



SPECIES ANALYSES

2018



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Species profiles in the EU market

This case study is available in the
Monthly Highlights N° 1-2017

1 Algae



EU production of algae has focused traditionally on seaweed harvesting for the extraction of hydrocolloid for industrial purposes. But EU macroalgae production is limited, and the competition with third countries has become significant.

However, the demand for edible algae is increasing in EU markets, and new production models and new market stream are emerging.

1.1 BIOLOGY, RESOURCES, AND EXPLOITATION

1.1.1 BIOLOGY

Marine macroalgae¹, or seaweeds, are aquatic plants that generally live attached to rock or other hard substrata in coastal areas. They are divided into three different groups, empirically distinguished on the basis of thallus (the algal body) color: **brown algae** also known as **kelp** (phylum *Ochrophyta*, class *Phaeophyceae*), **red algae** (phylum *Rhodophyta*) and **green algae** (phylum *Chlorophyta*, classes *Bryopsidophyceae*, *Chlorophyceae*, *Dasycladophyceae*, *Prasinophyceae*, and *Ulvophyceae*). Red and brown algae are almost exclusively marine, whereas green algae can also be found in inland freshwater, and even in terrestrial situations.²

In Europe, the main exploited algae species are *Laminaria hyperborea*, *Laminaria digitata*, and *Ascophyllum nodosum*. These species, and especially kelp forests, are considered among the world's most ecologically dynamic and biologically diverse habitats. Other species are found on the European Atlantic coast, but currently few of them are commercially valuable.

1.1.2 RESOURCE, EXPLOITATION, AND MANAGEMENT IN THE EU

Although Asian production is based mostly on the cultivation of algae, the European seaweed industry is based mainly on the harvesting of macroalgae. On the European Atlantic coast, macroalgae have been harvested by coastal populations for a long time. Two main uses were identified: human consumption and agriculture (cattle food and soil enrichment).

The first recorded commercial use of seaweed was in the 17th century, when it was used for the production of glass (France and Norway). The commercial value and levels of landings for each species vary and depend on harvesting techniques. The most important, in terms of landings and value, are *Laminaria digitata*, *Laminaria hyperborea* and *Ascophyllum nodosum*, because these species are harvested mechanically by fishing vessel in France and Norway. *Ascophyllum nodosum* is harvested by fishing vessel in Norway, whereas in France and Ireland, it is harvested manually. All other species are harvested manually, either on foot or by diving.³ Mechanical harvesting is done by fishing vessels and is practised mainly in Norway (Rogaland to Sør-Trøndelag), France (Brittany), Spain (Galicia and Asturias) and to a lesser degree in the French Basque Country and Ireland.

Manual harvesting of seaweed and gathering of storm-cast seaweed are important in France, Ireland, Spain, and Portugal. Harvesters gather either the cast or cut seaweed at low tide. Diving is another way to harvest seaweed manually and is practised mostly in Portugal.

Management tools differ according to the country, the species, and the harvesting technique. Seaweed harvesting is regulated with different tools: licences or harvesting authorisations, quotas by harvesting zone, individual quotas by boat, harvesting size, and rotation systems. In most harvesting areas, the biomass is not well known, and several current projects aim to assess the importance of the resource in order to adjust the harvesting effort.

However, the preservation of kelp has become a strong environmental concern and some countries have decided to protect these habitats by restricting the use of mechanical harvesting or by creating protected areas around them. Kelp harvesting is blamed for harming the ecosystem because of the damage it can cause to substrata and the habitats of certain species. For example, seaweed harvesting was recently forbidden in the Spanish Basque Country owing to the implementation of a Natura 2000 marine area.

1.2 PRODUCTION

According to FAO production statistics, algae are included in the aquatic plants category (brown, red, and green algae as well as other species such as spirulina). Global algae production, all species included, amounted to 28,5 million tonnes in 2014, a 94% increase in the past decade. The leading producers are China and Indonesia, which provided 47% and 35%, respectively, of total world production in 2014 (production reached 13,6 and 10,1 million tonnes, respectively). Other important producers were the Philippines with 1,5 million tonnes produced in 2014 (5,4% of world production) and the Republic of Korea with 1,1 million tonnes (3,8%). EU production ranked only 12th in 2014, behind Japan, North Korea, Chile, Malaysia, Norway, and Zanzibar.

In terms of evolution, during the past ten years (2005–2014), total algae production remained relatively stable in North Korea, Chile, and Norway, increased slightly in the Philippines, increased strongly in China, South Korea, Zanzibar, and the EU, and soared in Indonesia and Malaysia. The only decrease in production during the past decade was observed in Japan. However, most of the leading producers have experienced a strong slowdown of this growth (China, Indonesia, Korea, the EU, etc.) or even a slight decrease in production (in the Philippines, for instance).

EU production amounted to more than 93.000 tonnes in 2014, providing approximately 0,3% of the world supply. France (63% of EU production, almost exclusively brown algae) and Ireland (32%, almost exclusively brown algae) are the main producers. Other important EU producers are Spain (2,3%, mostly red algae) and Italy (1,3%, green and red algae).

From 2005 to 2014, EU algae production increased 67%, with a peak reached in 2013 at 104.000 tonnes. However, among major producers, the evolution of production over the decade has been different: increasing significantly in France (+155%) and Spain (+388%), staying stable in Ireland (+0,3%), and decreasing in Italy (–25%).

¹ Refers to several species of macroscopic, multicellular, marine algae, as opposed to phytoplankton (microalgae).

² <http://www.seaweed.ie/algae/seaweeds.php>

³ Netalgae project
http://www.netalgae.eu/uploadedfiles/Filieres_12p_UK.pdf

Table 1-1 **WORLD PRODUCTION OF AQUATIC PLANTS (volume in thousand tonnes)**

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
China	9.756	10.019	10.074	10.300	10.772	11.339	11.824	13.090	13.844	13.572
Indonesia	918	1.175	1.733	2.148	2.967	3.918	5.176	6.522	9.316	10.148
Philippines	1.339	1.469	1.505	1.667	1.740	1.802	1.841	1.751	1.559	1.550
Republic of Korea	636	779	811	935	870	915	1.007	1.032	1.140	1.097
Japan	613	604	618	561	561	530	438	539	503	455
Korea Dem. People's Republic	444	444	444	444	444	444	444	444	444	444
Chile	425	339	340	412	456	381	418	440	530	430
Malaysia	40	60	90	111	139	208	239	331	269	245
Norway	154	145	135	154	160	159	152	141	154	154
Tanzania (Zanzibar)	74	77	85	108	103	125	130	151	110	133
EU	56	52	73	74	52	56	81	75	104	93
Total world	14.701	15.352	16.047	17.059	18.431	20.042	21.885	24.671	28.142	28.491

Source: FAO Fishstat (production= harvesting + aquaculture production).

Table 1-2 **PRODUCTION OF AQUATIC PLANTS IN THE EU (volume in tonnes)**

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
France	23.099	19.192	39.792	39.810	19.032	22.717	47.687	41.579	69.430	58.812
Ireland	29.500	29.500	29.503	29.500	29.500	29.503	29.503	29.509	29.542	29.600
Spain	441	486	134	111	69	125	263	527	1.218	2.154
Italy	1.600	1.400	1.400	1.400	1.400	1.400	1.200	1.200	1.200	1.200
Portugal	624	765	495	198	351	498	461	801	839	786
Estonia	809	394	1.608	1.483	1.032	351	690	430	249	626
Greece	-	-	-	-	-	-	198	174	93	126
Denmark	-	-	-	1.000	1.001	1.000	1.000	1.000	1.800	100
EU total	56.073	51.737	72.932	73.501	52.385	55.594	81.002	75.220	104.370	93.404

Source: FAO Fishstat (production= harvesting + aquaculture production). No reported production means that data is not available.

1.3 PROCESSING

The European seaweed processing industry is divided into two main categories: those producing alginic acid (alginate) and those producing products for agriculture (fertilizer and animal feed). The production of alginate and the production of cattle food require large quantities of raw material. To limit the cost of transporting wet material and remain competitive with the importation of dried material, industries often settle close to seaweed harvesting areas.

In France, for example, the two main companies are located in Northwest Brittany, where the most important kelp forest is found.

In Ireland, the company processing *A. nodosum* is located on the west coast, where seaweed is gathered. Other small companies are located in the same area.

Recently however, the seaweed processing industry has contracted. This trend has been caused by the decrease in seaweed stocks, the high cost of European labour, and environmental constraints.

Local seaweed production is not sufficient to satisfy the high demand of the processing industries and especially for those extracting alginates. The processing industries, which have access to the raw material locally (France and Ireland, for example), also import dried seaweed when local supplies are out of season or insufficient. Some processors can choose to delocalise their processing plants to third countries, where they can access inexpensive raw materials and inexpensive labour (Chile, the Philippines, and China).

Nowadays, the European seaweed industry can supply several markets (human consumption, cosmetics, pharmacology, etc.), but seaweed is used mainly to produce hydrocolloids:

- **Alginate:** extracted from brown algae, used in the pharmaceutical industry and in the production of textiles as well as in many other applications, for their good gelling and bio-active properties.
- **Agar-agar:** extracted from red algae, it is a good gelling agent used as a substrate for culturing media and for the food-processing industry.
- **Carrageenan:** extracted from red algae, used especially in the manufacturing of dairy products and meat reconstruction, for their thickening, gelling, and stabilising properties. It is used for example in the fish-finger processing industry.

Some species are exploited and used for human consumption and particularly in France, Spain (Galicia), and Ireland, where several companies harvest edible seaweed. These new types of industry have developed recently, following the increasing demand from European consumers. All edible algae are harvested manually and dried artisanally.

Moreover, the recent interest from the bio-fuel and bio-tech industries in the macroalgae sector will probably generate further perspectives. The Horizon 2020 (EU Framework Programme for Research and Innovation) project GENIALG gathers researchers and stakeholders from the algae sector to produce *Saccharina latissimi* and *Ulva sp.* to process in biorefineries. These new perspectives may also lead to the development of macroalgae farming in Europe, for which several projects are currently in development, but face strong constraints.⁴

1.4 TRADE

1.4.1 EU TRADE

Since 2012, EU trade-data nomenclature distinguishes seaweed and other algae⁵ fit for human consumption and those unfit for human consumption.

In 2015, the EU had a trade deficit of EUR 13 million for algae fit for human consumption and EUR 40 million for algae unfit for human consumption. The deficits may be attributable to the imports of macroalgae for the processing industry (mainly from Iceland) and the relatively low share of EU production dedicated to food use.

For algae unfit for human consumption, the main extra-EU suppliers are Iceland (46.000 tonnes in 2015), Indonesia (7.100 tonnes), and Tanzania (6.600 tonnes).

For algae fit for human consumption, the main extra-EU suppliers are Chile (approximately 2.500 tonnes in 2015) and China (800 tonnes).

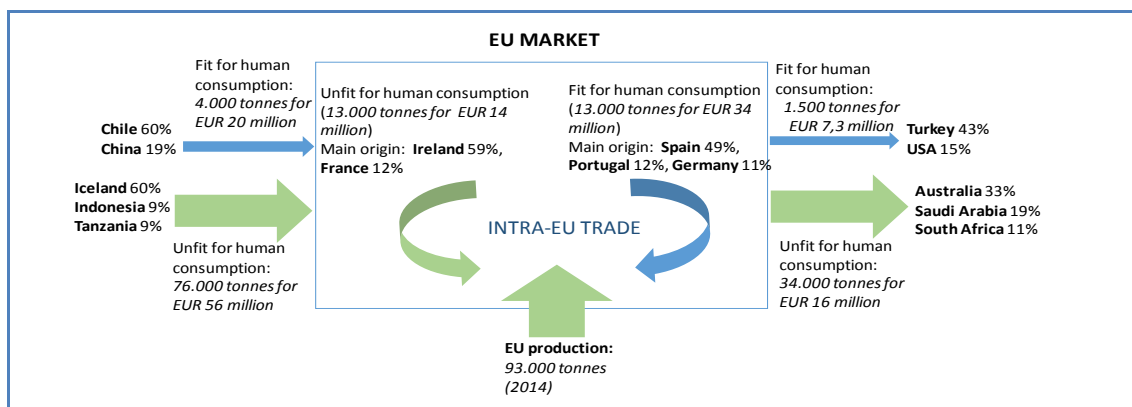
Intra-EU trade is active for each type of product. France and Ireland are the main suppliers of algae unfit for human consumption, whereas Spain, Portugal, and Germany are the main suppliers of algae fit for human consumption.

Exports of algae fit for human consumption are relatively low and main destinations are Turkey (660 tonnes in 2015) and the USA (230 tonnes). However, exports of algae unfit for human consumption reached 34.000 tonnes in 2015. The main destinations were Australia (11.300 tonnes), Saudi Arabia (6.400 tonnes), and South Africa (3.700 tonnes).

⁴ Netalgae project
http://www.netalgae.eu/uploadedfiles/Filieres_12p_UK.pdf

⁵ Seaweed and other algae, fresh, chilled, frozen, or dried whether ground or not.

Figure 1-3 EU TRADE BALANCE OF SEAWEED AND OTHER ALGAE IN 2015

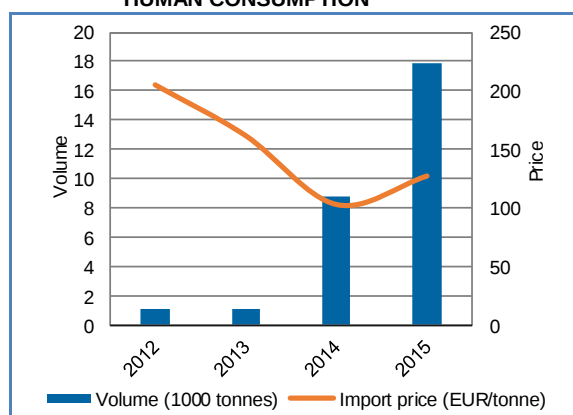


Source: EUMOFA based on COMEXT.

1.4.2 IMPORT TRENDS AND PRICES

In France, the largest algae producer and processor in the EU, the import of algae unfit for human consumption experienced a strong increasing trend from 2013 to 2015 from approximately 1.000 tonnes to 18.000 tonnes. This strong increase may be attributable to the increasing needs of the processing industry as well as a decrease in harvesting French production in 2015. At the same time, the average import price dropped 38%, falling from 205 EUR/tonne to 128 EUR/tonne.

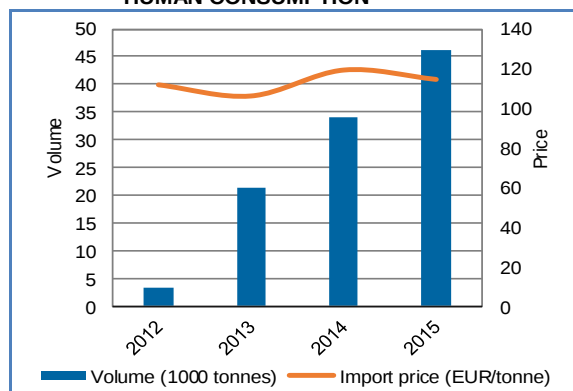
Figure 1-4 FRANCE: IMPORTS OF ALGAE UNFIT FOR HUMAN CONSUMPTION



Source: FAO and EUMOFA.

In Ireland, the import volume increased significantly between 2012 and 2015 (from 3.000 tonnes to 46.000 tonnes), mainly to supply the processing industry. But the average import price has remained stable over the period, fluctuating between 106 EUR/tonne and 119 EUR/tonne.

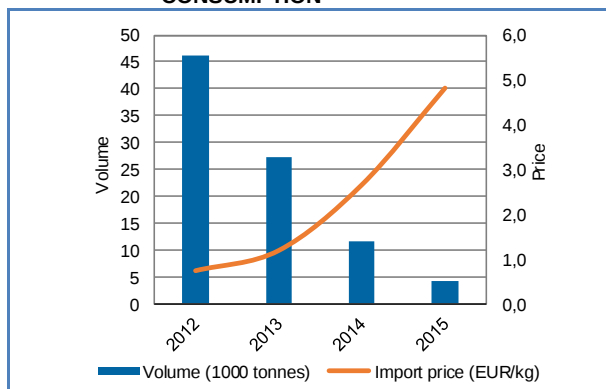
Figure 1-5 IRELAND: IMPORTS OF ALGAE UNFIT FOR HUMAN CONSUMPTION



Source: FAO and EUMOFA.

A strong decline in imported volumes of EU imports of algae fit for human consumption is noticeable, falling from 46.000 tonnes in 2012 to 4.000 tonnes in 2015. Over the period, on the contrary, prices experienced a strong increasing trend, 0,74 EUR/kg to 4,82 EUR/kg. This significant trend may be explained by more local supply of algae for food use in the EU or by imports including more added-value algae products.

Figure 1-6 EU IMPORTS OF ALGAE FIT FOR HUMAN CONSUMPTION



Source: FAO and EUMOFA.

1.5 CONSUMPTION

Human consumption of algae has always been important in Asian countries, especially in Japan and China, where algae farming is intensive, but also traditionally in European coastal communities (for example in France, Norway, Wales, and Ireland).

The most important Asian species for human consumption are Nori (*Porphyra* species), Kombu (*Laminaria* and *Saccharina* species), and Wakame (*Undaria pinnatifida*). Nori are especially used in many sushi dishes, for rice balls and as a condiment for various noodle, soup, and other dishes.

In addition to consumption in Asian restaurants, there is renewed interest in European countries in the consumption of seaweeds, because of their rich protein and mineral content and because they are considered healthy and natural.⁶

⁶ http://www.seaweed.ie/uses_general/humanfood.php

2 Anchovy



Anchovy is a small pelagic species found and caught in many seas and oceans around the world, but particularly in the Pacific and Atlantic oceans. The species' short life rarely exceeds three years. It feeds on planktonic organisms like mollusc larvae and fish eggs and larvae. The European stock moves from southern to northern waters and from the deeper water to the surface layers in summer, when spawning peaks. Spawning lasts from April to November (<http://www.fao.org/fishery/species/2106/en>).

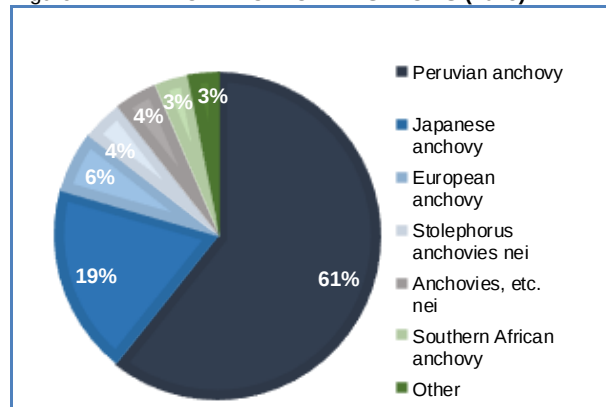
Three different European anchovy stocks are targeted: (1) the Bay of Biscay stock; (2) the stock of the southwest of the Iberian Peninsula (Bay of Cádiz); and (3) the Mediterranean stock. Anchovy is commonly caught using purse-seiners, lampara nets, and midwater trawls (winter).

This case study is available in the
Monthly Highlights N° 3-2017

2.1 PRODUCTION

Most of the world's total anchovy catch is represented by the Peruvian anchovy (*Engraulis ringens*), with a total catch of 4,3 million tonnes (2015). The Peruvian anchovy catches vary greatly from year to year, following variations in *El Niño*, and are primarily caught by the Peruvian fleet. The second largest species caught is Japanese anchovy (*Engraulis japonicas*), accounting for 19% of the world's anchovy catch in 2015. European anchovy (*Engraulis encrasicolus*) follows, responsible for 6% of total anchovy catches.

Figure 2-1 WORLD CATCH BY SPECIES (2015)



Source: FAO.

Table 2-1 TOP FISHERY NATIONS GLOBALLY (1.000 tonnes)

	2011	2012	2013	2014	2015
Peru	7.129	3.777	4.871	2.322	3.771
China	767	826	867	926	956
Chile	1.191	904	803	818	540
South Africa	120	307	79	240	238
South Korea	293	222	209	221	212
Indonesia	205	203	191	199	206
Turkey	228	164	180	96	193
Others	1.212	1.391	1.253	1.008	985
Total	11.145	7.795	8.452	5.831	7.100

Source: FAO.

Table 2-2 TOP FISHERY NATIONS IN THE EU (1.000 Tonnes)

	2011	2012	2013	2014	2015
Spain	28	27	36	43	50
Italy	46	43	30	32	38
Greece	9	9	9	10	14
Croatia	14	8	9	9	12
France	7	9	5	6	6
Other	23	9	2	2	12
Total	127	105	91	102	132

Source: FAO.

Most of the global anchovy catch is processed for fishmeal and fish oil. Along with Chile, Peru is the largest producer of fishmeal. In 2015, the allocated fishmeal production for the

two countries reached approximately 1,1 million tonnes, accounting for 25% of the world production, mainly produced

from anchoveta (Peruvian anchovy)⁷. The production of fishmeal in South America is normally greater, but weather conditions such as *El Niño* have affected the fishery negatively several times in recent years, causing volatility in the output of fishmeal and fish oil. It is estimated that approximately 0.9 million tonnes of the global anchovy catches in 2015 were utilised for human consumption⁸. Approximately 32% of the volume was made up of frozen products, with Japan (99%) as the main producer. Other product categories are salted, prepared or preserved, and fresh.

In 2015, the EU fleet caught 132.000 tonnes of European anchovy, a 29% increase over 2014. The Spanish and Italian fleets accounted for approximately 66% of the catches. Both Spanish and Italian fleets saw an increase over the previous year, 16% and 19%, respectively. Management of European anchovy. Management of the anchovy has not been easy because of its small size and fragility, which makes it hard to tag. The biomass fluctuates greatly, mainly because of the anchovy's short life, but environmental reasons also cause recruitment to be highly volatile (randomly resulting in high or low mortality – or survival – of eggs, larvae, or juveniles). After observing a very low recruitment in the Bay of Biscay stock in 2005, the EU closed the fishery. In 2010, the fishery was reopened. The biomass returned to a sufficient level of abundance and has remained on a reproductive biomass level.

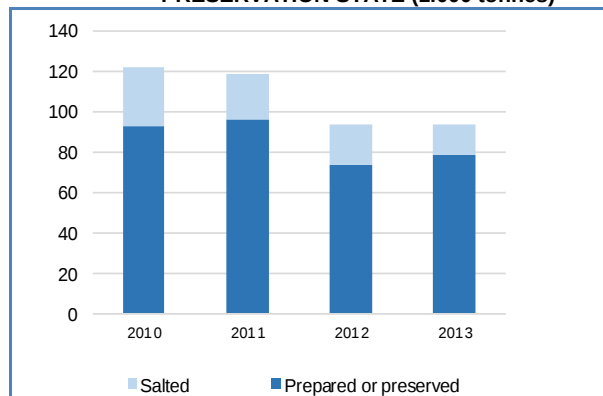
Catches of anchovy in EU waters are limited and covered by TACs, and are subject to a minimum market size of 12 cm in the Atlantic Ocean and 9 cm in the Mediterranean Sea. The Bay of Biscay stock is subject to a long-term management plan⁹. On 24 February, the European Commission issued a proposal for a regulation concerning the Mediterranean Sea that establishes a multi-annual plan for small pelagic stocks in the Adriatic Sea¹⁰. The General Fisheries Commission for the Mediterranean (GFCM) and the Scientific, Technical and Economic Committee for Fisheries (STECF) have given scientific advice indicating that the exploitation of anchovy in the Adriatic Sea exceeds the levels required to achieve the maximum sustainable yield (MSY). The main measures to be implemented concern access to waters, control of fishing effort, and technical measures to regulate the use of various kinds of gears¹¹.

2.2 PROCESSING GLOBALLY AND IN THE EU

In 2013, approximately 94.000 tonnes of salted and prepared or preserved anchovy were produced globally. The prepared or preserved category accounted for 83% of the total production at 78.000 tonnes, while salted anchovy products accounted for 16.000 tonnes. Salted products frequently receive further processing.

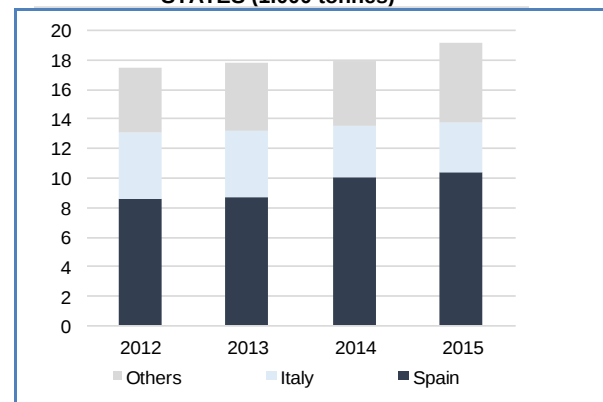
In 2015, the allocated EU processing of anchovy totalled 19.140 tonnes. Spain is the leading EU Member State processing anchovy and accounting for 54% of total EU production in 2015, at approximately 10.400 tonnes. Italy followed as the second largest producer with 17% of the total volume at 3.340 tonnes. France and Croatia are other important EU countries taking part in the processing of anchovy¹².

Figure 2-2 PROCESSING GLOBALLY BY PRESERVATION STATE (1.000 tonnes)



Source: FAO.

Figure 2-3 PROCESSING IN THE EU BY TOP MEMBER STATES (1.000 tonnes)



Source: EUROSTAT.

2.3 TRADE

2.3.1 IMPORT

The EU import of anchovy (all product categories) was approximately EUR 188 million and 30.000 tonnes in 2015. The main supplier was Morocco at approximately EUR 108 million and 14.000 tonnes, followed by Peru with approximately EUR 29 million and 6.000 tonnes. The prepared or preserved product category is the largest imported to the EU, reaching a value of EUR 162 million and 21.000 tonnes, up 18% in value over 2014. The second largest product category, dried/salted/smoked anchovy imported to the EU, supplied mainly by Argentina, Peru, and Morocco, commonly receives further processing by the EU canning industry (Spain, Italy, and France).

2.3.2 EXPORT

The most valuable product category for export of anchovy is prepared or preserved. In 2015, the export value of prepared and preserved products reached EUR 34 million. In volume, the dried-salted smoked category is most important, accounting for 32% of the total. As the largest processor of anchovy in the EU, Spain is naturally the largest exporter, accounting for 43% and 50% of the total export value and volume, respectively, in 2015. Morocco and Albania were the main markets for anchovy products exported from the EU in 2015, accounting for 23% and 22%, respectively, of the total export value. Products exported to Morocco are mainly fresh and frozen products assumed to be destined for further processing in Morocco. Products exported to Albania are mostly dried, salted, or smoked..

⁷ International Fishmeal and Fish Oil Organization (IFFO).

⁸ Pelagic Fish Forum.

⁹ <http://www.guidedesespeces.org/fr/anchois>

¹⁰ <https://ec.europa.eu/transparency/regdoc/rep/1/2017/EN/COM-2017-97-F1-EN-MAIN-PART-1.PDF>

¹¹ <http://data.consilium.europa.eu/doc/document/ST-6575-2017-INIT/en/pdf>

¹² <http://ec.europa.eu/eurostat/web/prodcom/data/database>

Table 2-3 **EXTRA EU IMPORT (value in million EUR and volume in 1.000 tonnes)**

Product category	2012		2013		2014		2015	
	Value	Volume	Value	Volume	Value	Volume	Value	Volume
Prepared or preserved	133	22	133	21	137	21	162	21
Dried / Salted / Smoked	20	9	14	6	15	5	24	8
Fresh	2	1	4	2	2	1	2	1
Frozen	8	5	3	1	1	1	0	0
Total	163	37	154	30	155	28	188	30

Source: EUMOFA.

Table 2-4 **EXTRA EU IMPORT BY MAIN MARKETS (value in million EUR and volume in million tonnes)**

Country	2012		2013		2014		2015	
	Value	Volume	Value	Volume	Value	Volume	Value	Volume
Spain	54	14	52	11	53	10	70	13
Italy	56	14	47	9	48	8	60	9
France	39	7	37	6	38	6	41	6
Other	14	2	18	4	16	4	17	2
Total	163	37	154	30	155	28	188	30

Source: EUMOFA.

Table 2-5 **EXTRA-EU EXPORT (value in million EUR and volume in 1.000 tonnes)**

Product category	2012		2013		2014		2015	
	Value	Volume	Value	Volume	Value	Volume	Value	Volume
Prepared-Preserved	30	3	29	3	29	3	34	3
Dried-Salted-Smoked	8	3	9	3	13	5	18	7
Fresh	2	1	2	1	7	4	12	7
Frozen	0	0	2	1	4	3	8	5
Total	40	7	42	8	53	15	72	22

Source: EUMOFA.

Table 2-6 **EXTRA-EU EXPORT BY MAIN SUPPLIERS (value in million EUR and volume in million tonnes)**

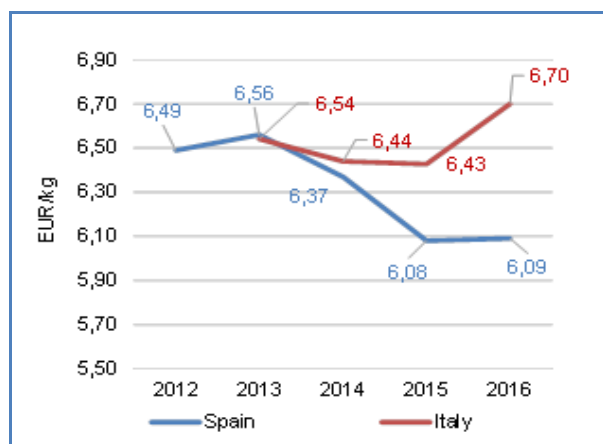
Country	2012		2013		2014		2015	
	Value	Volume	Value	Volume	Value	Volume	Value	Volume
Spain	14	3	12	3	23	7	31	11
Italy	20	3	22	4	21	4	26	5
Croatia	0	0	3	2	7	3	11	4
Other	6	1	3	0	2	0	4	2
Total	40	7	40	10	53	14	72	22

Source: EUMOFA.

2.4 CONSUMPTION

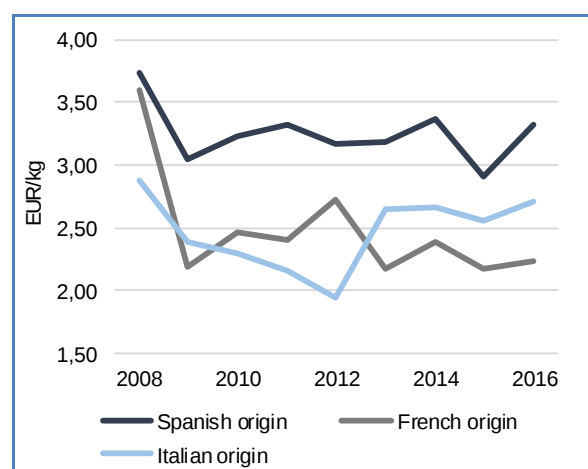
In 2014, the apparent consumption of anchovy in Spain was approximately 53.000 tonnes, with 64% supplied from national landings and 36% from imports. Anchovy is consumed as canned, salted, or processed, fresh and frozen. In Spain, the per capita consumption of fresh anchovy was stable around 1 kg/year between 2012 to 2014 (0,96, 1,12, and 1,09, respectively). The retail price has remained stable over the past years¹³. In 2015, fresh anchovy was the third most consumed seafood product in Italy, at approximately 18.000 tonnes. Consumption in Italy has seen a steady increase since 2013, when the total domestic consumption was 15.000 tonnes¹⁴. The average yearly wholesale prices reported by Mercabarna in Spain indicates that anchovy from the domestic fleet is the favoured raw material over other foreign suppliers, i.e. France and Italy.

Figure 2-4 RETAIL PRICES OF FRESH ANCHOVY IN SPAIN AND ITALY



Source: MAGRAMA / ISMEA.

Figure 2-5 WHOLESALE PRICE OF FRESH ANCHOVY IN MERCABARNA, SPAIN



Source: MERCABARNA.

¹³ Spanish Ministry of Agriculture and Fisheries, Food and Environment: El Mercado de la Anchoa en España. http://www.mapama.gob.es/es/pesca/temas/mercados-economia-pesquera/informeanchoaene2016-5agosto_tcm7-429344.pdf

¹⁴ <https://www.eumofa.eu/documents/20178/77960/The+EU+fish+market+-+2016+Edition.pdf/ca1e7801-c4da-4799-aa00-f3d1784a3021>

3 Clam

This case study is available in the
Monthly Highlights N° 10-2018

3.1 INTRODUCTION

Clam is a common name for several kinds of bivalve molluscs. The word is often applied only to those that are edible and live as infauna, spending most of their lives partially buried in the sand of the ocean floor. Clams have two shells of equal size connected by two adductor muscles and have a powerful burrowing foot. Clams in the culinary sense do not live attached to a substrate (whereas oysters and mussels do) and do not live near the bottom (whereas scallops do). Many edible clams are oval or triangular; however, razor clams have an elongated parallel-sided shell, suggesting an old-fashioned straight razor.

Globally, there are many species commonly or locally defined as clams. This study focuses on the species which are commonly regarded as clams in the main EU consuming countries: “almejas” in Spain, “palourdes” in France and “vongole” in Italy.

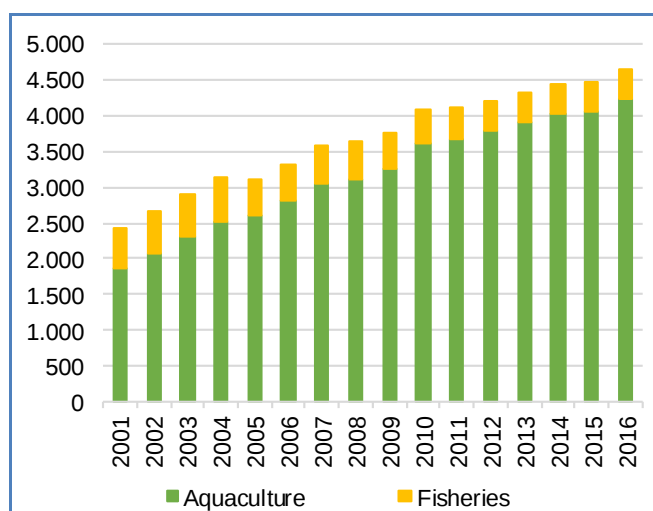
The main species sold under these designations are grooved carpet shell (*Ruditapes decussatus*), Pullet carpet shell (*Venerupis pullastra*) and Japanese carpet shell (*Ruditapes philippinarum*).



3.2 PRODUCTION

3.2.1 GLOBAL PRODUCTION

Figure 3-1 GLOBAL PRODUCTION OF ALMEJA CLAMS
(volume in 1000 tonnes)



Source: FAO.

Clams are available from both fisheries and aquaculture. During the past 15 years, global supply of clams (from both fisheries and aquaculture) has increased from 3,9 million tonnes to 6,2 million tonnes (in 2016). Of the total, 5,6 million tonnes come from Asia followed by the Americas with 0,4 million tonnes¹⁵.

When limiting the scope to species of clams which fall under the designation almejas, global supply has also increased steadily, from around 3,5 million tonnes in 2007 to 4,65 million tonnes in 2016. Of the total, 91% is produced in Asia, with China as the by far biggest producer. In 2nd place follows the Americas with a production share of 7%, while Europe ranks next with 1% of total production.

The dominant clam species is Japanese carpet shell (*Ruditapes philippinarum*). Approximately 91% of the global production of “almejas” consisted of Japanese carpet shells in 2016.

¹⁵ FAO.

3.2.2 PRODUCTION IN THE EU

Along the Atlantic coast the main species found include the European clam or (crosscut) carpet-shell clam (*Ruditapes decussatus*), the pullet carpet-shell clam (*Venerupis pullastra*) and the introduced Japanese clam (*Tapes philippinarum*). On the Mediterranean coast, the striped venus clam (*Chamelea gallina*) fisheries are of relevant socio-economic importance, particularly in the Adriatic Sea¹⁶.

Over the last nine years, EU production of clams from fisheries has been considerably higher than that from aquaculture. From a total production of 100.000 tonnes in 2008, production fell to 85.000 tonnes in 2011. Production from both fisheries and aquaculture peaked at 126.000 tonnes for a value of EUR 403 million in 2015. Production then fell to 108.000 tonnes valued at EUR 319 million in 2016.

Of the 44.400 tonnes of clams from aquaculture in 2016, 82% was farmed in Italy. The main clams farmed in Italy is Manila clam (*Ruditapes philippinarum*). Other clam farming Member States are France, Spain, and Portugal, all with production in 2016 ranging between 2.000 and 3.000 tonnes.

As with aquaculture, Italy is the main producer of clams from fisheries. Of the 64.000 tonnes landed in 2016 at EU level, 28% was landed in Italy. Spain accounted for 16% of the landings and France for 13%.

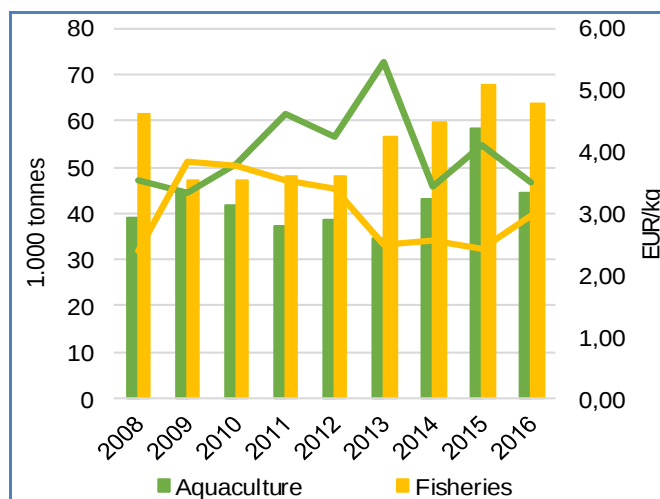
Since 2011, the unit value for clams from aquaculture has been higher than for clams from fisheries. Unit value for clams from fisheries trended down in the period, from 3,77 EUR/kg in 2010 to 2,41 EUR/kg in 2015. Unit value for farmed clams peaked in 2013, at 5,44 EUR/kg, as production volume fell to the lowest level since 2003. In 2016 the unit value gap narrowed as clams from aquaculture and fisheries moved in the opposite direction.

3.3 TRADE

3.3.1 EXTRA-EU IMPORTS

In 2013 imports of fresh and frozen clams (including cockles and ark shells) to the EU amounted to around 15.000 tonnes, of which two-third was of Vietnamese origin. Since then, significant changes have taken place in terms of both import volume and main suppliers. In the following three years import volumes trended down, but from 2016 to 2017 imports rose by 30%. In 2017, imports of fresh and frozen clams (mainly frozen) to the EU totalled 3.951 tonnes in volume worth EUR 12,1 million. It is assumed that most of the fresh product imported to the EU consist of clams. This is due to the fact that most of the fresh products are imported from Tunisia and the country is one of the few suppliers of the native clam species (*Tapes decussatus*) which is highly demanded on the Italian market.

Figure 3-2 PRODUCTION OF CLAMS IN THE EU (volume in 1000 tonnes, price in EUR/kg)



Source: EUMOFA/EUROSTAT.

Table 3-1 EXTRA-EU IMPORTS OF FRESH, FROZEN AND PREPARED/PRESERVED CLAMS, COCKLES AND ARK SHELLS BY MEMBER STATE (volume in tonnes, value in 1000 EUR)

Product	2015		2016		2017		2018 (Jan-May)	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Prepared/preserved	22.558	50.135	29.491	53.995	35.212	67.909	13.244	24.688
Frozen	5.535	8.394	2.162	3.996	3.448	8.577	1.072	2.203
Fresh	1.113	4.215	886	4.988	504	3.478	132	1.563
Total	29.207	62.744	32.538	62.979	39.164	79.964	14.448	28.454

Source: EUMOFA.

¹⁶ DIRECTORATE-GENERAL FOR INTERNAL POLICIES, POLICY DEPARTMENT B: STRUCTURAL AND COHESION POLICIES - FISHERIES
RESEARCH FOR PECH COMMITTEE - THE CLAM FISHERIES SECTOR IN THE EU - THE ADRIATIC SEA CASE, JAN 2016

Table 3-2 **EXTRA-EU IMPORTS OF FRESH AND FROZEN CLAMS, COCKLES AND ARK SHELLS BY MEMBER STATE (volume in tonnes, value in 1000 EUR)**

Country	2015		2016		2017		2018 (Jan-May)	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Spain	2.091	2.793	1.870	3.562	3.046	7.306	891	1.620
Italy	1.532	4.289	1.056	4.647	609	3.060	184	1.461
Portugal	2.545	3.660	6	59	123	562	79	172
France	2	132	2	130	14	339	15	227
Netherlands	415	1.394	31	128	92	276	12	69
United Kingdom	39	157	60	229	51	230	10	46
Other	25	184	24	230	17	282	14	172
Total	6.648	12.609	3.048	8.984	3.951	12.055	1.204	3.766

Source: EUMOFA.

Spain is the leading importer of fresh and frozen clams (including cockles and ark shells) in the EU. In 2017, 77% of the volume imported to the EU went to Spain, 15% and 3% went to Italy and Portugal, respectively. The main supplier of fresh and frozen clams to the EU over the last two years is Chile with an import share of 55% in 2017. Chilean product was also the cheapest in 2017 with an average import price of 1,34 EUR/kg. The main supplier to the Italian market is Tunisia and most of the imports consist of fresh product with an average import price of 8,94 EUR/kg in 2017.

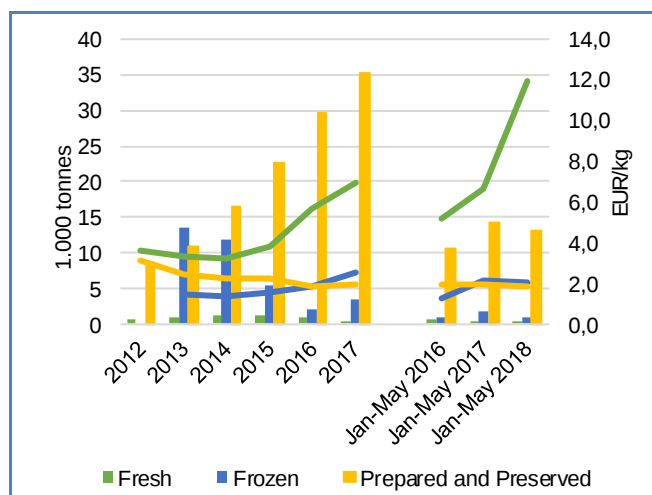
EU imports of prepared/preserved product have over the last few years shown an increasing trend, both in terms of volume and value – with volume increasing the most. From 2015 to 2017 import volume rose by 56% while value rose by 35%.

Table 3-3 **EXTRA-EU IMPORTS OF PREPARED/PRESERVED CLAMS, COCKLES AND ARK SHELLS BY MEMBER STATE (volume in tonnes, value in 1000 EUR)**

Country	2015		2016		2017		2018 (Jan-May)	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Spain	8.151	19.178	10.503	19.171	11.134	20.904	4.875	8.782
Portugal	6.823	10.073	10.567	14.268	11.499	16.662	3.986	4.991
Italy	6.445	17.775	7.174	17.038	10.761	25.511	3.843	9.324
Netherlands	313	804	512	1.178	1.013	2.564	263	961
UK	439	806	313	705	279	609	107	218
Belgium	168	413	165	318	185	514	54	112
Other	219	1.086	257	1.318	342	1.144	115	299
Total	22.558	50.135	29.491	53.995	35.212	67.909	13.244	24.688

Source: EUMOFA.

Figure 3-3 **EXTRA-EU IMPORTS OF CLAM, COCKLES AND ARK SHELLS BY PRESERVATION**
(volume in 1000 tonnes, price in EUR/kg)



Source: EUMOFA.

While a declining import trend is observed for fresh and frozen clams (including cockles and ark shells) since 2013, imports of prepared/preserved products have increased steeply. Regarding unit value (EUR/kg), the trend has been the opposite. Import prices have fallen from approximately 2,50 EUR/kg in 2013 to just below 2,00 EUR/kg in 2017. In the first five months of 2018, import prices for fresh clams have shown a steep rise on very limited volumes (132 tonnes).

3.3.2 EXTRA-EU EXPORTS

Exports of clams to markets outside the EU are far lower than imports. Exports of fresh/frozen clams have from 2015 to 2017 increased from 297 tonnes to 816 tonnes. Spain, Portugal, and Italy were the main exporters of fresh/frozen clams in 2017. Exports of prepared/preserved clams trended in the opposite direction, falling from 901 tonnes in 2015 to 351 tonnes in 2017. The main exporters were the same as for fresh/frozen clams.

Table 3-4 **EXTRA-EU EXPORTS OF FRESH, FROZEN AND PREPARED/PRESERVED CLAMS, COCKLES AND ARK SHELLS** (volume in tonnes, value in 1000 EUR)

Country	2015		2016		2017		2018 (Jan-May)	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Prepared/preserved	901	8.353	821	6.436	351	2.478	163	723
Fresh	53	280	122	1.355	362	3.964	132	1.449
Frozen	244	629	259	666	455	2.053	118	334
Total	1.198	9.262	1.202	8.458	1.167	8.495	413	2.506

Source: EUMOFA.

3.3.3 INTRA-EU EXPORTS

While imports to the EU are dominated by prepared/preserved and frozen clams, the trade between member states is dominated by fresh/live clams. Over the last three years around 70% of internal trade of clams was fresh/live clams. Italy is the biggest exporter of fresh/frozen clams (including cockles and ark shells) to the EU market. The country is also the main importer of fresh and frozen clams from other member states (with exports 1.100 tonnes higher than imports in 2017). Portugal was the 2nd biggest exporter of fresh/frozen and prepared/preserved clams in 2017. Most of the exports are from own production which amounted to 7.136 tonnes (from aquaculture and catches combined). The Netherlands is the main intra EU exporter of prepared/preserved clams, cockles and ark shells and the 3rd largest exporter of fresh/frozen products (mainly frozen). It is assumed that the majority of the exports of prepared/preserved product consist of cockles.

Table 3-5 **INTRA-EU EXPORTS OF FRESH, FROZEN AND PREPARED/PRESERVED CLAMS, COCKLES AND ARK SHELLS** (volume in tonnes, value in 1000 EUR)

Country	2015		2016		2017		2018 (Jan-May)	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Fresh	28.885	91.326	28.666	107.337	32.146	120.621	9.215	42.204
Prepared/preserved	9.170	56.069	10.442	65.075	11.109	57.031	3.869	17.021
Frozen	2.083	7.357	1.426	6.732	4.963	25.018	1.780	12.753
Total	40.137	154.752	40.534	179.145	48.218	202.670	14.863	71.979

Source: EUMOFA.

Table 3-6 **INTRA-EU EXPORTS OF FRESH AND FROZEN PRESERVED CLAMS, COCKLES AND ARK SHELLS BY MEMBER STATE (volume in tonnes, value in 1000 EUR)**

Country	2015		2016		2017		2018 (Jan-May)	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Italy	7.554	34.969	7.892	44.223	9.930	52.364	3.823	21.292
Netherlands	5.445	18.726	3.755	15.504	5.711	25.984	1.979	8.844
Portugal	7.925	18.774	5.975	17.749	6.498	18.967	1.901	6.848
Spain	1.302	4.888	1.540	7.142	2.676	12.700	1.170	9.262
France	2.830	10.073	3.376	11.755	4.489	16.565	794	4.246
Greece	971	957	2.313	1.935	2.877	2.031	438	630
Other	4.941	10.295	5.242	15.762	4.928	17.028	891	3.836
Total	30.967	98.683	30.092	114.069	37.108	145.639	10.995	54.958

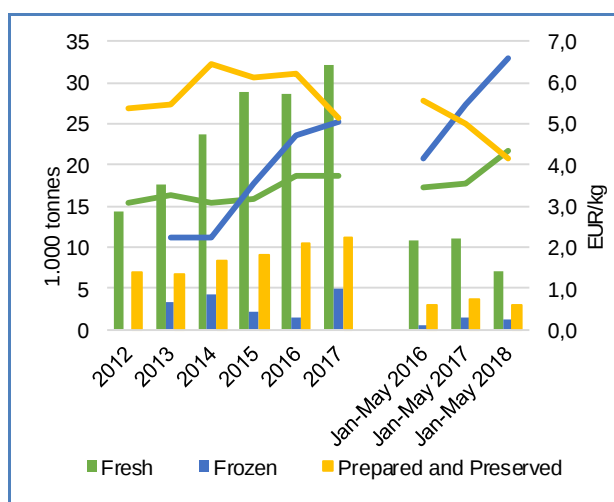
Source: EUMOFA.

Table 3-7 **INTRA-EU EXPORTS OF PREPARED/PRESERVED CLAMS BY MEMBER STATE (volume in tonnes, value in 1000 EUR)**

Country	2015		2016		2017		2018 (Jan-May)	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Netherlands	3.624	32.513	3.268	32.517	3.637	28.697	1.232	9.255
Portugal	1.940	3.442	1.801	3.242	2.319	4.517	1.168	2.112
Italy	514	2.763	956	4.219	1.135	4.935	467	2.209
Spain	705	2.336	1.253	3.379	1.235	3.855	435	1.373
United Kingdom	1.528	10.869	2.305	17.555	1.712	12.281	197	1.203
Bulgaria	10	24	4	12	569	942	144	56
Other	850	4.123	855	4.151	502	1.803	224	812
Total	9.170	56.069	10.442	65.075	11.109	57.031	3.869	17.021

Source: EUMOFA.

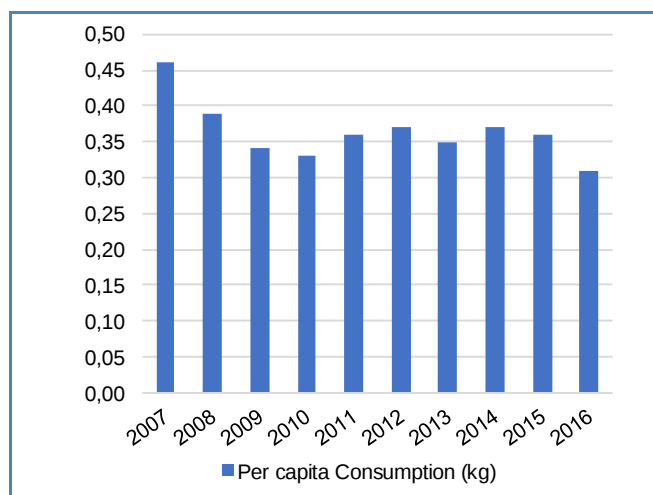
Intra-EU export prices for fresh/frozen clams have shown a steady increase from 2014 despite increased trade volumes. From 2016 to 2017 exports rose by 23% and the average export price rose by 3%. In the first 5 months of 2018 the average export price for fresh/frozen clams rose by 24%.

Figure 3-4 **INTRA-EU EXPORTS OF CLAMS, COCKLES AND ARK SHELLS BY PRESERVATION (volume in 1000 tonnes, price in EUR/kg)**

Source: EUMOFA.

3.4 CONSUMPTION

Figure 3-5 EU CONSUMPTION OF CLAMS, COCKLES AND ARK SHELLS (kg per capita)



Source: EUMOFA.

Most clams produced in the EU are sold live/fresh, in the form of graded, whole-shelled products, either loose or in mesh bags. They are either eaten raw as a starter or, more usually, as an ingredient in cooked dishes, particularly in Italian cuisine¹⁷.

Apparent consumption of clams in the EU in 2016 is estimated to 156.605 tonnes which corresponds to a per capita consumption of 0,31 kg¹⁸.

The European market for clams is essentially made up of two countries: Italy and Spain. Although no official figures are available on the export of clam species defined as almejas, it is believed that a few years ago, the Spanish market absorbed more than 50% of the national production, whereas currently it depends heavily on imports. This decrease is determined by two main factors: competition by a local product, mainly from the Gulf of Cadiz, and the risk of penalties and disputes due to potential presence of a product with size below the legal one¹⁹. Consumption of almeja clams in Spain has shown a downward trend both in terms of volume and value over the last few years²⁰. Household consumption of fresh and frozen almeja clams (and cockles) fell from 32.500 tonnes in 2013 to 25.100 tonnes in 2017 (-23%). Household consumption of fresh and frozen almeja clams (and cockles) in 2017 was equal to a per capita consumption of 0,53 kg, down from 0,74 kg in 2013.

¹⁷ Fisheries and aquaculture in Europe, Magazine No 60.

¹⁸ EUMOFA, Supply balance.

¹⁹ DIRECTORATE-GENERAL FOR INTERNAL POLICIES, POLICY DEPARTMENT B: STRUCTURAL AND COHESION POLICIES – FISHERIES RESEARCH FOR PECH COMMITTEE - THE CLAM FISHERIES SECTOR IN THE EU - THE ADRIATIC SEA CASE, JAN 2016.

²⁰ Ministerio de Agricultura, Alimentación y Medio Ambiente; Secretaría General de Pesca; El mercado de la Almeja en España, February 2016.

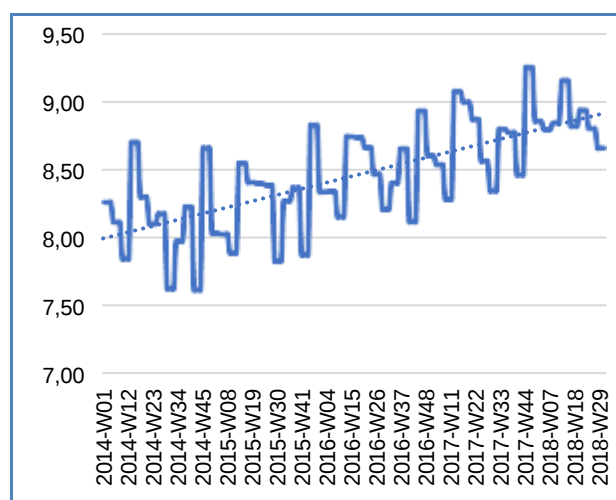
Table 3-8 **HOUSEHOLD CONSUMPTION OF ALMEJA CLAMS IN SPAIN 2012–2017 (volume in tonnes, value in 1000 EUR)**

Year	Product	Volume	Value	Price EUR/kg	Consumption per capita (kg)	Expenditure per capita (EUR)
2012	Almeja clams and cockles - fresh	25.082	207.782	8,28	0,55	4,51
	Almeja clams - frozen	5.929	32.871	5,54	0,13	0,72
	<i>Almeja clams and cockles (total)</i>	<i>31.011</i>	<i>240.653</i>	<i>7,76</i>	<i>0,68</i>	<i>5,23</i>
	Preserved almeja clams	1.347	14.256	10,59	0,00	0,32
2013	Almeja clams and cockles - fresh	26.661	221.316	8,30	0,60	4,89
	Almeja clams - frozen	5.871	30.916	5,27	0,14	0,71
	<i>Almeja clams and cockles (total)</i>	<i>32.532</i>	<i>252.232</i>	<i>7,75</i>	<i>0,74</i>	<i>5,60</i>
	Preserved almeja clams	1.066	12.702	11,92	0,00	0,28
2014	Almeja clams and cockles - fresh	24.232	207.782	8,28	0,55	4,51
	Almeja clams - frozen	6.272	32.871	5,54	0,13	0,72
	<i>Almeja clams and cockles (total)</i>	<i>30.504</i>	<i>240.653</i>	<i>7,89</i>	<i>0,68</i>	<i>5,23</i>
	Preserved almeja clams	994	14.256	10,59	0,00	0,32
2015	Almeja clams and cockles - fresh	22.180	182.700	8,24	0,48	3,93
	Almeja clams - frozen	5.890	33.840	5,75	0,13	0,73
	<i>Almeja clams and cockles (total)</i>	<i>28.070</i>	<i>216.540</i>	<i>7,71</i>	<i>0,61</i>	<i>4,66</i>
	Preserved almeja clams	1.180	14.620	12,39	0,03	0,31
2016	Almeja clams and cockles - fresh	21.814	180.164	8,26	0,49	4,04
	Almeja clams - frozen	5.706	32.600	5,71	0,13	0,73
	<i>Almeja clams and cockles (total)</i>	<i>27.520</i>	<i>212.764</i>	<i>7,73</i>	<i>0,62</i>	<i>4,77</i>
	Preserved almeja clams	1.151	14.314	12,44	0,03	0,32
2017	Almeja clams and cockles - fresh	19.055	174.311	9,15	0,43	3,97
	Almeja clams - frozen	6.047	34.170	5,65	0,14	0,78
	<i>Almeja clams and cockles (total)</i>	<i>25.102</i>	<i>208.481</i>	<i>8,31</i>	<i>0,53</i>	<i>4,75</i>
	Preserved almeja clams	1.038	13.423	12,93	0,02	0,31

Source: MAPA.

