



ORGANIC AQUACULTURE IN THE EU

CURRENT SITUATION,
DRIVERS, BARRIERS,
POTENTIAL FOR GROWTH



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List of acronyms

ASC	Aquaculture Stewardship Council
BAT	Best Available Technologies
EFF	European Fisheries Fund
EMFF	European Maritime and Fisheries Fund
EMFAF	European Maritime Fisheries and Aquaculture Fund
EU	European Union
FEAP	Federation of European Aquaculture Producers
FTE	Full Time Equivalent
MS	Member State
MSC	Marine Stewardship Council
RAS	Recirculating Aquaculture System
SME	Small and Medium Enterprise
Wfe	Whole fish equivalent

Summary

Organic production accounts for **9,1% of agricultural land at EU 27 level** in 2020 (+56% since 2012). Consumption of organic products is on the increase, having reached EUR 44,8 billion at EU 27 level in 2020 (+15% compared to 2019), accounting for **4,7% of EU food consumption** (including seafood). Further growth is expected as the EU's **Farm to Fork Strategy** aims to reach at least 25% of the EU's agricultural land by 2030 as well as an expected significant increase in organic aquaculture.

The **total organic aquaculture production at EU 27** level is estimated at **74.032 tonnes in 2020**, accounting for 6,8% of the total EU aquaculture production. The production has increased by 60% compared to 2015 (46.341 tonnes at EU 27 level in 2015¹), this is mainly due to a growth in organic mussel production.

Based on data collected for this study (EU and national sources), the **main species produced are mussels (41.936 tonnes)**, accounting for more than half of the total organic aquaculture production, followed by salmon (12.870 tonnes), trout (4.590 tonnes), carp (3.562 tonnes), oyster (3.228 tonnes) and European seabass/gilthead seabream (2.750 tonnes).

The **main EU producers** of organic aquaculture are **Ireland** (salmon and mussel), **Italy** (mussel and finfish), **France** (oyster, mussel, and trout), **the Netherlands** (mussel), **Spain** (mussel and sturgeon), **Germany**, **Denmark** and **Bulgaria** (mussel).

Main developments over the last years are:

- A significant increase in organic **mussel** production, the main producing MS being the Netherlands, Italy, Germany, Ireland, Denmark, France, Spain and Bulgaria. The organic mussel production accounted for 41.936 tonnes in 2020 (10% of EU mussel production), compared to 18.379 tonnes in 2015,
- An increase in organic **oyster** production at EU level (mainly produced in France): about 3.220 tonnes produced in France in 2020 compared to less than 900 tonnes in 2018,
- The decrease or stagnation for most of the finfish species:
 - o Slight decrease in organic **salmon** production; this is mostly due to a decrease in the Irish production (12.870 tonnes in 2020 compared to a peak of 16.481 tonnes in 2017) and to Brexit (the UK produced 2.400 tonnes in 2015). Over the same period, the production of organic salmon increased by almost 10.000 tonnes in Norway (25.546 tonnes in 2020), and 8.000 tonnes in the UK (13.128 tonnes in 2020).
 - o Stability of organic **trout** production: 4.590 tonnes in 2020 compared to 4.700 tonnes in 2015 (EU 27); the UK produced 200 tonnes in 2015.
 - o Decrease in organic **carp** production: estimated at 3.562 tonnes in 2020 (7.000 tonnes in 2015), the main EU producers of organic carp being Hungary, Romania and Lithuania.
 - o **European seabass/gilthead seabream** is the only finfish group on an increasing trend: 2.750 tonnes in 2020 (2.000 tonnes in 2015), main EU producer being Greece.

For **shellfish**, in most cases there are **limited differences between conventional and organic in terms of production methods**. Thus, shifting to organic is not complex for producers but it increases the administrative burden. The main barrier to market growth for the organic shellfish segment is to be found in the somewhat limited market incentives for producers in terms of price premium or demand from customers. In addition, the evolution of the EU organic Regulation² on the quality of water suitable for

¹ Source: EU organic aquaculture, EUMOFA, 2017 - https://www.eumofa.eu/documents/20178/84590/Study+report_organic+aquaculture.pdf

² Regulation (EU) 2018/848 of the European Parliament and of the Council of 30 May 2018 on organic production and labelling of organic products and repealing Council Regulation (EC) No 834/2007

organic production adds some uncertainty for producers to establish their strategy on organic production (Until the 31th of December 2021, waters classified under categories A and B were suitable for organic production. However, as stated in the EU organic regulation (point 3.1.3.2. of part III of Annex II), only waters classified under category A, or of high ecological status as defined by Directive 2000/60/EC or of good environmental status as defined by Directive 2008/56/EC are suitable for organic production since the 1st of January 2022).

As for **finfish**, organic production has not increased because of the **limited demand from the market** and the **technical difficulties in producing under the organic scheme** (availability of organic feed and juveniles). In addition, the organic scheme may not be in line with the production method developed by producers (for instance extensive pond polyculture in some Eastern MS or closed recirculating aquaculture systems) or national requirements (for instance requirements for the largest aquaculture sites in Denmark).

Another difficulty that stakeholders face when establishing a **clear communication strategy toward their clients** is the competition with **other certification** schemes (for instance Aquaculture Stewardship Council (ASC) or Marine Stewardship Council (MSC), the latter may also apply to shellfish production in the Netherlands) and the fact that organic scheme only covers aquaculture products and not wild caught products (farmed products account for about a quarter of EU seafood production and consumption).

This report proposes **prospects for growth of organic aquaculture** in the EU. These prospects are differentiated for shellfish and finfish, with **“optimistic” prospects** (if the present difficulties are addressed) and a **“pessimistic” prospects** (if the present difficulties are not addressed).

1. INTRODUCTION

The objective of the study is to update the EUMOFA study on organic aquaculture published in 2017³. The study covers the whole sector, with a focus on the main species, namely: Atlantic salmon, rainbow trout, carp, gilthead seabream, European seabass, oysters, mussels, clams and algae (micro and macro).

It aims to collect quantitative data available on organic aquaculture in the period 2016–2020. The data collection is based on EU statistics (EUROSTAT, EUMOFA, FAO) and national sources including; statistical offices, ministries in charge of aquaculture and professional organisations.

The study also provides qualitative information to understand better the patterns of organic farming, the barriers and drivers for growth, as well as the growth's prospects. Interviews have been conducted with public and professional bodies in charge of the aquaculture and organic sector, as well as with selected stakeholders.

The organic EU production is governed by Regulation (EU) 2018/848⁴, which entered into force on the 1st of January 2022, repealing Council Regulation (EC) No 834/2007⁵.

This report is structured in the following sections:

- An introduction to provide context on the development of organic aquaculture;
 - o overview of the organic sector at EU level, including organic trends in the agricultural sectors,
 - o overview of the aquaculture sector at EU level,
- Data on the development of EU organic aquaculture:
 - o general overview,
 - o information by MS,
 - o information on the main third countries: UK and Norway,
 - o focus on the main species,
- Analysis of the drivers, barriers, and prospects for growth:
 - o drivers and barriers,
 - o prospects for growth based on scenarios (optimistic- or pessimistic scenarios) for shellfish and finfish.

³ https://www.eumofa.eu/documents/20178/84590/Study+report_organic+aquaculture.pdf

⁴ Regulation (EU) 2018/848 of the European Parliament and of the Council of 30 May 2018 on organic production and labelling of organic products and repealing Council Regulation (EC) No 834/2007

⁵ Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91

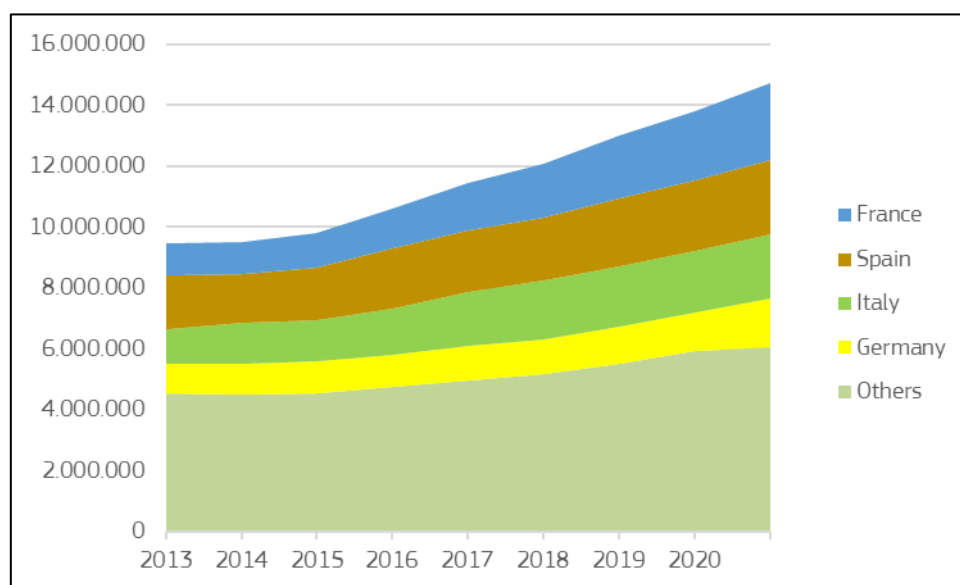
2. CONTEXT: TRENDS IN ORGANIC PRODUCTION AND AQUACULTURE

2.1 Global EU organic production and market overview

Organic agricultural production

The organic sector has been very dynamic in the EU-27 over the last decade. The agricultural sector has shown an important development in terms of cultivated surface area and production volume. According to Eurostat data, the organic surface area in EU 27 reached 14,7 million hectares in 2020: an increase of 55,6% from 2012 to 2020. The most important organic areas are located in France (2.517.478 ha in 2020, +144% from 2012 to 2020), in Spain (2.437.891 ha, +39% since 2012), Italy (2.095.364 ha, +79% since 2012) and Germany (1.590.962 ha, +66% since 2012). All together, the above-mentioned four MS represent 59% of the EU 27 organic surface area. The progression is observed in almost all MS to different extents (from +15% in Czechia up to +240% in Croatia), with the exception of Poland where organic surface has reduced by 22% over the 2012-2020 period.

Figure 1: Development of EU 27 organic surface⁶ from 2012 to 2020



Source: Eurostat

According to Eurostat data, at EU 27 level the organic area represents 9,1% of the utilized agricultural area. The largest shares of organic surface area compared to total agricultural surface area are found in Estonia (22,4%), Sweden (22,3%), Austria (25,3%⁷) Italy (16%), Czechia (15,3%) and Latvia (14,8%). At the other end of the spectrum, the ratio is low in Bulgaria (2,3%), Ireland (1,7%) and Malta (0,6%).

With regards to animal production, the share of organic cattle compared to total cattle production varies among the MS and the type of cattle. Concerning bovine animals, the share of organic cattle at EU 27 level was 6,0% in 2020 (up to 30,3% in Greece), and 4,5% for dairy cows (up to 22% in Austria). Regarding pigs,

⁶ Fully converted and in conversion process

⁷ In 2019

the share reached 1,0% (up to 3,4% in Denmark). The share of organic sheep and goats was 8,2% (up to 36% in both Austria and Latvia).

Organic consumption and market in the EU

The consumption of organic products is also increasing in the EU-27. According to the Research Institute of Organic Agriculture (FiBL)⁸ and the International Federation of Organic Agriculture Movements (IFOAM), the value at the retail stage in 2020 was estimated at EUR 44,8 billion at EU 27 level (+15,1% compared to 2019). From 2000 to 2020, the value of the organic market increased by 707% in the EU. The EU is the second largest market for organic food globally, after the United States (EUR 49,5 billion).

The sales value at the retail stage accounted for 4,7% of the total food market in 2020. The most important market was Germany with EUR 15,0 billion. The second most important market was France with EUR 12,7 billion.

Compared to 2019, the countries with the highest organic market growth in 2020 were Germany (+22%), Austria (+18%), Ireland (+16%), Denmark (+13%), the Netherlands (+12%) and Luxembourg (+6,8%).

At EU level, the yearly consumption of organic products per capita remain heterogeneous. In Central and Eastern European countries, the consumption per capita remains quite low, and tends to be more important in Western and Northern MS, ranging from 5 EUR/capita/year in Bulgaria to 383,6 EUR/capital/year in Denmark.

