European Commission

CASE STUDY

MUSSEL IN THE EU

PRICE STRUCTURE IN THE SUPPLY CHAIN

FOCUS ON SPAIN, FRANCE, ITALY AND IRELAND

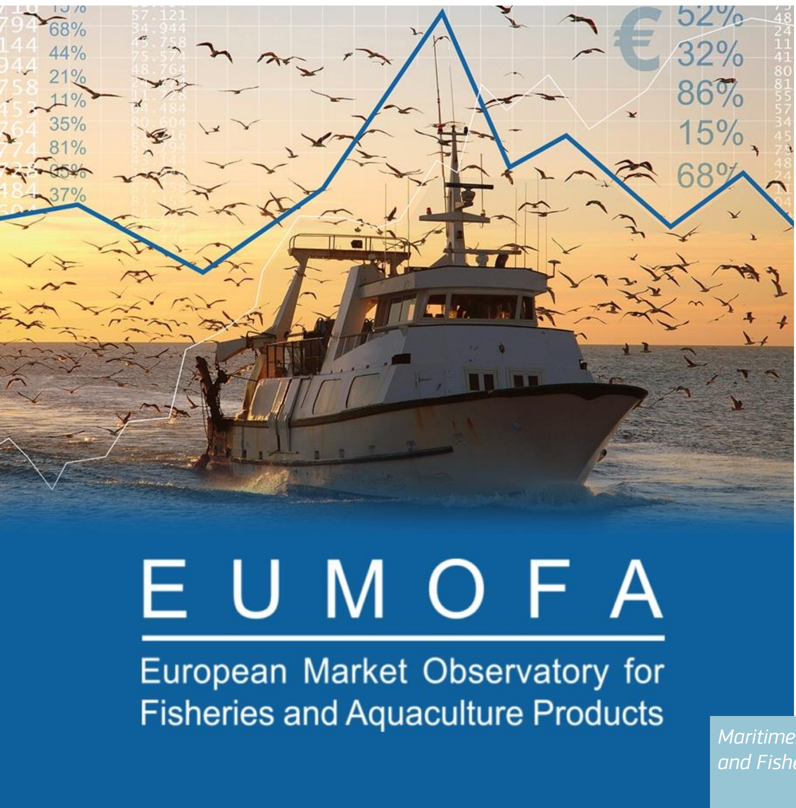

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Table of contents

Summary

- At global level, mussel's production amounted to 2,2 million tonnes in 2020, primarily from aquaculture (97% of the total). China is the main producer contributing to 43% of the global mussel's production in 2020, followed by the EU-27 and Chile, with 20% and 19% respectively. The global production has increased by 7% between 2011 and 2020, driven mainly by the increase of the Chinese and Chilean production.
- In 2020, the 27 EU Member States produced 430.748 tonnes of mussels, mainly from aquaculture (94% of the total). Mussel's production from fishery occurs only in Denmark and shows a significant decreasing trend in recent years. The EU production has been decreasing for the last ten years (2011-2020). Spain is by far the main producer (47% of the EU production in 2020). In 2020, it was followed by France (14% of the EU production), Italy (12%), the Netherlands (8%), Denmark (7%), Greece (4%) and Ireland (3%).
- This study focuses on the mussel's market in Spain, France, Italy and Ireland.
    - Spain only produces the Mediterranean mussel (*Mytilus galloprovincialis*), with the majority of the production being concentrated in Galicia (97% of the Spanish production in 2020). Spain is the largest EU producer of mussel and the main EU consumer of mussels. It also has a significant mussel processing industry. Mussel production is carried out through two production methods: the suspended rope culture (which is the predominant method) and the bottom cultured production.
    - France is the second largest producer and consumer, producing both blue and Mediterranean mussels. A significant share of mussel production is marketed under quality schemes. A variety of production methods is used, "*bouchot*"[1] being the predominant method used (83% of the French mussel's production in 2020).
    - Italy ranks third in terms of production and consumption, with a significant decrease in production in recent years. Most of Italian mussel production (*Mytilus galloprovincialis*) is concentrated on the Adriatic coastline. Three production methods are implemented: the bottom culture (typical of the lagoon areas of the Po delta), the fixed-pole method (the oldest method, widespread in sheltered lagoon and coastal area of the southern regions) and the dominant system: suspended long-lines (or floating rows) in the open sea.
    - Ireland ranked seventh at EU level in 2020. It is a relatively small market (small apparent consumption[2] in comparison to the other major producers). Two production methods are practiced: rope grown system and bottom grown system, with rope grown system being the most widespread method used.
- The EU imports of mussels from third countries are higher than exports. In 2021, the EU trade deficit amounted to EUR 104,4 million. EU imports from third countries mainly concern preserved products, with Chile being the main supplier. On the contrary, the EU mainly exports fresh (mostly from France and Italy) and prepared-preserved mussels (mainly from Spain and Belgium). The main destinations of the EU production include Switzerland and the United Kingdom. Intra-EU trade occurs between several countries that are both major producers and consumers (except for Belgium which has no aquaculture production but is a major mussel consumer). Therefore, the Belgian market is heavily dependent on imports from the other MS (it was the largest importer within the EU in 2021, imports coming mainly from the Netherlands).

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[1] "*Bouchot*" is a wooden pole of 2 to 6 meters long, for breading mussels.

[2] Apparent consumption = (catches + aquaculture + imports) - exports

- In 2020, mussel apparent consumption in the EU was estimated at 537.212 tonnes live weight equivalent (LWE), with an estimated per capita consumption of 1,20 kg. Spain was the largest market with an apparent consumption of 167.403 tonnes (LWE) and 3,54 kg/capita. France followed with an apparent consumption of 127.337 tonnes (LWE) (1,89 kg/capita) and Italy with 103.328 tonnes (LWE) (1,73 kg/capita). Ireland has a small market for mussels (1.890 tonnes LWE, 0,38 kg/capita).
- The price structure analysis developed in this report focuses on the following value chains:
    - Fresh mussels, normal size, sold in supermarkets and in specialized stores in Spain, based on the analyses carried out by the Observatory of prices and food of the MAPA on the value chain and price formation of fresh mussels of aquaculture[3];
    - Fresh mussels cultured on "*Bouchot*" in France and certified Traditional Speciality Guaranteed (TSG) "*Moule de bouchot*" sold by the producer to a purchasing central of large retailers;
    - Fresh standard mussels (without certification) cultured on longlines in France and sold directly by the producer to local restaurants in France;
    - Fresh rope mussels produced in Italy and sold in nets in large scale retails in Italy;
    - Fresh rope mussels produced in Ireland and exported in bulk to the French market, to be processed and packed by a French buyer (packer).
- The main results of this analysis can be summarized as follows:
    - The first sale prices vary between 0,70 EUR/kg to 1,70 EUR/kg depending on the species, the mussel's quality and the country of origin (the highest ex-farm prices are observed in France for "*Bouchot*" mussels), and the segmentation effort undertaken by the producer (i.e. certification);
    - the retail price (excl. VAT) for mussels was different in Italian, Spanish and French markets: it was about 2,65 EUR/kg in Italy, 2,82 EUR/kg in Spain and 3,60 EUR/kg in France. The raw material accounts for 26% of the final price at retail stage in both Spain and Italy and for 44% of the final price in France;
    - the Irish mussel is sold in the French market at 3,91 EUR/kg at retail stage.

[3]https://www.mapa.gob.es/es/alimentacion/temas/observatorio-cadena/Estudio%20Mejill%C3%B3n%20acuicultura_tcm30-128411.pdf

List of acronyms

AOC	Appelation d'Origine Contrôlée
BMTI	*Borsa Merci Telematica Italiana* (the Italian Online Commodities Exchange)
CN	Combined Nomenclature
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
HORECA	Hotels, Restaurants and CAtering
LR	*Label Rouge*
LWE	Live Weight Equivalent
MAP	Modified Atmosphere Packging
MAPA	*Ministerio de Agricultura,Pesca y Alimentación* (Ministry of Agriculture, Fisheries and Food)
MS	Member States
PDO	Protected Denomination of Origin
RNM	*Réseau des Nouvelles des Marchés*
STECF	Scientific, Technical and Economic Committee for Fisheries (STECF)
TSG	Traditional Speciality Guaranteed
VAT	Value Added Tax

1. SCOPE AND CONTENT

1.1. Case study scope

Key elements on the analysis of mussel's price structure and distribution of value in the supply chains are detailed in the following table.

Products	Origin	Characteristics	Market and price drivers
Mussels	Mainly aquaculture (EU)	Broadly farmed in the EU, in both Northern and Southern Member States Fresh product, processed products in Spain (canned) and Ireland (precooked) Products under quality schemes: geographical indications, traditional speciality guaranteed and organic Large intra-EU trade flows	Species (blue mussel, Mediterranean mussel) Origin (national/imports) Production method End market (fresh products versus processed products) Differentiation strategies (size, meat to shell ratio[4], certification strategies, etc.)

1.2. Content of the document

In conformity with the methodology developed within EUMOFA and available on its website (http://www.eumofa.eu/price-structure), this document includes:

- A description of the product;
- An analysis of production and market trends at EU level;
- An analysis of the price structure along the supply chain in France, Italy, Spain, and Ireland.

EUMOFA provides other relevant publications on the topics covered by this study:

- Mussel species profile https://www.eumofa.eu/documents/20178/137160/Mussel_31-1.pdf

- Country profiles:
  - Spain - https://www.eumofa.eu/spain
  - France - https://www.eumofa.eu/en/france
  - Italy - https://www.eumofa.eu/italy
  - Ireland - https://www.eumofa.eu/en/ireland

[4] Meat to shell ratio is the ratio between the meat and the total weight of the live mussel.

2. DESCRIPTION OF THE PRODUCT AND MARKETS

2.1. Biological and commercial characteristics

Case study product

Name:

- Blue mussel (*Mytilus edulis*), **FAO 3-alpha code:** MUS
- Mediterranean Mussel (*Mytilus galloprovincialis*), **FAO 3-alpha code:** MSM

Presentation: Fresh; Preserved

Other main species:

Some of the main cultured mussel species are listed below:

- Green Mussel (*Perna viridis*)
- Chilean Blueshell Mussel (*Mytilus chilensis*)
- New Zealand Green Mussel (*Perna canaliculus*)
- Korean Mussel (*Mytilus coruscus*)

Related codes in the product nomenclature (COMEXT/EUROSTAT)

Mussels are identified in the Combined Nomenclature (CN) through the codes listed below:

Live, fresh or chilled mussels - Conversion factor[5]: 1,00

- 03073110: *Mytilus* spp.
- 03073190: *Perna* spp.

Frozen: codes have been modified in 2017. The list below provides the codes before and after 2017- Conversion factor: 4,5

- 03073210: Mussels «*Mytilus spp.*» frozen, even in shell (from 2017)
- 03073290: Mussels «*Perna spp.*» frozen, even in shell (from 2017)
- 03073910: Other *Mytilus spp.*, frozen, dried, salted or in brine, even in shell (excl. smoked) (until 2016)
- 03073990: Other *Perna spp*. Frozen, dried, salted or in brine, even in shell (excl. smoked) (until 2016)

[5] Import and export volumes are provided in in “product weight” in the trade statistics. They are converted in live weight equivalent (LWE) by using conversion factors elaborated by EUMOFA experts, for the purpose of building a harmonised supply balance.

Smoked

- 03073905: Smoked, whether in shell or not, whether or not cooked before or during the smoking process, not otherwise prepared. Conversion factor: 2.61
- 03073980: Mussels «*Perna spp.*», smoked, dried, salted or in brine, even in shell. Conversion factor: 4.5

Prepared/preserved mussels – Conversion factor: 2.61

- 16055310: Mussels, prepared or preserved, in airtight containers (excl. merely smoked)
- 16055390: Mussels, prepared or preserved (excl. In airtight containers and merely smoked).

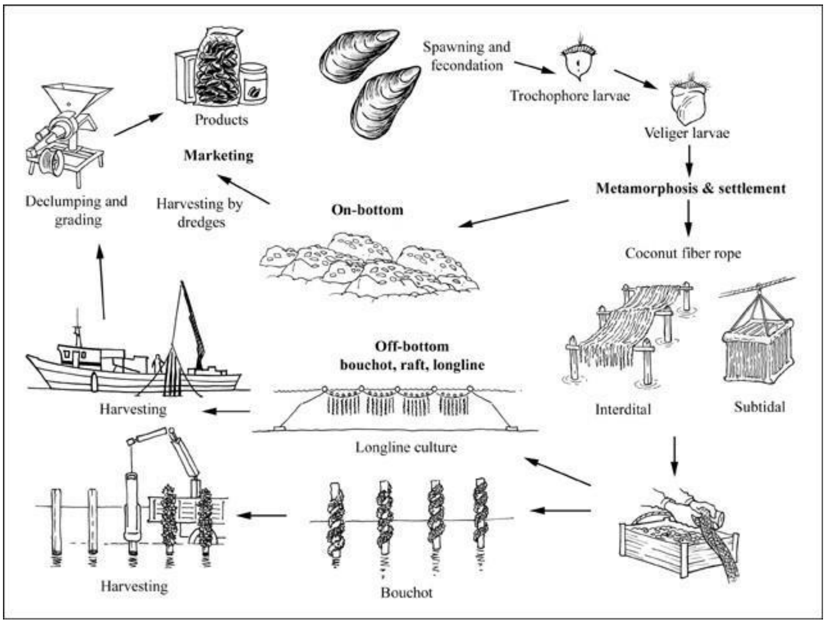
Table 1: Mussel's biological parameters

Parameter	Characteristics
Temperature	5-20°C for *Mytilus edulis* and 10-20°C for *Mytilus galloprovincialis.*
Habitat	Mussels are found in a wide variety of habitats, from tidal areas to fully submerged zones, with a broad range of temperatures and salinities.
Diet in the wild and in farming	Mussel feed on phytoplankton and organic matter by constantly filtering seawater.
Juvenile phase	Mussels produce larvae that are carried by currents between March and October depending on latitude. 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 substrata. Unlike oysters the larvae do not attach themselves directly to the support but use filaments known as byssus. The most common mean 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 seeds cannot be collected. So the juvenile mussels are collected from natural deposits.
Grow-out	Rearing until harvest takes approximately one year
Distribution in the wild	Specific characteristics of mussel are its high fecundity and a mobile larval phase, allowing for widespread distribution. *Mytilus edulis* is widely distributed in European waters, extending from the White Sea, Russia as far as south as the Atlantic coast of Southern France. *Mytilus galloprovincialis* is present in the Mediterranean area and produced in Northern part of Spain, South Africa and China.
Catches	Fishing takes place year-round, with peaks in March– June and September–December.
Farming systems	Four methods are used in European coastal areas: • on plots or by spreading (primarily in the Netherlands and Germany), the juveniles are spread over plots in shallow water. 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 ground. • on ropes (in Spain and the Mediterranean): The mussels are attached to ropes that are vertically suspended 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. Offshore mussel farming also uses this technique. • On trestles (in France, mainly in Brittany and in the Thau lagoon): mussels are grown using the same technique as for oysters, in meshbags on trestles set up on intertidal ground, or directly on the ground.

Source: FAO

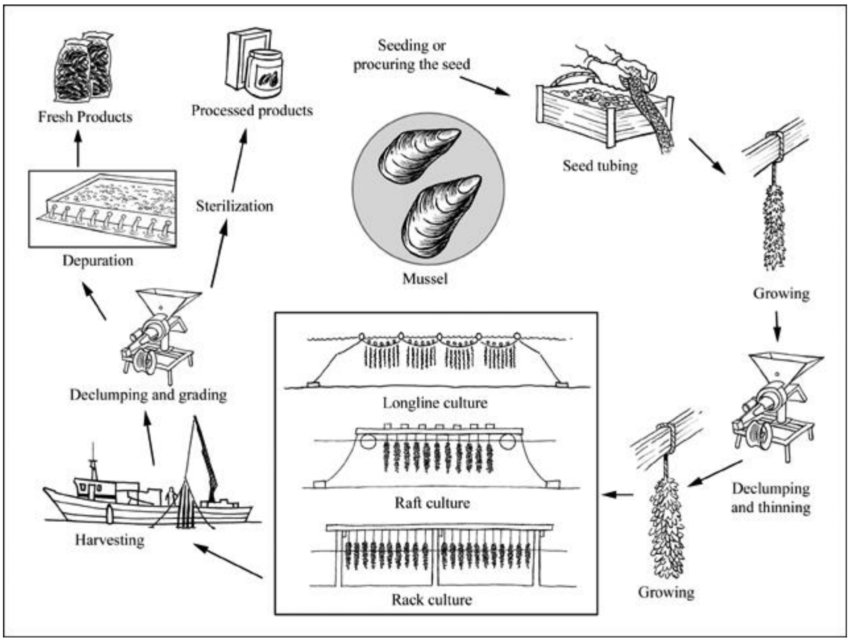
The production stages are provided in the following figures for both *Mytilus edulis* and *Mytilus galloprovincialis.*

Figure 1: Production cycle of *Mytilus edulis*



Source: FAO

Figure 2: Production cycle of *Mytilus galloprovincialis*



Source: FAO

Consumption of live bivalve molluscs (shellfish including mussels) has some risks to human health, as these filtering organisms can accumulate contaminants from aquatic environment, such as pathogenic bacteria, viruses, algal toxins, etc. To reduce the risk from fecal-oral transmitted microorganisms, the shellfish harvesting areas are classified according to the results of a monitoring plan based on fecal indicator bacteria[6]. In the EU, with Regulation (EC) No 853/2004[7], the EU laid down the criteria for the classification of shellfish harvesting areas and determined the level of post-harvest treatment required before shellfish can be considered suitable for human consumption. The harvesting areas are classified in three sanitary levels:

- shellfish (including mussels) coming from Class A areas can be directly placed on the market without further post-harvest treatments,
- those from Class B areas must undergo purification treatment; and
- shellfish from Class C areas must be subject to extended relaying treatment or cooked by an approved method to ensure that it meets the category 'A' standard.
- Shellfish from areas not classified cannot be placed on the market.

[6] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8908438/

[7] Regulation (EC) No 853/2004 of the European Parliament and the Council of 29 April 2004 laying down specific hygiene rules on the hygiene of foodstuffs.

2.2. World production

In 2020, the global mussel's production amounted to 2,2 million tonnes, primarily from aquaculture (2,1 million tonnes, 97% of the total). Between 2011 and 2020, the global mussel's production has increased by 7%, driven mainly by the increase of the Chinese and Chilean production (Table 4).

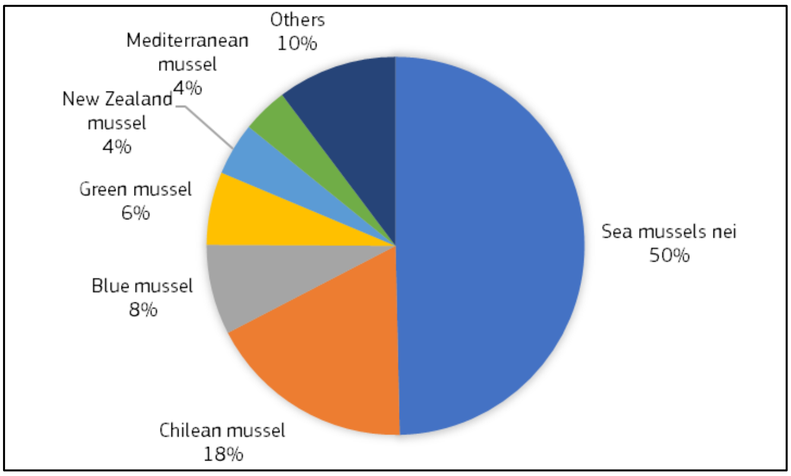
Table 2: Evolution of world mussel production between 2011 and 2020 (1.000 tonnes)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Evol. 2020/11
Aquaculture	1.923	1.869	1.825	1.929	1.922	2.090	2.138	2.152	2.090	2.104	9%
Fishery	96	102	95	91	100	116	85	83	85	65	-32%
Total	**2.019**	**1.971**	**1.920**	**2.020**	**2.022**	**2.206**	**2.223**	**2.235**	**2.175**	**2.169**	7%

Source: FAO Fish Stat

In 2020, half of the global production concerned the Sea mussels nei[8] (50% of the global production). The same year, 18% of the production concerned the Chilean mussel, while the blue mussels and the Mediterranean mussels, both produced in Europe, respectively contributed to 18% and 4% to the global production.

Figure 3: World production by species (2020)



Source: FAO Fish Stat

China is the main producer, contributing to 43% of the global mussel's production in 2020. China was followed by the EU-27 and Chile, both contributing to respectively 20% and 19% of the global production in the same year. While the Chinese and Chilean productions have increased by respectively 24% and 38% between 2011 and 2020, the EU-27 production has decreased by 12%.

[8] This category of species corresponds to several species of mussels. Production is declared under this category when the accurate species is not known.

Table 3: Evolution of mussel production in the main producing countries between 2011 and 2020 (1.000 tonnes)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Evol. 2020/11
China	762	819	812	856	899	953	998	963	929	943	**+24%**
EU-27	493	476	428	484	502	519	505	542	490	431	**-12%**
Chile	296	250	252	245	219	314	353	379	390	409	**+38%**
New Zealand	101	87	84	98	77	94	100	86	99	102	**0%**
Thailand	127	103	128	117	116	115	50	34	38	69	**-45%**
Republic of Korea	80	70	41	58	60	64	83	56	60	68	**-16%**
Indonesia	3	3	8	4	7	5	3	45	37	35	**+1.132%**
Philippines	22	26	23	19	16	19	19	26	25	19	**-14%**
Brazil	21	27	23	25	23	23	23	17	18	17	**-18%**
Canada	26	29	26	25	23	25	24	27	26	17	**-34%**
United Kingdom	36	34	47	41	31	26	17	15	13	12	**-68%**
Others	52	48	49	49	49	49	47	44	49	47	**-10%**
Total	**2.019**	**1.972**	**1.920**	**2.020**	**2.022**	**2.206**	**2.223**	**2.235**	**2.175**	**2.169**	**+7%**

Note: Green for positive evolution (2011-2020), red for negative evolution and grey for no evolution. Totals may differ from sum of data in column due to rounding.

Source: FAO Fish Stat

2.3. EU production

2.3.1. EU production by main producing Member States

The EU mussel's production amounted to 430.748 tonnes in 2020, of which 406.970 tonnes were from aquaculture, i.e. 94% of the total. Between 2011 and 2020, the EU production has fluctuated with a downward trend (by 13%[9]). The overall decreasing trend is observed in almost all EU MS (except for Greece and other MS with small volumes such as Sweden, Bulgaria and Portugal). Italy, Ireland and Germany have recorded the most significant decrease (by respectively -36% and -35% for both Ireland and Germany).

Both fishery and aquaculture production have overall decreased by respectively 11% and 39% between 2011 and 2020. The decrease of the fishery production is attributed to the decrease of the Danish production, which is responsible for almost all the EU mussel fishery (95% of the EU fishery production in 2020).

Spain is by far the main producing country within the EU, with a production of 204.492 tonnes in 2020, accounting for almost half of the EU mussel's production (47%). France (61.378 tonnes; 14% of the EU mussel's production), Italy (50.913 tonnes; 12%), the Netherlands (32.420 tonnes; 8%), Denmark (28.548 tonnes; 7%), Greece (19.155 tonnes; 4%) and Ireland (14.729 tonnes; 3%) followed.

Table 4: Evolution of mussel's production in main producing Member States between 2011 and 2020 (Tonnes)

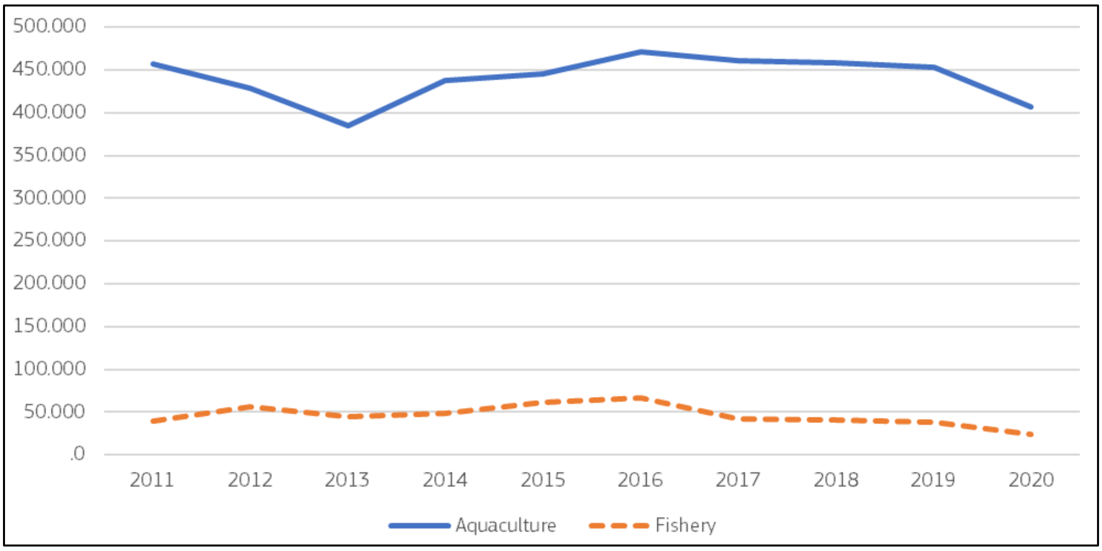
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Evol. 2020/11
ES	208.849	203.890	162.249	220.644	225.566	216.023	241.871	242.733	228.222	204.492	**-2%**
FR	69.098	81.659	77.958	63.385	59.913	51.027	51.668	49.109	60.721	61.378	**-11%**
IT	79.520	63.257	64.235	63.700	52.526	57.806	62.502	61.941	53.324	50.913	**-36%**
NL	36.700	40.000	37.112	54.100	54.211	53.175	43.969	45.482	38.094	32.420	**-12%**
DK	34.983	39.963	38.300	43.093	47.089	44.943	43.058	42.248	43.630	28.548	**-18%**
EL	17.240	16.679	18.720	16.752	18.645	23.359	19.240	22.003	23.733	19.155	**+11%**
IE	22.671	19.984	18.949	12.222	16.250	16.156	17.110	13.889	15.184	14.729	**-35%**
DE	20.830	13.883	5.036	5.280	25.476	66.748	16.856	15.864	22.037	13.490	**-35%**
Others	6.156	6.153	7.618	6.945	7.720	9.118	7.936	5.681	7.513	5.624	**-9%**
EU-27	496.047	485.468	430.177	486.121	507.396	538.355	504.210	498.950	492.458	430.749	**-13%**

Note: Green for positive evolution (2011-2020) and red for negative evolution.

Source: EUROSTAT

[9] EUROSTAT data were used in this section to analyse the EU production, while FAO data were used in the section on world production. The use of different sources for the EU production may result in some discrepancies, even though very small in the case of mussels.

Figure 4: Evolution of EU-27 mussel production (tonnes)



Source: EUROSTAT

2.3.2. Import - Export

Extra-EU imports

Mussel's imports from third countries concern mainly preserved mussels, representing 91% of the extra-EU imports in volume and 87% in value in 2021. These amounted to circa 43.000 tonnes for a value of over EUR 114 million. Almost all prepared mussels imported to the EU come from Chile, which are likely to correspond to cooked mussels.

Table 5: Extra-EU imports of mussels(2021)

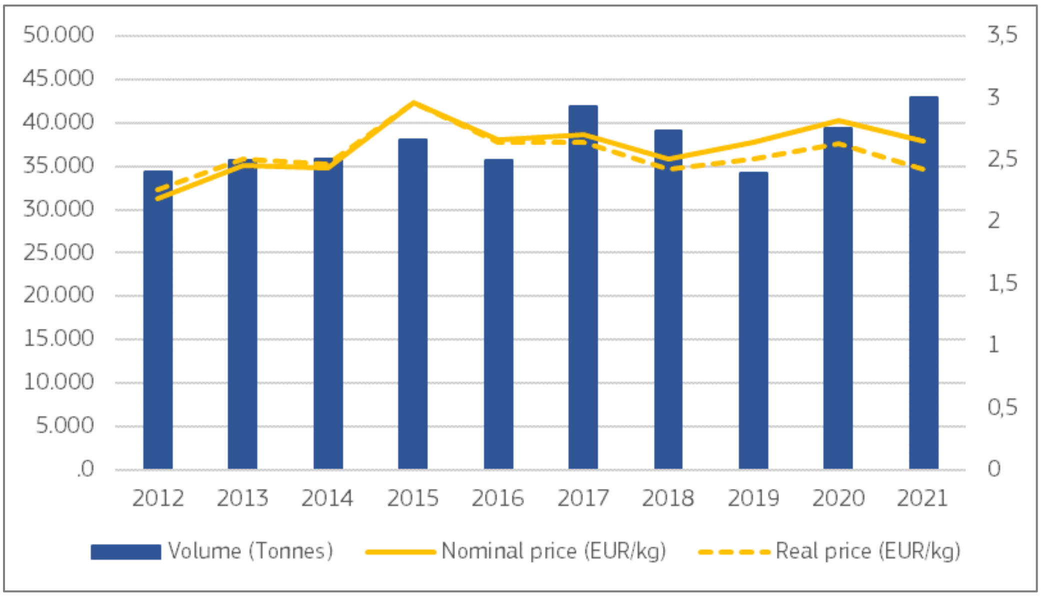
	Volume (tonnes)	Value (1.000 EUR)	Price (EUR/Kg)	% val. 2021
Fresh	1.593	1.926	1,21	1%
Frozen	2.603	13.974	5,37	11%
Smoked	34	763	22,43	1%
Prepared-preserved	42.923	114.080	2,66	87%
Total	**47.153**	**130.743**	**2,77**	**100%**

Source: EUMOFA elaboration of EUROSTAT-COMEXT data

Between 2012 and 2021, imports' value has increased by 27% (13% in real terms)[10], while imports' volume has decreased by 7%. The decrease in volume is related to the decrease of imports of fresh and frozen mussel (-85% and -50% respectively). In contrast, imports of preserved mussels have increased in volume by 25%. Prices of imported preserved mussels have also increased by 21% in nominal terms (7% in real terms).