While consumption has shown a downward trend, prices paid by Spanish households have in the recent years trended up. In 2015, the price paid for fresh clams averaged 8,24 EUR/kg while in 2017 the price had risen to 9,15 EUR/kg.

An upward price trend is also observed for live/fresh clams on the Italian market. While retail prices trended around 8,00 EUR/kg in the beginning of 2015, prices have exceeded 9,00 EUR/kg in periods during 2018.

Figure 3-6 **RETAIL PRICES FOR LIVE/FRESH CLAMS (VONGOLE) IN ITALY (price in EUR/kg)**

Source: EUMOFA.

4 Crab

This case study is available in the
Monthly Highlights N° 11-2017

4.1 SUMMARY

The total volume of crab landed and imported to the EU was 67.500 tonnes in 2016. The intra-EU trade consists mainly of fresh and frozen whole crab, while extra-EU imports consist mainly of prepared and preserved crab products as well as frozen whole crab. France and Spain are the main importers. The export volumes of crab from the EU have increased from 260 tonnes in 2010 to 3.000 tonnes in 2016, and the total value reached EUR 76 million in 2016.

The main commercial species in the EU is the brown crab (also known as edible crab), which is only distributed in European waters. Crab is usually caught during summer and autumn, and of the total catch of brown, approximately 90% of the catch stems from EU Member States.

4.2 BIOLOGY

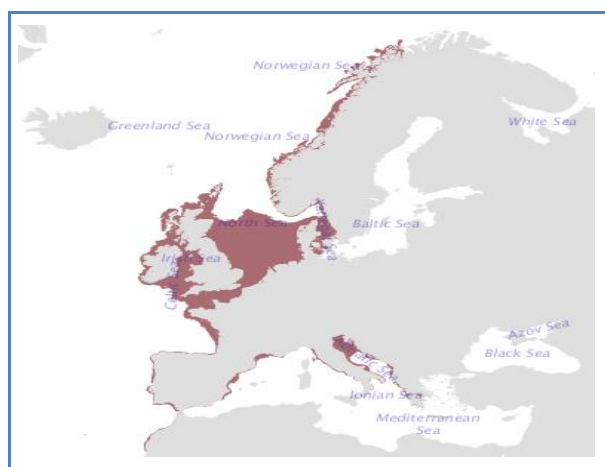
Crab is a crustacean covered with a thick external skeleton. Crabs grow through moulting, mostly in the warm season. Moulting is most frequent in the crabs' early life, and the growth decreases as the crab matures. Many species of crab are caught in European waters, with the brown crab (*Cancer pagurus*) as the main commercial species. Other species caught for commercial use are the spinous spider crab (*Maja squinado*), the velvet swimcrab (*Necora puber*), and the queen crab (*Chionoecetes opilio*). The brown crab, in the Cancridae family, is a European species distributed between North Africa and northern Norway. The main habitat is around the British Isles, including Ireland, but there are also significant populations along the French and Norwegian coasts.

As a marine species, the brown crab is only found in waters with high and relatively stable salinity. The species is relatively stationary and migration is primarily vertical, moving to the upper and warmer shore at night to feed before returning to deeper water at daytime. To avoid cold surface water during winter, the brown crab often migrates as deep as 30–50 metres. Occasionally, brown crab has been caught as deep as 400 m.

The brown crab lives for approximately 15 years and can reach a width of up to 30 cm (carapace) and weigh up to 2,5 kg. It takes 5–7 years to reach the age of maturity, and crabs mate when the female is moulting. The brown crab usually lives on hard and stony bottoms, but the female migrates to sandy bottoms, where they dig into the sediment when spawning, usually in late autumn or early winter.

Brown crabs are omnivorous. They are particularly fond of shells and bristle worms. As scavengers, they are important as renovators of the seabed²¹.

Figure 4-1 BROWN CRAB DISTRIBUTION MAP



Source: FAO.

4.3 MANAGEMENT

Crab is usually caught during summer and autumn; more specifically, larger volumes are landed from May to December with a peak from July to November. Most crab is captured using baited traps or creels. The traps can be fished individually or in strings.

Crab is managed primarily through fishing effort limitations and technical conservation measures and is not subject to catch limits such as TACs and quotas. Usually, the total number of traps allowed is limited, depending on the boat size, the number of crew, and the fishing ground²².

According to EU regulation on brown crab, only whole individuals, excluding berried females and soft-shelled crabs, with a minimum shell width of 13 cm, shall be marketed²³.

²¹ <http://www.imr.no/temasider/skalldyr/taskekrabbe/en>

²² http://www.seafish.org/media/publications/SeafishResponsibleSourcingGuide_CrabsLobsters_201309.pdf

²³ EU regulation No. 2406/96 of 26 November 1996 laying down common marketing standards for certain fishery products.

4.4 CATCH AND LANDINGS

4.4.1 EU CATCH OF CRAB

In 2016, the EU crab catch amounted to 67.800 tonnes. The main species was brown crab, with 70% of the catch in terms of volume in 2015, followed by the spinous spider crab (9%) and the queen crab (8%).

Table 4-1 **EU CATCH OF CRAB – MAIN SPECIES (1000 tonnes)**

Species	2011	2012	2013	2014	2015	2016
Brown crab	40,4	40,9	41,7	46,6	42,2	47,2
Spinous spider crab	5,8	5,6	5,3	6,5	5,8	6,2
Queen crab	0	0	0	0,2	3,8	5,2
Marine crabs	1,7	1,2	3,4	6,7	3,7	5,2
Velvet swimcrab	3,1	2,7	2,4	2,5	2,4	2,1
Green crab	1,4	1,7	1,3	1,4	0,8	0,6
Other	1,2	0,5	0,5	1,5	2,5	1,2
Total	53,7	52,5	54,6	65,4	61,2	67,8

Source: Eurostat.

Table 4-2 **MAIN NATIONS CATCHING BROWN CRAB (1000 tonnes)**

Country	2011	2012	2013	2014	2015	2016
United Kingdom	25,8	27,3	28,0	32,1	29,0	33,8
Ireland	6,7	6,3	6,4	7,1	7,2	7,3
Norway	5,3	5,0	5,2	4,6	4,7	4,9
France	7,0	6,1	5,9	6,1	4,6	4,5
Netherlands	0,4	0,5	0,6	0,6	0,5	0,6
Other	0,6	0,8	0,8	0,7	0,9	1,1
Total	45,8	45,9	46,9	51,2	47,0	52,1
EU total	40,4	40,9	41,7	46,6	42,2	47,2

Source: Eurostat.

4.4.2 CATCH OF BROWN CRAB

Only European countries take commercial catches of brown crab. The UK is by far the largest player, with 72% of the total catch in 2016. The catch has been relatively stable, with an increase of only 3% from 2011 to 2015, but increased 11% from 2015 to 2016. Of the total catch in 2011 through 2016, between 88% and 91% of the catch stem from EU Member States.

vessel. Consequently, landings can differ from a nation's catches, which represents catches by all vessels of that nation, regardless of where it is landed.

The total landings of crab in the EU amounted to 55.500 tonnes in 2016, a 6% increase over the previous year. More than half of the volume was landed in the UK, followed by France, Ireland, and Greece with 17%, 14%, and 5%, respectively. In value, the UK had approximately the same share, followed by France, Ireland, and Spain with 21%, 10%, and 7% respectively.

4.4.3 LANDINGS IN THE EU

Landings represent the unloading of crab in a given country from all fishing vessels, regardless of the nationality of the

Table 4-3 **LANDINGS OF CRAB IN THE EU (million EUR and 1000 tonnes)**

Country	2012		2013		2014		2015		2016	
	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume
United Kingdom	48,6	29,3	45,4	28,6	53,3	32,5	54,3	29,0	57,8	32,0
France	23,2	10,3	23,5	10,4	24,5	11,1	21,1	9,1	21,2	9,7
Ireland	8,9	6,2	9,1	6,1	8,2	6,1	7,6	7,0	10,2	7,8
Spain	6,0	0,9	6,6	1,3	14,1	3,1	12,5	1,7	7,2	1,4
Greece	0,6	0,5	0,5	0,5	1,1	0,8	1,5	1,3	3,3	2,8
Netherlands	0,9	1,0	1,0	0,8	0,7	0,5	1,9	2,7	0,5	0,5
Total	90,2	49,5	88,4	48,7	103,9	55,3	101,9	52,2	102,9	55,5

Source: EUMOFA/Eurostat.

Table 4-4 **LANDINGS IN THE EU BY SPECIES (million EUR and 1000 tonnes)**

Species	2012		2013		2014		2015		2016	
	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume
Brown crab	64,7	39,3	64,3	38,5	71,9	43,0	69,8	40,3	74,3	42,5
Spinous spider crab	11,5	4,9	10,7	4,8	11,6	5,5	12,9	5,6	13,5	6,0
Velvet swimcrab	8,6	2,5	7,4	2,1	8,0	2,2	8,2	2,4	8,6	2,1
Marine crabs	2,4	1,1	4,0	1,6	11,3	3,8	8,9	2,7	4,7	3,8
Red crab	0,0	0,0	0,0	0,0	0,0	0,0	0,2	0,0	0,5	0,0
Green crab	0,7	1,2	0,6	1,1	0,6	1,1	0,6	0,6	0,4	0,6
Total	90,2	49,5	88,4	48,7	103,9	55,3	101,9	52,2	102,9	55,5

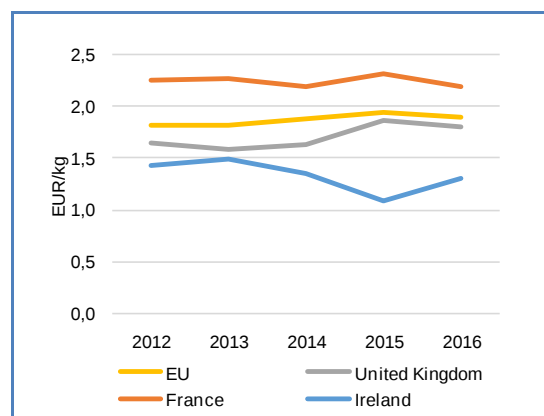
Source: EUMOFA/Eurostat

Table 4-5 **AVERAGE LANDING PRICE OF BROWN CRAB. SELECTED COUNTRIES AND EU TOTAL (EUR)**

Country	2012	2013	2014	2015	2016
France	2,4	2,6	2,6	2,8	2,7
United Kingdom	1,5	1,5	1,6	1,8	1,7
Ireland	1,4	1,5	1,3	1,1	1,3
EU	1,6	1,7	1,7	1,7	1,7

Source: Eurostat.

The average landing price for crab in the EU increased 7%, from 1,82 EUR/kg in 2012 to 1,95 EUR/kg in 2015, but fell almost to 2012 levels in 2016 (1,85 EUR/kg). The three Member States taking the largest landings of crab have experienced relatively fluctuating prices since 2012. The average price from 2012 to 2016 was almost 70% higher in France than in Ireland. In France, the landing prices of crab remained relatively stable in the period surveyed despite an increase in the price of brown crab, which rose from 2,45 EUR/kg in 2012 to 2,73 EUR/kg in 2016. This was made possible by the growing share of spinous spider crab in total crab landings and by the lower price of the species (1,78 EUR/kg in 2016, i.e. 35% less than the brown crab price).

Figure 4-2 **AVERAGE LANDING PRICES OF CRAB IN THE EU AND SELECTED MEMBER STATES (EUR/kg)**

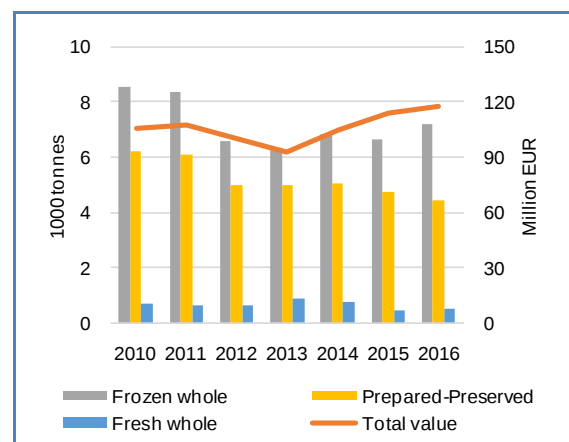
Source: EUMOFA/Eurostat.

4.5 TRADE

4.5.1 EU IMPORTS

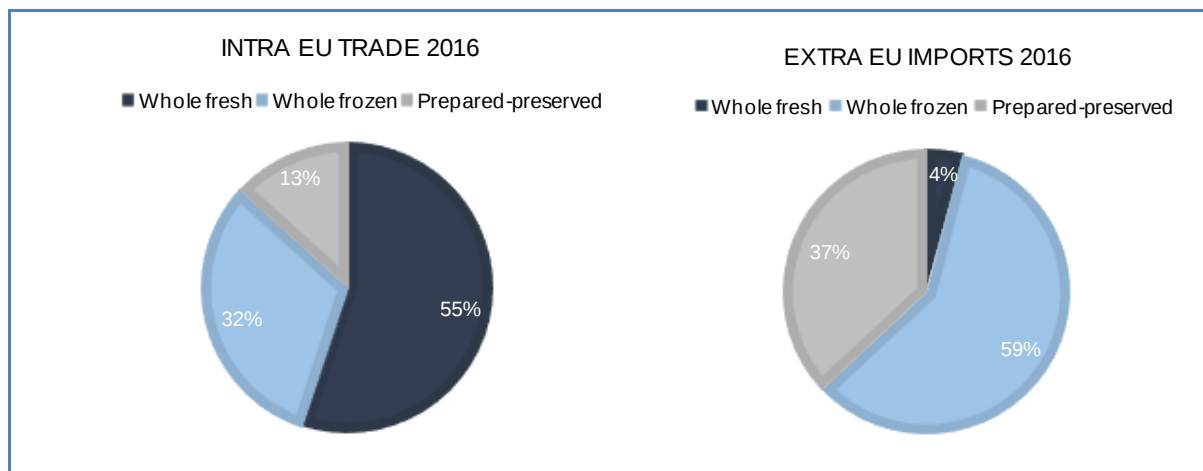
In 2010 and 2011, the extra-EU imports of crab were 15.000 tonnes. From 2012 to 2016, the imported volume decreased to approximately 12.000 tonnes annually. Except from small volumes from Norway, the imported crab consists of crab species other than the brown crab, more than half of which are from Asian countries. Based on trade flows from Canada and the USA to the main exporting countries in Asia, most of the volume imported is assumed to be snow crab (queen crab) and king crab. It can also be crab from Asian aquaculture or fisheries, e.g. Chinese mitten crab or blue swimming crab.

Although the intra-EU trade consists mainly of fresh and frozen whole crab, the extra-EU imports consist mainly of prepared and preserved crab products as well as frozen whole crab. Main EU importers in 2016 were France (EUR 92,8 million), Spain (EUR 53,4 million), Germany (EUR 33,1 million), and Belgium (EUR 28,5 million), all preservation states and all origins (intra-EU and extra-EU) combined.

Figure 4-3 **EXTRA-EU IMPORTS OF CRAB (1000 tonnes and million EUR)**

Source: EUMOFA.

Figure 4-4 INTRA-EU TRADE AND EXTRA-EU IMPORTS OF CRAB – BY PRESENTATION AND PRESERVATION (volume)



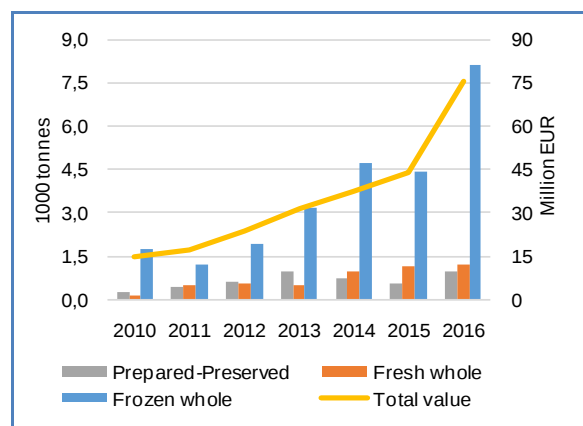
Source: EUMOFA.

4.5.2 EU EXPORTS

The extra-EU export volumes have increased from approximately 2.000 tonnes in 2010 to more than 10.000 tonnes in 2016. This corresponds to an increase in export value from EUR 14 million in 2010, to EUR 76 million in 2016. The growth in crab exports consists mainly of an increase in whole frozen crab from the Netherlands, the UK, and Spain. The combined export volume of whole frozen crab from these countries was 200 kg in 2010 and increased to 6.100 tonnes in 2016.

Over the same period, the extra-EU export volumes of brown crab have experienced an 11-fold increase from approximately 260 tonnes in 2010 to 3000 tonnes in 2016. This is mainly the result of an increase in exports to Asian countries, including China, Japan, Indonesia, Hong Kong, the Republic of Korea, and Vietnam. Practically no imports and 3000 tonnes of exports indicates that the self-sufficiency rate of brown crab in the EU is greater than 100%.

Figure 4-5 EXTRA-EU EXPORT OF CRAB (1000 tonnes and million EUR)



Source: EUMOFA.

4.6 CONSUMPTION

On the EU market, brown crab is available both live and processed. Typical processing operations include: primary processing, e.g. cooked whole, claws, or dressed crab; secondary processing, e.g. white, brown, and mixed crab meat (fresh, frozen, pasteurised, or canned); and tertiary processing, i.e. crab as an ingredient in another product including patés, pastes, and crab cakes²⁴.

Brown crab is not an everyday purchase, and there is a sharp contrast between how consumers on the British Isles and continental Europe view the brown crab. In the UK, brown crab is bought twice a year on average and at any time during the year. On the continent, consumption of brown crab is more often associated with social events in connection with special occasions²⁵.

²⁴ http://www.acrunet.eu/images/ACRUNET/Technical_Reports/Activity_5/ACRUNET_Technical_Report_Activity5_Action1.pdf

²⁵ Ibid.

5 Haddock

This case study is available in the
Monthly Highlights N° 7-2017



5.1 SUMMARY

The EU fleet participates in the haddock fishery in several areas in the Northeast Atlantic, including the North Sea, where the species is subject to total allowable catches (TACs). In 2015, the EU took 15% of the total global haddock catch. Norway and Russia led the world in haddock catches.

In general, the EU depends on imported haddock to meet market demand, achieving only 30% self-sufficiency through its own catches. Most extra-EU haddock imports arrive as fresh/frozen whole, less-processed products from Norway. Such products are either transferred straight to the domestic market or processed and, in some cases, re-exported to other EU Member States.

Haddock is not one of the top seafood species consumed in the EU (less than 0,33 kg per capita annually), but it is still important in certain markets such as the UK, the EU's largest whitefish market. In the UK, haddock is used mainly for fish and chips, especially in northern England and Scotland. In 2015, it reached a total consumption of approximately 30.000 tonnes product weight.

5.2 BIOLOGY

Haddock (*Melanogrammus aeglefinus*) can be found in both the Northeast and Northwest Atlantic. It is found in the east from the Celtic Sea to Spitsbergen, the Barents Sea, and around Iceland. In the west, it is found from Georges Bank to Newfoundland²⁶.

In the northeast, there are two different species of haddock, Northeast Arctic haddock (Barents Sea) and North Sea haddock. The EU fleet fishes mainly North Sea haddock because of its location and availability. Haddock can also be found in the Skagerrak and Kattegat. It can reach up to 60 cm in length and 4 kg in weight. Spawning lasts from March to May and occurs in the central North Sea. North Sea haddock grows more slowly than cod, causing the species to be, on average, smaller than haddock in the Barents Sea²⁷.

5.3 MANAGEMENT

The total allowable catch (TAC) is made up of separate quotas in different subareas where the EU participate: the Irish Sea, Rockall, the North Sea, West of Scotland, the Skagerrak, the southern Celtic seas, the English Channel, and the Northeast Arctic. TACs are set based mainly on the level of the biomass in different subareas, but can also be influenced by the biomass of other species, e.g. cod in the same area. This is to prevent putting too much pressure on the stock, with both fishermen and a large biomass of cod preying on the species.

In the Barents Sea, the Joint Norwegian-Russian Fisheries Commission (<http://www.jointfish.com/eng>) sets TACs on several species, including haddock. It has implemented revised management rules for cod, haddock, and capelin to achieve as optimally a managed stock as possible and to set reasonable TACs each year. In 2017, the joint commission celebrated its 40th anniversary.

From 2012 to 2013, the haddock quota was significantly reduced in the Northeast Atlantic, caused mainly by a strong biomass of northeast Arctic cod, leading to an increased quota on that species. In subsequent years, the cod biomass weakened, and its quota was lowered, reducing the pressure on haddock stocks and allowing an increased quota in following years.

In 2017, the EU quota decreased 34%, from approximately 73.100 tonnes in 2016 to approximately 48.130 tonnes, mainly the result of a weaker biomass. In comparison, the Norwegian quota was reduced 4%, to 114.000 tonnes.

In addition to quotas in EU waters, the EU also has a small haddock quota in the Northwest Atlantic Fisheries Organization (NAFO) convention area (on the east coast of Canada), where catches amounted to 225 tonnes in 2016²⁸.

5.4 PRODUCTION

Globally Norway is the largest player in the haddock fisheries. In 2015, the total catch was 281.000 tonnes, a 7% increase over 2014, with Norway accounting for 35% of the total. The common gears used in the haddock fishery are bottom trawls, longlines, gillnets and, to a lesser extent, traps²⁹.

²⁶ <https://www.ices.dk/explore-us/projects/EU-RFP/EU%20Repository/ICES%20FishMap/ICES%20FishMap%20species%20factsheet-haddock.pdf>

²⁷ http://www.imr.no/temasider/fisk/hyse/hyse_nordsjoen_skagerrak_kattegat/nb-no

²⁸ Northwest Atlantic Fisheries Organization.

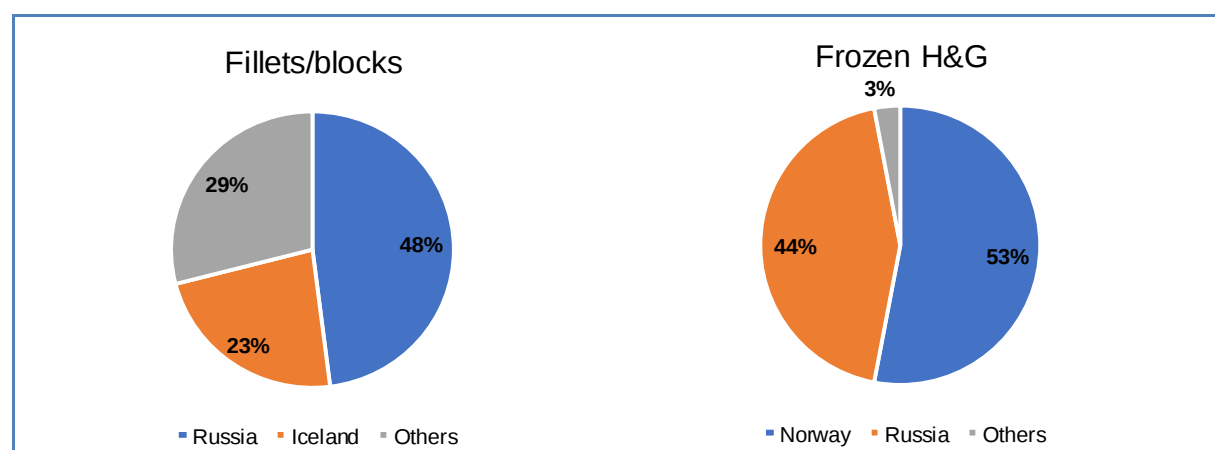
²⁹ <http://www.fao.org/fishery/species/2228/en>

Table 5-1 MAIN NATIONS CATCHING HADDOCK (1000 tonnes)

Country	2010	2011	2012	2013	2014	2015
Norway	125	160	161	101	94	97
Russia	112	140	144	86	79	92
Iceland	65	51	48	45	36	41
UK	34	30	35	40	36	33
Canada	22	15	9	8	16	18
Other	39	34	34	28	27	27
Total	396	396	397	280	262	281

Source: FAO

Figure 5-1 EXTRA-EU IMPORTS OF HADDOCK – BY PRESENTATION, PRESERVATION, AND PARTNER COUNTRY



Source: Eurostat

Catches of haddock are used as (1) frozen fillets/blocks both single and double frozen, (2) fresh/frozen headed and gutted, and (3) a small number of salted products. Russia and Iceland represented most of the frozen fillets/blocks production (in volume), with approximately 48% and 23% of the total, respectively. For frozen, headed and gutted (H&G) volume of haddock, Norway accounted for approximately 53% and Russia 44%, whereas for fresh, headed and gutted, there were an equal split between Norway, the EU, and Iceland. Overall in 2015, 32% of haddock catches were produced as frozen fillet/block, whereas frozen and fresh headed and gutted accounted for 31% and 36%, respectively³⁰.

The UK is the EU's largest player in the haddock fishery, with catches of approximately 33.000 tonnes in 2015, approximately 70% of the total EU catch. France was the next largest with approximately 6.260 tonnes, followed by Ireland with approximately 3.130 tonnes. The top three ports for landing haddock in the EU are located in the UK: Peterhead, Scrabster, and Fraserburgh. All haddock landings in these ports are fresh whole. This is the common landing presentation and preservation status in other ports in the EU as well (99%). The small volume that is not landed as fresh whole is landed as frozen fillets or frozen whole. In 2015, the EU accounted for 15% of the total catches of haddock at approximately 47.000 tonnes.

5.5 TRADE

In 2016, the EU imported various haddock products for a value of EUR 210 million and 70.000 tonnes. This was a decrease in value (-8%) from 2015, but an increase in volume (+9%). The EU depends strongly on importing haddock to fulfil the domestic demand, achieving just 30% self-sufficiency through its own catches³¹.

The UK is the EU's largest whitefish market. In 2016, it imported haddock products at a value of EUR 115 million and 33.000 tonnes. Most of the imported volume to the EU, and the UK, comprises frozen products, headed and gutted or fillets.

Although the Netherlands is listed as the second largest importer of haddock from extra-EU countries, it is not just a consumer market, but also a large trading hub for haddock, commonly re-exporting a large share of the imported volume to the UK, as well as to France. This is mostly a "clean" re-export, but also processed volume (whole to fillets). The main suppliers of haddock to the EU are Norway, Russia, and Iceland, accounting for 42%, 22%, and 20%, respectively, of the total import value in 2016. Volumes from Norway are mainly headed and gutted products, both frozen and fresh, whereas most products from Russia and Iceland are frozen fillets.

³⁰ Groundfish Forum 2016.

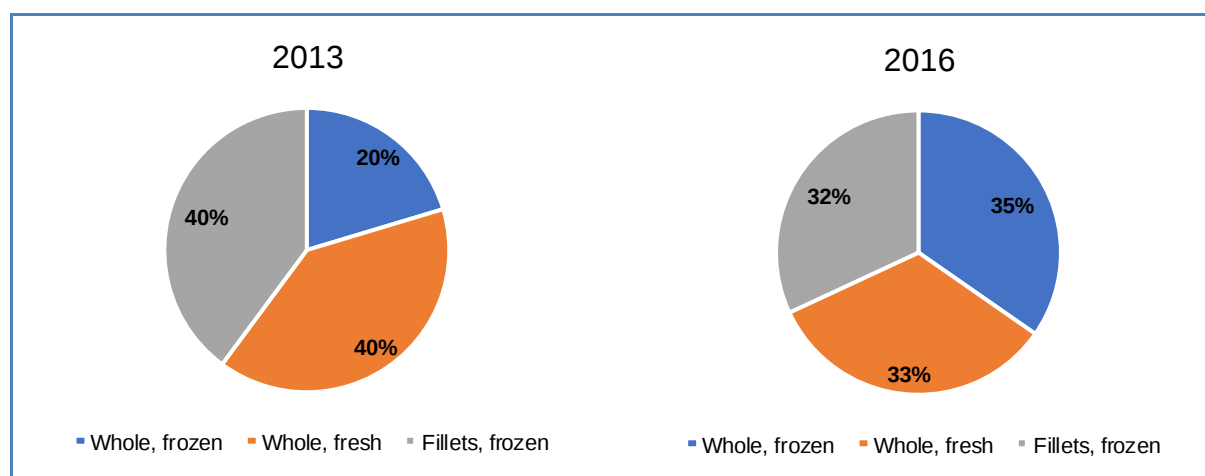
³¹ The EU fish market – 2016 edition (based on Eurostat/National statistics).

Table 5-2 EXTRA-EU IMPORT OF HADDOCK – TOP MEMBER STATES (million EUR and 1000 tonnes)

Member State	2014		2015		2016	
	Value	Volume	Value	Volume	Value	Volume
United Kingdom	105	24	131	29	115	33
Netherlands	37	9	44	11	49	14
Denmark	25	13	25	12	22	11
Sweden	15	8	17	8	14	7
Poland	12	4	6	2	8	4
Other	5	1	5	1	3	1
Total	199	60	229	64	210	70

Source: EUMOFA, based on Comext.

Figure 5-2 EXTRA-EU IMPORT OF HADDOCK BY PRESENTATION AND PRESERVATION (volume)



Source: Eurostat.

Table 5-3 EXTRA-EU IMPORT OF HADDOCK – TOP PARTNER COUNTRY (million EUR and 1000 tonnes)

Partner Country	2014		2015		2016	
	Value	Volume	Value	Volume	Value	Volume
Norway	93	36	94	36	89	40
Russia	35	7	46	10	47	12
Iceland	38	7	52	9	43	9
China	22	5	23	4	17	4
Faroe Islands	10	3	12	3	12	4
Other	2	1	1	1	2	1
Total	200	59	228	63	210	70

Source: EUMOFA, based on Comext.

5.6 CONSUMPTION

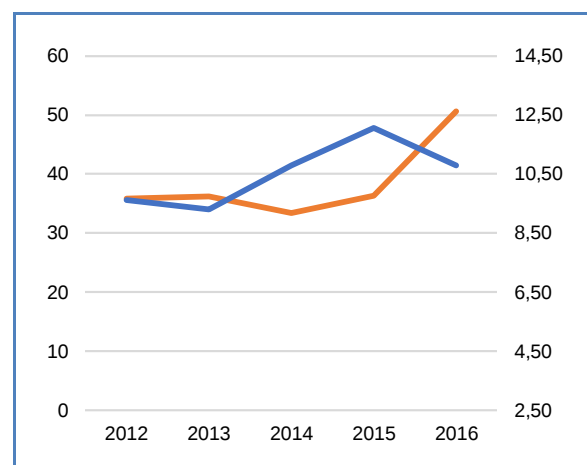
The overall consumption of haddock in the EU is lower than for other species. Although consumption of haddock is 0,33 kg/capita annually, the consumption of other whitefish species is significantly greater, with cod at 2,4 kg/capita and Alaska pollock at 1,58 kg/capita. In the UK however, haddock has an important position. In 2015, UK consumption of fresh haddock reached almost 30.000 tonnes, making it the fourth most consumed species after cod, salmon, and pollack³².

Along with cod, haddock is the top species used in fish and chips. Typically, haddock is preferred in Scotland, Yorkshire, other parts of northern England and the Midlands, whereas cod is preferred in the rest of England. In Scotland, haddock from the North Sea is used, whereas haddock from the Barents Sea and Iceland is common in England, often as FAS (frozen at sea) fillets³³.

The retail price of fresh haddock in the UK has been increasing since 2013, which can be explained by a shrinkage in the availability of haddock in the market, mainly on account of reduced quotas. One reason for this was the large increase in Atlantic cod quotas the same year. In 2016 and 2017, the haddock quotas have been increasing again, and available volume and prices are responding.

In general, haddock is marketed as a variety of products: fresh, chilled as fillets, frozen, smoked, and canned³⁴. In 2015, 9% of French households bought fresh haddock once or more times. This makes haddock 15th on the list of the most purchased seafood products in France³⁵.

Figure 5-3 **DEVELOPMENT OF THE UK QUOTA AND RETAIL PRICE OF FRESH HADDOCK**



Source: EUMOFA.

³² The EU fish market – 2016 edition.

³³ <http://www.seafish.org/research-economics/market-insight/market-summary>

³⁴ <http://www.fao.org/fishery/species/2228/en>

³⁵ http://www.franceagrimer.fr/content/download/44427/424200/file/STA-MER-chiffres%20cl%C3%A9s%20anglais-avril%202016_VMaJ.pdf

6 Atlantic herring

This case study is available in the
Monthly Highlights N° 4-2018

6.1 INTRODUCTION

The **Atlantic herring** (*Clupea harengus*) is one of the most abundant fish species in the world. It can be found on both sides of the Atlantic Ocean, congregating in large schools. Individuals can grow up to 45 cm in length and weigh up to 1,1 kg. Herring mature between 2-9 years. They feed on copepods, krill and small fish, while their natural predators are seals, whales, cod and other larger fish. Herring schools move between spawning and wintering grounds in coastal areas and feeding grounds in open water by following migration patterns learned from earlier year classes. The most important herring stocks in the East Atlantic are the winter-spawning Norwegian and Icelandic herring, the autumn spawning Icelandic and North Sea herring and the Baltic Sea herring. Herring is mostly utilized fresh, dried or salted, smoked, canned, or frozen. It can be fried, broiled, microwaved and baked³⁶.

In 2017, global landings of Atlantic herring were estimated at around 1,7 million tonnes³⁷. The majority of this was caught in the North Atlantic by the EU fleet, as well as by Norway, Iceland, the Faeroe Islands, Russia and Greenland. In 2016, the EU fleet landed 743.000 tonnes of Atlantic herring.

As a big producer as well as the world's largest importer of Atlantic herring, the EU occupies a special position as a market for frozen herring and especially herring fillet. In 2017, EU herring imports from non-EU suppliers reached EUR 172 million, a 21% decrease from 2016. The largest supplier was Norway, constituting 78% of total EU herring import value.

In 2017, EU herring exports reached EUR 172 million, a 7% increase over 2016. Herring is mainly exported to African markets in whole and frozen forms.

In 2015, herring ranked 5th among fish species consumed in the EU, and 1st within the small pelagics category. Herring consumption is mostly in Germany, Poland and the Netherlands.

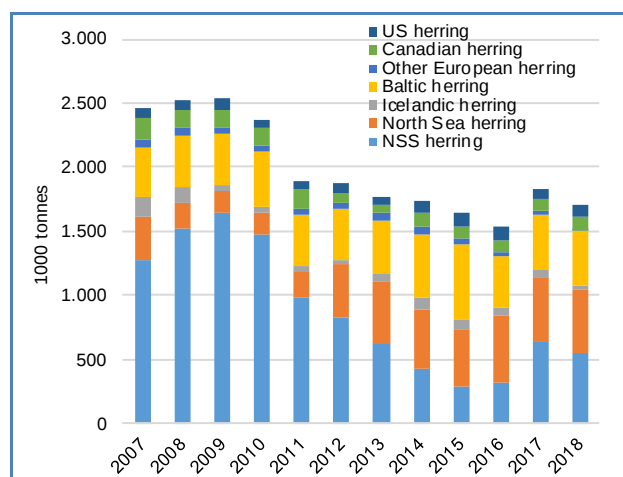
6.2 QUOTAS

Herring in the various ocean areas differ from each other to a greater or lesser extent and the resource is therefore divided in to different stocks based on spawning grounds.

The combined Atlantic herring quota decreased for several consecutive years until 2017 mainly due to the downward trend seen in the Norwegian spring spawning (NSS herring) quotas. Because of a 100% increase in the NSS herring quota in 2017, combined herring quotas increased by 19% this year. The three main herring stocks, constituting around 85% of the total, are NSS herring, North Sea herring and Baltic herring.

Global herring supply in 2018 is expected to decline due to a decrease in the NSS herring quota³⁸.

Figure 6-1 **GLOBAL ATLANTIC HERRING QUOTAS**



Source: ICES.

³⁶ <http://www.fishbase.org/summary/24>

³⁷ Pelagic Fish Forum.

³⁸ www.ices.dk

Table 6-1 TACS OF ATLANTIC HERRING (volume in 1000 tonnes)

	TAC 2014	TAC 2015	TAC 2016	TAC 2017	TAC 2018
NSS herring	418	283	317	646	546
North Sea herring	470	445	518	482	491
Icelandic herring	87	83	71	63	39
Baltic herring	505	585	394	443	423
Other European herring	59	43	32	25	12
Canadian herring	100	100	100	100	100
US herring	104	105	106	75	101

Source: ICES.

6.3 EU LANDINGS (FIRST SALES)

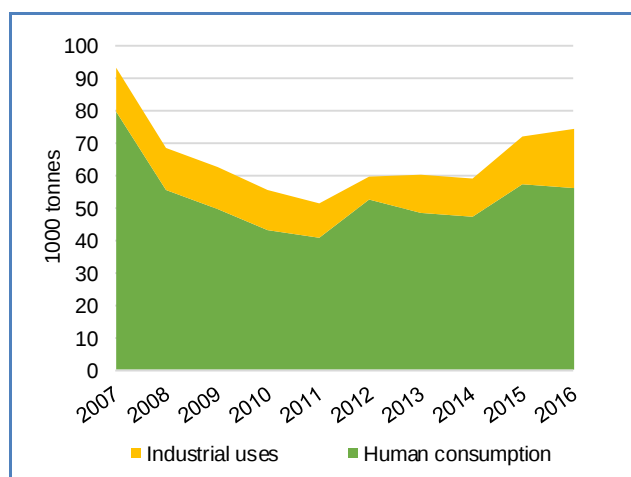
In 2016, herring landed in the EU reached a 9-year peak at 743.000 tonnes, worth EUR 363 million. This was mostly driven by increased Danish landings but also by notable increases in Germany, the UK and Sweden. In total, volumes increased by 3% and value by 34% from 2015. In 2016, 75% of EU herring landings was destined for human consumption, while the rest was mainly used as fishmeal and fish oil.

Table 6-2 LANDINGS OF ATLANTIC HERRING BY MAIN EU MEMBER STATES (value in EUR million, volume in 1000 tonnes)

Catching nation	2011		2012		2013		2014		2015		2016	
	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume
Denmark	61	110	80	121	72	143	63	149	74	156	104	185
Netherlands	77	88	102	102	44	90	28	85	77	173	91	127
Germany	30	51	28	56	31	57	20	53	23	56	44	66
UK	23	40	41	63	20	45	16	49	20	42	36	48
Sweden	26	58	26	49	33	73	21	63	28	83	35	104
Finland	12	66	19	94	24	99	19	87	16	88	18	92
Poland	9	25	12	26	8	21	10	27	10	35	12	38
Other	20	74	34	88	49	76	21	77	23	88	23	84
Total	257	512	340	598	280	604	197	591	271	721	363	743

Source: Eurostat.

Figure 6-2 TOTAL EU LANDINGS OF HERRING BY USAGE

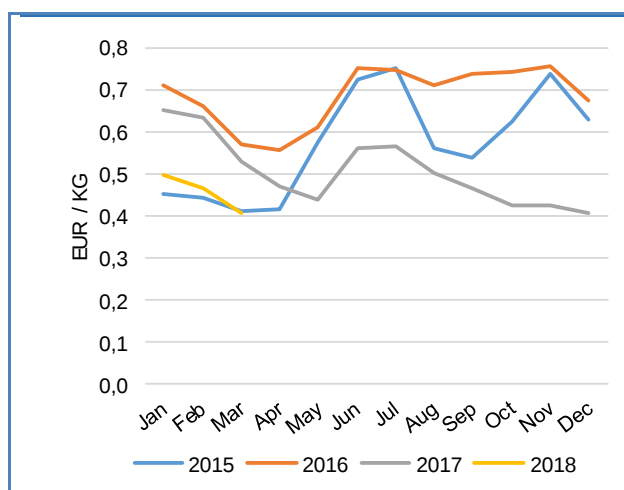


Source: Eurostat.

In Denmark, Atlantic herring first-sales price decreased significantly in 2017 compared to both 2016 and 2015. The average price in 2017 was 0,48 EUR/kg, a 24% decrease from 2016. The downward trend has continued in the first months of 2018, when first sales decreased 32% compared to the same period in 2017. The main Danish port for herring is Skagen.

This downward first-sales price trend was also seen in other supplying nations such as Norway³⁹. This can be seen in the light of larger quotas and increased competition for herring globally. The lack of access to the Russian market is also especially noticeable when the supply increases.

Figure 6-3 **FIRST-SALES PRICE OF ATLANTIC HERRING IN DENMARK**



Source: EUMOFA.

6.4 TRADE

6.4.1 EXTRA-EU IMPORTS

In 2017, extra-EU imports of herring reached 182.100 tonnes and EUR 226 million. This was a 6% increase in volume terms and a 21% decrease in value from 2016. The top-three import markets in 2017 were Denmark, Poland and Sweden, representing more than 60% of total value and 65% of volumes.

EU imports from Norway reached 142.000 tonnes worth EUR 178 million in 2017, representing 79% of total EU import value of herring in 2017. This was a 5% increase in volume from 2016 and a 23% decrease in value. The import value of herring from the 2nd largest supplier, Iceland, totalled EUR 29 million in 2017, a 22% decrease over 2016.

In 2017, 80% of herring imports value consisted of frozen products, mainly fillets and whole products from Norway, and fillets from Iceland.

Table 6-3 **EXTRA-EU IMPORT OF HERRING BY MEMBER STATE (value in EUR 1000, volume in tonnes)**

Country	2013		2014		2015		2016		2017	
	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume
Denmark	59.673	37.626	54.449	37.554	60.731	39.623	88.649	47.659	65.319	41.918
Poland	43.404	37.700	35.083	40.016	44.744	41.288	52.373	42.830	40.866	51.260
Sweden	35.321	17.425	26.970	16.694	31.995	19.626	46.764	23.414	33.386	24.810
Netherlands	29.314	19.463	30.419	20.869	37.572	24.333	26.089	13.934	30.755	20.470
Germany	36.942	25.716	38.588	29.584	25.259	18.016	40.270	23.840	25.889	19.280
Lithuania	19.823	14.159	15.519	12.017	15.900	11.310	19.060	11.898	16.919	10.901
Other	15.920	13.084	10.480	10.015	10.178	7.454	12.419	8.273	13.399	13.467
Total EU	240.397	165.173	211.509	166.749	226.378	161.649	285.625	171.847	226.532	182.105

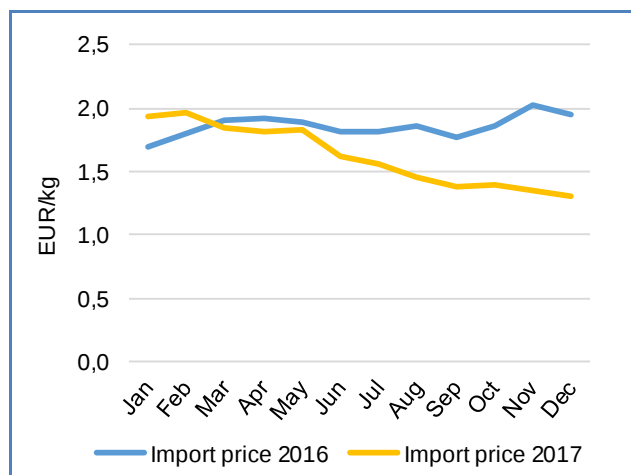
Source: Eurostat/Comext.

Table 6-4 **EXTRA-EU IMPORT OF HERRING BY PRESERVATION STATE (value in EUR 1000)**

Product category	2013	2014	2015	2016	2017	Change from 2017 to 2016
Frozen	177.522	166.016	180.122	226.395	182.199	-20%
Prepared-Preserved	37.134	26.064	27.164	39.592	25.463	-36%
Fresh	22.239	16.895	16.937	17.666	16.693	-6%
Dried-Salted-Smoked	3.502	2.533	2.154	1.971	2.177	10%
Total	240.397	211.509	226.378	285.625	226.532	-21%

Source: EUMOFA.

³⁹ NSSL.

Figure 6-4 **PRICE OF FROZEN HERRING FILLETS IMPORTED TO THE EU**

Source: Eurostat/Comext.

Due to a general decrease in herring prices (at first-sales level) in 2017, there was a notable drop in the import price of frozen herring fillets. In 2017, the average import price was 1,58 EUR/kg, a 15% decrease from 2016.

6.4.2 EXTRA-EU EXPORTS

Herring is one of the most exported fish products by EU Member States. In 2017, volumes totalled 218.000 tonnes, increasing by 10% from the previous year. Value increased by 7% to EUR 172 million. More than 95% of herrings exported was whole and frozen. About 65% of the herring exported by the EU originated in the Netherlands, home to the largest EU freezer trawler company involved in pelagic fishing⁴⁰. In 2017, exports from the Netherlands reached 141.000 tonnes, worth nearly EUR 100 million, up 3% in volume and down 6% in value from 2016.

Table 6-5 **EXTRA-EU EXPORT OF HERRING BY MEMBER STATE (value in EUR 1000, volume in tonnes)**

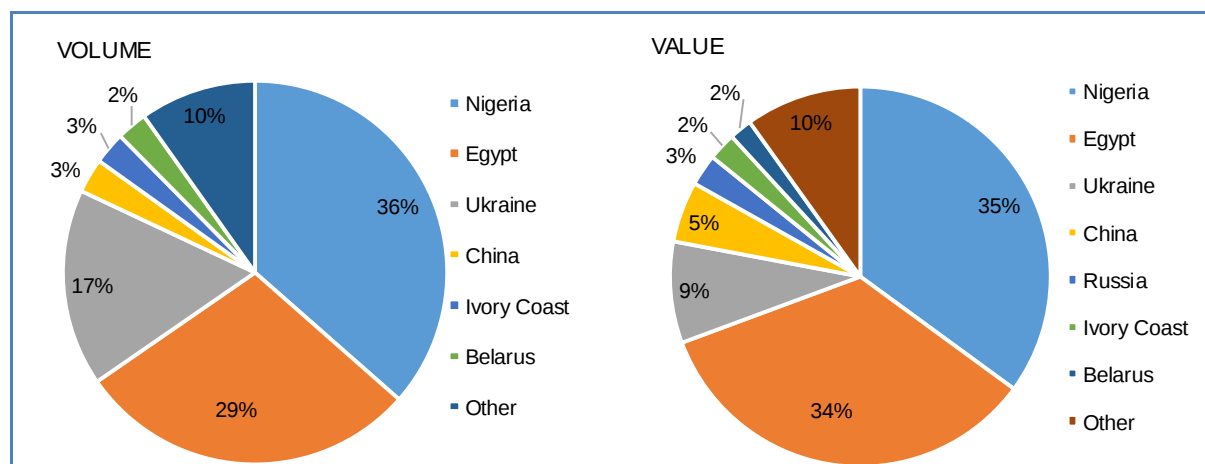
Country	2013		2014		2015		2016		2017	
	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume
Netherlands	104.507	120.014	124.773	197.879	107.583	131.054	106.011	136.763	99.767	141.287
UK	9.732	13.189	17.332	17.747	12.257	13.902	6.956	5.833	17.059	10.135
Germany	11.650	5.533	10.499	5.124	10.243	2.736	8.782	3.056	13.580	8.249
Estonia	8.250	15.765	11.157	24.440	12.498	33.541	9.316	25.794	9.839	28.189
Poland	12.579	3.624	8.560	2.534	8.625	2.728	7.495	2.525	9.167	2.871
Denmark	1.045	277	995	343	6.566	4.320	7.666	4.941	8.480	7.018
Other	19.920	25.200	18.350	24.712	20.395	28.307	14.608	19.809	13.920	20.094
Total EU	167.682	183.603	191.667	272.779	178.167	216.587	160.835	198.721	171.812	217.843

Source: EUMOFA.

In 2017, Nigeria, Egypt and Ukraine were the main markets for EU exports, accounting for 82% of total volume and 78% of total value.

⁴⁰ The EU fish market – 2017 edition, <http://www.eumofa.eu/documents/20178/108446/The+EU+fish+market+2017.pdf>

Figure 6-5 EXTRA-EU EXPORT OF HERRING BY MAIN DESTINATION, VOLUME AND VALUE IN 2017



Source: EUMOFA.

6.4.3 INTRA-EU TRADE

A large share of the herring products traded consists of exchanges between the EU Member States. In 2017, the top three intra-EU exporters of herring in terms of value were Denmark, Poland and Germany. In terms of volume of intra-EU herring exchanges, Sweden ranks as the 2nd largest exporter.

Table 6-6 INTRA-EU TRADE OF HERRING BY MEMBER STATE (value in EUR 1000, volume in tonnes)

Country	2013		2014		2015		2016		2017	
	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume
Denmark	152.407	137.669	126.647	133.031	145.844	129.973	159.920	118.713	138.679	103.912
Sweden	58.493	65.353	48.376	59.170	52.669	65.631	64.996	77.755	57.619	83.033
Germany	103.570	79.109	93.328	84.374	78.179	56.951	75.670	54.574	85.733	63.899
Netherlands	24.812	18.542	26.514	27.180	40.901	41.745	38.934	41.274	51.673	52.612
Poland	142.202	54.444	140.916	55.509	140.980	57.775	148.493	58.061	137.601	51.546
Other	90.942	93.577	85.870	104.583	94.543	114.889	96.168	98.747	85.612	94.274
Total EU	572.426	448.693	521.652	463.849	553.116	466.964	584.181	449.124	556.917	449.276

Source: Eurostat.

6.5 CONSUMPTION

In 2015, per capita EU consumption of herring reached 1,38 kg, ranking herring 5th after tuna, cod, salmon and Alaska pollock. After a drop in 2014, consumption of herring increased by 16% in 2015. Increased catches in Poland, Estonia, Germany and Sweden may have contributed to the increase in consumption. Herring is the most consumed small pelagic species in the EU followed by mackerel and sardine⁴¹.

6.6 PROCESSING

6.6.1 HUMAN CONSUMPTION

Most of the herring in the EU is consumed processed and a large share of this processing takes place in the EU. The fish processing industries in Denmark, Sweden, Poland and Germany, among others, import large amounts of raw material for their fish processing facilities⁴². Germany and Poland have leading roles as processing countries for herring.

In 2016, PRODCOM data shows that Germany and Poland were the largest processors of prepared/processed herring, amounting to 176.000 tonnes worth EUR 560 million. France and the UK are the largest processors of smoked herring, with output totalling 4.100 tonnes worth EUR 21 million in 2016.

⁴¹ The EU fish market – 2017 edition, <http://www.eumofa.eu/documents/20178/108446/The+EU+fish+market+2017.pdf>

⁴² <https://stecf.jrc.ec.europa.eu/documents/43805/861045/STECF+14-21+-+EU+Fish+Processing+Industry.pdf>

Table 6-7 **PREPARED/PRESERVED HERRING
PROCESSED BY MEMBER STATE**
(value in EUR 1000, volume in tonnes)

Country	2015		2016	
	Value	Volume	Value	Volume
Germany	281.950	68.051	280.075	63.778
Poland	273.374	110.009	279.653	111.841
Lithuania	22.213	7.897	24.011	8.481
Belgium	12.782	3.011	14.138	3.874

Source: PRODCOM.

Table 6-8 **SMOKED HERRING PROCESSED BY
MEMBER STATE** (value in EUR 1000,
volume in tonnes)

Country	2015		2016	
	Value	Volume	Value	Volume
France	10.036	1.720	10.452	1.828
UK	13.940	2.680	10.619	2.310
Germany	6.108	1.298	4.784	881
Poland	2.746	988	2.423	1.013

Source: PRODCOM.

6.6.2 FISHMEAL AND FISH OIL

Fishmeal is an important ingredient in feeds for farmed fish and animals. Fish oil has a high content of omega-3 fatty acids. Fish oil is mainly used in the production of fish feeds and refined oils for human consumption.

Fishmeal and fish oil production is based on landings of small, oily, short-lived species such as blue whiting, capelin, sandeel, Norway pout, and sprat as well as by-products (trimmings) from the fish processing sector. In 2016, around 183.000 tonnes of herring from fisheries in the EU were used in the production of fishmeal and fish oil. This was 25% of total EU herring landings.

The total European production is approximately 500.000 metric tonnes of fishmeal and 170.000 tonnes of fish oil a year and the total value of production is approximately 1.000 million EUR/year. Exports go to a large variety of countries⁴³.

⁴³ <http://www.eufishmeal.org/production/>

7 Lobster

This case study is available in the
Monthly Highlights N° 8-2018

Lobster is one of the most valued seafoods in the world and has a global market. In the EU, the European lobster is caught mostly by using traps and EU landings amounted to 4.150 tonnes in 2016. However, significant quantities of American lobster, a similar species, are imported from both Canada and the USA. In 2017, extra-EU imports reached 15.309 tonnes for a value of EUR 229 million. Lobster is most often marketed alive and its price may experience high seasonal variations.



7.1 BIOLOGY, RESOURCES AND EXPLOITATION

On the EU market two species are marketed as lobster. The species locally produced is the European lobster (*Homarus gammarus*) but substantial quantities of American lobster (*Homarus americanus*) are also marketed in the EU⁴⁴.

7.1.1 BIOLOGY

Homarus gammarus, known as European lobster or common lobster, is a species of clawed lobster from the eastern Atlantic Ocean, Mediterranean Sea and parts of the Black Sea. It is closely related to the American lobster, *Homarus americanus*. Lobsters may grow to a length of 60 cm and a mass of 6 kg and bear a pair of large claws. They are blue (European lobster) or brown (American lobster) in colour and turn red only when cooked.

Adult *Homarus gammarus* live on the continental shelf at depths up to 150 metres, although not normally deeper than 50 m. They prefer hard substrates, such as rocks or hard mud, and live in holes or crevices, emerging at night to feed. Mating occurs in the summer, producing eggs which are carried by the females for up to a year before hatching into planktonic larvae. Lobsters can live for at least 20 years and possibly up to 50 years. At the minimum landing size (MLS) of 87 mm carapace length, lobsters are generally between 4 and 8 years old⁴⁵.

7.1.2 RESOURCES, EXPLOITATION AND MANAGEMENT IN THE EU

Although there are still some data needed to fully assess European stocks status, lobster is highly monitored and highly regulated because of its economic importance at regional level. The species was previously considered to be relatively migratory with regional or local populations constituting as many sub-stocks. Current studies show that the movements are more numerous than one might think, thus, North Brittany and part of Granville Bay would constitute a single stock. For some stocks, declining catches of individuals which have not reached sexual maturity would consolidate the spawning stock and production yields⁴⁶. Except for the minimum landing size, most management measures are implemented at regional level: fishing licenses, fishing closures, fishing areas, limitation on the number of pots by vessels, etc⁴⁷. Concerning American lobster, the main Canadian stocks are intensively exploited and several management measures aiming to reduce fishing effort have been enforced. The status of exploitation of American stocks varies depending on fishing areas⁴⁸. Several fisheries of American lobster have obtained the Marine Stewardship Council certification (e.g. Gaspésie, Gulf of Maine, etc). In the EU, the Normandy and Jersey lobster fisheries have been certified by MSC since 2009 (437 tonnes in 2016)⁴⁹.

Homarus gammarus is a highly praised food, and is widely caught using lobster pots, and to a lesser extent as bycatch for bottom trawlers, mostly around the British Isles. European lobster, much rarer than the American lobster, is mostly marketed alive. American lobster is marketed in Europe, mostly during the Christmas season, either frozen, whole, cooked or alive. Depending on fishing areas, it is caught at different periods of the year, then it is kept alive in pounds, in order to be sold during the high consumption season.

⁴⁴ Rock lobster (*Jasus* spp.) and tropical or spiny lobster (*Palinurus* spp.) are excluded from this case study due to the focus on *Homarus* species.

⁴⁵ <http://www.bim.ie/media/bim/content/downloads/BIM.Lobster.Handling.and.Quality.Guide.pdf>

⁴⁶ <http://www.guidedesespeces.org/fr/homard>

⁴⁷ http://www.pdm-seafoodmag.com/guide/crustaces/details/product/Homard_europ%C3%A9en.html

⁴⁸ <http://www.guidedesespeces.org/fr/homard>

⁴⁹ <https://fisheries.msc.org/en/fisheries/normandy-and-jersey-lobster/@@view>

7.2 PRODUCTION

World catches of *Homarus* species amounted to 167.260 tonnes in 2016⁵⁰ (of which 97% was American lobster and 3% European lobster), up by 92% from 2007, mostly attributed to the strong increase of American lobster over the period (+96%), while catches of European lobster experienced a moderate increase (+13%).

In 2016, catches of American lobster reached 162.547 tonnes. The leading producers were Canada (56%) and the USA (44%). European lobster catches reached 4.713 tonnes in 2016. The main producer was the EU, accounting for 89% of the total European lobster catches. Inside the EU, the UK is the main producer, accounting for 70% of the total EU lobster catch. Other main producers are France (12%) and Ireland (3%).

