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Committee for Fisheries (STECF)

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The EU Fish Processing Sector.  
Economic Report  
(STECF-19-15)

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## **Abstract**

Commission Decision of 25 February 2016 setting up a Scientific, Technical and Economic Committee for Fisheries, C(2016) 1084, OJ C 74, 26.2.2016, p. 4–10. The Commission may consult the group on any matter relating to marine and fisheries biology, fishing gear technology, fisheries economics, fisheries governance, ecosystem effects of fisheries, aquaculture or similar disciplines. This report contains the 2019 economic report of the EU fish processing sector, covers the period 2008 to 2017 and includes information on the EU fish processing industries in terms of number of enterprises, employment, income and costs. The profitability and performance of the sector is also reported in terms of gross value added, profits, profit margins and labour productivity. In 2017 the sector was made up of about 3,500 firms, provided about 130,000 jobs and produced a turnover of €32 billion. The first time, because of new variables collected under EUMAP, the analysis of the socio-demographic aspects of the labour forces employed by the sector is provided, in terms of gender, age, nationality and educational aspects. The report provides an in-depth look of the different factors affecting the economic performance of the EU fish processing industry with a special focus on the major drivers and issues affecting the sector. Following a specific request, the report provides an assessment of the sources of raw material (e.g. internal catches, internal aquaculture, imports) detailing potential specificities by species, type of industry and Member State and provide suggestions for the improvement of the future data collection. The report also provides a first insight on the potential impact of the Autonomous Tariff Quotas (ATQs).

## **SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES (STECF) – 2019 Economic Report on the EU Fish Processing Sector (STECF-19-15)**

### **Request to the STECF**

STECF is requested to review the report of the STECF Expert Working Group meeting, evaluate the findings and make any appropriate comments and recommendations.

### **STECF observations**

The Expert Working Group, STECF EWG 19-15, on the Economic report of the EU fish processing sector 2019, was convened in Ispra, Italy 18-22 November 2019. STECF reviewed the report and notes that the EWG addressed all the ToRs. The report covers the period 2008 to 2017 (2018 being requested but optional) and provides a comprehensive overview of the latest available information on the structure and economic performance of the EU fish processing industry, from an economic and social point of view.

STECF notes that under the new EU-MAP the transmission of data about the fish processing sector is only voluntary. The EWG used complementary sources of data (e.g. Structural Business Statistics and Prodcom from Eurostat - in line with suggestions in the 2017 report) to close gaps where MS have not delivered data.

STECF observes that the EWG paid special attention to the aggregation of national indicators. Those indicators are aggregated for EU totals but as not all MS delivered data, the EWG tried to adjust the data set to maintain a homogeneous number of MS. This was necessary to avoid biases, for EU totals, and was done by the inclusion (or exclusion) of some MS, throughout the analysed period. The EWG used imputations/estimations for some MS, in line with the protocol approved by the STECF in plenary report 19-02.

STECF notes that the report covers the period 2008 to 2017 (including 2018 where available) and includes information on the EU fish processing industries in terms of number of enterprises, employment, income and costs. The profitability and performance of the sector is also reported in terms of gross value added, profits, profit margins and labour productivity.

STECF observes that the EWG analysed the socio-demographic aspects of the labour forces employed by the sector for the first time. The new variables includes information on gender, age, nationality and educational level. This data was collected under the EUMAP and were provided by the MS.

STECF observes that the report provides an in-depth look at the different factors affecting the economic performance of the EU fish processing sector. A special focus was on the major drivers and issues affecting the sector and gives insight on the main factors influencing the industry's economic performance, such as import and export trends, competitiveness, market prices and consumption, certification, innovation and level of dependency with the local fishing fleet and aquaculture sector.

STECF observes that the EWG addressed a special request on the assessment of the sources of raw material (e.g. catches by EU fishing fleets, EU aquaculture company production and imports) with details on potential specificities by species, type of industry and MS. The report also provides suggestions for the improvement of the future data collection.

STECF observes that the report provides a first insight on the potential impact of the Autonomous Tariff Quotas (ATQs), which allow fish processors to import raw material with a preferential or zero tariff.

STECF notes the following main findings from the EWG report:

- In 2017, the overall number of enterprises carrying out fish processing as a main activity was equal to around 3,500 firms. In 2017, the sector has produced a turnover of about €32 billion and employed more than 130 thousand people (corresponding to around 120 thousand FTE).
- The great bulk of enterprises (98%) of the sector are SMEs (less than 250 employees), 85% are small-sized (less than 50 employees) and more than half are micro-enterprises. The distribution of enterprise by size-classes shows many differences across MSs, with Finland, Slovenia, Sweden, Greece and Italy with the highest percentages of micro-enterprises. The highest shares of bigger enterprises (above 50 employees) are in Eastern Europe (e.g. Poland and Lithuania).
- Over the analysed period (2008-2017) a concentration of production is observable. Indeed, data show a decrease in the number of enterprises (-7%) and an increase of +20% in the turnover across the sector.
- The analysis carried out on changes over the last two years (2017 vs. 2016) supports this positive trend of higher efficiency, testified by a slight increase in turnover (+2%) and a decrease in operational costs (-2%). The result has been a generalised and (more than) proportional increase of all the profit indicators. In particular, the value added produced by the sector in 2017 was 18% higher than the previous year and represented 20% of total income. This efficiency trend has also positively impacted the labour indicators: the average wage is stable at €30 thousand over the 2016-2017 period and 34 FTE per enterprise on average.
- Spain is the leading country followed by Italy, in terms of the number of active companies and by UK, in terms of turnover produced by the sector (Poland and Denmark follow as third and fourth countries in terms of turnover).
- The main drivers for change affecting the industry in the latest years can be summarised as
  - residual high dependency on imports for the supply of raw materials,
  - occurrence of outsourcing,
  - increase of concentration both on the demand and on the supply side, the increasing demand for certified products,
  - the "supermarketization" also for the supply of fish products (i.e. the increasing role of supermarkets as the dominant food suppliers among the different distribution channels) and
  - the limitation to the exchange of fish products created by current and potential phenomena (e.g. the Russian embargo, already in place and extended until 2020, and Brexit, whose impacts remain unknown).
- The purchase of fish and raw material is the dominant cost item for the sector, accounting for almost 70% of the total production costs. Understanding which segments and Member States use EU raw material (either from wild fisheries or from aquaculture) and which ones depend on imported supplies is of high importance for assessing the strengths and vulnerabilities of the sector. The history of the data collection (DCR and DCF before and currently EUMAP) suggests that the compilation of the raw material data is quite costly and challenging. This is why a series of initiatives have already been undertaken, from pilot studies carried out by MSs to specific studies funded by the Commission, e.g. SECFISH project.
- In relation to the social aspects, the analysis revealed that a) the sector can be considered a gender equal sector as the proportion of female and male is well balanced; b) the 40-64 age class make up the largest proportion (50%) of people employed in the processing industry; c) an almost equal distribution of employees regarding their educational levels when looking at the EU totals but with very high differences between MS and the share of unknown too high to provide average at EU levels and make comparison with other sectors d) the vast majority (83%) of people employed in the sector are EU nationals of their own country, being the rest mainly workers from other EU MS.

## **STECF conclusions**

STECF concludes that the Report on the Economic performance of the fish processing industry provides a comprehensive overview of the most recent information on the structure and economic performance of the EU fish processing industry, from an economic and social point of view.

STECF concludes that the report has largely benefited from the methodological approach based on estimations for data-missing countries as it closed some Gaps for MS which have not delivered data. Considerable time has been spent agreeing the most appropriate estimation and imputations for data. From a quality control perspective, estimated data was cross-checked with submitted data.