⁸ The world of Organic Agriculture – Statistics and emerging trends, FiBL, IFOAM, 2022

Table 1: Organic retail market by EU MS

	Year	Sales value at retail stage (EUR million)	EUR/capita	Organic share in total food consumption
Denmark	2020	2.240	384	13,0%
Austria	2020	2.265	254	11,3%
Luxembourg	2020	171	285	9,1%
Sweden	2020	2.193	212	8,7%
France	2020	12.699	188	6,5%
Germany	2020	14.990	180	6,4%
Estonia	2019	62	47	3,7%
Italy	2020	3.872	64	3,5%
Netherlands	2020	1.361	78	3,3%
Belgium	2020	892	77	3,2%
Finland	2020	409	74	2,6%
Spain	2020	2.528	53	2,5%
Ireland	2020	189	39	2,2%
Croatia	2018	99	24	2,2%
Slovenia	2013	49	27	1,8%
Czechia	2019	204	19	1,5%
Latvia	2017	51	6	1,5%
Lithuania	2017	51	18	1,0%
Poland	2019	314	8	0,6%
Bulgaria	2020	na	na	0,4%
Greece	2017	66	6	0,3%
Hungary	2015	30	3	0,3%
Portugal	2011	21	2	0,2%
Romania	2016	41	2	0,2%
Cyprus	na	na	na	na
Malta	na	na	na	na
Slovakia	na	na	na	na
EU-27	2020	44,8	101,8	4,7

na: not available

Source: FIBL, IFOAM

2.2 Place of the EU in world aquaculture

In 2020, aquaculture production reached 87 million tonnes globally. China is by far the largest producer, accounting for 57% of the world production with 49,6 million tonnes. The second largest aquaculture producer is India with 8,6 million tonnes, accounting for 10% of world production. The EU-27 reached the 10th position, accounting for 1,3% of world production with 1,1 million tonnes produced.

Table 2: World aquaculture production in 2020

Countries	Production (tonnes)	% total
China	49.620.149	56,7%
India	8.635.986	9,9%
Indonesia	5.226.594	6,0%
Viet Nam	4.600.828	5,3%
Bangladesh	2.583.866	3,0%
Egypt	1.591.896	1,8%
Norway	1.490.076	1,7%
Chile	1.485.896	1,7%
Myanmar	1.145.018	1,3%
EU-27	1.093.796	1,3%
Thailand	962.467	1,1%
Philippines	854.178	1,0%
Ecuador	774.529	0,9%
Brazil	629.450	0,7%
Others	6.806.198	7,8%
Total	87.500.927	100,0%

Source: FAO

According to EUMOFA data, from 2010 to 2019, the total EU-27 aquaculture production increased by 11% to reach 1.147.182 tonnes⁹. This progression is noticeable in most MS. Among the top 4 producing MS, an important progression is observed in Spain and Greece, with an increase of 21% to 307.572 tonnes and 24% to 128.748 tonnes respectively. Production remained stable in Italy at 154.000 tonnes, whereas it decreased by 5% in France to 194.000 tonnes.

⁹ Note a slight difference of volumes between EUMOFA (1.147.182 tonnes) and FAO (1.141.290 tonnes) data at EU 27 level.

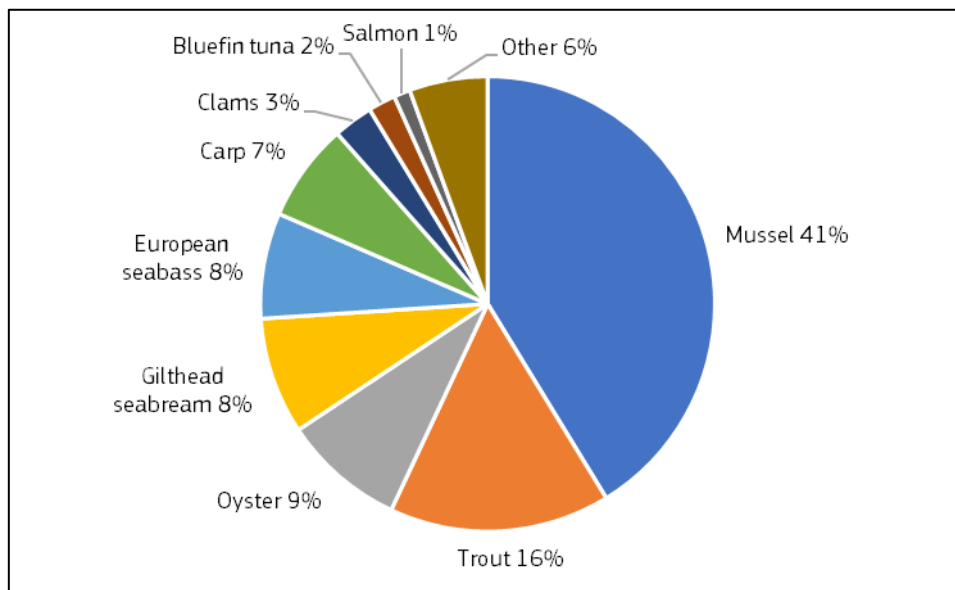
Table 3: Aquaculture production by MS (tonnes)

	2010	% 2010	2019	% 2019	evol 2010-2019
Spain	253.787	24,5%	306.572	26,7%	+21%
France	204.414	19,8%	194.335	16,9%	-5%
Italy	153.729	14,9%	153.937	13,4%	0%
Greece	104.008	10,1%	128.748	11,2%	+24%
Netherlands	67.145	6,5%	46.340	4,0%	-31%
Poland	30.751	3,0%	42.627	3,7%	+39%
Germany	40.694	3,9%	41.077	3,6%	+1%
Denmark	32.343	3,1%	40.221	3,5%	+24%
Ireland	46.189	4,5%	34.977	3,0%	-24%
Czechia	20.420	2,0%	20.989	1,8%	+3%
Croatia	na	0,0%	20.444	1,8%	na
Hungary	14.244	1,4%	17.315	1,5%	+22%
Finland	11.771	1,1%	15.296	1,3%	+30%
Malta	6.881	0,7%	13.823	1,2%	+101%
Romania	8.945	0,9%	12.848	1,1%	+44%
Bulgaria	7.913	0,8%	11.963	1,0%	+51%
Sweden	10.738	1,0%	11.497	1,0%	+7%
Portugal	8.224	0,8%	11.475	1,0%	+40%
Cyprus	4.107	0,4%	8.079	0,7%	+97%
Austria	2.167	0,2%	4.242	0,4%	+96%
Lithuania	3.088	0,3%	3.776	0,3%	+22%
Slovakia	687	0,1%	2.739	0,2%	+299%
Slovenia	858	0,1%	2.087	0,2%	+143%
Estonia	573	0,1%	1.062	0,1%	+85%
Latvia	548	0,1%	628	0,1%	+15%
Belgium	539	0,1%	86	0,0%	-84%
Total	1.034.762	100%	1.147.182	100%	+11%

na: not available

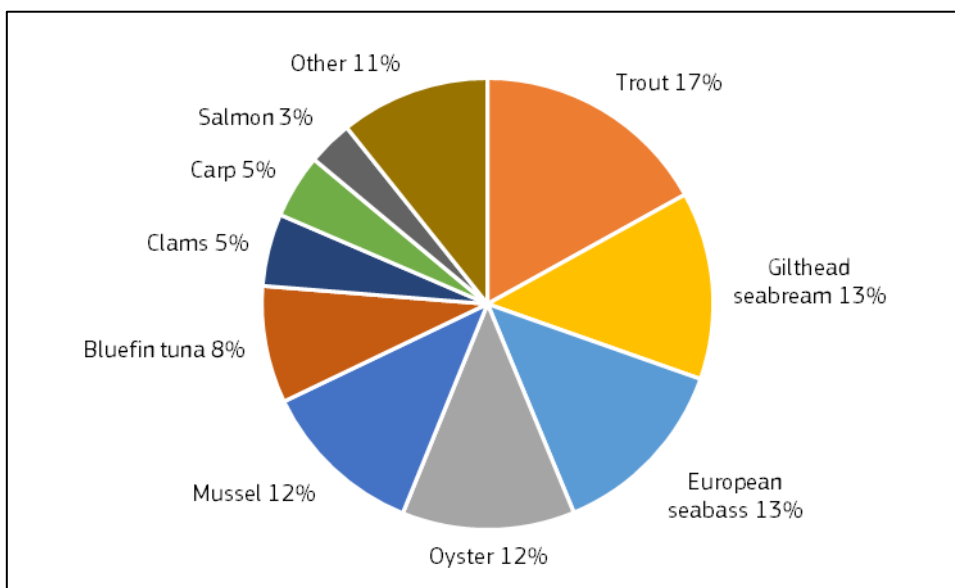
Source: EUMOFA

In volume, EU aquaculture production in 2019 included mostly mussels (473.000 tonnes), trout (180.000 tonnes), oysters (100.000 tonnes), gilthead seabream (95.000 tonnes), European seabass (86.000 tonnes), carp (80.000 tonnes), and to a lesser extent clams (32.000 tonnes), bluefin tuna (22.000 tonnes) and salmon (13.000 tonnes).

Figure 2: EU 27 aquaculture production breakdown by main species (in volume)

Source: EUMOFA, 2019

In value, top species farmed in EU in 2019 were trout (EUR 623 million), gilthead seabream (EUR 494 million), European seabass (EUR 491 million), oyster (EUR 455 million), mussel (EUR 433 million), bluefin tuna (EUR 308 million), and to a lesser extent; clams (EUR 191 million), carp (EUR 169 million) and salmon (EUR 118 million).

Figure 3: EU 27 aquaculture production breakdown by main species (in value)

Source: EUMOFA, 2019

3. STATE OF CURRENT ORGANIC AQUACULTURE PRODUCTION BY MS AND MAIN THIRD COUNTRIES

3.1 General overview

Based on EU and national sources, the total organic aquaculture production in the EU-27 is estimated at **74.032 tonnes** in 2020 accounting for 6,8% of the total EU aquaculture production¹⁰. As a comparison, the EU organic aquaculture production in 2015¹¹ was estimated at **46.341 tonnes** at EU 27 level (49.723 tonnes at EU 28 level), accounting for 4% of the EU aquaculture sector.

In terms of MS¹²:

- The main producing MS is Ireland with 18.512 tonnes of organic aquaculture production, accounting for more than half of the total national aquaculture production. The species are salmon and mussel.
- In Italy, France, the Netherlands, Spain, Germany and Denmark, organic aquaculture production ranges from 5.000 to 10.000 tonnes. Shellfish (mainly mussel and oyster) and to a lesser extent finfish (trout, sturgeon.) account for the largest volumes produced.
- In Bulgaria (mussel), Hungary (finfish) and Greece (European seabass and gilthead seabream), production ranges between 1.000 and about 3.000 tonnes.
- Production is below 1.000 tonnes in Romania, Slovenia, Lithuania, Poland, Croatia, Austria and Belgium. Some organic aquaculture production has been reported in Czechia and Portugal but has stopped in recent years (however, there are on-going projects in Portugal).
- No production has been reported since 2015 in Finland, Malta, Sweden, Cyprus, Slovakia, Estonia and Luxembourg¹³.

In terms of species:

- Mussel is the main species, with 41.936 tonnes certified organic in 2020 (10% of the EU mussel production). Main MS are the Netherlands, Italy, Germany, Denmark, France and Spain with production above 3.000 tonnes each. The production is particularly high in Denmark (organic accounts for 73% of the national production), Ireland (34%) and Germany (29%).
- Salmon is the second main species with 12.870 tonnes. It is only produced in Ireland. The EU production has decreased since Brexit, as the UK is an important producer.
- Trout is the third species with 4.590 tonnes, France accounts for half of the production (with 2.346 tonnes), followed by Spain (917 tonnes) and Denmark (642 tonnes). The share of organic trout production in the EU is 2%. Since 2015, the EU production of organic farmed trout has decreased due to a strong reduction in Denmark and to a lesser extent in France and Italy.
- Carp is the fourth species with 3.562 tonnes (4% of the EU production), main MS are Hungary, Romania and Lithuania. The production in 2020 is two times lower than in 2015.
- Oyster accounts for 3% of the EU production (3.228 tonnes of organic oyster), organic production is almost exclusively located in France. The production increased since 2015.
- Other species are European seabass/gilthead seabream, with 2.750 tonnes (1,5% of EU production). The main MS is Greece with 57% of the EU production.

¹⁰ Comparison with 2020 total volume (FAO).

¹¹ https://www.eumofa.eu/documents/20178/84590/Study+report_organic+aquaculture.pdf

¹² Sources as indicated in the country specific and species specific sections of the report.

¹³ No production reported in Eurostat and no information available from national authority.