During the past decade (2007–2016), Canadian and American fisheries almost doubled their catches, whereas major EU producing countries have experienced lower but still significant increases in lobster catches, +18% in the UK and +40% in France.

EU lobster landings amounted to 4.150 tonnes in 2016 for an estimated value of EUR 65 million⁵¹. The UK and France were the major Member States for lobster landings, accounting for 79% and 14%, respectively, of the EU lobster landings. The estimated average price for lobster in the EU at first-sale stage was 15,73 EUR/kg in 2016, with high variability among Member States.

From 2007 to 2016, EU lobster landings experienced fluctuations with a peak reached in 2011 at 4.829 tonnes. Among major producers, over the period, landings increased in the UK (+18%), soared in France (+123%) and strongly decreased in Ireland (-54%), potentially highlighting changes in landing strategies among EU fleets targeting lobster in the Channel and Celtic Sea.

Table 7-1 **WORLD CATCHES OF LOBSTER, HOMARUS SPP. (volume in tonnes)**

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Canada	48.870	58.984	58.342	67.277	66.978	74.790	74.686	92.779	90.875	90.624
USA	34.107	37.120	43.949	52.360	57.298	67.835	67.732	67.035	66.189	71.923
EU28	3.840	4.018	4.117	4.721	5.117	4.080	4.090	4.722	4.358	4.176
Channel Islands	227	230	245	305	333	338	305	358	366	367
Other	128	113	106	144	157	166	142	114	151	170
Total	87.172	100.465	106.759	124.807	129.883	147.209	146.955	165.008	161.939	167.260

Source: FAO –Fishstat.

Table 7-2 **EUROPEAN LOBSTER, EU LANDINGS (volume in tonnes)**

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
United Kingdom	2.761	2.758	2.763	2.717	3.177	3.134	2.958	3.383	3.094	3.260
France	264	312	319	564	804	593	562	649	570	589
Ireland	308	500	427	476	735	251	374	451	372	142
Netherlands	20	23	26	26	27	40	47	81	82	64
Denmark	7	11	17	32	30	27	24	27	30	35
Other	43	51	61	58	55	39	43	49	53	60
Total	3.403	3.654	3.612	3.874	4.829	4.084	4.008	4.641	4.201	4.150⁵²

Source: Eurostat.

Lobster is a relatively easy species to rear in aquaculture and the lobster biology is well understood. The main limitation for lobster aquaculture has been high production costs due to the duration of the production cycle, the demand for 18-22°C water to get acceptable growth rates, and the need for individual rearing compartments to avoid cannibalism and uneven growth rates due to hierarchies. Moreover, the lack of a high quality formulated feed has been a limiting factor⁵³.

⁵⁰ FAO.

⁵¹ Eurostat.

⁵² The slight difference in volume of EU caught and EU landings (26 tonnes in 2016) can be due to landings in non-EU countries or losses.

⁵³ https://www.norwegian-lobster-farm.com/wp-content/uploads/2013/05/AE_34_4_p5-9.pdf

However, during the last decade rising prices of lobster and development of new recirculation technology have again made lobster a promising candidate for closed cycle aquaculture. Lobster aquaculture has been experimented on for several years in Norway, Iceland and the UK, but has not reached commercial production levels yet⁵⁴.

In addition, the aquaculture of juvenile lobsters has been developed in both American and European regions for seeding purposes where wild stocks had declined⁵⁵.

7.3 TRADE

Lobster is traded live, frozen (raw or cooked, whole or tail) and to a lesser extent processed (soup, bisque). In 2017, the EU had a trade deficit of EUR 220 million for lobster. The deficit is mainly attributable to the imports of live whole lobster (EUR 167 million in 2017). Extra-EU imports of frozen lobster are also significant (27% of total extra-EU imports).

The main extra-EU suppliers of live lobster are the USA and Canada (56% and 43% in value, respectively). Imports from these countries respectively reached 6.227 tonnes and 4.838 tonnes in 2017.

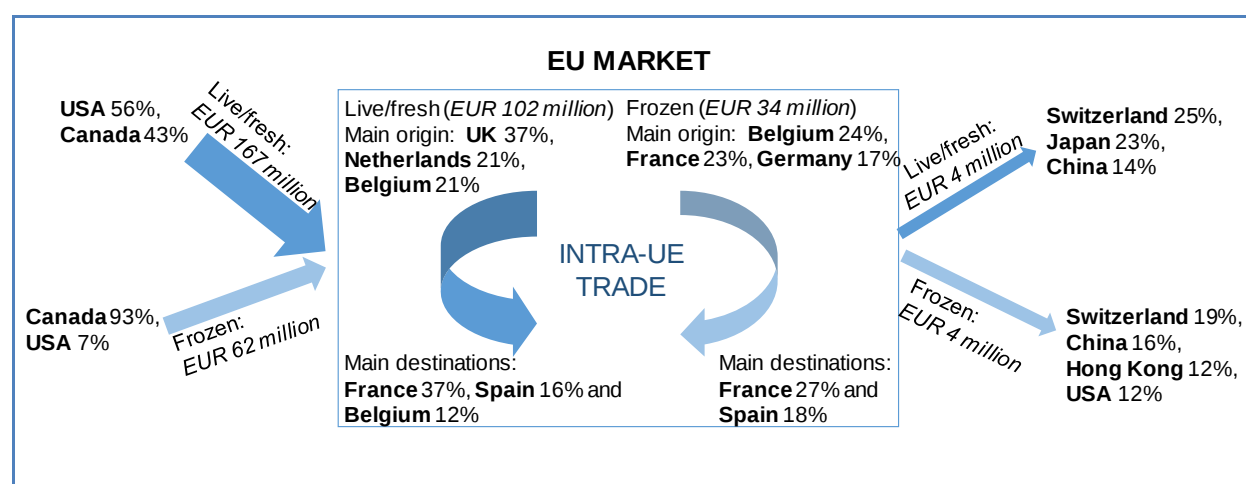
The main extra-EU supplier of frozen lobster is Canada (93% in value) with 3.864 tonnes imported by the EU in 2017.

Intra-EU trade is active for each preservation state, but live lobster accounted for 75% of intra-EU exports value in 2017. The UK (37%), the Netherlands and Belgium (both 21%) are the main suppliers of live lobster intra-EU exports in value terms. The main destinations were France (37% of live and 27% of frozen intra-EU lobster exports) and Spain (16% and 18%, respectively).

Extra-EU exports are relatively limited. They were 459 tonnes in 2017 of which 54% frozen products. The main destinations were Switzerland and China for frozen products and Switzerland and Japan for fresh/live products.

Spain, Italy and France are by far the main markets for lobster in the EU with apparent markets (landings + imports - exports) exceeding 4.000 tonnes in 2016 (net weight).

Figure 7-1 **THE EU TRADE MARKET FOR LOBSTER IN 2017**



Source: EUMOFA.

However, the Comprehensive Economic and Trade Agreement (CETA) between Canada and the EU, which went into effect in late 2017 and gives Canada zero duty access to the EU28 market, is expected to have negative effects on US exports of lobster to Europe. US exporters might lose market share, and US prices might decline⁵⁶.

⁵⁴ <http://www.guidedesespeces.org/fr/homard>

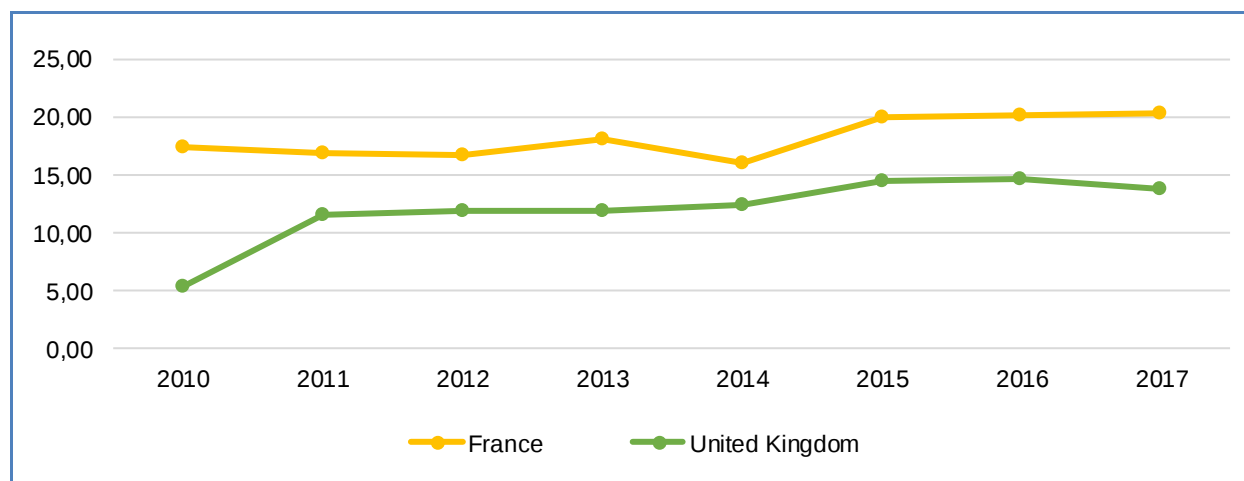
⁵⁵ <https://www.acadienouvelle.com/actualites/2017/04/13/levage-homard-pratique-rentable/>

⁵⁶ <http://www.fao.org/in-action/globefish/market-reports/resource-detail/en/c/1107044/>

7.4 FIRST-SALES PRICES

For the two largest producers in the EU, average yearly first-sale price show significant differences. Over the 2010–2017 period, in the UK, average first-sale prices varied from 5,00 EUR/kg to 14,67 EUR/kg in 2016. In France, over the same period, the average first-sale prices have been much higher: from 16,11 EUR/kg in 2014 to 20,34 EUR/kg in 2017. Overall, lobster yearly first-sale prices have been rising in recent years.

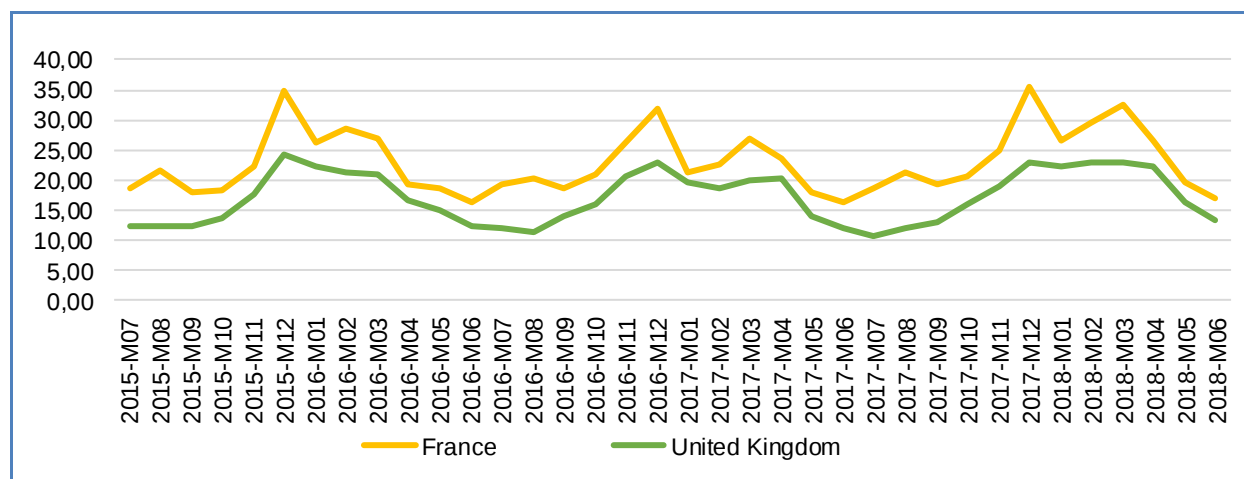
Figure 7-2 **AVERAGE LOBSTER FIRST-SALES PRICE IN THE UK AND FRANCE (in EUR/kg)**



Source: EUMOFA.

Monthly average first-sale price shows clear seasonality in both UK and French fish auctions. A strong peak is observed in December (Christmas season): up to more than 35,00 EUR/kg in France and 23,00 EUR/kg in the UK. Then prices fall in January and increase again but to a lesser extent in March. In addition, a slight increase is also observed in July–August in France.

Figure 7-3 **MONTHLY LOBSTER FIRST-SALES PRICE SEASONALITY IN THE UK AND FRANCE (in EUR/kg)**



Source: EUMOFA.

8 Norway lobster



The EU takes the absolute majority of catches and landings of Norway lobster (*Nephrops norvegicus*) in the world, as well as being the main consumer market. Main

fishery and export nations are located in northern Europe, i.e. the UK, Denmark, and Ireland, whereas the main markets are located in southern Europe, i.e. Italy, Spain, and France.

8.1 BIOLOGY

Norway lobster belongs to the crustaceans group found in the EU's Atlantic waters, from the Azores to the North Sea. It can also be found in the Mediterranean Sea. It commonly lives in burrows on muddy seabeds at depths ranging from a few metres to 500 m or more. The species' normal size is between 10 and 20 cm in length, but it can reach up to 25 cm.⁵⁷

After mating in summer, Norway lobster spawns in September and carries eggs under its tail until hatching in April–May. The larvae enter a non-swimming stage before becoming a juvenile post-larval with a total length of approximately 16 mm. The juveniles settle on the bottom and enter the burrows of adults before creating their own burrows. They remain there for approximately a year, protected from predators, such as cod and haddock.⁵⁸

8.2 PRODUCTION

The most important commercial stocks in EU waters are located in the Irish Sea, the North Sea, the Bay of Biscay, and along the Atlantic–Iberian coast. The main gear is *Nephrops* trawl, but seine nets and baited traps are also used. Trawling occurs commonly at dawn and dusk, when the species is not burrowed in the bottom. Norway lobster fisheries occur in mixed fisheries with, for example, southern hake.⁵⁹

8.2.1 EU QUOTAS AND LANDINGS

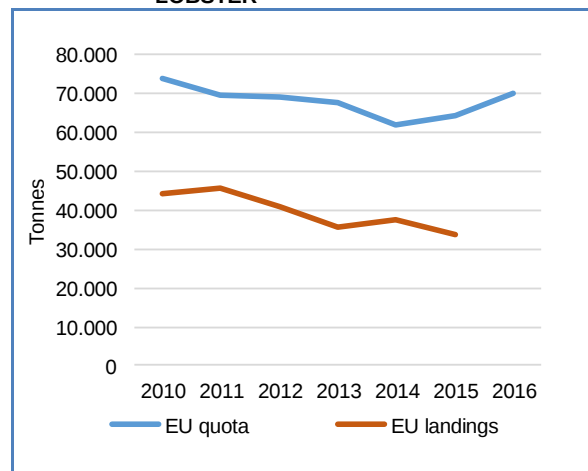
Norway lobster is managed under total allowable catches (TAC), and most of the EU quota is taken around the British Isles, the Norwegian Sea, and the Faroe Islands. In 2016, the Norway lobster quota for EU vessels in both EU and foreign waters was 69,840 tonnes, a 9% increase over 2015. The main quota holder and top fishery nation in the EU is the UK (51%), followed by Denmark (14%), France (14%), and Ireland (13%).

EU landings are well below the EU quota. This is partly the result of the recovery plan for cod in the North Sea, which led to the closure of several areas where Norway lobster is caught commercially. This disturbed the traditional fishing patterns and increased the natural predation rate of cod on Norway lobster. Also, a large number of vessels using *Nephrops* trawl with a relatively low size selectivity has resulted in catches of Norway lobster below the minimum length size, which are discarded, leading to a smaller

This case study is available in the
Monthly Highlights N° 12-2016

potential volume.⁶⁰ The maximum discard rate has been set for 2017 and 2018 at 7% and 6%, respectively, of the annual catches by vessels obliged to land Norway lobster in North-Western waters.⁶¹

Figure 8-1 EU QUOTA DEVELOPMENT OF NORWAY LOBSTER



Source: EC / EUMOFA.

In 2015, more than 99% of the landings of Norway lobster by the EU fleet comprised fresh products. Of the total landings, 65% was landed in the UK, a 17% decrease from 2014. This was equivalent to 45% of the total value. Fraserburgh (Scotland), Kilkeel (Northern Ireland), and Mallaig (Scotland) were the top three ports. Scottish vessels accounted for most UK landings, and in 2015, they landed approximately 16,500 tonnes (75%).

⁵⁷https://ec.europa.eu/fisheries/marine_species/wild_species/norway_lobster_en

⁵⁸<http://www.gov.scot/uploads/documents/no07.pdf>

⁵⁹https://ec.europa.eu/fisheries/marine_species/wild_species/norway_lobster_en

⁶⁰<http://www.nsrac.org/wp-content/uploads/2014/12/2-1415-2015-02-16-Nephrops-LTMP.pdf>

⁶¹<http://ec.europa.eu/transparency/regdoc/rep/3/2016/EN/3-2016-6439-EN-F1-1.PDF>

Table 8-1 EU LANDINGS OF NORWAY LOBSTER BY MAIN MEMBER STATES (value in million EUR and volume in tonnes)

Country	2012		2013		2014		2015	
	Val	Vol	Val	Vol	Val	Vol	Val	Vol
UK	129.838	31.436	74.010	21.593	104.716	26.509	93.952	22.066
France	30.167	2.743	29.630	2.685	33.311	2.971	40.094	3.669
Ireland	13.300	2.236	12.007	2.059	27.230	3.810	33.379	4.289
Denmark	26.407	3.277	22.386	2.583	25.730	3.029	22.670	2.394
Other MS	16.930	1.539	22.810	2.170	23.566	2.372	19.996	1.469
EU total	216.642	41.231	160.842	31.089	214.553	38.691	210.091	33.887

Source: EUMOFA.

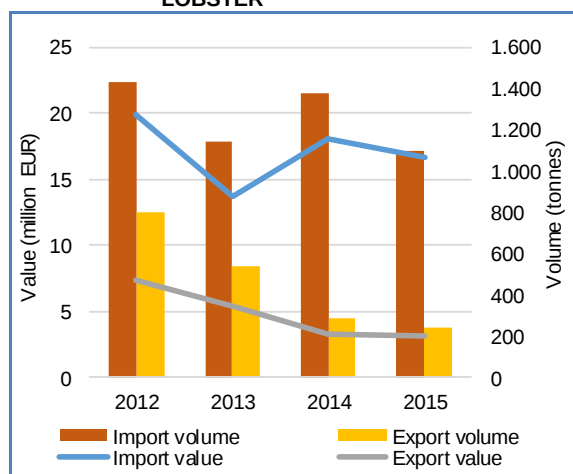
8.3 TRADE

8.3.1 EXTRA-EU TRADE

The EU is the major end market for Norway lobster because it consumes most of its own landings, as well as importing some of the landings of non-EU countries. In 2015, the extra-EU import value was EUR 16,57 million and 1.094 tonnes. This was an 8% decrease in value and a 21% decrease in volume from 2014. Approximately 90% (EUR 14,89 million) of the extra-EU import value of Norway lobster covers frozen products, mainly from Iceland (EUR 12,16 million). The remaining 10% (EUR 1,68 million) includes fresh products, mainly imported from Norway (EUR 0,98 million).

In 2015, extra-EU exports of Norway lobster ended at EUR 3,1 million and 244 tonnes. This was a 4% decrease in value and 14% decrease in volume from 2014. Similar to imports, 90% of the export value covers frozen products. Denmark and the UK are the main exporters of all products of Norway lobster from the EU, accounting for 24% and 22% of the total value, respectively. The main markets for the extra-EU exports of Norway lobster in 2015 were the USA and India, each accounting for 17% of the export value.

Figure 8-2 EU TRADE BALANCE FOR NORWAY LOBSTER

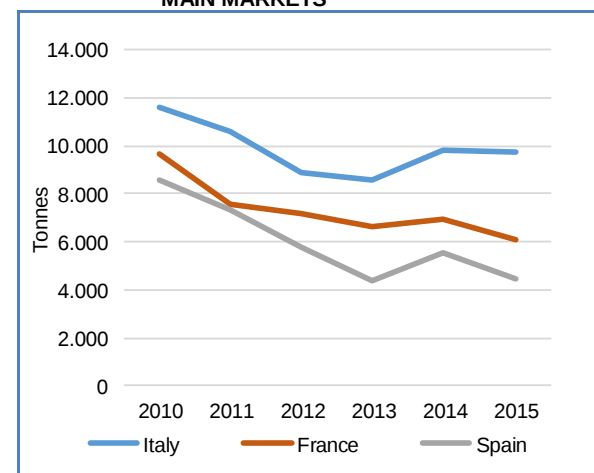


Source: EUMOFA.

8.3.2 INTRA-EU TRADE

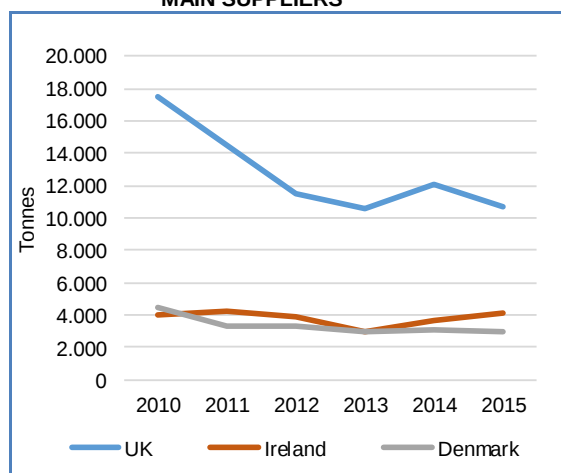
In 2015, Norway lobster ranked 14th as the highest valued seafood species traded internally in the EU, at approximately EUR 262 million. Norway lobster accounted for 1% of the total value, an increase of 8% over 2014. In comparison, salmon and cod, the top two exported species in value, accounted for 25% and 8%, respectively. With the exception of France, all of the large players in the Norway lobster fisheries in the EU export a substantial share of their national landings, e.g. the UK, Ireland, and Denmark. This is sent primarily to large consumer markets such as Italy and Spain, which depend almost exclusively on imports to satisfy domestic demand.

Figure 8-3 INTRA-EU TRADE OF NORWAY LOBSTER: MAIN MARKETS



Source: EUMOFA.

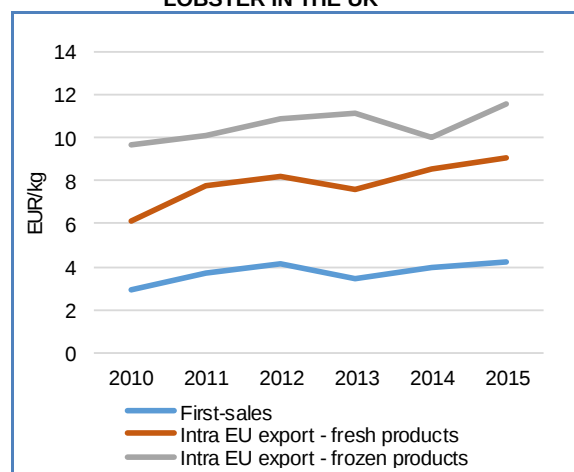
Figure 8-4 INTRA-EU TRADE OF NORWAY LOBSTER: MAIN SUPPLIERS



Source: EUMOFA.

As the leading EU fishing nation of Norway lobster, the UK is naturally also the largest exporter. Internally in the EU, Norway lobster was the third most valuable seafood product exported by the UK in value, at EUR 117,73 million, after salmon and scallop. This was a 2% decrease from 2014. About 56% (EUR 65,6 million) of the exported value of Norway lobster from the UK to other EU Member States in 2015 was frozen product, mainly to Italy (46%) and Spain (34%). The remaining 44% (EUR 51,7 million) was fresh product, exported mainly to France (65%).

Figure 8-5 AVERAGE ANNUAL PRICES FOR NORWAY LOBSTER IN THE UK



Source: EUMOFA.

8.3.3 CONSUMPTION

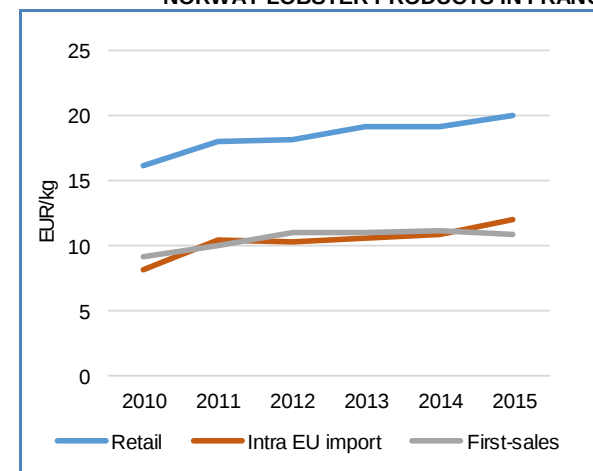
France is a main EU consumer of Norway lobster, with an average annual consumption of more than 11.000 tonnes in recent years. Fresh Norway lobster is consumed mainly in France's western region, which accounts for approximately 80% of the volume. The main consumer group in France is made up of people aged 50 years or older.⁶²

In Spain, average consumption in the past year has ranged from 5.000 to 6.500 tonnes⁶³, whereas in Italy, consumption is estimated at around 10.000 tonnes annually. In all large markets, it is commonly consumed throughout the year, but with peaks in summer and at Christmas. Norway lobster is sold as fresh and frozen, but also canned (plain peeled tails). Fresh products are sold both chilled and live and the price is determined by the size. For example, in November at the wholesale Mercamadrid in Spain, the price for large Norway lobster (*grandes*) was 57 EUR/kg, compared to EUR 18,50 EUR/kg for the small size (*pequeñas*). At Mercabilbao, large

specimens were over double the price of smaller ones (42 EUR/kg vs 18 EUR/kg).

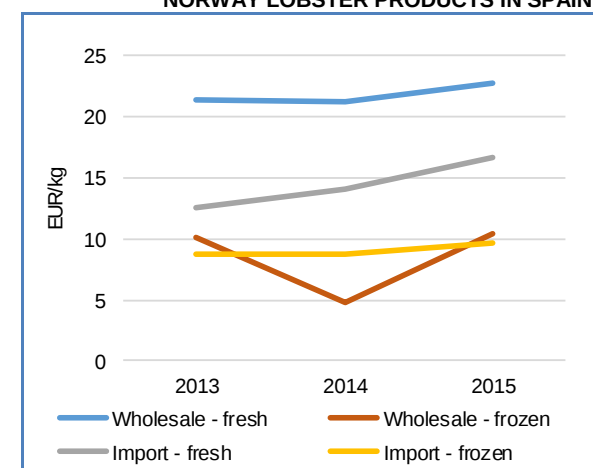
From 2010 to 2015, the retail prices of fresh Norway lobster increased 18% in France, following the trend for first sales (+20%) and intra-EU import price (+48%) in the same period. At the wholesale level in Spain, the price of fresh Norway lobster increased between 2013 and 2015 (+7%), stimulated by an increased import price (+33%).

Figure 8-6 AVERAGE ANNUAL PRICES FOR FRESH NORWAY LOBSTER PRODUCTS IN FRANCE



Source: EUMOFA.

Figure 8-7 AVERAGE ANNUAL PRICES FOR FRESH NORWAY LOBSTER PRODUCTS IN SPAIN



Source: MAPAMA.

⁶² FranceAgriMer - Consommation des produits de la pêche et de l'aquaculture 2015.
<http://www.franceagrimer.fr/content/download/46570/445195/file/STA-MER-CONSO%202015-juil2016.pdf>

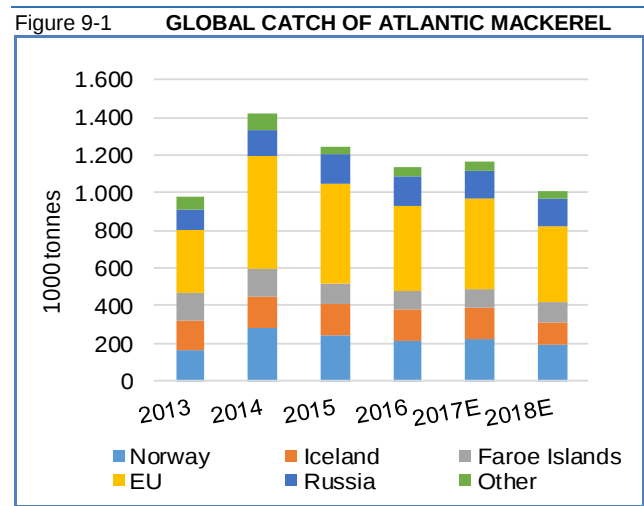
⁶³ MAPAMA – El mercado de la Cigala en España.
http://www.mapama.gob.es/es/pesca/temas/mercados-economia-pesquera/informecigalaabril2016_tcm7-439435.pdf

9 Atlantic mackerel

This case study is available in the
Monthly Highlights N° 7-2018

Atlantic Mackerel (*Scomber scombrus*) is a fast-swimming schooling pelagic fish easily recognisable with its round torpedo-shaped body. Mackerel can reach the age of 25 years and a size of 70 cm and 3,5 kg but are seldom larger than 50 cm and 1 kg. It is a typical plankton feeder, swimming with the mouth open and filtrating zooplankton through the gill rakers. It also uses particulate feeding on fish larvae and small fish. Mackerel prefer waters warmer than 6°C. They spawn for the first time when they reach about 30 cm in length. Mackerel do not have a swim bladder and need to constantly swim to avoid sinking. Geographic distribution includes the area from North-Western Africa and north to the Barents Sea including Svalbard, and westward to Iceland and Greenland. Mackerel migrates into the North Sea and the Norwegian Sea after spawning to feed. There has been a historical expansion of mackerel in the last several years, and mackerel is found west to Greenland, north to the Barents Sea and up to Svalbard, and east into Skagerrak in the summer. Mackerel stay in these areas throughout the autumn before migrating towards the spawning areas early in the winter. Total landings of mackerel have been higher than recommended by ICES in recent years. The main reason is substantial disagreement between the countries participating in the fishery on how to share the quotas. In 2015, there was a management agreement between the EU, Norway and the Faroe Islands. Iceland did not agree with the other countries, and together with Russia and Greenland have set their own unilateral mackerel quota outside the management arrangement in recent years.

9.1 GLOBAL CATCH OF ATLANTIC MACKEREL



Source: Pelagic Fish Forum.

In 2014, global Atlantic mackerel catches exceeded 1,4 million tonnes, which represent a peak in landings for the past 50 years⁶⁴.

In 2015 and 2016, catches decreased but increased again in 2017 to above 1,16 million tonnes. Preliminary catch and quota figures for 2018 show that mackerel harvests should be at a lower level than in 2017, but above 1 million tonnes. The main catching nations are Norway, Iceland, the Faroe Islands, the EU and Russia. In 2016 and 2017, the EU harvest constituted 41% of total catches⁶⁵.

9.2 EU FIRST SALE OF ATLANTIC MACKEREL

In 2016, mackerel landed in the EU reached 297.000 tonnes worth EUR 386 million. This was mostly driven by landings from the largest quota holder, the UK, but also by landings in Ireland, the Netherlands and Spain. In total, volumes decreased by 19% and value decreased by 6% compared to 2015.

Catching nation	LANDINGS OF ATLANTIC MACKEREL BY EU MEMBER STATE (value in million EUR, volume in 1000 tonnes)											
	2011		2012		2013		2014		2015		2016	
	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume
UK	162	118	99	89	104	99	150	156	92	104	119	114
Ireland	45	43	40	55	56	51	61	83	44	76	53	71
Netherlands	93	68	56	39	20	21	58	47	103	114	47	53
Spain	21	18	27	23	17	18	30	37	23	34	29	30
Denmark	47	28	26	25	17	14	19	21	19	22	19	17
France	17	13	13	11	13	10	14	10	13	11	14	10
Other	21	16	12	9	11	7	11	8	12	10	5	2
Total	407	305	273	251	238	220	343	361	304	369	286	297

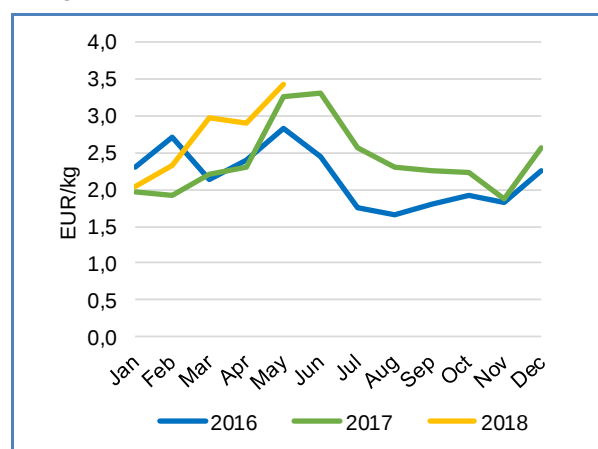
Source: Eurostat.

64 FAO.
65 Pelagic Fish Forum.

In the UK, Atlantic mackerel first-sales average price increased by 18% in 2016 compared to 2015. The average price in 2017 was 0,99 EUR/kg, a 3% decrease from 2016. During the first five months of 2018 average first-sale price in the UK increased by 42% over the same period in 2017.

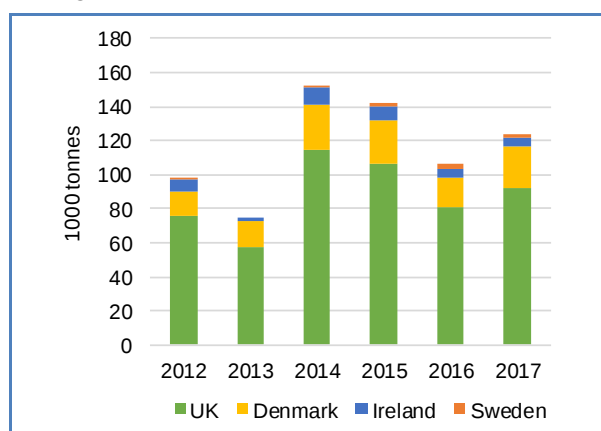
This increasing price trend was also observed in other supplying nations such as Norway⁶⁶. This must be seen in the light of declining quotas and good market conditions for the Atlantic mackerel in general.

Figure 9-2 **FIRST SALE PRICE OF ATLANTIC MACKEREL IN THE UK**



Source: Comext.

Figure 9-3 **LANDINGS OF ATLANTIC MACKEREL IN NORWAY BY THE EU FLEET**



Source: www.fiskeridir.no

The EU fleet has a long tradition of landing mackerel in Norway. In 2014, EU mackerel landings in Norway exceeded 152.000 tonnes, a level which was not seen since 2000. Landed volumes have varied strongly throughout the years and reached their lowest level in 2006 with 26.000 tonnes. In 2017, EU vessels landed 124.000 tonnes of Atlantic mackerel in Norwegian harbours. The UK is by far the most important catching nation landing fisheries products in Norway, constituting around 75% of the mackerel landings. The second largest, Denmark, constitutes between 15% and 20% of the landings from the EU fleet in Norway.

9.3 TRADE OF ATLANTIC MACKEREL

9.3.1 EXTRA-EU IMPORT

Mackerel is one of the most important commercial species in the small pelagics commodity group in the EU. In 2017, extra-EU imports of mackerel reached 123.250 tonnes and EUR 187,5 million. This was a 16% increase in volume and a 3% increase in value compared to 2016. The Faroe Islands (EUR 43,6 million), Norway (EUR 36,5 million), Iceland (EUR 33,9 million) and Greenland (EUR 24 million) were the main supplying countries to the EU market, representing 74% of the total extra-EU import value.

Table 9-2 **EXTRA-EU IMPORT OF ATLANTIC MACKEREL BY TOP COUNTRY (value in 1000 EUR, volume in tonnes)**

Catching nation	2013		2014		2015		2016		2017	
	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume
Faroe Islands	35.976	29.025	33.312	32.050	29.588	25.200	41.841	33.328	43.622	33.471
Norway	33.164	22.733	35.707	24.744	35.151	25.591	30.237	20.160	36.527	24.749
Iceland	9.846	7.501	9.587	6.674	17.827	14.021	26.647	19.372	33.958	20.945
Greenland	2.850	2.582	7.904	6.329	12.465	11.003	11.340	9.864	24.172	20.341
Morocco	51.087	11.975	45.716	11.505	49.613	13.853	51.229	14.191	20.703	6.769
China	6.459	4.315	9.895	5.710	6.357	3.644	7.534	4.790	9.800	5.225
Other	10.177	3.349	14.788	5.228	9.926	2.682	13.345	4.693	18.670	11.752
Total	149.558	81.480	156.909	92.239	160.927	95.993	182.172	106.398	187.451	123.250

Source: Comext.

⁶⁶ NSSL.

In 2017, 78% of the import value was frozen products. The frozen category consists mainly of round frozen mackerel from the Faroe Islands, Norway, Iceland and Greenland. In 2017, the frozen category increased 28% from 2016 to EUR 147 million while the prepared/preserved category decreased 44% to nearly 36 million.

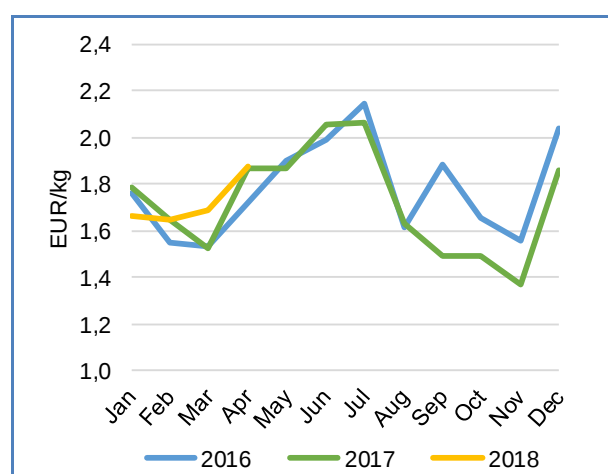
Table 9-3 EXTRA-EU IMPORT OF ATLANTIC MACKEREL BY PRESERVATION STATE (value in 1000 EUR)

Preservation state	2013	2014	2015	2016	2017	Change 2016/2017
Frozen	84.775	91.389	98.403	115.215	146.948	28%
Prepared-Preserved	62.646	63.093	60.194	64.424	35.934	-44%
Fresh	2.123	2.411	2.313	2.522	4.561	81%
Smoked	15	15	16	12	9	-23%
Total	149.558	156.909	160.927	182.172	187.451	3%

Source: Comext.

In 2016, the average import price of Atlantic mackerel was 1,73 EUR/kg which was a 13% increase from 2015. The average import price decreased by 4% in 2017 to 1,66 EUR/kg. During January – April 2018 the import price increased by 2% to 1,69 EUR/kg.

Figure 9-4 IMPORT PRICE OF ATLANTIC MACKEREL



Source: Comext.

9.3.2 EXTRA-EU EXPORT

Mackerel is one of the most important commercial fish species in volume exported by EU Member States. In 2017, the exported volume totaled 189.000 tonnes, a 5% decrease from the previous year while total export value decreased by 1% to EUR 241 million. In 2017, Nigeria, Ghana and Egypt were the main markets for EU-export and constituted 56% of total volume and 53% of total value. In 2017, exports to Nigeria decreased by 21% in volume and 25% in value while exports to the second largest market Ghana showed a 108% growth in volume and a 71% growth in value.

More than 95% of mackerel exports consist of round frozen mackerel. In 2017, exports from the Netherlands reached 72.000 tonnes worth nearly EUR 92 million, a decrease of 22% in volume and 14% in value from 2016.

Table 9-4 EXTRA-EU EXPORT OF ATLANTIC MACKEREL TO MAIN MARKETS (value in 1000 EUR, volume in tonnes)

Catching nation	2013		2014		2015		2016		2017	
	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume
Nigeria	52.199	43.054	142.077	115.217	126.844	104.446	95.349	81.408	75.689	61.048
Ghana	8.598	7.517	6.920	7.947	7.678	8.551	13.475	12.471	28.032	21.311
Egypt	11.265	11.242	25.870	26.738	35.051	36.629	25.497	23.940	24.694	24.450
Russia	34.518	21.357	38.201	21.294	4.731	3.800	8.098	6.589	23.216	16.330
Ukraine	19.094	12.214	11.074	7.545	5.058	3.962	13.182	9.869	13.794	9.610
Japan	4.883	2.411	6.247	4.709	7.075	4.845	5.332	3.660	11.242	7.875
Other	57.226	38.885	83.262	60.583	79.224	63.089	82.160	60.554	64.720	48.619
Total	187.782	136.680	313.650	244.033	265.661	225.322	243.093	198.491	241.387	189.243

Source: Comext.

9.3.3 INTRA-EU TRADE

A large share of the mackerel products traded consists of exchanges between the Member States. In 2017, the top five intra-EU exporters of mackerel were the Netherlands, the UK, Portugal, Denmark and Germany constituting 67% of total value and 73% of volume. In 2017, intra-EU exports increased by 12% in volume and 15% in value from 2016.

Table 9-5 **INTRA-EU TRADE OF ATLANTIC MACKEREL BY MEMBER STATE (value in 1000 EUR, volume in tonnes)**

Catching nation	2013		2014		2015		2016		2017	
	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume
Netherlands	52.199	43.054	142.077	115.217	126.844	104.446	95.349	81.408	75.689	61.048
UK	8.598	7.517	6.920	7.947	7.678	8.551	13.475	12.471	28.032	21.311
Portugal	11.265	11.242	25.870	26.738	35.051	36.629	25.497	23.940	24.694	24.450
Denmark	34.518	21.357	38.201	21.294	4.731	3.800	8.098	6.589	23.216	16.330
Germany	19.094	12.214	11.074	7.545	5.058	3.962	13.182	9.869	13.794	9.610
Spain	4.883	2.411	6.247	4.709	7.075	4.845	5.332	3.660	11.242	7.875
Ireland	57.226	38.885	83.262	60.583	79.224	63.089	82.160	60.554	64.720	48.619
Poland	187.782	136.680	313.650	244.033	265.661	225.322	243.093	198.491	241.387	189.243
Other	49.985	20.671	56.163	23.439	60.852	24.452	63.349	21.203	78.260	25.287
Total	504.289	301.852	510.851	319.691	502.694	331.078	486.847	288.292	562.293	324.035

Source: Comext.

9.4 CONSUMPTION

In 2015, EU consumption of mackerel was 1,07 kg per capita, ranking mackerel as the seventh most consumed species in the EU after tuna, cod, salmon, Alaska pollock, herring and mussels⁶⁷. Mackerel consumption decreased by 4% from 2014, mainly due to lower EU catches in 2015. The UK's and Irish mackerel landings in the EU decreased by 33% and 17%, respectively, in 2015 from the previous year.

9.5 PROCESSING OF ATLANTIC MACKEREL

Most of the mackerel in the EU is consumed in a processed form and a large share of this processing takes place in the EU. In addition to own catch/landings in the EU, the fish processing industry imports large amounts of round frozen mackerel for their fish processing facilities.

In 2017, France, Poland and Portugal were the largest processors of prepared/preserved mackerel (mostly canned), amounting to 43.000 tonnes worth EUR 212 million. Total volume showed a 5% increase in volume and a 11% increase in value over 2016⁶⁸.

In addition to canning, there is a notable mackerel smoking activity in some Member States (Poland, Germany, Lithuania, Ireland, and Romania, among others).

Table 9-6 **PREPARED/PRESERVED MACKEREL WHOLE OR IN PIECES (value in 1000 EUR, volume in tonnes)**

Country	2015		2016		2017	
	Value	Volume	Value	Volume	Value	Volume
France	109.980	20.672	94.344	17.446	90.832	15.806
Poland	47.241	11.574	50.427	14.310	64.670	16.528
Portugal	45.396	9.102	46.460	9.203	56.284	10.612
Spain	29.324	6.766	32.689	6.138	33.755	6.137
Other	15.829	5.105	15.365	4.975	21.103	5.823
Total	247.770	53.219	239.285	52.073	266.644	54.906

Source: PRODCOM.

⁶⁷ The EU fish market, 2017.

⁶⁸ <http://ec.europa.eu/eurostat/web/prodcom>

10 Monk



Monk is of great commercial importance for several EU fleets fishing in the Atlantic. Moreover, it is one of the most valuable species landed in the EU.

However, monk sold in the EU markets can be several species, including imported monk products.

10.1 BIOLOGY, RESOURCES, AND EXPLOITATION

10.1.1 BIOLOGY

Five main species can be marketed on the EU markets as monk (or anglerfish, or goosefish). The most common species caught by EU vessels is *Lophius piscatorius*, or “white” or common monk; *Lophius budegassa*, or “black” or “red” monk, makes up an increasingly large part of more southerly North Atlantic catches. Species of monk also exist in North American waters: *Lophius americanus* in the Atlantic and *Lophiodon caulinaris* and *Lophius litulon* in the Eastern Pacific, as well as *Lophius gastrophysus* along the Brazilian coasts. Cape monk, also known as devil’s anglerfish, *Lophius vomerinus*, is caught in the South Atlantic, mainly off Namibia and South Africa. Common monk is a demersal species found in coastal waters of the North-East Atlantic, from the Barents Sea to the Strait of Gibraltar, and the Mediterranean and Black seas.⁶⁹

Monk are found on sandy and muddy sediments at depths of up to 1.000 m, where they lie half-buried, waiting for prey, such as small fish, sandeels, and occasionally larger fish. Monk is a slow-growing species. Its maximum length is 200 cm, and its common length is 40–100 cm.⁷⁰ The species is available to fisheries mostly between April and December, with peaks during spring.⁷¹

10.1.2 RESOURCE, EXPLOITATION, AND MANAGEMENT IN THE EU

The two European monk species are usually caught and recorded together in the landing statistics and are managed under a combined species Total Allowable Catches (TAC). Three management areas are considered in EU Atlantic waters, where stocks are mostly fished by bottom trawlers (France, the UK, Ireland, Denmark, Spain, and Portugal), gillnetters (France) and, to a lesser extent, longliners: Celtic Sea and Bay of Biscay; West Scotland and North Sea; and the Cantabrian Sea and Atlantic Iberian waters.

In the **Celtic Sea** and the **Bay of Biscay**, where monk is the most abundant, stock status is not precisely known. The available information, however, indicates that stock abundance of common monk and red monk is fluctuating (down from 2008 to 2010 and rising since 2010). In the absence of complete and reliable data, scientists have advised that catches be maintained at the current level (26.691 tonnes landed). The TAC for 2016 was set at 42.500 tonnes.

In **west Scotland** and the **North Sea**, because of limited knowledge of the species’ biology, lack of consistency

This case study is available in the
Monthly Highlights N° 10-2016

between management zones and assessment areas, and lack of data detailing the performance of fisheries, biologists have not been able to set an accurate assessment of the state of stocks; however, the level of reproductive biomass appears to have increased since 2012. ICES recommended increasing levels of landings to 17.642 tonnes in 2016 (landings in 2014 amounted to 13.300 tonnes).⁷² Stocks off the coasts of **Spain** and **Portugal** are exploited at the maximum sustainable yield (MSY).⁷³ In the Mediterranean, four stocks of black monk are currently monitored: Northern Spain, Gulf of Lions, Strait of Sicily and Balearic Islands. In these areas, monk is an important bycatch of mixed fisheries (bottom trawlers and trammel nets) targeting demersal species. Although limited data on stock parameters (biomass, recruitment) for all these stocks prevents a precise estimation of stock status, a preliminary assessment considered all of them to be exploited unsustainably (fishing mortality above sustainable yield reference point). The implementation of multi-annual plans to reduce fishing effort has been advised.⁷⁴ However, so far, the Mediterranean EU Member States have adopted 34 national management plans under the MEDREG⁷⁵, including several for fisheries conducted with trawlnets. No specific multi-annual management plan has been implemented for monk at sea-basin level.

10.2 PRODUCTION

10.2.1 CATCHES

World catches of monk, including all species, amounted to 96.000 tonnes in 2014, 17% down from 2004, one of the best years in the past decade. The leading producers are France and the UK, which provided 25% and 17%, respectively, of total world production in 2014. Outside the EU, other important producers were South Korea (14%), the USA (9%), and South Africa and Namibia (10% in total). Chinese catch series data is not available. However, for ten years (2004–2014), while global monk catches in Europe and Asia remained stable or increased, other countries important to the monk fisheries experienced significant declines in monk catches: especially the USA (–60%), Namibia (–65%), and South Africa (–28%) where overexploitation issues leading to strong management measures have impacted the intensity of fisheries activity (Fisheries Snapshots: Monkfish - from trash to treasure (TRAFFIC the wildlife trade monitoring network); <http://www.traffic.org/fish/>). To a lesser extent Norway and Iceland, also important monk producers, likewise experienced significant drops in monk landings in the period 2004–2014, 43% and 47%, respectively. EU production amounted to more than 56.000 tonnes in 2014, providing 61% of the world supply. France (40% of EU production), the UK (28%), and Spain (14%) are the main producers. Other important EU producers are Ireland (2.6%), Denmark (2.3%), and Italy (1.8%). From 2004 to 2014, EU monk catches increased 13%. However, among major producers, evolution of catches over the decade has been different: significant increases in Ireland (+75%) and the UK (+34%), stable in France Spain and Italy, and strongly decreasing in Denmark (–32%).

⁶⁹ Responsible sourcing guide, Seafish, Version 7.1. Oct 2013.

⁷⁰ FAO Fishbase.

⁷¹ www.pdm-seafoodmag.com

⁷² Seaweb Europe <http://guidedesespèces.org/fr/baudroie-lotte>

⁷³ ICES Advice 2016, Book 7: White anglerfish (*Lophius piscatorius*) in divisions 8.c and 9.a (Cantabrian Sea and Atlantic Iberian waters); <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/a np-8c9a.pdf>

⁷⁴ Report of the Scientific, Technical and Economic Committee for Fisheries on Assessments of Mediterranean Sea stocks - Part I

(STECF12-19), https://stecf.jrc.ec.europa.eu/documents/43805/319223/2012-11_STECF+12-19+-+MED+stock+assessments+part+1_JRC76735.pdf
Report of the Scientific, Technical and Economic Committee for Fisheries (STECF), 2012 Assessment of the Mediterranean Sea stocks part II (STECF 13-05), https://stecf.jrc.ec.europa.eu/documents/43805/544890/2013-04_STECF+13-05+-+Med+stock+assessments_JRC81592.pdf
⁷⁵ [http://www.europarl.europa.eu/RegData/etudes/note/join/2013/513990/POL-PECH_NT\(2013\)513990_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/note/join/2013/513990/POL-PECH_NT(2013)513990_EN.pdf)

Table10-1 **WORLD CATCHES OF MONK SPECIES (volume in tonnes)**

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
EU-28	49.754	49.680	51.535	54.614	50.162	48.692	48.964	51.989	51.932	54.533	56.452
South Korea	11.885	11.448	12.226	14.417	17.944	14.961	13.104	15.808	12.090	11.686	12.848
United States	21.199	19.103	14.582	12.141	10.937	8.563	7.250	8.585	9.742	8.604	8.522
South Africa	8.554	7.722	7.399	7.771	7.809	7.020	7.852	7.792	6.766	6.721	6.165
Namibia	8.991	11.087	9.831	8.932	8.555	6.922	7.904	0.	0.	1.979	3.181
Brazil	2.434	2.550	2.517	2.508	2.488	2.744	2.592	2.412	2.625	2.265	2.735
Other	6.799	8.107	7.881	5.349	3.879	3.780	3.798	3.647	2.575	1.817	2.484
Norway	4.069	3.661	5.422	5.474	5.034	5.324	6.364	5.693	4.375	3.676	2.319
Iceland	2.224	2.852	2.587	2.777	2.947	4.069	3.283	3.227	2.650	1.500	1.181
Total	115.909	116.210	113.980	113.983	109.755	102.075	101.111	99.153	92.755	92.781	95.887

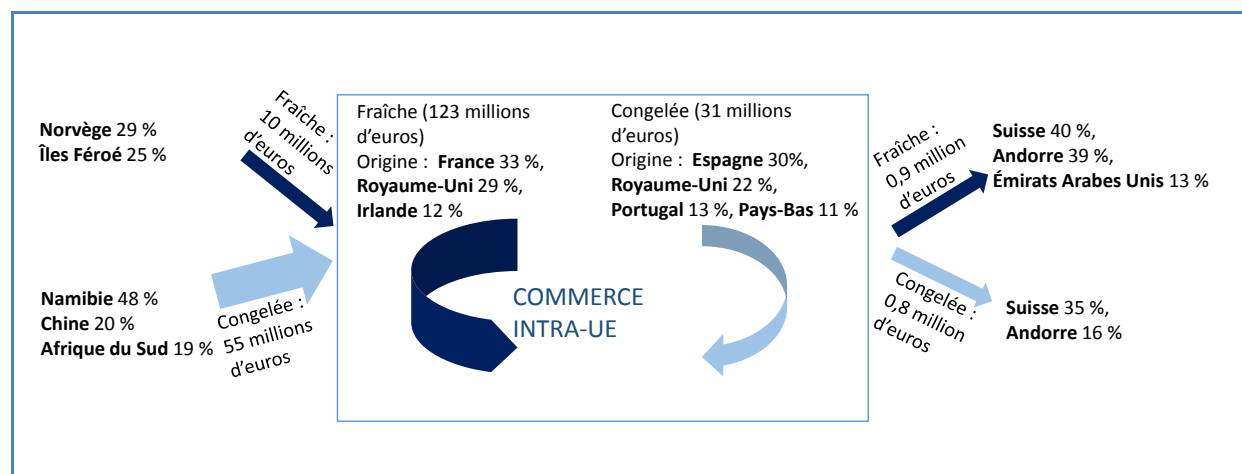
Source: FAO Fishstat. Chinese catch series data is not available.

Table10-2 **CATCHES OF MONK SPECIES IN THE EU (volume in tonnes)**

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
France	21.377	20.844	19.810	22.426	18.730	17.597	17.348	19.774	20.610	23.399	22.855
United Kingdom	11.815	12.126	13.987	15.867	15.433	15.072	14.392	15.124	13.336	13.563	15.841
Spain	7.250	6.042	7.010	5.570	6.605	6.075	6.367	6.617	6.680	7.274	7.749
Ireland	2.250	2.921	3.384	3.477	2.838	3.261	4.144	3.794	3.854	3.745	3.935
Denmark	2.121	1.898	1.814	1.389	1.596	1.725	1.607	1.378	1.429	1.344	1.444
Italy	1.272	2.239	2.222	1.991	1.711	1.876	1.976	1.901	1.646	1.406	1.293
Belgium	1.495	1.302	1.193	1.363	964	853	1.031	1.279	1.716	1.633	993
Germany	413	407	298	632	738	625	641	468	687	742	843
Portugal	545	531	390	464	431	388	295	338	831	647	655
Greece	1.056	1.217	1.303	1.277	910	1.070	996	1.140	963	618	632
Other	160	153	124	158	206	150	167	176	180	162	212
EU-28	49.754	49.680	51.535	54.614	50.162	48.692	48.964	51.989	51.932	54.533	56.452

Source: FAO Fishstat.

10.3 TRADE

Figure 10-1 **The EU MONK TRADE MARKET (2015)**

Source: EUMOFA.

10.3.1 EU TRADE

In 2015, the EU had a monk trade deficit of EUR 65 million. The deficit is attributable mainly to the imports of frozen monk. Extra-EU imports of fresh monk are relatively limited (15% of total extra-EU imports). For frozen monk, the main extra-EU supplier is China (5.233 tonnes in 2015). Other main suppliers are Namibia (4.121 tonnes), South Africa

(1.735 tonnes) and, to a lesser extent, Brazil (437 tonnes) and the USA (334 tonnes).

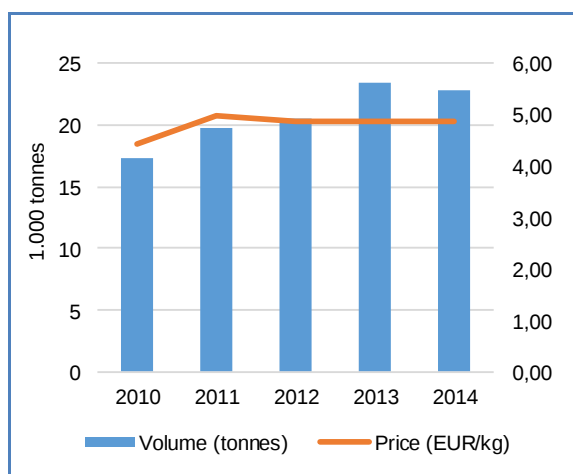
For fresh monk, the main extra-EU supplier is Norway (approximately 330 tonnes in 2014). Other main suppliers are the Faroe Islands (300 tonnes), Morocco (286 tonnes), and Iceland (206 tonnes). Intra-EU trade is active for each of the preservation states. France and the UK are the main suppliers of fresh monk, whereas Spain and the UK are the

main suppliers of frozen monk. Extra-EU exports are relatively low, and the main destinations for fresh and frozen monk are neighbouring countries: Switzerland and Andorra.

