10.65
Frozen fish	3.56	2.82	2.42	2.49
Fish conserves	2.93	2.97	3.22	3.08
Molluscs and crustaceans	5.59	5.22	5.47	5.92

Regional factors of distribution and consumption

There are wide regional differences in seafood consumption in Spain, as shown in Table 17. The largest consumption is in Northwest, followed by Castilla-Leon (inner), and Andalucia. Lesser fish consumption is in Northeast, Centre-South, Levante (east, coastal) and Canary Islands.

Table 17. Household seafood consumption per capita (kg) – geographical area (MAPA)

	Total seafood	Total fish	Fresh fish	Frozen fish	Conserve	Molluscs and crustaceans
Northeast	21.22	12.2	9.47	2.74	3.28	5.74
East	18.94	10.37	7.64	2.73	3.43	5.15
Andalucia	21.83	13.31	10.79	2.52	2.84	5.67
Centre-South	23.66	15.36	12.68	2.68	3.22	5.08
Castilla-Leon	24.98	16.87	14.21	2.67	2.56	5.54
Northwest	28.57	17.72	15.15	2.57	3.08	7.77
North	25.28	17.6	15.12	2.48	2.41	5.27
Canary Islands	15.48	8.72	4.69	4.03	4.22	2.54

Table 18 shows that seafood consumption is larger in urban and populated areas, although it does not grow in metropolitan areas.

Table 18. Household seafood consumption per capita (kg) – habitat (thousands inhabitants) (MAPA)

	<2	2 to 10	10 to 100	100 to 500	>500
Seafood	21.85	20.09	22.19	24.36	24.12
Fish	13.83	11.97	13.4	15.37	15.33
Fresh fish	10.69	9.37	10.76	12.76	12.59
Frozen fish	3.14	2.6	2.64	2.61	2.74
Preserves	2.63	3.05	3.17	3.19	3.14
Molluscs and crustaceans	5.39	5.07	5.63	5.8	5.65

Distribution channels: Evolution of the market shares of the main retailers

Table 19 shows the evolution of distribution channels for household consumption. The most relevant characteristics is that following the decline of traditional retailers until mid-90s, favouring super and hypermarkets, the shares seem stable.

Table 19. Seafood distribution shares for household consumption (%) (MAPA)

	1987	1990	1995	1996	1997	1998
Traditional	76.7	69.9	48.1	48.8	52.8	52.0
Self-service and supermarket	13.8	19.7	28.3	29.2	26.2	28.3
Hypermarket	1.7	6.0	13.9	12.7	15.3	15.7
Cooperative	0.6	0.8	1.0	1.0	0.4	0.3
Open air	3.4	1.7	3.0	2.5	2.5	2.0
Other	3.8	1.9	5.7	5.8	2.9	1.7

Evolution of food retail price index (total food, seafood, meat, vegetables, etc.)

Figure 18 shows the evolution of the consumer price index and the food component of the index. It is worth noting the general evolution of food prices at a lower rate than inflation. Tables 20 to 22 present a more detailed picture of price evolution by groups of products. It is worth note that these "prices", taken from MAPA, are "unit values" (= value/quantity) without any price index formula adjustment.

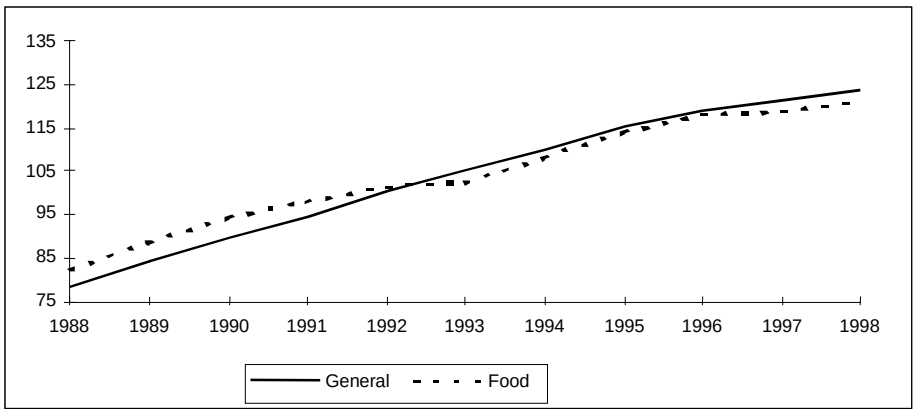

Fig. 18. Inflation (CPI) and food price indexes (base: 1992 = 100) (INE).

Table 20. Unit values of main food groups – households (ptas/kg) (MAPA)

	1993	1994	1995	1996	1997	1998
Meat	719	729	734	749	740	743
Seafood	708	727	752	782	833	871
Fresh vegetables	151	156	155	163	171	179
Fresh fruit	107	129	137	137	137	140
Total food	227	235	239	242	246	248

Table 21. Unit values of main food groups – restoration (ptas/kg) (MAPA)

	1993	1994	1995	1996	1997	1998
Meat	818	831	863	922	954	926
Seafood	871	922	861	976	1062	1053
Fresh vegetables	144	176	174	152	140	154
Fresh fruit	123	144	139	130	121	128
Total food	222	232	248	261	272	286

Table 22. Unit values of main food groups – institutions (ptas/kg) (MAPA)

	1993	1994	1995	1996	1997	1998
Meat	562	569	599	574	563	584
Seafood	542	552	534	553	578	601
Fresh vegetables	110	114	129	117	114	119
Fresh fruit	117	120	129	121	116	111
Total food	177	186	204	190	196	197

In general, the highest prices are for restoration, perhaps due to higher quality, and the lowest prices are for institutions. However, household prices for fresh fruits and vegetables are sometimes higher than for restoration.