[10] In the report, values are real terms by using the GDP deflator (base=2015)

Figure 5: Evolution of extra-EU imports of prepared-preserved mussels between 2012 and 2021



Source: EUMOFA elaboration of EUROSTAT-COMEXT data

While the imports of frozen mussels have decreased by 50% between 2012 and 2021, prices have increased by 48% in nominal terms (31% in real terms).

Extra-EU exports

Extra-EU exports of mussels amounted to 6.770 tonnes for EUR 26,3 million in 2021. Extra-EU exports concern mainly fresh mussels (47% of exports volume and 33% of their value), followed by prepared-preserved mussels (42% of exports volume and 57% of their value). Spain and Belgium were the main exporting MS of prepared mussels to third countries (48% and 15% of the exports value of prepared mussels in 2021) while Italy and France were the main exporters of live mussels to third countries (respectively 40% and 27% of the exports value of live mussels). The main destinations were Switzerland and the United Kingdom (30% and 20% of the extra-EU exports value respectively). Extra-EU exports increased by 9% in volume and 15% in value in nominal terms (1% in real terms) between 2012 and 2021.

Table 6: Extra-EU exports of mussels (2021)

	Volume (tonnes)	Value (1.000 EUR)	Price (EUR/Kg)	% val. 2021
Fresh	3.173	8.734	2,75	33%
Frozen	744	2.468	3,32	9%
Smoked	28	136	4,92	1%
Prepared-preserved	2.825	14.967	5,30	57%
Total	**6.770**	**26.305**	**3,89**	**100%**

Source: EUMOFA elaboration of EUROSTAT-COMEXT data

The volume of extra-EU exports of prepared-preserved mussels have fluctuated between 2012 and 2021, with an overall 10%-decrease. Over the same period, the prices of exported prepared mussels have continuously increased by 18% in nominal terms (5% in real terms).

Exports volume of fresh mussels have been very variable during the period between 2012 and 2021, with an impact on prices.

Intra-EU trade flows

Intra-EU exports

Within the EU, the Netherlands was by far the main mussels' exporter, with a value of over EUR 131 million in 2021 (mainly fresh mussel). Spain was the second largest exporter with circa EUR 77 million (main exporter of prepared-preserved mussels). Other major exporters within the EU included Denmark, Germany, Ireland, France and Italy. To a lesser extent Portugal was a key exporter of frozen mussels (more than EUR 8 million).

Table 7: Value of intra-EU exports of mussel from the main MS (1.000 EUR, nominal value, 2021)

MS	Fresh	Frozen	Prepared-preserved	Smoked	Total
Netherlands	118.144	1.872	10.951	145	**131.112**
Spain	41.037	9.922	25.638	27	**76.624**
Denmark	14.457	868	12.117	-	**27.442**
Germany	13.446	722	3.415	19	**17.602**
Ireland	12.517	2	4.151	-	**16.670**
France	8.295	457	3.285	160	**12.197**
Italy	6.887	181	3.066	461	**10.595**
Portugal	16	8.024	132	0	**8.172**

Source: EUMOFA elaboration of EUROSTAT-COMEXT data

Intra-EU imports

Within the EU, Belgium was the main importer with more than EUR 83 million in 2021, followed by France and the Netherlands with around EUR 55 million each. Other main importers included Italy and Germany (more than EUR 25 million). Mussels are mainly traded fresh (75% of the intra-EU trade value in 2021). Belgium was the main importer of fresh mussels, almost all coming from the Netherlands.

Table 8: Value of intra-EU imports in the main MS of destination (1.000 EUR, nominal value, 2021)

MS	Fresh	Frozen	Prepared-preserved	Smoked	Total
Belgium	77.375	887	4.854	3	**83.119**
France	37.652	3.322	14.507	31	**55.512**
Netherlands	51.625	954	2.241	21	**54.841**
Italy	24.953	4.484	7.072	1.012	**37.521**
Germany	15.198	2.415	8.128	20	**25.761**
Spain	6.445	1.633	3.101	329	**11.508**
Portugal	1.090	6.786	776	21	**8.673**

Source: EUMOFA elaboration of EUROSTAT-COMEXT data

2.3.3. Apparent consumption by Member State

In 2020, the total supply of mussels in the EU-27 (production + imports) was 552.636 tonnes LWE. The EU supply in mussels was mainly based on the EU production which represented 78% of the EU supply and to lesser extent on imports which represented 22% of the EU supply. Since exports represented 15.424 tonnes LWE, apparent consumption at EU-27 level (production + imports – exports) was estimated at 537.212 tonnes LWE.

The main MS in terms of apparent consumption in 2020 were Spain, France, and Italy (apparent consumption higher than 100.000 tonnes LWE). Apparent consumption in each other MS was under 25.000 tonnes LWE.

Table 9: Apparent consumption of mussel in the main MS (2020, in tonnes of live weight equivalent)

	Production (Fishery + aquaculture)	Import	Total supply (production + import)	Export	Apparent consumption (total supply – export)	Per capita apparent consumption (kg/capita)
ES	204.492	44.385	248.877	81.473	167.404	3,54
FR	61.378	72.568	133.946	6.609	127.337	1,89
IT	50.913	56.613	107.526	7.198	103.328	1,73
BE	-	24.978	24.978	3.235	21.743	1,89
NL	32.420	29.484	61.904	47.999	13.905	0,80
DE	13.490	18.993	32.483	18.986	13.497	0,16
EL	19.155	4.666	23.821	12.853	10.968	1,02
DK	28.548	4.629	33.177	22.716	10.461	1,80
PT	1.016	14.047	15.063	9.077	5.986	0,58
SE	2.297	2.254	4.551	373	4.178	0,40
BG	1.281	952	2.233	107	2.126	0,31
RO	117	1.906	2.023	29	1.994	0,10
IE	14.729	82	14.811	12.921	1.890	0,38
Others	912	11.057	11.969	1.960	10.009	0,11
EU-27	**430.748**	**121.888**	**552.636**	**15.424**	**537.212**	**1,20**

Source: EUMOFA elaboration of EUROSTAT-COMEXT

3. THE SPANISH MARKET

3.1. Structure of the supply chain

3.1.1. Production

Mussel production in Spain amounted to 204.492 tonnes in 2020[11], almost all from aquaculture. *Mytilus galloprovincialis* is the largest species produced in Spain with 75% of the Spanish aquaculture production in volume. Mussel production from aquaculture was estimated at almost EUR 106 million in 2020, which represents a 6% decrease (-13% in real terms) from 2011 to 2020, while the production volume has remained relatively stable (-2%). According to APROMAR's annual report, the production capacity is stable and year-to-year variations in volumes are mainly related to red tides which prevent harvesting mussels in affected areas.

Table 10: Mussel production in Spain, 2011-2020 (volume in tonnes)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Aquaculture	208 583	203 664	162 012	220 449	225 307	215 855	241 715	242 725	228 195	204 466
Fishery	266	226	237	195	259	167	156	8	27	25
Total	208 849	203 890	162 249	220 644	225 566	216 023	241 871	242 733	228 222	204 492[2]

Note: totals may differ from sum of data in column due to rounding

Source: EUROSTAT

Mussel production is concentrated in Galicia (97% of the Spanish production in 2020[12]), with 3.387 rafts[13]. The other producing regions are Cataluña, Andalucía, Comunidad Valenciana and Baleares.

69% of Galician production takes place in the Ría de Arousa, with traditional **suspended rope culture**. Mussel seeds used for farming are usually harvested manually from rocks using scrapers. They can also be collected using ropes that are specifically designed to facilitate seeds adhesion, when the ocean and environmental conditions allow it. Its cultivation begins by fixing the seed to the ropes. After 4 to 6 months, when mussels reach 4.5 cm to 5.5 cm, they are spread over new ropes to limit the density on each rope. Mussel can be harvested when a compromise is reached between three fundamental parameters: the marketing size, the meat to shell ratio[14] (between 18 and 25%) and the weight per unit length of rope (15 kilos per meter). Growth cycle varies from 14 to 18 months.

Long-lines systems have also been developing for the last decade in Andalucía and more recently in País Vasco and Galicia, in the Ría Ares-Betanzos.

The **rope mussel sector** is almost entirely family and locally owned, representing an important driver of social and economic development on Galician coast.

More than 78% of the mussels produced in Spain are commercialized within their region of production. 62% of the mussel harvested is sold fresh by producers to treatment plants which clients are wholesalers and retailers. The remaining 38% goes to the processing sector.

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[11] Statistics published by the Ministry of Agriculture for the production of mussels show similar trends over the period but with an average of 30,000 t more per year (for the same total value).
[12] APROMAR aquaculture report 2021
[13] https://www.mexillondegalicia.org/?page_id=146
[14] Meat to shell ratio is the ratio between the meat and the total weight of the live mussel.

Protected Denomination of Origin (PDO) "Mexillón de Galicia"

The PDO "Mexillón de Galicia" was registered in 2006. Its cultivation area is the internal maritime area of the Galician rías in the provinces of A Coruña and Pontevedra, which are authorised to cultivate mussels using rafts.

In 2019, 56.000 tonnes of mussels were certified "Mexillón de Galicia", which represented 25% of the Spanish production and 103 companies and trademark directories used the seal "Elaborado con Mexillón de Galicia, Denominación de Origen Protegida": 19 treatment plants, 35 processing plants and 50 trademark directories[15].

Economic performance

The latest STECF report[16] provides an analysis of the economic performance of the segment "mussel rafts" which concerns 1.959 companies in 2018. Economic results are provided in the table below. Mussel production volumes highly fluctuate over time, in relation with environmental conditions in the Galician estuaries: in 2018, production volumes increased by 13% compared to 2016, a year that was severely affected by red tides and closing of production areas. Despite those fluctuations, all economic indicators had a positive value over the period 2009-2018, and raised in 2018. In 2016 and 2018, the mussel industry was the most profitable of the main Spanish aquaculture segments, with a Gross Value Added of €104,4 million and a net profit of €15,8 million. Spanish mussel sector is based on small family units and high level of employment, where labour cost is the most relevant operational cost (22% represented by wages and salaries, 49% by imputed unpaid labour).

Table 11: Economic performance of the "mussel rafts" sector between 2014 and 2018, (million EUR)

	2014	2015	2016	2017	2018
Total income	110,1	na	56,3	132,7	137,2
Total operating costs	73,9	na	49,9	115,4	116,9
GVA	81,0	na	42,8	100,4	104,4
Net profit	34,7	na	4,5	14,4	15,8

na : not available

Source: STECF 2020-12-20

[15] http://www.ipacuicultura.com/noticias/en_portada/75158/mexillon_de_galicia_alcanza_en_2019_su_propio_record_con_casi__56_000_toneladas_certificadas.html

[16] The EU Aquaculture Sector – Economic report 2020 - STECF 2020-12-20

3.1.2. Trade

Imports

In 2021, 21.213 tonnes (product weight) were imported for a value of EUR 60 million. Mussels are imported prepared-preserved (77% of imports in value), frozen (11%), fresh (11%) and smoked (1%). Chile is by far the main supplier of the Spanish market (72% of imports in value in 2021), exclusively with prepared-preserved mussels. New Zealand is the second main supplier of the Spanish market (9% of imports in value), supplying mainly frozen mussels.

Table 12: Mussels import to Spain 2017-2021 (tonnes, product weight)

	2017	2018	2019	2020	2021
Fresh	6.354	4.788	4.586	4.083	4.836
Frozen	903	1.097	1.195	1.132	1.252
Prepared-preserved	15.136	13.494	11.089	13.411	15.074
Smoked	27	54	65	45	50
Total	**22.420**	**19.434**	**16.935**	**18.671**	**21.213**

Source: EUROSTAT-COMEXT

Exports

In 2021, total exports amounted to 63.738 tonnes (product weight) for a value of EUR 85 million. Mussels are exported fresh (49% of imports in value), prepared-preserved (39%) and to a lesser extent frozen (13%)

Table 13: Mussels export from Spain 2017-2021 (tonnes, product weight)

	2017	2018	2019	2020	2021
Fresh	41.827	51.570	47.750	37.233	47.406
Frozen	11.585	6.316	4.285	3.627	3.232
Prepared-preserved	4.055	11.732	13.286	10.662	13.085
Smoked	272	211	145	21	15
Total	**57.739**	**69.829**	**65.467**	**51.542**	**63.738**

Source: EUROSTAT-COMEXT

The European market is the main market of Spanish mussels (90% of exports in value). In 2021, Italy and France were the main destinations, representing respectively 42% and 32% of exports in value. Exports to the other EU MS concerned mainly fresh mussels (54% of exports in value) and prepared-preserved mussels (33%) whereas extra-EU exports were mainly made of preserved-prepared mussels (84% of exports in value) and to lesser extent frozen mussels (9%).

In 2021, Spain had a positive trade balance of EUR 25 million, attributed mainly to significant exports of fresh mussels.

3.1.3. Supply chain

The Spanish mussel production is split between mussel sold fresh (62%) and processed (38%).

Structure of the fresh mussel supply chain

The fresh mussel supply chain is organized around the following actors (Figure 6): mussel growers; treatment plants; wholesalers / central purchasing bodies; specialist shops / mass retailers.

Cultivation is realized by **mussel growers**. The traditional way in Spain is extensive system in rias with suspended rope culture. After harvest, producers bring their production to treatment plants.

The two fundamental functions of **treatment plants** are:

- purifying and preparing the mussel for marketing,
- shipping and distributing the purified mussel.

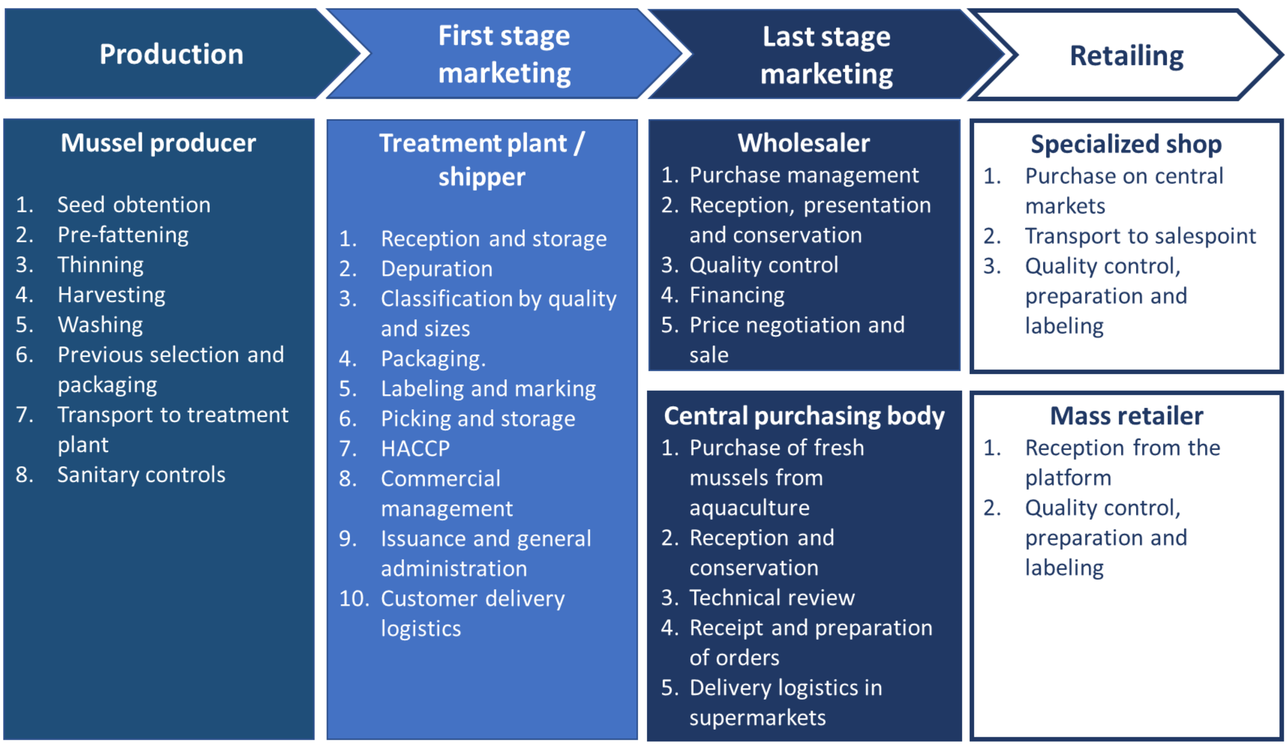
Treatment plants are the only organisations authorised to put fresh mussels on the market. They handle delivery logistics to wholesalers and retailers' platforms.

There are two main distribution channels:

- **Wholesalers** operate in central markets or have their own distribution center. Wholesalers based in central markets mainly supply specialized stores (fishmongers and food makets) and the HORECA channel;
- **Large retailers** manage the contact and price negotiation with treatment plants through centralised purchasing services (which can be externalised or not) and the logistics and daily supply to supermarkets and hypermarkets through logistic platforms.

Alternatively, wholesalers can also sell to large supermarkets and, in coastal areas fishmongers can buy mussels directly from treatment plants.

Figure 6: The Spanish supply chain for fresh mussels



Source: Ministry of agriculture, study on the value chain and price formation of fresh mussel from aquaculture

Structure of the processing sector

In 2020, the volume of canned mussels produced in Spain was 15.112 tonnes.

Table 14: Spanish production of canned mussels in 2019, 2020

	2019	2020
Volume (in metric tonnes)	14.406	15.112
Value (in 1.000 euros)	122.854	136.737

Source: ANFACO-CECOPESCA – 2020

The processing sector used to be the main market for the Spanish production of mussels, but the free trade agreement between the EU and Chile in 2002[17] had a strong impact on the supply chain of the sector[18]. Between 2003 and 2011, imports of prepared-preserved mussels in airtight containers from Chile were multiplied by 116 and imports of Chilean mussel partly replaced Galician mussel to supply the processing sector. The Spanish production still represents a large majority of the raw material used in the sector, as shown in the Diagram Figure 8 and confirmed by the ANFACO. However, this caused an important change in the traditional operating model of the mussel sector in Galicia, and a collapse in mussel sales in volumes and value.[19].

In 2020, 38%[20] of mussels produced in Spain were sold to the processing sector compared to 61% in 2006.

The different stages of processing are described in the following figure. All stages can take place in the same plant or take place in specialized plants.

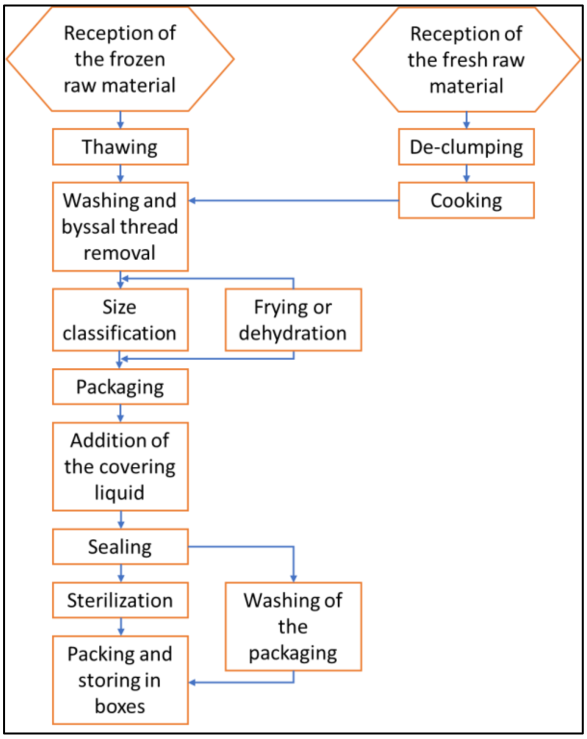
[17] The year of complete tariff dismantling was 2007

[18] Fernando González Laxe y Federico Martín Palmero. Universidad de A Coruña. *El mercado de mejillón en España, Efectos de la competitividad*, Distribución y consumo 2014 – Vol. 3

[19] https://www.mercasa.es/media/publicaciones/215/1406496600_DISTRIBUCION_Y_CONSUMO_133_articulo_mejillon.pdf

[20] Informe La Acuicultura en España, Apromar 2021

Figure 7: The Spanish supply chain for canned mussels

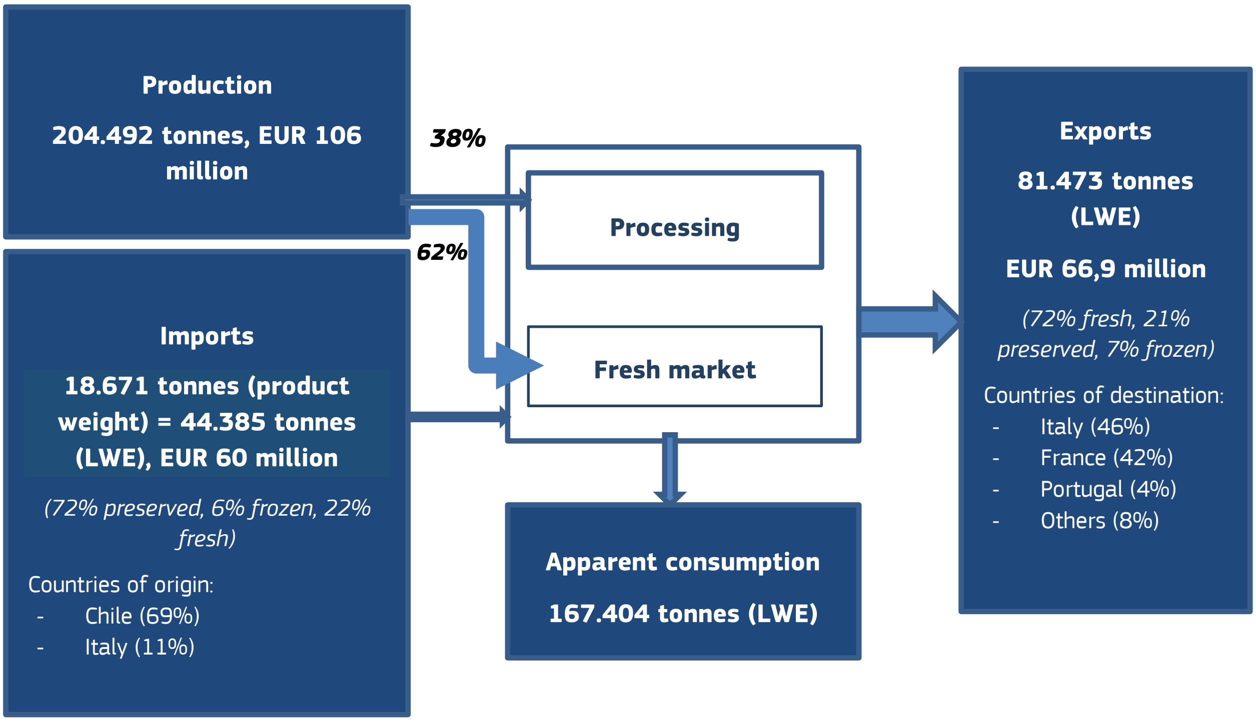


Source: ANFACO, Processing sector: canned fishery products

3.1.4. Apparent consumption

In 2020, the total supply of mussels in Spain amounted to 248.876 tonnes LWE, 82% from national production and 18% from imports. 33% of this supply were exported, thus the apparent consumption can be estimated at 67% of the national supply, *i.e.* 167.403 tonnes LWE.

Figure 8: The Spanish supply chain for mussels (2020)



Source: EUMOFA elaboration based on national statistics, EUROSTAT-COMEXT and interviews with stakeholders. % show the shares in volume.

3.2. Characteristics of the market and consumption

3.2.1. Presentation of the product

Different categories are defined, according to the presentation of the product.

PDO Mexillón de Galicia is presented under the following varieties:

- SPECIAL-1: Up to 23 pieces/kg
- SPECIAL-2: 24 to 27 pieces/kg
- NORMAL-1: 28 to 32 pieces/kg
- NORMAL-2: 33 to 40 pieces/kg

Fresh mussel is commercialized under the following categories:

- Extra, special or selection: less than 23 pieces/kg
- Big or giant: between 24 and 27 pieces/kg
- Normal: between 28 and 40 pieces/kg

There are 10 categories of mussels in the industry, based on the average weight of mussels contained in the cans or containers. The quality standards defined in the Order of October 15, 1985[21] for canned and frozen mussels, distinguishes three main commercial types, based on the average mussel meat weight (mussels have to be homogeneous in size in any given can or container according to the standards):

- Big: greater than 7.5 g
- Medium: greater than 5.5 g
- Small: smaller than 5.5 g

Cans containing mussels greater than 9g on average can also use the label "giant mussels".

The most common size category is "small", with a development of the format "13-18 per can". Sales of the "medium" category show a decline trend, whereas sales of the "big" category remains stable, with more specific consumers.

3.2.2. Characteristics of the market

Consumers primarily purchase fresh or preserved mussels, with respectively 71% of the volumes and 46% of the value, and 25% of the volumes (in product weight) and 49% of the value of mussels consumed at home. Frozen mussels only account for 3% of the volumes and 5% of the value of the domestic consumption at home[22]. The national production is completed by imports from France ("moules de Bouchot") or Italy, in particular between August and October.

Demand varies depending on the area. In Central and North Western regions, consumers tend to prefer mussels large and extra, while in the Mediterranean, they traditionally purchase the normal category. The segmentation also depends on the outlet. For instance, fishmongers primarily sell extra and large mussels.

Overall, the home consumption of fresh mussels has decreased over the past ten years. It dropped in 2013 as a consequence of decreased supply, which was due to algae pollution and the presence of toxins in the water. By 2017, the consumption at home had almost reached its 2012 level but it decreased sharply again until 2019. It remained stable in 2020 while the HORECA consumption of mussels decreased because of the COVID crisis – which affected the HORECA sector in general[23]. Despite those fluctuations in consumption, mussels benefit from a good image – it is healthy and affordable – and does not have real substitute products[24].

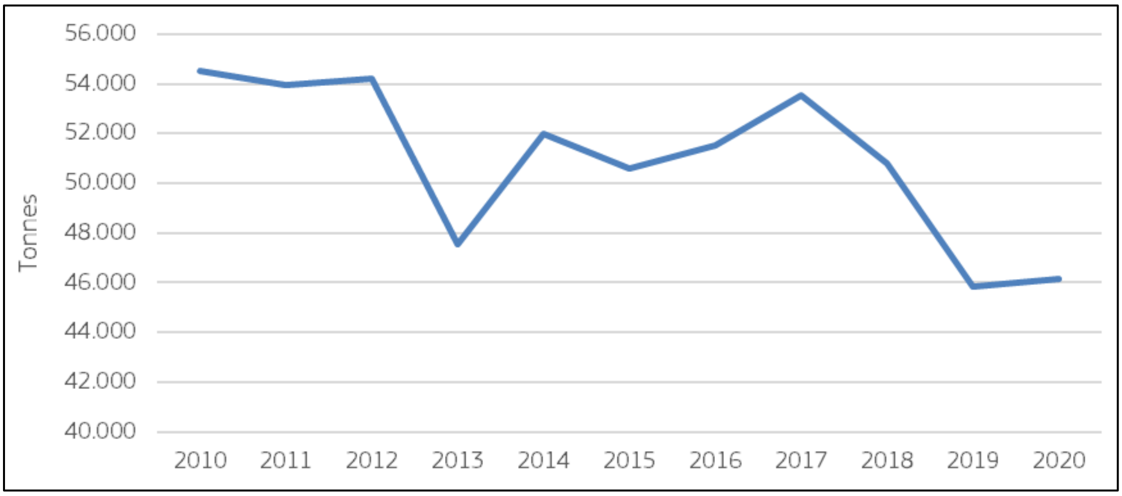
[21] BOE.es - BOE-A-1985-21750 Orden de 15 de octubre de 1985 por la que se aprueba la Norma de Calidad para el Mejillón, Almeja y Berberecho en conserva.

[22] Annual at home consumption data, 2010-2020, MAPA, Series anuales (mapa.gob.es)

[23] Ibidem

[24] Interview with a wholesaler

Figure 9: Evolution of at-home consumption of fresh mussels in Spain, 2010-2020



Source: Ministry of Agriculture, Food Consumption Panel

At retail stage, fresh mussel is mainly sold in supermarkets and large stores. According to the Food Consumption Panel of the Ministry of agriculture, fisheries, and food for home consumption, in 2020, large retail outlets (hypermarkets + supermarkets) represented 70% of sales volume and 64% of sales value; fishmongers accounted for 19% of sales volume and 25% of sales value. In 2020, around 10.000 tonnes of mussels were also consumed out of home (against around 15,000 tonnes in 2019)[25].