10.4 SUPPLY TRENDS AND PRICES

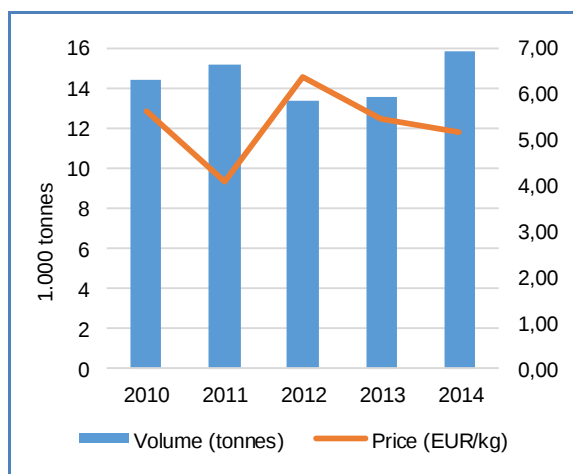
In France, the leading EU monk producer, the significant increase in catches from 2010 to 2013 (+35%) has not led to any first-sales price decreases. After increasing between 2010 and 2011 (+13%), first-sales prices have decreased slightly and have remained stable around 4,90 EUR/kg. In Spain, the increasing trends (+22%) in monk landings over the five-year period has led to a decrease in first-sales prices (-11%), which remained stable after 2012 at around 5,00 EUR/kg.

Figure 10-2 **VOLUME OF CATCHES AND PRICE OF MONK LANDED IN FRANCE**



Source: FAO (volume) and EUMOFA (price).

Figure 10-3 **VOLUME OF CATCHES AND PRICE OF MONK LANDED IN THE UK**

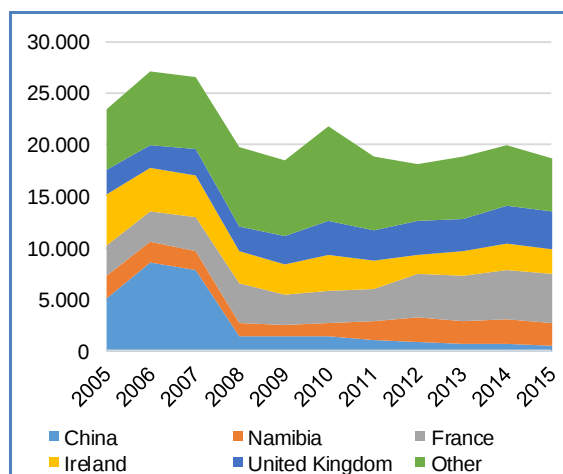


Source: FAO and EUMOFA.

Spain, however, is by far the main monk importer in the EU. Therefore, the supply breakdown of Spanish monk imports has experienced strong changes in the past decade. Indeed,

China used to be the main supplier of monk in the Spanish market (up to 8,600 tonnes in 2006). But imports from China decreased strongly in 2008 and fell until 2015. In the meantime, imports from France and the UK have increased. This evolution could be explained by the reduction of fish consumption in Spain and increasing catches in France and in the UK providing a "local" supply more available.

Figure 10-4 **EVOLUTION OF MONK SPANISH IMPORTS BY MAIN ORIGINS**



Source: EUMOFA.

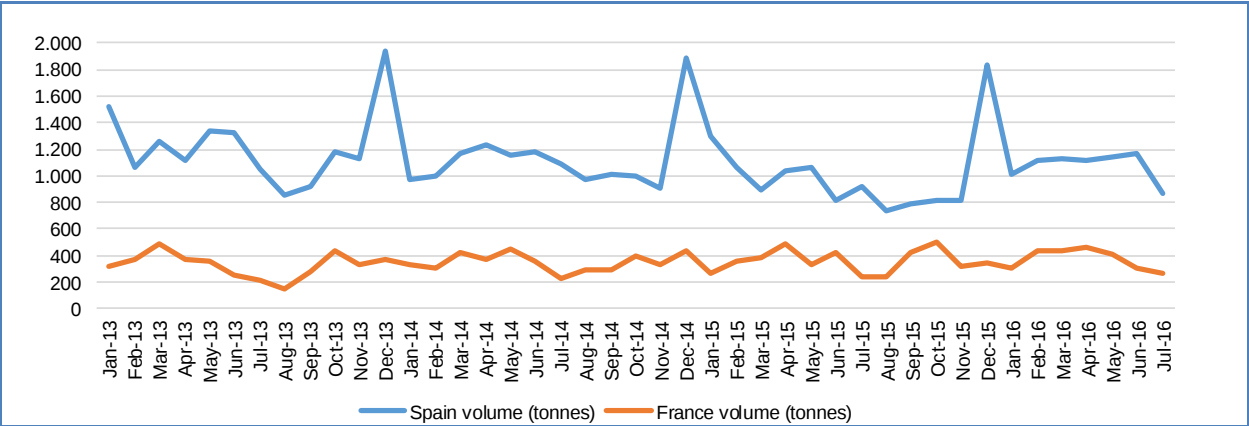
Overall, considering (i) the uncertainties about the stock status of Japanese monk, Cape monk, and the strong reduction in American monk catches, and (ii) the trends in imports and the relatively "good health" of European stocks (except in the Mediterranean), it is likely that EU monk supply will rely increasingly in the near future on EU landings.

10.5 MONK HOUSEHOLD CONSUMPTION

Processing of monk is limited because its flesh is much appreciated for its firmness and the absence of bones, making it one of the most valuable species. It is sold mainly fresh or frozen, headed and gutted, sometimes peeled, or in fillets. The cheeks are also popular and are sold mainly fresh in retail. However, monk liver is a gastronomic niche product, popular in Japan and sold canned in France. Monk is usually consumed on special occasions (e.g. Christmas) and in food service. In France, household consumption in 2015 was estimated at 4,300 tonnes of fillets at an average price of 16,80 EUR/kg; this corresponds to about 13,000 tonnes in live-weight equivalent. Since French apparent consumption is estimated at 26,720 tonnes (live-weight equivalent), more than half of French consumption takes place in food service.

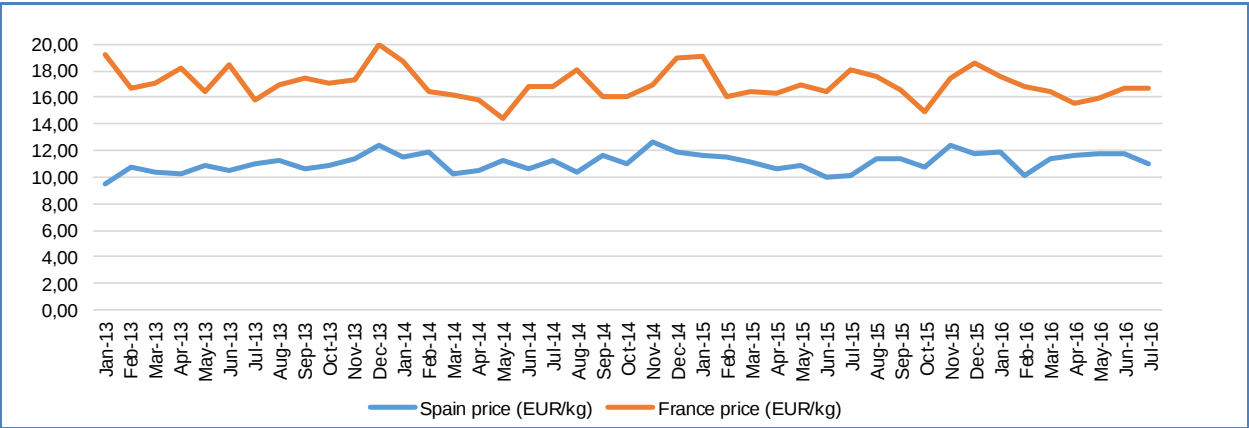
The monthly household consumption pattern appears to be quite different between France and Spain. In Spain, monthly consumption averages approximatively 1,000 tonnes (following a slightly decreasing three-year trend) but almost doubles in December. In France, however, monk household consumption averages 400 tonnes and is stable all year long. Concerning purchase prices, monk prices averaged 11,00 EUR/kg in Spain, remaining stable for three years. In France, monk retail prices experienced greater monthly fluctuations, averaging 17,00 EUR/kg, but reaching almost 20,00 EUR/kg in December 2013 and falling to 14,45 EUR/kg in May 2014.

Figure 10-5 FRESH MONK HOUSEHOLD CONSUMPTION IN SPAIN AND FRANCE



Source: EUMOFA (in net weight).

Figure 10-6 FRESH MONK HOUSEHOLD CONSUMPTION PRICES IN SPAIN AND FRANCE



Source: EUMOFA.

11 Mussel



Mussel is a major aquaculture product in several EU Member States. Imports of the popular seafood species accounted for approximately 7,5% of the EU supply in volume in 2016. However, seasonality of supply and consumption patterns, as

well as new certification opportunities, can lead to significant variability in retail prices among Member States.

11.1 BIOLOGY, RESOURCES, AND EXPLOITATION

11.1.1 BIOLOGY

Mussel is the common name used for members of several families of bivalve molluscs, from saltwater and freshwater habitats. Mussels are found in a wide variety of habitats, from tidal areas to fully submerged zones, with a broad range of temperatures and salinities. They feed on phytoplankton and organic matter by constantly filtering seawater and are therefore always farmed in areas that are rich in plankton. Water quality is an important factor in mussel rearing.

Specific characteristics of mussel is its high fecundity and a mobile larval phase, allowing for widespread distribution. Usually between March and October, depending on the latitude, mussels produce larvae that are carried by currents. In less than 72 hours, the larvae fatten and develop to a stage where they can no longer float. They settle and attach themselves to various substrata⁷⁶.

Unlike oysters, the larvae do not attach themselves directly to the support but use filaments known as byssus. The most common means of collecting the seed (spat) is a rope placed at a location chosen for currents and availability of micro-organisms. Between May and July, these ropes are collected and transferred to mussel farms. In cold water, mussel seed cannot be collected, and so the juvenile mussels are collected from natural deposits.

11.1.2 RESOURCE, EXPLOITATION, AND MANAGEMENT IN THE EU

In the EU, commonly caught and farmed mussels include the blue mussel *Mytilus edulis* and the Mediterranean mussel *Mytilus galloprovincialis*. However, several other species are caught and farmed around the world, and some of them consumed in the EU. These main species are: Chilean mussel *Mytilus chilensis* farmed in Chile, and New Zealand mussel *Perna canaliculus*. Mussel culture has a long history, and mussel farming represents a much larger production in most producing regions (94% of the total world production in 2015 according to FAO). However, mussel fishing (hand-gathering, dredging, etc.) still represents a significant share of the production in a few major producing countries, e.g. Indonesia (100%), Denmark (97%), and to a lesser extent Brazil (21%) and Germany (15%). In 2015, mussel harvesting accounted for 10% of EU total mussel production, reinforced by Danish production. Rearing until harvest takes approximately one year. Four methods are used in European coastal areas:

- **On plots or by spreading** (primarily in the Netherlands): The juveniles are spread over plots in shallow water, generally in bays or sheltered areas and they attach to the ground. The mussels are harvested by dredging with specially fitted vessels.
- **On stakes** (known as *bouchots* in France): This culture uses rows of wooden stakes driven into intertidal

This case study is available in the
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ground. Three to five metres of collecting rope or tubing filled with spat are wrapped around the stake and attached. A net is then placed over the whole structure to keep the mussels from falling as they fatten on the stake. The mussels are harvested by manual or mechanical scraping to detach the clump of mussels from its wooden support.

- **On ropes:** The mussels are attached to ropes that are suspended vertically in the water from a fixed or floating structure. This technique is suitable for seas with weak tides like the Mediterranean and is widely used in the protected bays of the Atlantic Ocean, notably in the *rias* of Galicia. Offshore mussel farming, which recently developed in several Member States, such as France, Ireland, Portugal, the UK, and Belgium, also uses this technique. The mussels are harvested by raising the ropes out of the water and removing the clusters.
- **On trestles:** In some places, mussels are grown using the same technique as for oysters, in mesh bags on trestles set up on intertidal ground, or directly on the ground.

11.2 PRODUCTION

11.2.1 PRODUCTION

Global production of mussels, all species included, amounted to almost 2 million tonnes in 2015. China is by far the leading producer, providing 42% of the total world production in 2015, followed by the EU (27%). Other major producers are Chile (11%), Thailand (6%), New Zealand (4%), and the Republic of Korea (3%). Over the past decade (2006–2015), world production has experienced a 13% increase mostly attributable to China (+57%) and Chile (+66%). However, significant decreasing trends have occurred in Thailand (–48%), Korea (–32%), and New Zealand (–21%). According to FAO, EU production amounted to 545.000 tonnes in 2015, providing approximately 27% of the world supply. Spain (41% of EU production), France (14%), and Italy (12%) were the main producers. Other important EU producers are the Netherlands and Denmark. According to FAO, however, blue mussel accounted for 40% of EU production, and Mediterranean mussel for 60%. The EU production remained stable in the period 2006–2015, averaging 521.000 tonnes yearly, despite a few noticeable drops in 2008, 2010 and 2013. Among the top-three producing Member States, France and Italy experienced relatively stable productions: –1% and +3%, respectively, from 2006 to 2015. By contrast, Spain experienced remarkable fluctuations: in 2008, production dropped 21% from 2006; in 2011, it increased 16% over 2008; in 2013 production decreased 22% from 2011 and in 2015 it increased +39% over 2013 (reaching almost the 2006 level). However, different trends are noticeable among main producing Member States. Over the period 2006–2015, the largest production increase has been observed in the Netherlands (+73%). In the meantime, significant decreasing trends have been experienced in the UK (–39%), Greece (–35%), and Denmark (–16%). Furthermore, EU mussel producers have the choice of a range of labelling options, possibilities for certification, and values to promote:

- **Organic labelling:** Ireland is by far Europe's main producing Member State for organic mussels, and reached about 9.000 tonnes of organic certified blue mussel in 2015. EU organic mussel production is currently estimated at 20.000 tonnes. More information on organic aquaculture is available [here](#).
- **Eco-labelling** standards set criteria for the environmental responsibility of the producer or the

⁷⁶https://ec.europa.eu/fisheries/sites/fisheries/files/docs/body/mussels_en.pdf

sustainability of the stock that is being fished. In January 2010, Denmark's Limfjord mussel industry was the world's first mussel fishery to receive Marine Stewardship Council (MSC) certification. This fishery comprises 27 fishing vessels that produce about 30.000 tonnes of mussels annually. Since then, an additional ten mussel fisheries have received this certification (<http://www.fao.org/in-action/globefish/fishery-information/resource-detail/es/c/338588/>).

- **Collective labels and brands:** in Europe, several collective brands dedicated to mussels, promote a higher quality based on a combination of attributes; such as rigorous production practices, fishing technique, particular area of production, or even country of production (e.g. *Moules de la Baie du Mont St Michel* in France or *Mexillón de Galicia* in Spain).

Table 11-1 **WORLD PRODUCTION OF MUSSEL SPECIES (volume in tonnes)**

Country	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
China	539.957	448.667	479.902	637.373	702.157	707.401	764.395	747.077	805.583	845.038
EU-28	562.714	553.604	501.136	534.756	494.958	529.108	510.920	454.434	524.188	544.629
Chile	131.886	166.573	193.926	170.478	228.566	295.550	250.029	251.940	245.435	219.366
Thailand	229.746	228.250	203.213	193.626	166.927	126.616	103.203	127.919	117.013	118.775
New Zealand	97.403	99.700	100.282	90.002	95.321	101.423	86.605	83.762	97.510	76.982
Republic of Korea	88.210	107.638	75.379	65.802	67.935	80.163	69.602	41.456	57.939	59.612
Brazil	14.421	13.350	16.683	17.261	15.839	21.286	26.878	21.741	24.612	23.174
Indonesia	1.515	420	14	30	447	2.867	3.353	8.067	4.024	22.930
Canada	24.027	24.153	19.962	21.515	25.725	25.938	29.036	26.145	25.233	22.725
USA	12.086	9.984	11.498	15.838	18.276	13.224	11.653	12.416	11.910	17.716
Philippines	19.722	20.143	23.045	19.965	20.906	22.471	25.686	22.920	18.785	15.970
Other	50.367	39.700	50.069	61.338	50.773	38.511	36.386	35.103	33.596	30.427
Total	1.772.054	1.712.182	1.675.109	1.827.984	1.887.830	1.964.558	1.917.746	1.832.980	1.965.828	1.997.344

Source: FAO Fishstat.

Table 11-2 **EU PRODUCTION OF MUSSEL SPECIES (volume in tonnes)**

Country	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Spain	228.840	209.671	180.273	198.784	189.313	208.849	203.891	162.117	220.518	225.447
France	78.724	76.032	81.697	79.235	71.499	69.098	81.660	77.958	80.853	78.212
Italy	61.928	58.479	67.239	76.800	64.256	79.520	63.257	64.235	63.700	63.700
Netherlands	31.300	43.731	36.082	45.618	56.227	36.700	40.000	37.112	54.100	54.100
Denmark	55.219	58.284	36.819	40.003	28.541	34.980	39.963	38.301	43.173	46.529
United Kingdom	34.336	30.318	36.849	35.380	35.405	35.769	34.331	24.388	20.593	21.029
Greece	28.522	22.653	21.362	23.091	17.377	17.239	16.679	18.720	16.752	18.645
Ireland	33.976	38.168	27.800	26.802	22.999	22.671	20.615	18.949	12.222	16.250
Germany	3.670	10.539	6.896	3.600	4.905	20.830	6.933	5.036	5.280	12.738
Other	6.199	5.729	6.119	5.443	4.436	3.452	3.591	7.618	6.997	7.979
EU-28	562.714	553.604	501.136	534.756	494.958	529.108	510.920	454.434	524.188	544.629

Source: FAO Fishstat.

Table11-3 EU PRODUCTION: BREAKDOWN BY SPECIES IN 2015 (volume in tonnes)

Country	Blue mussel	Mediterranean mussel
Spain	139	225.308
France	63.956	14.256
Italy	0	63.720
Netherlands	54.100	0
Denmark	46.529	0
United Kingdom	21.029	0
Greece	0	18.645
Ireland	16.250	0
Germany	12.738	0
Other	1.800	6.298
Total	216.541	328.227

Source: FAO Fishstat.

11.2.2 PROCESSING AND MARKETING

Mussels are sold in several presentations, preservation states, and packagings. They may be sold loose, in prepacked mesh bags, or in chilled, ready-to-use vacuum packs. In Spain, the larger Mediterranean mussel is frequently canned without their shells. Mussels are now being presented pre-cooked, with a range of dressings in durable vacuum packs.

11.3 TRADE

11.3.1 EU TRADE

In 2015, the EU had a mussel trade deficit of EUR 118 million. The deficit is attributable mainly to the imports of frozen and preserved mussel from Chile and New Zealand. Extra-EU imports of fresh mussel are limited (EUR 0,3 million for 112 tonnes in 2016).

For prepared and preserved mussel, the main extra-EU supplier is Chile (38.000 tonnes in 2016). The other main supplier is New Zealand (5.500 tonnes) for which imports are recorded under unspecified preservation states but are likely to be frozen.

Intra-EU trade is active for each of the preservation states and dominated by fresh mussel products. In 2016, intra-EU total exports reached more than 200.000 tonnes and EUR 315 million, of which 65% were fresh products.

The Netherlands and Spain are the main mussel suppliers, and Belgium and France are the main destinations of exports on the intra-EU trade market.

The volume of extra-EU exports is relatively low (551 tonnes in 2016), and the main destinations for fresh and frozen mussel are neighbouring countries, mostly Switzerland and to a lesser extent Norway.

11.4 HOUSEHOLD MUSSEL CONSUMPTION

Mussels are generally eaten cooked, but can also be eaten raw, like oysters. They are sold mostly live, but can also be sold as processed products, tinned, or in a marinade (particularly in Spain) (https://ec.europa.eu/fisheries/marine_species/farmed_fish_and_shellfish/mussels_en).

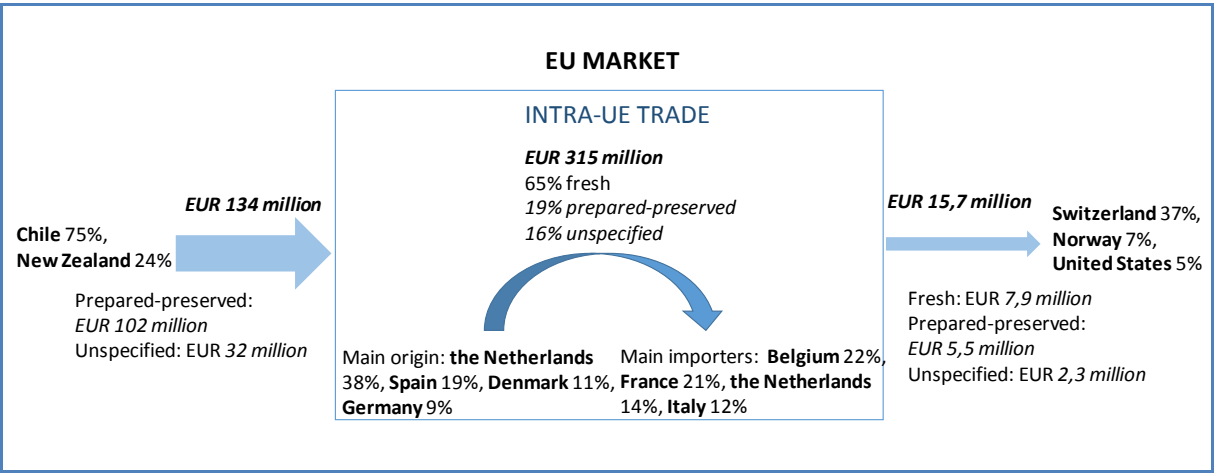
Monthly patterns of household consumption appear to be similar between Italy and the Netherlands, with strong seasonality and high consumption levels during summer and, to a lesser extent, the Christmas season.

In Italy, monthly consumption averages approximatively 3.500 tonnes (following a slightly increasing trend since 2012), but almost doubles in July–August. However, consumption peaks seem to become lower but longer in the period 2012–2016 (reaching “only” 5.000 tonnes but lasting until September), whereas Christmas consumption peaks seem to follow the opposite trend.

In the Netherlands, monthly household mussel consumption averages 350 tonnes (following a slightly increasing trend since 2012), but the seasonality is even stronger with almost no consumption before July and a strong peak in summer (1.000–1.200 tonnes monthly) and a smaller one in the period December–January (300–400 tonnes).

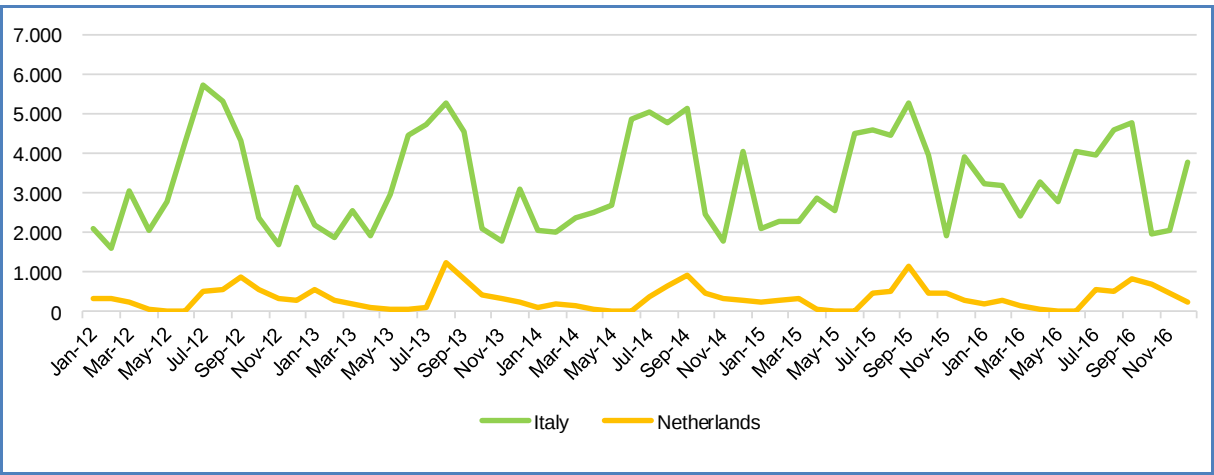
Mussel purchase prices averaged 2,50 EUR/kg in Italy, following a slightly decreasing trend over the four-year period, but staying stable on an annual basis. In the Netherlands, mussel retail prices experienced greater monthly fluctuations, averaging 4,00 EUR/kg, but reaching more than 10,00 EUR/kg in May 2016 and falling to 2,57 EUR/kg in July 2016.

Figure 11-1 EU MUSSEL TRADE MARKET IN 2016



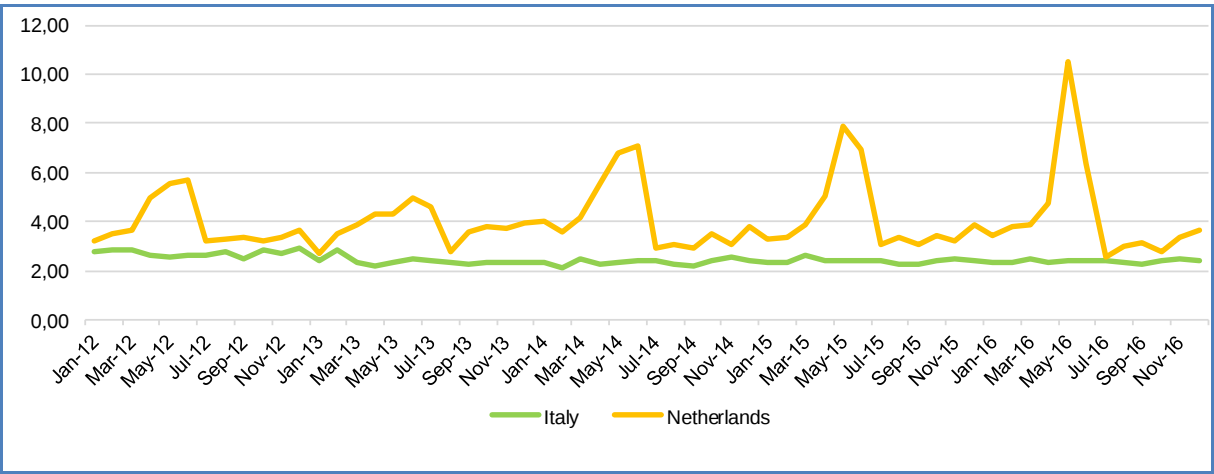
Source: EUMOFA.

Figure 11-2 MUSSEL (MYTILUS SPECIES) HOUSEHOLD CONSUMPTION IN ITALY AND THE NETHERLANDS (1.000 tonnes)



Source: EUMOFA (in net weight).

Figure 11-3 MUSSEL (MYTILUS SPECIES) HOUSEHOLD CONSUMPTION PRICES IN ITALY AND THE NETHERLANDS (EUR/kg)



Source: EUMOFA

12 Non-food fisheries

This case study is available in the
Monthly Highlights N° 10-2017

In 2016, EU fisheries for non-food use constituted approximately 20% of the catches in volume and 3% in value. The main catching Member State was Denmark, accounting for 78% of total EU landings in volume. The catches for non-food use goes mainly to the production of fishmeal and fish oil, while small volumes are utilized as bait in fisheries or feed in zoos. The EU produces approximately 500.000 tonnes of fishmeal and 120.000 tonnes of fish oil each year, for which Denmark is the largest producing nation. Fishmeal and fish oil are in great demand as an ingredient in the feed used in aquaculture in the EU and Norway.

12.1 PRODUCTION

The term non-food fishery describes catches used for purposes other than human consumption. Species for non-food use come from small, short-lived fish, for which, partly or wholly, there are no consumption markets.

Main species caught in the EU for non-food use are sandeel, sprat, blue whiting, boarfish, and Norway pout. Herring is caught mainly for human consumption, but out of the large volume caught, some will be used in the production of fishmeal and fish oil.

Owing to significant variations in the quotas for non-food-use species, the availability in EU fisheries varies strongly from year to year. From 2016 to 2017, there were particularly large variations in the quotas of sandeel (+459%) and blue whiting (+85%).

Total values of non-food-use fisheries in the EU were nearly EUR 222 million in 2016 (i.e. 3% of total value of EU fisheries). Danish fisheries accounted for 77% of the total value (EUR 172 million). In Denmark, non-food-use fisheries represented 31% of total national fisheries in value. In 2016, total landings for non-food use in the EU reached 786.000 tonnes, a 24% decrease from 2015 (1,04 million tonnes). The volume accounted for 20% of the total landings in the EU. Denmark is the largest catching Member State, and in 2016, the Danish fleet landed 615.000 tonnes of fish for industrial use. This was approximately 78% of total EU landings for this purpose. In addition to the Danish fleet, the Swedish and Finnish fleets contributed raw material to the reduction industry (Reduction: Commonly used to designate the activity of fish processed into fishmeal and fish oil).

Table 12-1 **EU QUOTAS FOR MAIN SPECIES FOR INDUSTRIAL USE (volume 1000 tonnes)**

Species	2012	2013	2014	2015	2016	2017	% change 2016/17
Sandeel	180	264	207	0	87	486	459%
European sprat	441	457	422	479	458	461	1%
Blue whiting	73	133	218	482	208	385	85%
Boarfish	82	82	128	53	43	27	-37%
Norway pout	0	167	106	128	129	142	10%
Herring	696	754	783	818	619	684	11%

Source: European Commission, eufishmeal.org.

Table 12-2 **MAIN EU MEMBER STATES LANDINGS FOR INDUSTRIAL USE (million EURO, volume 1000 tonnes)**

Catching MS	2011		2012		2013		2014		2015		2016	
	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume
Denmark	158	682	96	358	165	590	147	719	205	881	172	615
Finland	9	52	10	58	16	72	13	64	12	74	14	79
Sweden	12	89	1	3	9	33	5	25	25	81	18	80
Other	10	1	2	14	2	9	1	3	5	6	17	12
Total	189	825	109	433	192	704	166	812	247	1.042	222	786

Source: Eurostat.

Table 12-3 MAIN SPECIES FOR INDUSTRIAL USE IN THE EU (1000 tonnes)

Species	2011	2012	2013	2014	2015	2016	% of total landings in 2016
European sprat	292	182	185	253	407	358	73%
Herring	105	75	117	116	150	183	25%
Blue whiting	1	3	70	174	185	155	50%
Sandeel	356	59	254	204	254	42	1%
Boarfish	18	43	26	15	0	0	1%
Capelin	18	43	26	15	0	0	0%
Other species	34	27	27	35	46	47	N/A
Total	825	433	704	812	1042	786	

Source: Eurostat.

Table 12-4 CATCH OF MAIN SPECIES FOR INDUSTRIAL USE BY THE EU MEMBER STATES (1000 tonnes)

Species	2007	2008	2009	2010	2011	2012	2013	2014	2015
Herring	684	578	531	509	507	661	716	726	769
European sprat	499	468	543	495	411	340	342	406	530
Blue whiting	337	240	85	85	19	62	122	193	235
Sandeel	180	280	339	344	335	65	254	188	219
Boarfish	18	25	84	138	31	81	70	43	17
Capelin	0	0	0	0	11	0	0	10	0

Source: FAO.

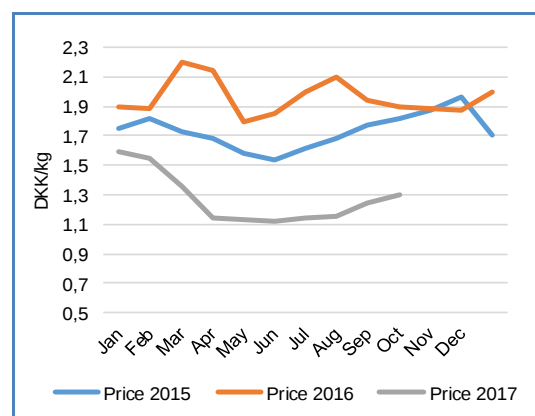
In 2016, total EU landings of European sprat reached 491.000 tonnes. Approximately 358.000 tonnes (73%) were landed for industrial use, the rest for human consumption. In all, 183.000 tonnes of Atlantic herring were landed for industrial use, approximately 25% of total herring landings in the EU.

Total EU blue whiting landings in 2016 reached 310.000 tonnes, of which approximately 50% was used for reduction to fishmeal and fish oil. Between 1.000 and 5.000 tonnes of the annual sandeel catch are used for human consumption, whereas 100% of the boarfish catch is used in the fishmeal and fish oil industries.

12.2 FIRST-SALES PRICE

Average first-sales price for volume delivered to the reduction industry in Denmark has decreased significantly so far in 2017 (October), ending at 1,23 DKK/kg (0,17 EUR/kg). In 2016, the average first-sales price ended at 2,00 DKK/kg (0,27 EUR/kg). The price is an average for sprat, herring, blue whiting, Norway pout, and sandeel. A strong increase in Danish sandeel landings explains the decrease in first-sales prices for industrial use throughout 2017. The EU sandeel quota was set at 486.000 tonnes this year, an increase of 399.000 tonnes over 2016. About 400.000 tonnes of sandeel have been landed so far at a first-sales price of 1,10 DKK/kg (0,15 EUR/kg). According to ICES models, there was a strong increase in the sandeel stock from 2016 to 2017, which provided the basis for the increased sandeel quota⁷⁷. Total Danish industry landings by mid-November increased 260.000 tonnes over 2016.

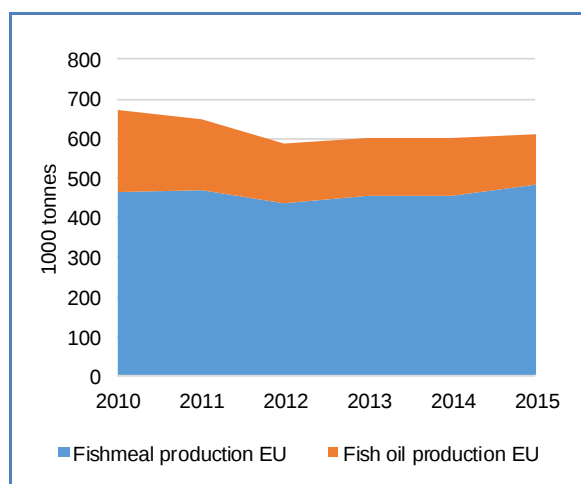
Figure 12-1 DANISH FIRST-SALES PRICES FOR SPECIES USED IN REDUCTION (SPRAT, HERRING, SANDEEL AND BLUE WHITING)

Source: Fiskeridir DK, <http://lbst.dk/fiskeri/fiskeristatistik>.⁷⁷ International Council for Exploration of the Seas.

12.3 EU PRODUCTION AND SALES PRICES

Fishmeal and fish oil are produced mainly from small pelagic species with little or limited value as human consumption. The most important species for the production of fishmeal and fish oil in the EU are sandeel, Norway pout, blue whiting, sprat, and boarfish. A small amount of herring might also be sold to the reduction industry (25% in 2016). In years with high quotas, capelin is also an important raw material for fishmeal and fish oil producers, but mainly in other European countries, such as Iceland and Norway. The trimmings (cuttings, offal) from the processing/filleting industry for human consumption are another important resource.

Figure 12-2 EU PRODUCTION OF FISHMEAL AND FISH OIL

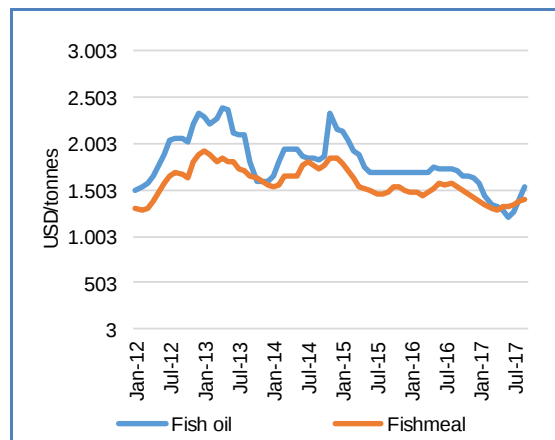


Source: FAO.

Total fishmeal production in the EU is approximately 450–500.000 tonnes/year, and fish oil production is 120–150.000 tonnes/year. The main producers of fishmeal and fish oil are the largest fishing nations for non-food use. Denmark is by far the largest fishmeal and fish oil producer in the EU. In 2015, approximately 233.000 tonnes were produced in Denmark, nearly half the total EU production (483.000 tonnes)⁷⁸.

Although fishmeal production varied in line with resources available, the overall trend in the past 15–20 years is declining. The use of the trimmings is increasing in importance.

Figure 12-3 EUROPEAN MARKET PRICES FOR FISHMEAL AND FISH OIL



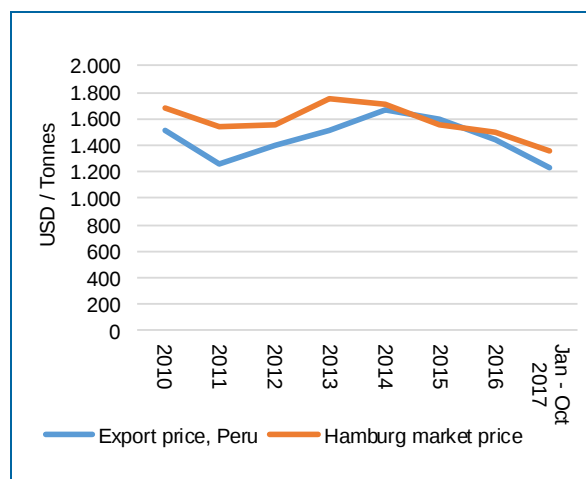
Source: Oilworld.

Fishmeal and fish oil prices in the EU correspond to global prices, which is closely linked to the supply in South America, particularly in Peru, the world's largest producer and exporter of fishmeal and fish oil. Fluctuations in the Peruvian export prices of fishmeal and fish oil will be reflected in prices elsewhere in the world. In 2016, the average fishmeal price in the Hamburg market was USD 1.501/tonnes (2003 EUR/tonnes), while the average fish oil price was USD 1.700/tonnes (2.269 EUR/tonnes). In periods of scarce supply, fish oil prices might reach USD 2.500/tonnes (3.336 EUR/tonnes), but only small volumes are sold at this price.

As a result of increased supply from Peru throughout 2017, fishmeal and fish oil prices showed a declining trend, especially throughout the first half year of 2017. Increased demand especially from the Chinese market throughout the year has contributed to higher prices in recent months⁷⁹.

The largest increase was seen in fish oil prices. Fish oil exports from Peru in the period January–September 2017 were 138.000 tonnes, a 138% increase over the same period in 2016. Exports of fish oil from Peru to the EU increased 72% in the same period to nearly 52.000 tonnes.

Figure 12-4 EUROPEAN MARKET PRICES FOR FISHMEAL COMPARED TO PERUVIAN EXPORT PRICE



Source: Oilworld.

⁷⁸ FAO.

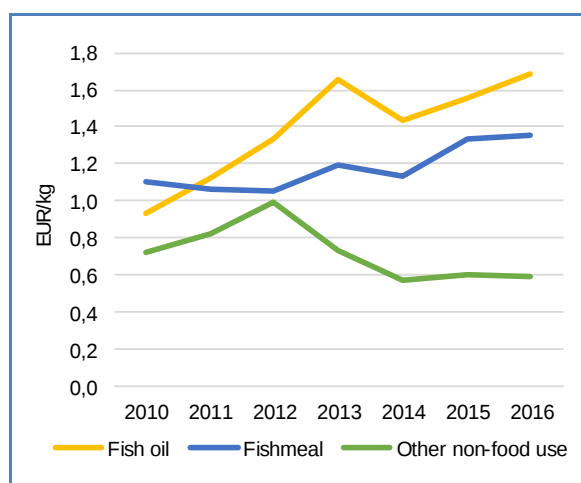
⁷⁹ Statistics China.

12.4 EXTRA-EU IMPORT FOR NON-FOOD USE

In 2016, the volume of imported non-food products totaled 844.000 tonnes, a slight increase over the year before, when they were 837.000 tonnes. The non-food-use commodity, one of the most important in terms of volume among extra-EU imports, attained 284.000 tonnes of fishmeal, 177.000 tonnes of fish oil, and 383.000 tonnes of other non-food products (fish waste, crustaceans, seaweed, and ornamental fish)⁸⁰.

Peru, Norway, Morocco, and Mauritania are the most important countries of origin for non-food products imported to the EU. The average EU import price of fishmeal and fish oil has increased in recent years, in line with export prices in Peru and prices in the large consumption markets (China, Japan, and Norway).

Figure 12-5 **EXTRA-EU IMPORT PRICE OF NON-FOOD PRODUCTS**

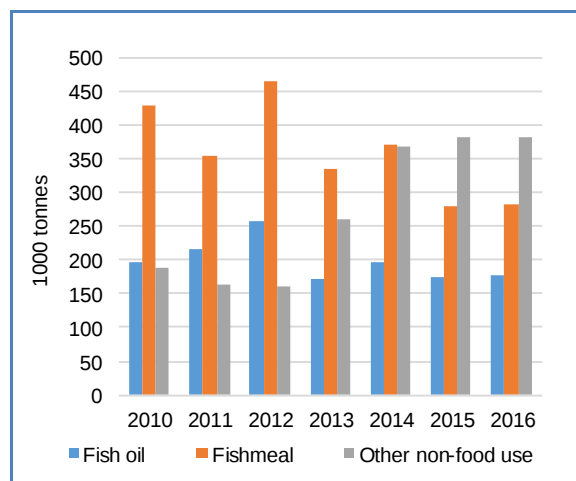


Source: EUMOFA.

The average EU import price of fish oil in 2016 was 1,69 EUR/kg, a 9% increase over the year before.

The average import price of fishmeal was 1,36 EUR/kg the same year, a slight increase over the year before (1,34 EUR/kg in 2015). The fish oil imports to the EU come mainly from Norway, the USA, Peru, and Mauritania.

Figure 12-6 **EXTRA-EU IMPORTS OF NON-FOOD PRODUCTS**



Source: EUMOFA.

Denmark and Germany were the top EU importers in 2016 with 421.000 tonnes and 139.000 tonnes, respectively. The main uses for fishmeal and fish oil are as ingredients in aquaculture feed (i.e. salmon in Norway and Scotland and Sea bass/Sea bream in Greece), as well as an ingredient in feed for Denmark's pork industry. In smaller scales, volumes of non-food use are utilized for bait in fisheries and for feed in zoos. Imports of fishmeal and fish oil to Germany are mainly re-exported to Norway and other European markets.

Table 12-5 **EXTRA-EU IMPORT OF NON-FOOD USE PRODUCTS BY MEMBER STATE, 2010–2016 (1000 tonnes)**

Country	2010	2011	2012	2013	2014	2015	2016
Denmark	263	301	343	336	432	412	421
Germany	212	152	219	141	200	126	139
Ireland	11	0	2	29	45	56	51
France	36	29	42	37	44	50	45
Spain	59	54	61	41	49	41	42
Total EU	815	736	884	766	937	837	844

Source: EUMOFA.

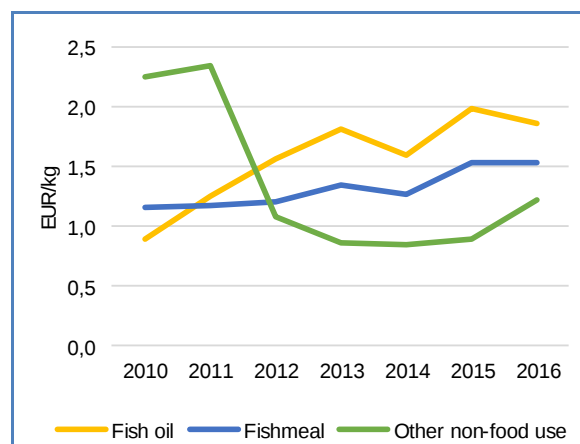
⁸⁰ EUMOFA.

12.5 EXTRA-EU EXPORTS

In 2016, extra-EU exports for non-food use totalled 338.000 tonnes, a 4% decrease from the year before. Exports of fishmeal were 182.000 tonnes, and fish oil amounted to 128.000 tonnes. Exports of other non-food use reached 28.000 tonnes.

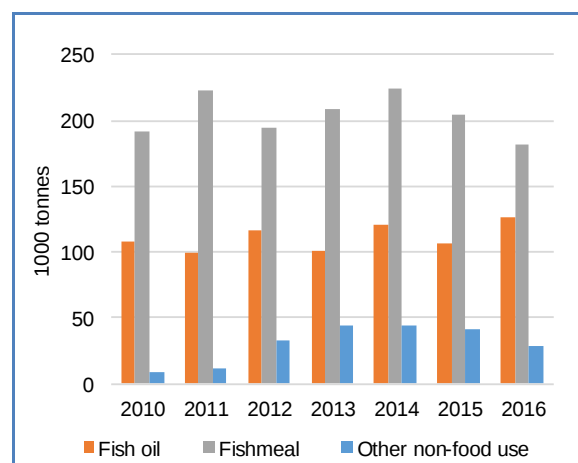
Extra-EU export prices for fishmeal and fish oil follow the increasing global trend observed in recent years. The average export price of fish oil in 2016 was 1,87 EUR/kg, a 6% decrease from 2015, but notably higher than the years before. The average extra-EU export price of fishmeal was 1,53 EUR/kg, the same as the year before.

Figure 12-7 **EXTRA-EU EXPORT PRICE FOR NON-FOOD PRODUCTS**



Source: EUMOFA.

Figure 12-8 **EXPORTS OF NON-FOOD PRODUCTS FROM THE EU**



Source: EUMOFA.

The largest extra-EU exporters of non-food products in 2016 were Denmark and Germany, with 202.000 tonnes and 60.000 tonnes, respectively. The overall largest market for extra-EU exports of fishmeal and fish oil is Norway, accounting for 65% of total volume and value for fishmeal and 90% of the volume and 80% of the value for fish oil. EU exports of fishmeal and fish oil to Norway in 2016 totalled 119.000 tonnes and 114.000 tonnes, respectively. Fishmeal and fish oil are crucial ingredients in salmon feed for the Norwegian aquaculture industry. Norwegian salmon and trout production amounted to 1,3 million tonnes per year.

Table 12-6 **EXTRA-EU EXPORT OF NON-FOOD USE PRODUCTS BY MEMBER STATE, 2010-2016 (1000 tonnes)**

Country	2010	2011	2012	2013	2014	2015	2016
Denmark	200	213	207	209	205	221	202
Germany	71	83	80	68	97	48	60
United Kingdom	7	14	9	17	26	26	28
Ireland	0	0	20	26	25	32	23
France	5	5	6	5	7	10	10
Total EU	308	333	343	354	390	353	338

Source: Eurostat.

12.6 INTRA-EU TRADE

Table 12-7 INTRA-EU EXPORT OF NON-FOOD USE PRODUCTS BY MEMBER STATE, 2010-2016 (1000 tonnes)

Country	2010	2011	2012	2013	2014	2015	2016
Germany	157	129	175	139	165	156	163
Denmark	174	177	141	170	120	118	125
Poland	26	23	27	33	45	65	89
Spain	40	49	53	50	56	54	53
Ireland	4	4	28	32	33	36	42
Total EU 28	634	611	645	634	633	676	700

Source: Eurostat

In 2016, intra-EU exports of non-food use totalled 700.000 tonnes, a 4% increase over 2015. Intra-EU exports of fishmeal were 292.000 tonnes, and fish oil amounted to 106.000 tonnes. Intra-EU exports of other non-food use (fish waste, crustaceans, seaweed and other algae and ornamental fish) were 302.000 tonnes.

The largest intra-EU exporters of non-food-use products in 2016 were Germany and Denmark with 160.000 tonnes and 125.000 tonnes, respectively. The largest EU markets for German exports were Denmark, Greece, and the UK, with a total of approximately 87.000 tonnes. The largest EU markets for Danish export were Greece, the UK, and Germany with a total of approximately 70.000 tonnes.

12.7 FUTURE OUTLOOK

The EU fisheries for non-food use are limited by quotas and demand from human-consumption markets. Earlier, species such as herring and Atlantic mackerel were used for non-food products to a much greater degree.

Today, some herring is still used for the non-food industry, but almost no mackerel. The switch from non-food use to human consumption can also be observed for species such as blue whiting and sprat. Because catch volumes may fluctuate strongly, however, a surplus will result, which cannot be placed in the consumption markets. It will be utilised in fishmeal and fish oil production.

The pelagic species used exclusively or partly for non-food use are small, fatty, and easily perishable fish. Whether or not they are used for human consumption is a matter of quality. Catches delivered for non-food use might therefore not be suitable for human consumption.

The quotas of small pelagic species will also fluctuate in future and, if surplus results for which there is no consumption market, it will be used as raw material for the fishmeal industry. However, the global trend is towards less raw material directly from fisheries. This is the result of increased demand from consumption markets and stricter regulations leading to more raw material from the fillet industry as recycled trimmings. The fillet yield for most fish species varies between 30% and 65% of the mass of the fish, and the cut-offs constitute a valuable resource for fishmeal and fish oil producers⁸¹.

One hundred kilos can produce between 20 and 22 kilos of fishmeal and between 2 and 6 kilos of fish oil during the production process⁸². The oil yield depends on the fat content of the fish, which will vary from species to species. European sprat and sandeel are fattier than blue whiting, and will therefore create more oil during the production process. The volume of fishmeal will not vary in the same way.

⁸¹ <http://www.eufishmeal.org>

⁸² <http://www.fao.org/docrep/003/x6899e/x6899e04.htm>

This case study is available in the
Monthly Highlights N° 9-2018

13 Octopus

13.1 INTRODUCTION

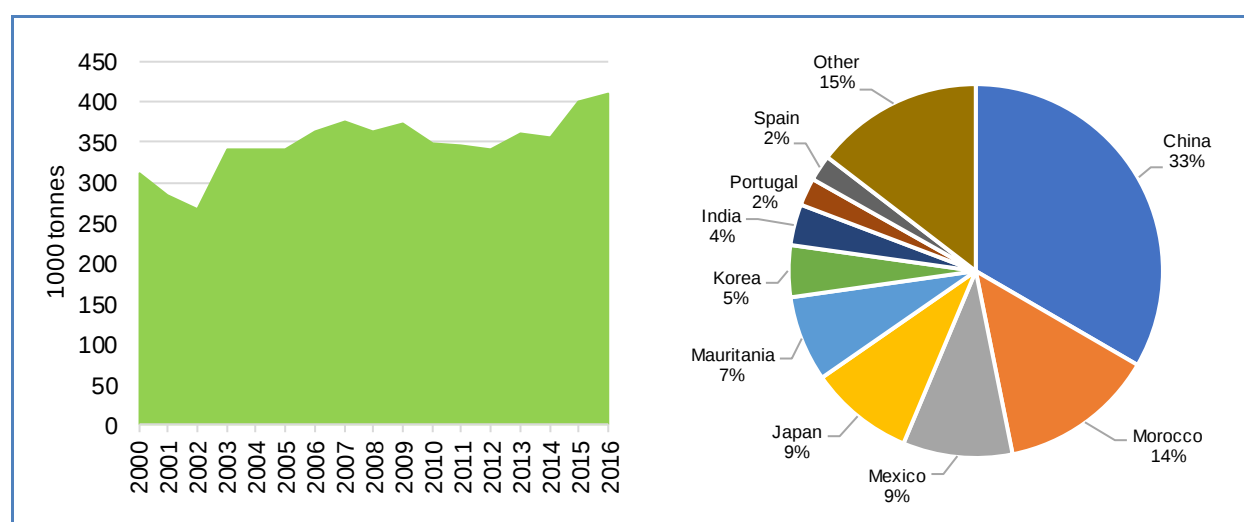
Octopus belongs to the group called cephalopods along with squids and cuttlefish among others. These species have their feet or tentacles connected to their head, not their body. Most of the species within this group have an ink bag that they empty when they feel threatened. The size varies from a few centimetres to the giant cephalopod which can reach 18 meters long. The octopus has a well-developed nervous system and is considered to be the most intelligent among the invertebrate animals. The most obvious difference between the three groups mentioned is that octopuses have no shell at all, while cuttlefishes have an internal shell and squids have the horny remains of a shell.

All species are carnivores, and they mostly feed on fish, molluscs and crustaceans. There are 800 species of octopus/cuttlefish/squid and they are common in all ocean areas. No species live in freshwater, but some can live in brackish waters.



During the past 15 years, global catches of octopus has varied between 267.000 and 410.000 tonnes a year. Over 50% of the global catches of octopus comes from Asia. China is the largest catching country constituting between 100.000 and 150.000 tonnes a year. Morocco is the second largest catching country accounting for 64.000 tonnes in 2015 and 55.000 tonnes in 2016. Mexico, Mauritania and Japan caught more than 30.000 tonnes each in 2016. From 2015 to 2016, there was a small increase in global catch volume of 2,5 %.

Figure 13-1 **GLOBAL CATCHES OF OCTOPUS (LEFT) AND CATCHES BY COUNTRY IN 2016 (RIGHT) (volume in tonnes)**



Source: FAO.

13.2 OCTOPUS IN THE EU

13.2.1 FISHERIES

EU landings of octopus accounted for only 7% of worldwide landings in 2016, they reached 30.000 tonnes worth EUR 161 million. This was mostly driven by landings in Spain, Portugal and Italy. Landings in the three main countries constituted 79% of total EU volume and 80% of total value. In total, volumes increased by 14% and value 20% compared to 2015. In 2016, Spain was the most important country in terms of landed volumes with 9.000 tonnes worth EUR 44 million. Octopus is not subject to fishing quotas in the EU, but there is a general minimum conservation reference size set at 750 g ⁸³.

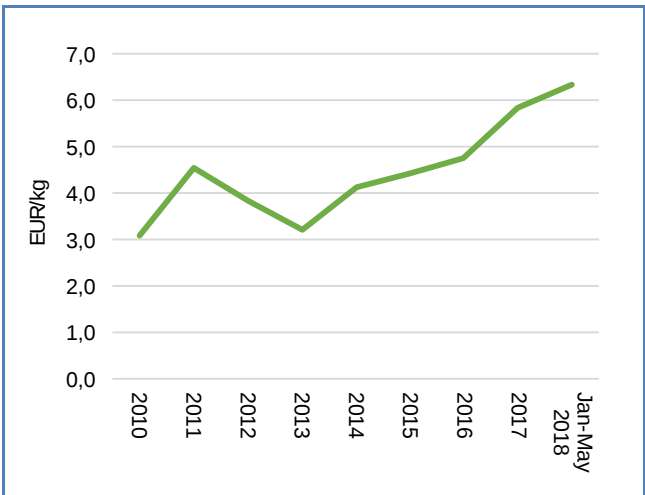
Table 13-1 LANDINGS OF OCTOPUS IN THE EU BY MEMBER STATE (volume in 1000 tonnes, value in million EUR)

Country	2012		2013		2014		2015		2016	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Spain	11	46	12	37	8	34	9	36	9	44
Portugal	7	29	10	28	8	33	6	27	8	36
Italy	7	45	7	49	7	42	7	50	7	49
Greece	2	10	2	9	2	11	2	12	4	21
France	2	6	2	6	2	6	2	6	2	7
Croatia	0	0	1	3	1	3	1	3	1	2
Other	1	1	1	3	1	4	1	4	1	1
Total	30	137	35	133	29	130	27	135	30	161

Source: EUMOFA.

During the past eight years, octopus prices have ranged from 3,07 EUR/kg to 6,36 EUR/kg, a nearly continuous increase of 107%. In 2017, EU first-sales prices increased significantly, and the growth has continued throughout the first months in 2018. In 2017, the average price increased by 22%.

Figure 13-2 EU FIRST-SALES PRICE OF OCTOPUS



Source: EUMOFA.

83 Annex II of Council Regulation (EC) No 850/98.

13.2.2 EXTRA-EU IMPORTS

In 2017, imports of octopus in the EU totalled 101.000 tonnes in volume worth EUR 790 million. There was a small increase in volume and a 22% increase in value from 2016 to 2017. After a large decline in 2013, the import value increased in the following years up to and including 2017.

Spain is the leading importer of octopus in the EU. Since 2013, import value has increased every year and exceeded EUR 450 million in 2017, a 49% increase from 2016. The three main importing countries, Spain, Italy and Portugal, dominated EU imports and represented 92% of total import volume and 94% of value in 2017.

Imports of frozen octopus products dominated the EU market with 98% import share in 2017. Some fresh octopus are also imported to the EU, especially to Italy and Spain, mainly from Senegal and Morocco⁸⁴.