Table 4: Overview of the EU production of organic aquaculture (volume in tonnes)

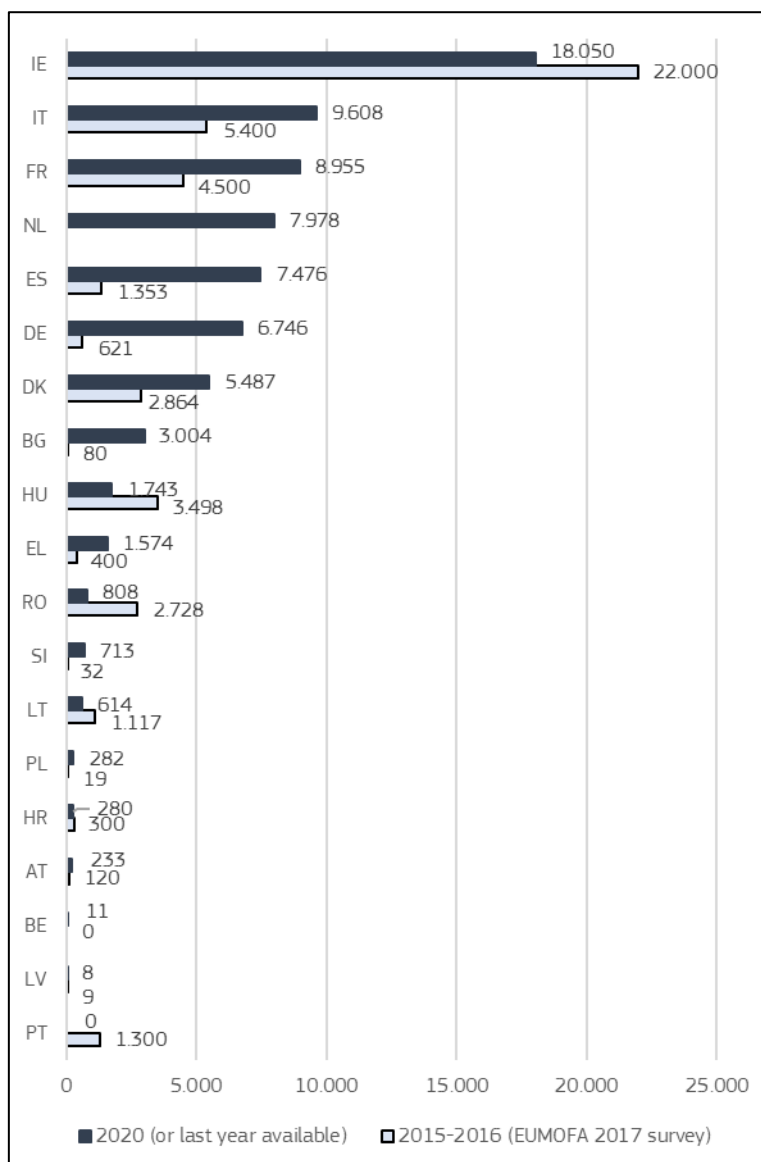
MS	Volume of organic production (2020 or last year available)	Total aquaculture production 2020 (FAO)	% of organic / total production	Details on organic production
IE	18.050	37.709	47,9%	12.870 t of caged salmon, 4.685 t of rope mussel and 495 t of bottom mussel (2020)
IT	9.608	122.778	7,8%	7.759 t of mussel, 1.320 t of Japanese carpet shell, 323 t of rainbow trout, 125 t of European seabass, 223 t of gilthead seabream, 13 t of oyster and 4,5 t of shrimps (2018)
FR	8.955	191.000	4,7%	Oyster (3.178 t), mussel (3.135 t), trout (2.346 t), European seabass/gilthead seabream (250 t), pond fish (43 t), other shellfish (3 t) and trout eggs (16 t) (2020)
NL	7.978	39.940	20,0%	Data available for mussel only. Small production of oyster but no data available (2020).
ES	7.476	276.562	2,7%	3.104 tonnes of mussel, 2.520 t of sturgeon, 916 t of trout, 564 t of seaweeds, 210 t of European seabass and 124 t of gilthead seabream (2020)
DE	6.746	32.258	20,9%	6.500 tonnes of mussel, 250 tonnes of trout, 15 tonnes of carp and 35 t of other species (2020)
DK	5.487	42.607	12,9%	4.818 t of mussel growing trend), 642 t of trout (decreasing trend) and 22 t of algae (2020)
BG	3.004	15.047	20,0%	3.000 t of mussel and 4 t of algae (2019)
HU	1.743	18.373	9,5%	Chinese carps (silver carp, bighead carp, grass carp), common carp and predatory fishes (pike-perch, pike, wels catfish) (2020)
EL	1.574	131.645	1,2%	European seabass and gilthead seabream (data is not differentiated between the two species) (2020)
RO	808	12.200	6,6%	761 t of "carp, barbels, cyprinids" and 47 t of rainbow trout (2020)
SI	713	1.673	42,6%	623 t of mussel and 90 t of finfish (2020)
LT	614	4.477	13,7%	614 t in 2021, mainly carp (2019)
PL	282	47.700	0,6%	Mainly a production of "carp, barbels and cyprinids" (2020)
HR	280	21.718	1,3%	145 t gilthead seabream, 100 t European seabass, 35 t mussel(2020)
AT	233	4.527	5,1%	147 t of carp, 52 t of rainbow trout and 2 t of sea trout (2018)
BE	11	209	5,3%	Production of trout
LV	8	717	1,1%	No detail on species available
CZ	0	20.401	0,0%	No production in 2020 and 1 t of "carp, barbels and cyprinids" in 2019
PT	0	14.552	0,0%	No production in 2020. Last data reported in 2017: 1.100 t of mussel
FI	0	15.053	0,0%	No production reported
MT	0	19.829	0,0%	No production reported
SE	0	12.090	0,0%	No production reported
CY	0	7.343	0,0%	No production reported
SK	0	2.296	0,0%	No production reported
EE	0	1.090	0,0%	No production reported
LU	0	0		No production reported
EU 27	74.032	1.093.796	6,8%	/

Source: EUMOFA elaboration based on FAO, EUMOFA and national sources

The following figure compares the volume of organic aquaculture by MS in 2020 (or last year available, see details in the previous table) and in 2015-2016 from the previous EUMOFA study on organic aquaculture¹⁴.

A strong growth of organic aquaculture is observed in Italy, France, Spain, Germany, Denmark and Bulgaria, while a decrease is reported in Ireland and Hungary.

Figure 4: Comparison of organic aquaculture in volume by MS: 2020 (or last year available) and 2015-2016 (EUMOFA survey-2017) in tonnes



Source: EUMOFA elaboration based on Eurostat, national sources and EUMOFA 2017 survey

¹⁴ https://www.eumofa.eu/documents/20178/84590/Study+report_organic+aquaculture.pdf

3.2 Data by Member State (MS) of the EU 27

Ireland

Based on the Ireland's Seafood Development Agency (BIM) data, the organic production of the aquaculture sector in 2020 was 12.870 tonnes for caged salmon, 5.180 tonnes for mussel (90% of rope-mussel) and 462 tonnes for salmon hatchery. From 2016 to 2020, the total volume of production decreased by 13%: -11% for caged salmon and -20% for rope mussel.

According to the BIM data, in 2020 most organic products are exported: 85% of caged salmon, 96% of rope mussel (only 60% in 2016), and 100% of bottom mussel.

Table 5: Volume of organic production in Ireland between 2016 and 2020 (tonnes)

	2016	2017	2018	2019	2020
Caged salmon	14.393	16.481	11.984	11.333	12.870
Rope mussel	5.871	5.712	5.738	6.258	4.685
Bottom mussel	508	1.448	650	1.220	495
Total	20.772	23.641	18.372	18.811	18.050

Source: Bord Iascaigh Mhara

The sale value of organic production was EUR 131,5 million in 2020 (+27% since 2016): EUR 118,9 million for caged salmon, 3,6 million for rope mussel, 1,1 million for bottom mussel and EUR 7,8 million for salmon hatchery.

Table 6: Ex-farm value of organic production in Ireland between 2016 and 2020 (EUR)

	2016	2107	2018	2019	2020
Caged salmon	95.134.998	120.689.265	95.742.392	108.721.367	118.942.346
Rope mussel	3.826.347	3.799.118	3.869.227	4.124.768	3.589.017
Bottom mussel	330.200	2.109.000	812.500	2.562.000	1.113.750
Total	103.458.145	131.175.988	105.542.441	118.801.215	131.476.444

Source: Bord Iascaigh Mhara

Based on BIM data, in 2020 49 production units were registered (47 in 2016), employing a total of 244 FTEs (238 FTEs in 2016).

The average price of organic caged salmon was 9,24 EUR/kg in 2020 (a 4% decrease compared to 2019, at 9,59 EUR/kg in 2019), the price has also decreased in 2021 based on qualitative interviews. Production costs have been increasing over the last few years, for both organic and conventional salmon.

The COVID outbreak has had a negative impact on the organic market for salmon. While procurement was conducted with contracts prior to COVID-19 (fixed volume and prices), the share of sales through spot market increased with lower prices (source: qualitative interview with a stakeholder).

There is a strong demand for frozen products from the French and German. The producers interviewed consider that "organic" has a good image for consumer in terms of sustainability and climate action.

Drivers identified:

- Support from public authorities
- Strong and growing demand for frozen salmon in the French and German market
- According to the producers interviewed, consumer awareness of the environmental footprint of their food consumption.

Barriers identified:

- Profitability of organic farmed products has decreased over the past few years
- Authorities do not take action to promote organic salmon on the national market (based on stakeholder feedback)
- Regulation is complex for organic salmon
- Issuing a new organic licence may require 3 to 5 years.

Italy

Eurostat provides data on the volume of organic production in Italy until 2018. Details by species are available until 2015: 5.188 tonnes of organic mussel and 150 tonnes of organic trout.

Table 7: Volume of organic production in Italy between 2015 and 2018 (tonnes)

	2015	2016	2017	2018
Total	5.492	6.044	8.952	9.608

Source: Eurostat

Another source (Pulcini *et al.*¹⁵) provides detailed data by species for 2015, 2016 and 2018¹⁶. Main species produced are molluscs:

- Firstly, mussel with 7.758 tonnes in 2018 (+59% compared to 2015), this accounted for 79% of the total organic production;
- Secondly, Japanese carpet shell with a very limited volume in 2015 (20 tonnes), which reached 1.320 tonnes in 2018, accounting for 14% of the total organic production. An organic-certified hatchery initiated an activity in 2017 and could supply several farms in northern Adriatic.

Finfish species, such as rainbow trout (232 tonnes), European seabass (125 tonnes) and gilthead seabream (223 tonnes), accounted for 7% of the organic aquaculture production in volume in 2018.

Table 8: Volume of organic aquaculture production in Italy between 2015 and 2020 (tonnes)

	2015	2016	2018
Mussel	4.877	8.092	7.758
Japanese carpet shell	20	264	1.320
Rainbow trout	350	353	323
European seabass	10	10	125
Gilthead seabream	134	137	223
Oyster	1	4	13
Shrimps	5	5	5
Mullet	79	89	na
Eel	1	4	na
Atherina boyeri (Smelt)	0	3	na
Char	1	0	na
Total	5.477	8.960	9.766

na : not available

Source: Pulcini *et al.*¹⁷

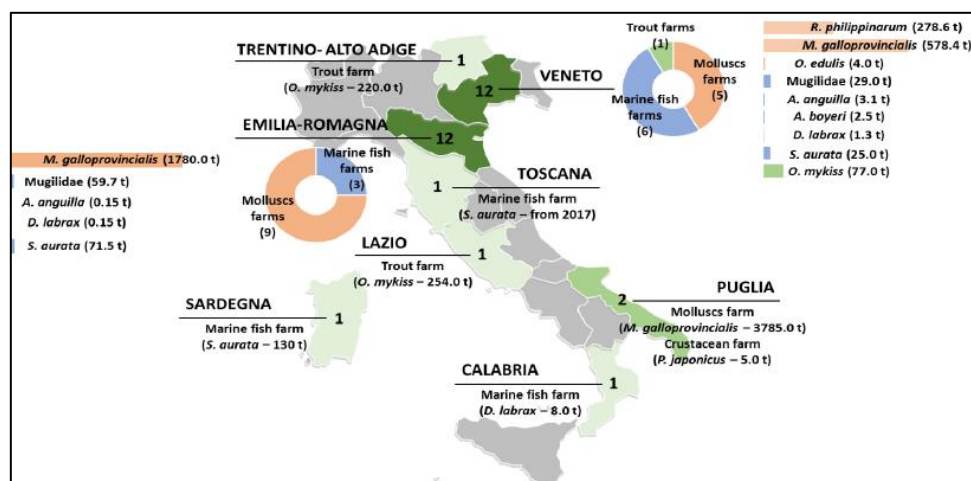
¹⁵ Pulcini *et al.* – Aquaculture Production in Italy from 2015 to 2018: Species Production and Nutritional Quality Aspects, BioBreed H2O project, 2020, based on data collection program under Reg. EC No 762/2008 and organic aquaculture (2015-2018) – [Link](#)

¹⁶ Total volume of organic production in Italy slightly differs between Pulcini *et al.* and Eurostat but are coherent in the trends.