Wholesalers play an important role in the supply chain, especially for the marketing of fresh mussels through fishmongers and HORECA. It can be estimated that overall, they market between 45% and 55%[26] of fresh mussels consumed in Spain both at home and out of home.

Table 15: Market shares of main distribution channels for at home consumption of fresh, frozen and prepared-preserved mussels in 2020

	VOLUME			VALUE		
	Fresh	Frozen	Prepared-preserved	Fresh	Frozen	Prepared-preserved
Hypermarkets	10%	3%	19%	9%	3%	23%
Supermarkets	60%	43%	72%	53%	43%	67%
Frozen store	0%	36%	0%	0%	38%	0%
Fishmongers	19%	8%	1%	25%	6%	1%
Street markets	7%	4%	0%	9%	3%	1%
Others	3%	7%	8%	4%	6%	9%

Source: Ministry of Agriculture, Food Consumption Panel

Prepared-preserved mussels are mostly purchased in supermarkets and hypermarkets. A small part is consumed out-of-home (through the HORECA channel) or purchased in "gourmet shops".

They are mostly consumed as "*mejillón en escabeche*" (picked mussels) (about 80%-90% of the consumption of processed mussels). They are traditionally consumed as appetizer, in bars or at-home. During the pandemic, the decrease of consumption through the HORECA channel has been compensated

[25] Based on data from the annual report on out-of-home consumption, Kantar panel, 2020, MAPA, Consumo alimentario extradoméstico (mapa.gob.es)

[26] Depending on the proportion of fresh vs frozen mussels purchased by the HORECA channel, which is not known.

by an increase of home consumption. Consumption is currently reorganizing, influenced by new factors like environmental impact, toxins, climate change, size variations, etc.

The segmentation of the market of processed mussels is based on the size category, the composition of the covering liquid, the sauce and the regional preferences of consumers.

3.2.3. Consumption

In 2020, the Spanish per capita apparent consumption of fisheries and aquaculture products reached 36,02 kg LWE/year. Spain ranked second at EU level, both in terms of per capita consumption and of per capita household nominal expenditure on fisheries and aquaculture products with 287 EUR/capita/year[27].

Mussel is consumed fresh, frozen, and canned. Penetration rate is rather high for fresh and canned mussels (15,3% and 18,21% respectively in 2020)[28], and very low for frozen mussels (1,6% in 2020). It decreased slightly (-9%) for fresh mussels over the 2016-2020 period, whereas it increased by 18% for canned mussels, and by 8% for frozen mussels.

[27] The EU Fish Market, 2021. European Market Observatory for Fisheries and Aquaculture Products.
[28] By comparison, the main consumed species by Spanish households, hake, has a penetration rate of 38,6%.

Table 16: Penetration rate for home consumption of fresh, frozen and prepared-preserved mussels, 2016-2020

	2016	2017	2018	2019	2020	Evol 16/20
Fresh	16,89	17,53	16,71	15,54	15,30	-9%
Frozen	1,48	1,46	1,44	1,39	1,60	8%
Canned	15,50	16,29	16,36	16,71	18,21	18%

Source: Ministry of Agriculture, Food Consumption Panel

In 2020, consumption per capita was 1 kg/year for fresh mussels; 0,35 kg/year for canned mussels; and 0,04 kg/year for frozen mussels.

Like penetration rate, consumption per capita of fresh mussels is on a decreasing trend (-15% over the 2016-2020 period), whereas it increased by 25% for canned mussels, and by 11% for frozen mussels.

Table 17: Home consumption per capita of fresh, frozen and prepared-preserved mussels, 2016-2020, kilograms

	2016	2017	2018	2019	2020	Evol 16/20
Fresh	1,17	1,17	1,11	0,99	1,00	-15%
Frozen	0,04	0,04	0,04	0,04	0,05	11%
Canned	0,28	0,29	0,30	0,30	0,35	25%

Source: Ministry of Agriculture, Food Consumption Panel

3.3. Price transmission in the supply chain

3.3.1. Ex-farm prices

The ex-farm price is the price paid by purification plants to mussel producers.

Table 18: Ex-farm price (nominal price, EUR/kg) for aquaculture mussels (2012-2020)

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Price (EUR/kg)	0,49	0,49	0,50	0,51	0,55	0,54	0,55	0,52	0,52

Source: Eurostat

Mussel ex-farm price shows a slightly increasing trend over the 2012-2016 period, followed by a decrease until 2020. Feedback gathered from the sector, at all stages of the supply chain, indicate that prices increased significantly in 2021 and 2022 for all size segments and markets.

3.3.2. Ex-purification plant prices

The price paid by wholesalers or large retailers to purification plants is the price referenced as the price "at origin" in the Spanish Observatory of the Food Chain. The price below however should be considered carefully as statistics are incomplete after 2016 and missing after 2018. Feedback from wholesalers highlights that it reflects mainly the prices for small mussels or for the industry (which represent around 80% of the volumes put on the market) and that prices for fresh medium or large mussels were above 1 EUR/kg until 2019 and increased significantly after 2020.

Table 19: Ex-purification plant price for aquaculture mussels in Spain (2012-2018)

	2012	2013	2014	2015	2016	2017	2018
Price (EUR/kg)	0,85	0,87	0,90	0,90	0,83	0,80	0,80

Source: EUMOFA, based on data from the Ministry of Agriculture[29]

3.3.3. Import and export prices

Prices of imported fresh mussels increased by 23% over the 2012-2021 period in nominal terms (14% in real terms), but by 26% for export prices (16% in real terms). Year-to-year fluctuations can be observed, and prices tend to be lower when volumes increase (e.g. in 2016). In 2021, Italy and France represented the main trade partners both for imports of fresh mussels (respectively 56% and 39% of import volumes), while Italy and Bulgaria were the main partners for exports (respectively 49% and 22% of export volumes).

Table 20: Import and export price (nominal price) and volume for fresh mussels in Spain

		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Price (EUR/kg)	**Import**	1,08	0,91	0,89	0,99	0,95	1,13	1,09	1,11	1,17	1,33
	Export	0,70	0,69	0,63	0,68	0,74	0,75	0,67	0,74	0,74	0,88
Volume (Tonnes)	**Import**	4.009	6.460	6.412	5.681	8.301	6.354	4.788	4.586	4.083	4.836
	Export	35.599	36.153	37.153	43.194	35.176	41.827	51.570	47.750	37.233	47.406

Source: EUROSTAT-COMEXT

Both import and export prices of frozen mussels doubled between 2012 and 2021, while volumes dropped. Import prices increased faster until 2016 and remained fairly stable since then, between 5,51 EUR/kg and 6,65 EUR/kg.

Table 21: Import and export price (nominal price) and volume for frozen mussels in Spain

		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Price (EUR/kg)	**Import**	2,99	3,98	5,14	5,59	6,65	5,63	5,65	6,16	5,82	5,51
	Export	1,51	1,68	1,94	1,79	1,87	2,01	2,88	3,50	3,00	3,31
Volume (Tonnes)	**Import**	2.557	1.625	1.867	1.091	1.464	903	1.097	1.195	1.132	1.252
	Export	9.526	8.993	9.695	12.296	11.764	11.585	6.316	4.285	3.627	3.232

Source: EUROSTAT-COMEXT

Import volumes of prepared-preserved mussels increased over the 2012-2021 period (+16%) and peaked in 2013 and 2017. Import prices have increased by 16% over the 2012-2021 period in nominal terms (7% in real terms). Imports mainly come from Chile, with 93% of import value in 2021[30].

[29] Observatory of the Food chain, weekly prices, [Observatorio de le Cadena Alimentaria (mapa.gob.es)](mapa.gob.es)

[30] The increase in export volumes and fall in prices in 2018 are linked with exports to France and Italy, but import data from those two countries do not reflect this trend, so there might be some reporting issues.

Table 22: Import and export price (nominal price) and volume for prepared-preserved mussels in Spain

		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Price (EUR/kg)	Import	2,66	2,82	2,82	3,34	3,11	3,21	3,09	3,13	3,31	3,08
	Export	3,70	3,90	2,99	3,77	4,28	4,57	2,04	2,25	2,57	2,51
Volume (Tonnes)	Import	11.556	15.154	12.029	12.466	12.123	15.136	13.494	11.089	13.411	15.074
	Export	2.731	2.413	3.344	3.166	3.615	4.055	11.732	13.286	10.662	13.085

Source: EUROSTAT-COMEXT

3.3.4. Wholesale prices

The following table clearly shows the difference in prices between different size segments.

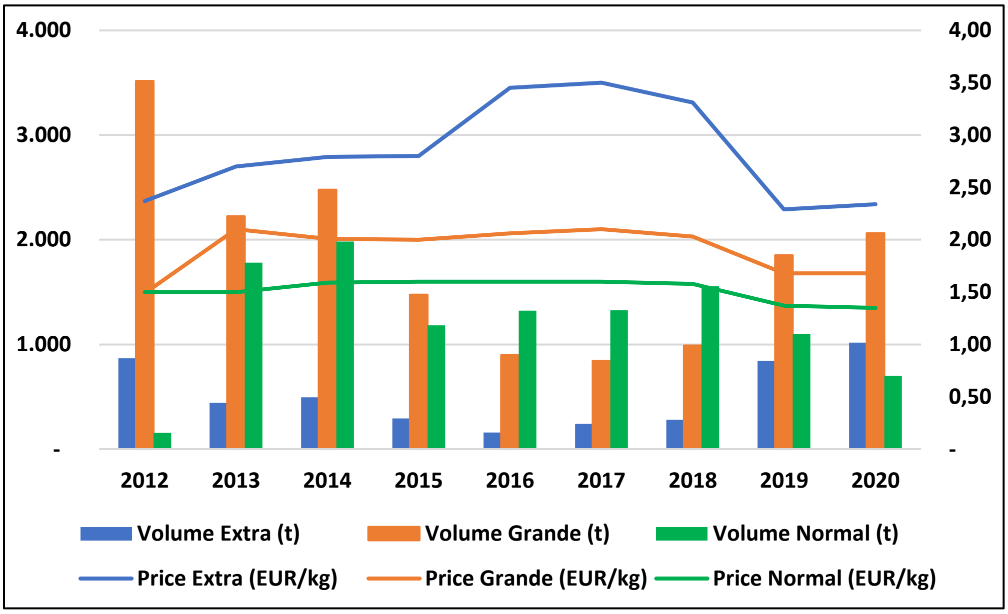
Table 23: Wholesale price (in EUR/kg) for mussels in Spain by wholesale market and type of production

Wholesale market	Type of production	2012	2013	2014	2015	2016	2017	2018	2019	2020
Mercasa	"NORMAL"	1,63	1,58	1,59	1,56	1,55	1,56	1,58	n.a.	n.a.
Mercamadrid	"EXTRA"	2,37	2,70	2,79	2,80	3,45	3,50	3,31	2,29	2,34
Mercamadrid	"GRANDE"	1,49	2,10	2,01	2,00	2,06	2,10	2,03	1,68	1,68
Mercamadrid	"NORMAL"	1,50	1,50	1,59	1,60	1,60	1,60	1,58	1,37	1,35

Source: Mercasa, Mercamadrid

As shown in the figure below, there is no clear correlation between wholesale prices and volumes sold through wholesale market except for the "Extra" category, which tends to indicate that wholesale prices for the other categories depend mainly on the overall supply of mussels and on the demand from large retailers and the industry.

Figure 10 – Wholesale prices and volumes in Mercamadrid for fresh mussels by type of production (2012-2020)



Source: Mercamadrid

3.3.5. Retail prices

The following tables present home consumption data in volume and value for fresh and canned mussels.

Table 24: Fresh mussel consumption, expenditure, and average price in Spain over the 2016-2020 period

	2016	2017	2018	2019	2020	2021	Evol. 2021/16
Volumes (t)	51.521	53.534	50.784	45.826	46.146	41.358	-20%
Total expenditure (1.000 EUR)	129.782	136.755	130.934	120.151	129.878	151.346	17%
Average price (EUR/kg)	2,52	2,55	2,58	2,62	2,81	3,66	45%

Source: MAPA, Food Consumption Panel[31]

Total expenditure of Spanish households for fresh mussels is stable over the 2016-2020 period, but this apparent stability in fact results from two opposite trends: a decrease in volumes compensated by an equivalent increase in prices. In 2021, total expenditures keep increasing significantly while volumes decline sharply.

Table 25: Canned mussel consumption, expenditure, and average price in Spain over the 2016-2020 period

	2016	2017	2018	2019	2020	2021	Evol. 2021/16
Volumes (t)	12.431	13.380	13.579	13.994	16.398	13.826	11%
Total expenditure (1.000 EUR)	103.550	113.438	114.469	119.559	139.475	119.489	15%
Average price (EUR/kg)	8,33	8,48	8,43	8,54	8,51	8,64	4%

Source: MAPA, Food Consumption Panel

Total expenditure of Spanish households for canned mussels increased by 15% over the 2016-2021 period. It mainly results from an increase in volumes consumed at home (+15% over the 2016-2020 period), as prices were almost stable over the period (+4%).

[31] Consumo alimentario extradoméstico (mapa.gob.es)

3.3.6. Price transmission

The analysis covers fresh mussels sold by supermarkets (based on 2021 data on prices) and a more specific example of the value chain for mussels, size extra, sold through specialised shops in Madrid area in 2022 (as consumers' preferences in terms of sizes, and transport costs, differ significantly from one geographical area to the other).

For the analysis of the value chain for mussels sold in supermarkets, the data on costs between the purification plants and the final point of sale are mainly based on the 2009 study of the Observatory of prices and food of the MAPA on the value chain and price formation of fresh mussels of aquaculture[32]. There is no indication of a technological change that would have fundamentally changed the costs' structure, thus labour costs, transport costs and other input costs (sanitary products and packaging) have been updated by applying national indexes from the National Institute of Statistics (INE), while other costs (including shrink or loss, overhead, depreciation, etc.) have been updated by applying the 2009 ratio to the purchase price at the different stages. Prices at the different stages come from available statistics for 2021. Data used for the second analysis – large mussels sold through specialised shops in the Madrid area - come from information gathered during the survey.

For the first analysis, it should be noted that these figures are approximate and aim to provide orders of magnitude.

Feedback gathered from the PDO "Mexillón de Galicia", from purification plants and from wholesalers indicate that mussels' size is the main factor influencing prices at the different stages. The demand in terms of sizes can vary significantly between different geographical areas. For instance, demand is greater for small mussels in Mediterranean areas and for exports while the demand in central Spain is greater for large mussels. It also varies between large retailers and fishmongers.

The two other main factors influencing costs, and therefore prices to final consumers are transports (i.e. the distance between Galicia and the point of sale) and volumes. Large retailers purchase in greater quantities. Mussels are therefore delivered in larger bags, with lower packaging costs and less manipulation.

The producer price in the following analyses corresponds to the price/kg paid to producers for mussels delivered at the purification plant.

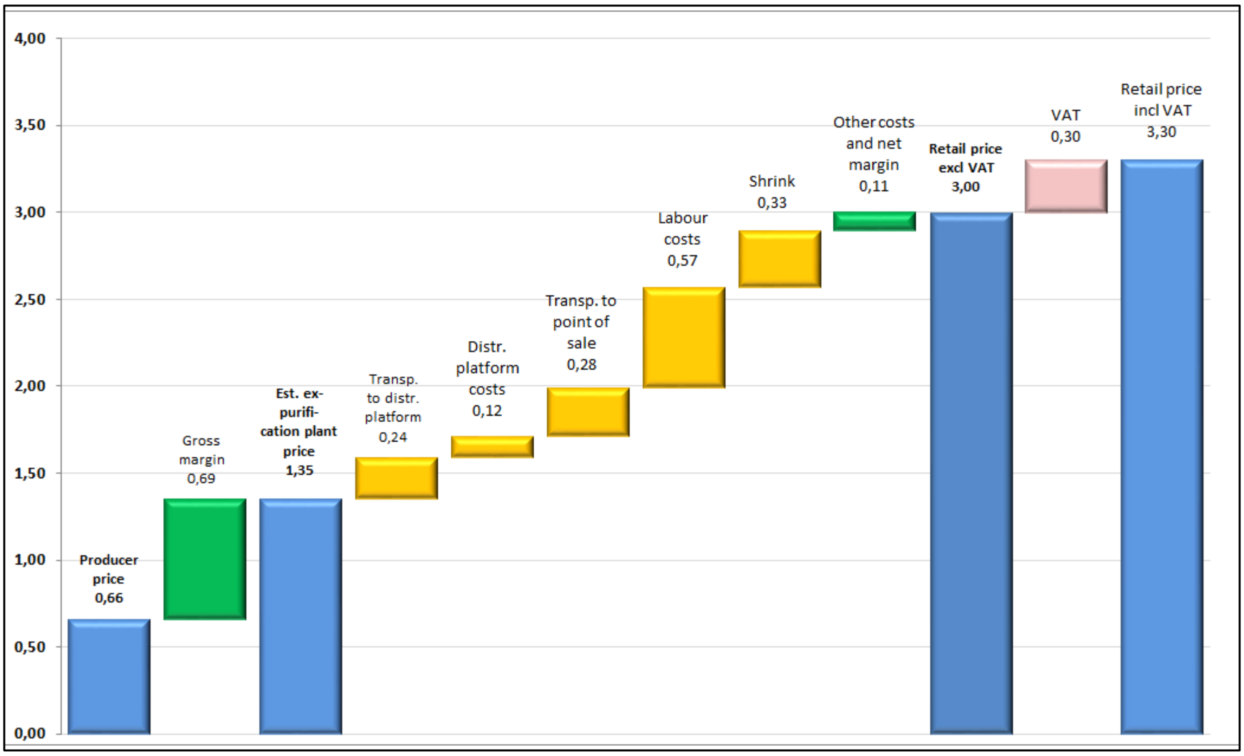
[32] https://www.mapa.gob.es/es/alimentacion/temas/observatorio-cadena/Estudio%20Mejill%C3%B3n%20acuicultura_tcm30-128411.pdf

Table 26: Costs and margins for fresh mussel (all sizes) retailed by supermarkets in Spain (EUR/kg, 2021)

	Price (EUR/kg)	% of the final price	Source
Producer price	**0,66**	20%	*EUMOFA estimates, based on Eurostat ex-farm prices for 2020 and the increase shown in 2021 in data fom Pesca de Galicia*
Other costs and Net margin/ loss	0,69	21%	
Estimated ex-purification plant price	**1,35**	41%	*Survey (feedback provided indicate a price between 1,20 and 1,50)*
Transport to distribution platform	0,24	7%	*2009 study and Ministry of Transport data on annual gasoline prices*
Distribution platform costs	0,12	4%	*2009 study ratio*
Transport to point of sale	0,28	9%	*2009 study and Ministry of Transport data on annual gasoline prices*
Labour costs	0,57	17%	*2009 study and Eurostat labour costs*
Shrink	0,33	10%	*2009 study ratio*
Other costs and Net margin	0,11	3%	
Average selling price, exclusive of VAT	**3,00**	91%	
VAT (10%)	0,30	9%	
Average selling price	**3,30**	100%	*MAPA annual data on food consumption, 2021*

Source: EUMOFA

Figure 11: Costs and margins for fresh mussel retailed by supermarkets in Spain (EUR/kg, 2021)



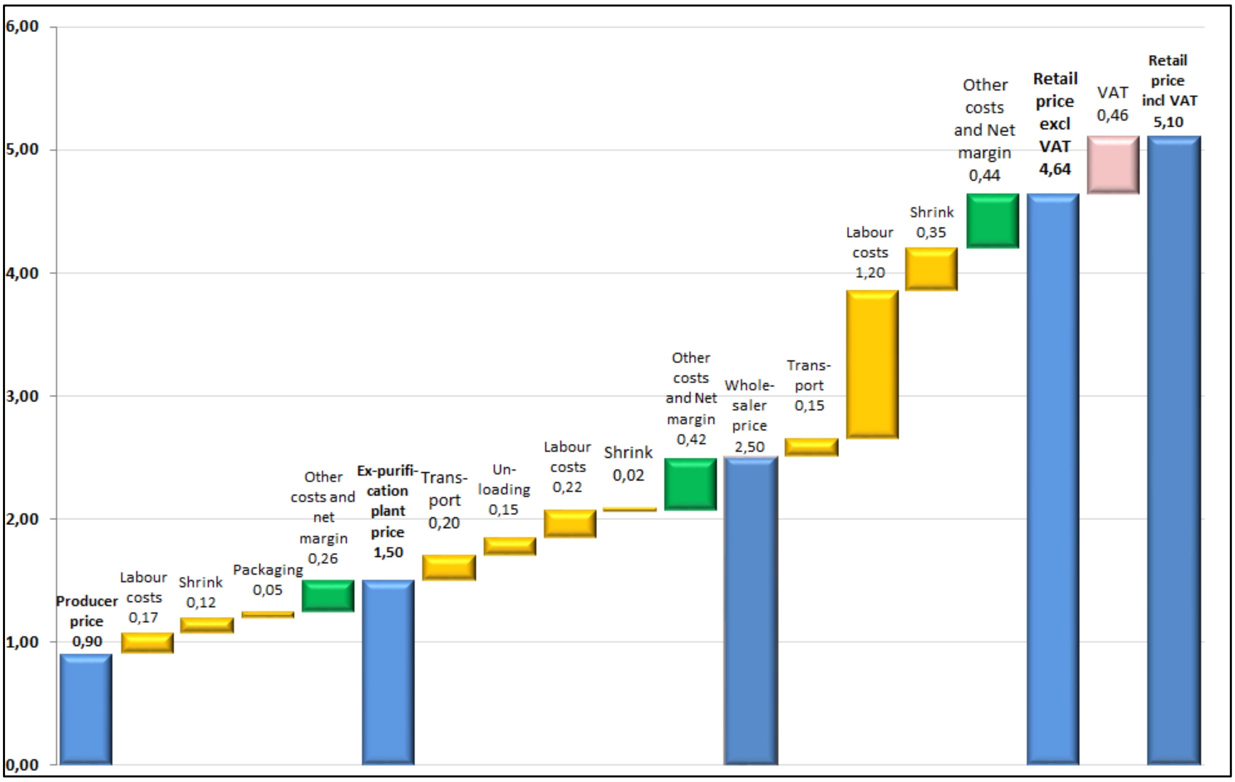
Source: EUMOFA

Table 27: Costs and margins for fresh mussel, extra (below 23 pieces/kg) retailed by specialised shops in Madrid area (EUR/kg, 2022)

	Price (EUR/kg)	% of the final price	Source
Producer price	**0,90**	18%	*survey*
Labour costs	0,17	3%	*survey*
Shrink	0,12	2%	*survey*
Packaging and other input costs	0,05	1%	*survey*
Other costs and net margin	0,26	5%	
Ex-purification plant price	**1,50**	29%	*survey*
Transport cost Galicia-Madrid	0,20	4%	*survey*
Unloading charges	0,15	3%	*survey*
Labour costs	0,22	4%	*survey*
Shrink	0.02	0%	*survey*
Other costs and net margin	0,42	1%	
Wholesaler price	**2,50**	41%	*survey*
Transport to point of sale	0,15	3%	*survey*
Labour costs	1,20	24%	*survey*
Shrink	0,35	7%	*survey*
Other costs and net margin	0,44	16%	
Average selling price, exclusive of VAT	**4,64**	91%	
VAT (10%)	0,46	9%	
Average selling price	**5,10**	100%	*survey*

Source: EUMOFA

Figure 12: Costs and margins for fresh mussels, size extra (below 23 pieces/kg) retailed by specialised shops in Madrid area (EUR/kg, 2022)



Source: EUMOFA

4. THE FRENCH MARKET

4.1. Structure of the supply chain

4.1.1. Production

The French mussel's production from aquaculture has decreased since 2011, going from over 69.000 tonnes to around 61.000 tonnes in 2020. Catches have been variable over the same period: between 159 tonnes and 5.752 tonnes because of irregular spat recruitment, but with an overall significant decreasing trend (-96% between 2011 and 2020).

Table 28: Mussel production in France between 2010 and 2020 (tonnes)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Aquaculture	65.021	77.138	74.138	57.633	56.802	50.366	51.478	48.844	60.255	61.219
Fishery	4.076	4.521	3.819	5.752	3.112	661	191	265	466	159
Total	**69.098**	**81.659**	**77.958**	**63.385**	**59.913**	**51.027**	**51.668**	**49.109**	**60.721**	**61.378**

Note: *Totals may differ from sum of data in column due to rounding.*

Source: EUROSTAT

Species produced:

Mussel aquaculture production in France concerns **two common species**:

- Blue mussel (*Mytilus edulis*) which is widely distributed along the English Channel to the Southwest coastline of France. With 55.390 tonnes and almost EUR 126 million in 2020, the production of blue mussel represented 90% of the national mussel production in volume and 91% in value.
- The Mediterranean mussel (*Mytilus galloprovincialis*) which is mainly produced in the Mediterranean. Its production amounted to 5.830 tonnes in 2020, i.e. 10% of the French mussel production in volume and 9% in value.

Farming techniques:

There are **three farming techniques** for mussels in France: while blue mussels are cultivated on "***Bouchot"*** (wooden stakes) or on **longline** at Sea, the Mediterranean mussel is cultivated on **tables** in the Mediterranean lagoons or on longlines in open Sea. The most important farming technique is the "*Bouchot"* culture with a production of over 50.000 tonnes in 2020, i.e. 83% of the French mussel's production.

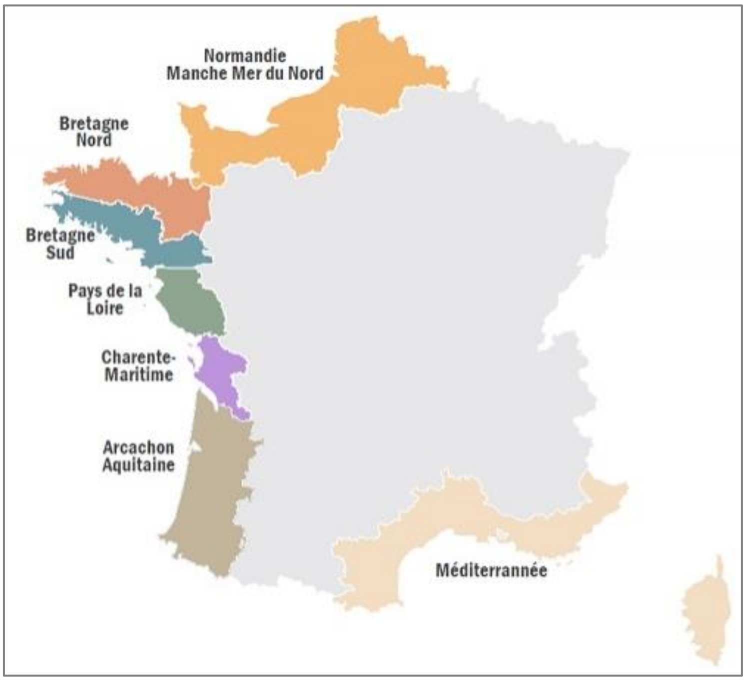
Both farming technique and species have an impact on the **mussel growth performance**, which results in different types of products in terms of size and quality. Higher growth performance is recorded for mussels reared on longlines in relation to the submersion time. As a result, marketable size for mussels reared on longlines is reached faster compared to the "*Bouchot"* culture type (12 months for longlines versus 15-18 months for "*Bouchot"*). The intertidal conditions provide the mussels reared on *Bouchot* with a robust shell, wich is very convenient during the harvest and the processing according to producers. In addition, *Mytilus galloprovincialis* can reach greater sizes than *Mytilus edulis* (until 15 cm for *M. galloprovincialis* versus 10 cm for *M. edulis*). The production area may also have an impact on the growth performance as it is related to the availability of trophic resources for mussels[33].

[33] Based on interviews with producers and the study « Etude de le marché de la moule fraiche en France, spécifiquement sur la filière française Moule de Bouchot », France AgriMer. 2021.

French production by rearing region:

Unlike Spain where the production is only developed in one region (Galicia), mussel farming is present in the different coastlines of France. "North Brittany" is the main producing area with 45% of the national production in 2020, followed by "Normandy" (19%), "*Charente Maritime*" (13%), "South Brittany" 9%, "Mediterranean" (9%) and "*Pays de la Loire*" (5%)[34].

Figure 13: Mussels producing regions in France



Note : Normandy – North sea: "Normandie – Manche – Mer du Nord" ; North Brittany : "Bretagne Nord"; South Brittany : "Bretagne Sud" ; Mediterranean: "Méditerranée"

Source: CRC Pays de la Loire[35]

Mussels' sector structure

The French mussel industry included 620 enterprises in 2020, spread along the French coastline, with 288 enterprises in the Atlantic coast, 211 in the Mediterranean, and the rest is located in the North Sea and Channel (i.e. the regions "*Bretagne Nord*" and "*Normandie*"). Almost half of the French mussel enterprises are involved in "*Bouchot"* production system[36].

Economic performance

The latest STECF report[37] provides an analysis of the economic performance of the segment "mussel on bottom" which concerns 351 enterprises in 2018 and which excludes the longlines production. Economic results are provided below. These show that the segment remains very profitable, with a net profit of EUR 42,1 million, which has strongly raised in recent years despite strong variation of production volume from one year to the next.