STECF concludes that EWG 19-15 experienced delays on the provision of final tables for the national chapters, due in part to re-submissions of data by MS and/or technical problems faced by JRC to compile the data. This led to delays on parts of the report and time wasting for experts.

STECF concludes that because of this, the amount of time devoted, during the meeting, for discussion among experts on general topics was very limited. Timing aspects should be taken in due account for the next reports, to avoid such situations.

As for the AER report, STECF concludes that a discussion on the streamlining of the processes is necessary and this should be completed before the next meeting between JRC and STECF.

STECF concludes that the experts detected a not always similar list of variables by MS on which data they decided to collect. That seems to derive from an incomplete awareness and understanding of what is mandatory and voluntary. DG Mare and STECF need to clarify these aspects before the next data call in 2021.

STECF concludes that in order to provide an accurate EU analysis and comparison among MS, it would be advisable that all MS would submit social data according to the age and educational categories recommended by PGECON and to split the age group 40-64 into smaller groups.

STECF concludes that, the collection of raw material is difficult, as highlighted by the lower coverage by MS., This is mainly due to large difficulties in deriving information directly from industries. The industry seems very reluctant to deliver the data because of the extra workload and costs incurred. Therefore, it might be challenging to collect and receive representative data and further elaboration is necessary before a mandatory data collection for raw material could be considered.

STECF concludes that a way forward, could be to investigate if the data stored at the enterprise level according to the Control Regulation (traceability legislation) could be used for analysing the raw material input for the industry. This could minimize the cost for the industry and at the same time provide the needed data for analysing the raw material value chain within the EU fish processing sector.

STECF concludes that the data requested within the SECFISH project for a feasibility study are available at the enterprise level and that it is possible to gather the data at a CN 8-digit level (or species and product level), which makes it comparable at a species and product level within the EU. However, a main species and main product form approach in line with the Finnish data collection example could be used as an alternative approach.

STECF concludes that the EU fish processing sector faces specific challenges in the context of the circular economy because of the specificities of their products or value-chains, their environmental footprint or dependency on materials from outside Europe. Key questions are how and which residuals of raw materials could be re-used to close the loop in a circular context. It is therefore highly recommended that studies on raw materials residual streams of the EU fishing, aquaculture and fish processing sectors are initiated by the EU Commission in order to reach the goals of the adopted Circular Economy Package.

STECF concludes that with the available data and for the studied commodities (e.g. Alaska pollock frozen, blue grenadier frozen and surimi), the main conclusion of the analysis carried out on ATQs is that they do not significantly affect the market conditions and the behaviour of imported quantities and prices do not change depending on the availability of quota. This can be due to a variety of factors not necessarily related with the ATQ, and therefore, further research is needed for being conclusive on this issue.

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**EXPERT WORKING GROUP EWG-19-15 REPORT**

## **REPORT TO THE STECF**

### **EXPERT WORKING GROUP ON The EU Fish Processing Sector. Economic Report (EWG-19-15)**

**Ispra, Italy, 18-22 November 2019**

This report does not necessarily reflect the view of the STECF and the European Commission and in no way anticipates the Commission's future policy in this area

## **1 INTRODUCTION**

The 2019 Economic Report on the EU Fish Processing Sector provides a comprehensive overview of the latest information available on the structure and economic performance of the EU fish processing industry, from an economic and social point of view, updated at the year 2017 (for some countries at 2018).

The report covers the period 2008 to 2017 (2018 being requested but optional) and includes information on the EU fish processing industries in terms of number of enterprises, employment, income and costs. The profitability and performance of the sector is also reported in terms of gross value added, profits, profit margins and labour productivity.

For the first time, the analysis of the socio-demographic aspects of the labour forces employed by the sector is provided, in terms of gender, age, nationality and educational aspects.

The report provides an in-depth look of the different factors affecting the economic performance of the EU fish processing industry with a special focus on the major drivers and issues affecting the sector and gives insight on the main factors influencing the industry's economic performance, such as import and export trends, competitiveness, market prices and consumption, certification, innovation and level of dependency with the local fishing fleet and aquaculture sector.

Given that under the new EU-MAP, the transmission of data about the fish processing sector is only done on a voluntarily basis, complementary source of data (e.g. Structural Business Statistics and Prodcom from Eurostat) was used for some countries (in line with what suggested by the 2017 report).

Furthermore, in aggregating national indicators to obtain the EU totals, a lot of effort has been devoted by the experts to maintain a homogeneous number of Member States over the time series. Indeed, for the first time, the data for EU totals represent the actual evolution and are not biased by the inclusion (or exclusion) of some Member States, throughout the analysed period (mainly due to the voluntarily of the data collection for the fish processing sector under EUMAP). The compilation of EU aggregates required the use of imputations/estimation for some Member States, in line with the protocol approved by STECF 19-02. Thanks to this, the EU overview analysis is based on the aggregation of a full dataset for 24 Member States (all the Member States collecting data under DCF and/or EUMAP). It is important to highlight that the reported has largely benefited of this methodological approach but a lot of time was spent, during the meeting, for agreeing on the most proper estimation and imputations and on cross-checking submitted data with estimated data.

Furthermore, for the first time and with the aim of providing a real EU overview of the sector, the report includes a brief analysis of the sector also for Member States involved in data collection under EUMAP, but not collecting data for the fish processing sector because of a very small sized industry (i.e. Austria, Hungary and Czech Republic). For these countries and for those not submitting data because of the voluntarily of the data collection (Netherlands, Portugal and Estonia) and in one case for inconsistent data for 2016 and 2017 (France), the analysis is reported in a more synthetic shape (mini-chapter) in the Annex, using Eurostat (Structural Business Statistics and Prodcom) data, for the description of the main economic indicators.

The purchase of fish and raw material is the dominant cost item for the sector, accounting for almost 70% of the total production costs. Understanding which segments and Member States use EU raw material (either from wild fisheries or from aquaculture) and which ones depend on imported supplies is of high importance for assessing the strengths and vulnerabilities of the sector. The history of the data collection (DCR and DCF before and currently EUMAP) tells us that the compilation of the raw material data has revealed quite costly and challenging. This is why a series of initiatives have already been undertaken, from pilot studies under the MSs work plans to specific studies committed by the Commission, e.g. SECFISH project. In the light of this and

using some data submitted by Member States (still optional) the report provides an assessment of the sources of raw material (e.g. internal catches, internal aquaculture, imports) detailing, to the possible extent, potential specificities by species, type of industry and Member State and trying to provide suggestions for the improvement of the future data collection.

In line with a specific request from the Commission, the report also provides a first insight on the potential impact of the Autonomous Tariff Quotas (ATQs), which allows fish processors to import raw material with a preferential or zero tariff.

The report is structured as follow:

- An overview of the economic performance of the EU fish processing industry, with specific sections on the structural aspects, on economic data and performance indicators (e.g. revenue items, cost items, earnings, profitability, etc.)
- A section on social indicators (e.g. employment by gender, labour productivity and average salaries, education level, nationality, etc.).
- A special chapter on raw materials, including impacts of ATQs
- National chapters on the economic performance of the fish processing industry at Member States level (for 19 countries)
- A section on the methodology used for the compilation of the report
- Annexes containing Mini national-chapters (for 7 countries) and the protocol followed for data checks on coverage and quality

## **1.1 Terms of Reference for EWG-19-15**

### ***Background and objectives***

The economic report on the fish processing industry is one of the main sources of economic and social data for scientific advice on the performance of the EU fish processing industry. It is also increasingly used by scientific bodies, national administrations and international institutions.