¹⁷ Pulcini *et al.* – Aquaculture Production in Italy from 2015 to 2018: Species Production and Nutritional Quality Aspects, BioBreed H2O project, 2020, based on data collection program under Reg. EC No 762/2008 and organic aquaculture (2015-2018) – [Link](#)

The number of organic aquaculture farms is relatively stable in Italy: 29 in 2015 and 31 in both 2016 and 2017. Aquaculture farms are concentrated in two northern regions: Veneto and Emilia-Romagna with 12 aquaculture farms in each region. However, the first region in terms of volume of production is Puglia with 3.785 tonnes of organic mussel in 2016 (47% of national production of organic mussel) and 5 tonnes of organic shrimps.

Figure 5: Number and geographical distribution of Italian organic aquaculture farms and production volumes (tonnes) per species and region (2016)



Source: Pulcini *et al.*¹⁸, Aquaculture Production in Italy from 2015 to 2018: Species Production and Nutritional Quality Aspects, BioBreed H2O project, 2020 - [Link](#)

The methods of production between organic and conventional mussel are close. Based on EUMOFA price structure analysis on mussel in Italy published in 2019, it appeared that there was no price premium for organic mussel at production stage¹⁹, the scheme was used by stakeholders to develop their markets, in particular on the French market. A stakeholder interviewed in the context of the present study reported a price premium of 10% for organic shellfish (ex-packaging stage).

Barriers identified:

- Low consumer awareness on organic seafood and low demand,
- Consumer confusion on the different sustainability schemes,
- Competition with other sustainability schemes.

France

In France organic aquaculture production has been reported since 2018. In 2020, organic aquaculture amounted to an estimated volume of 8.955 tonnes, trout, mussel and oyster being the main species: 3.135 tonnes of mussel, 3.178 tonnes of oyster, 2.346 tonnes of trout, an estimated volume of 250 tonnes of marine fish (European seabass/gilthead seabream), 43 tonnes of pond farmed fish, and 3 tonnes of other shellfish. 16 tonnes of organic trout eggs were also produced. This was a +63% increase compared to 2019, mostly attributable to oyster (+175%) and to a lesser extent mussel (+67%) and trout (+22%). In 2020, 26 trout farming sites were certified for organic production, only two sites for marine fish farming, and ten

¹⁸ Pulcini *et al.* - Aquaculture Production in Italy from 2015 to 2018: Species Production and Nutritional Quality Aspects, BioBreed H2O project, 2020, based on data collection program under Reg. EC No 762/2008 and organic aquaculture (2015-2018) - [Link](#)

¹⁹ https://www.eumofa.eu/documents/20178/151118/PTAT+Fresh+Mussel_EN.pdf

sites for pond fish farming. Concerning shellfish production, 45 companies reported organic shellfish sales in 2020.

Table 9: Organic aquaculture production in France (in tonnes)

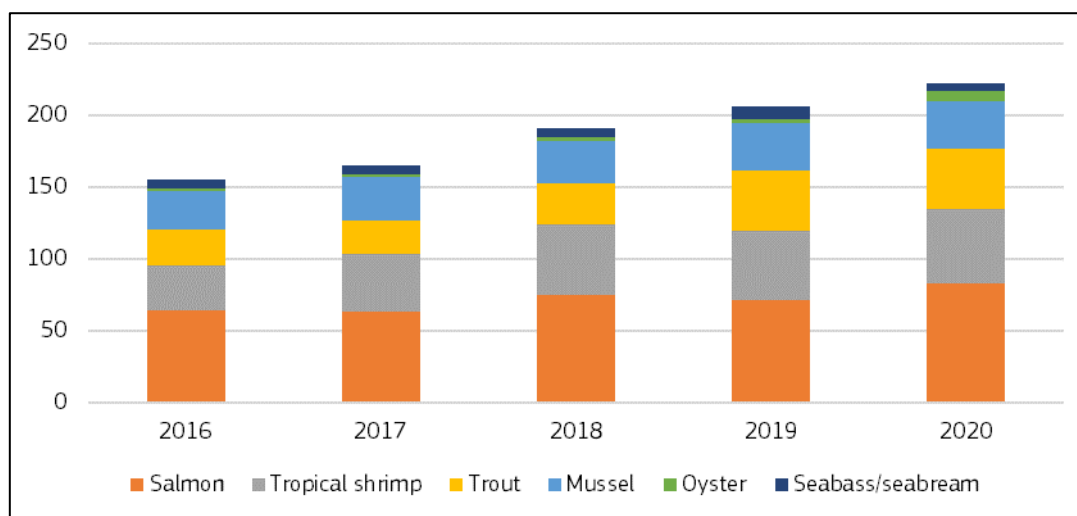
Species	2018	2019	2020
Oyster	883	1.157	3.178
Mussel	1.666	1.882	3.135
Trout	1.518	1.926	2.346
European seabass/ gilthead seabream	101	258	250*
Pond fish	22	254	43
Other shellfish	55	8	3
Total fish	4.245	5.485	8.955
Salmonid eggs	15	10	16

Source: Agreste, enquête aquacole. *estimated based on previous years due to confidentiality issues.

Salmonid eggs are not included in the total as they are considered as a by-product.

On the retail side, the market for organic fish and seafood was estimated at EUR 221 million in 2020. Salmon was the main species consumed (38% of the total value) followed by tropical shrimp (24%, mostly from Madagascar and Ecuador), trout (19%, mostly relying on domestic production) and mussel (15%). The size of this market has followed a constantly increasing trend from 2016 to 2020 (+43%). In 2021 it is expected that it slowed down significantly, following a similar trend to several other organic items.

Figure 6: Value of the consumption of organic fish and seafood in France by main species (in million EUR)



Source: Agence Bio, AND International. The value provided for oyster is likely to be underestimated considering the level of production of organic oyster in France.

Drivers identified:

- Important retail demand for organic fish products.
- Importance of the shellfish sector

Barriers identified:

- Concerns from shellfish farmers regarding the Regulation (EU) 2018/848 that entered into force on 1 January 2022, particularly concerning the requirement for growing waters to be classed as A in Regulation (EC) No 854/2004 or of high ecological status as defined by Directive 2000/60/EC or of good environmental status as defined by Directive 2008/56/EC. However, shellfish farmers are still

negotiating the implementing conditions with the administration in charge of certification and quality schemes. Therefore, for the moment there is still no impact on the market. However, installations/conversions to organic farming slowed down or even stopped because of the uncertainty regarding the eligibility criteria for the label (especially in the Mediterranean).

Prospects for growth:

- Increasing demand for organic trout

The Netherlands

Based on Eurostat, 7.978 tonnes of organic mussel were produced in the Netherlands in 2020. The production has increased over the last few years: +54% between 2016 and 2020. There were 24 mussel producers in the Netherlands in 2019.

There are two methods of production of mussels in the Netherlands: bottom-culture (most of the Dutch production) and rope-grown mussels. According to the National Shellfish association, most of the rope-grown mussel is organic (60%) and bottom-culture mussel is 10-20% organic. Only a share of the organic production is sold as organic on the market (due to low demand). A share of the organic mussel production is exported, to Belgium, Germany, France and Denmark (based on stakeholders feedback). No detailed data are available.

There is also a small production of organic oyster, but no data is available.

Table 10: Volume of organic aquaculture production in the Netherlands between 2016 and 2020 (tonnes)

Species	2016	2017	2018	2019	2020
Mussel	5.195	3.611	3.751	8.536	7.978
Oyster	na	na	na	na	na

Source: Eurostat

According to the stakeholders interviewed, there is no additional cost to produce organic shellfish (only additional administrative work) and no price premium.

MSC applies for wild caught products and “organic” for farmed products. In the Netherlands, due to the method of production used, some of the mussel and oyster production are eligible both to MSC and “organic”. In this context, the stakeholders interviewed reported that: 1) There was a high demand from the retail sector for MSC and a limited demand for organic, and 2) There may be a confusion between these different schemes for the consumers. However, MSC is more expensive for producers with a fee paid to the scheme owner when an operator uses MSC (this is not the case for organic, which is public). In addition, based on stakeholder feedback, the perception of “organic” differs between markets: while it may be positively perceived in Germany and Austria, it may however be considered as an “expensive” product in Belgium.

According to a shellfish packer interviewed for the study, production is increasing faster than demand: in 2021 58% of his procurement in mussel were organic (compared to 14% in 2018) but only accounted 9% of the sales. The same operator indicates that they purchase organic oyster but they don’t sell it with the certification due to low demand.

The stakeholders interviewed consider that shellfish is sustainable (low carbon footprint, no inputs used) and that organic and conventional shellfish products are similar. Thus, there are no ‘higher’ benefits to highlight to consumers, neither for health, nor for the environment.

Drivers identified:

- The shift between conventional and organic is not demanding, there is no significant difference in the methods of production between organic and conventional mussels.
- No specific additional costs for organic production; the main issues are for the certification, labelling and separation of conventional and organic products.

Barriers identified:

- Low consumer awareness of organic shellfish.
- Possible confusion on the market between organic and conventional, as the production method is similar.
- No market incentive: There is no price premium for organic shellfish and a limited demand.
- Strong competition with the MSC labelled products.
- Difficulties to increase volume of production due to space availability

Prospects for growth:

- Growth will depend on communication of the organic scheme
- Shellfish production is considered sustainable (protein rich and low carbon footprint), “organic” could be a way to promote this sustainability.

Spain

The volume of organic aquaculture has doubled in 2020 compared to 2015, it reached 7.476 tonnes (data on volume in this section are from Eurostat). This accounted for 2,14% of the aquaculture production in Spain (source: MAPA). The sales value of the organic production was EUR 80,25 million (source: MAPA), accounting for 16% of the sales value of the Spanish aquaculture.

The main producing areas for organic products are Galicia (organic mussel), Andalucía (organic sturgeon) and Castilla-La Mancha (trout). There are 174 aquaculture farms, including 140 mussel farms in Galicia (data on production by region in this section are from MAPA).

The main species is mussel with 3.104 tonnes (42% of total organic volume) and volumes almost three times higher in 2020 compared to 2015. The main growth was in 2018 (+1.441 tonnes) with an increase in the number of producers. The production is exclusively in Galicia.

The second species is sturgeon with 2.520 tonnes, the volume was stable between 2016 and 2019 and increased by 43% in 2020 (source: Eurostat). The production is almost exclusively in Andalusia (source: Spanish Ministry).

Trout accounted for 12% of total volume (917 tonnes in 2020) with a volume 2,5 times higher in 2020 compared to 2015 (source: Eurostat). There are two producing regions: Castilla-La Mancha and la Rioja (source: Spanish Ministry).

The production of algae has strongly increased over the last few years: The production is 10 times higher in 2020 compared to 2015, with 564 tonnes in 2020 (source: Eurostat). The production is mainly in Galicia and to a lesser extent in Asturias (source: Spanish Ministry).

There is a limited production of organic European seabass and gilthead seabream in Spain: 210 tonnes and 124 tonnes respectively. The production is on an increasing trend (source: Eurostat). These productions are located in the Valencia Region (source: Spanish Ministry).

Organic oyster production is very limited: 37 tonnes in 2020 (source: Eurostat), located in Asturias (source: Spanish Ministry).

Table 11: Volume of organic aquaculture production in Spain between 2015 and 2020 (tonnes)

Species	2015	2016	2017	2018	2019	2020
Mussel	1.163	896	1.684	3.125	2.976	3.104
Sturgeon	1.007	1.751	1.745	1.756	1.766	2.520
Trout	365	473	302	402	689	917
Algae	57	282	508	722	675	564
European seabass	117	0	42	112	119	210
Gilthead seabream	0	0	113	157	109	124
Oyster	0	0	0	56	6	37
Total	2.708	3.401	4.393	6.329	6.340	7.476

Source: Eurostat

Based on MAPA data²⁰, the import of organic seafood to Spain was EUR 22 million in 2020 and the export was 18 million (organic products accounting for 0,85% of seafood export from Spain). Thus, the trade balance was -EUR 4 million. The 2020 consumption of organic seafood was estimated by MAPA at EUR 59 million in 2020, accounting for 0,59 % of total seafood consumption.