[34] Enquête aquacole. Le Service de la Statistique et de la Prospective, Ministère de l'Agriculture et de l'Alimentation. https://agreste.agriculture.gouv.fr/agreste-web/disaron/Chd2116/detail/

[35] https://www.crc-pays-de-loire.fr/la-conchyliculture/l-organisation-professionnelle/les-structures-et-leurs-roles-Co16.html

[36] Enquête aquacole. Le Service de la Statistique et de la Prospective, Ministère de l'Agriculture et de l'Alimentation. https://agreste.agriculture.gouv.fr/agreste-web/disaron/Chd2116/detail/

[37] The EU Aquaculture Sector – Economic report 2020 - STECF 2020-12-20

Table 29: Economic performance of the "mussel on bottom" sector between 2014 and 2018, (million EUR)

	2014	2015	2016	2017	2018
Total income	122,7	109,8	149	122,1	140,1
Total operating costs	73,1	56,9	81,0	64,7	78,0
GVA	85,2	79,5	103,7	87,3	97
Net profit	9,5	17,1	48,3	41,5	42,1

Source: STECF 2020-12-20

The STECF report attributes the decline of the mussel production in France to important resurgence of predators (sea-star, birds, spider crabs, seabass, etc.) in some areas of production (Channel and Atlantic coasts) and to high mortality rates since 2014, located mainly in production areas in the West of France. For instance, the region "*Pays de La Loire*" (particularly *Pertuis Breton*) was particularly concerned by mortalities, with a mortality rate up to 84% of production in 2015/2016 and 72% in 2018/2019[38]. Implementing prevention methods against predators and declining the mussel production because of mortalities constitute a financial challenge for the mussel industry. In recent years, the European Maritime Fisheries Fund has been used in order to compensate the mussel farmers impacted[39].

4.1.2. Trade

Imports

The French market of mussels is highly dependent on imports. On average, France imports 55.000 tonnes each year. Mussels are imported mainly fresh (72% in 2021) and prepared-preserved (26%). Fresh mussels are imported from the other EU countries, mainly Spain, the Netherlands and Ireland, while prepared mussels are mainly imported from Chile, which are likely to correspond to cooked mussels imported for the French processing industry.

Table 30: Mussels' imports to France, 2017-2021 (tonnes, product weight)

	2017	2018	2019	2020	2021
Live, fresh or chilled	44.749	44.121	42.834	32.191	37.760
Prepared or preserved	14.063	13.490	12.365	12.525	13.572
Frozen	1.879	1.416	1.828	1.425	1.298
Smoked	2.247	1.739	3.227	2.826	365
Total	**60.915**	**59.201**	**57.350**	**46.424**	**52.667**

Source: EUROSTAT-COMEXT

Spain is the largest supplier of fresh mussels to the French market. In 2021, it represented 56% of the imports of fresh mussels. The Netherlands was the second supplier (24% of the imports of fresh mussels in 2021), followed by Ireland (8%), Italy (6%) and the United Kingdom (4%). Imports from the Netherlands and Italy have significantly decreased in recent years (2017-2021) by respectively -43% and -53%.

[38] *Etude sur le marché de la moule fraîche en France et spécifiquement sur la filière moule de bouchot*. AND International for FranceAgriMer. 2021 - https://www.franceagrimer.fr/Actualite/Filieres/Peche-et-aquaculture/2021/Le-marche-de-la-moule-fraiche-en-France-et-specifiquement-sur-la-filiere-francaise-moule-de-bouchot

[39] The European Maritime Fisheries Fund had a specific measure for the compensation of shellfish farmers who temporarily suspend the harvesting of farmed shellfish exclusively for health reasons.

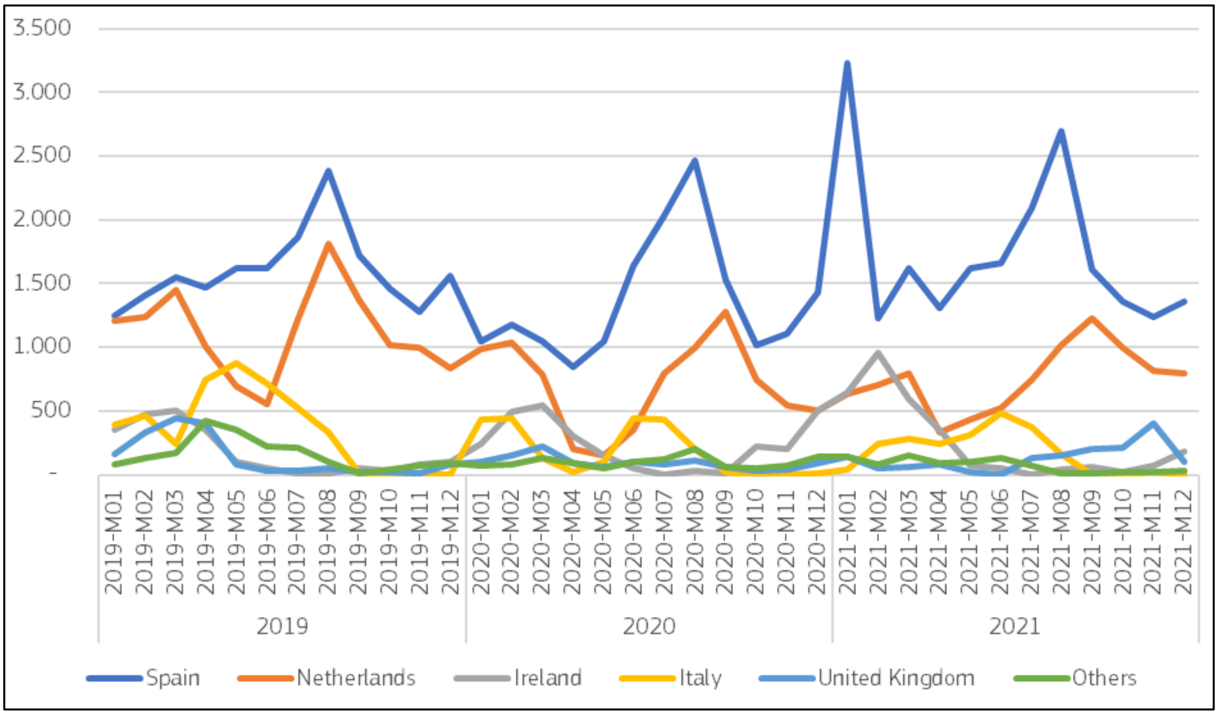
Table 31: Imports of fresh mussels to France, 2017-2021 (tonnes, product weight)

	2017	2018	2019	2020	2021
Spain	16.657	19.020	19.205	16.400	21.010
Netherlands	16.016	14.153	13.631	8.484	9.146
Ireland	3.139	2.188	2.110	2.751	3.037
Italy	4.566	5.266	4.305	2.242	2.160
United Kingdom	584	888	1.666	1.139	1.546
Others	3.786	2.605	1.916	1.174	860
Total	**44.749**	**44.121**	**42.834**	**32.191**	**37.760**

Source: EUROSTAT-COMEXT

French imports of fresh mussels fluctuate throughout the year. France imports mainly fluctuate during the period when national production is not marketed[40] or during periods of high demand (mainly during summer). The figure below shows a monthly variation in the volumes of fresh mussels imported by main origins. Imports are particularly important at the beginning of the year between January and March/April (when the French Bouchot mussels are not marketed) and during the summer specially between July and August (which corresponds to the highest consumption period of mussels in France). In terms of origin, Spanish and Dutch imports reach a peak during summer while Irish imports are mostly correlated to the marketing season of the French *Bouchot* mussels, i.e. between November and March. Imports from Italy occur from April to July and are mainly made by operators located in the Mediterranean region (according to interviews).

Figure 14: Monthly variation of French exports of fresh mussels, *Mytilus spp.* between 2019 and 2021 (tonnes, product weight)

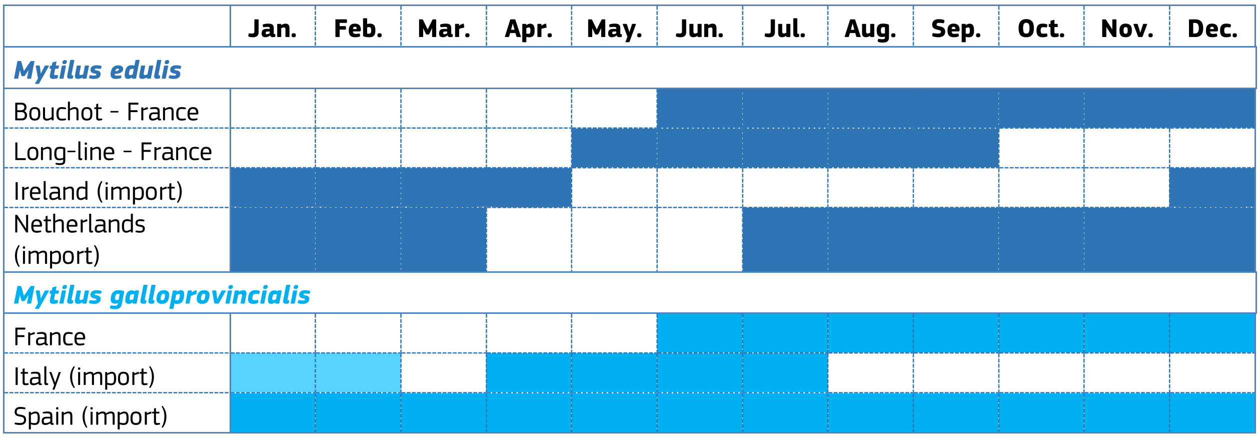


Source: EUROSTAT-COMEXT

[40] This concerns mainly blue mussels which are marketed only from Juneto December as the rest of the year, the meat quality is low (due to spawning).

Mussels from different species and origins are available in the market according to the seasonality of production and supply (figure below.)

Figure 15: Seasonality of mussel supply in the French market



Source: EUMOFA elaboration based on interviews with producers

Chile is by far the main supplier of the French market for prepared-preserved mussels. 75% of the imports of prepared-preserved mussels came from Chile in 2021.

Table 32: Imports of prepared-preserved mussels to France, 2017-2021 (tonnes, product weight)

	2017	2018	2019	2020	2021
Chile	10.188	9.885	8.492	9.297	10.132
Ireland	822	509	773	841	1.251
Spain	842	761	778	907	1.040
Denmark	496	247	476	499	481
Germany	263	385	341	360	361
Others	1.452	1.702	1.505	621	307
Total	**14.063**	**13.490**	**12.365**	**12.525**	**13.572**

Source: EUROSTAT-COMEXT

Exports

Mussel exports from France remain relatively low in comparison to the supply. In 2021, 6.164 tonnes were exported, from which the greatest share is exported fresh (88% of the exports volume). Spain is the main destination, with more than half of the French exports volume in 2021, followed by the Netherlands (19%). Lower volumes were exported the same year to Germany, Switzerland and Belgium.

Table 33: Mussel exports from France, 2017-2021 (tonnes, product weight)

	2017	2018	2019	2020	2021
Live, fresh or chilled	3.157	3.382	4.410	4.143	5.410
Prepared or preserved	363	479	575	651	569
Frozen	94	107	118	142	150
Smoked	15	23	23	29	35
Total	**3.629**	**3.992**	**5.125**	**4.964**	**6.164**

Source: EUROSTAT-COMEXT

4.1.3. Supply chain

The French mussel supply chain highlights the flow of mussels from producers to final consumers. The following are key actors in this supply chain[41]:

- **Producers**

In France, producers can be involved in different activities, in addition to production:

- **Spat collection**: There is no hatchery of mussels in France and spart is collected from the wild between April and May in the Atlantic coast ("*Charente-Maritime*", "*Pays de la Loire*" and "*Bretagne Sud*") and all year long in the Mediterranean Sea. Spat collection is insufficient in the other production areas ("*Bretagne Nord*" and "*Normandie*") and producers buy spat from producers involved in spat collection.
- **Mussels' preparation, conditioning and dispatching**: The vast majority of the French shellfish farmers own a dispatch centre with purification equipment if necessary which allows them to market mussels for human consumption, according to the European regulations (EC) n°853/2004 and n° 854/2004[42]. In this centre, producers receive, wash, clean, grade and pack mussels.
- **Trade activities**: some producers created their commercial company to sell their own production and mussels from other producers. Others chose to create **associate producers trading companies (i.e. producers group)** in charge of processing and trading the products. These have been created by producers themselves as a result of the increasing role of the large retail in the French mussel's market. They are mainly present in *Brittany* (mussel's main production area in France). They supply the supermarket chains and the catering sector to a lesser extent. The largest companies are *Mytilimer*, *Cultimer* and *Groupement des producteurs Mytilicoles de Pénestin*. To illustrate the importance of volumes traded through these companies, a recent study on "*Bouchot*" mussels stated that almost 40% of the "*Bouchot"* mussel production was sold through associate producers' companies[43].

[41] Bases on : 1) interviews with three regional committees for shellfish, 2) *Etude sur le marché de la moule fraîche en France et spécifiquement sur la filière moule de bouchot*.. AND International for FranceAgriMer. 2021 - https://www.franceagrimer.fr/Actualite/Filieres/Peche-et-aquaculture/2021/Le-marche-de-la-moule-fraiche-en-France-et-specifiquement-sur-la-filiere-francaise-moule-de-bouchot , 3) SUCCESS project - WP4 - Task4.1. Description of value chains for fishery and aquaculture products in the EU- "Mussel case study".

[42] Regulation (EC) No 853/2004 of the European Parliament and the Council of 29 April 2004 laying down hygiene rules for the hygiene of foodstuffs and Regulation (EC) No 854/2004 of the European Parliament and of the Council of 29 April 2004 laying down specific rules for the organisation of official controls on products of animal origin intended for human consumption.

[43] *Etude sur le marché de la moule fraîche en France et spécifiquement sur la filière moule de bouchot*. AND International for FranceAgriMer. 2021 - https://www.franceagrimer.fr/Actualite/Filieres/Peche-et-aquaculture/2021/Le-marche-de-la-moule-fraiche-en-France-et-specifiquement-sur-la-filiere-francaise-moule-de-bouchot

As a result, producers can be only producers or producers and involved in mussels preparation, purification and conditioning, or producers and involved in mussels preparation, purification and conditioning /traders. In addition, there is also several producers which are involved in both mussel and oyster production.

According to national statistics[44], the greatest share of the French mussel production is sold to wholesalers (43% of the production value in 2020). This was followed by sales to large retailers (25%) and direct sale to HORECA or specialised retailers (e.g. fishmongers) (12%). In 2020, these marketing channels represented 80% of the production value. Direct sales to consumers (including open market stalls) were less important and represented 9% of the production value the same year. However, direct sales to consumers are the most important marketing channel for the Mediterranean mussels and is a good way for producers to sale mussels at higher prices.

Table 34: Breakdown of the French mussel production value by marketing channel, 2020, value (1.000 EUR)

Marketing Channel	Value	Share
Direct sale to consumer	10.301	**7%**
Direct sale to HORECA, specialised retailers, etc.	16.229	**12%**
Sale to other producers	7.994	**6%**
Large retailers	34.850	**25%**
Wholesalers	59.441	**43%**
Export	2.612	**2%**
Others	6.332	**5%**
Total	**137.759**	**100%**

Source: Service de la Statistique et de la Prospective, Ministère de l'Agriculture et de l'Alimentation[45]

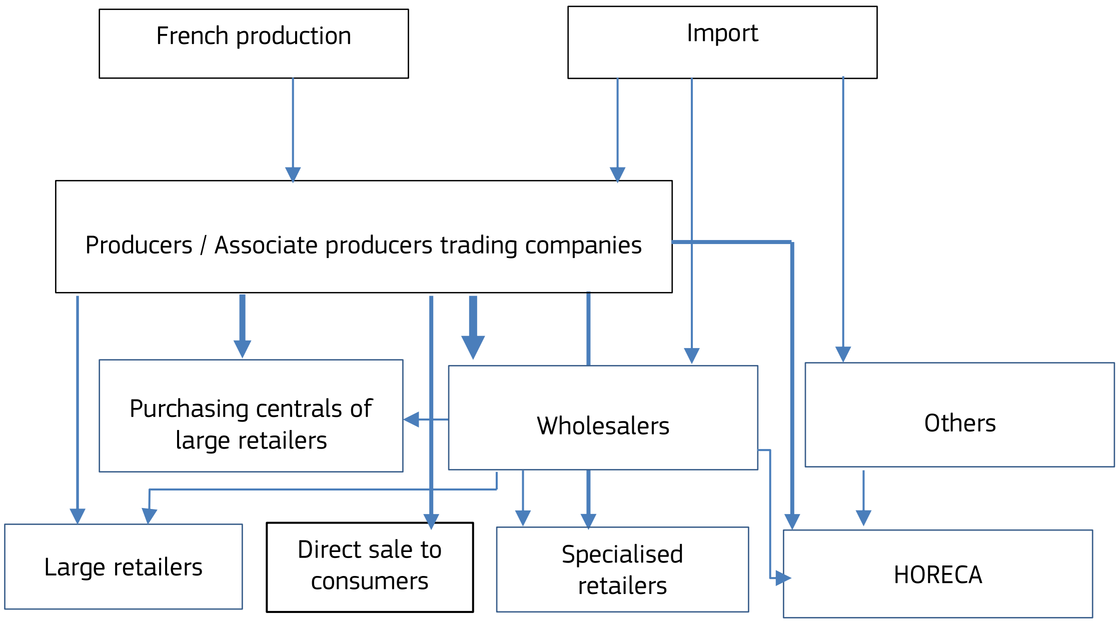
- **Wholesalers** remain key players in the French market of fresh mussels, particularly to supply the catering sector and the specialized retail sector. In 2020, they absorbed 43% of the mussel production value.
- **Large retailers** are also main actors in the mussel supply chain, as they absorb significant share of mussel production (25% of the French production value in 2020). Large retailers have two sourcing strategies: some supermarkets situated mainly in coastal areas, ensure supply directly from local producers, whereas for others, supply occurs via purchasing centrals of large retailers, mainly from large producers or more commonly from associate producers' companies. Some supermarkets may adopt both strategies.

[44] Enquête aquacole. Le Service de la Statistique et de la Prospective, Ministère de l'Agriculture et de l'Alimentation. https://agreste.agriculture.gouv.fr/agreste-web/disaron/Chd2116/detail/

[45] Enquête aquacole. Le Service de la Statistique et de la Prospective, Ministère de l'Agriculture et de l'Alimentation. https://agreste.agriculture.gouv.fr/agreste-web/disaron/Chd2116/detail/

The figure below provides an illustration of the mussels' supply chain in France, by highlighting the flow of mussels' supply chain from the producers to the final consumer.

Figure 16: Mussel supply chain in France

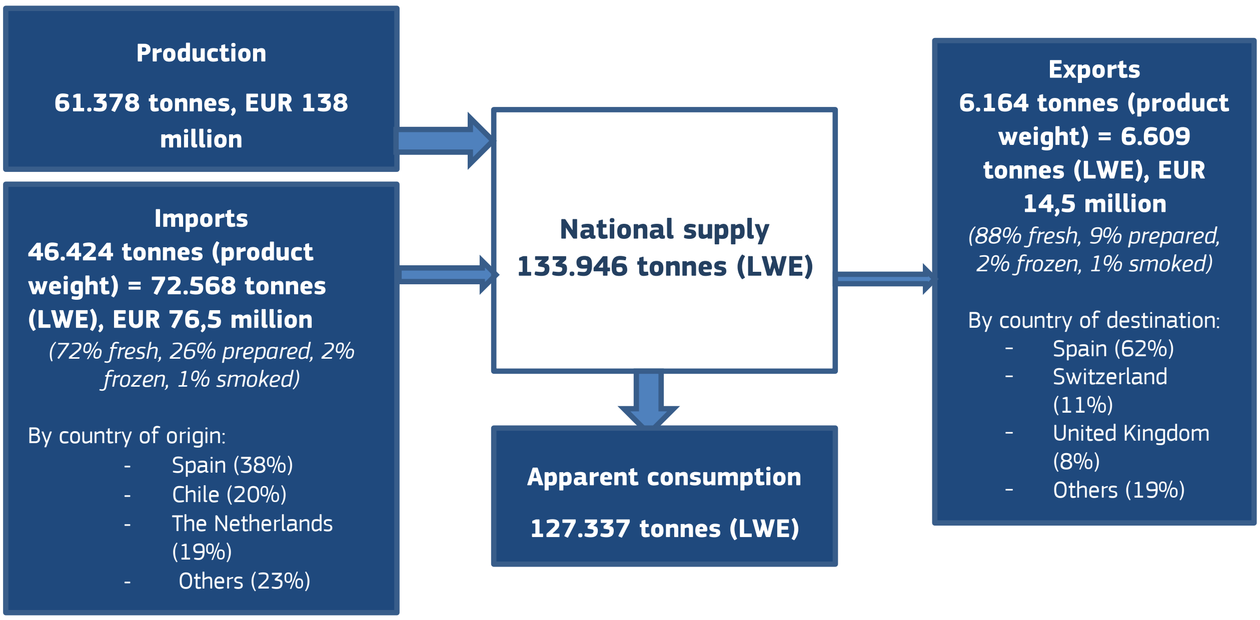


Source: EUMOFA elaboration based on interviews. The arrows' thickness provides an indication of the importance of volumes traded between two stages in the supply chain.

4.1.4. Apparent consumption

In 2020, the French mussels' supply reached 133.946 tonnes (LWE), from which 46% came from national production and 54% from imports. Only 5% of the French supply in mussels is exported. Therefore, the national apparent consumption is estimated at 127.337 tonnes (LWE), i.e. 95% of the national supply in mussels) (Figure 17).

Figure 17 – Supply balance for mussels in France (2020, tonnes of live weight equivalent)

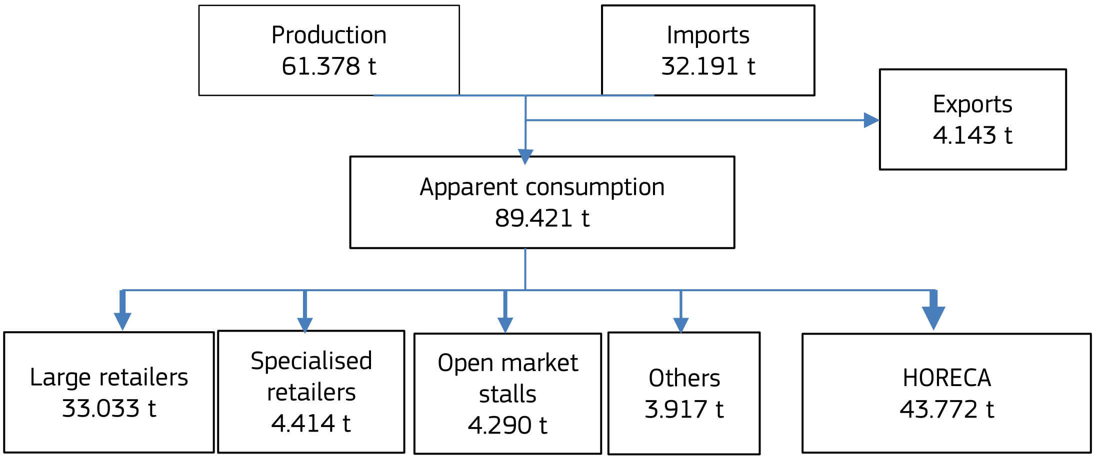


Source: EUMOFA elaboration based on national statistics (production) and EUROSTAT-COMEXT

As already mentioned, the apparent consumption of mussels in France is estimated at 127.337 tonnes (LWE) from which almost 90.000 tonnes concern fresh mussels. Based on Kantar data and FranceAgriMer[46], the household consumption of fresh mussels could be estimated to circa 46.000 tonnes, from which 72% from large retailers, 10% from 42 specialized retailers (i.e. fishmongers), 9% from open market stalls and 9% from other markets. The out of home consumption could be estimated at circa 44.000 tonnes (

Figure 18).

Figure 18: Estimated volumes of fresh mussels by marketing channel in France, 2020



Source: EUMOFA elaboration of EUROSTAT-COMEXT, Estimates based on KANTAR data and FranceAgriMer

[46] The calculation in this section was based on the methodology used in a recent study on the French market of "*Bouchot* mussels" to adjust the coverage rate of Kantar data on household consumption of fresh mussels. The study considered that data provided by Kantar panel cover 90% of the large retailers market and 60% of the other markets. Study source: *Etude sur le marché de la moule fraîche en France et spécifiquement sur la filière moule de bouchot*. AND International for FranceAgriMer. 2021 - https://www.franceagrimer.fr/Actualite/Filieres/Peche-et-aquaculture/2021/Le-marche-de-la-moule-fraiche-en-France-et-specifiquement-sur-la-filiere-francaise-moule-de-bouchot

4.2. Characteristics of the French market and consumption

4.2.1. Presentation of the product

Mussels are sold live fresh to be cooked and consumed at home or at restaurants. For final consumers, mussels are available in the market whether in bulk or in bags (2, 5, 10 and 15 kg bags), after being cleaned and purified. The two main innovations implemented within the French mussel industry in recent years consist of the increased market share of mussels for which the byssal threads were removed (these are particularly sought by specific markets such as HORECA) and the development of modified atmosphere packaging (MAP) from 0,5 to 7 kg (with the majority being sold at 1,4 kg). Bags are mainly sold to HORECA, while MAP are mainly sold to large retailers.

4.2.2. Characteristics of the market

The French market of mussels is first segmented according to[47]:

- **The species**: two different species are reared in France with different characteristics and different markets (the blue mussel is marketed everywhere in France while the Mediterranean mussel is mainly marketed through short marketing channels, mainly in the Mediterranean region).
- **The Production method**: mussels reared on "bouchot" are the most valuable species.
- **The origin (France/import):** with a clear price differentiation when comparing average French sales price and average import price (see section on price transmission in the supply chain).
- **The certification strategies** which include:
  - **Traditional Speciality Guaranteed** (TSG) "*Moule de Bouchot*": obtained in 2013, it guarantees a traditional production method. Specifications concern methods of production, purification and storage. National statistics estimated that production under TSG represented 57% of the national production in 2019 (this share does not correspond to the French production on "*bouchot*" which is higher as production on "*bouchot*" could be marketed under other certifications such as PDO, organic and Label Rouge schemes, see below).
  - **Protected Designation of Origin (PDO) «** *Moules de Bouchot de la Baie du Mont Saint-Michel* **»**: the first geographical indication under the French scheme ("Appelation d'Origine Contrôlée" (AOC)) was obtained in 2006 and was followed by the geographical indication under the EU scheme PDO in 2011. National statistics estimated around 10.000 tonnes of production under PDO, which represented 17% of the French mussel production. The PDO guarantees the mussel's geographical origin and provides quality specifications such as the size, which result in price premium estimated at +0,20-0,30 €/kg[48] in comparison to a "Bouchot" mussel at dispatch level.

[47] Based on : 1) interviews with three regional committees for shellfish, 2) *Etude sur le marché de la moule fraîche en France et spécifiquement sur la filière moule de bouchot*. FranceAgriMer. 2021, 3) SUCCESS project - WP4 - Task4.1. Description of value chains for fishery and aquaculture products in the EU- "Mussel case study".

[48] *Etude sur le marché de la moule fraîche en France et spécifiquement sur la filière moule de bouchot*. AND International for FranceAgriMer. 2021 - https://www.franceagrimer.fr/Actualite/Filieres/Peche-et-aquaculture/2021/Le-marche-de-la-moule-fraiche-en-France-et-specifiquement-sur-la-filiere-francaise-moule-de-bouchot

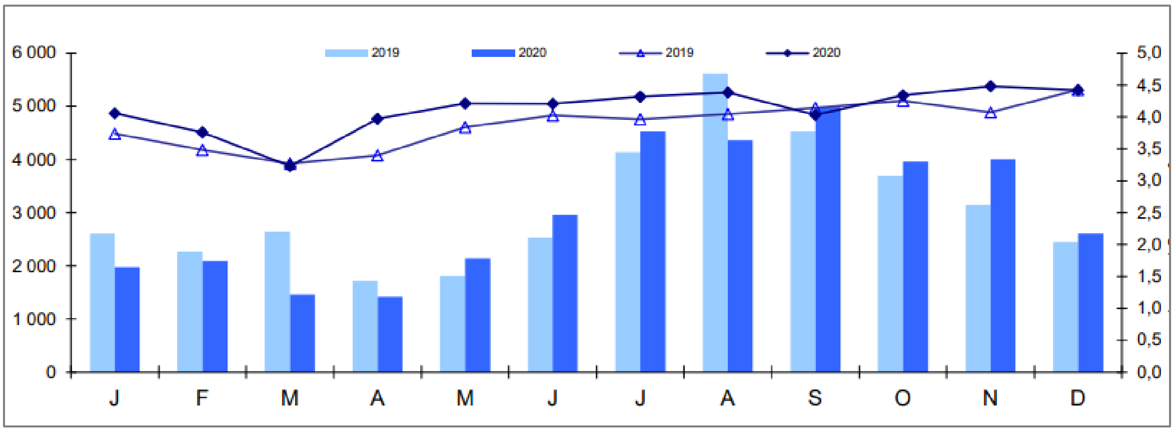
- **Organic production:** in the case of mussel production, requirements under organic certification concern the water quality and the production density. According to national statistics 3% of the national mussels' production was organic in 2019. The certification results in a price premium estimated at + 0,15 €/kg in comparison to a "bouchot" non-organic mussel at dispatch level[49].
- **Label Rouge (LR):** which is a French certification that guarantees a high quality product. National statistics estimated that production under LR represented 2% of the French mussels' production in 2019. The LR certification provides quality specifications such as size, organoleptic characteristics and meat to shell ratio[50], which results in price premium estimated at +0,20-0,30 €/kg and up to 50% of the price of a "bouchot" mussel at dispatch level[51].