Following the 2019 DCF/EU-MAP call for economic data on the EU fish processing sector, the EWG is requested to analyse and comment on the economic performance of the EU and national fish processing sectors between 2008 and 2017 (2018 when available).

The final draft of the EWG report will be reviewed by the STECF.

The report should provide an in-depth look at the different factors affecting the economic performance of the EU fish processing industry with a special focus on the major drivers and issues affecting the sector. Besides interpreting and explaining the quantitative values, the report should contain qualitative information and analysis on the drivers and trends in the fish processing performance and other aspects of policy relevance based largely on the scientists' expert knowledge. The main objectives of the report is to obtain high quality interpretation of all data outputs to ensure the usefulness of the report for DG MARE's policy development, Member States and the industry.

Experts are asked to analyse the sector and its components, e.g. by markets and trade determinants by main segments of processing activities, competitiveness, market prices and consumption, certification, innovation, links and level of dependency with the local fishing fleet and aquaculture sector, the role of European Maritime Fisheries Fund support, contribution to the local communities and the Blue Economy, strengths, weaknesses, opportunities and threats.

Given the social importance of this activity in many communities, particular emphasis should be paid to the social aspects of the analysis including trends on employment, salaries, labour productivity and breakdown of the fish processing employment by gender, education level and nationality (nationals, EU nationals, non-EU nationals).

### ***Structure and content***

Being the basis for the structure of the report, the EWG is requested to work and comment on, at least, the following items:

- An executive summary containing the key findings (abstract).
- An overview of the economic performance of the EU fish processing industry. This should include the drivers and main trends based on expert knowledge. It must include specific sections on:
  - EU fish processing sector overview (including recent developments).
  - Economic data and performance indicators (e.g. revenue items, cost items, earnings, profitability, etc.), including contrasting company size (e.g. SMEs vs. non-SMEs), when possible.
  - Employment and social indicators (e.g. employment by gender, labour productivity and average salaries, education level, nationality, etc.).
  - Comparative across Member States highlighting the differences and similarities of national industries.
- National chapters on the economic performance of the fish processing industry providing<sup>1</sup>:
  - National fish processing sector overview (including recent developments).
  - Economic performance indicators, including by size category (e.g. contrasting SMEs and non-SMEs when possible).
  - Employment and social indicators (e.g. employment by gender, labour productivity and average salaries, education level, nationality, etc.).
  - Description of trends and drivers based on expert knowledge.
  - Outlook.
- Special Chapter on raw materials. As indicated in previous reports, the purchase of fish and raw material is the dominant cost item, accounting for almost 70% of the total production costs. Anecdotal evidence indicate that the majority of the raw material is imported from third countries<sup>2</sup>.

Understanding which segments and Member States use EU raw material (either from wild fisheries or from aquaculture) and which ones depend on imported supplies is of high importance for assessing the strengths and vulnerabilities of the sector. While the compilation of such information has revealed quite costly and challenging, a series of initiatives have already been undertaken. This includes pilot studies conducted in some Member States, a work package within the SECFISH project<sup>3</sup> (focusing on the methodology to collect raw material data and the systematic collection of such data in a few Member States. Combining these various sources, the expert group should provide an assessment of the sources of raw material (e.g. internal catches, internal aquaculture, imports) detailing, to the possible extent, potential specificities by species, type of industry and Member State.

The EU legislation includes autonomous tariff quotas (ATQs), which allows fish processors to import raw material with a preferential or zero tariff. This chapter will also assess the benefits obtained by the industry from the ATQs. When it would not be possible to identify Member States or subsectors making use of specific ATQs, the assessment could be based on several assumptions or on a theoretical scenario where ATQs are used in full compared to an alternative scenario where ATQs would not exist. The impact of ATQs should be quantified in absolute terms (e.g. euros) and relative to the economic performance of the sector (e.g. percentage of production cost).

- Annexes
  - Data coverage and quality.

### ***Streamlining of the report and data issues***

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<sup>1</sup> Given the use of EUMAP as well as Eurostat data, it should be clearly identified the source of data. A more detailed discussion about data coverage and quality issues could be included in an Annex.

<sup>2</sup> See last year report, page 43.

<sup>3</sup> Agreement number - MARE/2016/22 (Thünen) - SI2.768889.

After six reports, efforts should also be invested in streamlining the structure and content of the report. In particular, the following should be taken into account:

It shall be considered whether some specific (sub)sections provide limited value added and therefore should be dropped from the report.

The narrative should add value to the figures compiled in the charts and tables. This could be achieved by highlighting a few figures with special relevance and by explaining what are the drivers and/or consequences.

The main socio-economic indicators, if possible and where relevant, should also be put into context with homologous figures at the EU and national levels (e.g., national average salaries, GDP, etc.), or in relations with the other fisheries sectors (the fishing fleet and aquaculture).

Given that under the new EU-MAP, the transmission of data about the fish processing sector is only done on a voluntarily basis, the use of complementary source of data (e.g. SBS and PRODCOM from Eurostat) may be required for some countries. The special Chapter 3 of the last report provides some insights on the usability of these alternative sources of data.

When aggregating national indicators to obtain the EU totals, special attention should be made to maintain a homogeneous number of Member States. The data for EU total should reflect an estimation of the actual evolution and should not be distorted by the inclusion (or exclusion) of Member States throughout the analysed period. The compilation of EU aggregates may require the use of imputation in some Member States. The imputation of missing values should follow the principles approved by the STECF plenary.

The economic report on the fish processing industry is produced on a biennial basis. This should be taken into account when presenting the information and making the interpretations. Besides the long-term evolution, a special focus should be made not only on the last year, but rather on the last two years, when relevant. Indications on the latest developments should be presented in annual terms and not with respect to the previous report (which implies an increase or decrease over two years).

A discussion and explanation about data coverage, data issues and how they were addressed should be included in an Annex.

### ***Data transmission***

As a matter of priority, the EWG is requested to ensure that all unresolved data transmission (DT) issues encountered prior to and during the EWG meeting are reported on-line via the Data Transmission Monitoring Tool (DTMT)<sup>4</sup>. Guidance on precisely what should be inserted in the DTMT, log-on credentials and access rights will be provided during the EWG.

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<sup>4</sup> For details refer to ToR 7.1 of STECF plenary report 19-01.

## 2 EU OVERVIEW

This chapter provides an overview of the structure and economic performance of the fish processing industry in the EU from 2008 to 2017. The chapter summarises the number of enterprises, their size, the employment they provide, and trends in these variables for the EU and aggregated for the MS. A comparison of average salaries and labour productivity (a measure of the capital intensity of production) are given for the MS. Summaries for the EU are reported for the main financial variables, including turnover, subsidies, profits and gross value added as a social contribution are included. A breakdown of comparative costs across MS including raw material and labour costs is among the information shown.

The 2019 report has attempted to give a comprehensive overview of the EU fish processing industry, including in the analysis all the EU MSs with a fish processing sector. Relevant figures are given for all EU countries, including countries involved in data collection under DCF and currently EUMAP but also those countries not still involved in the data collection for the fish processing industry (e.g. Austria, Hungary and Czech Republic).

The main economic analysis is, instead, focusing on the EU in its formation at 24 countries, hence including all the MSs previously and currently involved in the collection of economic data for the fish processing industry under DCF and EUMAP. For the 2019 report a special attention has been paid to provide complete EU totals, by estimating/imputing missing figures for countries that, for different reasons, have not submitted data under the current data call or partial data (e.g. Belgium only 2016).