Organic aquaculture products accounted for 2,3% of total consumption of organic food in Spain in 2020 (source: MAPA), this is much below the share of aquaculture products in total food consumption (12,2%). However, the comparison may be biased if wild caught products (not eligible to fishery) are considered in the total food consumption (the methodology is not clear on this specific point). The share of seafood has slightly increased in the organic consumption between 2015 and 2020 (1,2% in 2015).

Seafood is the product category with the highest difference between organic and total food consumption. The few categories of products for which the share consumption is higher for organic than for total food consumption are: vegetables (16,9% for organic versus 9,1% for total), cereals (incl. processed), fruits 9,1% for organic versus 7,2% for total), olive oil (4,7% versus 2%), eggs and egg products (2,5% versus 1,3%) and honey (0,6% versus 0,5%).

Driver identified:

- Public support

Barriers identified:

- Licencing procedure (for organic and non-organic production)
- Availability of organic feed
- Compliance with organic regulation
- Consumer aspects:
 - o Possible confusion with other schemes
 - o Image of wild caught product is better than farmed products, difficult to provide an environmental-friendly message for farmed products
- Additional cost of production for organic products
- Limited demand for organic seafood and competition with other certification schemes

Expected growth:

- No growth is expected in the next five years.

²⁰ Source : Estudios de caracterización de la producción ecológica – MAPA - [link](#)

Germany

According to DESTATIS data, the total production in Germany was 6.746 tonnes in 2020, which was 10 times higher than in 2015²¹. The main species produced in 2020 was mussel with 6.500 t, accounting for 96% of the total organic aquaculture production, followed by trout and carp.

Table 12: Volume of organic aquaculture production in Germany between 2015 and 2020 (tonne)

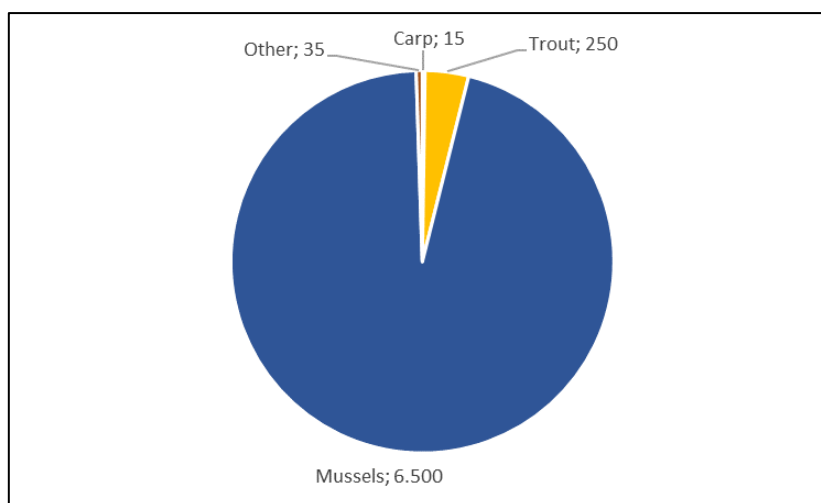
Species	2015	2016	2017	2018	2020
Total	621	1.758	270	6.596	6.746

Note: no data available in 2019

Source: DESTATIS

Based on national data, there were 112 aquaculture farms producing organic aquaculture products in Germany in 2020, in comparison with 234 companies in 2016. The most represented type of farms are producing rainbow trout (24 farms) and common carp (23 farms). These aquaculture farms are generally small-scale companies, and the organic production is a side-business activity, which explains the wide number of operators in comparison with the volume produced. The number of organic mussel farms remains stable over the period 2016-2020 (3 companies). Apart from mussel farms, the general decrease in the number of operators is observed in all other types of production (-45% for rainbow trout and -76% for common carp).

Figure 7: Organic aquaculture production in Germany by species in 2020 (tonnes)



Source: DESTATIS

Based on the qualitative information gathered, the difference in production costs for organic trout is +1 EUR/kg compared to conventional trout.

Drivers identified:

- Retail demand for organic fish product is important.

²¹ Note that mussel production statistics are not annually completed by national authorities, explaining the important annual fluctuation for the total organic production in Germany.

Obstacles identified:

- Licensing procedures are costly for farmers;
- Producing costs are higher in the organic sector compared to conventional aquaculture;
- Availability of German organic products is limited compared to international offer, and the market is dominated by imports.

Denmark

The volume of organic aquaculture was 5.487 tonnes in 2020 (Eurostat). This was mainly mussel (88%, 4.818 tonnes), followed by rainbow trout (12%, 642 tonnes)²² and aquatic plants (0,4%, 22 tonnes). The production of mussel has grown since 2016 (3,6 times higher in 2020 compared to 2016) while rainbow trout has highly decreased (production almost 3 times lower in 2020 compared to 2016).

National source (Fiskeristyrelsens Akvakulturregister) also reported a small production of brown trout (maximum 6 tonnes/year), and a few kg of crayfish and oysters.

Based on Fiskeristyrelsens Akvakulturregister, the aquatic plant produced in 2020 is sugar kelp. There has been limited production of other algae during the previous years: Bladder wrack/black tang/rockweed, Purple Laver Seaweed and Toothed/serrated wrack.

Table 13: Volume of organic aquaculture production in Denmark between 2015 and 2020 (tonnes)

Species	2015	2016	2017	2018	2019	2020
Mussel	1.299	1.345	2.227	2.594	5.578	4.818
Rainbow trout	1.634	1.831	572	372	421	642
Aquatic plant	1	na	na	na	na	22
Total	2.934	3.182	2.803	2.966	6.003	5.487

na: not available

Source: Eurostat

There were 20 aquaculture farms involved in organic mussel production in 2020 while there were only nine in 2016.

The number of aquaculture farms involved in organic rainbow trout remained relatively stable even with the decrease of volume: 11 in 2016 and 10 in 2020 (source: Fiskeristyrelsens Akvakulturregister).

The decrease in rainbow trout production is linked, according to a stakeholder, to a mismatch between the EU organic legislation and the Danish regulation of fish farming. The Danish Aquaculture Executive Order requires that sites with more than 100 tonnes of feed comply with the "Best Available Technologies" (BAT)²³, which require more intensive technologies with recirculation of water. Fish farms with more than 100 tonnes of feed must, by 2026, comply with BAT standard requirements. It follows from a political agreement from 2016, where 'large' fish farms were defined as plants with over 100 tonnes of feed. However, these BAT requirements (on land farms, with recirculation) are not compatible with organic trout farming regulation.

For trout production, many producers buy from the same hatcheries because the hatchery for organic fry needs to be separated from non-organic hatcheries. The costs of operating an exclusive organic hatchery are quite high, which does not make it profitable for each producer to have their own. The separation of

²² One stakeholder interviewed (active in organic rainbow trout sector) mentioned that data statistics could overestimate a bit the level of production as it could include some inter-companies sales.

²³ <https://www.elov.dk/bilag/bilag-7-til-dambrugsbekendtgørelsen/>

sites between organic and conventional makes it difficult to benefit of any economy of scale at production stage for companies already in place.

Most of the market for organic finfish is export, mainly retail in north-west Europe (based on interview, no detailed data available).

In terms of prices (based on Fiskeristyrelsens Akvakulturregister data):

- Price of organic rainbow trout has increased over the last few years; it was 3,54 EUR/kg in 2016 and 5,50 EUR/kg in 2020 (respectively 26,4 DKK/kg and 41,1 DKK/kg). Based on a qualitative interview, the rise in price has been comparable to the rise in costs over the last years.
- Price of organic mussel ranged between 0,50 EUR/kg and 0,84 EUR/kg between 2016 and 2020 (respectively 3,76 DKK/kg and 4,43 DKK/kg), it was 0,59 EUR/kg in 2020 (4,43 DKK/kg).

Drivers identified:

- Awareness of the EU organic scheme in Denmark and in other MS.

Barriers identified:

- BAT regulation in Denmark,
- Closed Recirculation Aquaculture Systems (RAS) cannot be used in EU organic production with the exemption of hatcheries, nurseries and facilities for the production of species used for organic feed organisms,
- Possible misunderstanding for consumer of the organic scheme in the seafood sector (only covering farmed products).

Prospects for growth:

- Potential for growth (if BAT requirements are changed for finfish).

Bulgaria

Organic aquaculture production in Bulgaria is growing and reached 3.004 tonnes in 2020, this is almost exclusively mussel (3.000 t in 2019, compared to 80 t in 2015), with just 4 tonnes of organic algae.

Table 14: Volume of organic aquaculture production in Bulgaria between 2015 and 2019

Species	2015	2016	2017	2018	2019
Mussel	80	1.400	2.000	1.500	3.000
Algae	na	na	na	0	4

na: not available

Source: EUROSTAT

Hungary

Volume of production is available from Eurostat but the breakdown by species is not available. The total organic aquaculture production was 1.743 tonnes in 2020 with a 50% decrease since 2015. Based on qualitative feedback, the species produced are the Chinese carps (silver carp, bighead carp, grass carp), common carp and predatory fishes (pike-perch, pike, wels catfish).

There are some imports of organic fish, mainly salmon according to qualitative interview.

Based on national administration data, there were four organic aquaculture farms in 2020, compared to five in 2015, for a total surface of production of 3.169 ha.

Table 15: Total volume (tonne) of organic aquaculture production in Hungary between 2015 and 2020 (breakdown by species not available)

Species	2015	2016	2017	2018	2019	2020
Total	3.498	2.672	3.238	3.240	2.970	1.743

Source: Eurostat

According to qualitative feedback, the price for organic aquaculture production and the costs of production are about 20% higher than for conventional aquaculture.

Drivers identified:

- Good image of organic products,
- Promotion campaign on fish consumption will cover organic ("Kapj rá!"²⁴ – meaning: "Get hooked!"). The campaign was launched in the framework of the Hungarian Fisheries Operational Programme 2021-2027,
- The National Aquaculture Strategic Plan 2021-2030 aims to increase the current 12% share of areas under organic aquaculture to 20%.

Obstacles identified:

- Higher price is an obstacle on the national market, for fish compared to other animal protein (pork and poultry) and for organic vs conventional
- The difference between organic and conventional semi-extensive ponds is not necessarily clear to consumers
- Low availability of feed

Prospects for growth:

- Policy objective to reach 20% of surface of aquaculture under organic production in 2030 (compared to 12% at present), however, the present trend is decreasing due to low market demand.

Greece

Based on national statistics, the volume of production of organic aquaculture was 1.574 tonnes in 2020 - it increased by 119% since 2015. The main species produced are European seabass and gilthead seabream.

Table 16: Volume of organic aquaculture production in Greece between 2015 and 2020 (tonnes)

Species	2015	2016	2017	2018	2019	2020
Gilthead seabream and European seabass	720	1.130	1.495	1.452	1.267	1.574

Source: Directorate for Fisheries Policy & Development of Fisheries Products

The production costs of organic aquaculture are considered significantly higher compared to conventional production.

Obstacles identified:

- Low demand for organic products of Mediterranean fish farming due to their high cost
- Increased production costs involved in complying with European organic farming legislation and demanding certification, makes it difficult for many SMEs to switch to organic fish farming

²⁴ <https://kapjra.hu/>

- The stagnation of the aquaculture sector limits the development of innovation in the sector
- The increase of production costs in general, drive consumers to disengage from purchase of expensive food, in particular organic products

Romania

The volume of organic aquaculture production in Romania was 808 tonnes in 2020, with a strong decrease the last years, and it peaked at 4.927 t in 2016.

The main species is carp (94% of total, 761 t). Organic trout accounts for 6% of the total organic production with 47 t (6% of total). Six companies are involved in organic aquaculture production in Romania.

Table 17: Volume of organic aquaculture production in Romania between 2015 and 2020 (tonnes)

Species	2015	2016	2017	2018	2019	2020
Carp	2.728	4.927	4.843	1.508	1.416	761
Trout	0	0	0	42	35	47

Source: Eurostat

Drivers identified

- Profitability of trout and salmon farming with organic method
- Demand for organic salmon and trout on market with high GDP/capita,

Barriers identified:

- Carp production is quite large in Romania. Stakeholders interviewed in the context of this study reported that the 'carbon footprint' of conventional carp production in polyculture is assessed to be low, even lower than organic production. In this context, the added value of organic is perceived as limited.
- Carp may be produced in polyculture (several species farmed in the same pond) which is not allowed with the organic rules if some of the species are not organic.
- High operational costs and administrative burdens for organic production.