Table 13-2 **EU IMPORTS OF OCTOPUS BY MEMBER STATE (volume in 1000 tonnes, value in million EUR)**

EU Member State	2012		2013		2014		2015		2016		2017	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Spain	28	182	33	133	36	207	45	275	44	308	50	458
Italy	36	183	34	121	37	166	39	197	40	209	36	230
Portugal	5	29	7	25	6	32	9	52	8	50	7	53
Greece	4	22	4	16	3	19	3	20	4	25	3	25
France	2	8	2	6	2	6	2	7	2	8	2	8
Netherlands	0	2	1	2	1	3	1	4	1	4	1	4
Other	3	13	2	6	3	9	2	10	2	10	2	12
Total	78	439	82	310	88	441	102	566	101	613	101	790

Source: EUMOFA.

Table 13-3 **EU IMPORTS OF OCTOPUS BY PRESERVATION STATE (value in million EUR)**

Preservation state	2012	2013	2014	2015	2016	2017
Frozen	428	304	434	559	606	778
Live/Fresh	9	5	7	6	7	8
Smoked	0	0	0	0	0	4
Prepared/Preserved	2	0	0	1	1	1
Unspecified	0	0	0	0	0	0
Total	439	310	441	566	613	790

Source: EUMOFA.

Table 13-4 **EU IMPORTS OF OCTOPUS BY MAIN SUPPLIERS TO THE EU MARKET (volume in 1000 tonnes, value in million EUR)**

Country	2012		2013		2014		2015		2016		2017	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Morocco	23	164	41	179	31	202	46	309	46	336	43	399
Mauritania	9	60	8	29	12	71	16	95	13	96	20	187
Indonesia	6	27	3	11	6	21	7	31	7	32	7	36
Senegal	8	46	4	13	5	23	5	27	5	26	5	39
Mexico	7	29	6	19	9	36	9	34	9	43	5	30
Viet Nam	5	13	3	8	5	14	4	12	3	10	4	16
Other	21	101	16	50	20	75	15	58	17	70	16	84
Total	78	439	82	310	88	441	102	566	101	613	101	790

Source: EUMOFA.

84 EUMOFA.

13.2.3 EXTRA-EU EXPORTS

In 2017, the EU exported 13.189 tonnes of octopus with a value of EUR 118 million to markets worldwide. The average price was 8,90 EUR/kg in 2017. From 2016 to 2017, the export price of octopus increased by 24%.

The export volume has increased each year since 2013. The main EU Member State exporting octopus is Spain, representing 75% of the total export volume.

Octopus is exported from EU Member States to countries worldwide. The main destination market is the United States which imports 68% of the total export volume. In 2017, 13 countries imported more than 50 tonnes of octopus from the EU, including Switzerland, Japan, Argentina, and Brazil.

Table 13-5 **EU EXPORT OF OCTOPUS BY MEMBER STATE (volume in tonnes, value in million EUR)**

Member State	2012		2013		2014		2015		2016		2017	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Spain	7.666	53	5.153	26	5.279	34	6.429	44	8.100	59	9.919	88
Portugal	1.251	8	2.568	11	2.993	17	3.075	18	2.450	17	2.753	25
Italy	435	3	346	2	213	2	290	3	276	2	282	3
Netherlands	50	0	31	0	46	0	40	0	101	1	60	0
Other	160	1	151	1	124	1	125	1	149	1	175	2
Total	9.562	65	8.250	41	8.655	54	9.959	66	11.075	80	13.189	118

Source: EUMOFA.

Table 13-6 **EU EXPORTS OF OCTOPUS TO FOREIGN MARKETS (volume in tonnes, value in million EUR)**

	2012		2013		2014		2015		2016		2017	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value
United States	3.192	21	4.901	23	5.815	35	7.023	45	7.637	54	9.064	81
Switzerland	807	7	1.040	6	849	7	988	8	1.051	10	1.020	11
Japan	1.485	11	236	1	14	0	8	0	245	2	502	3
China	2.092	13	254	1	3	0	123	1	5	0	26	0
Argentina	276	2	259	1	305	2	309	2	406	2	445	4
Brazil	131	1	96	1	394	3	221	2	138	1	461	4
Canada	147	1	98	0	130	1	113	1	207	1	245	2
Russia	340	3	348	2	221	1	0	0	0	0	0	0
Other	1.094	7	1.018	5	924	6	1.174	8	1.387	10	1.427	13
Total	9.562	65	8.250	41	8.655	54	9.959	66	11.075	80	13.189	118

Source: EUMOFA.

13.3 Processing

Octopus is mainly imported to the EU as frozen products and are sent to processing facilities in Europe for secondary processing and value-addition. European processors buy the frozen raw materials which they process before reaching consumers at the end market⁸⁵.

They are usually sent to processing facilities in Europe for secondary processing and value-addition.

The main EU processors of octopus follow the same ranking as the main importers with Spain in the lead. In Spain and Portugal, processors are the main suppliers for retailers and food service. Main processed products are raw packed octopus, whole cooked, cooked tentacles and cooked sliced octopus. Processors in Italy are the main suppliers of processed products to wholesalers and retailers (large scale). Octopus is also processed into canned products.

In supermarkets in Mediterranean countries, a wide range of products are offered to customers. The products range from whole raw frozen products to value-added products that are cut and sold as fresh, fried, marinated or cooked.

In 2017, PRODCOM⁸⁶ data shows that Spain, Italy and the UK⁸⁷ were the largest producers of processed scallops, mussels, cuttlefish, squid and octopus, frozen, dried, salted or in brine, amounting to 203.000 tonnes worth EUR 772 million. Total volumes showed a 37% increase in volume and a 20% increase in value over 2016.

Table 13-7 **SCALLOP, MUSSEL, CUTTLEFISH, SQUID AND OCTOPUS, FROZEN, DRIED SALTED OR IN BRINE BY EU MEMBER STATE (volume in tonnes, value in million EUR)**

Member State	2016		2017	
	Volume	Value	Volume	Value
Spain	118.159	510.568	173.362	616.691
Italy	14.111	49.714	18.027	84.872
United Kingdom	8.117	57.923	12.205	70.796
Portugal	9.433	43.170	9.394	49.861
France	5.009	39.767	5.712	41.633
Greece	6.571	38.237	5.740	33.273
Other	8.650	32.759	7.718	31.993
Total	170.050	772.139	232.157	929.119

Source: PRODCOM.

13.4 Consumption

Octopus products are mostly consumed in southern Europe, especially in Spain, Italy and Portugal. In the rest of Europe, consumption is much lower. In northern Europe, octopus are more often sold in certain niche markets such as restaurants with an Asian or Mediterranean cuisine. In general, the consumption of octopus in Europe is relatively stable⁸⁸. Recently, octopus has gained popularity in Germany and eastern European countries⁸⁹.

In 2016, the annual consumption of octopus in the EU was 0,29 kg per capita. Since the EU Member States in northern Europe consume smaller amounts of octopus, this number is not representative for the Mediterranean countries where octopus is more common to eat. The consumption has been stable in the last couple of years and there are only small variations in both consumption per capita in the EU and household consumption in Italy and Portugal.

Table 13-8 **HOUSEHOLD CONSUMPTION (volume in tonnes and value in EUR 1000)**

Member State*	2015		2016		2017	
	Volume	Value	Volume	Value	Volume	Value
Italy	18	170	17	169	19	188
Portugal	3	23	3	22	2	18
Total	21	193	20	191	21	206

Source: EUMOFA.

*Household consumption data for octopus is only available for Italy and Portugal in the EUMOFA database.

⁸⁵ <https://www.cbi.eu/market-information/fish-seafood/octopus/>

⁸⁶ PRODCOM is a service in Eurostat that provides statistics on production of manufactured goods.

⁸⁷ Mostly for scallops, very little for cephalopods

⁸⁸ <https://www.cbi.eu/market-information/fish-seafood/octopus/>

⁸⁹ <https://www.undercurrentnews.com/2018/03/26/record-high-moroccan-octopus-prices-force-smaller-players-out-of-market/>

This case study is available in the
Monthly Highlights N° 2-2017

14 Oyster



EU oyster production depends strongly on French production and its consumer market. After several years of decreasing production caused by the 2008 disease outbreak in French oyster farming areas, production has increased again since 2014. The key market is France, but a few niche export markets for high-range products have emerged.

14.1 BIOLOGY, RESOURCES AND EXPLOITATION

14.1.1 BIOLOGY

Oyster is the common name for several different families of saltwater bivalve molluscs that live in marine or brackish habitats. Many, but not all, oysters are in the taxonomic superfamily Ostreoidae. Oysters grow naturally in estuaries of brackish water. Oysters are filter-feeders living mostly in the intertidal zone (*Crassostrea* and *Saccostrea*); some are subtidal (*Ostrea*). Oyster larvae are known as spat. Reproduction depends on water temperature and salinity. Before settlement, the larvae spend some time at the pelagic stage and can be widely dispersed by water currents.

Commonly farmed oysters include the Eastern oyster (*Crassostrea virginica*), the Pacific oyster (*Crassostrea gigas*, the most-farmed oyster species worldwide), Belon oyster (*Ostrea edulis*), the Sydney rock oyster (*Saccostrea glomerata*), and the Southern mud oyster (*Ostrea angasi*).

14.1.2 RESOURCE EXPLOITATION AND MANAGEMENT IN THE EU

Oyster farming has a long history and is much more important than oyster fishery in most of producing regions (farmed oyster provided 98% of the world production of oysters in 2014, according to FAO). However, oyster harvesting (hand-gathering, dredging, diving, etc.) still represents a significant share of the production in a few major producing countries, e.g. Mexico (76%), the USA (34%), and to a lesser extent South Korea (7%).

In the EU, the culture of the native flat oyster (*Ostrea edulis*) is limited, despite stable production in recent years, as overexploitation and disease have led to its depletion. The Pacific cupped oyster, native to Japan, was brought to Europe in the 1970s after the depletion of the Portuguese oyster (*Crassostrea angulata*). Thanks to its rapid growth and adaptability to different surroundings, it is now the most widely reared oyster worldwide.

Production starts with the collection of spat in their natural setting. To gather the wild spat, oyster farmers use collectors placed at strategic locations. When the spat has grown to a few millimetres, they are removed from the collectors and are ready for rearing. However, a large share of spat now comes from hatcheries.

The kind of oyster-rearing method used depends on both the environment (tidal range, water depth, etc.) and tradition. Along the Atlantic coastlines of France, oysters are produced mainly by off-bottom culture. The oysters are placed in plastic mesh bags attached to low shore trestles. Bottom culture, where the oysters are placed directly on the shore or below low water, is less common today. Suspended culture, where

oysters are reared on ropes like mussels, is practiced in Spain. This method is suitable for rearing in waters without tides or offshore. Deep-water culture consists of placing the oysters in parks, which can be located at depths of up to 10 m⁹⁰. Over the past decade (as of 2008), Pacific cupped oyster experienced significant mortality in France caused by disease outbreaks (herpes virus in 2008 and *Vibrio aestuarianus* in 2012), which strongly affected production levels and profitability⁹¹. Oyster processing is seldom practiced in the EU, because consumers prefer oysters live or raw. A limited consumption of cooked or prepared oyster exists in southern Europe, but to a lesser extent than in Asia, where cooked or fried oyster is considered a delicacy.

14.2 PRODUCTION

14.2.1 GLOBAL PRODUCTION

Production of all species of oysters amounted to 5,3 million tonnes in 2014. China is by far the leading producer, with 82% total world production in 2014. Other major producers are South Korea (6%), the USA (4%), Japan (3%), and the EU (2%). Between 2004 and 2014, world production experienced a 23% increase, mostly attributable to Chinese production (+33%) and, to a lesser extent, South Korea (+14%). However, significant decreasing trends have occurred in the USA (-12%), Japan (-21%) and the EU (-32%).

14.2.2 EU PRODUCTION

According to FAO, EU production amounted to 93.103 tonnes in 2014, providing approximately 2% of the world supply. France (82% of EU production), Ireland (11%), and the Netherlands (3%) were the main producers. Other notable EU producers are the UK, Portugal, and Spain. In 2015, according to the European Mollusc Producers Association (EMPA), the EU production of oysters was 108.910 tonnes. Pacific cupped oysters accounted for 97,5% and flat oysters for 2,5%. EU production has declined from 2008 owing to a virus, which caused mortality and was particularly active in France, where production decreased 31% in the period 2008–2013. The production stabilised in 2013–2014 and started to rise again in 2015. In 2016, the level of 100.000 to 110.000 tonnes should be reached again, if no other problems emerge. The largest production increases have been observed in Ireland and Portugal, both of which target the French market. The presence of French stakeholders is significant in the Irish and Portuguese fish-farming sector, where they hold 50% of the means of production. Half of the spat used for oyster farming is supplied by hatcheries; the remaining 50% is wild spat collected by farmers. Three farmed oysters have a European geographical indication:

- Whit stable oysters (UK), PGI (protected geographical indication) since 1997;
- Huîtres de Marennes-Oléron (France), PGI since 2009;
- Fal oysters (UK), PDO (protected designation of origin) since 2013.

In France, two *Label Rouge* (*Huîtres fines de claires vertes*, and *Huîtres pousse en claires*) are linked to the PGI *Huîtres de Marennes-Oléron*. In addition, the Limfjord oyster dredge fishery (Denmark) was the first oyster fishery in the world to be granted MSC certification in 2012. In 2013, the two fisheries of the Dutch Oyster Association achieved MSC certification for harvested Pacific cupped oyster and flat oyster (<https://www.msc.org/newsroom/news/dutch-oyster-fisheries-achieve-msc-certification>).

⁹⁰ https://ec.europa.eu/fisheries/sites/fisheries/files/docs/body/oyster_en.pdf

⁹¹ Guide des espèces à l'usage des professionnels (SeaWeb Europe, 2016 Edition).

Table 14-1 WORLD PRODUCTION OF OYSTER SPECIES (volume in tonnes)

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
China	3.281.883	3.346.963	3.455.461	3.508.934	3.354.382	3.503.782	3.642.829	3.756.310	3.948.817	4.218.644	4.352.053
Republic of Korea	264.960	279.026	314.312	350.592	279.161	265.165	290.462	306.007	303.280	252.530	303.347
USA	214.829	180.769	184.745	191.970	173.239	188.836	172.582	144.556	200.316	202.525	188.491
Japan	234.151	218.896	208.182	204.474	190.344	210.188	200.298	165.910	161.116	164.139	184.100
EU 28	136.861	137.030	131.856	134.088	122.329	123.127	118.262	103.744	97.395	92.913	93.103
Mexico	48.608	46.136	48.320	50.265	44.453	40.645	52.715	85.696	51.990	42.945	53.758
Taiwan	20.750	28.430	28.547	28.199	34.514	21.882	36.056	34.643	26.923	27.793	25.276
Philippines	15.993	16.569	16.922	20.596	20.276	20.016	22.644	21.581	20.764	22.175	22.457
Other	73.882	64.590	63.546	66.637	57.627	68.451	72.190	73.882	64.590	63.546	66.637
Total	4.291.917	4.318.409	4.451.891	4.555.755	4.276.325	4.442.092	4.608.038	4.668.260	4.866.622	5.086.631	5.286.011

Source: FAO Fishstat.

Table 14-2 PRODUCTION OF OYSTER SPECIES IN THE EU (volume in tonnes)

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
France	118.762	119.485	112.819	112.986	105.123	105.056	96.294	84.827	83.165	77.699	76.705
Ireland	6.718	6.153	7.304	8.876	8.833	9.938	13.106	11.280	7.560	8.851	9.777
Netherlands	2.873	3.195	3.353	3.390	2.069	2.011	3.958	2.680	2.540	2.501	2.500
UK	2.181	1.700	2.099	1.800	1.379	1.901	1.514	1.254	1.528	1.458	1.346
Portugal	432	533	681	733	1.086	752	616	943	819	869	1.107
Spain	4.896	4.917	4.520	4.965	2.211	2.169	1.607	1.868	1.361	1.060	1.072
Denmark	69	68	122	115	76	67	68	32	70	284	462
Italy	896	942	911	1.212	1.490	1.172	1.050	804	296	142	83
Sweden	32	35	47	10	46	48	38	42	45	45	45
EU-28	136.861	137.030	131.856	134.088	122.329	123.127	118.262	103.744	97.395	92.913	93.103

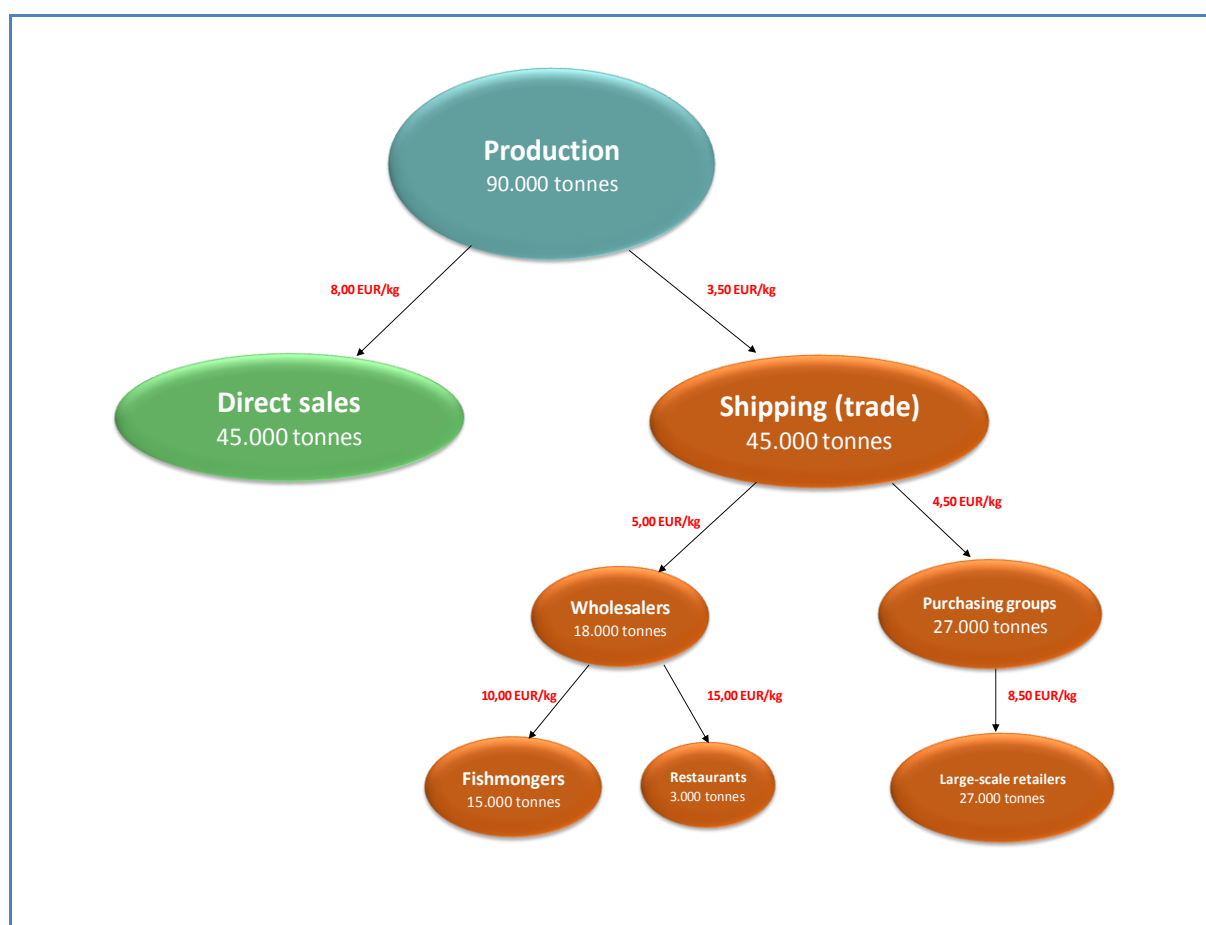
Source: FAO Fishstat.

Table 14-3 EU PRODUCTION BY MAIN SPECIES (2015, tonnes)

Country	Cupped oyster	Flat oyster
Germany	80	0
Ireland	7.000	500
Spain	600	400
France	93.500	1.500
Italy	70	10
Croatia	0	50
Netherlands	2.500	200
Portugal	1.000	0
United Kingdom	1.450	50
Total	106.200	2.710

Source: EMPA.

Figure 14-1 FRENCH OYSTER SUPPLY CHAIN



Source: EUMOFA and CNC (2014 data)

14.3 FOCUS ON THE FRENCH SUPPLY CHAIN

France had 4.246 shellfish farmers in 2016 (source: CNC), of whom 3.022 farmed oysters. Of these, 951 farmed on an exclusive basis. The rest farmed non-exclusively, usually in combination with other shellfish farming activities, in most cases mussel farming. The number of oyster farmers fell slightly in 2014, as consequence of the mortality episodes (as mortality affects the juveniles, the effects on production and profitability are being felt two years later) and the retirement of older farmers, which led to a small decrease in areas devoted to oyster farming in 2015–2016. The total turnover for 2014 of the French Pacific cupped oyster supply chain, as calculated by the French Shellfish Farming Committee (*Comité National de la Conchyliculture* or CNC), is close to EUR 1,2 billion, for a production of 90.000 tonnes: EUR 517,5 million at the farm level, EUR 121,5 million at the wholesale level, and EUR 424,5 million at the consumer level. A major characteristic of the French oyster supply chain is that half of the production is sold directly to consumers by oyster farmers

14.4 TRADE

14.4.1 EU TRADE

Exchanges between EU Member States are relatively important and have significantly increased in recent years, with intra-EU exports exceeding 18.000 tonnes and EUR 83 million in 2015. Extra-EU imports are negligible (2,2 tonnes in 2015), whereas extra-EU exports are more than 3.000 tonnes (for EUR 26,3 million).

The largest extra-EU exporters are France (80% of total export value in 2015) and Ireland (13%). Within the EU,

France (49% of total intra-EU export value in 2015) is the largest, followed by Ireland (27%), the Netherlands (10%), and the UK (5%).

Within the EU, France exports mainly to Italy (3.874 tonnes in 2015), the Netherlands (769 tonnes), Spain (676 tonnes), Belgium (549 tonnes), and Germany (337 tonnes). Outside the EU, France's main clients are China (1.118 tonnes in 2015), Hong Kong (572 tonnes), Switzerland (261 tonnes), and United Arab Emirates (117 tonnes).

The largest EU importers are France (31% of total import value in 2015), Italy (27%), Spain (11%), Belgium (9%), and Germany (4%). France sources oysters from Ireland (4.126 tonnes in 2015), the UK (1.954 tonnes), and the Netherlands (403 tonnes). Italy imports mainly from France (4.097 tonnes), the Netherlands (940 tonnes), and Croatia (347 tonnes). Spain imports from France (920 tonnes), the Netherlands (513 tonnes), Italy (482 tonnes), and Ireland (256 tonnes). Belgium's key suppliers are the Netherlands (986 tonnes) and France (492 tonnes).

Table 14-4 **EU EXPORTS OF LIVE OYSTERS (value in EUR)**

Trade flow	2012	2013	2014	2015
Intra-EU	105.056	96.294	84.827	83.165
Extra-EU	9.938	13.106	11.280	7.560

Source: Comext (CN 03 07 11).

Table 14-5 **EU EXPORTS OF LIVE OYSTERS IN 2015 (volume in tonnes, value in 1000 EUR)**

Country	Extra-EU		Intra-EU	
	Tonnes	1000 EUR	Tonnes	1000 EUR
France	2.477	21.056	6.991	40.879
Ireland	423	3.553	5.837	22.588
Netherlands	125	626	1.571	8.422
UK	36	289	1.187	4.163
Italy	20	90	488	1.973
Portugal	3	5	373	1.106
Spain	45	392	182	587
Denmark	9	80	111	970
Other	36	228	547	2.412
EU-28	3.173	26.319	17.286	83.145

Source: Comext (CN 03 07 11).

Table 14-6 **EU IMPORTS OF LIVE OYSTERS IN 2015 (volume in tonnes)**

Country	Extra-EU		Intra-EU	
	Tonnes	1000 EUR	Tonnes	1000 EUR
France	0,4	21.056	6.330	26.039
Netherlands	1	626	731	3.311
UK	-	289	1.187	1.465
Italy	-	90	5.556	22.397
Germany	0,2	5	600	3.372
Spain	-	392	2.368	9.331
Belgium	0,1	80	1.484	7.438
Other	1	228	529	7.958
EU-28	2	26.319	18.785	83.723

Source: Comext (CN 03 07 11).

14.5 OYSTER HOUSEHOLD CONSUMPTION

The key feature of oyster consumption is its strong seasonality. In France, 45% is consumed in December. The consuming population is elderly. The age group consuming most are people over 65 years old, followed by the categories 50–64 years and 35–49 years. For most consumers, consumption begins at the age of 40 and peaks at 65. To develop consumption, French stakeholder associations aim at lowering the age of first consumption. At the regional level, oyster is particularly popular in the west, the southwest, the southeast, and the Paris region.

14.6 MARKET PERSPECTIVES

The perspectives are positive for the French market. It is expected that French production will return to its pre-mortality-episode production level, i.e. 130.000 tonnes, in coming years.

The European market, excluding France, is stable. The future of Asian markets looks good. China has huge potential, and France already exports more than 1.000 tonnes. The perspective for Russia, which was on a positive trend before the import ban, is also good.

15 Salmon

This case study is available in the
Monthly Highlights N° 2-2018

Figure 15-1 **MAIN PRODUCING COUNTRIES OF ATLANTIC SALMON**



Source: FAO.

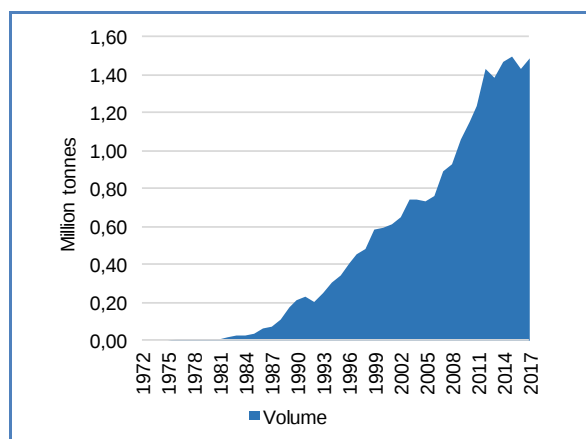
Salmon has been a staple of the diet of Europeans for centuries, mainly due to its historical abundance along the European coast. Wild salmon has been captured in Europe since Paleolithic times, and its importance can be recognized by the fact that regulations to protect salmon stocks have existed since at least 1030 AD⁹².

Atlantic salmon (*Salmo salar*) is the most important aquaculture species in Europe and a well-acknowledged and popular species for recreational fisheries. Wild Atlantic salmon are found in the North Atlantic on both the American and European side, distributed from Cape Cod and Portugal in the South to Labrador and Russia in the North. It is also found around the North Atlantic Islands, e.g. in the UK, Iceland, Greenland⁹³ and in the Baltic.

The species is known for undergoing long migrations and significant physiological changes during transitions of habitats from freshwater rivers, to coastal seas, and back to freshwater rivers to spawn⁹⁴. Atlantic salmon can be highly migratory in the ocean, undertaking feeding migrations in a broad range of areas⁹⁵. This species has for long been a subject of conflict between various stakeholders, such as commercial fishermen, recreational fishermen and the farming industry⁹⁶. Danube salmon (*Hucho hucho*) is a central European salmonid that lives exclusively in freshwater. Before the series of constructions of large hydroelectric power plants in Europe, which blocked the species access to important spawning grounds, the species was widespread in Southern Germany and Austria. It has for a long time been of interest for fish farmers, scientist and recreational fishers, but its popularity has never equaled that of other salmonids species. Danube salmon has primarily been targeted by anglers because of its size and has never been a part of commercial fisheries. Today, it is threatened by extinction and is classified as an endangered (EN) species according to the IUCN criteria⁹⁷. It is severely fragmented within the Danube drainage, and most of the populations is depend upon stocking, with very limited natural reproduction⁹⁸.

15.1 HISTORY OF SALMON FARMING IN EUROPE

Figure 15-2 **HISTORIC DEVELOPMENT FOR EUROPEAN ATLANTIC SALMON PRODUCTION (1972–2017)**



Source: Kontali Analyse.

The farming of Atlantic salmon dates back to the 19th century, when hatchery techniques were developed in the United Kingdom, which was the first country involved in the production of immature fish to restock rivers for recreational fishing⁹⁹. In the 1950s – 1960s, salmon farming pioneers in Norway started to experiment in cooperation with a wide-ranging research environment, with the aim of producing salmon for human consumption. This cooperation created a good basis for further growth potential in the salmon farming industry. Early in the 1970s, the development of floating cages gave the Norwegian salmon farming industry the opportunity to benefit from the natural conditions, with good sea temperatures, salinity and currents in sheltered fjords¹⁰⁰. The Norwegian success sparked the development of salmon farming, first in Europe, and then in all temperate seas in both hemispheres (figure 1). The now wide-spread farmed Atlantic salmon was based on a hybrid stock resulting from cross-fertilization of the Norwegian stock with different local stocks¹⁰¹.

⁹² The History Of Salmon 2.0

http://www.westcoast.fisheries.noaa.gov/publications/recovery_planning/salmon_steelhead/domains/north_central_california_coast/central_california_coast_coho/history_i.pdf

⁹³ http://www.fao.org/fishery/culturedspecies/Salmo_salar/en

⁹⁴ <https://www.marine.ie/Home/site-area/areas-activity/fisheries-ecosystems/salmon-life-cycle>

⁹⁵ <https://academic.oup.com/icesjms/article/69/9/1538/635167>

⁹⁶ Whelan, B., Aas, Ø., Uglem, I., Curtis, J. & Dervor, B. (2006). «Assessment of the socio-economic value of aquaculture and sport angling for wild in salmonids northwestern Europe. Implications for treatments for sea lice infestation." NINA Report no. 126. 45 pp.

⁹⁷ <http://www.iucnredlist.org/details/10264/0>

⁹⁸ Witkowski, A., Bajic, A., Treer, T., Hegedis, A., Maric, S., Sprem, N., Piria, M & Kaputsta, A. (2013). "Past and present of perspectives for the Danube huchen, Hucho (L.). In the Danube Basin". Arch.Pol.Fish. (2013) 21: 129-142.

⁹⁹ https://ec.europa.eu/fisheries/marine_species/farmed_fish_and_shellfish/salmon_en

¹⁰⁰ Hovland, W., Møller, D., Haaland, A., Kolle, N., Hersoug, B., Nævdal, G (2014). "Over den leiken ville han rå Norsk havbruksnærings historie".

Fagbokforlaget Vigmostad & Bjørke AS. Bergen, 2014.

¹⁰¹ https://ec.europa.eu/fisheries/marine_species/farmed_fish_and_shellfish/salmon_en

Although rapid production growth has led to several market collapses, and the industry has experienced considerable fish disease, salmon lice, salmon escapes and pollution problems¹⁰², the industry continues to grow. Currently, most of the farmed Atlantic salmon in Europe is produced in floating cages in sea, while there are a few land-based farms. The fish is normally harvested after one to two years in the water at sizes around 5 kg¹⁰³. The European production of Atlantic salmon has since the early 70s increased from approximately 150 tonnes to almost 1,5 million tonnes WFE in 2017¹⁰⁴ (figure 2). The most important producing country in Europe is Norway, followed by the UK, Faroe Islands and Ireland. Chile is the largest producer outside of Europe. Most modern salmon farming companies today handle salmon from egg to slaughter, before it gets processed and marketed in various types of products¹⁰⁵. Atlantic salmon is now found in dozens of different product preparations available in retail and food-service segments¹⁰⁶.

15.2 FISHERIES AND AQUACULTURE TRENDS FOR ATLANTIC SALMON

15.2.1 FISHERIES

Wild Atlantic salmon is distributed widely in the North Atlantic Ocean (figure 3), making many parties involved in the management of the species. Today, all fishing of wild Atlantic salmon in rivers and sea is highly regulated. The North Atlantic Salmon Conservation Organization (NASCO) has the responsibility for its conservation, restoration, enhancement and rational management. Distant-water salmon fisheries, e.g. in Greenland and Faroe Islands which target many Atlantic salmon strains originating from different rivers and countries, are regulated by NASCO under the terms of the convention.

Sovereign states have the responsibility for regulation of the Atlantic salmon fisheries targeting salmon originating from their own rivers¹⁰⁷. Most of today's catches of wild Atlantic salmon are done in recreational fisheries in rivers, where catch and release is increasingly common. This trend is a result of salmon management aimed at conserving stock and maintaining the opportunity for recreational fisheries¹⁰⁸. Norway, the UK, and Iceland are acknowledged and well-known destinations in Europe for anglers aiming to catch wild Atlantic salmon. Because of the species popularity, fishing rights in rivers holding wild Atlantic salmon commonly are sold or rented out by the fishing rights owners, often for significant amounts¹⁰⁹.

Figure 15-3 DISTRIBUTION OF WILD ATLANTIC SALMON



Source: Wikipedia.

Fisheries after wild Atlantic salmon in Europe mainly occurs in Norway, Iceland, UK, and Ireland, where Norway accounts for approximately 60% of the total wild Atlantic salmon catches. The preliminary nominal catches¹¹⁰ of Atlantic salmon in Europe in 2016 was 984 tonnes, which was 14 tonnes less than in 2015 (table 1). The changes in catches may be a result of increasing usage of catch and release in recreational fisheries, which is not included in these numbers¹¹¹. Most catches of wild Atlantic salmon in Europe occurs in rivers, and nets and traps used in sea fisheries to catch wild Atlantic salmon has declined significantly over time in Europe. This reduction reflects increasingly restrictive measures, including closure of fisheries, to reduce levels of exploitation in many countries¹¹². Limited amounts of wild Atlantic salmon from fisheries are sold and exported, although most of the sales occur in local markets.

¹⁰² Hovland, W., Møller, D., Haaland, A., Kolle, N., Hersoug, B., Nævdal, G (2014). "Over den leiken ville han rå Norsk havbruksnærings historie". Fagbokforlaget Vigmostad & Bjørke AS. Bergen, 2014.

¹⁰³ Marine Harvest Industry Handbook

¹⁰⁴ Whole Fish Equivalent – fish without blood, not gutted.

¹⁰⁵ Kontali Analyse

¹⁰⁶ https://ec.europa.eu/fisheries/marine_species/farmed_fish_and_shellfish/salmon_en

¹⁰⁷ ICES. (2017). "Report of the Working Group on North Atlantic Salmon (WGNAS)." 29 March–7 April 2017, Copenhagen, Denmark. ICES CM 2017/ACOM: 20. 296 pp.

¹⁰⁸ ICES. (2017). "Report of the Working Group on North Atlantic Salmon (WGNAS)." 29 March–7 April 2017, Copenhagen, Denmark. ICES CM 2017/ACOM: 20. 296 pp.

¹⁰⁹ Toivonen, A-L., Appelblad, H., Bengtsson, B., Geertz-Hansen, P., Gudbergson, Kristofersson, D., Kyrkjebø, G., Navrud, S., Roth, E., tuunainen, P & Weissglas, G. (2000). "Economic Value of recreational fisheries in the Nordic countries." TemaNord 2000:604. Nordic Council of Ministers, Copenhagen 2000

¹¹⁰ Nominal Catch: Round, fresh weight of wild Atlantic salmon and fish-farm escapees that are caught and retained. Catch and release salmon from recreational fisheries is not included.

¹¹¹ ICES. (2017). "Report of the Working Group on North Atlantic Salmon (WGNAS)." 29 March–7 April 2017, Copenhagen, Denmark. ICES CM 2017/ACOM: 20. 296 pp.

¹¹² ICES. (2017). "Report of the Working Group on North Atlantic Salmon (WGNAS)." 29 March–7 April 2017, Copenhagen, Denmark. ICES CM 2017/ACOM: 20. 296 pp.

Table 15-1 **NOMINAL CATCH OF ATLANTIC SALMON IN EUROPE**

Country	2013	2014	2015	2016
Norway	475	490	580	610
Iceland	147	69	125	118
Sweden	14	30	16	9
Denmark	11	9	9	9
Finland	46	59	45	51
Ireland	87	57	63	58
France	11	12	16	6
Spain	5	6	5	5
UK	207	143	139	118
Europe	1003	875	998	984

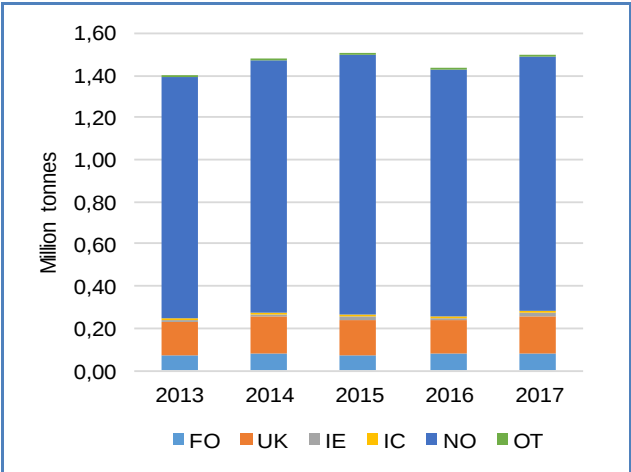
Source: ICES.

15.2.2 **AQUACULTURE**

The production of Atlantic salmon in Europe has been relatively stable the last five years compared to earlier years. The all-time peak was achieved in 2015 with approximately 1,5 million tonnes WFE. However, the production decreased by 4% in 2016 as a result of poor biological conditions, and in the following year the production was again close to the 2015 level (figure 4).

Norway is the largest producer of Atlantic salmon in Europe, accounting for 81% of the European production of this species; the second largest producer, UK, accounts for 12%. During 2013-2017, Iceland has had the fastest growth rate, with production rising by 255%. However, its share on total is still less than 1%¹¹³.

Figure 15-4 **DEVELOPMENT IN EUROPEAN AQUACULTURE PRODUCTION OF ATLANTIC SALMON (2013–2017)**



Source: Kontali Analyse.

Despite volumes produced having been relatively stable during the last five years, the first-sale value of farmed Atlantic salmon in Europe has increased by almost 40%, amounting to approximately EUR 8,7 billion¹¹⁴ in 2017. The salmon farming industry is known for its cyclical ups and downs, but the average earnings has not dropped below break-even since early 2000. The European salmon farming sector went through considerable consolidation over the last decade. Historically, the salmon farming industry was made up by small local companies¹¹⁵, but have now consolidated to more large seafood groups, often listed on stock exchanges. The top 10 companies now control approximately 60% of the total production in Europe, while companies listed on the Norwegian stock exchange control approximately 58% of all European Atlantic salmon production¹¹⁶.

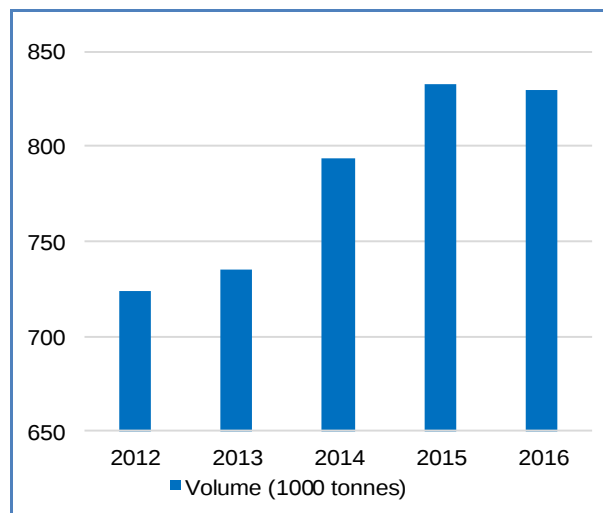
¹¹³ Kontali Analyse
¹¹⁴ Kontali Analyse
¹¹⁵ Marine Harvest Industry Handbook
¹¹⁶ Kontali Analyse

15.3 EU SALMON TRADE

In 2016, the EU imported 830.137 tonnes of salmon (including wild Pacific salmon, representing approx. 5 % of this), with a value of almost EUR 5,5 billion. These imports mainly consist of fresh whole salmon originating from Norway, entering into the EU market through Sweden and Denmark¹¹⁷. Compared to 2012, imported volumes have increased by 15% while the value grew by 83% (figures 5 and 6)¹¹⁸.

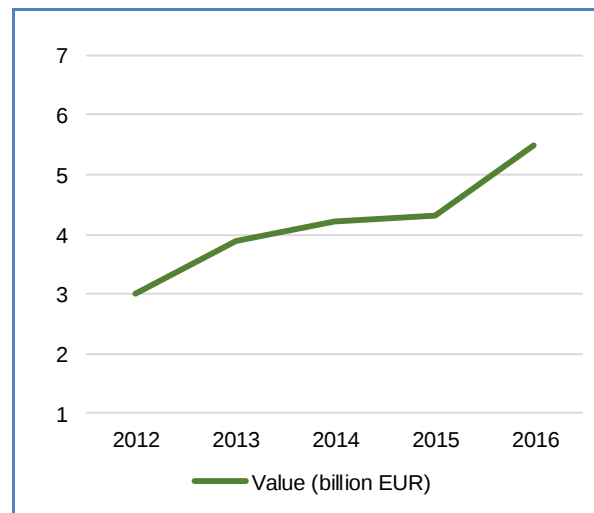
The main suppliers of Atlantic salmon to the EU in 2016 were Norway, the Faroe Islands and Chile. Norway sold to the EU 695.548 tonnes, covering 84% of the EU salmon imports in 2016. In the same year, EU internal production of this species was approximately 170.100 tonnes WFE¹¹⁹.

Figure 15-5 IMPORTS OF SALMON IN THE EU



Source: EUMOFA.

Figure 15-6 VALUE OF SALMON IMPORTED IN THE EU



Source: EUMOFA.

In 2016, algae-bloom killed as much as 25 million farmed salmon in Chile. In addition, through 2015 and 2016, Scotland and Norway suffered poor biological conditions due to sea-lice and side effects of implementing more and new treatment methods against sea-lice. These events in Chile, Scotland and Norway led to a worldwide 7% reduction in the supply of farmed Atlantic salmon from 2015 to 2016¹²⁰. Consequently, the import price of salmon to the EU increased by 25%¹²¹, leading to a large increase in value terms (figure 6). From 2012 to 2016, the average import price rose by 73%.

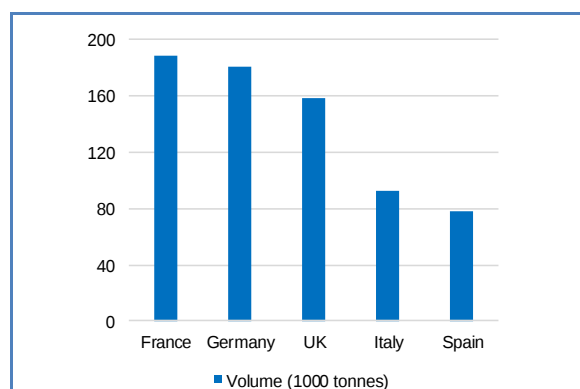
EU exports of salmon, primarily originating from the UK, amounted to 82.363 tonnes worth EUR 592 million in 2016. Salmon from the EU is mainly exported fresh or frozen, but the biggest share of the value comes from exports of smoked salmon fillets¹²².

15.4 THE EU MARKET FOR SALMON

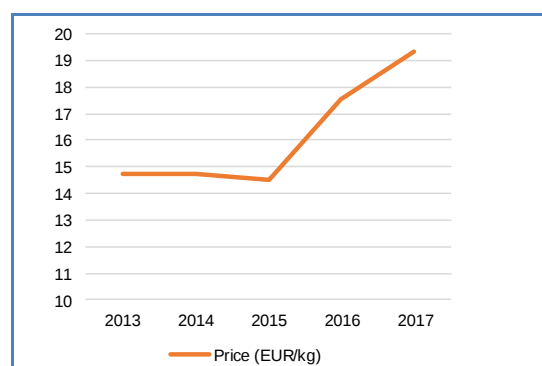
Salmon in the EU is distributed through the retail and food-service sector, including fishmongers, large-scale retail chains, restaurants, caterings, canteens, schools, and hospitals. It is mainly consumed fresh or smoked, and apparent consumption per capita of farmed salmon in 2015 was 2,17 kg. Over the last decade, EU consumption has increased by 40%¹²³. The most important European seafood consumption trends are growing demand for convenient products, interest in the health benefits from consuming seafood, an increase in e-commerce and low-cost stores and an increased focus on sustainability. These trends have led to more “food-to-go / ready-to-eat” meals available in grocery, and private labeling of products to emphasize quality, health benefits and sustainability¹²⁴.

In 2016, the main EU Member States where Atlantic salmon was consumed were France, the UK, Germany, Italy and Spain (figure 7). Salmon is the most consumed species in France, mainly sold in grocery. However, due to increased retail prices of salmon in 2016 and 2017 (figure 8), consumers have searched for cheaper alternatives. This trend can also be seen in other main consuming Member States except from Italy, where salmon consumption is continuing to increase¹²⁵.

¹¹⁷ The EU fish market – 2017 Edition¹¹⁸ EUMOFA¹¹⁹ Kontali Analyse¹²⁰ Kontali Monthly Salmon Report¹²¹ EUMOFA¹²² The EU Fish Market – 2017 Edition¹²³ The EU Fish Market – 2017 Edition¹²⁴ Norwegian Seafood Council (2017). “Seafood development in European and American grocery”.¹²⁵ Norwegian Seafood Council (2017). “Seafood development in European and American grocery”.

Figure 15-7 **ESTIMATED TOP 5 CONSUMING COUNTRIES OF ATLANTIC SALMON IN THE EU (2016)**

Source: Kontali Analyse.

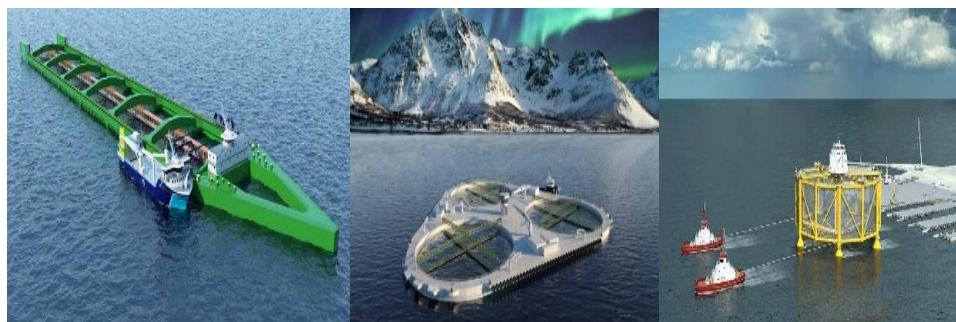
Figure 15-8 **AVERAGE RETAIL PRICES OF ATLANTIC SALMON FILLETS IN FRANCE (2013 – 2017)**

Source: SNM.

Consumption of organic fish and seafood products has been continuously rising since 2012, with salmon being one of the most important species. This is a result of the increased awareness of the consumers. However, production and consumption of organic fish and seafood today still represents a niche. Retail companies and traders of fish and seafood are adapting to the trend, so more organic seafood is available to the EU consumer. The supply of organic salmon to the EU market consist of internal production (mainly Irish) and imports solely from Norway. Organic salmon provides good sales price premiums, which in most cases cover the extra costs involved in organic production¹²⁶. Fish processing is an important industry in the EU and salmon is one of the most important species used as raw material by the sector. The industry produces smoked salmon, portions and ready meals, and is mainly carried out in Poland, France, the UK, the Baltic States and the Netherlands. The EU is the most important market for consumption of smoked salmon, where Germany and France are the most significant Member States¹²⁷.

15.5 RECENT TRENDS

In Europe, Atlantic salmon is still mainly farmed in floating sea cages, as it has since the early 70s. However, in 2015 the Norwegian Government announced a development-license scheme with the purpose of motivating the salmon industry to invest in new farming technologies. This has led to the creation of various new farming concepts, such as closed and semi-closed constructions in sea, as well as open solutions aimed at producing salmon off-shore¹²⁸.

Figure 15-9 **NEW SALMON FARMING CONCEPTS**

From the left: HAVFARMEN (Nordlaks/NSK Ship Design), FJORDMAX (Salaks), OCEAN Farm (Salmar Ocean Farming).

Source: Nordlaks / NSK Ship Design; Salaks; Salmar Ocean Farming.

Of many applications to the new development licenses, five concepts have so far been approved and granted capacity by the Norwegian authorities. Two of them are going to produce salmon off-shore at more vulnerable sites, two others are closed constructions and one concept is semi closed¹²⁹. The development license scheme is expected to contribute to innovation and improving technology in the sea-based salmon industry in the years to come. Many full-cycle pilot land-based salmon farms have been built around the world, as well as some commercial ones¹³⁰. The production systems built today still meets challenges and have not been free from problems, but improving technology and knowledge are making it increasingly feasible to produce salmon on land on a large scale¹³¹. Europe is the leading continent for land-based salmon farming, but still produces only small quantities of Atlantic salmon¹³². The production of Atlantic salmon in Europe is estimated to grow by 6% in 2018 compared to 2017, reaching almost 1,6 million tonnes. The growth is mainly driven by the improvement in biological conditions in the sea through 2017, leading to better productivity in standard floating sea cage farming¹³³. Salmon consumption in Europe continues to be driven by convenience and by the benefits of consuming seafood holding healthy fatty acids. In addition, as consumers' awareness rises, demand for farmed salmon certified by different schemes that guarantee sustainable production may continue. Salmon is keeping its position as a leading source of seafood nutrition in Europe and will continue to be a staple in the diet to Europeans, as it has been for centuries.

¹²⁶ EU Organic Aquaculture, EUMOFA 2017

¹²⁷ Marine Harvest Industry Handbook

¹²⁸ Norwegian Directorate of Fisheries

¹²⁹ Norwegian Directorate of Fisheries

¹³⁰ Warrer-Hansen, I (2015). "Potential for Land based Salmon Grow-out Recirculating Aquaculture systems (RAS) in Ireland." A report for the Irish Salmon Grower's Association.

¹³¹ Warrer-Hansen, I (2015). "Potential for Land based Salmon Grow-out Recirculating Aquaculture systems (RAS) in Ireland." A report for the Irish Salmon Grower's Association.

¹³² Kontali Analyse

¹³³ Kontali Monthly Salmon Report

16 Sardine



In the past ten years, the EU sardine supply has changed significantly. Between 2004 and 2014, with the exception of Croatia (+241% in volume) and Italy (+116%), most of the main sardine-fishing countries in the EU have experienced a decline in landings, especially in Portugal (–79%), Spain (–30%) and, to a lesser extent, in France (–19%) and Greece (–9%). The main reasons were the decline in sardine stocks in the southern Atlantic and western Mediterranean. As a result, the EU market supply for sardine (mostly consumed fresh or canned) has experienced strong changes, trends which are likely to last in the near future.

16.1 BIOLOGY, RESOURCES, AND EXPLOITATION

16.1.1 BIOLOGY

Sardine, or European pilchard (*Sardina pilchardus*), is a small pelagic species found in the Northeast Atlantic from Norway and Scotland to Senegal, and in the Mediterranean.

Its maximum length is 25 cm, and the common length is 10–20 cm; in the EU, the minimum landing size is 11 cm. Seasonally, the species is available to fisheries mostly between April and September, with peaks during summer.

16.1.2 RESOURCE, EXPLOITATION, AND MANAGEMENT IN THE EU

Two stocks are considered in EU Atlantic waters, mostly fished by purse-seiners (Spain, France, and Portugal) and pelagic trawlers (France): the Northern stock (ICES Subareas VII and VIIIa,b,d), fished mainly by France, Spain, the UK, and the Netherlands, and the Southern stock (ICES Subarea VIIIc and Division IXa), fished by Spain and Portugal.

For the **Northern stock**, total landings were 45.000 tonnes in 2014; landings have doubled since 1990. In 2014, landings from ICES Subarea VIII were 39.000 tonnes, 45% of which were caught by France and 55% by Spain. In recent years, the Spanish fleet has increased effort in ICES Subarea VIIIb, owing to the decrease in fishing opportunities for the Southern stock. Sardine biomass in ICES Subarea VIII has increased during the past five years. Nevertheless, ICES advised that catches should be no more than 33.065 tonnes in each of the years 2016 and 2017.

For the **Southern stock**, landings were 27.900 tonnes in 2014 (43% caught by Spain and 57% taken by Portugal). However, landings have decreased since 1981. A sharp decrease of 65% (from 80.400 tonnes to 27.900 tonnes) took place between 2011 and 2014, caused by the stock's decline and catch regulations. Sardine is important for the fishery sector and fish canning industries in those countries. Southern stock biomass decreased 71% during the past ten

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years, because of prolonged low recruitment. Currently, it is at its lowest historical level.

In the **Mediterranean**, several sardine stocks are exploited by EU fleets. In the past ten years, the biomass of **Gulf of Lions** sardine stock was reduced by two-thirds, from more than 200.000 tonnes to less than 67.000 tonnes. This has led to a strong decrease in landings in the region (French and Spanish fleets).¹³⁴

In terms of **fishery management**, none of the stocks is managed by EU TAC. Management measures for the Northern stock include technical measures and limits on purse-seine licensing in French waters. Management measures for the Southern stock include technical measures and limits on fishing effort and catches. Between 2011 and 2014, strict catch limits helped reduce fishing mortality. In February 2016, Spain and Portugal agreed to set maximum catches for both countries at 14.000 tonnes, following the ICES scenario of “precautionary considerations”. So far, the Mediterranean EU Member States have adopted 34 national management plans under the MEDREG¹³⁵, for fisheries conducted with trawlnets, purse-seines, shore-seines, boat-seines, and dredges within their territorial waters. In the Adriatic, a multi-annual plan for small pelagic fisheries is currently in development.

16.2 PRODUCTION

16.2.1 CATCHES

Catches of *Sardina pilchardus* amounted to 1,2 million tonnes in 2014, down 3% from 2010, the best year in the past decade.

The leading producer by far is Morocco, which provided 70% of total world production in 2014. Moreover, during the past ten years, Moroccan annual sardine catches increased from 500.000 to 800.000 tonnes. Other important producers outside the EU are Mediterranean countries (Algeria, Tunisia, and Turkey).

EU production provides approximately 21% of the world supply. In 2013, Croatia became the main EU producer and accounted for 22% of EU supply in 2014. Other important producers in the EU are the Netherlands (20%), Spain (18%), Italy (10%), France (10%), and Portugal (6%).

Sardine caught by the EU fleet come from three fishing areas:

- the Mediterranean (43% of total catches in 2014), where Croatia, Italy, and Spain are the main fishing nations;
- the Northeast Atlantic (30%), where Spain, France, and Portugal are the main fishing nations;
- the Eastern-Central Atlantic (27%), where the Netherlands and Lithuania catch sardine in the framework of the Sustainable Fisheries Partnership Agreements signed with Morocco and Mauritania.

¹³⁴ Presentation project ECOPELGOL (small pelagics stocks monitoring in the Western Med), 19/03/2016, Ifremer Sète, France.

¹³⁵ Council Regulation (EC) No 1967/2006 of 21 December 2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea.

Table 16-1 **WORLD LANDINGS OF SARDINE (volume in tonnes)**

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
EU-28	276.026	269.806	271.328	256.155	258.284	275.862	297.584	312.582	231.000	196.947	249.503
Algeria	63.796	69.512	83.928	73.703	40.047	55.289	31.219	33.975	31.873	36.169	35.762
Morocco	644.743	630.000	542.002	519.293	646.979	790.632	771.547	504.029	672.836	705.898	851.355
Tunisia	14.256	18.612	24.802	19.871	18.386	19.024	14.359	21.468	20.577	20.449	19.279
Turkey	12.883	20.656	15.586	20.941	17.531	30.091	27.639	34.709	28.248	23.919	18.077
Other	51.427	77.816	121.868	122.879	84.068	73.690	103.608	130.398	34.406	17.744	33.788
Total	1.063.131	1.086.402	1.059.514	1.012.842	1.065.295	1.244.588	1.245.956	1.037.161	1.018.940	1.001.126	1.207.764

Source: FAO Fishstat.