4.2.3. Consumption

In 2020, the French per capita apparent consumption of fisheries and aquaculture products reached 33,26 kg LWE/year. France ranked fourth at EU level, in terms of per capita consumption and 9th in terms of per capita household nominal expenditure on fisheries and aquaculture products with 136 EUR/capita/year[52].

Mussel is considered as a popular aquatic product in France. Mussels are often consumed cooked at home or at restaurants. Mussels are also consumed during summer festivals and events. Associated with French fries, "*moule frites*" is a popular dish for out-of-home consumption. Kantar data show that there is a peak of consumption during summer (between July and September).

Figure 19: Seasonality of mussel consumption and price in France in 2019 and 2020



Source: FranceAgriMer based Kantar Worldpanel

[49] *Etude sur le marché de la moule fraîche en France et spécifiquement sur la filière moule de bouchot*. AND International for FranceAgriMer. 2021 - https://www.franceagrimer.fr/Actualite/Filieres/Peche-et-aquaculture/2021/Le-marche-de-la-moule-fraiche-en-France-et-specifiquement-sur-la-filiere-francaise-moule-de-bouchot

[50] Meat to shell ratio is the ratio between the meat and the total weight of the live mussel.

[51] *Etude sur le marché de la moule fraîche en France et spécifiquement sur la filière moule de bouchot*. AND International for FranceAgriMer. 2021 - https://www.franceagrimer.fr/Actualite/Filieres/Peche-et-aquaculture/2021/Le-marche-de-la-moule-fraiche-en-France-et-specifiquement-sur-la-filiere-francaise-moule-de-bouchot

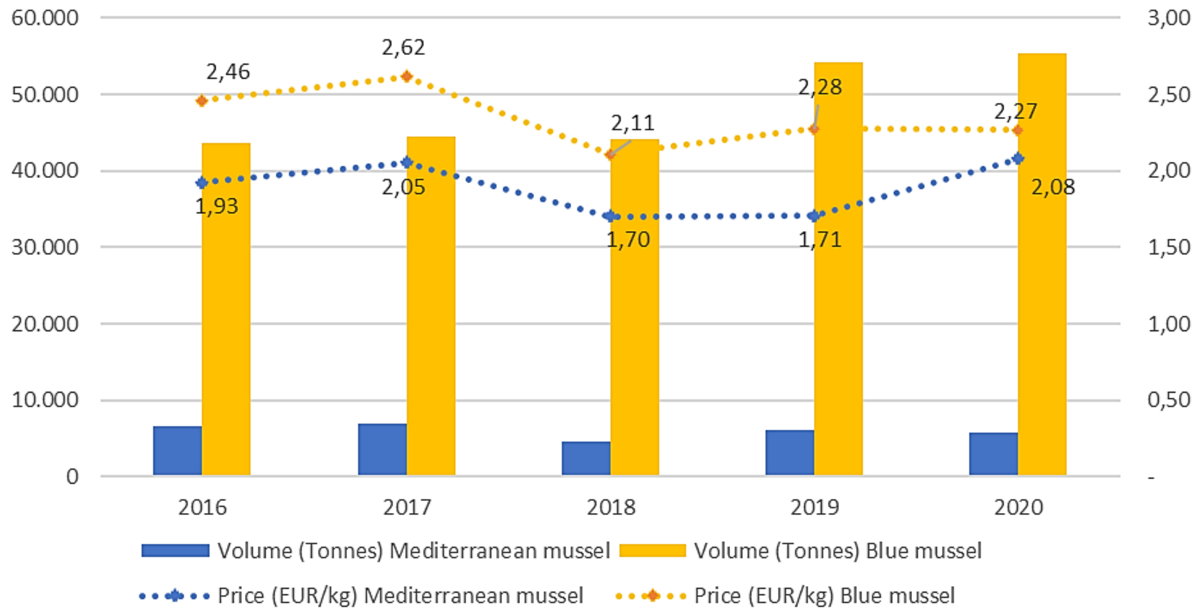
[52] The EU Fish Market, 2021. European Market Observatory for Fisheries and Aquaculture Products.

4.3. Price transmission in the supply chain

4.3.1. First-sale prices

According to EUROSTAT, the blue mussel species has higher first sale prices than the Mediterranean mussel (2,27 EUR/kg versus 2,08 EUR/kg in 2020). First sale prices of blue mussel have decreased between 2016 and 2020 (by -8%) while prices of Mediterranean mussel have increased during the same period (by 8%). The figure below shows that prices fluctuate without clear relation with volumes produced. Prices provided by EUROSTAT are higher than prices provided by producers at first sale stage during interviews (for mussels sold in bulk without any preparation). It is likely that EUROSTAT prices at first sale correspond to mussels that are already cleaned, sorted and purified[53]. Prices provided by producers during interviews range on average between 1,50 and 1,80 EUR/kg.

Figure 20: First sale prices of mussels in France (2016-2020) – EUR/kg



Source: EUROSTAT

[53] During interviews, producers were asked to provide an ex-farm price, i.e. the price of a mussel that didn't receive any preparation or conditioning operations.

Besides a distinction according to the species, the national statistics provide first sale prices by production technique (Table 35). Blue mussel on « *bouchot* » which represented 92% of the blue mussel production in 2020 is on average sold at 2,3 EUR/kg. According to interviews with producers, mussels cultured on "bouchot" are the most valuable. The prices provided in the table below show higher prices for blue mussels cultured on tables in 2020 (i.e. 2,8 EUR/kg). However, this price should be placed in the context of very limited volumes.

Table 35: First sale prices of mussels in France (2019/2020) – EUR/kg

		2019		2020	
		Price	%	Price	%
Blue mussel	Bouchot	2,2	90%	2,3	92%
	Long-line	2,9	8%	2,4	7%
	Table	2,6	1%	2,8	0,5%
	Others	2,8	1%	2,1	0,5%
Mediterranean mussel	Table	1,8	35%	2,1	41%
	Others	1,7	65%	2,0	59%

Source: Enquête aquacole Agreste (2019/2020)

First sale prices should be also considered in the context of the segmentation efforts undertaken by producers. The certification initiatives listed in the section 4.2.2 result often in price premiums, provided in the same section.

4.3.2. Import and export prices

The table below provides prices of fresh mussels imported from the main origin markets. The comparison between prices according to origin suggests that the Mediterranean mussels (imported from Spain and Italy) are imported at lower prices than the blue mussels (from the Netherlands, Ireland and the United Kingdom. Import prices of the Mediterranean mussel have remained relatively stable between 2017 and 2021, while they have increased for the blue mussel, particularly for mussels from Ireland. The Dutch mussels have the highest import prices which could be explained by the fact that mussels from the Netherlands arrive already cleaned, sorted and packed in MAP (significant facilities of cleaning and packing are located in the Netherlands), while a significant share of mussels from Ireland, Spain and Italy arrive mainly bulk to be cleaned, sorted and packed in France.

By comparing first sale prices of French mussels (which are likely to correspond to mussels at dispatch level, i.e. purified, cleaned and packed) with prices of imported mussels from the Netherlands (i.e. purified, cleaned and packed), the French mussels seem more valuable on the French market (on average 2,27 EUR/kg versus 1,83 EUR/kg).

Table 36: Prices of French imports of fresh *Mytilus spp.* from main origin markets between 2017 and 2021 (EUR/kg)

	2017	2018	2019	2020	2021
Spain	0,68	0,72	0,74	0,68	0,73
Netherlands	1,49	1,66	1,67	1,79	1,83
Ireland	0,86	0,97	0,92	1,01	1,12
Italy	0,69	0,74	0,70	0,67	0,70
United Kingdom	1,03	0,97	1,01	1,01	1,16

Source: EUROSTAT-COMEXT

The table below provides prices of imported prepared-preserved mussels. The difference in prices between origins suggest a variety of products that are imported, even though prepared mussels from Chile have the lowest prices (cooked mussels from Chile, canned mussels from Spain and cooked and vacuum-packed mussels from Ireland). There is also an increasing trend in prices from all origins, except from Denmark as prices have almost remained stable over the five last years. Import prices from Ireland and Spain have increased by respectively 13% and 11% during the same period.

Table 37: Prices of French imports of prepared-preserved mussels between 2017 and 2021 (EUR/kg)

	2017	2018	2019	2020	2021
Chile	2,32	2,19	2,27	2,56	2,49
Danemark	3,22	3,37	3,23	3,14	3,25
Germany	6,24	6,12	5,97	6,62	6,56
Ireland	1,87	1,90	1,91	2,10	2,11
Spain	5,30	5,11	5,60	5,66	5,91

Source: EUROSTAT-COMEXT

Export prices of fresh mussels from France have followed an overall decreasing trend in the last five years (by -27%), while the export volume have increased from almost 3.000 tonnes to almost 5.400 tonnes.

Table 38: French exports of fresh mussels between 2017 and 2021

	Volume (Tonnes)	Value (1.000 EUR)	Nominal price (EUR/kg)
2017	2.917	7.685	2,63
2018	3.300	7.671	2,32
2019	4.364	10.950	2,51
2020	4.122	9.733	2,36
2021	5.396	10.320	1,91

Source: EUROSTAT-COMEXT

4.3.3. Wholesale prices

Prices at wholesale stage are available from the quotations at Rungis wholesale market[54] (located in Paris suburbs). Prices are provided for three product types: French mussels under the TSG "*Moule de Bouchot*", imported mussels from the Netherlands and imported mussels from Spain. Data confirm that the French mussels are more valuable in the French market than imported products with a price gap of 0,3 to 0,4 EUR/kg. This price gap is lower at wholesale stage than at the other stages of the supply chain. However, prices for the French mussel at wholesale stage are not representative of the French market due to the small volumes of French mussels that are sold at Rungis market. The greatest volumes are directly exchanged between wholesalers and their customers without being recorded with "*Réseau des Nouvelles des Marchés*" (RNM)[55]. RNM reports a stability of prices between 2017 and 2020.

Table 39: Mussel prices at wholesale stage in France between 2017 and 2021 (EUR/kg)

	2017	2018	2019	2020	2021
***Moule de Bouchot* France**	2,1	2,1	2,1	2,1	2,6
Mussels from the Netherlands	1,8	1,8	1,8	1,8	2,2
Mussels from Spain	2,0	2,0	2,0	2,0	2,4

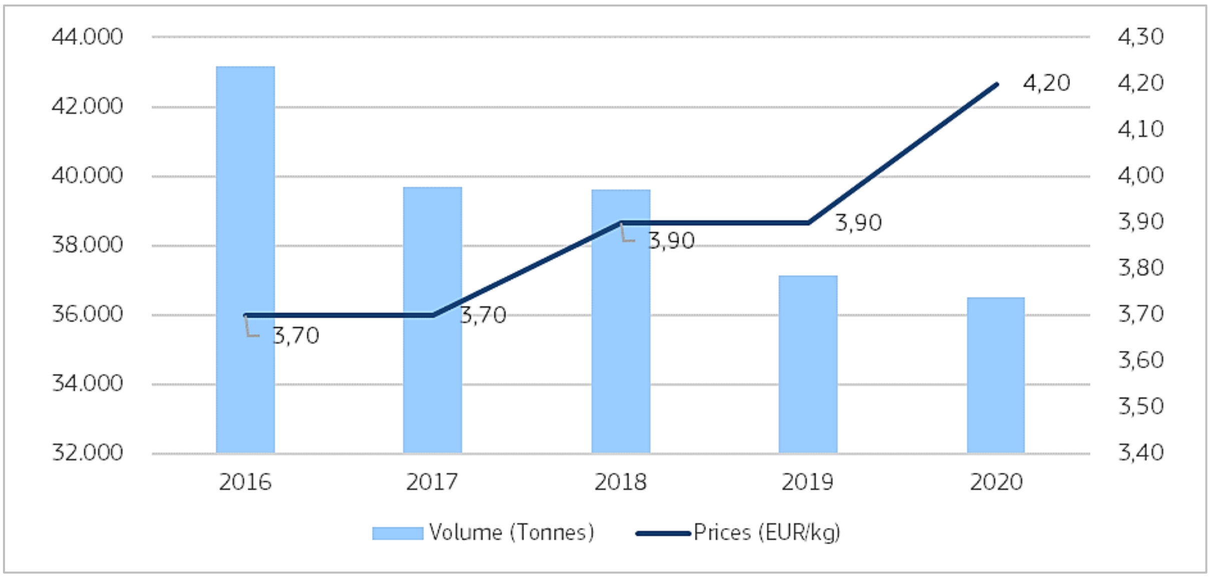
Source: RNM Rungis

[54] Data available through "*Réseau des Nouvelles des Marchés*" (RNM).
[55] *Etude sur le marché de la moule fraîche en France et spécifiquement sur la filière moule de bouchot*. FranceAgriMer. 2021.

4.3.4. Retail prices

Kantar Worldpanel provides data on French household consumption of fresh mussels and average prices of fresh mussels at retail stage. Over the period between 2016 and 2020, household consumption of fresh mussels has decreased by 15%, while prices have on average increased from 3,70 EUR/kg to 4,20 EUR/kg. In 2020, the total expenditure has reached over EUR 153 million for 36.510 tonnes.

Figure 21: Household consumption of fresh mussels between 2016 and 2020



Source: Kantar Worldpanel

Kantar Worldpanel provides also prices for fresh mussels by market. These show that mussels are sold at higher prices when they are sold in open market stalls (4,4-5,3 EUR/kg between 2016 and 2020) and in specialised retailers such as fishmongers (4,9-5,1 EUR/kg) than when they are sold at large retail stores (3,5-4,0 EUR/kg).

Table 40: Prices of fresh mussels at retail stage by market between 2016 and 2020 (EUR/kg)

	2016	2017	2018	2019	2020
Large retailers	3,5	3,6	3,7	3,7	4,0
Open market stalls	4,4	4,7	4,9	4,9	5,3
Specialised retailers	4,9	5,0	5,0	5,0	5,1

Source: Kantar Worldpanel

4.3.5. Price transmission

This section focuses on the following two supply chains:

- **Fresh standard mussels (i.e. without certification) cultured on longlines and sold directly by the producer to local restaurants** (i.e. in the same area), after being cleaned, sorted[56], prepared (i.e. removal of the byssal threads) and packed in bags.
- **Fresh mussels cultured on *Bouchot* and certified TSG "*Moule de bouchot*" sold by the producer to a purchasing central of larger retailers** which is located in the same area, after being cleaned, sorted[57], prepared (i.e. removal of the byssal threads) and packed in bags.

In both cases, the supply chain is short as the mussels are prepared by the producers themselves and sold directly to local customers, with low transport costs. Prices below are provided from operators involved in mussels farming on longlines and "*Bouchot*" in the Atlantic coast. Prices could vary according to the production area (the Mediterranean mussels have lower prices).

[56] Sorting is carried out as regards the marketable size in addition to some product quality specifications, which vary according to certifications.
[57] Ibidem.

Fresh standard mussels cultured on longlines and sold directly to local restaurants

The following supply chain concerns fresh mussels cultured on longlines and sold by the producer (prepared and packed in bags) to local restaurants.

Table 41: Price transmission of fresh mussel produced on longlines and sold to local restaurants (EUR/kg, 2021)

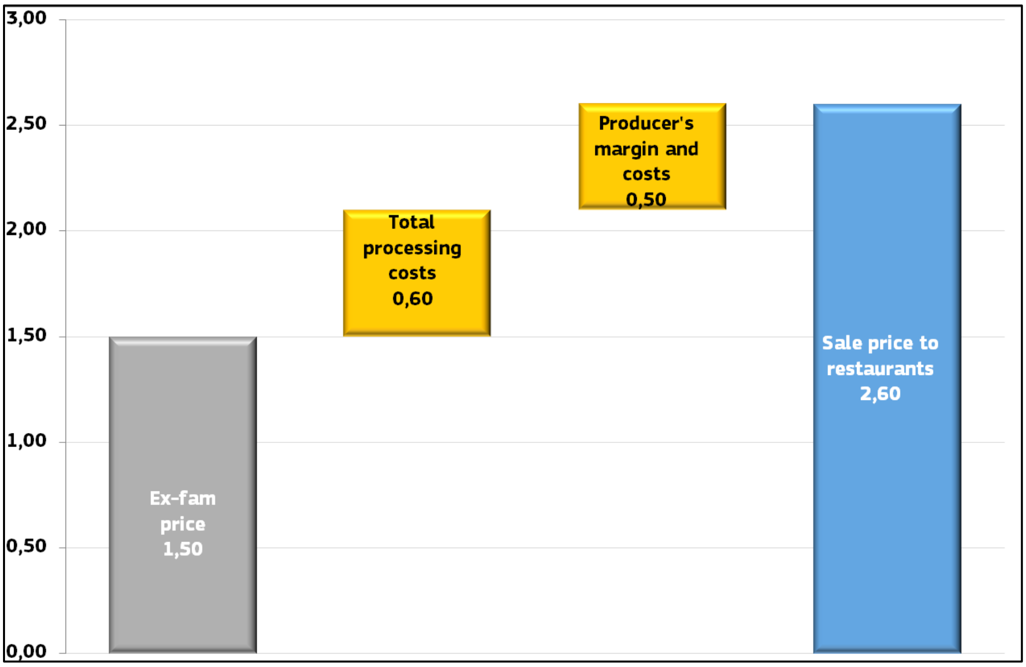
	Price (EUR/Kg)	% of final price	Source
Ex-fam price (1)	**1,50**	**58%**	**Interviews with producers**
Total processing costs (2)	0,60	23%	
Producer's margin and costs (including transport costs)	0,50	19%	
Sale price to restaurants (3)	**2,60**	**100%**	

Source: EUMOFA survey

Notes:

(1) price of mussel when it is sold in bulk to a wholesaler to be cleaned and packed.
(2) total costs related to activities of cleaning, removing the byssal threads and packing (bags)
(3) price of fresh mussels prepared and delivered to local restaurants.

Figure 22: Costs and margins for fresh mussels produced on longlines and sold to local restaurants (EUR/kg, 2021)



Source: EUMOFA

Fresh mussels certified TSG "Moule de bouchot" sold in large-scale retailer shop

The following supply chain concerns fresh mussels certified TSG and sold by the producer (prepared and packed in bags) to local restaurants.

Table 42: Price transmission of fresh mussel produced on *Bouchot* and sold in large retailers (EUR/kg, 2021)

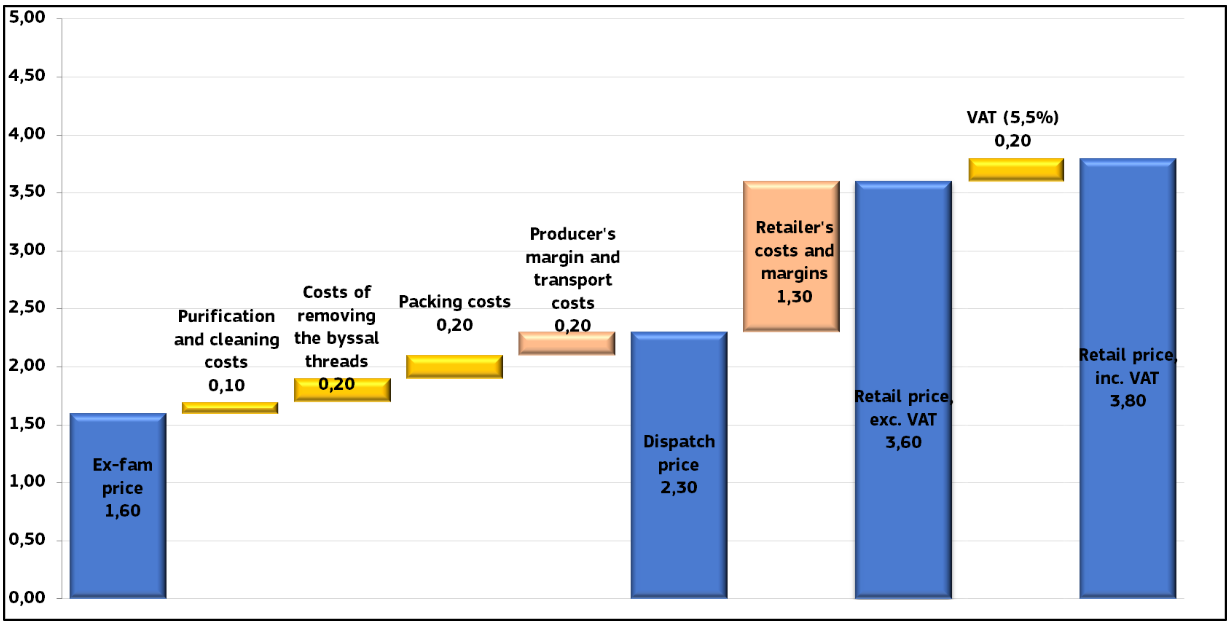
	Price (EUR/Kg)	% of the final price	Sources
Ex-fam price (1)	**1,60**	**42%**	**Interviews with producers**
Purification and cleaning costs	0,10	3%	
Costs related to removing the byssal threads	0,20	5%	
Packing costs	0,20	5%	
Total processing costs (2)	**0,50**	**13%**	
Producer's margin and transport costs	0,20	5%	
Dipatch price (3)	**2,30**	**61%**	
Retailer costs and margins	1,30	34%	
Average selling price, excluding VAT	3,60	95%	
VAT (5,5%)	0,20	5%	
Average sale price at retail stores (4)	**3,80**	**100%**	

Source: EUMOFA survey

Notes:

(1) Price of mussel when it is sold in bulk to a wholesaler to be cleaned, sorted and packed.
(2) Costs related to purification, cleaning, removing the byssal threads and packing in bags.
(3) Price of mussels after being cleaned and packed, sold to the purchasing central of large retailers.
(4) Price of mussels as sold in retail stores.

Figure 23: Costs and margins for fresh mussels produced *Bouchot* and sold in large retailers (EUR/kg, 2021)



Source: EUMOFA

5. THE ITALIAN MARKET

5.1. Structure of the supply chain

5.1.1. Production

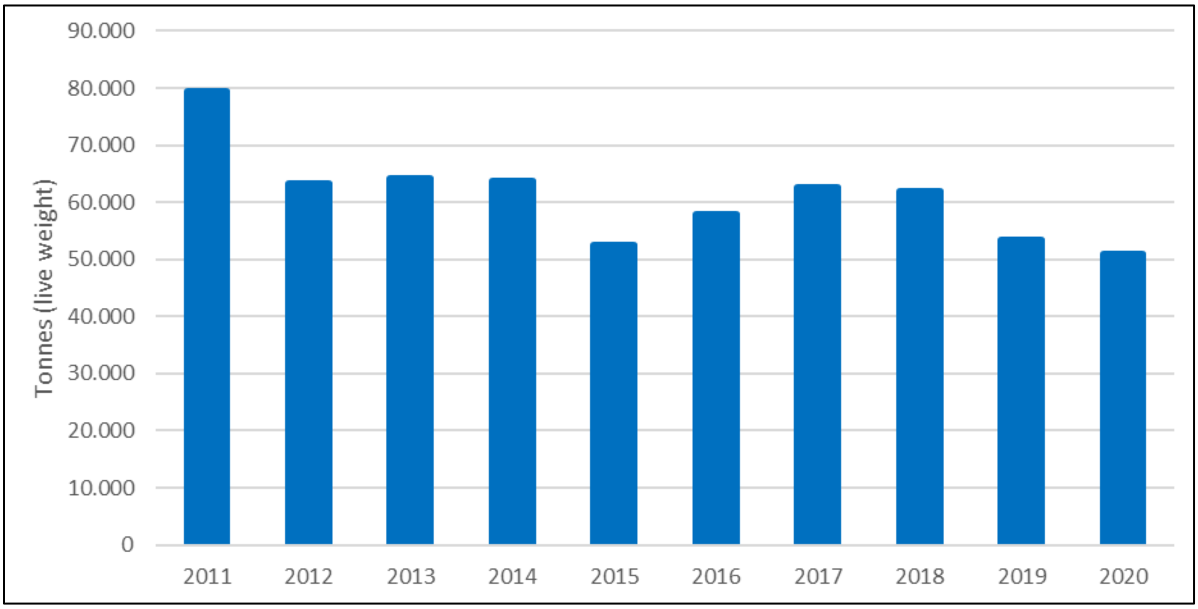
According to Eurostat data, the Italian production of mussels has fluctuated over the past decade but tends to overall decrease, going from over 79.000 tonnes in 2011 to less than 51.000 tonnes in 2020. It is almost entirely supplied by aquaculture, with some minor catches from fishery reported over the last three years (575 tonnes in 2020).

Table 43: Mussels production in Italy, 2010-2020 (volume in tonnes live weight)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Aquaculture	79.520	63.257	64.235	63.700	52.526	57.806	62.502	61.415	52.547	50.338
Fisheries	0	0	0	0	0	0	0	525	777	575
Total	79.520	63.257	64.235	63.700	52.526	57.806	62.502	61.940	53.324	50.913

Source: Eurostat

Figure 24: Evolution of mussel production in Italy between 2011 and 2020 (tonnes live weight)



Source: Eurostat

The national sector was composed of 240 mussel farming facilities in 2019, exploited by about 550 enterprises individually or in association. More than 85% of the production is located in 6 regions: Emilia-Romagna, Marche, Veneto and Apulia account for the largest share of the volume produced (73%), the following regions are Sardinia and Campania.

The Italian production is scattered in a large diversity of areas, covering 12 out of the 20 regions, with a high concentration on the Northern Adriatic coast. The region of Emilia-Romagna alone accounts for 38% of the national volumes with 20.095 tonnes in 2019. According to the Associazione Mediterranea Acquacoltori, they are about 87 regional producers, operating in 24 cooperatives/farms.

Sardinia, which is a significant producer and also a large importer of mussels from other Italian regions has a specific situation. Mussels locally produced or imported half-grown by one Sardinian cooperative to be reared in the Gulf of Oristano are mainly sold to other Italian regions. The high level of sales and price premium for Sardinian mussels is due to favourable natural conditions for the production and organoleptic quality of mussels: high salinity, continuous water change due to sea currents, good microbiological water conditions, mild temperatures. The cooperative markets its production through its own commercial brand.

Minor volumes are produced and marketed under the organic scheme by stakeholders who intend to develop their markets, in particular for exports to France. But the production is developing as the Italian demand for organic products is rising, according to a leading Italian retailer

Table 44: Breakdown of the volumes and % of total mussel production by region in Italy in 2019

	Volume (tonnes)	% volume prod.
Emilia Romagna	20.094,5	38%
Marche	6.590,7	13%
Veneto	6.171,4	12%
Apulia	5.134,1	10%
Sardinia	3.678,2	7%
Campania	2.878,5	5%
Abruzzo	1.945,0	4%
Liguria	1.855,0	4%
Lazio	1.461,0	3%
Sicily	1.214,0	2%
Friuli Venezia Giulia	1.204,4	2%
Molise	320,0	1%
Total	52.546,8	100%

Source: Associazione Mediterranea Acquacoltori (AMA)

Mussels are sold by mussel farmers under two presentations: ropes ("*treccia*") and bulk ("*sfuso*"). The ropes contain impurities (small mussels, other shellfish, algae, etc.) and bulk mussels are cleaned. Based on interview, there is between 15% and 50% loss ("*calo peso*" in Italian) between ropes and bulk. This percentage depends on the cleanliness of the product, in particular its content in algae, grass, and mud. It can decrease when mussel farmers implement additional stages of handling of the ropes during the farming. There is no detail on the share of ropes and bulk in the present statistics of production, thus, there is an uncertainty on the actual mussel volume of production in Italy. Based on interviews with professional stakeholders, the share of ropes / bulk differs in each region, and at national level the estimate is about 45% of the volume under ropes and 55% bulk. In Emilia-Romagna, the estimated distribution is 80% ropes / 20% bulk, while in other regions such as Sardinia and Liguria, 100% of mussels volumes would be sold in bulk.

The ex-mussel farmer price differs for ropes and bulk (see section on price transmission).

Wholesalers play an important role in the supply chain, as they often carry out the purification and packaging stages in their shipping centres. Few companies, individually or in association (cooperatives), handle the whole chain from production to consumer sale.

Economic performance

The latest STECF report[58] provides an analysis of the economic performance of the segment "mussel long line" which concerns 224 enterprises in 2018 and which excludes the bottom production. Economic results are provided below. They show the poor revenues and economic performance of the sector, with a net profit of EUR 5 million and an average wage of 14.000 EUR. The STECF report attributes it to the commercial strategy of the fragmented sector: the poor organisations of producers under Producer Organisations (POs) and persisting old traditions make it difficult to qualify Italian offer, as shown by constant low ex-farm prices in the past years. STECF estimates that over 70% of mussels are sold through the marketing of wholesalers and HORECA and the residual percentage through platforms of the Organized Channels. Since 2018, mussel businesses have initiated efforts towards vertical integration, especially in the Veneto and Emilia-Romagna regions through the creation of purification centers and processing of farm products. Those investments have been supported by EMFF Measures in favor of aquaculture and contributed to greater aggregation of supply.