Prospects for growth:

- The prospects for growth in the finfish segment are assessed to be limited by stakeholders interviewed.
- There is potential for development of shellfish farming in the Black Sea, where the quality of water seems adequate for organic farming.

Slovenia

Based on data from the national statistics office, organic aquaculture production reached 713 tonnes in 2020, mainly mussel (623 tonnes, 87% of total), followed by finfish (90 tonnes, 7% of total).

Organic aquaculture production has increased significantly over the last few years:

- the volume of organic mussel is ten times higher in 2020 compared to 2016²⁵,
- the volume of organic finfish is significant in 2020 (90 tonnes), compared to a maximum of five tonnes before 2020.

Table 18: Volume of organic aquaculture production in Slovenia between 2015 and 2020 (tonne)

	2016	2017	2018	2019	2020
Mussel	60	561	630	733	623
Finfish	5	3	0,4	0,3	90

Source: Eurostat in 2016 and National statistics in 2017-2020

Lithuania

Based on Eurostat, organic aquaculture production was 613 tonnes in 2019, with a decreasing trend since 2015 (-53%). Most of organic aquaculture production is “carp, barbels, cyprinids” (last year available with details by species is 2017).

Table 19: Volume of organic aquaculture production in Lithuania between 2015 and 2019 (tonnes)

Species	2015	2016	2017	2018	2019
Carp, barbels, cyprinids	1.164	714	811	na	na
Total	1.300	734	818	605	613

na: Not available

Source: Eurostat

The Agricultural Information and Rural Business Centre (AIRBC) provides data up to 2021, detailed by species. The total organic aquaculture production was 614 tonnes in 2021 (776 tonnes in 2019, compared to 613 tonnes reported by Eurostat for the same year). Main species is carp which accounts for at least 90% of the annual production. The production of carp is on a decreasing trend: -42% between 2017 and 2021. A positive trend is observed for *Carassius* spp. (cyprinids) but volumes remain limited in 2021: 32 tonnes.

²⁵ Eurostat in 2016 and National statistics in 2020.

Table 20: Volume of organic aquaculture production in Lithuania between 2017 and 2021 (tonnes)

Species	2017	2018	2019	2020	2021
Common carp	943	659	728	807	552
Carassius spp.	4	5	18	27	32
White amur	16	14	9	8	11
Northern pike	13	8	11	9	8
Bighead carp	7	10	4	9	5
Sturgeons nei	0	1	2	1	2
Tench	2	3	4	3	2
Freshwater fishes nei	0	3	1	0	0
Som	0	0	0	0	0
Total	984	704	776	864	614

Source: Agricultural Information and Rural Business Centre (AIRBC)

The ex-farm value of production was EUR 1,7 million in 2021, with a decreasing trend since 2017 (EUR 2,8 million in 2017, -38% between 2017 and 2021) due to a decrease in volume. The ex-farm price of carp was 4,73 EUR/kg, with an increasing trend over the last few years (3,28 EUR/kg in 2019).

Drivers identified

- Consumer demand for sustainable food on the national market
- Support from public bodies (for instance via EMFAF 2021-2027 in Lithuania)

Barriers identified:

- Increasing requirements for organic production,
- Closed Recirculation Aquaculture Systems (RAS) cannot be used in EU organic production with the exemption of hatcheries, nurseries and facilities for the production of species used for organic feed organisms.

Prospects for growth

- The trends in recent years are negative. However, in the National Aquaculture Plan the volume of organic production is foreseen to be increased by 66 % by 2030.

Poland

Based on EUROSTAT data, the production of organic aquaculture was 282 tonnes in Poland in 2020, 15 times higher than in 2015. Carp is the main species produced.

According to the Polish Institute of Inspection of Trade Quality of Agricultural and Food Products (Ministry of Agriculture and Rural Development), there were 11 companies involved in organic aquaculture in 2020.

Table 21: Volume of organic aquaculture production in Poland between 2015 and 2020 (tonnes)

Species	2015	2016	2017	2018	2019	2020
Carp	n.a	19	16	31	157	n.a
Total	18	19	17	32	160	282

na: not available

Source: Eurostat

According to the stakeholders interviewed, production costs are estimated to be 30% higher for organic carp production compared to conventional carp. As far as trout production is concerned, costs are also estimated to be higher due to higher feed costs; oxygenation of water and the lower density in fishponds.

Barriers identified:

- Expensive organic feed
- Loss at production stage (due to disease or predation – not compensated by higher prices)
- Negligible market and consumer demand for organic carp
- No public support for organic production
- No suppliers of certified feed in Poland for trout
- Profitability lower than in conventional farming
- There is no marketing for organic fish products, and prices are higher than conventional products
- Small quantities of trout available on the market

Prospects for growth:

- According to stakeholders, consumer awareness will increase for organic trout products

Croatia

Based on Eurostat, the volume of organic aquaculture production was 280 tonnes in 2020, the level of production has been relatively stable over the last years (2015-2020). Main species are gilthead seabream (52%) and European seabass (36%), followed by mussel (13%).

Table 22: Volume of organic aquaculture production in Croatia between 2015 and 2020 (tonnes)

Species	2015	2016	2017	2018	2019	2020
Gilthead seabream	na	na	na	104	107	145
European seabass	120	55	80	121	125	100
Mussel	na	na	na	60	59	35
Total	300	100	135	285	291	280

na: not available

Source: EUROSTAT

Based on qualitative feedback, there is a price premium for organic products (about 25-35%).

A large share of the production is exported to the EU market, in MS where the demand for organic product is higher than in Croatia.

Drivers identified:

- Higher profitability of organic production due to higher prices
- Consumer demand in some MS (Western EU)
- High demand during tourist season

Obstacles identified:

- Licensing procedures and spatial management (not specific to organic): Difficulties to develop new production
- Difficulties to comply with organic rules, for instance on animal welfare, with a need for important investments
- Low number of laboratories which can conduct the necessary analyses for organic production (for instance sediment sampling methods),
- Low availability and price of feed for hatcheries, and unavailability of non-GMO vitamin B2 (no possible use of such vitamin in organic production)
- Higher costs of production for organic than non-organic (price of feed, organic feed is less efficient than conventional feed, separation of technical units, workload, density),

- Low demand and awareness for organic products in Croatia, while consumers may consider that Adriatic fish is already healthy and antibiotic free,
- Competition at international level (in particular from Greece).

Prospects for growth:

- Expected growth by 20% annually until 2025, due to growing demand (based on qualitative feedback from stakeholders).

Austria

The only source available on organic aquaculture in Austria is Eurostat (data between 2016 and 2018). Volume of production of organic aquaculture ranged from 217 tonnes in 2016 to 233 tonnes in 2018 (+7%). Main species in 2018 was “carp, barbels, cyprinids” (63%), followed by rainbow trout (22%).

Belgium

No detailed data are available from Eurostat or national bodies. There is no production of organic aquaculture in Flanders and limited production in Wallonia.

There are only two fish farmers involved in organic aquaculture in Wallonia. Based on qualitative feedback, the production is operated by small companies and the production is mainly sold live for leisure fish. In this context, the organic production is low and estimated at about 11 tonnes per year. A part is intended for leisure fishery (sold live) and another for human consumption.

Public authorities support the conversion to quality schemes (including organic production). There is a slow move from the live fish sector (recreational activities) to the human food sector. The price on the live fish market is higher than for human consumption (organic or conventional) and the administrative burden is assessed to be lower.

Latvia

The volume of organic aquaculture production is low and relatively stable in Latvia: From 2 to 8 tonnes each year. No details on the species produced is available.

Table 23: Volume of organic aquaculture production in Latvia between 2015 and 2020 (tonnes)

	2015	2016	2017	2018	2019	2020
Total	7	2	8	7	8	8

Source: Eurostat

Czechia

Based on Eurostat, there was only 1 tonne of production of organic aquaculture in 2019 and no production in 2020, this is shown in Eurostat as “Carp, barbels, cyprinids”.

Portugal

Production of organic mussels was reported until 2017 by Eurostat (1.100 t). This was operated by one company which did not renewed its organic certification for mussels.

New organic production is currently being tested with expected production of about 20 tonnes of European seabass and gilthead seabream.

Based on interviews, an organic algae production is in progress:

- Sea lettuce (*Ulva* sp.), since 2017 the current production has been at 20-40 t/year (wet weight), the expected production in 2022 is 70 tonnes.
- *Gracilaria gracilis* (ogonori), current production at 5 t (wet weight)
- *Codium tomentosum* (velvet fingers), current production at 10 t (wet weight)
- *Porphyra dioica* (Atlantic nori), current production at 1.5-2.5 t (wet weight)
- *Porphyra umbilicalis* (Atlantic nori) – R&D stage
- *Palmaria palmata* is at R&D stage

Production of marine plants (*Salicornia* and *Sarcocornia*) are at R&D stage.

Cyprus, Estonia, Finland, Luxembourg, Malta, Slovakia, Sweden

No organic aquaculture production is reported from Eurostat in these MS and no information is available at national level. It is assessed that there is no organic aquaculture production in these MS.

3.3 Main third countries

United Kingdom

Organic aquaculture production in the United Kingdom is primarily directed towards salmon, where Scottish farmed salmon represents most of the volume produced. One exception is Glenarm Organic Salmon which is the largest producer of salmon in Northern Ireland. The company produces up to 600 tonnes of organic salmon annually which represents most of the region's annual production.

For Scotland, the Scottish Annual Finfish Production Surveys have for the past few years included organic aquaculture production as part of the survey questions. Of the 231 active Atlantic salmon seawater cage sites in 2020, 9 were certified as organic, producing 12.528 tonnes. This was a significant increase compared to 2019 (+181%) while the total Scottish salmon production slightly decreased (-6%). While the share of organic salmon in the total salmon production produced in Scotland averaged 2% in the period from 2011 to 2019, the share rose to 6,5% in 2020. The main reason was that in 2020 and 2021, new production sites for organic salmon were approved in Scotland (from 4 to 9 sites between 2019 and 2020). Provided there were no collapse in profit margins for producers, it is therefore likely that organic salmon production in Scotland continued up in 2021.

The biggest organic salmon producer in Scotland in 2020 was Cooke Aquaculture Scotland. Another company that started to offer Scottish organic salmon in 2020 was MOWI.

Table 24: Organic salmon production in the UK (in tonnes)

Country	2015	2016	2017	2018	2019	2020
UK - Northern Ireland*	600	600	600	600	600	600
UK - Scotland	2.382	3.903	4.644	4.219	4.462	12.528
Total UK	2.982	4.503	5.244	4.819	5.062	13.128

Source: Scottish Annual Finfish Production Surveys. *Northern Ireland production are estimated based on stakeholders interviews.

Of the 52 sites recorded as being active in rainbow trout production in 2020, none were certified as organic. Of the 18 sites recorded as producing other species than Atlantic salmon and trout in 2020, no organic production was reported.

In the Scottish Shellfish Farm Production Survey, producers were asked to provide information on organic aquaculture production. Of the 125 businesses and 167 sites producing shellfish, no organic aquaculture producers were identified in the survey.

Norway

Salmon also dominates organic aquaculture production in Norway. Of the total organic aquaculture production in 2020 of 27.000 tonnes wfe²⁶, 95% was Atlantic salmon while 1.400 tonnes were mussels. A small quantity of algae was also produced (43 tonnes) of the sea belt (*Saccharina latissima*).

There seems to be increased interest in producing organic salmonids in Norway. This is evident from the sharp increase in production from 2019 to 2020. Increased interest is also recorded for the period following

²⁶ wfe: whole fish equivalent

2020. By the end of 2020, seven Norwegian farming companies were certified for producing Atlantic salmon in sea sites. In the turn of the year 2021/2022, there were 13 companies with production sites certified for organic aquaculture production. Based on the increasing number of organic certified salmon companies (sites) it is likely that production continues to increase.

It is also worth mentioning that the first organic farmed Norwegian trout is likely to be available on the market in late 2022/beginning of 2023, as the first Norwegian trout producer was certified organic in late 2021.

There is a limited number of mussel producers in Norway and only one producer of organic mussels²⁷. Since most of the mussel production in Norway is sold as organic, the organic production is likely to remain relative stable.