Table 16-2 **LANDINGS OF SARDINE IN THE EU (volume in tonnes)**

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Croatia	16.357	16.521	16.950	16.900	21.194	32.191	29.600	46.051	43.734	53.085	55.783
France	31.450	37.724	40.295	38.658	29.657	39.780	26.233	24.109	20.387	27.484	25.601
Greece	9.217	11.258	11.321	9.410	10.544	10.072	6.511	5.809	4.993	6.863	8.404
Ireland	12.997	8.442	1.281	82	236	2.887	14.143	4.378	8	236	19
Italy	11.891	12.038	14.215	14.134	12.025	15.637	16.274	14.377	19.947	22.606	25.729
Latvia	1.645	5.528	8.281	6.282	6.454	8.229	9.756	13.802	7.535	2.048	985
Lithuania	15	920	8.711	4.073	9.123	15.017	27.159	25.565	4.620	2.415	11.615
Netherlands	46.770	31.825	20.259	10.318	9.608	33.933	46.861	52.091	27.028	4.605	50.868
Portugal	75.928	74.374	74.133	91.645	71.165	60.927	63.765	57.286	32.344	27.752	16.129
Spain	64.353	66.032	70.103	60.317	56.479	44.281	46.512	49.830	51.118	44.142	45.104
United Kingdom	2.682	3.630	2.191	3.673	28.339	6.322	8.223	5.490	7.629	3.977	3.889
Other EU	2.721	1.514	3.588	663	3.460	6.586	2.547	13.794	11.657	1.734	5.377
EU-28	276.026	269.806	271.328	256.155	258.284	275.862	297.584	312.582	231.000	196.947	249.503

Source: FAO Fishstat.

Table 16-3 **EU MAIN PRODUCERS OF CANNED SARDINE (2014)**

	Spain	France	Portugal	Croatia	Italy	Greece
Value (1000 EUR)	92.365	74.962	52.125	18.205	8.580	7.310
Volume (tonnes)	16.237	8.305	19.202	6.365	1.536	1.428
Price (EUR/kg)	5,69	9,03	2,71	2,86	5,59	5,12

Source: PRODCOM.

16.2.2 PROCESSING

The sardine canning industry is important mostly in southern European countries. Spain and Portugal are the main producers of canned sardine in the EU, with an annual production between 15.000 and 20.000 tonnes, followed by France and Croatia producing approximately 8.000 and 6.000 tonnes, respectively.

The industrial landscape has changed considerably in the second half of the 20th century, and many sardine canneries have disappeared. For instance, France, which had more than 200 sardine canneries on the Atlantic coast in the early 1950s, had only 12 in 2013.

16.3 TRADE

16.3.1 EU TRADE

In 2015, the EU had a sardine trade deficit of EUR 100 million. The deficit is attributable mainly to the import of canned sardine but also, to a lesser extent, to the imports of frozen sardine needed by the EU canning industry.

Morocco is by far the main supplier of both frozen sardine (23.100 tonnes in 2015) and canned sardine (36.000 tonnes). Intra-EU trade is active for each preservation state. Spain and Croatia are the main suppliers of both fresh and frozen, while Portugal dominates the intra-EU trade for the canned product.

It is worth noting that extra-EU imports of fresh sardine are almost non-existent (78 tonnes in 2015), demonstrating that there is no alternative to the European sardine for fresh supply. Because of its fragility and its limited suitability to manipulation, fresh sardine must be consumed quickly. Flows of fresh sardine are mostly limited to neighbouring countries (from Croatia to Italy and from Spain to Portugal). The main landing ports for small pelagics in Morocco are Dakhla and Laayoune, situated 2.000 km and 1.500 km from Tangier, respectively. The distance is too great to make exports of fresh sardine to Europe feasible.

Canned products form the core of extra-EU exports and have many destinations, the first three of them representing just over one-third.

Table 16-4 **EU TRADE BALANCE OF SARDINE IN 2015 (value in 1000 EUR)**

	Trade flow	Fresh	Frozen	Prepared/Canned	Total
Extra EU	Export	953	11.805	41.071	53.829
	Import	95	21.752	132.210	154.057

Source: EUMOFA.

Table 16-5 **SARDINE IMPORTS in 2015 (ORIGIN OF EU IMPORTS)**

Preservation state	Trade flow	European sardine		Other sardine*	
		Main origin	Total value (million EUR)	Main origin	Total value (million EUR)
Fresh	Intra EU	Spain 32%, Italy 28%, Croatia 19%	47,1	Spain 70%, Italy 12%, Netherlands 6%	3,7
	Extra EU	Turkey 77%, Morocco 20%	0,1	-	-
Frozen	Intra EU	Spain 38%, Netherlands 16%, Croatia 15%	39,3	Portugal 38%, Spain 35%, Germany 5%	3,4
	Extra EU	Morocco 97%, Tunisia 2%	20,6	India 35%, Morocco 29%, Senegal 20%	1,3
Canned	Intra EU	Portugal 47%, Spain 11%, Netherlands 10%	95,8	n.a.	-
	Extra EU	Morocco 91%, Thailand 6%, Peru 1%	132,2	n.a.	-

Source: COMEXT. *Sardine of the genus *Sardinops* and *sardinellas* (*Sardina spp.*).

Table 16-6 **SARDINE EXPORTS in 2015 (main markets)**

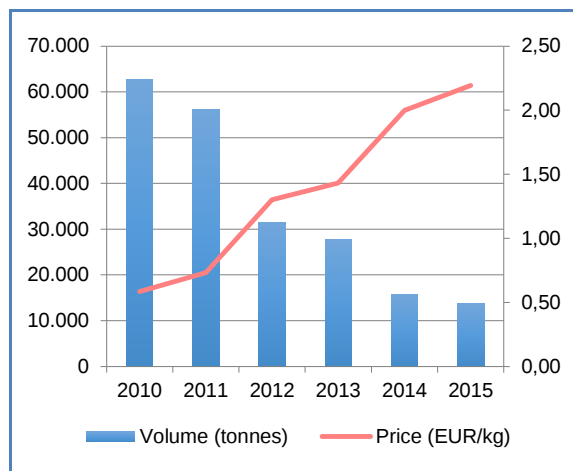
Preservation state	Trade flow	European sardine		Other sardine*	
		Main destination	Total value (million EUR)	Main destination	Total value (million EUR)
Fresh	Extra EU	USA 68%, Bosnia and Herzegovina 9%, Serbia 6%	0,7	Saudi Arabia 86%, Albania 7%, Tunisia 2%	0,3
Frozen	Extra EU	Morocco 34%, China 9%, Canada 8%	12,3	Morocco 36%, Benin 25%, Canada 23%	0,2
Canned	Extra EU	USA 14%, Serbia 12%, Australia 10%	41,5	n.a.	-

Source: COMEXT. *Sardine of the genus *Sardinops* and *sardinellas* (*Sardina spp.*).

16.4 SUPPLY TRENDS AND PRICES

The strong decrease in landings in Portugal between 2010 and 2015 (−78%) has led to a strong increase in first-sale prices (+275%). As a result decrease in value of landings was only 18%.

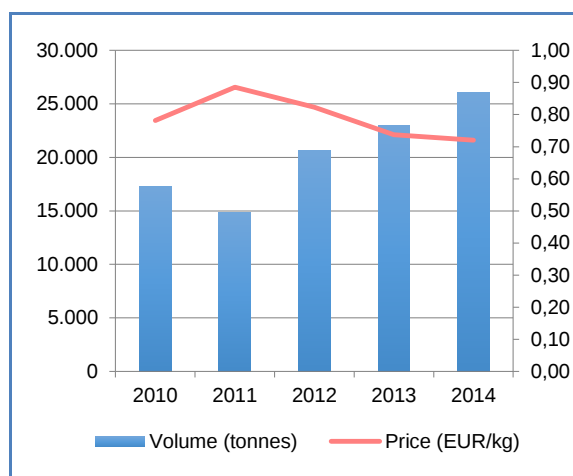
Figure 16-1 **VOLUME (IN TONNES) AND PRICE OF SARDINE (EUR/kg) LANDED IN PORTUGAL**



Source: EUMOFA.

As a consequence, the Portuguese canning industry had to find new sources for its supply of raw materials and alternative production strategies. Processing companies have turned to suppliers in Morocco, France, and Spain (Cantabria) and are importing approximately 50–60% of the fish they need. Moreover, to face the shortage of sardine, the main raw material for canning, the 19 canneries operating in Portugal (out of which 14 process sardine) began to diversify their products. They increased the production of canned tuna and mackerel, in particular. During the same period in Italy, the strong increase in landings (+39%) has led to only a limited decline in first-sales prices (−7%).

Figure 16-2 **VOLUME (IN TONNES) AND PRICE OF SARDINE (EUR/KG) LANDED IN ITALY**



Source: EUMOFA.

In conclusion, in the Atlantic waters, only part of the Southern stock's decline is compensated by the Northern stock. Despite the relatively good health of the Northern stock, the stagnation of the Southern stock makes procuring an adequate supply of fresh sardine difficult for Portugal and Spain.

In the Mediterranean Sea basin, the stocks' status and conservation measures will likely lead to a decrease in sardine landings.

The Mediterranean EU Member States (Italy, Spain, and Croatia) have maintained good positions in the trade of fresh sardine. Member States fishing in the Atlantic, however, have experienced strong decreases in the export of fresh sardine: from 4.800 tonnes in 2008 to 800 tonnes in 2015 for France, from 1.900 tonnes to 800 tonnes for the UK, and from 19.300 tonnes to 3.500 tonnes for Portugal, meaning that national production is almost entirely consumed in the country.

Given the situation of stocks and the supply trends, it is likely that the EU processing industry will increasingly rely on imports of frozen sardine in the future and that the fresh market will remain supply driven. The contraction of supply should lead to much higher first sales prices for fresh sardine, and possibly higher exports by France and the UK if Portugal, Italy, and Spain offer better prices for the fresh product.

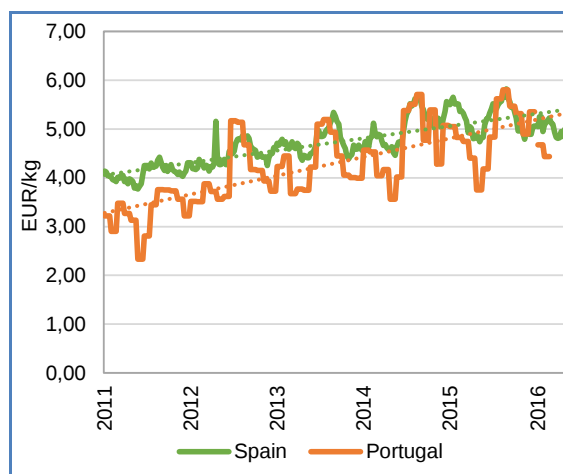
In the short and medium term, sardine caught by EU vessels may be essentially consumed fresh (because of better prices) or in high-range canned products.

16.5 CONSUMPTION OF FRESH AND CANNED SARDINE

Sardine is consumed mainly fresh (whole, fillets) and canned and, to a lesser extent, frozen. Sardine is a versatile fish that can be prepared in a variety of dishes (cooked, grilled, and baked). Around the Mediterranean, sardine grilling is a summer tradition. Canned sardine is commonly consumed all over Europe, in vegetable oil, olive oil, and tomato sauce. It can also be consumed dried, salted, and smoked, but these forms are currently rarer. It has a high content of omega-3 fatty acids and is a good source of vitamins and minerals.

Retail prices of fresh sardine experienced significant increases in Spain (approximately +30% over the period 2011–2015) and specifically in Portugal (+65%), where the decline in sardine landings has been the sharpest in the past five years. Nevertheless, the increases in retail prices have been much smaller than for first-sales prices (+278% for Portugal between 2010 and 2015).

Figure 16-3 **WEEKLY RETAIL PRICES OF FRESH SARDINE (EUR/KG) LANDED IN SPAIN AND PORTUGAL**



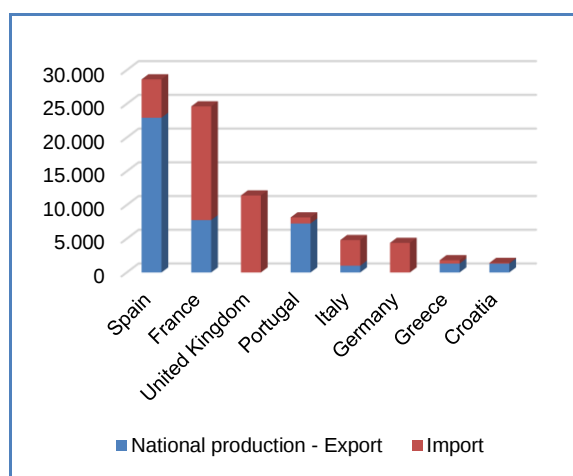
Source: EUMOFA.

Sardine is the 12th most consumed species in the EU, with 0,54 kg per capita, representing 2,3% of total consumption (EUMOFA – The EU Fish Market).

Spain, France, and the UK are the largest consumption markets for canned sardine with 29.000, 25.000, and 11.000 tonnes, respectively; Spain and Portugal are the main producers. France, the UK, and Germany are the main importers, the last two relying only on imports to supply their domestic markets.

The main exporter is Portugal, followed at a distance by Croatia. The largest apparent consumption per capita can be found on the Iberian Peninsula, with 783 g per head in Portugal and 616 g in Spain. France and Croatia follow with 374 g and 335 g, respectively.

Figure 16-4 **SUPPLY OF THE MAIN EUROPEAN MARKETS FOR CANNED SARDINE IN 2014 (volume in tonnes)**



Source: EUMOFA.

Table 16-7 **MAJOR EU MARKETS FOR CANNED SARDINE IN 2014 (BY DECREASING ORDER OF MARKET SIZE)**

Member State	Production (tonnes)	Import (tonnes)	Export (tonnes)	Apparent market (tonnes)	Consumption per capita (g)
Spain	25.264	5.686	2.319	28.631	616
France	8.305	16.858	535	24.628	374
United Kingdom	0	12.341	922	11.419	178
Portugal	19.202	896	11.933	8.165	783
Italy	1.536	3.807	533	4.810	79
Germany	0	6.763	2.373	4.390	54
Greece	1.428	500	106	1.822	167
Croatia	6.365	107	5.051	1.421	335

Source: EUMOFA.

16.6 QUALITY SCHEMES AND CERTIFICATION

One EU quality scheme (protected geographical indication) has been awarded to "Cornish Sardines". Some sardine products are also certified with quality labels, especially in France, where premium products have been developed in recent years: "Label Rouge" for canned sardine from Saint-Gilles-Croix-de-Vie, and Douarnenez, and "Marca Q de qualitat" for the sardine of the Producer Organisation Peix Blau in Catalonia.

Two EU fisheries are Marine Stewardship Council (MSC) certified:

- "South Brittany purse-seine sardine" in France for the fleet operating in the coastal waters of the Bay of Biscay (approximately 20.000 tonnes/year). Certified since 2010.
- "Cornish Sardines" for the traditional, small-scale fishery targeting sardine, which takes place during summer and autumn around the Cornish coast in the UK, certified sustainable since 2010 (production exceeds 1.000 tonnes/year);

Two others are currently being assessed:

- "Bay of Biscay purse-seine sardine" (8.000 tonnes/year);
- "Northern Adriatic Sea anchovy and European sardine pelagic pair trawl" (3.400 tonnes/year for sardine).

Portugal's purse-seine fleet was awarded MSC certification in January 2010, but the MSC certificate was suspended for a first time in January 2012 and again in August 2014, after a sharp drop in the Southern stock.

17 Seabass and seabream in Greece

Seabass and seabream are a well-known and popular marine seafood species in the Mediterranean. Greece is the largest aquaculture producer in Europe, by value and volume (excluding Turkey), mainly producing European seabass and gilthead seabream. However, in addition to seabass and seabream, other commercially significant marine species are also caught in the Mediterranean and Atlantic regions.

EUROPEAN SEABASS

Among the different seabass species, European seabass (*Dicentrarchus labrax*) is the main species farmed in the Mediterranean and the only seabass farmed by Greek aquaculture. European seabass is commonly found throughout the Mediterranean and Black seas and the Northeastern Atlantic, from Norway to Senegal, and normally along the coast and in brackish waters¹³⁶. European seabass has been reared using extensive methods, such as closed lagoons, for a long time. However, in the 1960s, intensive methods for rearing were developed using complex hatchery techniques. Currently, most farmed European seabass are produced in floating sea cages, with a few land-based farms. The fish is normally harvested after one and a half years and up to two years in size categories below 1 kg¹³⁷.

GILTHEAD SEABREAM

Gilthead seabream (*Sparus aurata*) is the main farmed seabream species in both the Mediterranean region and Greece, and also a significant species for marine fisheries. The number of different seabream species caught in marine waters is larger than for seabass, and gilthead seabream is commonly found in the entire Mediterranean and Eastern Atlantic, from the UK to the Canary Islands¹³⁸. It lives along the coast and in brackish waters, and has traditionally been farmed extensively in lagoons and ponds. In the 1980s, hatchery techniques were developed for gilthead seabream. It is normally reared in sea cages, but some land-based systems can be found. The fish is normally harvested after approximately 16 months in the sea, and, as with European seabass, in small size categories below 1 kg¹³⁹.

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17.1 HISTORICAL DEVELOPMENT

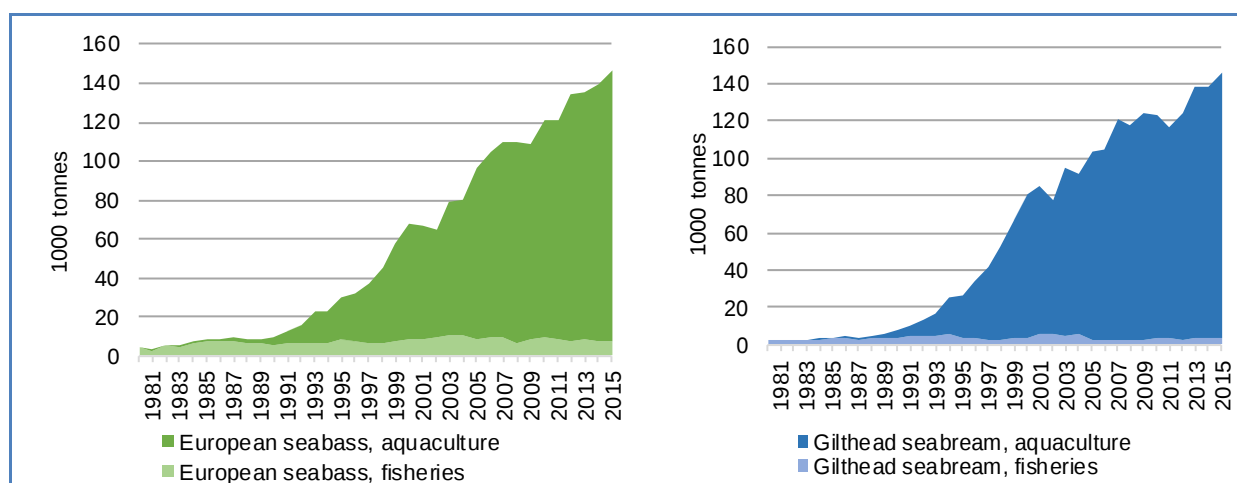
According to FAO figures for fisheries and aquaculture from 1980 to 2015, aquaculture volumes (tonnes) of European seabass and gilthead seabream in Europe (the Atlantic and Mediterranean and Black sea areas), started to increase in 1990, and since then have represented most of these two species supplied to market (Figure 14). Fisheries for seabass and seabream represent 23% of the total value for the EU, and 6% for Greece, calculated for the 5-year period, 2010–2015¹⁴⁰.

The value of fisheries for the main farmed species in Greece is low, and it has been declining for “other seabream” (other than aquaculture) that are normally caught wild in Greece.

17.2 PRODUCTION

Overall, the total aquaculture production of European seabass and gilthead seabream in the Mediterranean has been increasing since 2000 (Figure 15 and 16)¹⁴¹. However, the sector is known for cyclic ups-and-downs or booms-and-busts, i.e. rapid increases in supply overriding the demand and causing a significant price drop (collapse). Also, other sectors, such as salmon aquaculture, regularly experience boom-and-bust but with the difference that earnings have not dropped below break-even since 2000¹⁴². Greece is the largest producer in the EU (44.000 tonnes of seabass and 56.000 tonnes of seabream in 2016) and Turkey is the main EU producer outside the EU market and the main extra-EU exporter to – and competitor in – the EU market (52.000 tonnes of seabass and 50.000 tonnes of seabream in 2016). Since the harvest reached its highest level in 2010, Greek production, on average, decreased until 2016, and EU production has remained relatively flat. Turkey, on the other hand, increased their production, especially of gilthead seabream. At the moment, Turkey is at the same level as Greece – or beyond, with respect to total harvest volumes for European seabass and gilthead seabream¹⁴³.

Figure 17-1 **EUROPEAN SEABASS AND GILTHEAD SEABREAM IN EUROPE (INCLUDING NON-EU COUNTRIES) BY ORIGIN**



Source: FAO.

¹³⁶ https://ec.europa.eu/fisheries/marine_species/farmed_fish_and_shellfish/seabass_en

¹³⁷ Kontali Analyse AS.

¹³⁸ https://ec.europa.eu/fisheries/marine_species/farmed_fish_and_shellfish/seabream_en

¹³⁹ Kontali Analyse AS.

¹⁴⁰ EUMOFA landings data.

¹⁴¹ Harvest estimates, Kontali Analyse AS.

¹⁴² Marine Harvest - Industry Handbook.

¹⁴³ Kontali Analyse AS.

Table 17-1 **MAIN PRODUCERS OF EUROPEAN SEABASS FROM AQUACULTURE (volume in 1000 tonnes)**

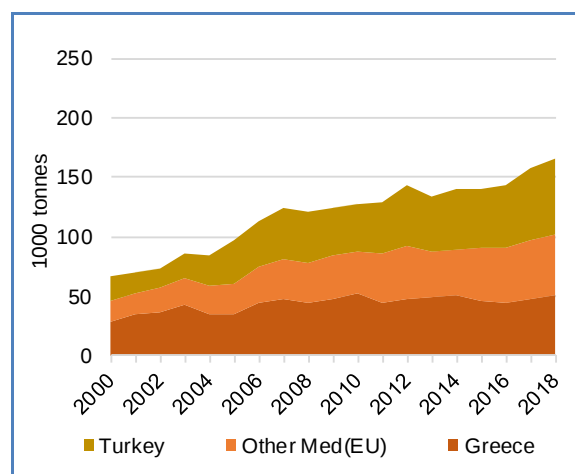
Country	2012	2013	2014	2015	2016	2017 E	2018 E
Turkey	50	46	52	50	52	60	65
Greece	47	49	50	46	44	48	50
Spain	16	10	10	12	14	15	15
Italy	9	9	8	8	9	10	11
France	4	2	2	2	2	2	2
Croatia	3	4	4	4	5	5	5
Cyprus	2	2	2	2	2	2	2
Portugal	2	1	1	1	1	1	1
Others	11	13	13	16	15	16	16
Total	144	136	142	141	144	159	167

Source: Kontali Analyse.

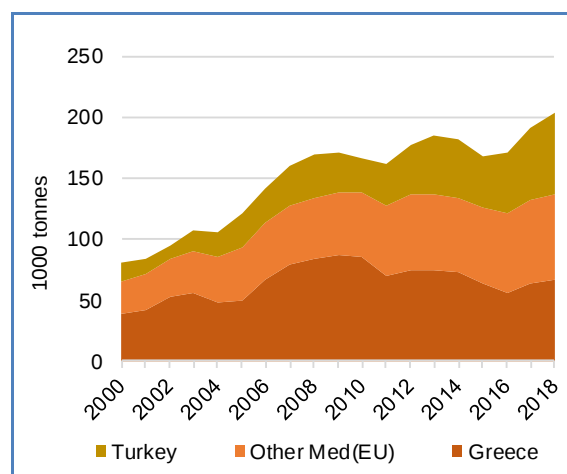
Table 17-2 **MAIN PRODUCERS OF GILHEAD SEABREAM FROM AQUACULTURE (volume in 1000 tonnes)**

Country	2012	2013	2014	2015	2016	2017 E	2018 E
Greece	74	75	73	63	56	64	67
Turkey	40	48	48	42	50	59	67
Spain	20	17	17	17	19	21	22
Italy	10	9	9	9	9	10	11
Croatia	2	3	4	5	5	5	5
Cyprus	3	4	4	4	4	4	4
France	2	2	2	2	2	2	2
Portugal	1	1	2	2	2	2	2
Others	26	26	25	25	25	25	25
Total	178	185	184	169	172	192	205

Source: Kontali Analyse.

Figure 17-2 **HARVEST ESTIMATES FOR EUROPEAN SEABASS FOR GREECE, OTHER EU PRODUCING COUNTRIES AND TURKEY**

Source: Kontali Analyse AS.

Figure 17-3 **HARVEST ESTIMATES FOR GILHEAD SEABREAM FOR GREECE, OTHER EU PRODUCING COUNTRIES AND TURKEY**

Source: Kontali Analyse AS.

17.3 MARKET

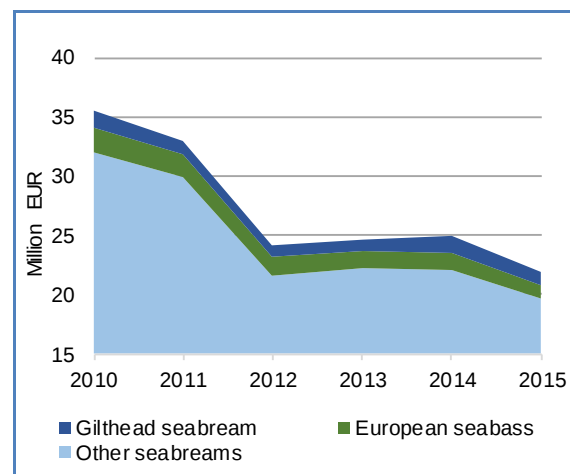
Despite the difference in supply (accessible volumes), aquaculture is facing competition from the same or similar wild species. Based on price information from Greece, it was observed that wild-caught fish achieve higher prices (Figure 18)¹⁴⁴. However, prices remained more similar over the period 2010–2015.

Monthly Greek export prices¹⁴⁵ for European seabass and gilthead seabream are fluctuating significantly (Figure 19), and when looking at value (volume × price; Figure 20), we observe a clear seasonality for trade, associated with both large volumes and high prices during summer and the Christmas holidays. The strong drop in prices is related to the aforementioned boom-and-bust cycles. Supply (production) is growing rapidly and prices are developing positively – at least in the short run – leading to supply exceeding demand, as observed from 2013 to 2014. Nevertheless, prices increased on average 17% and 20% for seabass and seabream, respectively, from 2010 to summer 2017 (assuming a linear trend), i.e. 2–3% per year. In contrast, the price of Atlantic salmon has increased 100% over the same period. This was mainly caused by a significant increase in demand in several global markets (i.e. sushi) during the respective period compared to seabass and seabream¹⁴⁶.

In good periods, the price of gilthead seabream follows European seabass. If not, prices of European seabass tend to achieve a higher price per kilogram and gilthead seabream

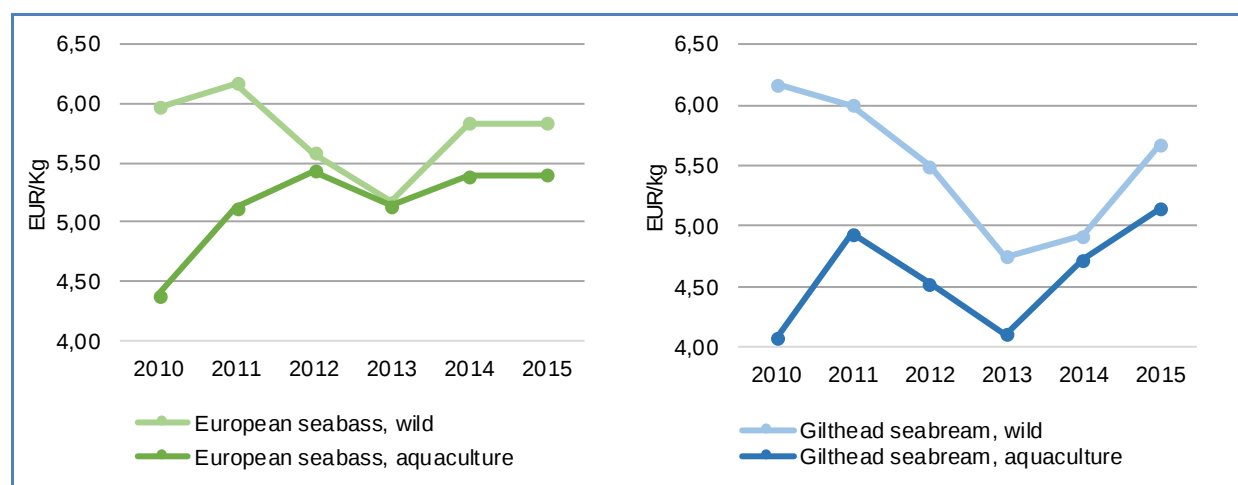
prices decrease rapidly. As for the last price drop in 2016 and 2017, the more significant drop for gilthead seabream is likely associated with a more rapid growth in supplied (harvested) volumes for gilthead seabream compared with European seabass.

Figure 17-4 **WILD CATCH OF SELECTED SPECIES IN GREECE**



Source: EUMOFA.

Figure 17-5 **FIRST-SALES PRICE DEVELOPMENT IN GREECE FOR FARMED AND WILD EUROPEAN SEABASS AND GILTHEAD SEABREAM**



Source: EUMOFA.

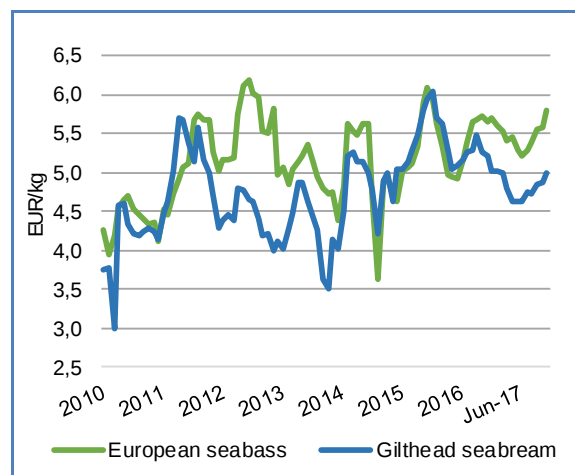
¹⁴⁴ EUMOFA.

¹⁴⁵ Kontali Analyse AS.

¹⁴⁶ Marine Harvest Industry Handbook.

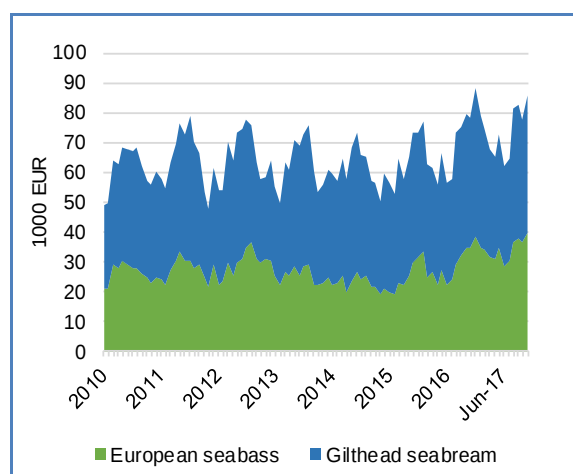
European seafood faces strong competition from imports¹⁴⁷, and so does the seabass and seabream farming sector, which experience strong competition in both volume (market share) and price, from the fast-growing seabass and seabream sector of Turkey. When comparing export prices of the two countries, a historically significant lower price level for Turkish European seabass and gilthead seabream is apparent. However, the tendency is for the difference to diminish, especially for European seabass.

Figure 17-6 **EXPORT PRICES OF FRESH WHOLE EUROPEAN SEABASS AND GILTHEAD SEABREAM IN GREECE**



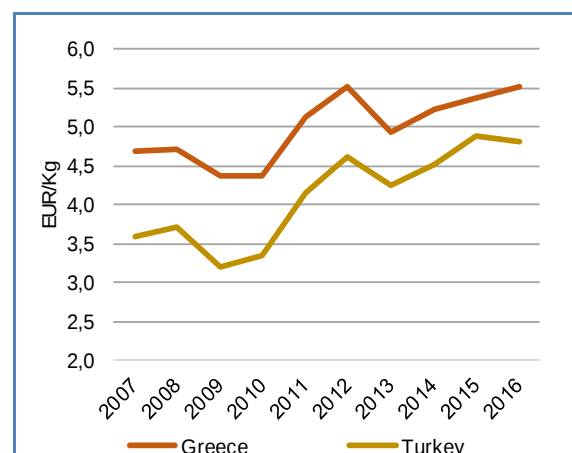
Source: EUMOFA.

Figure 17-7 **EXPORT VALUE OF FRESH WHOLE EUROPEAN SEABASS AND GILTHEAD SEABREAM IN GREECE**



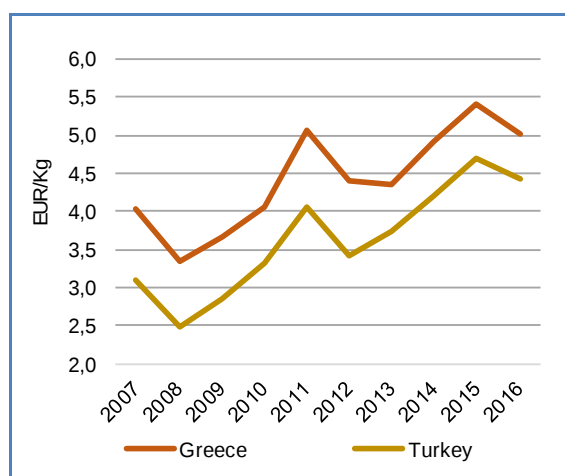
Source: EUMOFA.

Figure 17-8 **ANNUAL EXPORT PRICE OF FRESH WHOLE EUROPEAN SEABASS IN GREECE AND TURKEY**



Source: Eurostat and TurkStat.

Figure 17-9 **ANNUAL EXPORT PRICE OF FRESH WHOLE GILTHEAD SEABREAM IN GREECE AND TURKEY**

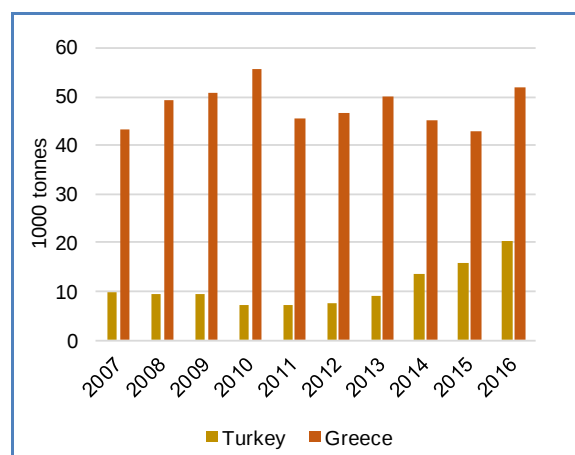


Source: Eurostat and TurkStat.

Increased imports entering Europe, mainly from Turkey, are routed to both the traditional seabass and seabream markets represented by Italy and Spain and to more recently developing markets, e.g. the UK, Germany, and the Netherlands (the last serving largely as a hub for further distribution throughout Europe). However, we observe that, in contrast with the traditional markets, imported volume of European seabass and gilthead seabream accounts for a large share of the EU market and is becoming the dominant market player in the emerging markets, compared with the main intra-EU exporters, e.g. Greece.

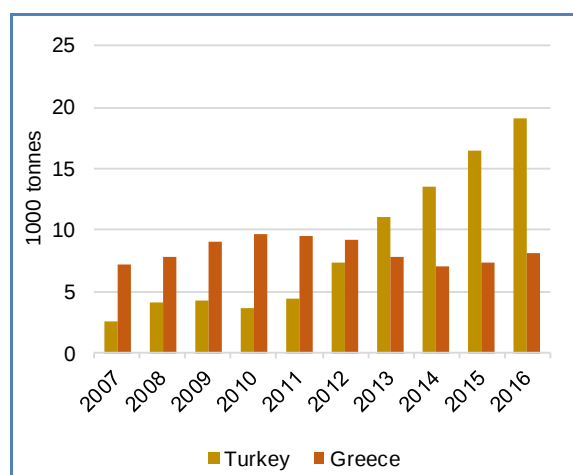
¹⁴⁷ The EU Fish Market 2016.

Figure 17-10 **VOLUME OF FRESH WHOLE EUROPEAN SEABASS EXPORTED TO TRADITIONAL MARKETS (ITALY, SPAIN) AND EMERGING MARKETS (GERMANY, THE NETHERLANDS, THE UK)**



Source: EUMOFA.

Figure 17-11 **VOLUME OF FRESH WHOLE GILTHEAD SEABREAM EXPORTED TO TRADITIONAL MARKETS (ITALY, SPAIN) AND EMERGING MARKETS (GERMANY, THE NETHERLANDS, THE UK)**



Source: EUMOFA.

17.4 SECTOR STRUCTURE

The Greek seabass and seabream sector has consolidated considerably, shrinking from 190 to 80 companies and from 230 to 330 locations between 1997 and 2010¹⁴⁸. The consolidation has continued and will likely strengthen starting in 2018, as a result of the banks selling out of the largest Greek seabass and seabream farming companies. Even before these sales, the Greek seabass and seabream sector is significantly more consolidated than the Norwegian salmon sector, with which it is often compared. In Norway, 80% of the production includes more than 20 companies of the largest producers¹⁴⁹, while for Greece this number is currently three. After the ongoing process it might well be less¹⁵⁰.

¹⁴⁸ Federation of Greek Mariculture (FGM).

¹⁴⁹ Marin Harvest Industry Handbook.

¹⁵⁰ Kontali Analyse AS.

18 Sole

This case study is available in the
Monthly Highlights N° 6-2018

Sole is one of the most valuable species for fleets operating in the English Channel and in the North Sea, particularly in Belgium, France, the Netherlands and the UK. After several years of lower abundance leading to reduction of quotas and landings (2012–2015), the EU TAC has been increased since 2016 and landings are expected to increase again. The EU market is also supplied by imports of several sole species, especially from Western African countries (particularly Morocco) often marketed as fillets of tropical sole.

18.1 BIOLOGY, RESOURCES, AND EXPLOITATION

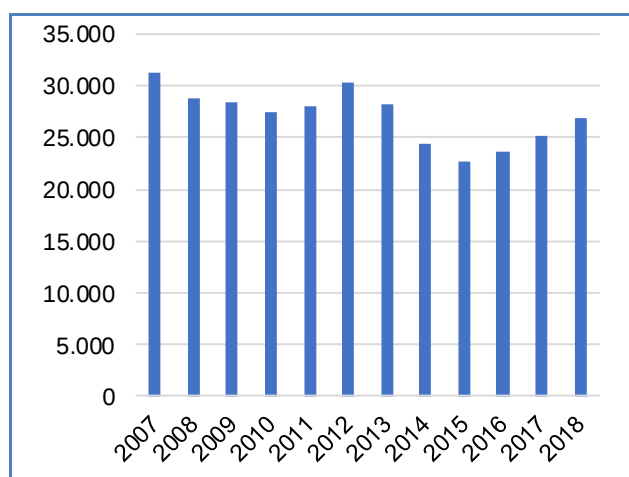
On the EU market several species are marketed as soles. The main species produced is common sole (*Solea solea*). But other Soleidae species are also marketed as soles: Senegalese sole (*Cynoglossus senegalensis*) and other tongue soles (tropical soles from Morocco, Mauritania and Senegal), thickback soles (*Microchirus variegatus*) and sand sole (*Solea lascaris*).

18.1.1 BIOLOGY

Sole is a flatfish living in shallow water on, or close to the sea floor. They burrow into sandy or muddy bottoms and retreat to deeper water during winter. Sole feed on small bottom-dwelling invertebrates, including worms and crustaceans. Sole are to be found throughout EU waters, as far north as the North Sea (including the Baltic Sea), as well as in the Mediterranean (including the Sea of Marmara, Bosphorus and southwestern Black Sea). When they are born, they have a distinct right and left side to their body, with one eye on each side. One of the eyes then migrates to the other side, which becomes the topside of the fish during the rest of its life¹⁵¹. Common soles live up to eight years and can reach a length of 70 cm and a weight of 3 kg. Their average size is 30 to 40 cm. Reproduction starts after 3–5 years of age, when 25–30 cm size is reached. Spawning happens mainly during the months of February–May (slightly earlier in the Mediterranean). Sole is caught by bottom trawling and with gill nets¹⁵². The minimum landing size is 20 cm in the Mediterranean and 24 cm in the Atlantic¹⁵³.

18.1.2 RESOURCE, EXPLOITATION, AND MANAGEMENT IN THE EU

Figure 18-1 EU TAC FOR SOLE SPECIES IN TONNES (2007–2018)



Source: European Commission TAC and quotas Regulations.

Sole stocks are managed by a TAC (Total Allowable Catch) and quotas system. The EU TAC is divided in 12 stocks of which the main stock (North Sea and Southern Norwegian Sea) accounts for more than 50% of the EU TAC¹⁵⁴. Over the last decade the EU TAC for sole has experienced significant fluctuations, mostly due to fluctuations in the main stock TAC (SOL/24-C). In particular, from 2012 to 2015, the EU TAC fell from 30,326 tonnes down to 22,723 tonnes (–25%) due to lower abundance and recruitment. In 2016, 2017 and 2018, the EU TAC has been increasing following the better indicators on resource status (+18% from 2015 to 2018).

In addition, some sole stocks are also managed by long-term management plans, including measures to limit fishing effort, fishing closures periods or areas and limitations on gear size (e.g. mesh size for gill-nets in France)¹⁵⁵. The EU sole stocks, currently covered by long-term management plans, are sole in the North Sea, sole in the Bay of Biscay, and sole in the Western Channel.

18.2 PRODUCTION

World catches of sole (all species combined) amounted to 42,820 tonnes in 2016 (of which 75% is identified as common sole), down by 24% from 2007¹⁵⁶. The leading producers are from the EU, who provided 61% of the total world production in 2016 (of which 95% were common sole). Inside the EU, the Netherlands and France are the main producers with catches accounting respectively for 37%, and 21% of total EU sole catches. To a lesser extent, Belgium, Italy and the UK are also significant EU producers (10%, 9% and 8%, respectively, of total EU sole catches). Outside the EU, other important producers are Nigeria (15% of the total world catches in 2016) and Morocco (8%), and to a lesser extent Egypt (4%), Tunisia (2%) and Mauritania (2%). According to Eurostat, EU common sole landings amounted to almost 24,000 tonnes in 2016, accounting for approximately 56% of the world sole catches. The Netherlands and France were the major Member States for sole landings, accounting respectively for 40% and 22% of EU sole landings. Other important EU Member States for sole landings were Italy (10%), Belgium (9%), and the UK (8%). During the past decade (2007–2016), most of the major EU producing countries experienced a significant decline in sole catches (–20% over the decade). However, Nigeria, Morocco and Tunisia have experienced increased catches (+159%, +4% and +88%, respectively). From 2007 to 2016, EU sole landings decreased by about 20% with the following declines in the main producing countries: –18% in the

¹⁵¹ <https://www.fishbase.de/summary/solea-solea.html>

¹⁵² https://ec.europa.eu/fisheries/marine_species/wild_species/sole_and_plaice_en

¹⁵³ <https://mare.istc.cnr.it/fisheriesv2/species?lang=en&sn=34099#ecl-accordion-header-prod-gears>

¹⁵⁴ <https://mare.istc.cnr.it/fisheriesv2/species?lang=en&sn=34099#ecl-accordion-header-prod-gears>

¹⁵⁵ https://ec.europa.eu/fisheries/marine_species/wild_species/sole_and_plaice_en

¹⁵⁶ FAO

Netherlands, –28% in France, –34% in Belgium, and –28% in the UK. The main reason for this general decreasing trend is the reduction of the TAC (English Channel, North Sea) due to decreasing fish abundance in these areas. Over the decade, increasing trends in landing volumes of sole have also been reported in Italy (+3%) and Portugal (+23%).

18.2.1 WORLD CATCH

Table 18-1 **WORLD CATCH OF SOLEIDAE SPECIES (VOLUME IN TONNES)**

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
EU-28	32.727	29.195	32.840	30.189	28.106	27.587	29.578	29.091	27.275	26.149
Nigeria	2.485	3.316	3.372	3.876	4.469	5.566	7.621	8.231	4.285	6.425
Morocco	3.465	3.290	4.107	3.322	2.410	2.271	2.680	2.887	3.862	3.613
Egypt	2.899	3.366	2.518	2.702	3.122	2.063	2.066	2.337	1.653	1.547
Tunisia	521	469	448	463	458	445	457	511	594	982
Mauritania	-	-	-	57	532	923	967	1.594	1.253	921
Other	14.277	5.995	5.213	4.403	3.727	4.834	4.546	3.898	3.846	3.183
Total	56.374	45.631	48.498	45.012	42.824	43.689	47.915	48.549	42.768	42.820

Source: FAO Fishstat.

18.2.2 LANDINGS IN THE EU

Table 18-2 **COMMON SOLE: EU LANDINGS (VOLUME IN TONNES)**

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Netherlands	11.584	10.732	11.012	10.222	8.818	9.354	9.905	8.696	10.329	9.518
France	7.213	7.211	5.433	4.134	8.272	7.806	8.193	7.707	6.384	5.214
Italy	2.310	1.801	2.209	2.248	1.798	2.081	1.505	2.288	2.448	2.375
Belgium	3.389	3.272	3.515	3.438	3.176	2.752	2.533	3.247	2.764	2.235
United Kingdom	2.791	2.452	2.362	2.307	2.660	2.561	2.431	2.447	1.995	1.997
Other	3.358	3.176	2.971	2.727	2.414	2.107	2.585	2.191	2.306	2.519
Total	30.645	28.643	27.503	25.075	27.138	26.661	27.151	26.576	26.227	23.857

Source: Eurostat.

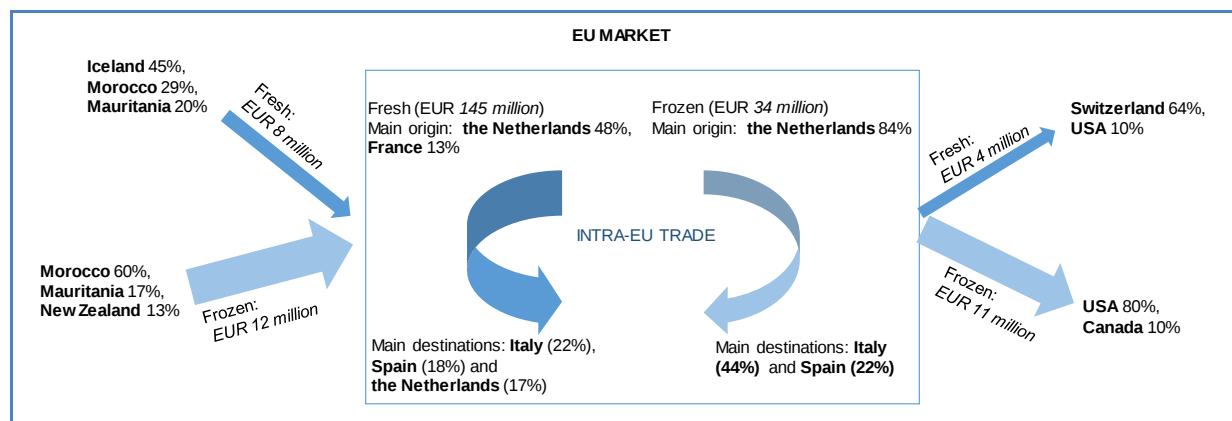
Furthermore, sole farming has been experimented in land-based fish farms for many years in several EU countries. The experimental production had to face several constraints as the production cycle is long and costs are high, which did not allow farmers to compete with producers of wild-caught sole dominating the EU market (especially for common sole). Nevertheless, for a few years, the aquaculture of Senegalese sole (*Solea senegalensis*) has experienced a significant development and its production has been increasing in several European countries. After years of scientific research and technical development, sole aquaculture has indeed reached a competitive level. According to FAO statistics, EU farmed sole production reached 1.181 tonnes in 2016. The main producers were Spain (63%), France (22%) and Portugal (12%). In addition, production of Senegalese sole has also developed in Iceland, where the world leading sole farming company has built a large land-based farming facility using surplus hot water from a geothermal power plant; the production rose from 0 to 360 tonnes in two years.

18.3 TRADE

Sole is traded almost exclusively as whole fish, frozen or fresh¹⁵⁷. In 2017, the EU had a sole trade deficit of EUR 6 million. The deficit is attributed mainly to the imports of frozen sole (EUR 12 million in 2017), although extra-EU imports of fresh sole are also significant (40% of total extra-EU imports). For frozen sole, the main extra-EU supplier is by far Morocco (1.772 tonnes in 2017), and to a lesser extent Mauritania (510 tonnes), and New Zealand (391 tonnes). For fresh sole, the main extra-EU suppliers are Iceland (397 tonnes in 2017), Morocco (262 tonnes) and Mauritania (179 tonnes). Intra-EU trade is active for each preservation state, but fresh fish accounted for 81% of trade value in 2017. The Netherlands is the main supplier of fresh and frozen sole (48% and 84%, respectively, of fresh and frozen sole intra-EU imports in value terms). The main destinations were Italy (respectively 22% and 44% of fresh and frozen intra-EU sole imports) and Spain (18% and 22%, respectively). Extra-EU exports are relatively limited (550 tonnes in 2017, of which 73% of frozen products). Main export destinations for frozen products were the USA and Canada, and Switzerland and the USA for fresh products. Italy, France and Spain are by far the main markets for sole in the EU with apparent markets (production + imports – exports) exceeding 6.000 tonnes in 2016.

¹⁵⁷ Sole fillets may be imported frozen, especially from Western Africa, but no CN code is dedicated to this product, thus it is not possible to identify and quantify to what extent it is traded.

Figure 18-2 THE EU TRADE MARKET FOR SOLE SPECIES IN 2017



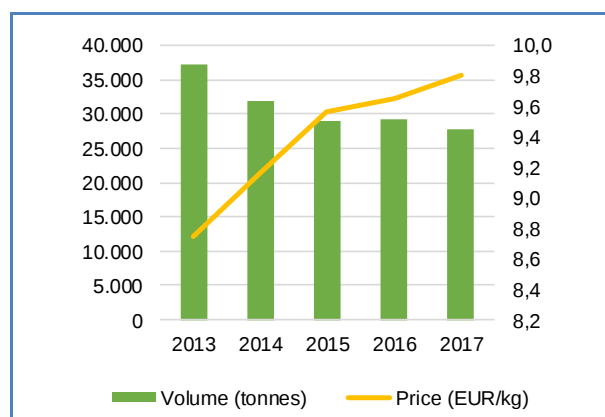
Source: EUMOFA.

18.4 CONSUMPTION

Processing of sole is rather limited as its flesh is very much appreciated for its taste, fine and fatless meat and the absence of bones. Therefore, it is a very valuable species and it is mainly sold as whole fresh or frozen. Sole is available throughout the year, but the peak season is from January to April¹⁵⁸. Sole is consumed steamed, fried, broiled, microwaved and baked.

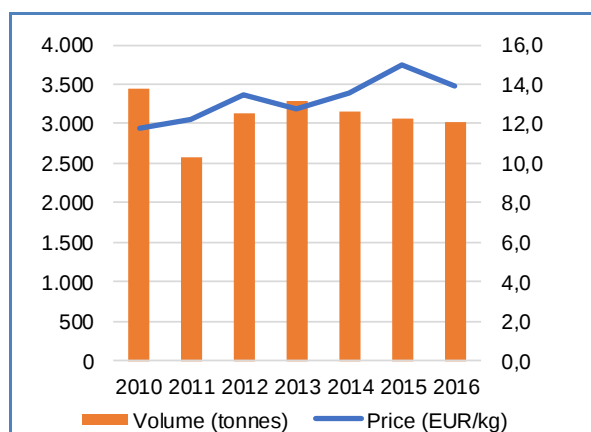
In Spain, household consumption of sole products declined over the 2013–2017 period, from more than 37.000 tonnes in 2013 to less than 28.000 tonnes in 2017¹⁵⁹. The reasons, in addition to a rise in price, may include the overall decreasing trend in Spanish fish and seafood consumption over the last decade as well as the lower availability of EU sole, the Spanish market being highly dependent on imports. The average purchase price rose by 12% during 2013–2017.

Figure 18-3 SOLE HOUSEHOLD CONSUMPTION IN SPAIN



Source: EUMOFA.

Figure 18-4 SOLE HOUSEHOLD CONSUMPTION IN THE UK



Source: EUMOFA.

In the UK, sole household consumption fluctuated over the 2010–2017 period, averaging 3.000 tonnes. However, since 2013, the consumption volume has experienced a slightly decreasing trend (–8%). Over the 2010–2017, the average purchase price rose by 19%, despite some fluctuations and a slight decrease in 2017 (13,95 EUR/kg) compared to 2016 (14,98 EUR/kg).

¹⁵⁸ <http://pdm-seafoodmag.com/guide/poissons/details/product/Sole.html>

¹⁵⁹ This volume, confirmed consumption data by MAPAMA, is much higher than the apparent market estimate (around 6.000 tonnes in 2016). The explanation might be that the “sole” designation in consumption panel data includes several other flatfish species.

19 Surimi industry

This case study is available in the
Monthly Highlights N° 3-2018

19.1 INTRODUCTION

19.1.1 WHAT IS SURIMI?

Surimi is a concentrate of whitefish proteins. The extraction of surimi takes place onboard factory vessels, just after fishing, or in land-based factories. The meat of fish fillets is minced and rinsed with fresh water several times; only soluble proteins are kept. The paste obtained from this process, odorless and tasteless, is put in the form of frozen blocks called surimi base. Then cryoprotectants¹⁶⁰ are added to the surimi base in order to preserve its gelling and elastic properties. These blocks are sold to the food processors, which transform this raw material with other ingredients to give it texture, taste and color, and obtain the final product, called surimi or kamaboko, which is popular on Asiatic and European markets.



Table 19-1 **COMPOSITION OF A PREPARED SURIMI¹⁶¹ PRODUCT REPRESENTATIVE OF THE PRODUCTS AVAILABLE ON THE EU MARKET**

Ingredients	Proportions
Fish meat	30 to 40%
Potato starch and/or wheat starch	5 to 10%
Egg white	0 to 10%
Rape oil	3 to 6%
Sugar, sorbitol or polyphosphates	3%
Salt or glutamate, flavorings, paprika extract	0,5 to 1,5%

Source: ADISUR.

19.1.2 SURIMI IN THE WORLD

Global supply of surimi has been quite stable in the last several years. About 820.000 tonnes of surimi base¹⁶¹ have been produced globally in 2016, for a total production of prepared surimi close to 2,7 million tonnes. The world supply is led by China, with a production of 1,2 million tonnes. The EU market¹⁶² for prepared surimi amounts to 170.000 tonnes.

19.2 PROCESSING IN THE EU

19.2.1 STRUCTURE AND EVOLUTION OF EU PRODUCTION

Nine producers of prepared surimi (sticks and other presentations) exist in the EU: four in France, three in Spain, one in Lithuania, and one in Poland. In 2016 the EU production was estimated at 148.000 tonnes. The top three producers were Spain (58.000 tonnes), France (52.000 tonnes) and Lithuania (35.000 tonnes)¹⁶³. According to a national survey¹⁶⁴, the French production fell from 56.433 tonnes in 2011 to 46.780 tonnes in 2016, almost exclusively in fresh preparations, the share of frozen prepared surimi remaining at a very low level (810 tonnes in 2016, vs. 45.552 tonnes for fresh surimi).

19.2.2 Raw materials used

Only one producer of surimi base, located in France, exists at the EU level and supplies primarily the French industry. The rest of the raw material is imported, mainly from the US. Extra-EU imports of surimi base amounted to 49.400 tonnes in 2016, out of which the four Member States producing prepared surimi imported 98%.

It should to be noted that the imported surimi base is not exclusively used for the manufacturing of prepared surimi, but that a small quantity is used to produce fish balls (for Asiatic restaurants) or pet food.

¹⁶⁰ Sugar, sorbitol and polyphosphates are used as cryoprotectants.

¹⁶¹ « Surimi base » refers to the raw material used by the industry, « prepared surimi » refers to the final ready-to-eat product.

¹⁶² Apparent market = domestic supply – imports; Supply = domestic production + imports.

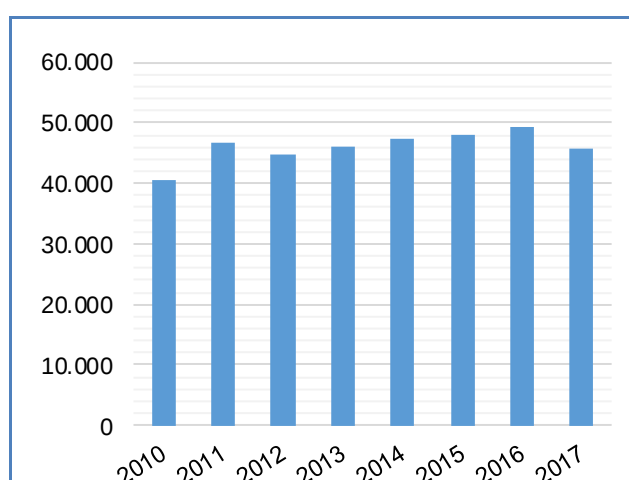
¹⁶³ These estimates (source : ADISUR/ADEPALE) are theoretical: they are based on the balance imports-exports of surimi-base and upon the assumption that all the surimi base imported is used for the production of prepared surimi, with an incorporation rate of 33%.