Table 45: Economic performance of the "mussel long line" sector between 2014 and 2018, (million EUR)

	2014	2015à	2016	2017	2018
Total income	61,1	na	46,4	47,5	44,8
Total operating costs	69,9	na	41,8	36,2	36,3
GVA	11,0	na	18,1	23,8	**20,7**
Net profit	-14,6	na	0,9	7,9	5,0

Na: not available

Source: STECF 2020-12-20

5.1.2. Trade

Imports

In 2021, Italy imported 41.001 tonnes (product weight) for a value of circa EUR 60 million. Mussels are mainly imported fresh (68% of the Italian imports volume) and prepared-preserved (28% of the Italian imports volume). Fresh mussels are imported predominantly from Spain and to a lesser extent from Greece, while prepared-preserved mussels are mainly imported from Chile according to EUROSTAT-COMEXT. According to an interviewed retailer, prepared-preserved imported volumes include frozen cooked mussels.

Table 46: Imports of mussels and mussels products to Italy 2017-2021 (tonnes, product weight)

	2017	2018	2019	2020	2021
Fresh	38.360	30.347	40.628	25.616	27.769
Frozen	1.751	1.800	1.444	1.123	1.479
Prepared-preserved	10.320	10.657	10.222	10.826	11.533
Smoked	133	228	253	264	220
TOTAL	**50.564**	**43.033**	**52.547**	**37.829**	**41.001**

Source: EUMOFA elaboration of EUROSTAT-COMEXT data

[58] The EU Aquaculture Sector – Economic report 2020 - STECF 2020-12-20

Fresh mussels and preserved mussels represented 91% of the total value of mussel products imported to Italy in 2021. During the period between 2017 and 2021, imports of fresh mussels have decreased by 11% in value terms, while imports of preserved mussels have increased by 14%.

Table 47: Imports of fresh mussels to Italy by origin, 2017-2021 (tonnes, product weight)

	2017	2018	2019	2020	2021
Spain	24.332	21.483	27.263	15.187	18.538
Greece	8.706	5.231	7.475	4.580	4.571
Others	5.323	3.633	5.890	5.849	4.659
Total	38.360	30.347	40.628	25.616	27.769

Source: EUROSTAT-COMEXT

Exports

Mussels are mainly exported fresh from Italy. In 2021, 6.531 tonnes of mussels were exported from Italy, from which 5.748 tonnes were fresh mussels (88%). Fresh mussels' exports represented a value of over EUR 10 million (68% of total export value). In 2021, the main destinations were Switzerland (23% of export value), France (23%), the Netherlands (12%) and Germany (11%).

Table 48: Exports volume of mussels and mussels products from Italy in 2021 (tonnes, product weight)

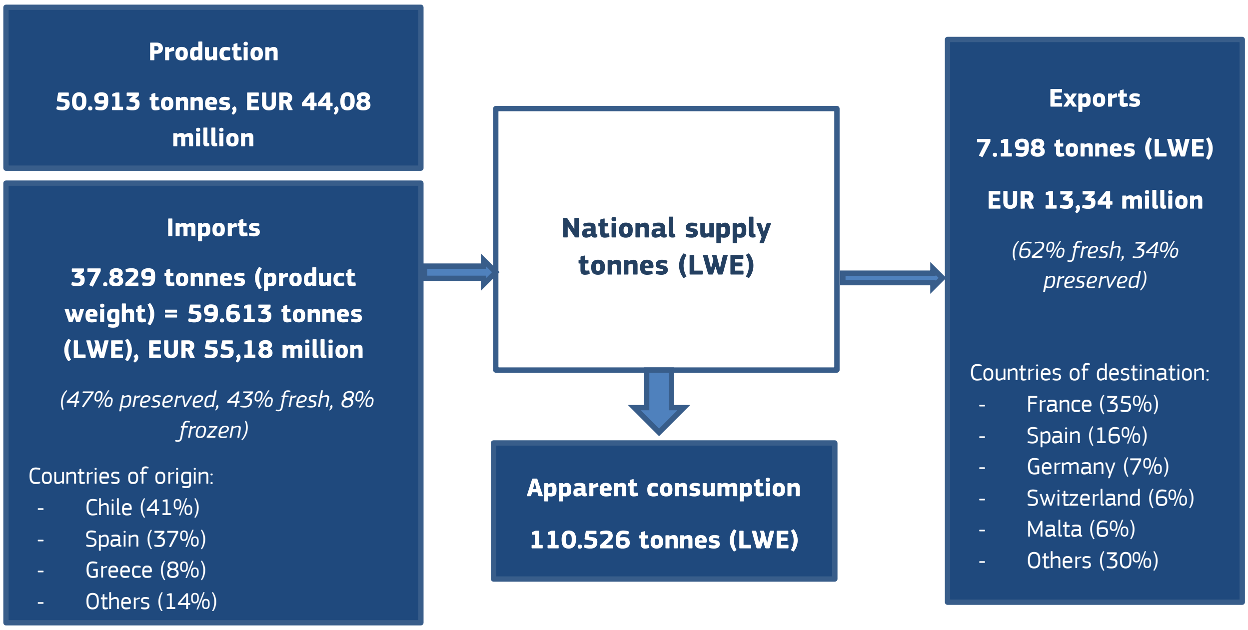
	2017	2018	2019	2020	2021
Fresh	8.802	7.383	6.305	4.434	5.748
Frozen	80	82	108	55	62
Prepared-preserved	579	657	757	924	685
Smoked	172	81	44	40	36
Total	**9.633**	**8.203**	**7.214**	**5.453**	**6.531**

Source: EUMOFA elaboration of EUROSTAT-COMEXT data

5.1.3. Apparent consumption

In 2020, the total supply (production + imports) of mussels in Italy amounted to 110.526 tonnes LWE, in a relatively balanced ratio between national production (46% of volume) and imports (54%). 7% of this supply was exported, thus the apparent consumption can be estimated at 93% of the total supply, *i.e.* 103.328 tonnes LWE. Exports are limited compared to the national supply.

Figure 25: The Italian supply chain for mussels (2020), % show the shares in volumes lwe



Source: EUMOFA elaboration based on EUROSTAT-COMEXT and interviews with stakeholders

5.2. Characteristics of the Italian market and consumption

5.2.1. Presentation of the product

In Italy, mussels are mostly sold live fresh to be cooked and consumed at home or at restaurants. For final consumers, mussels are available in the market in nets of 1 to 5Kg, after being cleaned, purified and sorted. According to interviews, the packing units that are commonly used for export to France are net bags of 20-25 kg. Contrary to France, removing the byssal threads is not commonly implemented in the Italian mussel industry. In retail stores, mussels can also be found live and packaged in trays of about 1kg under protective atmosphere, cleaned (byssus removed), and mixed with other shellfish (clams), ready to be cooked. There is a growing trend for frozen cooked mussels in trays, ready to heat and serve, repackaged with their cooking water in modified atmosphere packing (MAP) either in mixed preparations with other seafood (shrimps, clams) or 100% mussel preparations. Most of those frozen mussels are supplied from Chile, also from Italy and Spain in smaller proportions.

5.2.2. Characteristics of the market

The Italian mussel market is characterised by a high level of consumption, as mussels feature among the cheapest seafood products and are prepared in many Italian dishes. Final consumers primarily purchase fresh mussels. The Italian production fully supplies the demand in fresh mussels between April and September, and is completed by imports from Spain and Greece between October and March. Thus, the market partly relies on imports, mostly from Spain and Greece for fresh mussels, and from Spain and Chile for frozen products.

The segmentation of fresh mussels is mostly based on the origin of production. Mussels produced nationally are favoured to foreign imports when available, and are sold with higher prices. Within Italian production, mussels grown in Arborea area (in Sardinia) have the best quality reputation and benefit from a high price premium, due to specific environmental conditions and a good organoleptic quality.

Overall, the home consumption of fresh mussels has continuously decreased over the past ten years. During the COVID-19 crisis, the decrease of consumption through the HORECA channel has been compensated by an increase of home consumption, as shown by the significant increase of mussel sales in supermarkets in 2021 (based on interviews).

5.2.3. Consumption

In 2020, the Italian per capita apparent consumption of fisheries and aquaculture products reached 31,21 kg LWE/year. Italy ranked sixth at EU level in terms of per capita consumption and fourth in terms of per capita household nominal expenditure on fisheries and aquaculture products with 207 EUR/capita/year[59].

Household consumption of mussels is estimated at 26.244 tonnes of products in 2021 and 27.760 tonnes in 2020 (this volume only covers fresh mussels consumed at home, hence it may not be compared to the apparent market which is indicated in LWE and covers all presentation and HORECA)[60]. Household consumption continuously decreased over the past decade, with a drop of 32% in volume and 26% in nominal value (33% in real terms)[61] between 2012 and 2021. Over the years 2018-2020, household consumption of fresh mussels has remained broadly stable in volume. The share of mussels'

[59] The EU Fish Market, 2021. European Market Observatory for Fisheries and Aquaculture Products.
[60] EUMOFA/Europanel
[61] In the report, values are real terms by using the GDP deflator (base=2015)

consumption volume over the total consumption of fish products also decreased from 12% to 8% over the period.

Mussels still account for 50% of the molluscs' consumption in volume in 2020 due to lower average prices than clams and squids, and the penetration rate for household consumption of fresh mussels was 19,4% in 2020[62].. In 2020, mussels' consumption per capita was 1,73 kg/year in Italy, ranking the country third in the EU following Spain and France.

Table 49 –Household consumption of fresh mussels, 2012-2021

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Volume (t)	38.570	37.594	39.817	31.619	30.210	29.650	28.649	28.881	27.760	26.244
Value (EUR 1.000)	106.998	90.924	94.108	76.262	72.037	71.666	73.384	73.915	68.734	72.158

Source: EUMOFA/Europanel

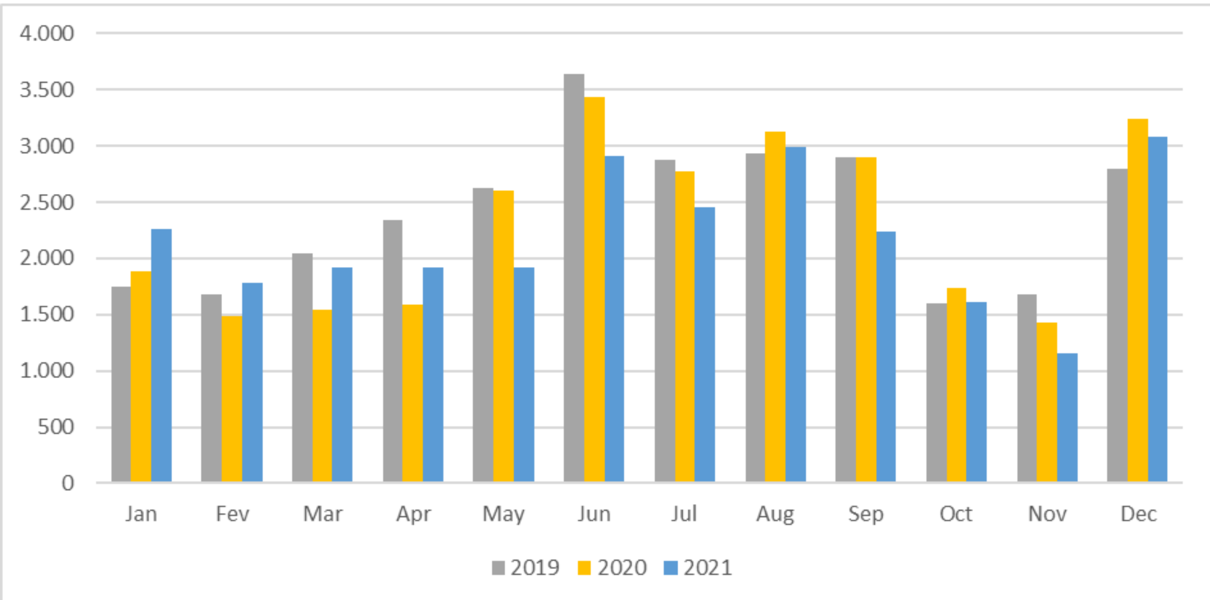
The consumption is highly seasonal with peaks:

- during summer: between 2.000 and 3.500 tonnes consumed each month by households between June and August, the demand grows due to tourism and when national production is available;
- in December, with about 3.000 tonnes consumed in the month, national production is not available and consumption is based on imports (in particular from Spain).

The monthly household consumption ranges between 1.500 and 3.500 tonnes/month.

Based on interviews, HORECA accounts for a large share of the national consumption, in particular during summer in touristic areas. However, no detailed information is available on this market. During the COVID-19 crisis, the closing of HORECA sector (in Italy and France) transferred part of the fish products volumes to the supermarkets, generating a large increase in sales in this channel, particularly in 2021. Retail sales are expected to be lower in 2022, also driven by the inflation of prices.

Figure 26: Monthly household consumption of mussels in Italy 2019-2021 (tonnes)



Source: EUMOFA elaboration on Europanel

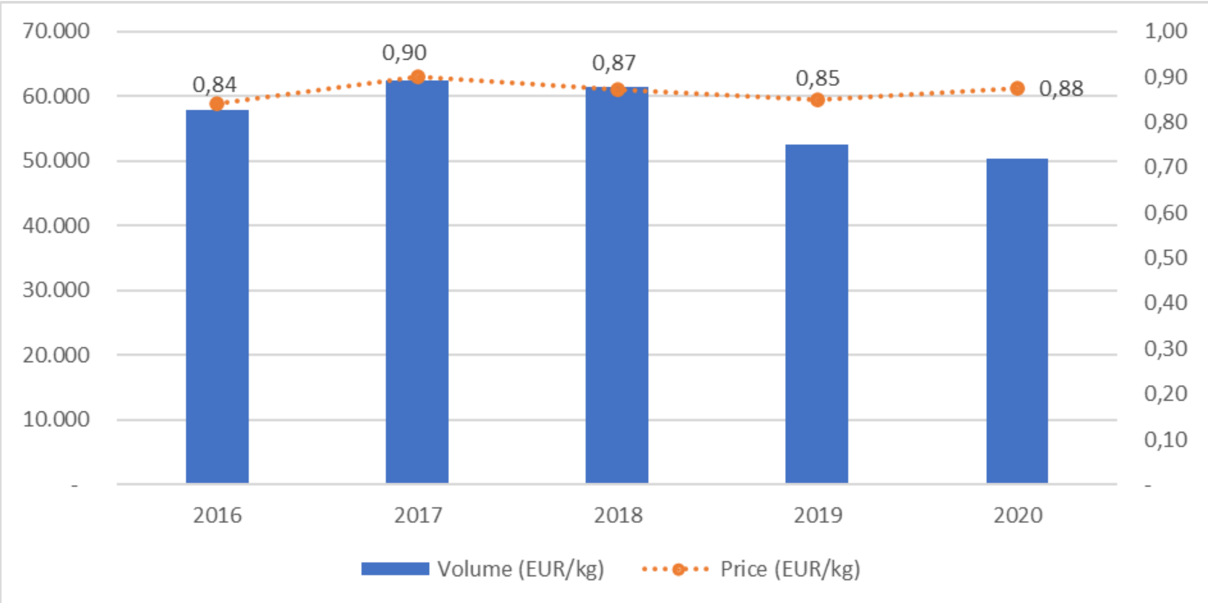
[62] Annuario sul settore ittico – 2020, Borsa Merci Telematica Italiana

5.3. Price transmission in the supply chain

5.3.1. First-sale prices

According to EUROSTAT, national economic studies[63] and operators interviewed, first sale prices of Mediterranean mussel have remained broadly stable over the period 2016-2020, ranging from 0,84 EUR/kg (2016) to 0,90 EUR/kg (2017) and reaching 0,88 EUR/kg in 2020. Based on prices provided during interviews, Eurostat prices most likely correspond to mussels sold in ropes ("*treccia*"), without processing. This product is sold from a producer to a purification and dispatch centre.

Figure 27 - First sale prices of mussels in Italy (2016-2020) – EUR/kg



Source: EUMOFA elaboration on EUROSTAT

ISMEA Mercati provides monthly national average prices[64]. Data are available for the years 2021 and 2022. The indicated mussel price at farm gate ("franco azienda") for live and purified mussels is:

- 1,20 EUR/Kg (VAT excluded) between February and June 2020
- 1,30 EUR/Kg (VAT excluded) between July 2021 and January 2022

Those prices most likely correspond to mussels in bulk obtained from ropes. However, purification is rarely handled by producers themselves, but rather by wholesalers with purification and dispatch centers. Only few companies, either single or associated, manage the entire supply chain, from production to sale to consumption. Hence ISMEA data either corresponds to the farm-gate prices of these few companies, or to a dispatch price.

The mussel price at the production stage differs depending on the type of products, according to interviews with operators:

- Mussel under ropes ("treccia"): 0,50 to 0,75 EUR/Kg,
- Bulk ("sfuso") ready for sorting and purification in dispatch centers: 1,00 to 1,20 EUR/kg for bulk in most of the regions however the price may be higher in Sardinia and Sicily,
- Bulk purified and packed in bags of 1 to 5 kg for restaurants: 1,90-2,00 EUR/kg

The price highly differs between regions, depending on:

[63] COZZA O MITILO - ANALISI ECONOMICA E PROSPETTIVE DI CONSUMO, MIPAAFT and Unioncamere, 2020
[64] https://www.ismeamercati.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/10109

- The type of presentation (ropes / bulk),
- The meat content of the mussel (between 24 and 30%),
- The level of impurities for ropes (between 15 and 50% of weight loss between ropes and bulk),
- The seasonality (higher prices during the touristic summer season).

Thus, the average yearly price in 2019 (source: Associazione Mediterranea Acquacoltori (AMA) based on MiPAAF-UNIMAR data) ranged from 0,51 EUR/Kg (Molise) to 2,21 €/Kg (Sardinia). Prices tend to be lower in the northern Adriatic regions, where the competition between producers is stronger due to a high concentration of farms, according to a retailer interview. Besides, in Emilia Romagna, about two-third of the production is sold under ropes (EUMOFA 2019 estimates by local stakeholders), while Sardinian production has a high share of bulk mussel.

Based on a retailer, organic mussels have a price premium of 0,50 EUR/Kg compared to standard products, when he purchases them. A producer 100% organic reports that his certification is only valued for exports to France, while his products are usually sold as conventional on the national market, due to a lack of demand for organic products.

Since 2020, stakeholders report significant fluctuations in the first-sale prices. During the COVID-19 crisis (from March 2020 to the last quarter of 2021), prices dropped to 0,50 EUR/Kg (-0,20 EUR/Kg) for mussels in ropes according to producers from Emilia-Romagna. In the last months of 2021, prices started to recover (0,60 EUR/Kg) and even show a slight increase in the beginning of 2022 (0,70-0,75 €/kg).

Table 50: Ex-farm price (nominal price, EUR/kg) for aquaculture mussels in Italy (2019), ranked by importance of the regional production volume

Region	First sale price (EUR/kg)
Emilia Romagna	0,70
Marche	0,64
Veneto	0,66
Apulia	0,55
Sardinia	2,21
Campania	1,11
Abruzzo	0,82
Liguria	1,12
Lazio	1,15
Sicily	1,46
Friuli Venezia Giulia	0,65
Molise	0,51

Source: Associazione Mediterranea Acquacoltori (AMA)

5.3.2. Import and export prices

As already mentioned, Italian mussel trade concerns mainly fresh (68% of import volume and 88% of export volume in 2021) and prepared-preserved mussels (28% of import volume and 10% of export volume). Prices of imported fresh mussels have increased by 23% between 2017 and 2021, but only by 10% for export prices. Both import and export prices increased relatively steadily over the period, except from a decline of import prices and a peak of export prices in 2018. The drop of import volumes in 2020 and 2021 and the inflation of import prices in 2021 could be explained by a deficient supply from Galicia (due to a bloom of biotoxin) and Greece (high mortality caused by heat waves), based on interviews with operators. In 2020, the extended closing of French HORECA sector (due to COVID-19 outbreak) affected the activity of Italian exporters, as shown by the decrease of export volumes: one producer reports that he usually sells 30 to 60% of his volumes to France.

Table 51: Import and export price (nominal price), volume and value for fresh mussels in Italy

		2017	2018	2019	2020	2021
Price (EUR/kg)	Import	0,73	0,68	0,82	0,82	0,90
	Export	1,63	1,77	1,69	1,74	1,80
Volume (tonnes)	Import	38.360	30.347	40.628	25.616	27.769
	Export	8.802	7.383	6.305	4.434	5.748
Value (EUR 1.000)	Import	28.029	20.691	33.146	21.061	24.953
	Export	14.352	13.062	10.684	7.707	10.364

Source: EUROSTAT-COMEXT

Import volumes of prepared-preserved mussels increased over the 2017-2021 period (+12%), with a relatively steady growth. Import prices fluctuated in the meantime, declining to 2,36 EUR/kg in 2018 before reaching a peak in 2019 and 2020 (2,70 EUR/kg) and finally returning to a value comparable to 2017 (2,58 EUR/kg in 2021). Imports of prepared-preserved mussels mainly come from Chile, with 76% of import value in 2021. Export volumes are negligible (< 1.000 tonnes) and mostly towards Germany, France and the UK. Export prices reached their lowest level in 2020 (5,37 EUR/kg) as volumes were high (924 tonnes).

Table 52: Import and export price (nominal price), volume and value for prepared-preserved mussels in Italy

		2017	2018	2019	2020	2021
Price (EUR/kg)	Import	2,53	2,36	2,70	2,70	2,58
	Export	6,50	5,84	6,02	5,37	5,95
Volume (tonnes)	Import	10.320	10.657	10.222	10.826	11.533
	Export	579	657	757	924	685
Value (EUR 1.000)	Import	26.121	25.161	27.623	29.216	29.757
	Export	3.764	3.841	4.557	4.968	4.075

Source: EUROSTAT-COMEXT

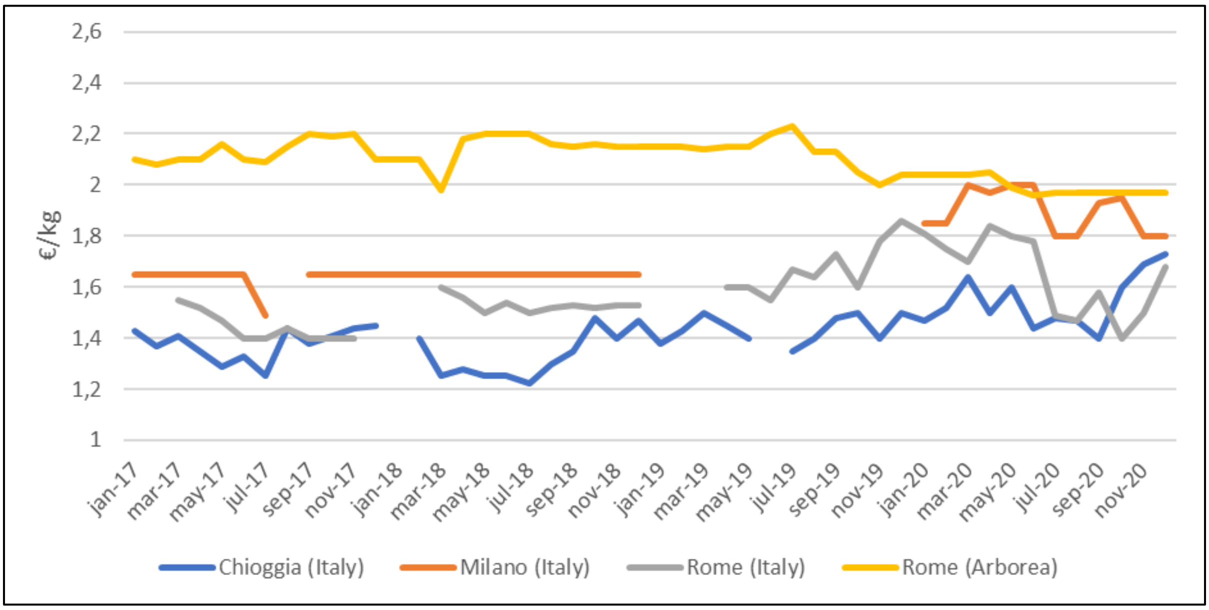
5.3.3. Wholesale prices

Analysis of prices at wholesale stage are available from the BMTI ("Borsa Merci Telematica Italiana")[65]. Prices are provided for three product types: Italian mussels, mussels from Arborea area (in Sardinia) and imported mussels from Spain. Data on 2019-2021 show that "standard" Italian mussels tend to be slightly more valuable than imported mussels from Spain, with a price gap of 0,10 to 0,30 EUR/kg on Rome's market. Mussels from Arborea benefit from a substantial price premium of 0,30 to 0,60 EUR/kg on Rome's market compared to other Italian mussels and are sold 2,00 EU/kg on average. The national product is mainly marketed in the spring and summer months, while in the autumn and winter months the supply is mainly composed of Spanish product.

[65] https://ittico.bmti.it/Prezzi/pages/index

As pointed out by an economic analysis of the sector[66], until 2019, mussels' prices at wholesale stage are stable. However, there are considerable variations between markets, which are largely determined by the size of the markets themselves and the prevailing type of buyers.

Figure 28 – Wholesale prices of nationally produced fresh mussels between 2017 and 2020 in various markets – EUR/kg VAT excluded

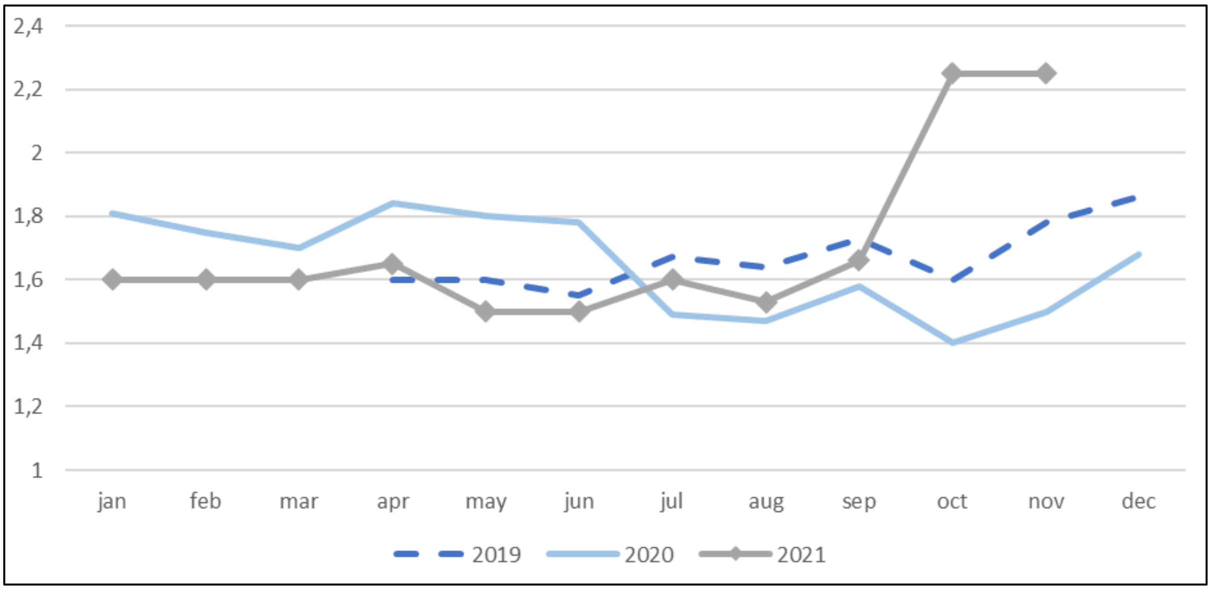


Source: EUMOFA elaboration on wholesale market quotations (in BMTI)[67]

While all mussels' prices were relatively stable over 2019, 2020 and the first quarters of 2021, ranging around 2,00 EUR/Kg for Arborea mussels, and between 1,40 to 1,80 EUR/kg for Italian "standard" mussels, they sharply increased after September 2021. Arborea mussels reached 2,37 EUR/kg and other Italian mussels 2,25 EUR/kg on Roma's market. Quotations continued to rise in the beginning of 2022. BMTI explains this trend by a general increase in the management costs (energy, raw materials) , a very high level of demand and a drop of foreign offer concomitantly.

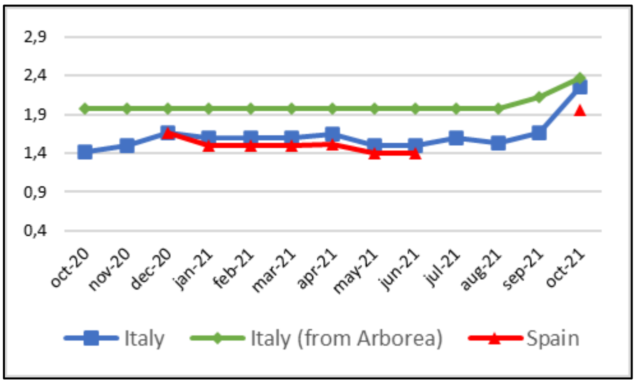
[66] COZZA O MITILO - ANALISI ECONOMICA E PROSPETTIVE DI CONSUMO, MIPAAFT and Unioncamere, 2020
[67] Annual fish market report – Years 2017, 2018, 2019 and 2020, Borsa Merci Telematica Italiana

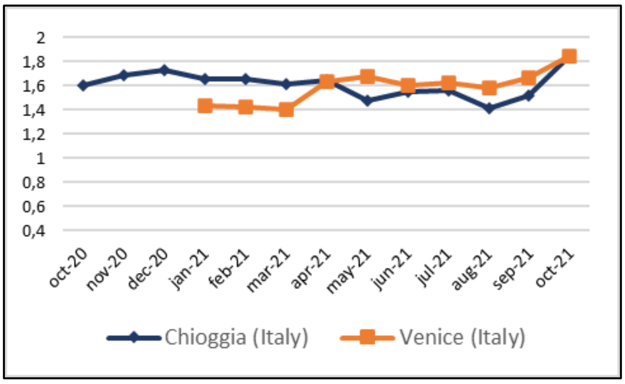
Figure 29 – Wholesale prices of "standard" Italian mussels in Roma's market (fresh Mediterranean mussel) 2019-2021 – EUR/kg VAT excluded



Source: EUMOFA elaboration on wholesale market quotations (in BMTI)[68][69]

Figure 30 – Wholesale prices of fresh mussels in the markets of Rome (left) and Chioggia and Venice (right), by origin of the product – EUR/kg VAT excluded





Source: BMTI elaboration on wholesale market quotations[70]

[68] Annual fish market report – Years 2019 and 2020, Borsa Merci Telematica Italiana
[69] Quarterly price and market analysis of fishery and aquaculture products, BMTI, November 2021 and February 2022
[70] Ibidem

5.3.4. Retail prices

GFK consumer panel provides detailed data on Italian household consumption of fresh mussels and average prices of fresh mussels at retail stage. According to BMTI's elaboration on these data since 2018[71], the average price for fresh mussels (all product categories included) was 2,59 EUR/kg in 2018, 2,60 EU/Kg in 2019 and decreased to 2,54 EUR/Kg in 2020.