As for seaweed, the number of companies harvesting, processing, and selling organically produced seaweed products is increasing. As of the beginning of 2022 there were five aquaculture producers of organic seaweed. The companies were also certified for processing. In addition, there are four companies certified for processing and selling certified algae.

Table 25: Organic aquaculture production in Norway (in tonnes wfe)

Species	2015	2016	2017	2018	2019	2020
Atlantic salmon	16.000	16.000	12.411	15.496	16.361	25.546
Mussel	600	1.200	1.200	1.200	1.410	1.410
Algae	-	-	-	-	-	43
Total	16.600	17.200	13.611	16.696	17.771	26.999

Source: Eurostat

²⁷ Source: Debio

Drivers identified:

A major driver behind the growth in organic aquaculture production in Norway is attributed to producers' commitments of producing fish and seafood in a sustainable and environmentally friendly way. Several producers use their organic certification as a part of their strategy of being transparent through their supply chain regarding their way of producing. Another driver behind producing organic aquaculture products is seeking profits. While producing finfish according to organic standards itself require a higher market price for maintaining a profit margin (due to higher feed cost, low fish density and long fallowing period), switching part of the production to organic standards could be seen as seeking new and better market opportunities in a niche market where margins/profits have historically been high.

It could also be argued that becoming an organic aquaculture finfish producer has become easier as the number of fish feed factories offering organic certified fish feed has recently increased.

3.4 Synthesis of EU organic aquaculture by species

Synthesis by species

In 2020, the total production of organic aquaculture in the EU was 74.032 tonnes. It is a +60% increase compared to 2015 figures. In 2020, the main species was by far mussel, accounting for 57% of the total volume followed by salmon (17%). Compared to 2015, bivalves and especially mussel became dominant in the organic production and most finfish species have either stayed stable (salmon, trout) or decreased (carp) except for European seabass/gilthead seabream.

Table 26: EU 27 organic aquaculture production in 2020 (tonnes)

Species	EU total production (2020)	Organic production (2020)	% organic / total	Evol. 2020/2015
Mussel	409.622	41.936	10%	+110%
Salmon	17.095	12.870	75%	-1%
Trout	187.936	4.590	2%	-8%
Carp	85.198	3.562	4%	-49%
Oyster	97.544	3.228	3%	na
European seabass/ gilthead seabream	174.501	2.750	2%	+38%
Other species	121.900	5.096	4%	na
Total	1.093.796	74.032	7%	+60%

na: not available

Sources: FAO 2020 (total) and EUMOFA.

Mussel

Mussel is the most important farmed species in EU aquaculture in terms of volume. The total production in the EU reached 409.622 tonnes in 2020. In recent years the volume of mussel production certified as organic has significantly increased in the main producing countries from around 20.000 tonnes in 2015 up to 41.936 tonnes in 2020. This increase is mostly attributable to the Netherlands, Germany and Denmark whereas the organic production decreased in Ireland which used to be the leader of EU organic mussel farming.

Table 27: EU production of organic mussel in 2020 (tonnes)

Country	Total (2020)	Organic (2020)	% Organic
Netherlands	32.400	7.978	25%
Italy	50.338	7.558	15%
Germany	13.490	6.500	48%
Ireland	14.729	5.180	35%
Denmark	6.317	4.818	76%
France	61.220	3.135	5%
Spain	204.466	3.104	2%
Bulgaria	2.141	3.005	***140%
Slovenia	383	623	163%
Croatia	497	35	7%
Total	409.622	41.936	10%

*Species *Mytilus* only ** Estimate based on 2018 organic production ***Bulgarian mussel production seem to have increased between 2019 and 2020

Sources: FAO 2020 (total) and EUMOFA.

Salmon

Historically, two EU Member states Ireland and UK, were involved in the organic production of Atlantic salmon, which is a major organically certified species in the EU. The major part of EU organic salmon was produced in Ireland. The rest was produced in the UK: in Scotland and, to a much lesser extent, in Northern Ireland.

The whole salmon production in Ireland is certified organic. The main driver behind organic salmon farming in Ireland was the regulatory framework for conventional salmon. The producers realized that it is very difficult for small scale producers to compete with Scotland and Norway in terms of production costs and consequently price. Instead, the Irish salmon farming industry focuses on the organic market segment.

In 2019, before Brexit, the total production of organic salmon in the EU was 16.395 tonnes (8% of the total EU farmed salmon production), Ireland accounting for 69% of the total and the UK 31%.

Since Brexit, the total EU organic salmon production has dropped as it is no longer including the UK production and only including the Irish production, reaching 12.870 tonnes in 2020 (about 75% of EU 27 total production in 2020).

In the meantime, UK production experienced a strong increase (+259%) due to the certification of new salmon farms in Scotland. The Scottish production reached 13.128 tonnes in 2020. In Norway the organic salmon production also soared to reach 25.546 tonnes in 2020 (compared to 16.361 tonnes in 2019), with new certified farming sites.

Table 28: EU production of organic salmon in (tonnes)

Country	Total (2020)	Organic (2019)	Organic (2020)	% Organic (2020)
Ireland	12.870	11.333	12.870	100%
UK	193.675	5.062	13.128	7%
Total EU 27	12.870	11.333	12.870	75%

Sources: FAO 2020 (total), EUMOFA

Trout

The organic trout production is widely spread among EU member states. The total production volume of organic trout in the EU reached 4.590 tonnes in 2020 (about 2% of the 2020 total farmed trout production in the EU). In 2020, the main producer was by far France (52% of the total volume) followed by Spain (19%), Denmark (11%), Italy (9%) and Germany (7%). Since 2015, the EU production of organic farmed trout has decreased due to strong decreasing trends specifically in Denmark and to a lesser extent in France and Italy. The decrease of rainbow trout production is analysed by a stakeholder interviewed as being linked to a mismatch between EU organic legislation and the Danish regulation of fish farming (see Denmark section).

Table 29: EU production of organic trout in the EU (tonnes)

Country	Total (2020)	Organic (2020)	% organic
France	37.200	2.346	6%
Spain	15.806	917	6%
Denmark	32.944	642	2%
Italy	34.473	323 *	1%
Germany	9.004	250	3%
Austria	2.625	54	2%
Romania	2.650	47	2%
Belgium	na	11	na
Total	187.936	4.590	2%

na: not available

*2018 data provided due to 2019 and 2020 data not available.

Sources: FAO 2020 (total), EUMOFA

Carp

Carp is one of the most widespread farmed fish species in Europe, traditionally in Central and Eastern Europe. EU total carp production reached 85.198 tonnes in 2020. In 2020, organic carp production in the EU amounted to 3.562 tonnes. Almost half of the total was produced in Hungary. Other main producing countries were Lithuania and Romania. Compared to 2015, the organic carp production has been divided by two.

In Central and Eastern EU countries, organic carp farming started around 2010 with the assistance of 2007-2013 funding from European Fisheries Funds (EFF). The conversion process focused on common carp because the differences between a normal traditional rearing practice and organic practices were not significant. However, it could be that the certification costs, the lack of demand for organic carp and the low premiums made farmers go back to non-organic production.

Table 30: EU production of organic carp in the EU (tonnes)

Country	Total (2020)	Organic (2020)	% Organic
Hungary	13.296	1.743	13%
Romania	9.030	761	8%
Lithuania	3.489	614	18%
Poland	24.270	282	1%
Austria	667	147	22%
Germany	4.788	15	0%
Czechia	18.365	1	0%
Total	85.198	3.562²⁸	4%

Sources: FAO 2020 (total), EUMOFA

²⁸ Possible discrepancies in the total are due to rounding.

Oyster

Most of the EU 27 oyster production occur in France. In 2019, EU production of farmed oyster reached 97.544 tonnes of which 83% was produced in France. Organic oyster accounted for 3% of the total volume with 3.328 tonnes produced in 2020 of which 98% was produced in France. Small productions also occur in Italy, Spain and the Netherlands.

Table 31: EU organic oyster production in 2020 (in tonnes)

Country	Total (2020)	Organic (2020)	% organic
France	80.785	3.178	4%
Italy	182	13*	7%
Spain	1.089	37	3%
The Netherlands	2.350	na	na
Total	97.544	3.228	3%

na: not available

* Estimate based on 2018 organic production

Sources: FAO 2020 (total) and EUMOFA

European seabass/gilthead seabream

European seabass and gilthead seabream production occur exclusively on the Mediterranean coast. Thus, member states involved in organic farming for these species are Italy, Greece, France, Croatia, and Spain.

Within the EU 27, organic production of European seabass and gilthead seabream amounted to 2.750 tonnes in 2020, which represented 1,5% of the total production of both species. In five years (2015–2020), production under organic certification increased from over 1.000 tonnes in 2015 to 2.750 tonnes in 2020, driven mainly by the increase of Greek production. With only two companies involved in European seabass and gilthead seabream organic production, Greece has the highest organic production with 1.574 tonnes in 2020, representing 1,6% of the Greek production of both species. In the same year, France has recorded the highest weight of the organic production in the total production of European seabass and gilthead seabream (i.e. 5,2%) with one leading farm Gloria Maris (other farms have only limited organic production). There is also an increasing trend of organic production in Spain from 116 tonnes in 2015 to 333 tonnes in 2020 and in Italy from 144 tonnes to almost 350 tonnes²⁹. There is also a unit in Portugal that produces organic European seabass and gilthead seabream at an experimental level.

Main barriers to growth concern the general stagnation of the sector and the related lack of innovation as well as increasing costs that are difficult for SMEs to bear.

²⁹ As organic production in Italy in 2020 were not available, data for 2018 have been used, assuming that Italian organic production have at least remained stable between 2018 and 2020.

Table 32: EU production of organic European seabass and gilthead seabream in 2020 (tonnes)

Country	Total (2020)	Organic (2020)	% Organic
Greece	102.739	1.574	2%
Italy	10.894	348 *	3%
Spain	29.224	333	1%
France	4.380	250	6%
Croatia	14.534	245	2%
Total 5 MS	161.771	2.750	2%
Total EU 27	174.501	2.750	2%

* Estimate based on 2018 organic production

Sources: FAO 2020 (total), EUMOFA

Algae

In Europe, algae aquaculture production is still at an early stage of development as most of the algae production come from harvesting from wild stocks. The JRC estimated that seaweed harvesting from wild stocks stood for 98% of the total algae production³⁰. According to the latest available data (JRC algae database), there are 126 algae producing companies with 57% of them producing macroalgae and 43% microalgae. According to Regulation (EU) 2018/848 on organic production and labelling of organic products, the collection of wild algae is considered as organic production with some requirements for the production zones and the status of wild stocks.

Within the EU, the organic algae production is still very limited and concentrated in one Member State. In 2020, 586 tonnes were produced, overall and of these 564 tonnes were in Spain (mainly in Galicia). There are no statistics on the breakdown of the Spanish production by species. However, these include species grown on the Atlantic coast and harvested by producers such as Nori (*Porphyra umbilicalis*), Wakame (*Undaria pinnatifida*), Kombu (*Saccharina latissima*), etc. Only small volumes of Sugar kelp were produced in Denmark the same year (22 tonnes). Statistics show also a very small organic algae production in Bulgaria in 2019 (4 tonnes). Furthermore and based on interviews there is organic production of seaweeds in Portugal with an estimated production ranging between 36,5 tonnes and 57,5 tonnes per year (not included in EUROSTAT as it concerns one unit, ALGAPLUS). The species cultured include Sea lettuce (*Ulva* spp.) (20-40 tonnes/year), ogonori (*Gracilaria gracilis*) (5 tonnes/year), velvet fingers (*Codium tomentosum*) (10 tonnes/year) and Atlantic nori (*Porphyra dioica*) (1,5-2,5 tonnes/year). This production is expected to increase as production of other species is still at R&D stage (*Porphyra umbilicalis* and *Palmaria palmata*).

Given the small volumes, organic algae products are sold locally. They can be sold in specialized organic stores or online. According to interviews, the main barrier to get access to the organic certification concerns the technical requirements which are not in line with some production constraints (e.g. limits of micronutrients or minerals, etc.).

³⁰ <https://www.frontiersin.org/articles/10.3389/fmars.2020.626389/full>

Other species

Several other species are farmed under the organic certification. In 2020, the main other organic species were sturgeon in Spain (2.520 tonnes) and clam (Japanese carpet shell) in Italy (1.320 tonnes). Very small production of freshwater species and shrimps were also reported in several EU countries.