¹⁶⁴ ADEPALE.

Table 19-2 **IMPORTS AND EXPORTS OF SURIMI BASE BY THE TOP EU SURIMI USERS IN 2017¹⁶⁵ (volume in tonnes)**

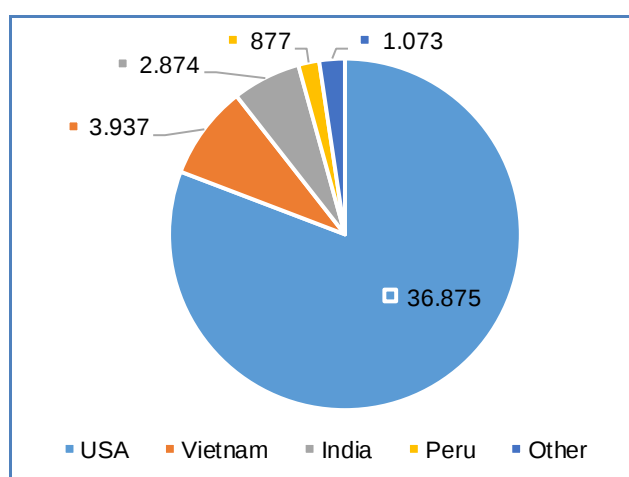
2016	Import	Export	Balance
Spain	18.038	839	17.199
France	15.777	964	14.813
United Kingdom	1.914	6	1.908
Italy	1.300	71	1.229
Lithuania	12.497	132	12.365
Netherlands	2.798	1.254	1.544
Poland	2.764	19	2.745
Other	2.217	194	2.023
EU-28 (Intra+Extra)	57.305	3.479	53.826

Source: Comext.

Figure 19-1 **EVOLUTION OF EU EXTRA-EU IMPORTS OF SURIMI BASE (volume in tonnes)**

Source: Comext.

The EU imports between 40.000 and 50.000 tonnes of surimi base each year. In 2017, the EU imported 45.636 tonnes, 8% down compared to 2016. This fall is due to the decrease of imports from Vietnam, for which it is easier to sell to Japan, Korea or China than to the EU.

Figure 19-2 **ORIGIN OF SURIMI BASE EXTRA-EU IMPORTS IN 2017 (volume in tonnes)**

Source: Comext.

In 2017, imports from Vietnam fell from 8.306 tonnes in 2016 to 3.937 tonnes; the EU's main supplier is increasingly the US, which supplied 81% of EU imports in 2017.

¹⁶⁵ A correction in Comext figures for Italy has been made, as the the UK does not record any export to Italy, but there are recorded 31.793 tonnes of imports from the UK. The figure 30.493 tonnes has been withdrawn to reach a consistent figure of 1.300 tonnes.

The surimi base used by the EU surimi industry is subject to a tariff-rate import quota, under which it is imported without duty in the framework of the Autonomous Tariff Quotas (Regulation EU n°2015/2265 of 7 December 2015 opening and providing for the management of autonomous Union tariff quotas for certain fishery products for the period 2016–2018). This regulation states that import duties on frozen surimi for processing (i.e. surimi base) are suspended for the period up to the annual amount of 60.000 tonnes. This quota concerns the following products:

- CN code 03049310 – Frozen surimi of tilapias (*Oreochromis spp.*), catfish (*Pangasius spp.*, *Silurus spp.*, *Clarias spp.*, *Ictalurus spp.*), carp, eels (*Anguilla spp.*), Nile perch (*Lates niloticus*) and snakeheads (*Channa spp.*);
- CN code 03049410 – Frozen surimi of Alaska pollock (*Theragra chalcogramma*);
- CN code 03049510 – Frozen surimi of fish of the families Bregmacerotidae, Euclichthyidae, Gadidae, Macrouridae, Melanonidae, Merlucciidae, Moridae and Muraenolepididae, other than Alaska pollock;
- CN code 03 04 99 10 – Frozen surimi of fish not elsewhere specified.

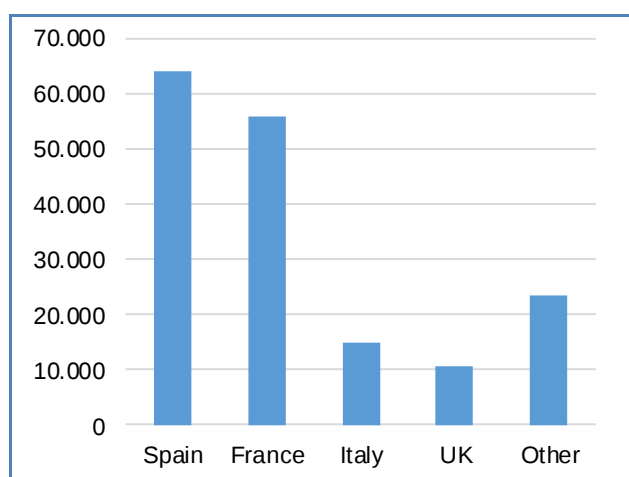
In 2016, the surimi base imported fell under the first category for 2%, under the second category (Alaska pollock) for 47%, under the third category for 23%, and under the last category for 27%. This duty-free quota ensures an adequate supply of the EU processing industry as it comfortably covers the import needs of the sector, which range between 40.000 and 50.000 tonnes annually, as shown above.

19.2.3 Fish species used

The main raw materials used in the EU are Alaska pollock (*Theragra chalcogramma*), blue whiting (*Micromesistius poutassou*), blue grenadier (*Macruronus novaezelandiae*) and Pacific hake (*Merluccius productus*). The surimi base produced in the EU (France) is made from blue whiting.

19.3 THE EU MARKET

Figure 19-3 **MAIN MARKETS FOR PREPARED SURIMI IN THE EU IN 2016 (volume in tonnes)**

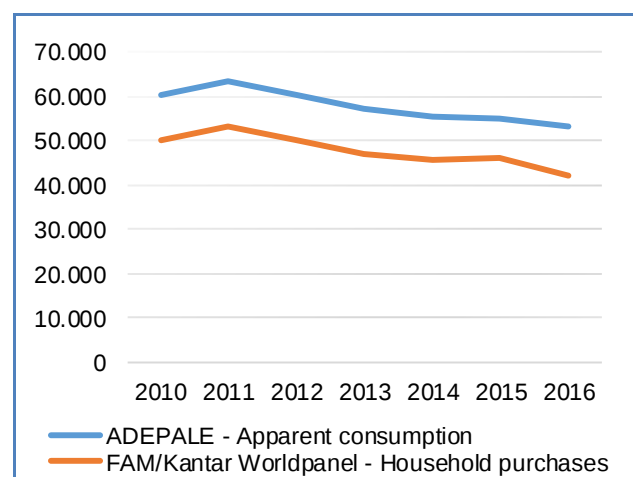


Source: ADEPALE (theoretical estimates).

According to ADEPALE/ADISUR¹⁶⁶, the EU market for prepared surimi is close to 170.000 tonnes, out of which the two leading countries, Spain and France, represent more than 70%.

Traditionally the French market was composed of fresh products and the Spanish market of frozen products. This situation did not change for France (where fresh products represent 98–99% of the total market for prepared surimi), while important changes have appeared on the Spanish market, where the proportion of frozen products decreased from about 97% in the early years of surimi popularity in Spain to 60% two years ago, and about 40% today.

¹⁶⁶ ADEPALE (Association Des Entreprises de Produits Alimentaires Elaborés) is the French Association of Processed Food Products. Within ADEPALE there is a group specialized on surimi called ADISUR (Association for the Development of Surimi Industries), whose members include not only the 4 French companies producing prepared surimi but also the other major European producers (from Lithuania and Spain).

19.3.1 The French market**Figure 19-4 FRENCH CONSUMPTION OF PREPARED SURIMI (volume in tonnes)**

Source: ADEPALE, FranceAgriMer/Kantar Worldpanel.

France used to be the leading market in the EU. But it experienced a continuous decrease since 2011, despite significant marketing efforts, to fall to 53.000 tonnes in 2016.

This evolution is shown in the figure 48, which represents the calculated apparent consumption (production + imports – exports) as well as the household purchases, as registered by a consumer panel. The two curves follow the same decreasing trend. The difference between the curves (around 10.000 tonnes per year) corresponds to the food service consumption.

Table 19-3 FRENCH IMPORTS OF PREPARED SURIMI IN 2016 (volume in tonnes, value in EUR 1000)

Countries	Volume	Value
Belgium	5.921	16.174
Thailand	698	2.256
Poland	560	1.164
China	512	1.039
Vietnam	400	899
Other	481	1.839
Total	8.572	23.371

Source: Comext.

In addition to the domestic production, the French market, which imports about 16% of its consumption of prepared surimi, is mostly supplied by Belgium (Belgium does not produce prepared surimi but the Lithuanian company Viciunai, the largest producer and distributor of surimi products in Europe, has established its distribution subsidiary in Belgium, which covers the Western EU markets), Thailand, Poland and China.

French consumers are mainly looking for sticks, which represent 93% of households' purchases.

19.3.2 The Spanish market**Table 19-4 SPANISH IMPORTS OF PREPARED SURIMI IN 2016 (volume in tonnes, value in EUR 1000)**

Countries	Volume	Value
India	2.566	4.532
Portugal	2.055	5.037
China	1.693	2.716
Belgium	1.584	3.787
Poland	1.019	1.859
Thailand	802	2.279
Lithuania	779	1.876
Other	1.351	3.012
Total	11.849	25.098

Source: Comext.

The Spanish market is growing rapidly, with the chilled sector driving this growth.

In 2016 the market reached 48.000 tonnes according to Globefish¹⁶⁷. It is supplied at 78-80% by domestic production and at 20-22% by imports¹⁶⁸.

The Spanish consumer is looking for crab-flavoured sticks, grated surimi, elver substitutes, coated products and analogues of spiny lobster tails.

About 63% of the prepared surimi consumed in Spain is bought from retailers, while 37% are eaten in food service establishments¹⁶⁹.

¹⁶⁷ <http://www.fao.org/in-action/globefish/market-reports/resource-detail/en/c/1071590/>

¹⁶⁸ ADEPALE calculations.

¹⁶⁹ Globefish.

19.3.3 The Italian market

Table 19-5 **ITALIAN IMPORTS OF PREPARED
SURIMI IN 2016 (volume in tonnes, value in EUR 1000)**

Countries	Volume	Value
Thailand	3.185	8.256
Belgium	2.133	5.750
France	1.599	6.651
Lithuania	1.217	2.694
China	1.195	2.310
Other	3.069	10.166
Total	12.398	35.827

Source: Comext.

The Italian market is the third largest market in the EU, with 13.000 tonnes in 2016.

It is completely supplied by imports, equally provided by EU processors (mainly Lithuania/Belgium and France) and extra-EU imports.

The Italian market is mainly composed of sticks (“bastoncini”) and slices (“affettati”)¹⁷⁰.

¹⁷⁰ Italian large-scale retailers.

20 Swordfish

This case study is available in the
Monthly Highlights N° 9-2017

Swordfish is commercially very important to several EU fleets fishing in the Atlantic Ocean and the Mediterranean Sea. EU fleets provide almost a third of the world's supply. Spain is by far the largest producer, with more than 21.000 tonnes landed in 2015. However, the main market for swordfish in the EU is Italy, which imports substantial amounts from Spain and Portugal, as well as from Asia.

20.1 BIOLOGY

Swordfish (*Xiphias gladius*) is a large, silver pelagic fish with a distinctive long bill on its upper jaw. It is found in tropical, temperate, and sometimes cold waters of all oceans, including the Mediterranean and its adjacent waters. The swordfish is primarily a warm-water species, and generally, its migrations consist of movements toward temperate or cold waters for feeding in summer and back to warm waters in autumn for spawning and overwintering. Swordfish can be found in depths of up to 700 m, where it hunts prey, especially cephalopods and fish. It can reach more than 4 m in length and several hundred kilograms. Its average length is 1,20–2,50 m.

20.1.1 RESOURCE, EXPLOITATION, AND MANAGEMENT IN THE EU

Swordfish is caught in coastal and offshore waters by longline, trawl, harpoon, and net. It is worth noting that swordfish is not a schooling species, and for its exploitation, gears such as purse-seiners or pelagic trawlers are excluded.

The species is available to fisheries mostly between April and December, with peaks during spring. Atlantic swordfish stocks are managed by the International Commission for the Conservation of Atlantic Tunas (ICCAT), which sets TACs and national quotas, as well as minimum landing size (125 cm) and other management recommendations. EU fleets target three main stocks.

The **North Atlantic stock** has been experiencing an increase in its biomass after significant trouble related to overfishing in the 1990s. It is not considered overexploited anymore. The TAC was set at 13.700 tonnes for 2017, of which 6.718 tonnes are for the EU¹⁷¹.

The **South Atlantic stock** is considered to be exploited sustainably. The TAC was set at 15.000 tonnes in 2017. Of this 4.824 tonnes are for the EU¹⁷².

In the **Mediterranean**, swordfish is considered overfished; fishing effort is almost twice what is needed to achieve maximum sustainable yield. However, in recent years, management measures have been implemented to reduce capacity and fishing effort for this species: reduction of the fleet in Greece, Italy, and Spain, fishery closures for several months, limitations on fishing-gear size and improved selectivity to reduce juvenile catches, and improved control requirements¹⁷³. In the Mediterranean, swordfish is managed by ICCAT through a TAC of 10.500 tonnes in 2017, of which 7.400 are allocated to the EU fleet. In 2017, the EU secured 70% of this quota. This measure, as part of the recovery plan for Mediterranean swordfish approved by ICCAT in 2016, will contribute to the early recovery of the Mediterranean swordfish, thus securing the livelihoods of fishermen and coastal communities that rely on the stock¹⁷⁴.

Other swordfish stocks important for fisheries are found in the Indian Ocean, Southeast Pacific, and Northeast Pacific. They are all considered to be sustainably exploited according to the Indian Ocean Tuna Commission and the Inter-American Tropical Tuna Commission¹⁷⁵.

Several fisheries targeting swordfish have been certified by the Marine Stewardship Council (MSC), especially in the USA, Canada, and Australia. In the EU, the North and South Atlantic Spanish longline fishery has been certified by MSC since 2015¹⁷⁶.

20.2 PRODUCTION

20.2.1 CATCHES AND LANDINGS

According to the FAO, world catches of swordfish amounted to 283.000 tonnes in 2015, up 15% over 2006.

The leading producer is the EU, which provided 29% of total world production in 2015. Inside the EU, Spain and, to a lesser extent, Italy and Portugal are the main producers, with catches accounting for 72%, 12%, and 11%, respectively, of total EU swordfish catches. Outside the EU, other important producers are Taiwan (12%), Indonesia (12%), and Japan (9%).

During the past decade (2006–2015), although swordfish catches remained stable or decreased slightly in the EU (–3%), Taiwan (–9%), and Japan (–7%), other important countries for swordfish fisheries have experienced significant increases in catches, especially Indonesia (+400%), Chile (+92%), China (+84%), and Sri Lanka (+78%). The gap between EU catches (source: FAO) and EU landings (Eurostat) highlights the fact that a share of EU swordfish catches is landed off-EU by fleets operating overseas (notably within Sustainable Fishing Partnership agreements).

According to Eurostat, EU swordfish landings amounted to more than 28.000 tonnes in 2015, accounting for approximately 23% of the world swordfish catches. Spain and, to a lesser extent, Italy are the major Member States for swordfish landings, accounting for 75% and 15%, respectively, of EU swordfish landings. Other important EU Member States for swordfish landings are France (3%), Greece (3%), Portugal (2%), and Malta (2%). From 2006 to 2015, EU swordfish landings increased 23%, with a peak in 2010 at almost 32.000 tonnes. However, among major producers, catches have evolved differently over the decade: significantly increasing in Spain (+54%), as well as in France, Portugal, and Malta, and strongly decreasing in Italy (–44%) and Greece (–30%).

¹⁷¹ <http://iccat.int/Documents/Recs/compendiopdf-e/2016-03-e.pdf>

¹⁷² <http://iccat.int/Documents/Recs/compendiopdf-e/2016-04-e.pdf>

¹⁷³ https://www.iccat.int/Documents/Meetings/Docs/2017_PA4_FINAL_ENG.pdf

¹⁷⁴ https://ec.europa.eu/fisheries/mediterranean-swordfish-eu-leads-effort-stock-recovery-while-securing-70-fishing-quotas_fr

¹⁷⁵ <http://www.guidedesespecies.org/fr/espardon>

¹⁷⁶ <https://fisheries.msc.org/en/fisheries/north-and-south-atlantic-swordfish-spanish-longline-fishery>

Table 20-1 **WORLD CATCHES OF SWORDFISH (volume in tonnes)**

Country	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU-28	36.259	34.852	27.099	34.686	28.759	38.315	33.711	35.453	37.941	35.705
Taiwan	16.467	16.326	10.590	12.087	9.730	11.027	14.400	12.944	12.922	15.067
Indonesia	3.001	3.116	2.952	2.651	3.546	3.753	6.570	4.536	11.950	14.963
Japan	12.809	14.796	13.460	12.372	12.335	11.423	10.518	10.163	10.846	11.900
Chile	3.147	3.741	2.792	3.514	4.363	4.949	6.339	4.852	5.799	6.029
China	2.977	3.302	3.630	2.672	2.843	2.727	3.297	3.416	3.915	5.466
Sri Lanka	2.868	3.225	3.193	3.176	3.160	3.675	3.845	5.537	4.365	5.102
Other	32.011	30.707	29.152	29.285	28.992	28.125	31.539	31.876	36.228	31.795
Total	109.539	110.065	92.868	100.443	93.728	103.994	110.219	108.777	123.966	126.027

Source: FAO, Fishstat.

Table 20-2 **LANDING OF SWORDFISH IN THE EU (volume in tonnes)**

Country	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Spain	14.019	12.546	17.107	22.611	22.431	18.351	19.965	25.143	27.088	21.642
Italy	7.627	6.518	4.534	5.121	6.274	5.357	4.018	2.862	3.393	4.273
France	90	672	25	426	581	867	650	719	909	848
Greece	1.036	825	439	719	1.762	1.854	1.504	2.146	2.082	728
Portugal	329	503	273	392	361	465	570	845	645	687
Malta	239	203	260	266	424	532	503	460	377	489
Cyprus	39	56	56	26	32	35	35	52	57	46
Other	1	3	2	1	2	13	10	12	18	26
EU-28	23.380	21.325	22.697	29.561	31.867	27.474	27.255	32.239	34.570	28.737

Source: EUROSTAT.

20.2.2 PRESENTATION

Swordfish flesh is much appreciated for its taste, firmness, and the absence of bones. The meat is grey-white and has a firm texture. It is sold mainly as steaks or loins, fresh or frozen, sometimes skinned. It can also be found as cold-smoked slices. Its mild, sweet flavour is highly regarded, and it is consumed grilled, broiled, baked, or poached, and even raw as *carpaccio* in Italy.

20.3 TRADE

20.3.1 EU TRADE

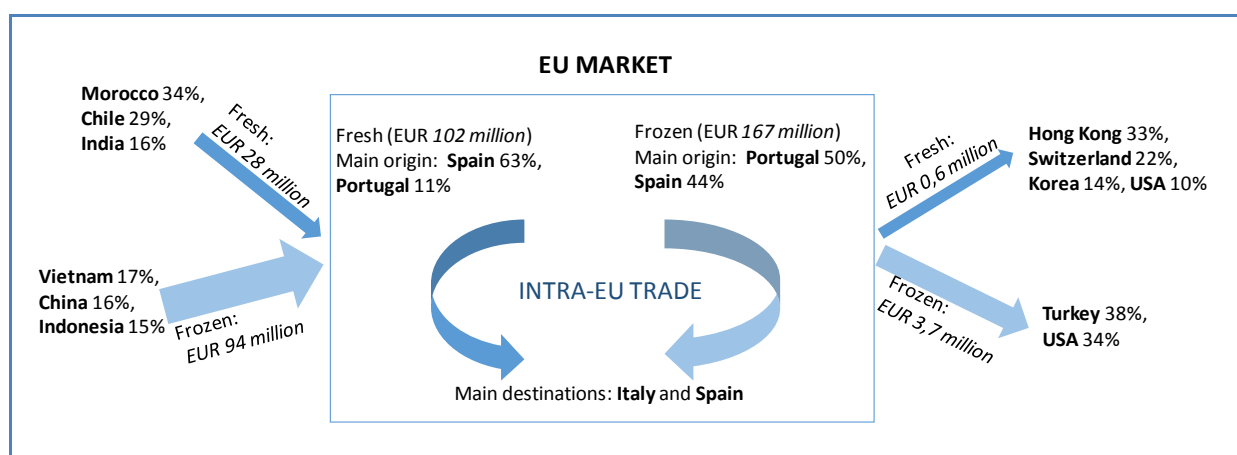
In 2016, the EU had a swordfish trade deficit of EUR 118 million. The deficit is attributable mainly to the imports of frozen swordfish. Extra-EU imports of fresh swordfish are relatively limited (23% of total extra-EU imports).

For frozen swordfish, the main extra-EU suppliers are Vietnam (3.028 tonnes in 2016), China (3.019 tonnes), Indonesia (3.023 tonnes), and to a lesser extent Ecuador (1.897 tonnes). For fresh swordfish, the main extra-EU suppliers are Morocco (approximately 1.100 tonnes in 2016), Chile (1.130 tonnes), and India (581 tonnes).

Intra-EU trade is active for each preservation state. Spain and Portugal are the main suppliers of fresh and frozen swordfish. In 2016, Spain and Portugal accounted for 74% and 94%, respectively, of intra-EU fresh and frozen swordfish exports. The main destinations were Italy (69% and 47%, respectively, of fresh and frozen intra-EU swordfish imports) and Spain (12% and 36%, respectively).

Extra-EU exports are limited (509 tonnes in 2016, of which 86% were frozen products); they were sent mainly to Turkey and the USA as frozen products and Hong Kong and Switzerland as fresh products.

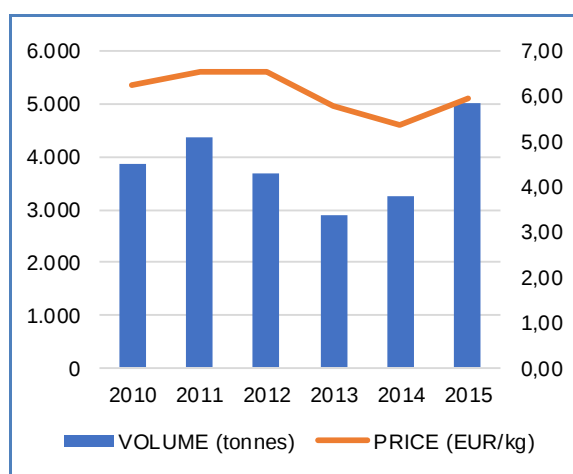
Italy is by far the main market for swordfish in the EU, with more than 22.000 tonnes of swordfish products imported in 2016 for a value of more than EUR 150 million (whereas exports reached only 410 tonnes). The main source countries were Spain and Portugal. According to the Institute for Agricultural and Food Market Services (ISMEA), swordfish was the fifth most-consumed species in Italy in 2015, accounting for 3% and 5.5%, respectively, of volume and value of fish and seafood household purchases (fresh or thawed).

Figure 20-1 **THE EU SWORDFISH TRADE MARKET IN 2016**

Source: EUMOFA, based on COMEXT.

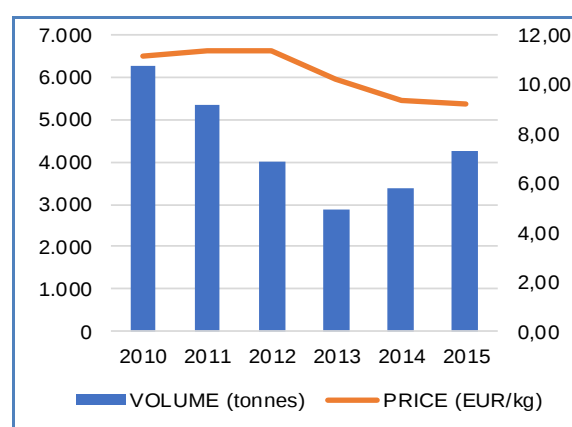
20.4 SUPPLY TRENDS AND PRICES

In Spain, the leading swordfish producer in the EU, the dependence of first-sales prices on the evolution of landing volume was not obvious during the period 2010–2015: a significant drop in landings in 2012 and 2013 (–33% between 2011 and 2013). First-sales prices, however, remained stable between 2011 and 2012, experienced a decreasing trend from 2012 to 2014 (–18%), and rebounded in 2015 (+10%), while landing volume also increased (+54%).

Figure 20-2 **VOLUME (IN TONNES) AND PRICE OF FRESH SWORDFISH (EUR/KG) LANDED IN SPAIN**

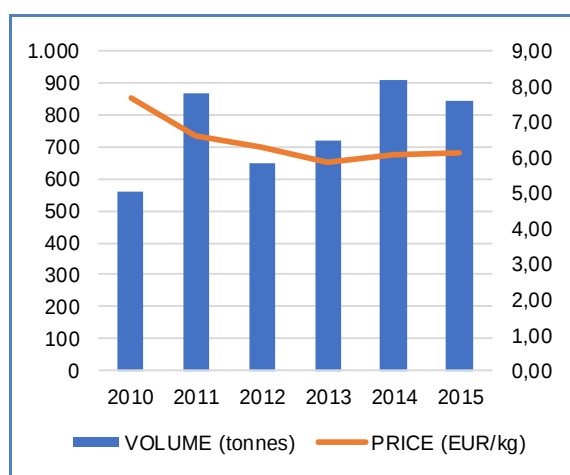
Source: EUROSTAT.

In Italy, landing volume of swordfish experienced a strong decreasing trend from 2010 to 2013 (–54%). Landings subsequently rebounded in 2014 and 2015 to reach 3.393 tonnes. In the meantime, the first-sales price remained stable in 2011 and 2012, then decreased in 2013 and 2014 (–17% in total) and stabilised, reaching 9,23 EUR/kg, in 2015.

Figure 20-3 **VOLUME (IN TONNES) AND PRICE OF FRESH SWORDFISH (EUR/KG) LANDED IN ITALY**

Source: EUROSTAT.

In France, from 2010 to 2015, first-sales prices have fluctuated, with a significant increase from 2010 to 2011 (+54%), a drop in 2012 (–25%), and an increase in 2013 and 2014 (+40% in total). In 2015, landings decreased slightly (–7%) to 848 tonnes. In the meantime, first-sales prices decreased between 2010 and 2013 (–23%) and then remained relatively stable until 2015, reaching 6,12 EUR/kg.

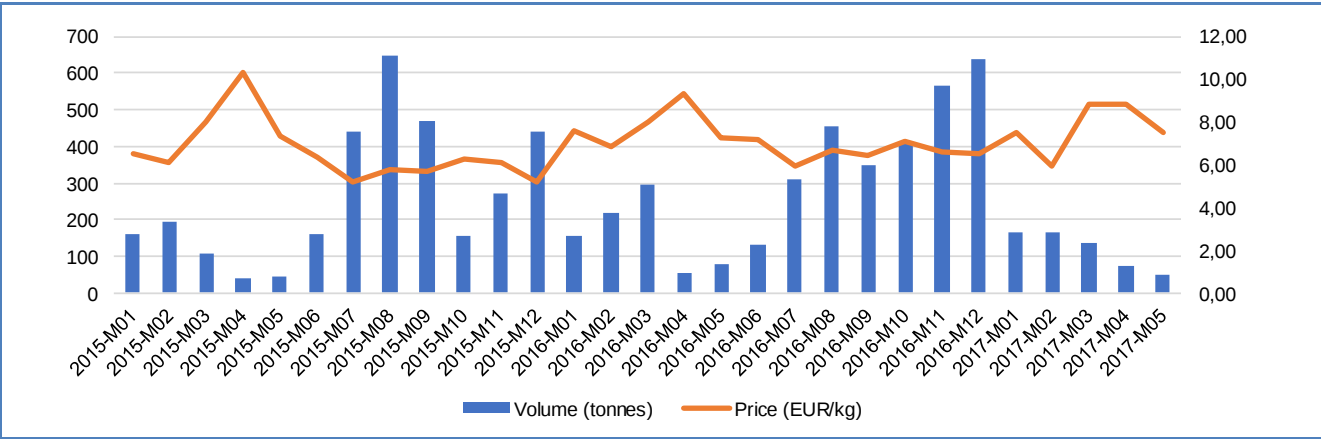
Figure 20-4 **VOLUME (IN TONNES) AND PRICE OF FRESH SWORDFISH (EUR/KG) LANDED IN FRANCE**

Source: EUROSTAT.

However, looking at average monthly first-sales data, important fluctuations are noticeable in landing volume and prices, and a seasonal pattern is clear.

In Spain, the leading producer of swordfish in the EU, two peaks for swordfish landings are evident: one in summer (July–August–September) and one in November–December. From January to June, landings are relatively small. As a consequence, first-sales prices follow the opposite trend with high prices in winter and spring (e.g. more than 10,00 EUR/kg in April 2015), whereas prices were lower in summer and autumn (between 6,00 EUR/kg and 7,00 EUR/kg in 2015 and 2016).

Figure 20-5 SEASONALITY OF FIRST-SALE VOLUME AND FIRST-SALE PRICES OF FRESH SWORDFISH IN SPAIN (volume in tonnes, price in EUR/kg)



Source: EUMOFA.

21 Farmed trout



The rainbow trout (*Oncorhynchus mykiss*), named after the many rainbow-coloured spots on its skin, is one of the main species bred in freshwater.

Native to the Pacific coast of the United States, it was brought to Europe at the end of the 19th century and today it is farmed in nearly all European countries.

21.1 BIOLOGY/FARMING

The optimum water temperature for breeding trout is below 21°C. Growth and maturation are influenced by water temperature and food. Under normal conditions, trout usually mature at 3-4 years. They are carnivorous and need a diet rich in protein.

Trout larvae are reared in round tanks made of fiberglass or concrete, which maintain a regular current and a uniform distribution of the larvae. The larvae hatch with a yolk sac that contains the food they need for their initial development. Once the sac has been absorbed, the fry swim up to the surface to look for food and begin to regulate their buoyancy. They are fed small flakes (proprietary feed) containing protein, vitamins and oils. Hand feeding is preferred in the first stages of rearing to avoid overfeeding.

The fry is then fed small pellets until they reach a weight of 50g and are 8 to 10 cm long. At this point, the young fish are transported to grow-out units, either floating cages in lakes or, most often, tanks located beside a river. These tanks, which are generally rectangular in shape and made of concrete, operate on two techniques: flow through, an open system where river water flows through the units via a raceway; or recirculation, a closed system that consists of circulating water in the tanks and recycling it or a system with partial recirculation. The advantage of recirculation is that the water temperature can be controlled all year long, so that effluents to the environment are very limited. In the right environment, a trout farmed in fresh water can grow to 350g in 10 to 12 months and to 3 kg in two years.

Trout are also grown in floating cages at sea, in the low saline waters of the Baltic and in the protected waters of the Scandinavian fjords, and off the west coasts of Scotland and Ireland. The ocean-farmed trout is generally farmed to higher weight than fresh water trout. The largest producer in the world of ocean-farmed trout is Chile. In seawater, trout are fed a diet similar to salmon, which accounts for their pink-coloured meat. When the fish have reached commercial weight, the trout are collected with a net or are pumped on to land.

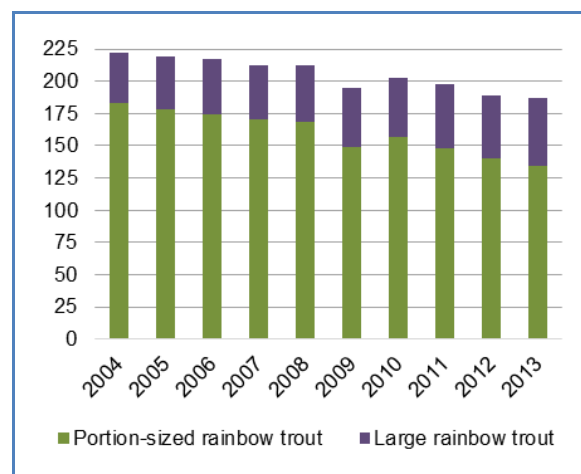
Ocean-farmed trout (in Scandinavia) can grow to 1-1,5 kg in 12 months and to 3-4 kg in 18 months).

This case study is available in the
Monthly Highlights N° 5-2014

21.2 PRODUCTION

The world's main trout producers are the EU, Chile, Turkey and Norway. Today, nearly all rainbow trout on the EU market comes from aquaculture. EU supply of trout is locally produced. The main EU- producer countries are Italy, France, Denmark, Spain and Poland.

Figure 21-1 EU TROUT PRODUCTION (1000 tonnes)



Source: FEAP.

In 2004 production of trout in the EU was over 220.000 tonnes (freshwater and marine farmed trout). Since then production has shown a downward trend, with a 7% decrease from 2010 to 2013 to 188.000 tonnes. The EU production of trout in 2013 was mainly portion-sized rainbow trout (71%) and large rainbow trout (28%); a small production of brook trout (1%) was produced in Austria. According to FEAP, the production of portion-sized trout fell by 14% over the last four years while production of large trout rose by 14%.

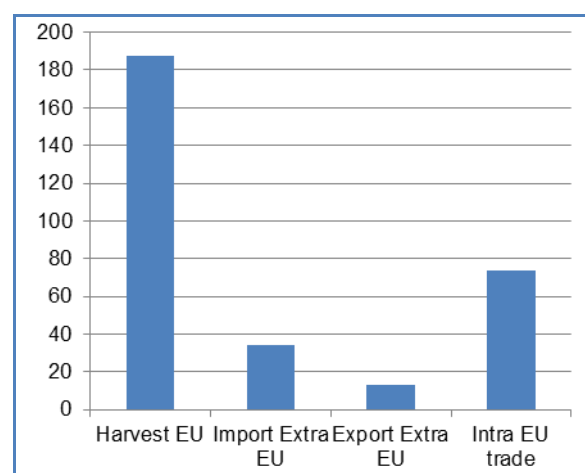
Large rainbow trout, which in some segments substitutes other farmed salmonids, has benefited from strong market demand. As a result, ex-farm prices have trended far higher during 2013 than in 2012. These favourable market conditions have continued in to the first half of 2014.

Small rainbow trout is to a large degree sold on local markets and has to a limited extent benefited from a general increase in prices. For trout farming in general, prices of fish feed have increased over the last years. Feed is the main production cost in trout farming accounting for 35-50% of the total – depending on the scale of production.

21.3 IMPORTS

Trade within the EU is substantial and dynamic. Trade between EU Member States is dominated by fresh trout and EU extra imports by frozen trout. In 2013, 73.632 tonnes of trout products worth EUR 323,40 million were traded between the EU Member States. This is an increase of over 40% between 2010 and 2013. Imports from EU member states are three times higher than extra-EU imports (both in volume and value). The main trout product group traded between the EU Member States is fresh trout. In 2010 approx. 63% of the EU internal trade was fresh products. In 2013 the percentage rose to 67%. The EU internal trade in frozen trout products doubled to approx. 16.000 tonnes in 2013 (22% of the total internal trade volume) Trade in dried, salted and smoked trout products has shown a negative trend in over the last four years. In 2010 more than 10.000 tonnes were traded between the EU Member States. In 2013 the trade was 8.140 tonnes. In the same period prices for dried, salted and smoked trout increased from 7,61 EUR/kg to 9,41 EUR/kg, while extra EU imports on the same trout product saw a slight increase from 7,35 EUR/kg to 7,89 EUR/kg.

Figure 21-2 **EU TROUT SUPPLY AND TRADE (2013) (1000 tonnes)**



Source: EUMOFA

Table 21-1 **EU IMPORTS FROM MEMBER STATES (value in 1000 EUR and volume in tonnes)**

Member State	2010		2011		2012		2013	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
DE	15.522	90.986	16.595	101.094	15.834	98.047	22.737	114.881
FI	7.254	23.835	8.882	31.473	10.064	31.595	10.162	37.420
PL	3.219	11.469	4.083	15.518	5.709	18.734	9.120	35.508
AT	3.217	13.372	3.775	15.678	4.559	18.776	5.121	21.910
ES	1.361	7.079	1.722	6.177	5.149	15.369	3.398	13.589
Other MS	21.558	81.710	18.738	82.232	26.046	109.860	23.094	100.076
Total	52.131	228.450	53.794	252.173	67.361	292.381	73.632	323.384

Source: EUMOFA.

Table 21-2 **QUARTERLY INTRA-EU IMPORTS BY MEMBER STATE (value in 1000 EUR and volume in tonnes)**

MS	Q1+Q2 2013		Q1+Q2 2014	
	Vol	Val	Vol	Val
DE	10.949	53.994	12.117	63.495
FI	4.910	17.492	5.607	23.952
PL	4.447	17.125	4.365	19.647
AT	2.411	10.289	2.294	10.303
ES	1.274	6.199	1.774	5.191
Other	10.941	46.008	10.681	50.207
Total	34.932	151.107	36.838	172.795

Source: EUMOFA.

Germany tops the list of intra EU importers, followed by Finland and Poland. The main product traded between EU Member States is fresh whole trout (portion sized). In the first half of 2014 intra EU trade with trout products continued to grow. Trade value rose by 14% while trade volume rose by 5%. The per kilo value in the first half of 2014 was 4,69 EUR/kg compared with 4,33 EUR/kg in the corresponding period in 2013. Extra-EU imports of trout have over the last 3 years grown by 53% in terms of volume and 57% in terms of value. The majority of imports come from Turkey (fresh-water portion-size trout) with an import share of 70% in 2013. The countries ranking 2 and 3 are Norway (20% import share) and

Chile (5% import share). Imports from both Norway and Chile consist of large ocean-farmed trout. Most of the trout imported by the EU is frozen products (57%) with Turkey as the main supplier. In the first half of 2014, approx. 86% of frozen trout imported to the EU was of Turkish origin. This is an increase in market share from 2013 and 2010, when Turkey had 78% and 68% respectively.

Fresh trout accounts for 25% of extra-EU imports for this product. It increased by 75% from 2010 to 2013. Norway was the main trade partner; 61% of EU imports of fresh trout in 2013 was of Norwegian origin. In the first half of 2014, EU imports of fresh trout continued to grow by 23%. Extra-EU imports of dried, salted and smoked trout (18% of trout

imports) have increased by 33% over the last 4 years. In the first half of 2014 imports rose by 12%. This preserved trout category is completely dominated by Turkey with an import share of 98% in 2013.

Table 21-3 **EU IMPORTS BY PRESERVATION (tonnes)**

Preservation	2010	2011	2012	2013
Fresh	3.515	4.517	4.994	6.145
Frozen	9.303	11.359	12.677	14.104
Dried, salted, smoked	3.302	4.336	4.189	4.407
Total	16.121	20.212	21.861	24.656

Source: EUMOFA.

Table 21-4 **EU IMPORTS FROM MAIN PARTNERS (value in 1000 EUR and volume in tonnes)**

Trade partners	2010		2011		2012		2013	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Turkey	10.637	44.286	13.185	60.412	14.226	64.065	17.284	74.275
Norway	2.908	15.695	4.124	21.204	5.019	20.862	4.832	25.028
Chile	1.322	5.236	1.153	4.945	962	3.353	1.225	3.973
Peru	319	1.233	668	2.335	558	2.467	527	2.622
Bosnia and Herzegovina	235	678	450	1.407	376	1.202	330	1.062
Other	699	2.684	632	2.676	719	3.448	458	2.427
Total	16.121	69.812	20.212	92.979	21.861	95.397	24.656	109.387

Source: EUMOFA.

Table 21-5 **IMPORTS BY MAIN EU MEMBER STATES FROM THIRD COUNTRIES (value in 1000 EUR and volume in tonnes)**

Member State	2010		2011		2012		2013	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
DE	5.420	20.878	6.584	29.166	6.629	27.249	7.275	30.514
AT	1.409	9.624	2.358	16.136	3.616	22.672	4.986	27.918
SE	2.164	12.012	3.106	16.308	4.060	17.169	3.671	19.212
PL	2.876	8.487	2.889	9.105	2.068	6.419	2.452	7.075
RO	502	1.335	638	1.851	844	2.410	1.537	4.489
Other	3.749	17.476	4.637	20.413	4.644	19.478	4.736	20.179
Total	16.121	69.812	20.212	92.980	21.861	95.397	24.656	109.387

Source: EUMOFA.

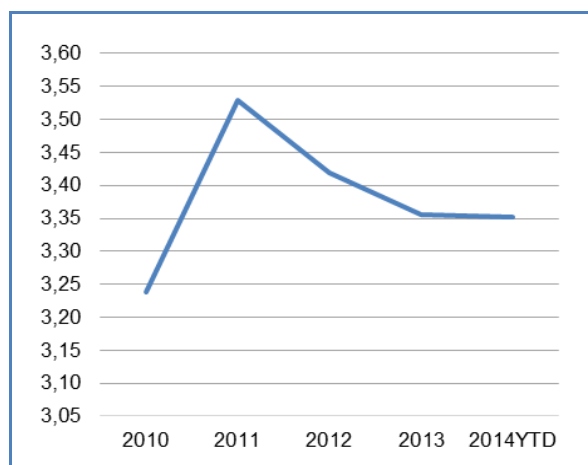
Germany does not only top the list of intra EU imports of trout, but is also the biggest EU importer of trout (in volume) from countries outside the EU, followed by Sweden. German imports have grown steadily from 2010 to 2013. Germany is also the biggest importer in terms of value.

However, Austria tops the list of highest value per kg. In 2013 the average import price in Austria was 5,60 EUR/kg. In comparison, the import value per kg for Poland was 2,89 EUR/kg in 2013. The higher Austrian import price indicates a significant percentage of value added products.

21.4 PRICE TREND

Import prices for frozen trout, which is the largest product category imported by the EU from third countries, have remained relatively stable over the last years. From 2010 to 2011, the average import price for frozen trout (both portion sized trout and large trout) rose by 9% to 3,53 EUR/kg. Since 2011, the average import prices have trended slightly down, by 5% from 2011 to 2013.

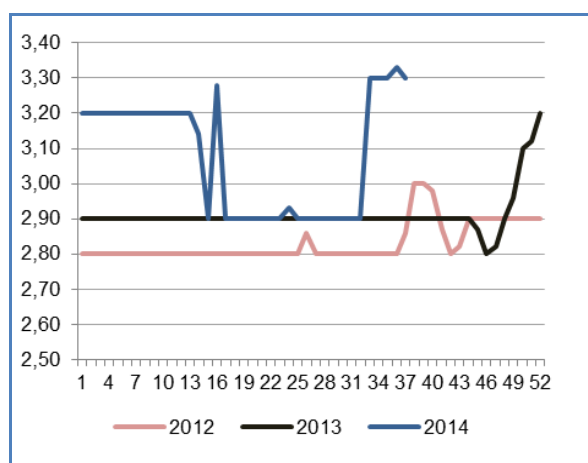
Figure 21-3 **EXTRA-EU IMPORT PRICE OF FROZEN TROUT (EUR/Kg)**



Source: EUMOFA.

At the Rungis wholesale market in Paris (France) prices for fresh domestic farmed trout have trended around 4,8 EUR/kg so far in 2014. This is 3% and 5% higher than the average price level in 2013 and 2012 respectively. At the Barcelona wholesale market (Mercabarna) in Spain, prices for portion sized trout have so far in 2014 averaged higher than in the 2 previous years. In fact the price level seen so far in 2014 is the highest recorded for the last 8 years.

Figure 21-4 **WHOLESALE PRICE OF FRESH TROUT, MERCABARNA, SPAIN (EUR/Kg)**



Source: Mercabarna.

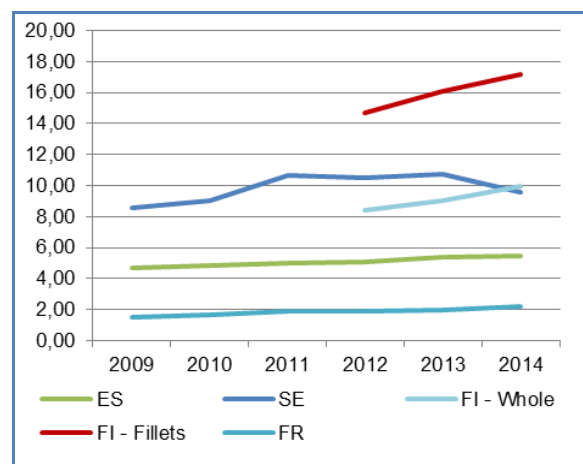
While a huge majority of the trout sold on the EU market is portion sized trout, large trout (trout larger than 1 kg) is also available on the EU market. On the Spanish market prices for fresh large trout have over the last years trended approx. 1 EUR/kg higher than portion sized trout.

21.5 MARKET TRENDS

Retail prices for trout register an increase on the EU market both for portion-sized trout and large-sized trout.

Prices for fresh whole trout (1 kg) in Finland have increased by almost 2 EUR/kg from 2012 to August 2014, and fresh trout fillets (1 kg) in Finland follow the same trend. Except for Sweden, where retail prices of fresh trout (whole, 1 kg) have decreased in 2014, retail prices in France (whole trout, portion size) and Spain (fillets, 200-300g) show an increasing trend over the last years, but the increase is far less.

Figure 21-5 **RETAIL PRICE TRENDS FOR FRESH TROUT PRODUCTS IN THE EU (EUR/kg)**

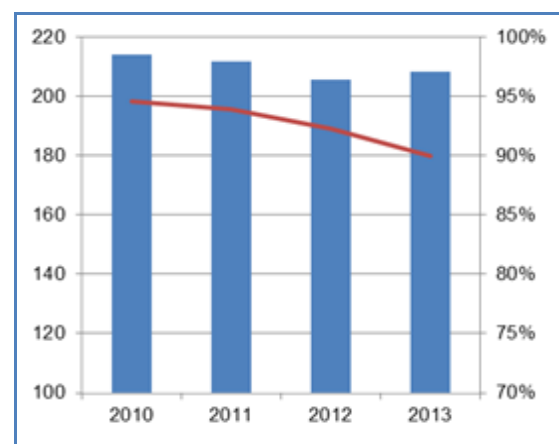


Source: EUMOFA.

21.6 CONSUMPTION

EU production of trout has declined fairly consistently over the last years. At the same time, imports to the EU have increased. However, until 2013 the increase in imports have not fully compensated for the fall in production. Export volumes from EU producers to markets outside the EU remained relatively stable. It therefore appears that consumption has trended down. In 2013, extra EU imports more than compensated for the fall in production. From 2012 to 2013, EU consumption of trout rose by 1,3%.

Figure 21-6 **APPARENT EU CONSUMPTION OF TROUT AND SELF SUFFICIENCY RATE 2010 – 2013 (tonnes whole fish equivalent)**



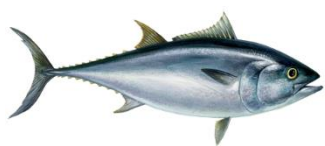
Source: EUMOFA.

Downward production trend combined with stable EU exports and increase in imports result in fall in the self-sufficiency rate. In 2010 EU producers could have been able to cover 95% of the EU market need for trout. In 2013, the rate fell to 90%.

22 Atlantic bluefin tuna

This case study is available in the
Monthly Highlights N° 7-2016

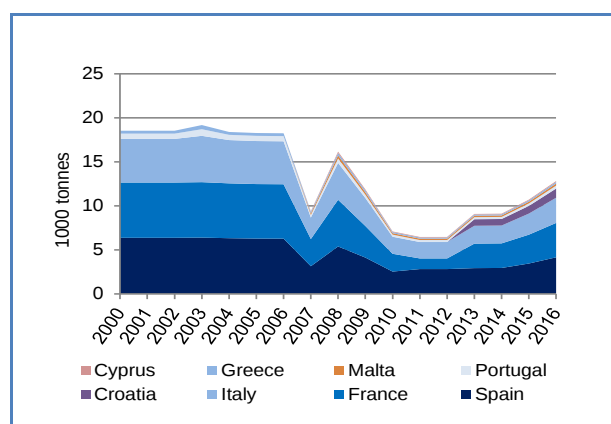
22.1 ATLANTIC BLUEFIN TUNA FISHERIES IN THE EU



For most of the EU fleet catching Atlantic bluefin tuna, the fishing season runs from 26 May to 24 June, and so the 2016 campaign was recently

completed. The EU quota for 2016 increased nearly 20% over 2015, with 12.813 tonnes, shared by eight Member States. The three largest fishing countries are Spain (2016 quota: 4.150 tonnes), France (3.900 tonnes), and Italy (2.860 tonnes), accounting for approximately 85% of the EU's total, and approximately 50% of the total Atlantic bluefin quota, when including the non-EU fishing nations.

Figure 22-1 HISTORICAL DEVELOPMENT OF EU QUOTAS FOR ATLANTIC BLUEFIN TUNA



Source: EUMOFA.

EU fisheries of Atlantic bluefin tuna take place in both the Mediterranean and the eastern Atlantic, where the total quota is shared with non-EU nations such as Morocco, Tunisia, and Japan. In addition, there is a western Atlantic regulatory area for bluefin tuna, where the USA, Canada, Japan, and Mexico are the major catch nations.

Mediterranean and east Atlantic bluefin tuna quotas are being fished by various types of vessels, where purse-seiners represent by far the largest share, with more than 60%. Longliners represent between 10% and 15%. Traditional coastal fisheries using traps made of set-nets between smaller open boats, along the coast of Spain, Portugal, and Italy, still account for 15–20% of the total catches. In Spain, where the fishery represents approximately 50% of total catches, the method is known as *almadraba*. In Portugal, virtually all catch is based on this method, whereas *almadraba* is only used for 10% of the Italian quota. In addition, a large part of the Moroccan catch is based on *almadraba* fishery.¹⁷⁷

The high market value for bluefin tuna has led to intensified fishing pressure that, in turn, resulted in drastic population reduction in every ocean where these fish are found. Recent

positive stock assessments allow an increase in Atlantic bluefin tuna quotas and catches. The EU is also implementing the state-of-the-art electronic bluefin catch document (eBCD) system, which greatly improves the traceability of all bluefin tuna products.

22.2 THE EU MARKET

Despite the 20% increase in quotas, most Atlantic bluefin tuna are fished only during a few weeks in May and June. Over the past few years, several reports suggest that an increasing number of Atlantic bluefin tuna is being marketed and consumed in local markets, especially from the *almadraba* catches. Although it is not easy to convey statistics directly related to Atlantic bluefin tuna consumption, the trends from certain marketplaces during the 2016 season confirm increasing local consumption. In Spain, sales of fresh Atlantic bluefin tuna through the auctions in Andalucia increased almost ten times during May and June, from 20 tonnes last year, to more than 180 tonnes this year, with the average price of the period falling 20% from EUR 9,90 to EUR 7,95/kg.¹⁷⁸

From mid-May through June 2016, Mercabarna, the wholesale market in Barcelona, doubled the sales of fresh tuna originating in the coastal regions of Mediterranean Spain, compared to 2015, to a volume of approximately 75 tonnes. This was five times higher than during the 2014 season.¹⁷⁹

In France, prices for fresh Atlantic bluefin tuna, sold through the auctions of Le Grau de Roi and Port La Nouvelle, registered a decline. For fresh volumes, which increased three times for both auctions combined, the price declined 10%, from EUR 14,42/kg in 2015 to EUR 12,91/kg in the current season.¹⁸⁰

As a result of pressure from non-governmental organisations, a substantial number of large-scale retailers and restaurants in several EU Member States have delisted Atlantic bluefin tuna. However, Atlantic bluefin tuna can be found in several retailers, commonly as steaks, and in restaurants presented raw, in carpaccio, sushi, or sashimi.

¹⁷⁷ The future of the Almadrabas Sector – Traditional Tuna fishing methods in the EU.

¹⁷⁸ Junta de Andalucia/Idapes.

¹⁷⁹ Mercabarna.

¹⁸⁰ France Agrimer.

Table 22-1 **EXTRA-EU TRADE OF ATLANTIC BLUEFIN TUNA - EXCLUDING LIVE FISH (value in thousand euro and volume in tonnes product weight)**

		2010	2011	2012	2013	2014	2015
Export	Value	96.229	98.149	109.994	130.802	146.357	148.680
	Volume	7.974	5.144	5.547	7.781	10.125	10.428
Import	Value	2.751	786	1.880	1.114	936	1.034
	Volume	371	120	393,00	188,00	139	159

Source: EUMOFA.

22.3 EU TRADE OF ATLANTIC BLUEFIN TUNA

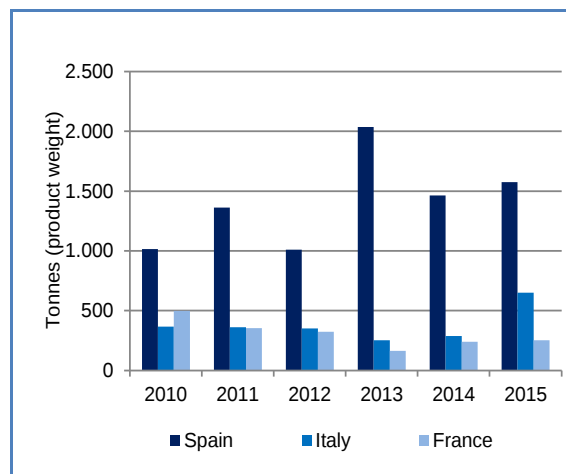
The EU is by far a net exporter of Atlantic bluefin tuna. Extra-EU export value has increased from less than EUR 100 million in 2010 and 2011, to EUR 150 million in 2015. More than 10.000 tonnes of Atlantic bluefin tuna were exported in both 2014 and 2015.

Intra-EU trade in bluefin tuna is heavily influenced by the trade of live fish, which is used by the fattening industry to grow both larger and better quality individuals, according to markets with the most rigorous requirements and greatest willingness to pay. In both 2014 and 2015, the trade of live tuna represented more than 50% of intra-EU imports, corresponding to an annual volume of more than 3.000 tonnes. The major trade flows for live tuna within the EU are going to Malta and Spain. Italy and France are the main suppliers to Malta, whereas France and Portugal dominate the supply to Spain.

Looking at the trade of fresh and frozen bluefin tuna (i.e. excluding live fish), Spain, Italy, and France represent the three largest import nations for intra-EU trade, with approximately 1.600, 650, and 250 tonnes in 2015, respectively. Spain's dominant role as an importer of bluefin tuna among EU Member States is becoming even more evident, considering that, over the past five years, Spain has been the destination for more than 90% of the fresh and frozen imports coming from outside the EU. These imports are predominantly fresh whole tuna, originating in Morocco. Fresh tuna dominates imports in France, Italy and Spain. Between 2010 and 2015, the share of fresh products to both Spain and France has been stable, close to 90% of the total. Italy has a higher share of frozen, averaging 30% over the past six years.

The EU does not import a substantial amount of Atlantic bluefin tuna from outside the EU. In 2015, the total import was 160 tonnes at a value of EUR 1 million. Morocco has been, and still is, the main extra-EU supplier of bluefin tuna to the EU. The major extra-EU exporters of Atlantic bluefin tuna are Spain, Malta, and Croatia, which account for more than 95% of total volume exported from the EU in 2015. The Japanese market far exceeds any other country in export volume from the EU, accounting for almost 90% of total exports in 2015.