The reader should note that a detailed explanation of the protocol for data use and imputation to overcome problems with missing or mistaken data, and other data issues is set out in the Methodological Annex (section **Error! Reference source not found.**).

The section provides insights on the following aspects:

- An overview of the EU fish processing industry with a focus on the main structural indicators (mainly number of enterprises, turnover and employment)
- An analysis of the economic performance of the sector, with a focus on the main income and cost indicators
- A sub-section describing the main trend and drivers of changes for the sector and highlighting the outlook for the next future.

The overview of the sector at EU level is carried out looking, where possible, at comparison across MSs, highlighting the main reasons of relevant differences.

### 2.1 Overview of the EU fish processing industry

In 2017 the overall number of enterprises carrying out fish processing as a main activity was equal to around 3 500 firms. According to Eurostat data, the degree of specialisation<sup>5</sup>, of the EU fish processing enterprises is around 84%, higher than what observed in the overall EU food manufacturing sector (around 78%). The overall turnover produced by the sector is estimated at EUR 32.5 billion. Spain is the leading country followed by Italy, in terms of number of active firms and by UK, in terms of turnover produced by the sector (Poland and Denmark follow as third and fourth countries in terms of turnover) (Table 2.1.1).

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<sup>5</sup> Defined as the share of turnover deriving from the principal activity on the total turnover.

**Table 2.1.1: Number of enterprises and turnover in the fish processing sector by EU countries, 2017**

Country	Number of enterprises	Turnover (million €)
Belgium	62	761.6
Bulgaria	46	85.0
Croatia	34	88.3
Denmark	99	2,610.2
Finland	136	353.3
Germany	244	2,172.6
Greece	169	295.9
Ireland	157	679.0
Italy	433	2,108.5
Latvia	113	183.2
Lithuania	39	504.2
Malta	5	24.1
Poland	170	2,760.2
Romania	17	98.8
Slovakia	8	92.4
Slovenia	18	32.9
Spain	606	6,050.4
Sweden	209	590.4
United Kingdom	341	3,934.9
<b>Sub-total EU 19</b>	<b>2,906</b>	<b>23,426.0</b>
Other DCF MSs	556	8,987.6
<b>Sub-total EU 24</b>	<b>3,462</b>	<b>32,413.6</b>
Non-DCF MSs	37	133.3
<b>Total EU 27</b>	<b>3,499</b>	<b>32,546.9</b>

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG

Notes: Sub-total EU 19: submitting countries in 2019 data call; Other DCF MSs: Cyprus, Estonia, France, Netherlands and Portugal, submitting data under DCF, until previous data call; Non-DCF MSs: EU MSs not covered by obligation under DCF/EUMAP but having a fish processing industry, namely Austria, Hungary and Czech Republic.

According to the data submitted by MS (under previous and last data calls – EU 24), there were 3 462 firms processing fish and fish products in the EU in 2017<sup>6</sup>. Their turnover amounted to EUR 32.4 billion and they have employed 130 664 persons (corresponding to 118 110 FTE).

All the structural indicators (number of enterprises and employment) show a sharp decrease over the last two years (2017 vs. 2016) while, over the period analysed (2008-2017) a decrease in the number of enterprises is detectable (-7%) versus and increase of +20% in the turnover produced by the sector.

The average number of FTEs per enterprise was equal, in 2017, to 34 increasing in comparison to the previous years and being the highest level over the data series considered, highlighting a phenomenon of re-sizing of the sector, in terms of number, and concentration of production, highlighted by the increase of turnover.

The average wage paid by the sector to EU workers (measured as personnel costs per FTE unit) was around EUR 30 000, almost stable over the last 3 years but increasing over the period 2008-2017. The share of the unpaid work is around 1%, over the last 3 years.

<sup>6</sup> From now ahead the analysis is based exclusively on EU 24 countries, hence Austria, Hungary and Czech Republic are excluded.



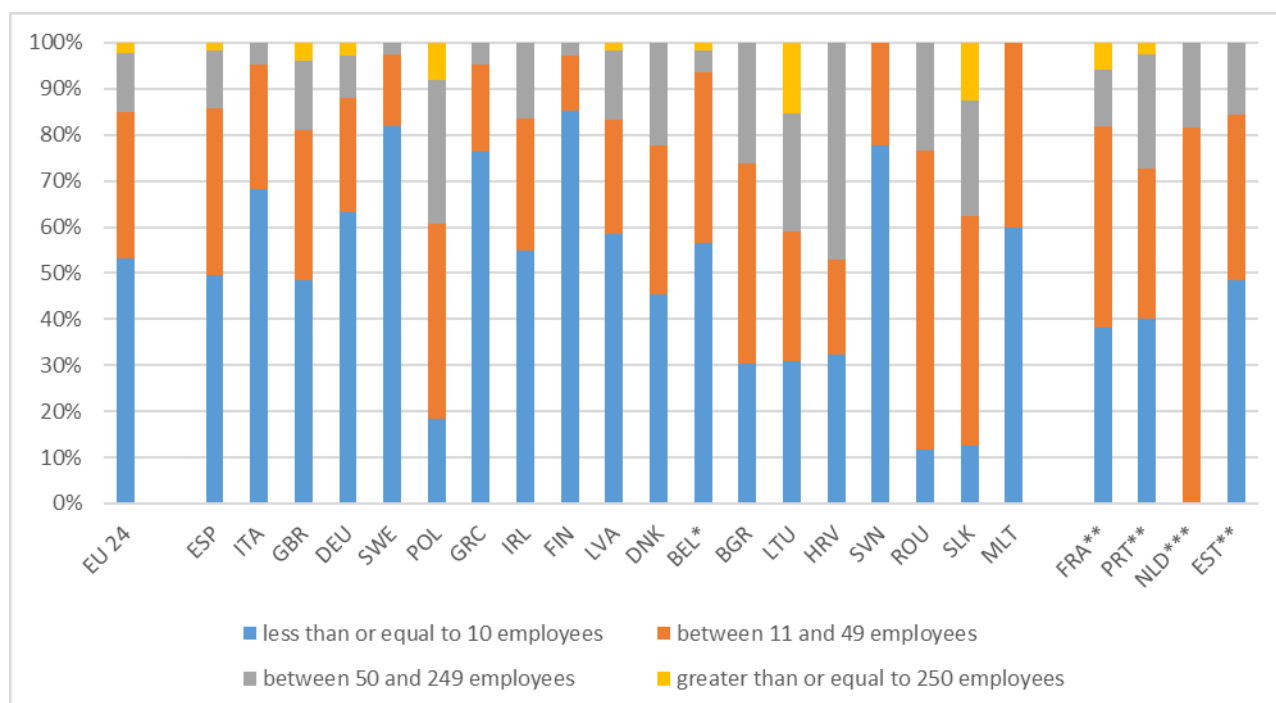
**Table 2.1.2: EU fish processing industry sector overview, 2008-2017**

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>											
Total enterprises	3,738	3,700	3,725	3,614	3,549	3,757	3,613	3,695	3,630	3,462	-5%
≤10 employees	1,959	1,936	1,987	1,964	1,897	2,105	1,974	2,067	1,938	1,840	-5%
11-49 employees	1,195	1,230	1,207	1,124	1,119	1,133	1,111	1,101	1,142	1,100	-4%
50-249 employees	504	458	454	450	455	442	446	449	471	449	-5%
≥250 employees	81	76	77	76	78	77	82	77	79	73	-8%
<b>Employment (number)</b>											
Total employees	129,429	125,502	125,583	124,873	124,524	125,486	127,449	128,790	132,964	130,664	-2%
FTE	118,502	114,813	116,185	115,843	114,369	114,510	115,922	116,082	120,160	118,110	-2%
<b>Indicators</b>											
Turnover (million €)	27,033.2	24,716.9	27,434.8	27,631.0	28,676.3	28,849.5	29,482.2	30,639.9	31,809.9	32,413.6	2%
FTE per enterprise	31.7	31.0	31.2	32.1	32.2	30.5	32.1	31.4	33.1	34.1	3%
Average wage (thousand €)	23.9	25.6	26.3	27.2	28.6	29.0	29.9	30.2	30.6	30.4	-1%
Unpaid work (%)	0.9	1.8	2.0	0.9	0.9	1.3	1.6	0.9	1.0	1.0	-1%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG

The great bulk of enterprises (98%) of the sector are SMEs (less than 250 employees), 85% are small-sized (less than 50 employees) and more than a half are micro-enterprises (Fig. 2.1.1).