Starting from March 2021, BMTI quarterly market analysis reports a substantial increase in fish and seafood fresh products prices, with a rapid acceleration over the last quarter of the year (+5,4% in September 2021 compared to September 2020). Consumer inflation for seafood products continued to increase at the start of 2022, driven by rising energy prices and raw material costs and higher fuel costs for fishing vessels. Interviews with operators confirm this trend. A retailer also connects the inflation of purchase prices and consumers prices to a deficit in foreign supply and an acceleration in demand concomitantly: according to him, a biotoxin bloom in Galicia led to a drop of more than 50% in Spanish exports in 2021 and 2022, and heat waves caused a high mortality in Greece. This retailer reports an important growth of fish and mussels' sales in supermarkets in 2021 due to the transfer of closed HORECA sector during the Covid crisis. But the beginning of 2022 records a strong decrease in sales in supermarkets (-24% for mussels' volumes compared to 2021) due to the reopening of HORECA sector and rising prices.

Table 53: Household consumption of fresh mussels 2018-2020

	2018	2019	2020
Price (EUR/kg)	2,59	2,60	2,54
Volume (t)	27.450	28.276	26.218
Value (EUR 1.000)	71.044	73.469	66.714
Penetration rate	19,1%	18,2%	19,4%
Average purchase per capita (Kg)	1,494	1,526	1,447
Average expense per capita (EUR)	3,87	3,97	3,7

Source: GFK in BMTI[72]

Based on EUMOFA (Europanel), the average price of fresh mussels' products for household consumption ranged between 2,34 EUR/Kg and 2,91 EUR/Kg (in 2021). The average price may differ depending on the presentation / preservation form, but no detail is available on these aspects.

Table 54: Household consumption of fresh mussel products 2012-2021, based on Europanel

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Price (EUR/kg)	2,69	2,37	2,34	2,41	2,41	2,46	2,64	2,66	2,61	2,91
Volume (t)	38.570	37.594	39.817	31.619	30.210	29.650	28.649	28.881	27.760	26.244
Value (EUR 1.000)	103.858	89.269	93.239	76.262	72.854	73.005	75.554	76.801	72.400	76.368

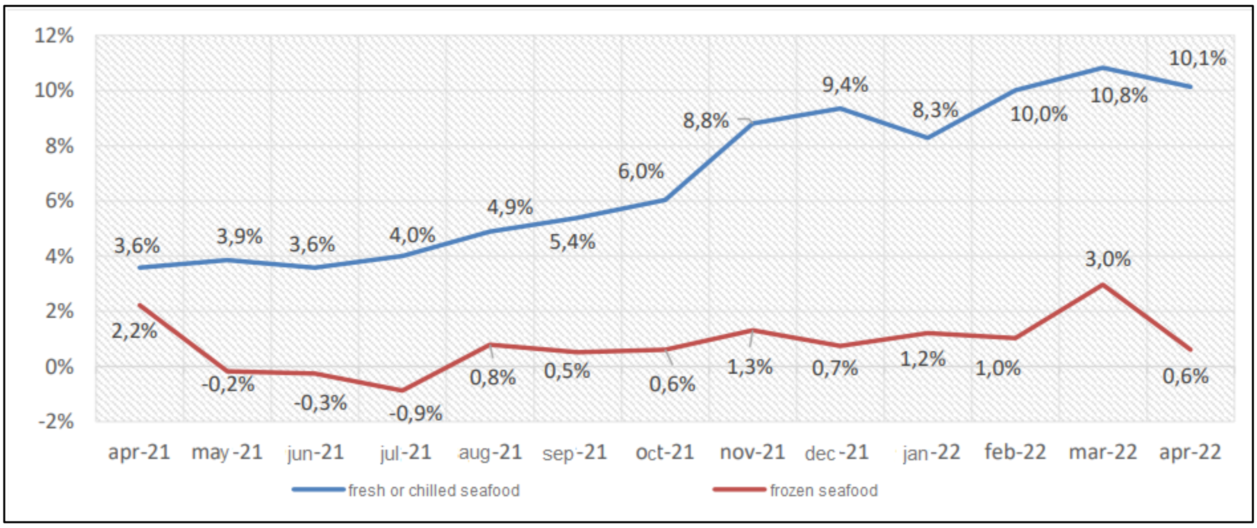
Source: EUMOFA/ Europanel

Based on interviews with stakeholders, the retail price of mussels may significantly vary depending on the area of production, the product quality, seasonality etc. A retailer reports an average retail price of 3,4 EUR/Kg since the recent inflation. Organic mussels' sales are still marginal but in development: they

[71] Annuario sul settore ittico – 2020 and 2019 BMTI
[72] Annuario sul settore ittico – 2020 and 2019 BMTI

are sold packaged in trays and cleaned from byssus for 4,3 EUR/Kg. According to the same retailer, the price of frozen cooked mussels repackaged with their cooking water in modified atmosphere packing (MAP) is at least doubled compared to the standard frozen product.

Figure 31 – Consumer prices of seafood products, year-on-year percentage evolution (2015=100), for fresh or chilled seafood and frozen seafood



Source: BMTI elaboration on Istat data (translated)

5.3.5. Price transmission

This section focuses on the supply chain of **fresh rope mussels produced in Italy and sold in nets of 1 or 1,5 Kg in large-scale retail**. In the case of this supply chain, individual or associated producers sell their production under ropes ("treccia") to cooperatives who take in charge the recovering of bulk mussels from the ropes, sorting, purification, packing and dispatch to restaurants, fishmongers and retailers' platforms. Few producers, either individual or associated, manage the entire supply chain, from production to consumer sale. In that case, they handle themselves the preparation, packing (in big bags of 20-25 Kg or smaller nets of 1-1,5Kg) and transportation of their production to local restaurants or exporters to France. In some production areas, the quality of water does not require purification. Most of Italian mussels' production is not processed.

Prices and costs below are provided from producers in Emilia-Romagna region, a professional aquaculture association and a large-scale Italian retailer. Average final retail price is based on Europanel data. These prices concern the end of the year 2021. Prices fell during the Covid crisis and the closing of the HORECA sector, but they started rising again in the last months of 2021 due to low volume available and global inflation, reaching even higher levels than before the crisis. It should be noted that prices are highly variable depending on production areas, product quality, and sales period.

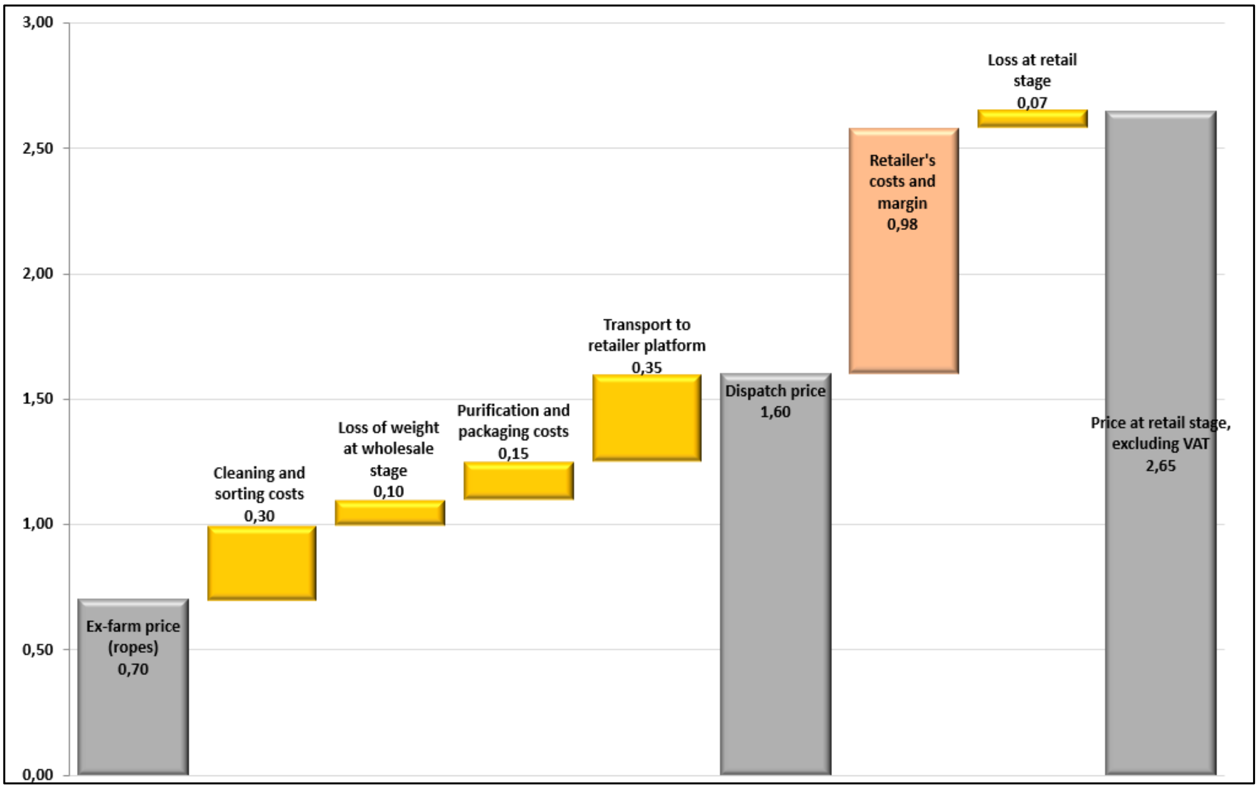
Table 55: Price transmission for standard fresh mussel produced in Emilia-Romagna region and sold in large-scale retail in Italy (EUR/Kg, 2021)

	Average price (EUR/kg)	% of the final price	Source
Ex-Mussel farm price (ropes) (1)	**0,70**	**24%**	Associazione Mediterranea Acquacoltori (AMA) and interviews with producers
Cleaning and sorting costs	0,30	10%	Interviews with producers and a retailer
Ex-Mussel farm price (bulk) (2)	**1,00**	**34%**	
Loss of weight at wholesale stage	0,10	3%	
Sorting, purification and packaging costs	0,15	5%	
Transport to retailer platform	0,35	12%	
Dispatch price (3)	**1,60**	**55%**	Interviews with producers and a retailer, Borsa Merci Telematica Italiana
Retailer's costs and margin	0,98	34%	Interview with a retailer
Loss at retail stage (4)	0,07	2%	
Retail price excl VAT	**2,65**	**91%**	
VAT (10%)	0,26	9%	
Retail price incl VAT (5)	**2,91**	**100%**	Eumofa, Borsa Merci Telematica Italiana

Source: EUMOFA

Sources:
(1) Ex-farm price (ropes) refers to the price of fresh mussels sold in ropes ("treccia") by the producer to the shipping center – interview with producers and retailer
(2) Ex-farm price (bulk) refers to price of fresh mussel sold in bulk, ready for sorting and sale, by the producer to the shipping center – interview with producers and retailer
(3) Dispatch price refers to the price of fresh mussels, purified, sold in nets of 1kg or 1,5kg and delivered to the retailer's platform – interview with producers and retailer.
(4) Loss at retail stage refers to the loss of merchandise due to the loss of vitality/mortality of mussels (maximum lifespan: 5 days) – interview with retailer
(5) Source: EUMOFA/Europanel

Figure 32: Costs and margins for standard fresh mussel of national origin sold in large retailers in Italy (EUR/Kg, 2021)



Source: EUMOFA

6. THE IRISH MARKET

6.1. Structure of the supply chain

6.1.1. Production

With a national production of 14.729 tonnes in 2020, the mussel industry in Ireland is the largest aquaculture sector, at national level, in terms of volume and third in terms of value after salmon and oysters. The same year, it made up 68% and 32% of total shellfish output volume and value[73]. Over the decade between 2011 and 2020, mussel production has decreased by 35% in volume. There was no mussel production from fishery in 2020.

Table 56: Mussels production in Ireland, 2011-2020 (volume in tonnes)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Aquaculture	22.671	14.557	15.360	11.374	16.015	16.156	16.340	13.889	15.184	14.729
Fishery	0	5.427	3.589	848	235	0	770	0	0	0
Total	**22.671**	**19.984**	**18.949**	**12.222**	**16.250**	**16.156**	**17.110**	**13.889**	**15.184**	**14.729**

Source: EUROSTAT

The mussel sector is split between bottom cultivation and suspended rope culture. According to national statistics:

- rope mussel production was estimated at 10.214 tonnes for a value of EUR 6,89 million in 2019 (68% of the Irish mussel production in volume and 47% in value).
- the bottom cultured mussel production was estimated at 4.894 tonnes for a value of EUR 7,89 million (32% in volume and 53% in value).

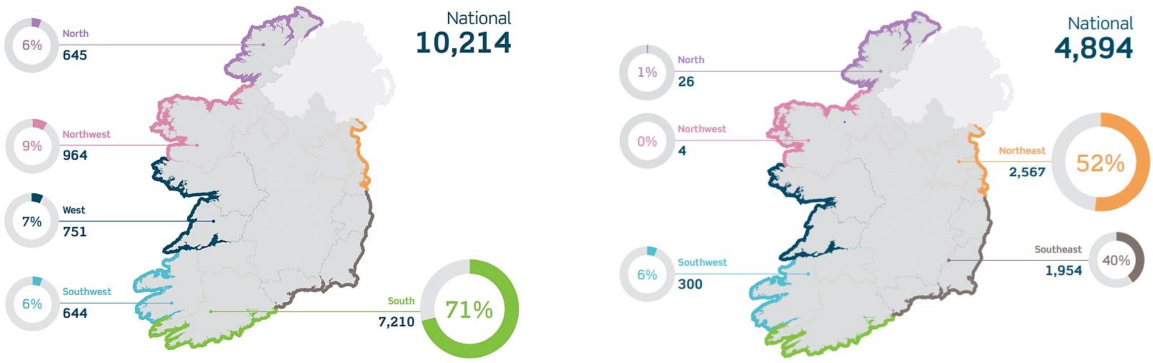
Rope mussel output has known a small oscillation, while bottom cultured mussel output has undergone a large and overall downward trend over the observed period, which explains the overall decrease trend of mussel production in Ireland during the decade between 2010 and 2019.

For **rope grown mussels**, mussel seeds used for farming are either collected from the wild or settle naturally on ropes. Ropes are suspended vertically in the water from a fixed or floating structure. Growth cycle varies from one to two and a half years depending on the bay. Fresh product is of mainly 55-70 mm shell length (110-80 pieces per kilogram)[74]. Production is concentrated in the Southwest: Cork and Kerry and to a lesser extent in the North West, from Killary harbour to Mulroy Bay (Figure 33).

Ireland's bottom grown mussel fishery became MSC certified in 2013. Production is limited by stock management issues rather than licensed ground capacity. Seed collection takes place in autumn and requires an authorization and is managed through a quota system allocated to individual vessels. Wild seed is transferred at 20 mm shell length (600 pieces per kilogram) from local seed beds to managed pots for growing until 55 to 70 mm shell length (80 to 110 pieces per kilogram), after 1 to 2,5 years[75]. Production is concentrated in three bays, Carlingford Lough, Wexford Harbour and Castlemaine Harbour (Figure 33).

[73] BIM aquaculture report. 2020.
https://www.researchgate.net/publication/344188564_BIM_National_Seafood_Survey_Aquaculture_Report_2020
[74] Ibidem
[75] STECF report.

Figure 33: Geographical distribution of mussels production in Ireland in 2019 (rope grown mussels on the left and bottom cultured mussels on the right)



Source: BIM aquaculture report 2020[76]

Harvesting method for rope mussels

The traditional approach to harvest mussels was to pull the ropes out of the water and then detach them, a method that can result in losing a proportion of the yield. The use of a new harvesting pump has increased the yield (inspired from the New Zealand model)[77]. The mussel ropes get threaded into the boats harvesting mechanism where they are automatically stripped from the rope, washed, graded and packed. According to an Irish producer, thanks to this mechanism, his company is able to harvest 24 tonnes in a day. The need for purification depends on the production area classification[78]. Companies that do not purify are harvesting in class A water areas. When the area is classified as B (seasonal event), they either do not harvest at all or process the mussels. After purification, mussels are once more de-clumped, washed, graded and packed[79].

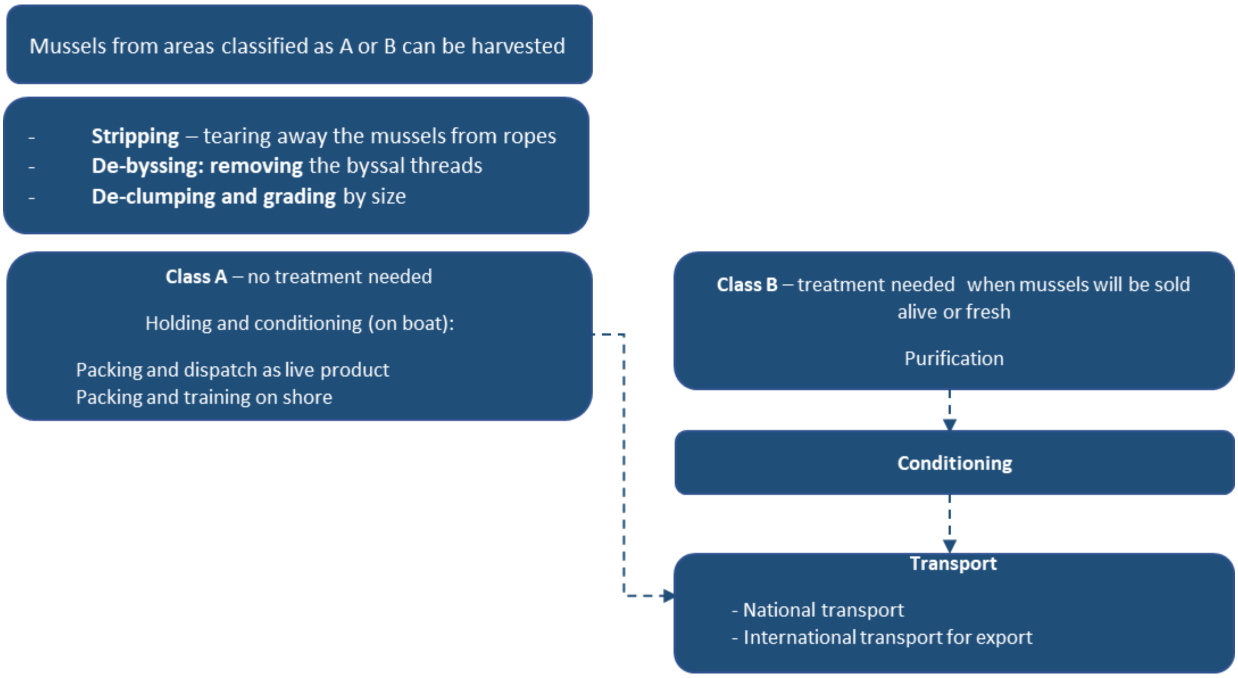
[76] BIM aquaculture report. 2020. https://www.researchgate.net/publication/344188564_BIM_National_Seafood_Survey_Aquaculture_Report_2020

[77] https://www.irishtimes.com/news/science/mussel-harvesting-gets-a-green-make-over-1.937938

[78] The production area classification occurs according to the EU regulation (EC) 853/2004.

[79] Protocol on Best Practice Guide on Holding and Conditioning Mussels.

Figure 34: Harvesting method for rope mussels



Source: EUMOFA elaboration based on interviews with producers

Mussel's sector structure

In 2019, there were 74 enterprises operating 87 production units and employing 323 persons. The rope mussel sector employed 221 persons (133 FTE) in 54 enterprises operating 55 production units, while the bottom cultured mussel sector employed 102 persons (73 FTE) in 20 enterprises operating 32 production units[80].

The **rope mussel sector** is almost entirely family owned, offering mainly part-time or seasonal employment, with significant degree of unpaid labour sustained by the owners themselves, as a result of difficulties for hiring people[81]. This sector is experiencing a transformation and is becoming gradually more capital intensive with the decline of employment and of the number of enterprises. As the age of license holders advances, more and more sites are being released or transferred to better-equipped and more professional entities[82].

The **bottom cultured mussel** sector is also fragmented with several issues related to continuing scarcity of the seed supply and the threat of the reduction of the production area (in relation to the designation of a proportion of the Wexford Harbour[83] as intertidal area for the wild-bird conservation)[84]. Businesses and vessels are mainly local, family owned, providing mainly full-time employment, with

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[80] BIM aquaculture report. 2020. https://www.researchgate.net/publication/344188564_BIM_National_Seafood_Survey_Aquaculture_Report_2020

[81] Avdelas, L., Avdic-Mravlje, E., Borges Marques, A.C., Cano, S., Capelle, J.J., Carvalho, N., Cozzolino, M., Dennis, J., Ellis, T., Fernández Polanco, J.M., Guillen, J., Lasner, T., Le Bihan, V., Llorente, I., Mol, A., Nicheva, S., Nielsen, R., van Oostenbrugge, H., Villasante, S., Visnic, S., Zhelev, K. and Asche, F. (2021), The decline of mussel aquaculture in the European Union: causes, economic impacts and opportunities. Rev. Aquacult., 13: 91-118.

[82] Ibidem.

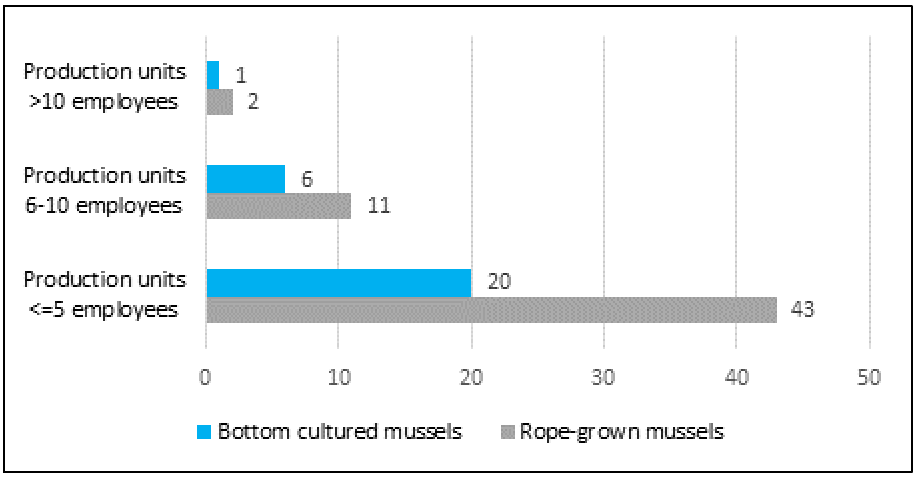
[83] In the Southeast of Ireland, which is the second largest producing area of bottom cultured mussels in Ireland.

[84] BIM aquaculture report. 2020. https://www.researchgate.net/publication/344188564_BIM_National_Seafood_Survey_Aquaculture_Report_2020

significant partnership investment by Dutch companies. The segment is fragmented but groupings are able to collectively lobby over seed fishing access and resource management in general[85].

Most of the industry is constituted of small enterprises employing less than 5 employees (76% of the production units).

Figure 35: Irish mussel sector structure, 2019



Source: BIM aquaculture report 2020[86]

Mussels' sector economic performance

Rope grown mussels

Stock input mainly comes from locally deployed seed collectors in early to late summer. Costs are tied up in the materials used and labour. The sector has struggled to remain profitable, and the profit has been relatively low over the 2009 to 2018 period, despite minimal cost, successful investment in technical innovation and efficiencies, as well as in certifications[87]. The lack of profitability is likely to be related to high labour costs and poor unit value of product. From 2017 to 2018 though, the sector has shown a recovery of output with an increase of GVA by 31%, but net profit has decreased by -20% (Table 56). The latest STECF report indicated a segment that is dependent on a distant export buyers' market, with little or no opportunity to expand output or increase unit value[88].

Bottom cultured mussels

The past years have been very difficult for the bottom cultured mussel sector. Indeed, the costs of running/maintaining a boat and crew and securing seed have eroded profits. The economic performance reflects the bad economic situation with negative net profits in 2017 and 2018. The latest STECF report, indicated no development opportunities for this segment, as it is dependent on unreliable supply of raw

[85] Avdelas, L., Avdic-Mravlje, E., Borges Marques, A.C., Cano, S., Capelle, J.J., Carvalho, N., Cozzolino, M., Dennis, J., Ellis, T., Fernández Polanco, J.M., Guillen, J., Lasner, T., Le Bihan, V., Llorente, I., Mol, A., Nicheva, S., Nielsen, R., van Oostenbrugge, H., Villasante, S., Visnic, S., Zhelev, K. and Asche, F. (2021), The decline of mussel aquaculture in the European Union: causes, economic impacts and opportunities. Rev. Aquacult., 13: 91-118.

[86] BIM aquaculture report. 2020. https://www.researchgate.net/publication/344188564_BIM_National_Seafood_Survey_Aquaculture_Report_2020

[87] Avdelas, L., Avdic-Mravlje, E., Borges Marques, A.C., Cano, S., Capelle, J.J., Carvalho, N., Cozzolino, M., Dennis, J., Ellis, T., Fernández Polanco, J.M., Guillen, J., Lasner, T., Le Bihan, V., Llorente, I., Mol, A., Nicheva, S., Nielsen, R., van Oostenbrugge, H., Villasante, S., Visnic, S., Zhelev, K. and Asche, F. (2021), The decline of mussel aquaculture in the European Union: causes, economic impacts and opportunities. Rev. Aquacult., 13: 91-118.

[88] The EU Aquaculture Sector – Economic report 2020 (STECF-20-12)

material and under threat in terms of available production grounds[89]. In addition, the future evolution of this sector is uncertain in relation to low sale prices, which despite vigorous marketing campaigns to distinguish Irish mussels, struggles to compete with that of its competitors[90].

Table 57: Economic performance of the mussel sectors (2017/2018) – (in EUR)

	Rope grown mussel sector		Bottom cultured mussel sector	
	2017	**2018**	**2017**	**2018**
Total income	**5 939 546**	**6 720 531**	**8 902 037**	**6 357 341**
Wages and salaries	2 053 914	1 247 124	2 563 930	1 780 890
Imputed value of unpaid labour	361 446	1 364 076	26 439	185 285
Energy costs	141 437	236 688	879 258	703 109
Livestock costs	247 960	101 060	987 457	475 025
Repair and maintenance	320 019	666 472	1 427 394	334 803
Depreciation of capital	922 575	478 277	1 247 008	1 228 145
Other costs	341 421	748 663	1 607 303	565 526
Total costs	**4 388 772**	**4 842 360**	**8 738 789**	**5 272 783**
Gross Added Value	3 316 207	4 356 795	4 399 286	3 065 194
EBIT*	1 736 119	1 101 103	701 585	1 206 200
Net profit	**1 370 745**	**1 099 307**	**-668 538**	**-2 442 223**

Source: BIM aquaculture report, 2020[91]

6.1.2. Trade

Imports

Mussel imports to Ireland are negligeable. In 2021, 67 tonnes (product weight) were imported for a value of EUR 0,4 million. Mussels are imported prepared-preserved (69% of imports in value and 67% in volume) and frozen (24% in value and 22% in volume). Mussels are mainly imported from Chile (37% in volume), the United Kingdom (24%), The Netherlands (14%), and New-Zealand (9%).

Exports

Total exports were estimated at 9.007 tonnes for a value of EUR 17,62 million in 2021. The bulk share of mussels is exported fresh (77% of exports in volume and 73% in value), but an increasing share of mussels is being exported prepared-preserved (20% in 2021 against less than 1% in 2017 in volume).

[89] Ibidem.

[90] Avdelas, L., Avdic-Mravlje, E., Borges Marques, A.C., Cano, S., Capelle, J.J., Carvalho, N., Cozzolino, M., Dennis, J., Ellis, T., Fernández Polanco, J.M., Guillen, J., Lasner, T., Le Bihan, V., Llorente, I., Mol, A., Nicheva, S., Nielsen, R., van Oostenbrugge, H., Villasante, S., Visnic, S., Zhelev, K. and Asche, F. (2021), The decline of mussel aquaculture in the European Union: causes, economic impacts and opportunities. Rev. Aquacult., 13: 91-118.