In Tables 23 to 25, the unit values are divided by the consumer price index, and normalised as indexes based 1993; that is, the evolution of real unit values. It is remarkable the different evolution of some groups for households, restoration or institutions.

Table 23. Real prices of main food groups – households (base: 1993 = 100) (own elaboration following MAPA and INE)

	1993	1994	1995	1996	1997	1998
Meat	1.000	0.968	0.931	0.918	0.889	0.876
Seafood	1.000	0.980	0.969	0.973	1.016	1.043
Fresh vegetables	1.000	0.986	0.936	0.951	0.978	1.005
Fresh fruit	1.000	1.151	1.168	1.128	1.106	1.110
Total food	1.000	0.988	0.960	0.939	0.936	0.927

Globally, food prices for institutions grow more than the general price index, being the contrary true for households and institutions. It is remarkable that fresh food and vegetable prices grow more for households. Seafood prices grow more for households in the last years, too.

Table 24. Real prices of main food groups – restoration (base: 1993 = 100) (own elaboration following MAPA and INE)

	1993	1994	1995	1996	1997	1998
Meat	1.000	0.970	0.962	0.993	1.007	0.960
Seafood	1.000	1.010	0.902	0.987	1.053	1.025
Fresh vegetables	1.000	1.167	1.102	0.930	0.840	0.907
Fresh fruit	1.000	1.118	1.031	0.931	0.849	0.883
Total food	1.000	0.998	1.019	1.036	1.058	1.093

Table 25. Unit values of main food groups – institutions (base: 1993 = 100) (own elaboration following MAPA and INE)

	1993	1994	1995	1996	1997	1998
Meat	1.000	0.966	0.972	0.900	0.865	0.881
Seafood	1.000	0.972	0.899	0.899	0.921	0.940
Fresh vegetables	1.000	0.989	1.070	0.937	0.895	0.918
Fresh fruit	1.000	0.979	1.006	0.911	0.856	0.805
Total food	1.000	1.003	1.051	0.946	0.956	0.944

Levels of income per family and % of household expenditures dedicated to food

The level of expenditure per household is 17.5 thousands € in 1998, and the level of expenditure per person is 5.34 thousands €, according to INE. The 5 groups in Table 26 account for two thirds of total food consumption in 1998, and for almost 75% of households' food consumption, according to the Food Consumption Survey of MAPA. This survey does not report total consumption expenditure. According to the Continuous Family Budget Survey of the Spanish Bureau of Statistics (INE), home expenditure in food, drinks and tobacco is 22.0% of total expenditure in 1998.

Table 26. Value shares in total food consumption 1998 (MAPA)

	Households	Restoration	Institutions	Total
Meat and meat products	25.4	16.4	29.2	23.1
Seafood	12.6	12.7	13.3	12.6
Milk and dairy	12.6	5.7	11.3	10.8
Fresh fruits and vegetables	13.0	3.4	10.0	10.4
Bread, cookies, etc.	11.1	4.6	9.0	9.3

Concluding comments

The first objective of this report is the collection of data in order to evaluate national seafood human consumption, using the apparent consumption approach (Production + Imports – Exports). There are very important difficulties in the availability of production data for Spain. As the only practical choice, the approach followed in this report is relying on FAO data. The Spanish situation is entirely different with respect to aquaculture data. There are collected and available data on production and value for aquaculture since mid-80s.

The analysis of seafood consumption in Spain can be performed better on direct consumption data. The main source of information on seafood consumption is the Food Consumption Survey based on the MAPA panels. This Survey begins in 1987 and although the methodology has changed

several times, there is an effort by MAPA in showing homogeneous information as if there is not any break in the series. An important point with this survey is the detailed demographic information. The annual results of the Consumption Panel of MAPA are used both for analysis of trends in fish consumption and the identification of regional and demographic seafood consumption patterns.

A relevant fact about the evolution of seafood consumption in Spain is that there is not a clear trend in most of the components of consumption. Very probably, it is not a idiosyncratic Spanish trait, but a global characteristic of food consumption. This fact is more remarkable in Spain because seafood consumption is more important and varied in Spain than in other countries.

Many factors influence seafood consumption, as other food consumption and prices, general economic conditions and socio-demographic variables. The analysis of seafood consumption must embody the variation in other variables. An analysis of seafood consumption related to meat consumption, prices, income, and several socio-demographic factors seems the minimum for a careful analysis of seafood consumption. This requires databases with variation in the determinants. A very detailed but static, unchanged, description is meaningless. In fact, this is not derived from the analysis of particular databases (Spain) but from what are well-known, we supposed, theories of consumer behaviour and very basic data analysis.