The distribution of enterprise by size-classes shows many differences across MSs, with Finland, Slovenia, Sweden, Greece and Italy having the highest percentages of micro-enterprises. On the contrary, the highest shares of bigger enterprises (above 50 employees) are located in Eastern Europe (e.g. Poland and Lithuania).

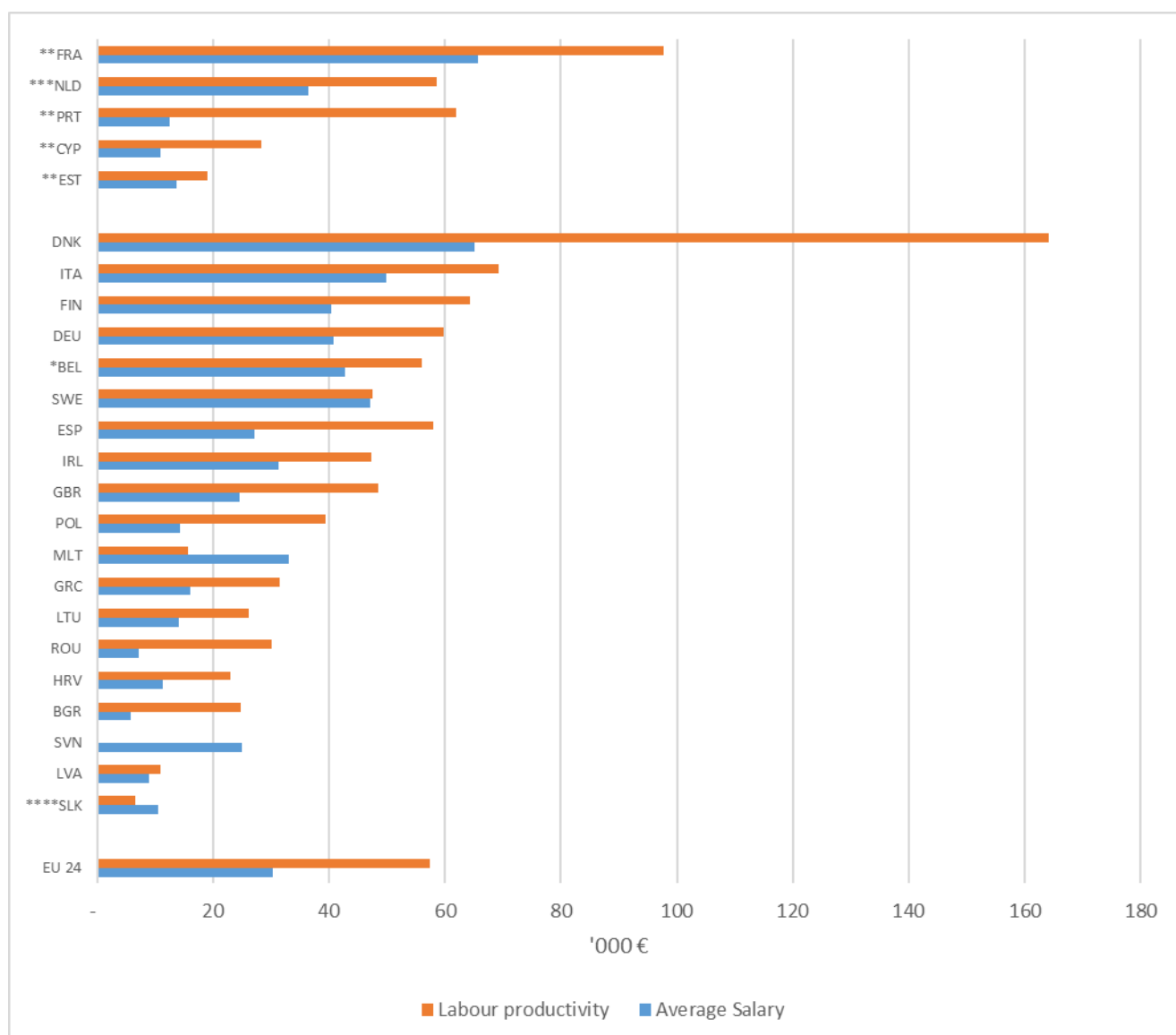


**Figure 2.1.1: Number of firms by country and by size classes, 2017**

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG. Notes: \* 2016; \*\* estimated on 2015 data; \*\*\* estimated on 2014; Cyprus not available

2017 data on personnel costs and employment by countries suggest that the average wage per FTE varies substantially by MSs (Figure 2.1.2), with the Danish fish processing industry paying the highest gross salaries on average (EUR 65 thousand), followed by the French, Italian and the Swedish industries (respectively, EUR 66 thousand, EUR 50 thousand and EUR 47 thousand). The EU average is around EUR 30 thousand, more or less in line with labour costs/FTE for the overall EU food manufacturing sector<sup>7</sup>.

Labour productivity, measured as the GVA produced by a unit of labour (FTE) ranged, in 2017, from EUR 4 thousand for Slovenia to EUR 164.5 thousand for Denmark. However, for almost all countries (with the exception of five countries) it was smaller than EUR 60 thousand, being, the EU average, EUR 57 thousand (a bit higher than the average observable for the overall EU food manufacturing sector)<sup>8</sup>.



**Figure 2.1.2: Average salary and labour productivity by country, 2017**

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG. Notes: \* 2016; \*\* estimated on 2015 data; \*\*\* estimated on 2014; \*\*\*\* calculated on employees

<sup>7</sup> <https://ec.europa.eu/eurostat/cache/scoreboards/BSP/#readMore>

<sup>8</sup> Ibidem.

The data collection requires MSs to provide also the number and the turnover of enterprises carrying out fish processing as a secondary activity. It is well known that the share of the turnover attributable to the processing of fish and fish products coming from these enterprises ("non-main") is, sometime, not so marginal, estimated to be, on average, more than EUR 5 billion (17% of the total turnover of the sector over the period 2008-2017). The number of enterprises integrating other type of activities (in many cases other types of food processing) can be estimated around 1 500 units.

Details on the number and turnover of enterprises carrying-out fish processing as a secondary activity by MSs is provided in the additional tables in sub-section 2.4<sup>9</sup>.

Countries with the highest number of enterprises are UK, Netherlands, Italy and Belgium while the highest turnover from fish processing as a secondary activity is produced in Netherlands, followed at a very high distance by France and UK.

## 2.2 Economic performance

Total income has increased for the European fish processing industry between 2008 and 2017 and amounted to EUR 33.9 billion in 2017, which was a small increase compared to 2016. Notable is that other income contributed to 4% and operating subsidies to approximately 0.2% of the total income during the entire reporting period. The sector received relatively small amounts of operating subsidies during the period although data (Table 2.2.1) show an increase from EUR 63.1 million in 2016 to EUR 70.1 million in 2017.