[91] BIM aquaculture report. 2020. https://www.researchgate.net/publication/344188564_BIM_National_Seafood_Survey_Aquaculture_Report_2020

Table 58: Mussels export from Ireland 2017-2021 (tonnes, product weight)

	2017	2018	2019	2020	2021
Fresh	12.104	8.662	9.545	8.416	6.965
Frozen	220	58	45	43	269
Smoked	0	6	1	0	0
Prepared-preserved	49	485	1.541	1.651	1.773
Total	12.374	9.211	11.132	10.111	9.007

Source: EUROSTAT-COMEXT

Given the total volume of mussel produced in Ireland and the relatively small domestic consumption level, the industry is heavily export focused. The EU-27 and UK markets constitute almost the only markets for Irish mussels. The other destinations only represent 1% of the Irish mussels' exports. France, the Netherlands, Italy and the United Kingdom took respectively 47%, 26%, 13% and 9% of exports in 2021 while and Spain and Denmark import smaller volumes from Ireland (respectively 2% and 1%). France, Italy and Spain imports mainly fresh mussels but also processed mussels while the Netherlands imports only fresh mussels.

Table 59: Mussels Exports from Ireland by destination 2017-2021 (tonnes, product weight)

	2017	2018	2019	2020	2021
France	4.377	4.175	5.062	4.453	4.200
Netherlands	5.896	2.978	3.652	2.547	2.297
Italy	608	949	1.247	1.138	1.143
United Kingdom	726	444	542	1.448	791
Spain	346	364	307	202	210
Others	421	301	322	324	366
Total	**12.374**	**9.211**	**11.132**	**10.111**	**9.007**

Source: EUROSTAT-COMEXT

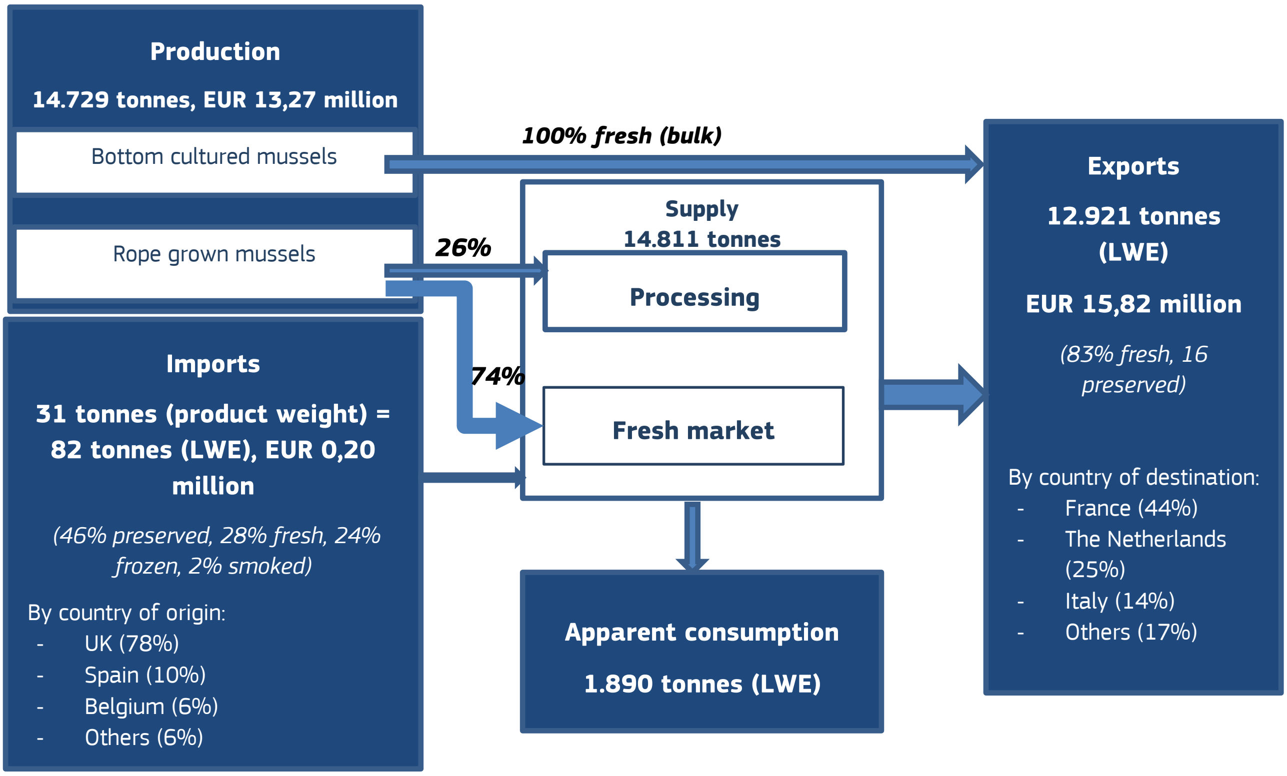
6.1.3. Apparent consumption

The Irish mussel production is split between rope grown mussel production and bottom cultured mussel production. **Products from bottom cultured mussel are exclusively exported fresh and mainly in bulk** to the Netherlands and France. According to the 2020 BIM aquaculture report[92], both countries took respectively 83,5% and 16,5% of the bottom mussel production in 2019[93]. Rope grown mussel segment produces between 8.500 tonnes and 10.500 tonnes annually for fresh but also for processed markets. According to the BIM annual aquaculture report, **26% of rope mussel products went to processing**, where mussels are processed and packed. The rope grown mussel is thinner-shelled and generally cleaner than the bottom variety and is ideal for the processed vacuum-packing market[94]. Some half-grown product is occasionally sold to the bottom mussel segment, but statistics are not available to quantify this share. The Irish mussels sector is export-oriented. In 2020, 87% of the mussel supply is

[92] BIM aquaculture report. 2020. https://www.researchgate.net/publication/344188564_BIM_National_Seafood_Survey_Aquaculture_Report_2020
[93] Ibidem.
[94] https://www.irishtimes.com/news/science/mussel-harvesting-gets-a-green-make-over-1.937938

exported to the EU market and the UK, either fresh or processed. In 2020, 83% of exports were fresh and 16% were preserved. The domestic market for mussels is small. This was estimated to 1.890 tonnes (LWE) in 2020[95]. As already mentioned, France is the main market of the Irish mussels. According to interviews, mussels are mainly sent in bulk to France by Irish exporters. The French buyers are mainly producers/wholesalers who import, clean, grade, pack and sell mussels in the French market.

Figure 36: The Irish supply chain for mussels (2020), % show the shares in volumes



Source: EUMOFA elaboration based on national statistics, EUROSTAT-COMEXT and interviews with stakeholders

[95] The figure on apparent market consumption of mussels in Ireland in this section is slightly below the apparent consumption calculated in the section on consumption because of the use of national statistics in this section, which provide statistics for the two types of production (considered relevant for this section).

6.2. Characteristics of the Irish market and consumption

6.2.1. Presentation of the product

Mussels can be sold live, fresh or processed, either ready to cook or precooked and ready to heat and serve[96]. According to interviews, the packing units that are commonly used include net bags of 1, 2, 5, 10, 25 kg and up to 1.000 tonnes; modified atmosphere packing (MAP) and trays of 1 to 5 kg. The MAP are sent in refrigerated trucks either to France or within Ireland, whereas the net bags in important volumes (bags of 20-25 kg or big bags to 1.000 tonnes) are sent to France. Producers who supply the internal market, mainly Irish restaurants usually sell mussels in 2 to 10 kg net bags.

6.2.2. Characteristics of the market

The Irish mussel production is export-oriented. However, both mussel segments have vulnerable competitive position in comparison to their EU competitors which are both important producers and consumers and to other low-cost suppliers such as Chile. France which is the largest market for the Irish mussels considers imported mussels from Ireland as a "gap filler" when the national production is not available. The unit value of Irish mussel has remained low, even with the certification initiatives implemented in last years. Ireland is now certified for both bottom and rope mussels. The Irish bottom cultured mussel achieved its MSC certification in 2013 and the Irish rope grown mussel sector was MSC certified in 2019. In addition, Ireland which is used to be the leader of organic mussels farming, has known a decrease of organic mussel production (35% of the Irish mussel production is organic, i.e. 5.180 tonnes)[97]. According to interviews, certifications such as MSC or organic provided good image for the whole sector, but without any impacts on prices. Producers mentioned the example of MSC certification which was sought by producers as a market access tool (to the Dutch market) rather than a price premium tool.

6.2.3. Consumption

In 2020, the Irish per capita apparent consumption achieved 25,5 kg LWE/capita/year placing Ireland in the 7th position at EU level, above the EU average (23,97 kg/year). In recent years, there is a downward trend in household consumption of fishery and aquaculture products in volume and value (-8% in value and -9% in volume in comparison to 2019 and -8% in value and -13% in volume in comparison to 2016). In addition, Ireland ranked 20 in terms of per capita household nominal expenditure on fishery and aquaculture products in 2020 with 75 EUR/capita/year.

More specifically, there is a small consumption of mussels in Ireland, with a significant decreasing trend of apparent consumption in recent years, from 3.214 tonnes (LWE) in 2012 to 1.890 tonnes in 2020 (LWE), i.e. a 41% decrease. The per capita consumption of mussels in Ireland is estimated at 0,38 kg/capita/year in 2020 (versus 0,70 kg/capita/year in 2012) (Table 60).

[96] https://www.irishfoodanddrink.com/fr/irish-mussels/

[97] Organic aquaculture in the EU. EUMOFA. 2022.

Table 60: Mussels apparent consumption in Ireland, 2012-2020 (tonnes, Live Weight Equivalent)

Year	Aquaculture	Fisheries	Imports	Supply	Exports	Apparent consumption	Per capita consumption
2012	15.188	5.427	469	**21.084**	17.870	**3.214**	**0,70**
2013	15.360	3.589	104	**19.053**	15.834	**3.218**	**0,70**
2014	11.375	848	457	**12.680**	8.891	**3.789**	**0,82**
2015	16.015	235	193	**16.443**	12.477	**3.966**	**0,85**
2016	15.121	-	113	**15.234**	12.352	**2.883**	**0,61**
2017	16.340	770	89	**17.199**	13.282	**3.917**	**0,82**
2018	13.889	-	155	**14.044**	10.217	**3.827**	**0,79**
2019	15.184	-	128	**15.312**	13.854	**1.458**	**0,30**
2020	14.729	-	82	**14.811**	12.921	**1.890**	**0,38**

Source: FAO, EUROSTAT-COMEXT, EUROSTAT

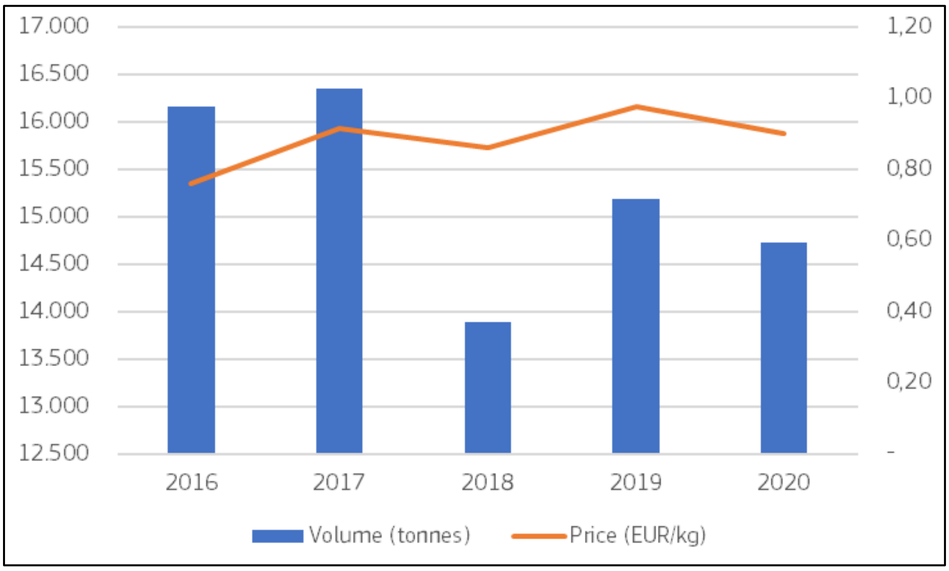
Apparent consumption: production + import – export. The per capita consumption is calculated as apparent consumption / Irish population)

6.3. Price transmission in the supply chain

6.3.1. First-sale prices

According to EUMOFA data, first sale prices have followed an overall increasing trend between 2016 and 2020 from 0,79 EUR/kg to 0,90 EUR/kg, i.e. a 14%-increase. These prices hide a significant variability according to the production method and to the end market.

Figure 37: First sale prices of mussels in Ireland (2016-2020) – EUR/kg



Source: Eurostat

The national Irish statistics provide prices distinguishing between bottom cultured mussel and rope grown mussels. According to the same source, prices vary depending on the market. In 2019, rope grown mussels were sold between 0,65-0,75€/kg when sold to the fresh market and between 0,5 and 0,6 €/kg when sold to processing. Bottom cultured mussels which are entirely sold to export were sold at 1,61 EUR/kg the same year.

Table 61: First sale prices of Irish mussels (2015-2019) – EUR/kg

Production type	Market	2015	2016	2017	2018	2019
Rope grown	Fresh market	0,7-0,75	0,7-0,75	0,65-0,76	0,49-0,76	0,65-0,75
	Processing market	/	/	/	0,60	0,5-0,6
Bottom cultured	Export market (fresh – mainly bulk)	/	/	1,18	0,8-1,9	1,61

Source: BIM annual aquaculture reports

According to desk research[98] and interviews with producers, the factors that could have an impact on mussel sale prices include:

- **Market specifications**: fresh products with insufficient meat yields and shell condition criteria are sold at low prices.
- **Health and safety**: red tide, causing shellfish closure in some bays can be lengthy and can occur at the height of harvest season, disrupting supply, reducing sales value and increasing losses of stock. To overcome this problem, large producers acquire sites in different bays in order to spread the risk and ensure the continuity of product supply (and thus ensuring stability in price).
- **Competitive situation on the European market**: the rope mussel industry faces challenges with an extreme competitive situation on the European market. This is partly driven by increased competition from Chile and Germany resulting in a drop in demand from key markets including France and the Netherlands[99]. To tackle this issue, producers continue to increase the value of Irish mussels abroad and to develop the home market close to production sites which, according to producers, is expected to gradually improve sales price.
- **Increasing labour costs**.

6.3.2. Export prices

As already mentioned, Irish mussel exports concern mainly fresh (77% of exports in volume and 73% in value in 2021) and prepared-preserved mussels (20% in volume and 24% in value). Since 2017, the exported prices have fluctuated, with a clear impact of volumes on prices. In 2021, fresh mussels have been exported with a price of 1,84 EUR/kg.

Table 62: Irish exports of fresh *Mytilus spp.*

	Volume (tonnes)	Value (1.000 EUR)	Nominal prices (EUR/kg)
2017	12.081	16.518	1,37
2018	8.662	13.267	1,53
2019	9.545	13.481	1,41
2020	8.416	12.116	1,44
2021	6.964	12.823	1,84

Source: EUROSTAT-COMEXT

Between 2017 and 2021, export prices of prepared-preserved mussels have fluctuated with a significant downward trend, as a result of the significant increase of exports volume which has passed from less than 50 tonnes to 1.773 tonnes during the same period. Export prices have decreased from 5,25 EUR/kg in 2017 to 2,40 EUR/kg in 2021.

[98] source: 1) STECF report, 2) BIM aquaculture report and 3) Avdelas, L., Avdic-Mravlje, E., Borges Marques, A.C., Cano, S., Capelle, J.J., Carvalho, N., Cozzolino, M., Dennis, J., Ellis, T., Fernández Polanco, J.M., Guillen, J., Lasner, T., Le Bihan, V., Llorente, I., Mol, A., Nicheva, S., Nielsen, R., van Oostenbrugge, H., Villasante, S., Visnic, S., Zhelev, K. and Asche, F. (2021), The decline of mussel aquaculture in the European Union: causes, economic impacts and opportunities. Rev. Aquacult., 13: 91-118.

[99] https://bim.ie/wp-content/uploads/2021/02/BIM-Business-of-Seafood-2018-1.pdf

Table 63: Irish exports of prepared-preserved Mussels

	Volume (tonnes)	Value (1.000 EUR)	Nominal price (EUR/kg)
2017	49	259	5,25
2018	485	904	1,86
2019	1.541	2.713	1,76
2020	1.651	3.549	2,15
2021	1.773	4.263	2,40

Source: EUROSTAT-COMEXT

6.3.3. Price transmission

This section focuses on the supply chain of **fresh rope mussels produced in Ireland and exported in bulk to the French market, to be processed and packed by French buyers**. This supply chain is likely to reflect the situation of a significant share of the mussel Irish production, according to interviews. In 2019, the French market imported 47% of the Irish production in volume.

In this case, the Irish supply chain is very short. Producers sell their production in bulk to exporters who export mussels to the French market (after packing). In France, buyers are usually producers or wholesalers who import Irish mussels in winter when the season of French mussels is over. This allows them to continue their business all over the year. French buyers import mussels in bulk, clean, sort, pack and sell them to their usual buyers. Prices below are provided from operators in Ireland and France involved in the supply chain described above.

Table 64 - Price transmission of fresh mussel exported to France (EUR/kg, 2021)

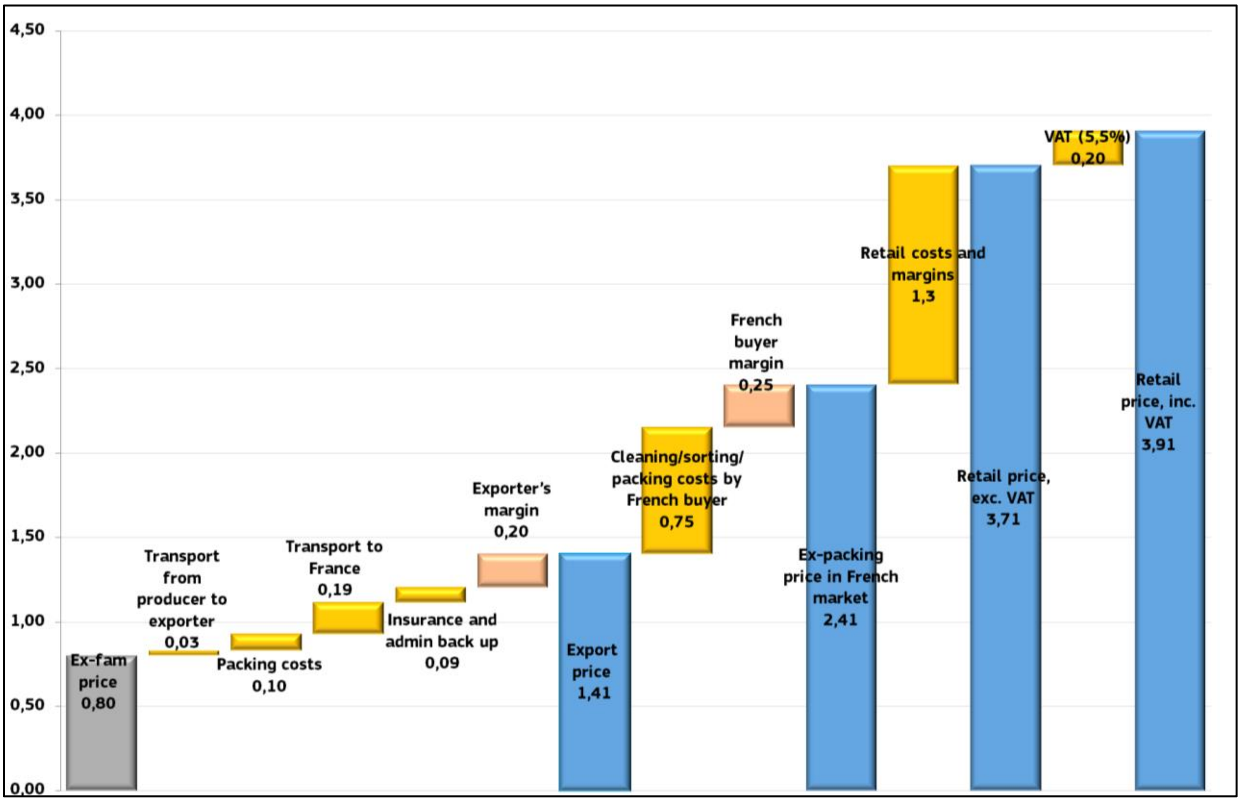
	Price (EUR/Kg)	% of export price	% of final price in the French market	Source
Ex-fam price (1)	0,80	**57%**	**20%**	Interview with producer
Transport from producer to exporter	0,03	2%	**1%**	Interview with an exporter
Packing	0,10	7%	**3%**	
International transport (to France)	0,19	**13%**	**5%**	
Insurance and admin back up	0,09	6%	**2%**	
Total processing costs, including transport (2)	0,41	29%	**10%**	
Exporter's margin	0,20	14%	**5%**	
Export price (3)	**1,41**	100%	**36%**	
Cleaning/sorting/packing costs by French buyer (4)	0,75		**19%**	Interview with a French buyer (producer)
French buyer margin	0,25		**6%**	
Ex-packing price in French market, excluding VAT (5)	**2,41**		**62%**	
Retail costs and margins (6)	**1,30**		**33%**	Same margin rates as the French supply chain
Retail price, exc. VAT	3,71		**95%**	
VAT (5,5%)	0,20		**5%**	
Retail price, inc. VAT	**3,91**		**100%**	

Source: EUMOFA survey

Sources and notes:

(1) Ex-farm price refers to price of fresh mussel sold in bulk by the producer to the Irish exporter – interview with producers.
(2) Processing costs for the Irish exporter include costs related to transport from producer, packing mussels in net bags and international transport to the French market – interview with Irish exporter.
(3) Export price refers to sale price of the Irish mussel to the French market – interview with Irish exporter.
(4) Processing costs by the French buyer – interview with French buyer.
(5) Ex-packing price refers to the price of fresh mussels sold after being cleaned, sorted and packed in the French market – interview with French buyer.
(6) The same margin rates as the French mussel supply chains have been used in order to calculate the mussel price at the retail stage in the French market.

Figure 38: Costs and margins for fresh mussels exported to France (EUR/kg, 2021)



Source: EUMOFA

7. CONCLUSIONS

The above analyses show that the value chain for mussels is still very country-specific. The production in France and Italy mainly goes to the domestic market and is completed by imports, while the Spanish production provides both the domestic market and other EU MS and the Irish production is mainly export-oriented. Consumption also differs in quantities consumed per capita as well as in terms of sizes, presentation (fresh, frozen preserved) and other types of market segmentation (e.g. organic, PDOs).

Spain is the largest market. In 2020, Spain was the major producer, contributing to 47% of the EU production and the largest consumer, with an average per capita apparent consumption of 3,54 kg LWE/year. The majority of the Spanish production goes to the fresh market (62%), including significant exports to France and Italy, while 38% goes to the processing industry. The main market segmentation for fresh mussels is based on mussels size (normal, large and extra). There is also a PDO, "Mexillón de Galicia", which represents about a quarter of the Spanish production and is marketed both on the fresh market and as preserved products (under a label "made with Mexillón de Galicia"). There are two main distribution channels: large retailers (70% of at home consumption of fresh mussels), who buy mussels directly to purification plants, and the traditional marketing chain through wholesalers and specialised shops, which still represents close to 20% of the consumption at home. Home consumption of fresh mussels has decreased over the past ten years, but it remains a highly consumed product, with a good image (affordable and healthy) and with no real substitute products.

France is the second largest producer and consumer within the EU. In 2020, it contributed to 14% of the EU production. It was also the second largest market with a per capita apparent consumption of 1,89 kg LWE/year. The French production is almost all absorbed by the internal market which heavily depends on imports. The French mussel market is mainly focused on fresh mussels (71%) and there are no processing activities for mussels in France. All preserved mussels are imported from Chile and to lesser extent Ireland and Spain. There is a high segmentation in the French market, through the use of quality schemes and certifications. In 2019, 84% of the French production was marketed under a quality scheme or a certification (e.g. TSG, PDO, organic, Label Rouge, others). This segmentation is likely to result in price premium in the French market. The French market is also characterised by higher prices for the French mussels in comparison to imported mussels (from Spain, the Netherlands, Ireland, etc.).

Italy is the third largest producer and consumer within the EU. In 2020, it contributed to 12% of the EU production, and recorded a per capita apparent consumption of 1,73 kg LWE/year. Most of Italian production is absorbed by the internal market which also relies on imports. The Italian mussel market is mainly focused on fresh mussels. All frozen mussels are imported from Chile and to a lesser extent from Spain, Ireland and New-Zealand. Trade data from Eurostat-Comext record all Chilean import volumes in the "prepared-preserved" category, most likely because frozen mussels imported from Chile are already shelled and cooked. All preserved mussels are imported from Spain, which also supplies a large share of fresh mussels, especially when Italian products are not available (between October and March). Fresh mussels produced nationally benefit from higher prices than imported mussels (from Spain, Greece, etc.). Mussel price may significantly vary between regions depending on the area of production, the product quality (flesh content), seasonality etc. The highest price premium is found for mussels from Arborea origin (in Sardinia), due to the market recognition of their highest quality, in relation with the environmental conditions of their production area. Organic production of mussels is limited in Italy, and mostly dedicated to the French export market. According to a retailer, there is however a growing demand on the national market, and a good price premium for organic mussels.

Ireland has a small market for mussels. In 2020, it was the seventh largest producer in the EU (with 3% of the EU production) but has a low per capita mussel consumption (0,38 kg/year). The Irish mussel production is mostly export-oriented, with the EU-27 and the United Kingdom being the only market (for both fresh and prepared mussels). When they are exported fresh, a significant share of mussels is exported in bulk. Ireland which used to be the leader of the organic production, has seen a decrease in its production under this certification. According to interviews, organic certification is rather a market access tool rather than a segmentation tool for price premium.

The price transmission analysis covered the following products:

- Fresh mussels sold by supermarkets in Spain;
- Fresh mussels, size extra, sold by specialized shops in Spain (Madrid area);
- Fresh standard mussels (without certification) cultured on longlines in France and sold directly by the producer to local restaurants in France;
- Fresh mussels cultured on Bouchot in France and certified TSG "Moule de bouchot" sold by the producer to a purchasing central of large retailers;
- Fresh rope mussels sold in nets in large scale retails in Italy;
- fresh rope mussels produced in Ireland and exported in bulk to the French market, to be processed and packed by French buyers.

The first sale prices vary between 0,66 EUR/kg (ex-farm price in Spain, before purification) to 1,60 EUR/kg (TSG in France), depending on the species, the mussel quality, the country of origin (the highest ex-farm prices are noticed in France for “Bouchot mussels” and the segmentation effort undertaken by producer (i.e. certification)). The French, Spanish and Irish prices data show that there is a difference in mussels prices depending on the end market. In France, mussels sold to restaurants are sold at higher prices than those sold to large retailers (2,60 EUR/kg versus 2,30 EUR/kg). The retail price in large retailers (excl. VAT) for mussels was different in Italian, Spanish and French markets: it was about 2,65 EUR/kg in Italy, 3.00 EUR/kg in Spain and 3,60 EUR/kg in France. The raw material cost accounts for 20% of the final price at retail stage in Spain, 26% in Italy and 44% of in France. The Irish supply chain provided in this report shows that the Irish mussel is sold in the French market (in supermarkets) at 3,71 EUR/kg (excl. VAT).

Table 65: Synthesis of the price structure analysis in Spain, France and Italy (EUR/kg, nominal value)

MS	Spain		France		Italy
Product	Standard		TSG “Moule de Bouchot”	Standard, reared on longlines	Rope mussels
Sales channel	Large retails	Specialised shops (size extra)	Large retails	Restaurants	Large retails
Year	2021	2022	2021		2021
Raw material: ex-farm or import price	0,66	0.90	1,60	1,50	0,70
Total processing costs and margins	1.05	1.60	0,70	1,10	0,90
Wholesale price / Dispatch price	n.a.	2.50	2,30	2,60	1,60
Retail costs and margin (incl. transport to point of sale)	1.29	2.14	1,30		1,05
Retail price excl. VAT	3.00	4.64	3,60		2,65
Retail price incl. VAT	3,30	5.10	3,80		2,91

Source: EUMOFA

Table 66: Synthesis of the price structure analysis in Ireland (EUR/kg, nominal value), 2021

Product	Produced in IE
Sales channel	Rope mussels exported in bulk to France
Year	2021
Raw material: ex-farm	0,80
Intermediate costs and margin	0,42
International transport (to France)	0,19
Costs for cleaning/sorting/packing by French buyer	0,75
French buyer margin	0,25
Retail costs and margins	1,30
Retail price, exc. VAT	3,71
VAT (5,5%)	0,20
Retail price, inc. VAT	3,91

Source: EUMOFA

STAKEHOLDERS INTERVIEWED

- Spain
  - ANFACO
  - Consello Regulador de Mexillón de Galicia
  - Asociación Galega de Empresarios Depuradores de Moluscos
  - Asociación de Empresarios Mayoristas de Pescados de Madrid (AEMPM)

- France
  - *Comité Conchylicole de la Méditerranée*
  - *Comité Conchylicole Poitou-Charente*
  - *Groupement Moules de Bouchot*

- Ireland
  - 2 Producers
  - 1 Exporter
  - French buyer
- Italy
  - 2 producers
  - 1 professional association
  - 1 retaile

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