4. DRIVERS, OBSTACLES AND PROSPECTS FOR GROWTH OF THE ORGANIC AQUACULTURE SECTOR

The following section provides an overview of the drivers and barriers for the organic seafood sector. It also provides some prospects on the growth of the sector.

4.1 Drivers

Consumer demand and awareness of organic scheme at EU level (for all food products)

Across the EU organic consumption is growing and accounted for 4,7% of the EU food consumption in 2020 (+15% compared to 2019).

The EU organic scheme is well known by EU citizens, ranking first in the Eurobarometer survey³¹ (compared to Fairtrade, protected geographical indication, protected designation of origin and traditional speciality guaranteed) with a high increase over the last years: 27% awareness in 2017 and 56% in 2020.

The scheme is not “sector specific” and covers the entire food and drinks sector allowing synergies with other value chains (in terms of communication to foster consumer awareness).

High development potential for shellfish

There are no significant differences in the method of production between conventional and organic shellfish production. Thus, there is an important growth potential for the shellfish organic sector (if there is a market demand or business strategy).

In this context, we can observe two strategies: Denmark has a massive collective strategy to certify mussels under the EU organic scheme, and France where organic is an individual strategy for some producers in order to comply with specific demand or with a differentiation strategy. Strong growth of organic seafood could be achieved with the certification of a large share of mussel and oyster without significant changes in the method of production.

Public support for organic

The EU organic scheme is supported by public bodies through:

- The objective set in the EU's Farm to Fork Strategy:
 - o 25% of the EU's agricultural land under organic farming by 2030 and a significant increase in organic aquaculture,
 - o reduce overall EU sales of antimicrobials for farmed animals and in aquaculture by 50% by 2030
- Possible support for conversion to the organic scheme (this will depend on MS for EMFAF),
- Communication/awareness campaign supported by public bodies (EU and national).

³¹ <https://webgate.ec.europa.eu/ebsm/api/public/deliverable/download?doc=true&deliverableId=73752>

4.2 Barriers

Finfish – Specific requirements and additional costs for organic production

Several barriers have been highlighted by stakeholders which are related to difficulties to comply with organic regulations for finfish (no technical barrier for shellfish). These specific organic requirements lead to additional costs, which must be compensated by a price premium in order to be profitable for producers.

The main issues mentioned by stakeholders:

- Animal welfare: need for specific investments or additional labour,
- Separation of organic production from conventional production: need to develop specific production facilities and no mutualisation of production costs between organic and conventional for producers,
- Availability and higher costs of organic feed, that must come from organic aquaculture or from certified fisheries,
- Availability of organic certified juveniles,
- Management of parasites in a context of limited use of medicine,
- Lower density for organic than for conventional.

Finfish – Different interpretation of the EU organic requirements by MS and certification bodies

In a letter to the European Commission (October 2021), the Federation of European Aquaculture Producers (FEAP) reported different interpretations of the Regulation (EU) 2018/848 between MS and certification bodies: definition of “*closed recirculation aquaculture facility*” (which is prohibited for on-growing purposes in the EU organic Regulation), definition of juveniles and the use of some products in animal feed (e.g. astaxanthin).

Finfish – closed recirculation aquaculture systems (RAS) are not allowed for on-growing purposes in the EU organic Regulation

Closed RAS is only allowed in the EU organic regulation for hatcheries and nurseries or facilities for the production of species used for organic feed organisms. RASs have several environmental advantages, but require significant input of external energy, high stocking densities (for economic reasons), advanced waste water treatment devices, use of UV radiation and use of pure oxygen. All the above, together with the disconnection of the aquaculture production from the external natural aquatic environment, makes the closed RAS not in line with the principles of organic production. Thus, stakeholders who invest in this method for on-growing purposes cannot be labelled as organic. In addition, the Federation of European Aquaculture Producers (FEAP) highlighted in a letter to the European Commission (October 2021) that the definition of RAS is unclear in the EU organic Regulation, which limits possible investments.

Finfish – Extensive polyculture in ponds with organic and non-organic is not allowed in the EU organic Regulation

Stakeholders from Eastern EU Member States produce finfish with extensive method in ponds, through a polyculture system (several species in the same ponds). The EU organic regulation does not allow that an organic carp (which is the main species produced) is farmed in the same pond as other conventional species.

From the producer side, this polyculture system is considered as environmentally friendly, and the added value of organic is not clear for the market targeted by these producers.

Finfish – No coherence between EU organic Regulation and national requirements in some MS

Danish public authorities develop requirements for the largest finfish production sites (see section on Denmark in this report) which are not compatible with the EU organic requirements. This limits the development of organic aquaculture in this MS.

Shellfish – Organic regulation for shellfish: classification of water quality

For shellfish, one of the main organic requirements is the water quality. Since the entry into force of the Regulation 2018/848 on the 1st of January 2022, only waters classified A from a health point of view or of high ecological status under the Water Framework Directive (WFD) (Directive 2000/60/EC) or of good environmental status under the Marine Strategy Framework Directive (MSFD) (Directive 2008/56/EC) are suitable for organic production. This leads to two difficulties for producers:

- Exclusion of some areas which are classified B and which have not achieved the good status neither under the WFD nor the MSFD.
- Increased uncertainty for producers to be able to develop a long-term and stable strategy based on organic products (depending on external factor: water quality in the growing areas).

Shellfish – Limited market incentive for organic shellfish

Based on qualitative feedback, there is a limited (or even no) market incentive for organic shellfish production. This means a limited market demand and a limited (or even no) price premium.

Shellfish/finfish – Competition with other sustainability schemes

Other sustainability schemes are available for wild caught products, the main one being MSC (applying only to wild caught fish) which is well known by consumers (recognised by 49% of consumers)³² and widely used in Northern EU. Other private schemes have also been developed for farmed products, for instance ASC. Only one situation of competition between MSC and “organic” for the same product has been identified at EU level: some Dutch shellfish which are at the in between aquaculture and fishery.

Stakeholders must pay a fee to scheme owner for some of these private schemes (there is no fee to the scheme owner for organic which is public).

³² <https://www.msc.org/understanding-seafood-consumers>

Shellfish/finfish–“Organic seafood”: confusing message for consumers

The message of organic products is clear for agricultural products: mitigated impact on environment, increased animal welfare, expected benefits for health.

For organic finfish, specific benefits may be highlighted to consumers: animal welfare, organic feed and limited use of veterinary treatments and antibiotics. The impact of these arguments will depend on the level of awareness of consumers on aquaculture farming method.

However, there are some communication barriers regarding the added value of “organic” aquaculture products to consumers:

- **Wild caught products are not covered by organic:** while the “organic scheme” is well known by consumers³³, it only applies to aquaculture products and not to wild caught products (except for algae)³⁴. Aquaculture accounts for 27% of the EU seafood production and 24% of EU seafood consumption, thus some of the main species consumed at EU level are not covered by “organic”: tuna, cod, Alaska pollock, hake, herring, squid, sardine, mackerel, sprat and saithe³⁵. In addition, consumers tend to prefer wild caught products (32% of the consumer at EU 27 level) compared to farmed product (7%), for 61% of the consumers, it depends on the products or they don’t have a preference (based on Eurobarometer).
- **Conventional shellfish production (mussel and oyster) is already environmentally-friendly:** conventional shellfish production is already extensive with no inputs (no feed, antibiotics) and a low carbon footprint. The organic scheme is based on water quality, the added value may be difficult to highlight for consumers.

Shellfish/finfish-Licensing procedures (common to organic and conventional)

Licensing procedures for aquaculture sites are complex for fish farmers. This limits the development of new sites. This limit concerns both conventional and organic.

³³ Organic scheme known by 56% of the EU 27 citizens – Source Eurobarometer 504 –

<https://webgate.ec.europa.eu/ebsm/api/public/deliverable/download?doc=true&deliverableId=73752>

³⁴ There are other indicators or schemes to assess the sustainability of wild caught fish, for instance maximum sustainable yield (MSY) or MSC scheme.

³⁵ Most consumed species from fishery, based on EU fish Market – EUMOFA

4.3 Prospects for growth of organic aquaculture in the EU

The development of organic aquaculture is supported by the EU policy. The Farm to Fork strategy established in 2020, aims at “25% of the EU’s agricultural land under organic farming by 2030 and a significant increase in organic aquaculture”. In 2021, the “EU Action Plan for the development of organic production” (COM(2021)141 final)³⁶ clearly identifies organic aquaculture as a sector with a potential for development. The Action Plan states that the Commission intends to 1) support research and innovation and 2) identify and address obstacle to the growth of EU organic aquaculture. Still in 2021, the “EU Strategic guidelines for a more sustainable and competitive EU aquaculture for the period 2021 to 2030” (COM(2021)236 final)³⁷ defines the promotion of organic aquaculture (and other aquaculture systems with lower environmental impact) as a key issue.

In order to assess the potential for growth, we propose prospects for the growth of organic aquaculture. These prospects are differentiated between molluscs and finfish.

In each case, we propose

- “pessimistic” prospects where the different barriers identified are not addressed,
- “optimistic” prospects indicating the maximum growth potential perceived at present, if the barriers identified are addressed.

These prospects have been elaborated by the EUMOFA team and are based on the data collected in the context of this study (volume of production, identification of barriers and drivers).

These prospects are realistic but are not a prediction of the future as many factors may impact the development of organic aquaculture at EU level (evolution of organic Regulation, consumer demand, costs of production, other regulations related to aquaculture, etc.).

The time frame for these prospects is 2030, as for the EU’s Farm to Fork strategy.

³⁶ <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52021DC0141>

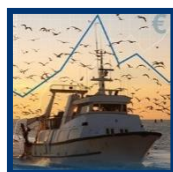
³⁷ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2021:236:FIN>

Table 33: Growth prospects for organic aquaculture in the EU

	“Pessimistic” growth prospects	“Optimistic” growth prospects
<p>Molluscs</p> <p>Present situation: 45.000 t organic (mainly mussel)</p> <p>About 600.000 t of production (organic + conventional)</p>	<p>Prospects: about 33.000 t - 30.000 t of organic mussel and 3.000 t of organic oyster (6% of EU production)</p> <p>Within pessimistic prospects, the organic scheme remains a company choice (no sectoral strategy to develop the organic scheme at regional, national or EU level) in a context of low incentive from the market for organic (low demand, no price premium).</p> <p>In terms of volume, the share of organic decreases in Denmark, Germany, Ireland and the Netherlands and remains stable in the main producing MS: Spain, France and Italy.</p>	<p>Prospects: about 120.000 t of organic molluscs (20% of EU production - 10-20% of the production in the main producing MS, 70% in other MS)</p> <p>Within the “optimistic prospects”, the organic shellfish production could reach:</p> <ul style="list-style-type: none"> - about 10-20% of the production in the main MS (namely Spain, France and Italy for mussel and France for oyster). At present, the share is 10% for mussel in Italy and 5% maximum in other MS and other species. - about 70% of the production in other MS, with the organic scheme used with a differentiation objective. At present, the share of organic is 73% for mussel in Denmark and between 20% and 35% for mussel in Ireland, Germany and the Netherlands. <p>There are no significant technical or economic barriers for the certification under the organic scheme of most of the EU production. The main barriers being the quality of water.</p> <p>The development of the “optimistic” prospects will depend:</p> <ul style="list-style-type: none"> - on the producers and professional bodies strategies regarding organic, - on the evolution of EU water quality (% of water area suitable for organic production).
<p>Finfish</p> <p>Present situation: 24.000 t organic</p> <p>About 500.000 t of production (organic + conventional)</p>	<p>Prospects: about 15.000 t (3% of EU production) of organic finfish</p> <p>Within these prospects, the technical barriers to developing organic finfish production remain (low availability of feed) and higher production costs (lower density, specialised production sites) are not compensated by the price premium.</p> <p>A small demand for organic products remains (in particular for specialised shops in organic).</p> <p>In this context, the EU organic production remains small because 1) the EU organic market is mainly supplied with products from third countries (namely UK and Norway) and/or 2) the market requires other certifications than organic (other sustainability certification, local production, etc.).</p>	<p>Prospects: maximum 125.000 t (25% of EU production) of organic finfish</p> <p>Within this scenario, the technical barriers for producing organic finfish are addressed (structuring of the value chain and possible adaptation of the EU Regulation).</p> <p>The higher production costs are counterbalanced by a price premium and there is a growing demand for organic. Some large-scale retailers require “organic” as a market access condition for farmed seafood products.</p> <p>For consumer communication, there is an articulation between organic scheme (for farmed products) and other initiatives for wild caught products, which makes the message of “organic seafood” clear for consumers.</p>

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