**Table 2.2.1: Economic performance of the EU fish processing industry sector, 2008-2017**

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Income (million €)</b>											
Turnover	27,033.2	24,716.9	27,434.8	27,631.0	28,676.3	28,849.5	29,482.2	30,639.9	31,809.9	32,413.6	2%
Other income	414.6	330.5	540.6	578.9	593.7	1,007.9	1,445.4	675.7	1,321.6	1,410.6	7%
Operating subsidies	66.6	62.7	64.4	77.7	90.6	72.7	60.1	84.5	63.1	70.1	11%
<b>Total Income</b>	<b>27,526.2</b>	<b>25,119.4</b>	<b>28,048.2</b>	<b>28,295.2</b>	<b>29,372.0</b>	<b>29,944.5</b>	<b>31,003.0</b>	<b>31,417.7</b>	<b>33,209.5</b>	<b>33,895.3</b>	<b>2%</b>
<b>Expenditure (million €)</b>											
Purchase of fish and other raw material for production	15,031.4	14,262.6	15,891.7	16,729.5	17,549.6	17,748.7	18,175.2	19,197.8	20,826.2	20,613.3	-1%
Wages and salaries of staff	2,806.3	2,882.2	2,998.6	3,119.2	3,246.8	3,277.8	3,409.6	3,475.2	3,642.7	3,551.7	-2%
Imputed value of unpaid labour	26.2	52.6	61.9	28.1	28.5	44.3	55.1	32.1	35.7	34.4	-4%
Energy costs	666.1	614.7	722.5	702.7	753.5	788.3	893.1	771.8	868.7	806.6	-7%
Other operational costs	4,826.9	4,515.4	4,924.3	4,834.8	4,807.4	4,628.8	4,723.2	4,963.1	5,443.6	5,345.1	-2%
<b>Total production costs*</b>	<b>23,455.5</b>	<b>22,403.1</b>	<b>24,672.0</b>	<b>25,485.6</b>	<b>26,464.1</b>	<b>26,571.2</b>	<b>27,342.4</b>	<b>28,535.2</b>	<b>30,916.8</b>	<b>30,440.9</b>	<b>-2%</b>
<b>Capital Costs (million €)</b>											
Depreciation of capital	606.5	412.0	493.0	475.9	466.7	394.3	400.4	412.9	378.9	413.8	9%
Financial costs, net	371.6	345.0	400.0	290.2	246.5	265.0	257.0	83.7	-40.3	52.6	231%
<b>Capital Value (million €)</b>											
Total value of assets	12,355.9	12,314.0	14,286.4	14,206.9	14,953.2	14,949.9	15,643.2	15,808.8	15,809.8	15,718.7	-1%
Net Investments	800.6	507.2	723.4	824.1	578.6	637.6	730.5	680.1	811.1	806.0	-1%
Subsidies on investments											0%
Debt	7,412.9	6,944.9	7,540.7	7,019.9	7,324.1	8,980.3	8,064.7	7,875.5	8,056.4	8,441.1	5%
<b>Economic performance (million €)</b>											
Gross Value Added**	6,627.1	5,411.8	6,193.7	5,692.3	5,875.1	6,406.0	6,853.8	6,083.0	5,729.9	6,783.1	18%
Operating Cash Flow**	3,861.1	2,539.6	3,197.5	2,622.7	2,690.4	3,156.6	3,449.2	2,660.2	2,114.7	3,267.1	54%
Earning before interest and tax**	3,254.6	2,127.7	2,704.5	2,146.8	2,223.7	2,762.3	3,048.8	2,247.3	1,770.6	2,853.3	61%
Net Profit**	2,883.0	1,782.6	2,304.5	1,856.5	1,977.2	2,497.3	2,791.8	2,163.6	1,810.9	2,800.7	55%
<b>Productivity and performance Indicators</b>											
Labour productivity (thousand €)	55.9	47.1	53.3	49.1	51.4	55.9	59.1	52.4	47.7	57.4	20%
Capital productivity (%)	53.6	43.9	43.4	40.1	39.3	42.8	43.8	38.5	36.2	43.2	
GVA margin (%)	24.1	21.6	22.1	20.2	20.1	21.5	22.2	19.4	17.3	20.1	
EBIT margin (%)	11.9	8.5	9.7	7.6	7.6	9.3	9.9	7.2	5.3	8.4	
Net profit margin (%)	10.5	7.1	8.2	6.6	6.8	8.4	9.0	6.9	5.5	8.3	
Return on Investment (%)	23.3	14.5	16.1	13.1	13.2	16.7	17.8	13.7	11.5	17.8	
Financial position (%)	40.0	43.6	47.2	50.6	51.0	39.9	48.4	50.2	49.0	46.3	

<sup>9</sup> A total for EU is not provided but only an average as a big number of data are missing, both at countries level and in terms of years available. Indeed, estimations are provided also for countries no more delivering data over last years, based on data previously submitted.

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

Notes: \*total costs are not properly equal to the sum because Slovakia submitted total costs but not all the detailed cost items. \*\* all the economic performance indicators cannot be calculated automatically from totals on income items because of other income from Slovenia not included in the calculation (see details in the Slovenian chapter)

Over the analysed period (2008-2017) a concentration of production is observable. Indeed, data show a decrease in the number of enterprises (-7%) and an increase of +20% in the turnover produced by the sector.

According to member states EU MAP data submissions, total production costs amounted to almost EUR 30.8 billion and EUR 30.3 billion respectively in 2016 and 2017. The slight decrease in total costs and increase in total income has resulted in an increase in all performance indicators in 2017. All the operational costs show a decrease in relation to 2016. The highest decrease (-7%) can be observed for energy costs.

**Table 2.2.2: Cost structure of the EU fish processing industry sector by country, 2017**

country	Total costs (million)	Total costs / Total income (%)	Cost items as a share of total costs (%)				
			Raw materials	Wages and salaries	Other operational	Energy costs	Unpaid labour
Belgium	743.5	97.6	84.4	7.9	0.0	7.7	0
Bulgaria	57.9	67.3	68.5	15.0	14.5	1.9	0.0
Croatia	103.1	83.2	47.6	18.4	29.4	4.6	0.0
Denmark	2,321.8	88.1	64.0	8.8	26.2	0.9	0.0
Finland	336.1	94.8	79.1	8.8	11.0	0.7	0.3
Germany	2,069.0	94.9	65.7	11.6	21.0	1.7	0.0
Greece	415.7	92.6	42.7	7.9	40.5	8.6	0.2
Ireland	637.7	92.6	82.7	14.8	0.0	1.9	0.5
Italy	2,544.4	96.5	76.2	8.5	10.8	4.1	0.5
Latvia	180.4	95.1	61.5	15.4	20.5	2.5	0.0
Lithuania	502.4	91.6	73.4	10.4	14.6	1.6	0.0
Malta	25.3	105.2	85.2	9.4	3.9	1.5	0.0
Poland	2,605.3	85.2	75.4	9.6	13.9	1.1	0.0
Romania	77.7	77.1	58.3	8.8	31.3	1.2	0.4
Slovakia	96.9	102.4	0.0	6.8	0.4	0.0	0.0
Slovenia	35.7	108.4	30.5	9.1	59.1	1.3	0.0
Spain	5,464.5	89.6	77.1	9.6	11.7	1.4	0.2
Sweden	594.9	99.7	54.2	12.6	32.0	1.2	0.0
United Kingdom	3,482.4	88.3	77.7	13.5	7.4	1.3	0.0
<b>Sub-total EU 19</b>	<b>22,294.8</b>	<b>89.9</b>	<b>72.8</b>	<b>10.4</b>	<b>14.2</b>	<b>2.0</b>	<b>0.1</b>
Other DCF MSs	8,146.2	89.5	53.7	15.1	26.7	4.5	0.0
<b>Total EU 24</b>	<b>30,440.9</b>	<b>89.8</b>	<b>67.7</b>	<b>11.7</b>	<b>17.6</b>	<b>2.6</b>	<b>0.1</b>