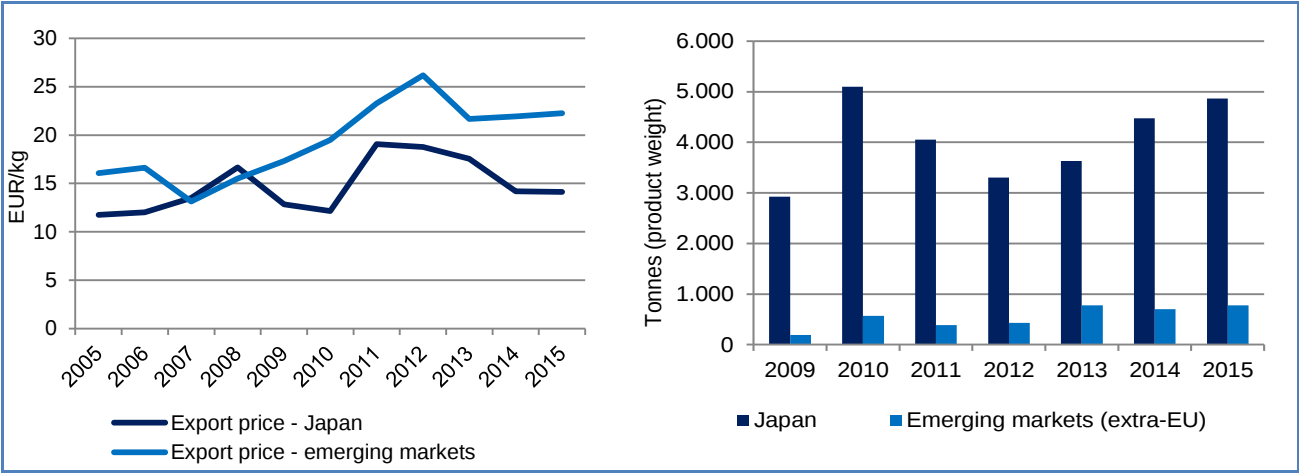
Japanese consumption of bluefin tuna is dominant on a global scale. In value, Atlantic bluefin tuna's share of total bluefin import has ranged between 40–60% over the past 15 years, reaching 43% in 2015. Malta is the third-largest supplier of Atlantic bluefin tuna to Japan, exhibiting a substantial increase over 2000–2015, with an average annual growth of 25%. The fourth largest supplier is Spain, which has maintained a stable supply to Japan for the past 15 years. Imports from Croatia peaked in 2006, and have since declined gradually, becoming in 2015 the sixth largest supplier of Atlantic bluefin tuna.

Figure 22-2 **MAIN EU IMPORTERS OF ATLANTIC BLUEFIN TUNA WITHIN THE EU**

Source: EUMOFA.

Although less significant than Japan, other countries such as the United States and South Korea have increased in importance as export markets in the past five years, thus gradually decreasing the EU's dependence on the Japanese market. The increase in export value on these markets is the result of both volume and price growth. It is especially interesting to compare the unit value of exports to Japan's at 13,51 EUR/kg, with that of exports to other emerging markets at 20,18 EUR/kg. The emerging markets might indicate a further globalisation of the Japanese culinary style (e.g. sushi and sashimi) and the fact that, although growth potential for bluefin is present in many markets, it is limited for Japan.

Figure 22-3 EU EXPORTS OF BLUEFIN TUNA TO JAPAN AND EMERGING MARKETS (EUR/kg and tonnes)

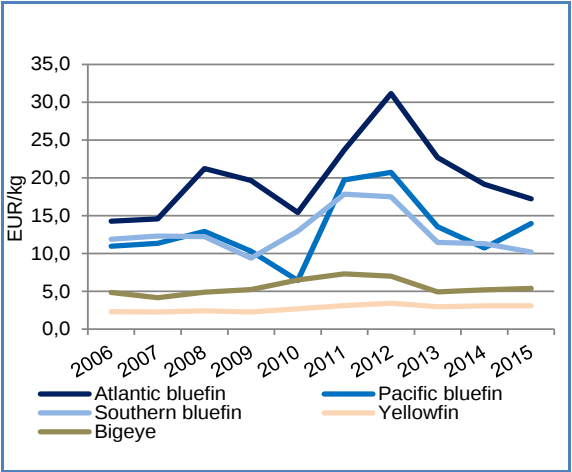


Source: EUMOFA (updated 13.06.2016).

22.3.1 BLUEFIN TUNA IN A GLOBAL CONTEXT

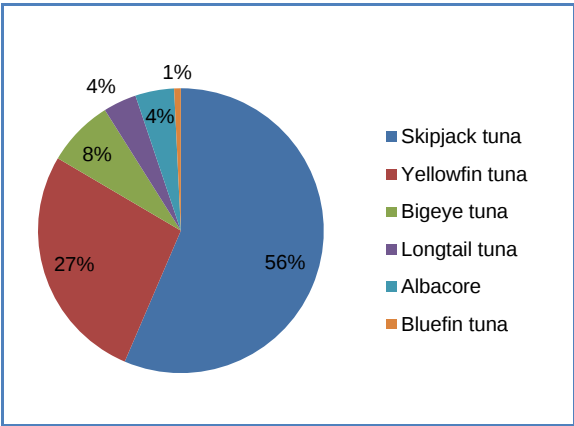
There are three main species of bluefin tuna: Atlantic bluefin tuna (*Thunnus thynnus*), Pacific bluefin tuna (*Thunnus orientalis*), and Southern bluefin tuna (*Thunnus maccoyii*). Together, they represent only 1% of global tuna catches, but are the most valuable tuna species in the world. Although prices have been trending downwards over the past 3–4 years, Atlantic bluefin tuna is still the most valued of the species, achieving premium prices among the bluefin tunas. Total tuna volume in 2014 was 7,5 million tonnes. However, most of this catch consists of low-value species, mainly skipjack sold to the canning industry.

Figure 22-4 JAPANESE IMPORT PRICES FOR DIFFERENT BLUEFIN TUNA SPECIES



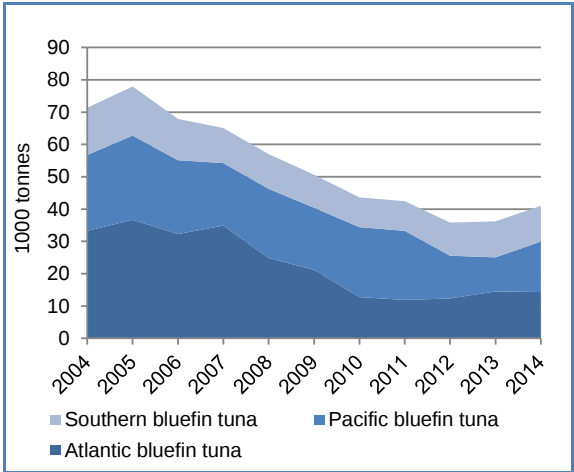
Source: Japanese national imports statistics.

Figure 22-5 GLOBAL CATCHES OF TUNA AND TUNA-LIKE SPECIES (2014)



Source: FAO.

Figure 22-6 GLOBAL CATCHES OF BLUEFIN TUNA SPECIES



Source: FAO.

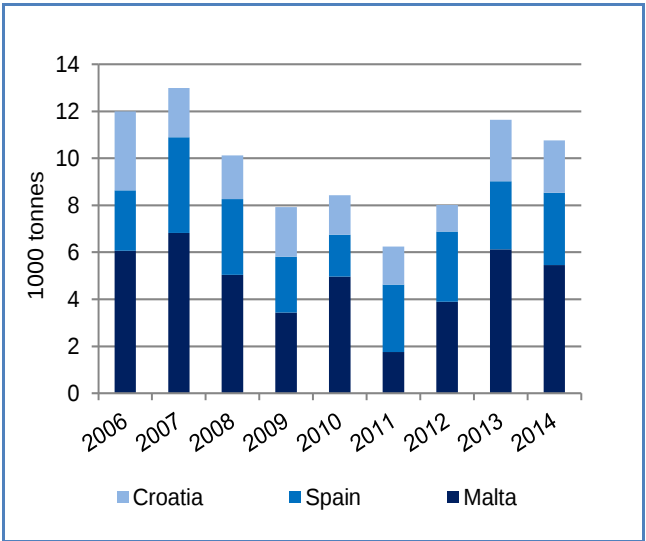
22.4 FATTENING AND FARMING

The high market value of bluefin tuna, combined with stagnation in the yield of the wild fisheries and issues with the stocks, have increased interest in aquaculture. The practice in most instances occurs at the intersection between the aquaculture and fishery sectors, which makes it difficult to consider them independently of each other. Most tuna aquaculture production, fattening, relies on the capture of wild-caught specimens for the purpose of increasing fat content.

The global aquaculture production of bluefin tuna is estimated to be approximately 36.400 tonnes. Pacific bluefin tuna is cultured in Japan and Mexico, Atlantic bluefin tuna in Mediterranean countries, and Southern bluefin tuna in Australia. The EU Member States practicing aquaculture of Atlantic bluefin tuna in the greatest volume are Malta, Spain, and Croatia, with production of 5.000, 3.000, and 2.000 tonnes, respectively. From 2006 to 2014, the aquaculture volume had an annual average increase of 2% in Malta, whereas Spain saw a 1% decline. The low growth rates were closely tied to quotas. The fattening period for Atlantic bluefin tuna in Mediterranean countries usually lasts 3–7 months, and wild-caught specimens typically range in weight from 40 to 400 kg. The main exception is Croatia, where farming can last for up to two years. It can be assumed that the reason for the two-year fattening period is to achieve maximum size and thereby exploit the quota to the fullest.

The more recent practice of growing hatchery-reared juveniles, referred to as farming, has increased in recent years. Pacific bluefin tuna farming has been driven by Japan, which first closed the life cycle in 2002. There has also been an intensive effort in closing the life cycle of Atlantic bluefin tuna in Europe, but this has not yet been achieved. However, great progress has been made in Spain, Cyprus, and Turkey.

Figure 22-7 GLOBAL AQUACULTURE PRODUCTION OF ATLANTIC BLUEFIN TUNA BY MAIN COUNTRIES



Source: EUMOFA. Croatia's 2006–2012 figures are based on FAO.

Species profiles: focus on imports

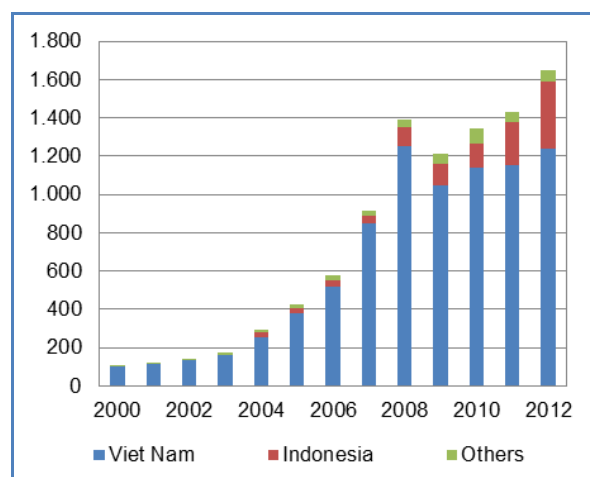
23 Pangasius imports in the EU

This case study is available in the
Monthly Highlights N° 4-2014



Around the world there is a variety of farmed catfish species. According to FAO, the world's harvest of catfish totalled approximately 3,3 million tonnes in 2012. Channel catfish (farmed in the Americas and China), Amur catfish and yellow catfish (farmed in Asia), and North African catfish (farmed in Africa) are among the most common farmed catfish species. Pangasius is the most important commercial farmed catfish species.

Figure 23-1 **HARVEST OF FARMED PANGASIOUS (1000 tonnes)**



Source: FAO, FISHSTAT.

Production of pangasius increased rapidly from 2003 to 2008. After a set-back in 2009, production has again increased steadily. Viet Nam has, by far, been the largest producer and supplier of pangasius products to the world market over the last decade.

In terms of value, 22% of the Vietnamese pangasius exports were shipped to the US market in 2013. The EU market received the same export share, while Latin

America (with Brazil, Mexico and Colombia in the lead) accounted for approximately 17%.

Although the Vietnamese pangasius industry has faced some serious challenges over the last few years (both related to profitability and trade barriers), industry reports indicate that production in other Asian countries is on the rise, particularly in Indonesia.

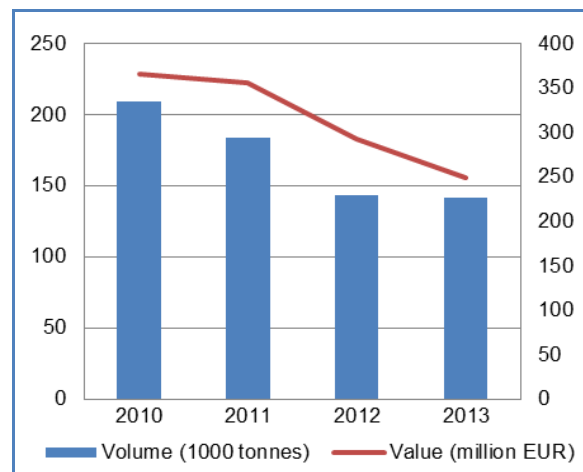
According to the Vietnamese Ministry of Agriculture and Rural Development (MARD), the pangasius harvest in Viet Nam is estimated at 977.000 tonnes in 2013, while

according to the Viet Nam Tra Fish Association, there are plans to harvest approximately 1,3 million tonnes in 2014.

The main pangasius product imported to the EU is frozen fillets (98% of the total). From next to nothing in 2000, imports of frozen pangasius fillets to the EU peaked in 2009. In 2010, EU imports totaled 211.000 tonnes in volume, at an import value of EUR 370 million. During the 3 following years, imports trended down by 31% in volume and value. In 2013,

99% of pangasius fillet volume imported to the EU was of Vietnamese origin.

Figure 23-2 **EU IMPORTS OF FROZEN PANGASIOUS FILLETS**



Source: EUROSTAT, COMEXT.

Spain is by far the biggest market for frozen pangasius fillets within the EU. Spain accounted for 21% of EU imports in 2013, in terms of volume. From 2010 to 2013, both the Spanish import share and import volumes have trended down.

The same trend is applicable for the 3rd largest EU market for frozen pangasius fillets, namely Germany. However, the import volume has halved over the last 4 years and the import share has fallen from 16% to 11%. In Germany, it is estimated that 70-75% of pangasius sales are in the retail sector, while the rest is sold in the food service sector.¹⁸¹

Italy and the UK, 4th and 5th ranked EU importing countries of frozen pangasius fillets, trended in the opposite direction.

During the first quarter of 2014, EU imports of frozen pangasius fillets continued to fall. Imports totalled 31.785 tonnes, worth EUR 55,2 million, which is down 6% from the corresponding period last year in terms of volume and down 8% in terms of value.

A low market price is the main driver behind the strong market position of frozen pangasius fillets on the EU market. Even though import prices for frozen cod fillets in 2013 and in the first quarter of 2014 were moderate, frozen pangasius fillets could be purchased for half of the price. Compared with frozen tilapia, which is regarded as a low priced white fish fillet product, pangasius import prices through the first quarter of 2014 were 30% lower.

In the Netherlands, which is the 2nd largest EU market for frozen pangasius fillets, pangasius is popular among consumers. According to GfK panel data presented by the Netherlands Visbureau, sales of pangasius fillets (in terms of volume) ranked number one in 2013, up from 3rd place in 2012 (http://www.visbureau.nl/cijfers/consumptiecijfers/consumptiecijfers_2013/).

¹⁸¹ Pangasius in the EU market – Prospects for the position of (ASC-certified) pangasius in the EU retail and food service sector, report

Canned tuna and fish sticks ranked 2nd, and 3rd, respectively. Due to its low price, pangasius ranked 6th in terms of sales value. The number one value item was smoked salmon followed by fresh salmon and canned tuna.

In 2012, the top 10 seafood products sold at supermarket level accounted for 52% of the total supermarket seafood sales.

Table 23-1 **TOP 5 EU IMPORTING MEMBER STATES OF FROZEN PANGASIOUS FILLETS**

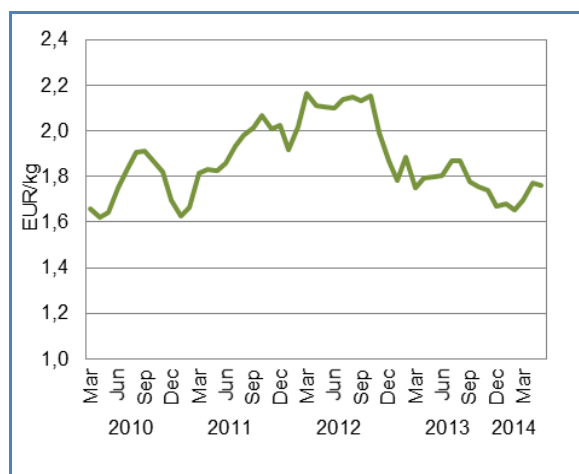
MS	2010		2011		2012		2013	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
ES	49.211	85.299	43.519	82.285	32.445	63.893	31.128	52.244
NL	27.329	53.621	26.607	56.596	21.651	48.038	20.165	39.344
DE	34.215	63.686	29.880	59.853	19.457	40.783	16.494	30.146
IT	10.265	18.070	12.758	24.967	12.883	25.994	12.991	21.480
UK	8.749	21.308	8.902	21.780	8.744	23.047	11.044	25.223
Other MS	79.019	122.899	61.751	109.877	47.804	90.647	49.557	80.610
Total	208.788	364.883	183.417	355.358	142.984	292.402	141.379	249.047

Source: EUROSTAT.

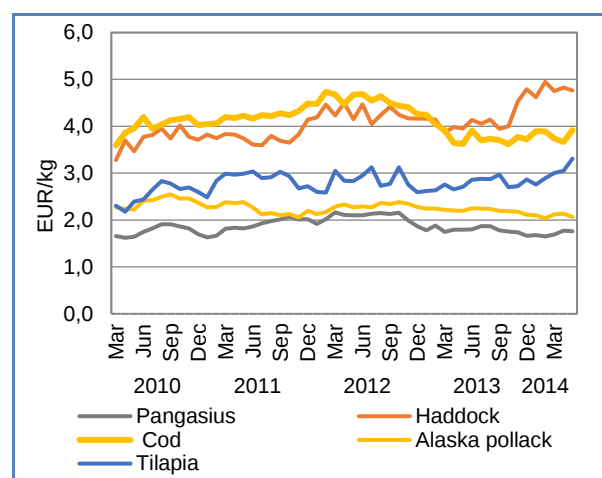
Table 23-2 **TOP 5 EU IMPORTING MEMBER STATES OF FROZEN PANGASIOUS FILLETS (value in 1000 EUR and volume in tonnes)**

MS	Q1 2013		Q1 2014	
	Volume	Value	Volume	Value
ES	8.327	14.361	8.316	13.886
NL	4.735	9.658	4.707	8.896
DE	4.537	8.423	3.360	6.454
IT	2.617	4.389	3.157	5.049
UK	1.656	3.787	2.530	5.669
Other MS	11.865	19.342	9.715	109.877
Total	33.737	59.960	31.785	149.831

Source: EUROSTAT, COMEXT.

Figure 23-3 **EU IMPORT PRICE OF FROZEN PANGASIOUS FILLETS (EUR/kg)**

Source: EUROSTAT, COMEXT.

Figure 23-4 **EU IMPORT PRICE OF SELECTED FROZEN WHITE FISH FILLETS (EUR/kg)**

Source: EUROSTAT, COMEXT.

In 2012, the top 10 seafood products sold at supermarket level accounted for 52% of the total supermarket seafood sales.

Pangasius has been and is the lowest value whitefish species in the retail and food service. Nevertheless, Alaska pollack is sometimes offered at similar or slightly lower price.

In the retail sector, pangasius is mainly sold in the form of frozen or defrosted fillets and often used for special offers and promotions. In the fresh segment, defrosted pangasius competes with a variety of local and imported species, while in the frozen segment Alaska pollack is the main competing species. In the food service sector, pangasius fillets are used as low cost meal ingredients and mainly compete with Alaska pollack.

One of the reasons behind the fall in EU imports and consumption of pangasius is, according to industry reports, bad reputation and publicity.

Over the last few years Vietnamese farmers, in cooperation with distributors in the EU, have worked intensively to certify pangasius production and processing. The first five Vietnamese pangasius producers gained Aquaculture Stewardship Council (ASC) certification in November 2012,

while the first processing facility achieved Best Aquaculture Practices (BAP) certification in March 2011.¹⁸²

Despite Vietnamese efforts, the sale of certified pangasius is still limited to small volumes in Germany, the Netherlands and Italy.¹⁸³

The Vietnamese Ministry of Agriculture and Rural Development has drafted a new decree on pangasius farming, processing and exporting. This requires all national pangasius farms and supply chain companies to be certified to the VietGAP Pangasius Standard or equivalent (ASC, GLOBALG.A.P., BAP and others).

The decree is anticipated to be enforced from 1 January 2016.

Table 23-3 **RANKING OF TOP 10 SUPERMARKET SALES OF SEAFOOD PRODUCTS IN THE NETHERLANDS (by volume)**

PRODUCT	2013	2012	2011	2010
Frozen pangasius fillets	1	3	1	2
Canned tuna	2	2	2	1
Fish sticks	3	1	3	3
Smoked salmon	4	5	5	6
Frozen salmon	5	4	4	4
Frozen saithe	6	9	9	9
Herring (preserved)	7	7	7	7
Fresh salmon	8	8	8	8
Marinated herring	9	6	6	5
Frozen shrimp	10	-	-	-

Source: Nederlands Visbureau, GfK.

Table 23-4 **RANKING OF TOP 10 SUPERMARKET SALES OF SEAFOOD PRODUCTS IN THE NETHERLANDS (by value)**

PRODUCT	2013	2012	2011	2010
Smoked salmon	1	1	1	1
Fresh salmon	2	3	3	4
Canned tuna	3	5	5	5
Frozen salmon	4	4	4	3
Marinated herring	5	2	2	2
Frozen pangasius fillets	6	6	6	11
Fish sticks	7	7	9	7
Frozen shrimp	8	8	11	9
Mussel	9	-	-	8
Frozen saithe	10	-	-	-

Source: Nederlands Visbureau, GfK.

¹⁸² <http://www.asc-aqua.org/index.cfm?act=update.detail&uid=136&lng=1>

¹⁸³ Pangasius in the EU market – Prospects for the position of (ASC-certified) pangasius in the EU retail and food service sector, report

24 EU shrimp imports

This case study is available in the
Monthly Highlights N° 6-2014

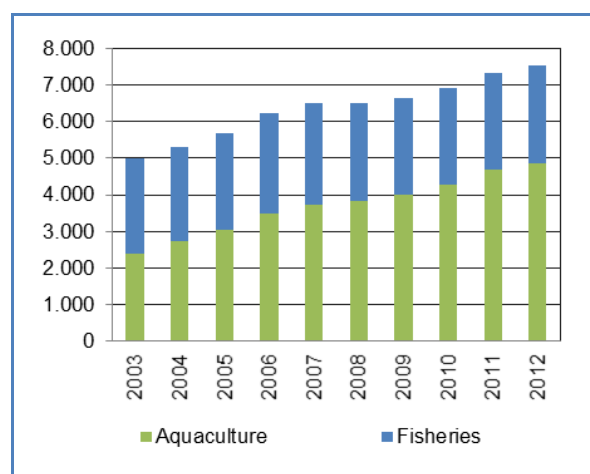


There are a variety of shrimp species and in trade and market terms shrimps are often divided into cold water and warm water (or tropical) shrimp. In the North Atlantic and Pacific, fisheries are dominated by Northern prawn (*Pandalus borealis*). Catches of different warm water shrimp species take place in the areas close to the equator. As opposed to cold water shrimp, warm water shrimp are also farmed.

24.1 PRODUCTION

Over the past ten years there has been significant growth in production of farmed tropical shrimp. According to the FAO, harvest of tropical shrimp more than doubled from 2003 to 2012, from 2,4 million tonnes to close to 4,9 million tonnes. Catches of shrimp in the same period remained stable at around 2,6 million tonnes. EU landings of shrimp in 2013 totalled approx. 20.000 tonnes valued at EUR 91 million. Shrimp species landed in the EU are common shrimp (*Crangon crangon*) and Northern prawn (*Pandalus borealis*). With very few exceptions, EU landings consist of fresh product.

Figure 24-1 GLOBAL CATCHES AND HARVEST OF SHRIMP 2003-2012 (1000 tonnes)

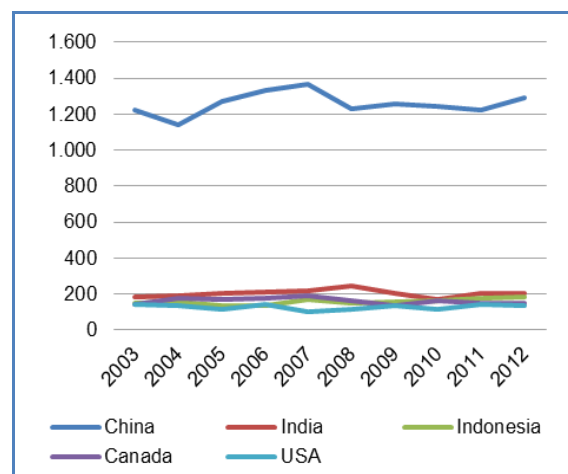


Source: FAO.

Production from the world's shrimp fisheries totalled 2,68 million tonnes in 2012, of which 1,3 million tonnes were caught by China. India ranked 2nd with 0,2 million tonnes, followed by Indonesia. Catches by the three countries amounted to 63% of the world total.

Shrimp farming is dominated by Asian and South American countries. The world's largest shrimp farmer is China which alone accounted for over 2 million tons and 43% of the total harvest volume in 2012. Thailand, Vietnam and Indonesia follow as the largest producers. Ecuador is the largest shrimp farmer in South America.

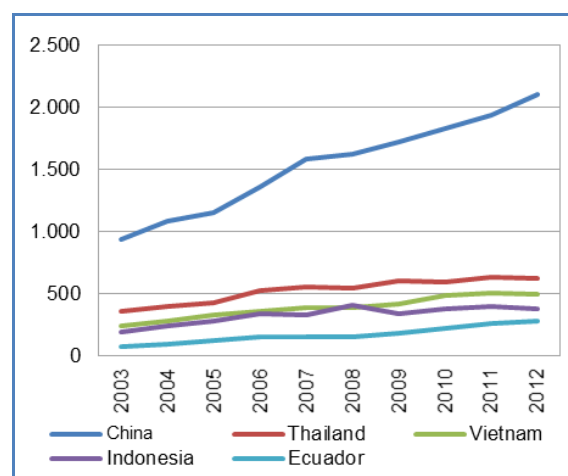
Figure 24-2 TOP 5 SHRIMP FISHING COUNTRIES 2003-2012 (1000 tonnes)



Source: FAO.

In recent years some shrimp farming countries have been challenged by disease. Early Mortality Syndrome (EMS) - also named Acute Hepatopancreatic Necrosis Syndrome (AHPNS), was first discovered in 2009 and in the following years caused much damage in China and Thailand, two of the major producing countries that were hit hardest. In 2013, Thailand's production decreased from 600.000 tonnes to 300.000 tonnes. This decrease has continued in 2014, but it is estimated that a recovery will occur next year. While the EMS-situation is somewhat under control, the weather conditions have been difficult for the farmers in Thailand this year.

Figure 24-3 TOP 5 SHRIMP FARMING COUNTRIES 2003-2012 (1000 tonnes)



Source: FAO.

24.2 IMPORTS

The main importers of shrimp are the USA and the EU with 5 year-average import volume of approx. 550.000 tonnes. Shrimp have been the number one seafood species consumed in the USA for the last 10 years. Tropical shrimp ranked number 10 on the list of the most important species consumed in the EU in 2011 with consumption estimated at 0,75 kg/capita.¹⁸⁴ EU shrimp imports are valued ahead of salmon, tuna and cod. Among the main importers of shrimp, Japan ranks 3rd. China has also become an important market. Because of the strong domestic demand, China is now moving towards becoming a net importer.

EU shrimp-import value amounted to EUR 3,3 billion in 2013. This represents an increase of 27% from 2010. In the first 9 months of 2014 imports rose 23% and 4% in terms of value and volume respectively.

Denmark is the biggest importer of frozen cold water shrimp in the EU, with an import share of 97% in 2013. Denmark's close relation to Greenland makes Denmark a hub for shrimp of Greenlandic origin. Danish imports of frozen cold water shrimps from Greenland amounted to 39.000 tonnes in 2013 of which 21.000 tonnes were re-exported to other EU Member States.

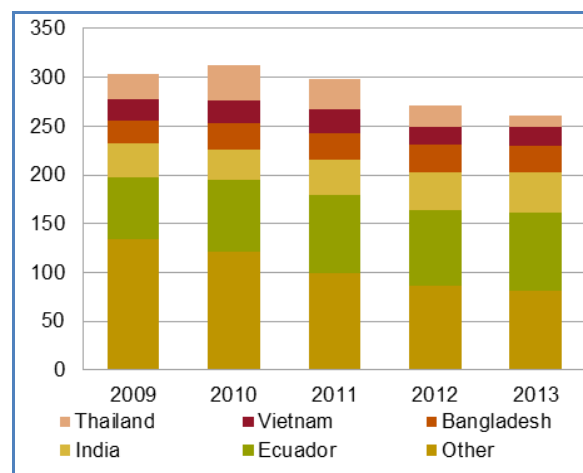
Almost half of the EU imports of frozen miscellaneous shrimp is red shrimp (*Pleoticus mulleri*) from Argentina and the main EU importer is Spain. There is also a significant volume of prepared-preserved shrimp under the miscellaneous shrimp category. Prepared-preserved shrimp consist mainly of tropical shrimp, where the main product forms include peeled frozen/in brine and frozen breaded shrimp.

The main commercial shrimp species imported to the EU is tropical shrimp as frozen whole product. Over the last years imports have shown a negative trend. From 2010 to 2013 import volumes have fallen 17%. In the same period the import value was unchanged, at close to EUR 1,7 billion.

While Ecuador is the 5th largest world producer of farmed shrimp, the country is the main supplier of frozen tropical shrimp to the EU with a market share of 30%. EU imports from Ecuador in 2013 were approx. 80.000 tonnes, which is 4% higher than in 2012 and 10% higher than in 2010. The imports from Ecuador rose by 23% in value from 2012 to 2013 and by 30% in the first 3 quarters of 2014.

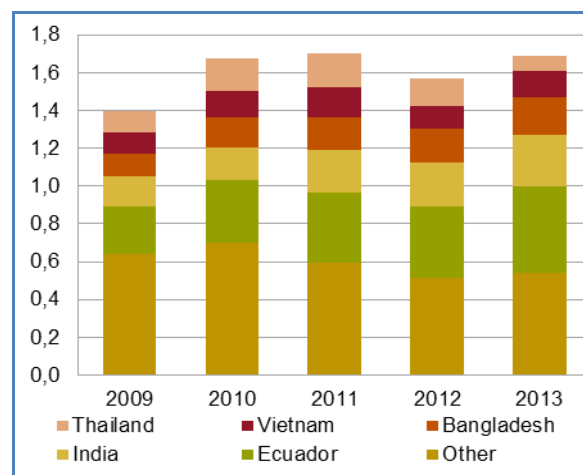
Behind Ecuador, East Asian suppliers dominate the EU market. From being the 2nd largest supplier in 2010, EU imports of tropical shrimp from Thailand have trended downward. From 2012 to 2013 the EU import volume from Thailand more than halved. The drop in 2013 can be attributed to EMS (Early Mortality Syndrome).

Figure 24-4 EU IMPORTS OF FROZEN TROPICAL SHRIMP FROM MAIN PARTNERS (1000 tonnes)



Source: EUMOFA.

Figure 24-5 EU IMPORTS OF FROZEN TROPICAL SHRIMP FROM MAIN PARTNERS (million Euro)



Source: EUMOFA.

Table 24-1 EU QUARTERLY IMPORTS OF FROZEN TROPICAL SHRIMP FROM MAIN PARTNERS (value in million euro and volume in tonnes)

Partner	Q1+Q2+Q3 2013		Q1+Q2+Q3 2014	
	Vol	Val	Vol	Val
Ecuador	60.403	330,17	66.335	429,06
India	26.819	162,96	39.446	310,93
Bangladesh	18.893	124,49	18.928	164,16
Viet Nam	12.942	86,73	16.915	134,83
Thailand	8.732	64,10	5.945	65,37
Other	53.609	335,66	53.531	397,08
Total	181.398	1.104,10	201.100	1.501,43

Source: EUMOFA.

¹⁸⁴ The EU fish market is published by the Directorate-General for Maritime Affairs and Fisheries of the European Commission.

Imports of frozen tropical shrimp bottomed out in 2013. In the first 3 quarters of 2014, EU imports rose by 11% and 36% in terms of volume and value. While imports from most EU trade partners are increasing, imports from Thailand have so far in 2014 trended down in volume and are stable in value. Based on the import trend seen in the first 9 months of 2014, the import value of frozen tropical shrimps this year is expected to be the highest so far recorded.

France is the largest market for frozen tropical shrimp within the EU. France accounted for 26% of EU imports in 2013, in terms of volume. Even though French imports have been stable over the last four years, import share has trended up as overall EU imports have trended in the opposite direction.

Spain, which was the biggest EU market for frozen tropical shrimp from 2010 to 2012, fell behind France in 2013. During this period Spanish imports of frozen tropical shrimp fell by 32%. Argentine frozen red shrimp (which is a cold water species) have replaced tropical shrimp to some extent.

The production challenges in shrimp farming since 2013 related to disease problems, have contributed to a reduction in harvest volumes - especially in some East Asian countries. As farmed tropical shrimp is a commodity sold on the global market, reduced availability has driven prices up. This has also been true for the EU market. From 2012 to 2013, average EU import prices for frozen tropical shrimp rose by 13%. The average import price in the first 3 quarters of 2014 was 7,47 EUR/kg which is 15% higher than in 2013 (whole year).

EU import prices for frozen tropical shrimp rose steeply in the 2nd half of 2013 and remained high in the first three quarters of 2014. The price increase for frozen tropical shrimp has so far not had any impact on EU import prices for cold water shrimp. This points to limited substitution between frozen tropical and cold water shrimps on the EU market

24.3 SUPPLY TRENDS

While catches of tropical shrimp over the last years have been stable, production of farmed shrimp has grown at an annual average of 4% from 2006 to 2012. Tropical shrimp aquaculture production fell by 19% worldwide from 2012 to 2013 (GOAL, Global Aquaculture Alliance). Both South American and Asian producing countries faced drops in aquaculture production in 2013, but some East Asian producers, especially Thailand and China were hit the hardest. A slight recovery is expected as from 2014.

Vietnam, the 3rd largest producer of farmed tropical shrimp and the 4th biggest supplier of frozen tropical shrimp to the EU market, has increased its exports significantly in 2014. In the first 3 quarters of 2014 EU imports of frozen tropical shrimp rose by 31% in terms of volume and 55% in value. US imports of shrimp from Vietnam rose by 59% in terms of volume in the first 8 months of 2014. The US imposed in September higher duty rates, ranging between 4,98% to 9,75% on Vietnam shrimp. The may lead to reallocation of volumes to other markets. Vietnam has taken advantage of the overall fall in shrimp production. The country suffered to a limited extent from EMS, and has in 2013 and so far in 2014 benefited from high prices on the world markets.

Table 24-2 TOP 5 EU MS IMPORTERS OF FROZEN TROPICAL SHRIMP (value in million euro and volume in tonnes)

Member State	2010		2011		2012		2013	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
France	68.619	364,35	59.300	340,47	65.208	375,34	67.907	436,50
Spain	94.822	487,97	83.990	426,56	67.029	327,71	64.054	371,03
UK	24.646	160,28	25.156	178,09	23.819	170,15	24.270	191,57
Belgium	35.743	191,44	42.303	251,15	31.771	193,03	26.842	188,57
Italy	35.266	174,83	35.706	182,10	31.335	163,76	26.259	156,60
Other	53.273	299,11	51.082	325,14	52.364	338,23	50.828	346,27
Total	312.369	1.677,98	297.537	1.703,50	271.526	1.568,22	260.160	1.690,54

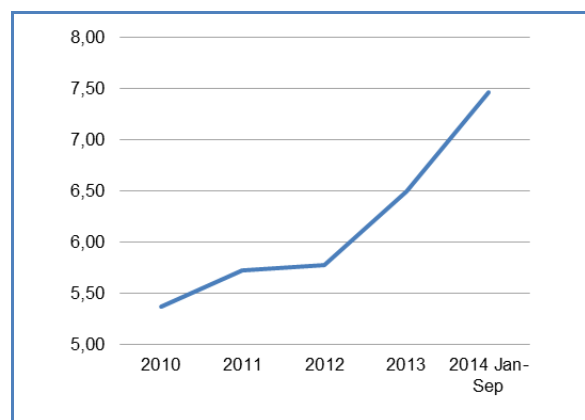
Source: EUMOFA.

Table 24-3 TOP 5 EU MS IMPORTERS OF FROZEN TROPICAL SHRIMP (value in million EURO and volume in tonnes)

MS	Q1+Q2+Q3 2013		Q1+Q2+Q3 2014	
	Vol	Val	Vol	Val
FR	49.835	301,45	48.654	350,22
ES	41.779	223,79	49.172	309,67
UK	16.604	124,47	18.619	176,05
BE	18.830	119,07	21.727	195,48
IT	19.774	112,55	23.178	159,54
Other	34.576	222,77	39.750	310,47
Total	181.398	1.104,10	201.100	1.501,43

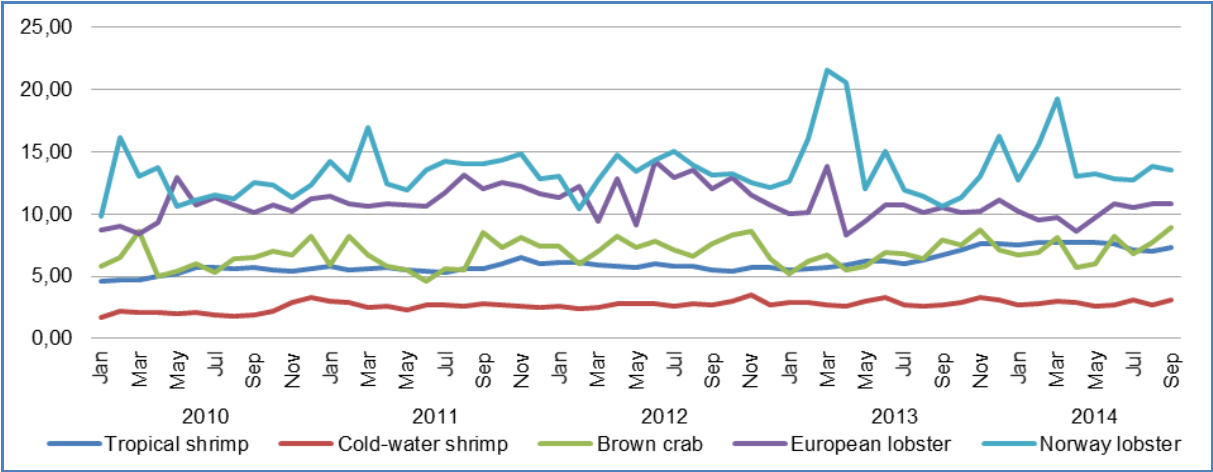
Source: EUMOFA.

Figure 24-6 EU IMPORT PRICE TREND FOR FROZEN TROPICAL SHRIMP (EUR/kg)



Source: EUMOFA.

Figure 24-7 EU IMPORT PRICE TREND FOR SELECTED FROZEN WHOLE CRUSTACEAN SPECIES (EUR/kg)



25 EU imports of tuna

This case study is available in the
Monthly Highlights N° 1-2015



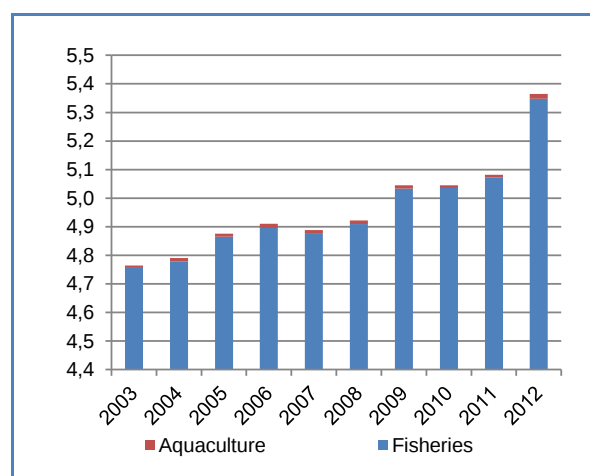
Tuna is caught in fisheries. Aquaculture production is limited to less than 1%. In 2012, 5,36 million tonnes of tuna were caught and produced.¹⁸⁵

25.1 PRODUCTION

Commercial fisheries harvest 23 stocks of tuna around the world: six albacore, five skipjack, four bigeye, four bluefin, and four yellowfin. In 2012, skipjack tuna was globally the most-caught, accounting for 56% of the total volume, 4,6 million tonnes. Yellowfin (26%), bigeye (10%), albacore (6%), and bluefin (Atlantic and Pacific) accounted for only 1% of total catches.

Of commercial catches worldwide, 86% comes from stocks that have been determined not to be overfished, mainly skipjack. Several bluefin stocks and two out of six albacore stocks are overfished.

Figure 25-1 **GLOBAL CATCHES AND HARVEST OF TUNA 2003–2012 (million tonnes)**

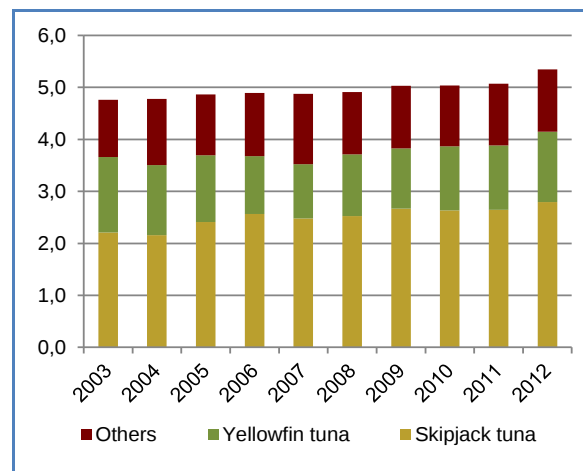


Source: FAO.

From 2003 to 2012, tuna catches increased 12%, essentially driven by skipjack tuna (+26%, to 2,8 million tonnes). For yellowfin in the same period, catches declined 7% to 1,3 million tonnes.

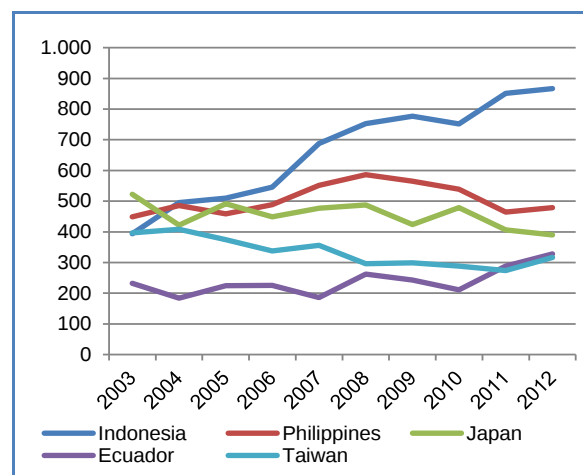
Indonesia, the Philippines, and Japan were the top three tuna-fishing nations. In 2012, they accounted for 50% of all catches (3,6 million tonnes). From 2003 to 2012, Indonesian landed volume grew 120%. In the same period, Japanese and Taiwanese catches declined 25% and 20%, respectively. In 2012, the only European nation in the top ten was Spain, accounting for 7% of global tuna catches. From 2003 to 2012, Spain's catches decreased slightly (-1%). In the period 2008–2012, total EU tuna catches ranged between 350.000 tonnes and 380.000 tonnes. Main players after Spain were France and Portugal. A large share of EU catches is taken in remote waters, i.e., Seychelles.

Figure 25-2 **MAIN TUNA SPECIES IN FISHERIES (million tonnes)**



Source: FAO.¹⁸⁶

Figure 25-3 **TOP FIVE TUNA-FISHING COUNTRIES 2003–2012 (1000 tonnes)**



Source: FAO.

¹⁸⁵ FAOstat.

¹⁸⁶ <http://ec.europa.eu/fisheries/market-observatory/documents/10157/bf18cf2c-1b33-440d-8870-e05b2644b58b>

Table 25-1 EU IMPORTS OF TUNA BY MAIN COMMERCIAL SPECIES AND PRESERVATION STATE (tonnes)

Main commercial species	Preservation state	2010	2011	2012	2013	2014 Jan-Sep
Albacore tuna	Fresh	793	691	301	118	251
	Frozen	18.048	24.740	17.172	18.398	8.794
Bigeye tuna	Fresh	41	33	24	57	79
	Frozen	6.518	7.943	6.279	6.230	6.117
Bluefin tuna	Fresh	356	122	571	174	139
Miscellaneous tunas	Frozen	10.629	11.073	11.484	12.671	11.509
	Prepared-Preserved	474.522	496.857	471.474	510.465	386.800
Skipjack tuna	Frozen	34.679	32.607	38.278	24.881	22.720
Yellowfin tuna	Fresh	3.037	3.641	3.284	3.307	2.411
	Frozen	103.316	101.191	104.366	88.731	77.464
Total volume		651.939	678.898	653.233	665.032	516.284

Source: EUMOFA.

25.2 IMPORTS

Canned tuna is the most important seafood product consumed in the EU, with an estimated consumption of 2,14 kg per capita.¹⁸⁷ The EU and the USA are the main markets for canned tuna.

EU catches covered only 26% of the demand in 2011. Therefore the EU relies heavily on tuna imports from extra-EU countries.

Main tuna species imported to the EU include albacore, skipjack, yellowfin. Miscellaneous tunas consist of canned tuna, tuna loins and bonito. Tuna loins represent raw material for the EU processing industry. Bonito is also commonly used in canning production as a cheap substitute for tuna which has a colour similar to skipjack.

The value of EU tuna imports amounted to EUR 2,74 billion in 2013, a 10% increase over 2012. In the same year, import volumes increased 2% over 2012, ending at 665.000 tonnes.

January to September 2014, imports of tuna to the EU decreased in both value (–15%) and volume (–1%) from the corresponding period in 2013.

The main group in import volume and value to the EU was miscellaneous tunas. This group accounted for 80% of total import volume in 2013. More than 80% of this was canned tuna, and the rest consisted of prepared and preserved loins.¹⁸⁸

In addition to the imported volume of canned and prepared and preserved tuna, several EU Member States are large producers of such products. In 2013, EU canned tuna production totalled roughly 170.000 tonnes, a decline from 340.000 tonnes in 2009 with production cost being a major issue. Main players are Spain, Italy, France, and Portugal. In 2013, Italy and Spain were the largest exporters of canned tuna from the EU with roughly 5.500 tonnes and 5.000 tonnes,

respectively.¹⁸⁹ In 2013, the main exporter of miscellaneous tunas to the EU market was Ecuador, with 120.000 tonnes at a value of EUR 566 million, a market share of 23%, and an increase in value (+16%) and volume (+11%); Spain and Italy were the main markets. However in 2014 (January–September), imports of Ecuadorian miscellaneous tuna products decreased in both value (–28%) and volume (–9%) from 2013.¹⁹⁰

Most Ecuadorian tuna imported to the EU is miscellaneous tunas, which are mostly canned tuna products from skipjack, yellowfin, and bonito.

Mauritius, Seychelles and Côte d'Ivoire export miscellaneous tunas to the EU market. A large part of the raw material has been caught by EU vessels and landed there. Seychelles has a fishery partnership agreement (FPA) with the EU, allowing EU vessels to operate in the waters of Mayotte (the French outermost region in the Indian Ocean). The first Seychelles–EU agreement was signed in 1987, and was recently extended until November 2019; the annual limit for EU vessels was also extended to 50.000 tonnes.¹⁹¹ Mauritius established a FPA with the EU in 1989. It has been extended and runs until January 2017. The agreement allows EU vessels to catch 5.500 tonnes of tuna per year.¹⁹² Côte d'Ivoire's fishery partnership agreement has been extended until 2018 for 6.500 tonnes per year.

In recent years, EU import volumes of miscellaneous tunas have remained stable. However in value these imports increased 59% between 2009 and 2013, a 10% annual growth. A similar trend was seen in the two largest import markets, with increases in the UK (+50%) and Spain (+60%), totalling an annual growth of 8% and 10%.

Amongst the main partners exporting prepared-preserved tuna, Ecuador, Mauritius, Seychelles, Côte d'Ivoire, Papua New Guinea and Ghana benefit from a preferential access arrangement to the EU market (0% duty), providing that the products respect the rules of origin foreseen in the agreements. Thailand lost its status in the EU's Generalised Scheme of Preferences (GSP), resulting in a 24% duty

¹⁸⁷ <http://ec.europa.eu/fisheries/market-observatory/documents/10157/bf18cf2c-1b33-440d-8870-e05b2644b58b>

¹⁸⁸ EUMOFA; <http://globefish.org/tuna-october-2014.html>

¹⁸⁹ EUMOFA; <http://www.ffa.int/node/842>; <https://www.ffa.int/node/651>

¹⁹⁰ EUMOFA.

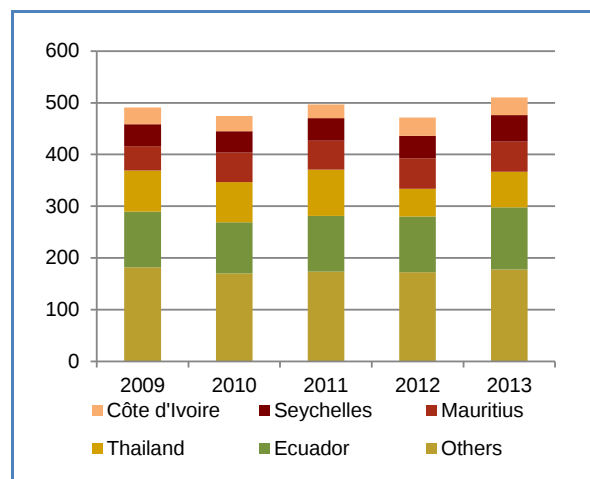
¹⁹¹ http://ec.europa.eu/information_society/newsroom/cf/mare/itemdetail.cfm?item_id=12813

http://eeas.europa.eu/delegations/mauritius/regional_integration/fpa/index_en.htm

¹⁹² http://ec.europa.eu/fisheries/cfp/international/agreements/mauritius/index_en.htm

applied to the country's imports, starting 1 January 2015. Vietnam and Indonesia benefit from GSP status and receive a reduced 20,5% tariff duty. The Philippines were granted the EU's enhanced Generalised Scheme of Preferences (GSP+), i.e. 0% duty.

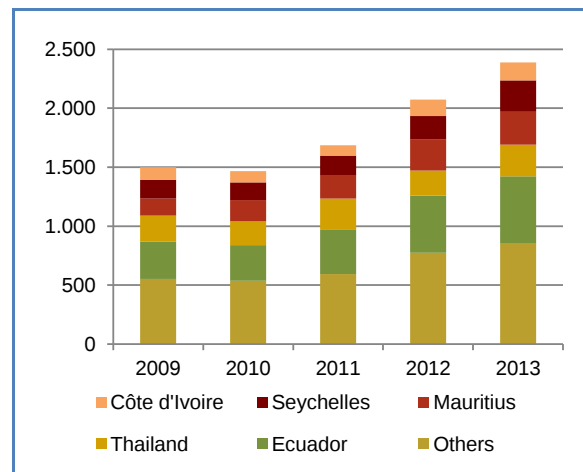
Figure 25-4 MISCELLANEOUS TUNAS FROM MAIN PARTNERS (1000 tonnes)



Source: EUMOFA.

The UK was the largest EU market for miscellaneous tunas in 2013, accounting for 25% of EU import volume. In the first three quarters of 2014, UK imports decreased in both value (-22%) and volume (-11%). Until September 2014, other large import markets were similar, with prices in the global market declining. In Italy and Spain, volumes increased slightly, but values decreased; in recent years, however, import volume has been fluctuating.

Figure 25-5 EU IMPORTS OF PREPARED-PRESERVED MISCELLANEOUS TUNAS FROM MAIN PARTNERS (million EURO)



Source: EUMOFA.

Table 25-2 TOP FIVE EU IMPORTERS OF PREPARED-PRESERVED MISCELLANEOUS TUNAS (volume in tonnes and value in million EURO)

Member State	2010		2011		2012		2013	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
UK	103.095	290,88	105.918	319,76	100.054	394,39	104.916	447,13
Spain	96.336	307,43	96.945	338,24	95.014	448,69	95.766	464,04
France	73.457	231,28	78.854	272,16	79.787	337,69	87.680	409,93
Italy	68.402	281,96	69.871	311,88	69.782	368,06	74.517	414,92
Germany	73.457	121,52	78.854	161,33	79.787	192,41	87.680	234,19
Other	70.445	232,49	77.635	283,20	58.667	332,63	72.598	419,05
Total	485.192	1.465,56	508.077	1.686,57	483.091	2.073,87	523.157	2.389,26

Source: EUMOFA.

Table 25-3 **EU QUARTERLY IMPORTS OF PREPARED-PRESERVED MISCELLANEOUS TUNAS FROM MAIN PARTNERS** (volume in tonnes and value in million EURO)

Partner	Q1+Q2+Q3 2013		Q1+Q2+Q3 2014	
	Vol	Val	Vol	Val
Ecuador	96.717	463,32	88.429	337,12
Thailand	56.902	226,11	54.643	196,23
Mauritius	44.591	220,27	48.840	192,06
Seychelles	37.602	192,95	32.881	174,84
Côte d'Ivoire	28.046	123,47	16.659	79,79
Philippines	25.282	91,26	30.716	98,54
Papua New Guinea	21.804	97,39	19.567	71,98
Ghana	17.198	78,24	16.863	80,13
Indonesia	13.192	50,14	14.834	52,53
Vietnam	10.545	34,80	11.970	34,58
Other	59.457	310,87	62.930	291,60
Total	411.336	1.888,82	398.332	1.609,40

Source: EUMOFA.

Table 25-4 **TOP FIVE EU IMPORTERS OF PREPARED-PRESERVED MISCELLANEOUS TUNAS** (volume in tonnes and value in million EURO)

MS	Q1+Q2+Q3 2013		Q1+Q2+Q3 2014	
	Vol	Val	Vol	Val
UK	80.102	341,40	71.605	266,45
Spain	75.744	372,26	79.656	309,74
France	71.170	330,55	59.121	271,68
Italy	59.118	331,18	60.998	310,48
Germany	45.500	175,54	41.905	139,80
Other	79.703	337,89	85.048	311,23
Total	411.336	1.888,82	398.332	1.609,40

Source: EUMOFA.

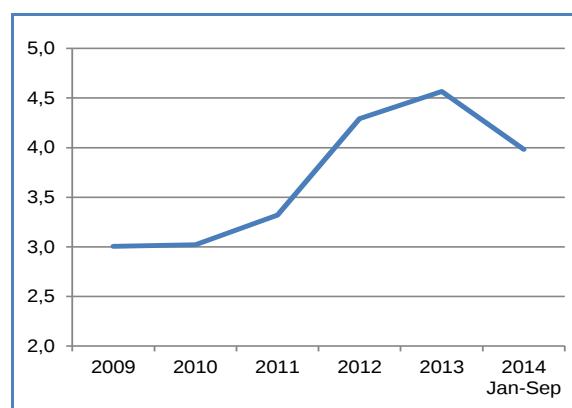
25.3 MARKET TRENDS

Including September 2014, the EU imports of miscellaneous tunas decreased 16% in value and 4% in volume. Imports declined in value in France, the UK, and particularly in Germany, as reflected in the drop of the EU import price.

Imports to the USA, the world's largest canned-tuna market, declined 5% in volume in the first half of 2014, although imports of semi processed cooked/frozen loins for domestic processing increased. This depressed the import price 23% in the first half of 2014. China and the Philippines were the main suppliers.¹⁹³

The average 2014 import price of canned tuna to the EU from several main exporters declined from previous years. The falling prices of canned-tuna raw material worldwide is the primary cause, in addition to a slight decrease in import volume. Prices for all Ecuadorian tuna products declined 2% from last year, with Thailand, Seychelles, Papua New Guinea, Ghana, and Côte d'Ivoire following the same trend. The Philippines (+16%), Indonesia (+6%), and Vietnam (+11%) increased supply to the EU market.¹⁹⁴

Figure 25-6 **EU IMPORT PRICE TREND FOR PREPARED-PRESERVED MISCELLANEOUS TUNAS (EUR/kg)**



Source: EUMOFA.

Although 86% of the world's tuna catches come from healthy stocks, the importance of tuna fisheries and concerns about management of the fisheries has led to several initiatives in order to establish long-term conservation and sustainable use of tuna stocks and reduce bycatch. This complement conservation measures taken within regional fishery management organisations.

Since the first MSC certification of tuna fisheries in 2007 (American Albacore Fishing Association), several tuna fisheries have been certified or are being assessed for MSC certification. This is in particular the case in the Central and Western Pacific Ocean, the world's largest tuna fishery.

In summer 2014, Papua New Guinea and the Philippines received a warning for not sufficiently controlling illegal, unreported, and unregulated (IUU) fishing. As of January 2015, the countries remain yellow carded from the EU and must demonstrate their anti-IUU activities to avoid a future EU import ban, as experienced recently by Sri Lanka.

¹⁹³ <http://globefish.org/tuna-october-2014.html>

¹⁹⁴ Globefish Highlights 1/2015.

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