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

Notes: Sub-total EU 19: submitting countries in 2019 data call; Other DCF MSs: Cyprus, Estonia, France, Netherlands and Portugal, submitting data under DCF, until previous data call. For Slovakia only wage and salaries and other operational costs have been provided

The analysis carried out on changes over the last two years (2017 vs. 2016) supports a trend toward a higher efficiency, testified by a slight increase in turnover (+2%) counterbalanced by a proportional decrease of operational costs (-2%) the result being a generalised and more than proportional increase of all the profit indicators. In particular, the value added produced by the

sector in 2017 was 18% higher than the previous year and represented 20% of total income. This efficiency trend has also positively impacted the labour indicators: the average wage is stable at €30 thousand over the 2016-2017 period and average FTE increasing +3% (34 FTE on average).

Purchase of fish and other raw material for production is the dominant cost item, accounting for 64-68% of the total costs during the period 2008-2017 and accounting for 68% of total incomes for 2017, remaining at the same level as the year before. Most of the remaining costs consist of other operational costs (18% of income) and labour costs (12% of income), while energy expenses represent only 3% of the total income for 2017.

For most MSs the production costs ranged from 80% to 100% (the lowest share is reported for Romania, 77%) of the total income in 2017 (Table 2.2.2). However, for some countries the cost/income ratio was quite far from the average (90%), sometime higher than 100%, as for Slovenia<sup>10</sup>, Slovakia and Malta. Indeed, for these countries a negative cash flow can be observed in Table 2.2.3.

Along with the share of costs on total income, Table 2.2.2 also shows the structure of costs of the fish processing industry by country and gives an overview of the contribution of the main cost items to the total production costs. The cost structure is quite similar across MSs in 2017. However, for France, Croatia, Cyprus, Portugal, Romania and Slovenia the shares are relatively far from the average. According to the table, purchase of fish and other raw materials for production is by far the most important component of the total costs for most MS (68% of the total for EU 24 on average), followed by other operational costs (17.6%) and labour costs (11.7%). Energy costs play a minor role (2.6% of the total in average), with "other DCF countries" (France, Estonia, Cyprus, Portugal and Netherlands) having an average of 4.5% and Belgium and Greece highly above the average, with energy costs amounting, respectively, at 7.7% and 8.6% of total costs.

**Table 2.2.3: Economic performance of the EU fish processing industry sector by country, 2017**

country	Gross Value Added	% of total EU	Operating Cash Flow	% of total EU	Earning before interest and tax	% of total EU	Net Profit	% of total EU
Belgium	76.9	1.1	18.3	0.6	7.5	0.3	5.4	0.2
Bulgaria	36.9	0.5	28.2	0.9	19.8	0.7	21.2	0.8
Croatia	38.4	0.6	20.8	0.6	12.9	0.5	12.6	0.5
Denmark	517.7	7.6	312.6	9.6	278.1	9.7	297.7	10.6
Denmark	48.9	0.7	18.3	0.6	12.1	0.4	10.2	0.4
Finland	351.2	5.2	111.2	3.4	75.3	2.6	71.3	2.5
Greece	67.2	1.0	33.3	1.0	25.1	0.9	14.2	0.5
Ireland	148.2	2.2	50.7	1.6	25.0	0.9	12.6	0.5
Italy	316.5	4.7	93.6	2.9	43.2	1.5	25.3	0.9
Latvia	34.2	0.5	9.3	0.3	8.3	0.3	6.7	0.2
Lithuania	98.1	1.4	46.0	1.4	37.2	1.3	34.1	1.2
Malta	1.1	0.0	1.2	0.0	1.6	-0.1	1.6	-0.1
Poland	693.7	10.2	453.6	13.9	389.0	13.6	340.7	12.2
Romania	30.2	0.4	23.1	0.7	19.9	0.7	18.7	0.7
Slovakia	4.1	0.1	2.3	-0.1	5.0	-0.2	5.0	-0.2
Slovenia	0.5	0.0	2.8	-0.1	3.9	-0.1	3.8	-0.1
Spain	1,150.1	17.0	635.6	19.5	635.6	22.3	635.6	22.7
Sweden	75.5	1.1	2.0	0.1	7.6	-0.3	5.9	-0.2
United Kingdom	927.8	13.7	461.7	14.1	392.4	13.8	415.6	14.8
<b>Sub-total EU 19</b>	<b>4,617.4</b>	<b>68.1</b>	<b>2,311.8</b>	<b>70.8</b>	<b>1,963.1</b>	<b>68.8</b>	<b>1,905.5</b>	<b>68.0</b>
<b>Other DCF MSs</b>	<b>2,165.7</b>	<b>31.9</b>	<b>955.3</b>	<b>29.2</b>	<b>890.2</b>	<b>31.2</b>	<b>895.1</b>	<b>32.0</b>
<b>Total EU 24</b>	<b>6,783.1</b>	<b>100.0</b>	<b>3,267.1</b>	<b>100.0</b>	<b>2,853.3</b>	<b>100.0</b>	<b>2,800.7</b>	<b>100.0</b>

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

Notes: 1) Sub-total EU 19: submitting countries in 2019 data call; Other DCF MSs: Cyprus, Estonia, France, Netherlands and Portugal, submitting data under DCF, until previous data call. 2) Earnings before interest and taxes and net profit are equal, for Spain, to Operating cash flow for missing data on depreciation and financial costs while, for Slovakia, Net profit is equal Earnings before interest and taxes for missing data on financial costs. The EU total is biased by this lack of data.

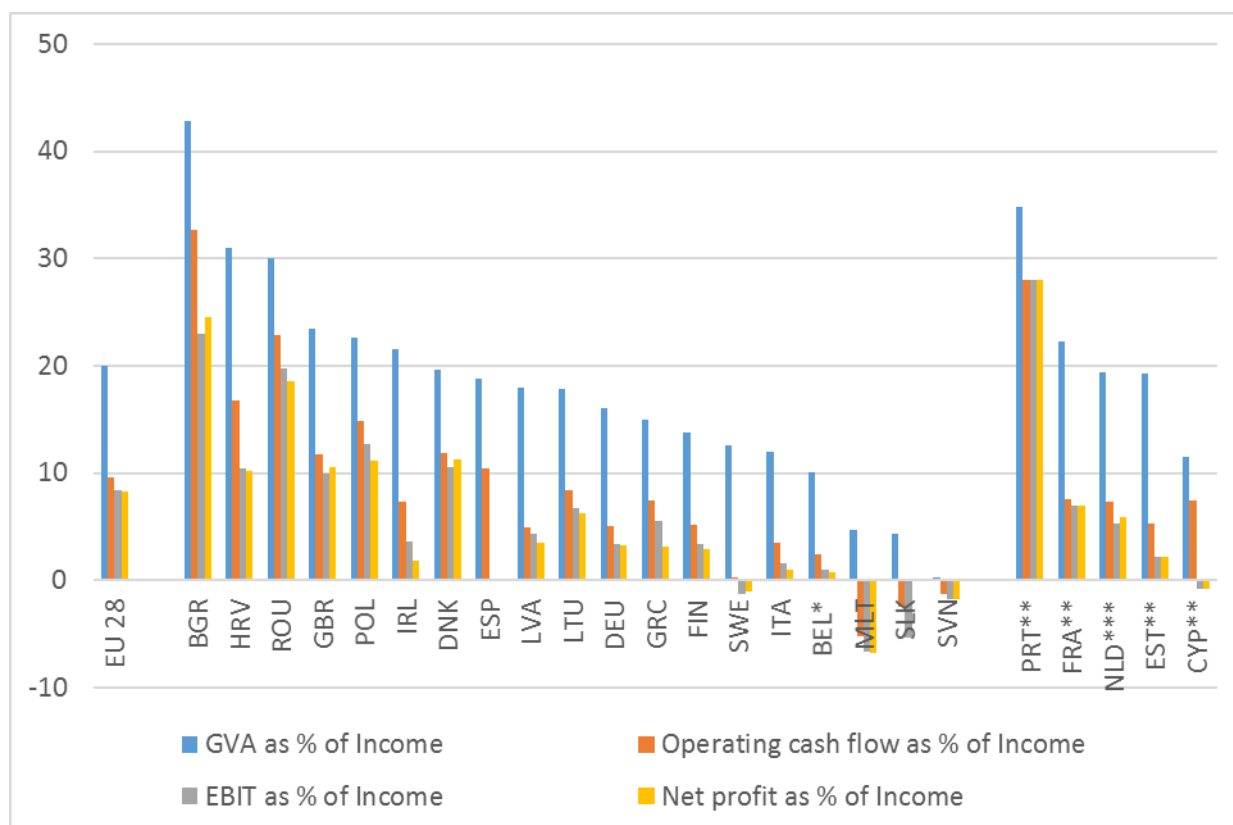
<sup>10</sup> The percentage value reported in the Table 2.3.2 for Slovenia refers to total production cost as a share of total income from fish processing (instead of total income) because costs reported by Slovenia are attributable to fish processing only while total income includes also income from processing activities other than fish processing.

The sector accounted for approximately EUR 7 billion of Gross Value Added (GVA) in 2017 (Tables 2.2.1 and 2.2.3). This shows the importance of the fish processing industry in the fishery sector in Europe, taking into account that the GVA produced by the EU fishing fleet amounts to EUR 4.5 billion (STECF, 2019).

The amount of operating cash flow generated by the EU fish processing sector in 2017 was EUR 3.3 billion. Earnings before interest and taxes and Net Profit were respectively EUR 2.85 billion and EUR 2.8 billion (the level of these two profit indicators should be read against the lack of data on depreciation costs for Spain and financial costs for Spain and Slovakia).

The highest share of GVA was produced by Spain (17% of the EU total), followed by UK and Poland, both accounting for more than 10% of EU total GVA. The shares increase, for all the three countries, when looking at the Operating cash flow, meaning that the cash flow of these countries is benefit of operating subsidies (amounting to EUR 23 billion for Spain in 2017) or of a lower share of personnel costs on total costs (see table 2.2.2)

EU 28 GVA as % of total income was around 20%, with large differences across MSs: highest GVA margin for Bulgaria, over 43% and lowest for Slovenia, 0.22%.



**Figure 2.2.1: Economic performance of the EU fish processing industry sector by country (indicators in relation to income), 2017**

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG. Notes: \* 2016; \*\* estimated on 2015 data; \*\*\* estimated on 2014 data

### 2.3 Trend and drivers and outlook

In this section some of the main drivers for change for the EU fish processing industry are analysed, being mainly the dependency on raw material, the occurrence of outsourcing, the increase of concentration both on the demand then on the supply side, the increasing demand for certified products, the “supermarketization” of the distribution and the limitation to the exchange

of products created by current and geopolitical phenomena, such as the Russian embargo, already in place and extend until 2020, and the Brexit, whose impacts are still evaluated in terms of potentiality, as the final shape of the Brexit is, still, not known at the time of writing.

### 1. Dependency on imports for raw materials

One of the main drivers for the industry is the high percentage of the costs of raw material, compared to the overall costs, which is expected to increase in the future. There is also difficulty in sourcing raw material. Because of high level of internal consumption, the sector is highly dependent on imports in spite of the slight increase in landings in the latest years (AER, 2019). Indeed, in 2018 the EU has seen its deficit rise since 2013 and reach its negative peak of more than EUR 20 billion (EUMOFA, 2019).

This leaves the companies very vulnerable to changes and developments in the world markets. Several countries report an increase in costs for raw material in 2017 (Germany, Spain, Finland, Greece, Croatia, Ireland, Latvia, Malta and Romania) and although the overall situation remains positive for the sector it may mean increasing pressure for the industry to stay profitable. For more information in raw material please refer to chapter 4 in this report.

The aquaculture production in EU has increased by 24% from 1990; however, since 2007 the production has decreased by 2% hence reducing the possibility to supply the fish processing sector. However, as EU capture fisheries production has been showing a decreasing trend in the last decade (a slight increase has been registered in 2017 but a new fall has been nowcasted for 2018 and 2019 – STECF, 2019) aquaculture has become relatively more important to supply the seafood market. In 2016, the aquaculture sector provided 20% of the fish and shellfish supply in EU (with this referring to the overall supply, including fresh consumed fish, and not only to the supply of raw materials to the processing industry)

The industry has to face new challenges in the light of the circular economy approach that could lead to a re-thinking of the use of wastes as raw materials (for further details see chapter 4 in this report).

### 2. Outsourcing to other MS and countries

Several countries still report<sup>11</sup> ongoing outsourcing of activities to other member states (e.g. the UK, Denmark and Germany) which leads to increasing investments in other MS or investing in third countries where processing is carried out locally (Spanish example). For these member states, e.g. in the case of Poland, this means that they increased their exports substantially. For Germany, however, this may have a negative impact as there may be not enough net investment to modernize the industry and the facilities may be outdated in the future. Some specific examples are detailed below.

Anecdotal evidence suggests that some UK processors send materials abroad for either primary or secondary processing. To maintain quality, and product value, primary processing activity may be outsourced to Asia, for example, for cheaper manual labour (e.g. hand peeling or hand filleting). Labour costs in the UK for this work would not be economically viable for the final product and mechanised alternatives often lessen product quality and final value. Some secondary processing activity may also be outsourced to specialised factories to meet allergy or dietary requirements, particularly for breaded products (e.g. material sent away to dedicated gluten free factory to avoid contamination of gluten free product). The export and re-import of such products will impact trade statistics, however there is no quantitative data available at present to estimate the scale of this impact.

Germany is another MS which outsources production. One of the largest German firms increased its investments in Poland in 2016 and 2017, growing its production capacity in that country by 50%, according to firm sources. By means of scale, this factory would employ almost 600 workers, which is approximately, for comparison purposes, 10% of the total employment in fish processing in Germany. The extended Polish facility also process innovative products and attain

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<sup>11</sup> Based on experts' knowledge.

the same certifications as the firm's German facilities (with the possible exception of ecological product labels).

For several years, the relocation of the fishing industry in Denmark to Eastern Europe and Asia has been used as an instrument to achieve wage savings and thereby increase earnings. However, in several cases this has turned out not to be as straightforward as initially thought. The savings on wages have not always met the costs of outsourcing, for example in the form of poor communication and poorly trained staff. The result has been problems with fluctuating quality, food safety issues and logistics problems. At the same time, the development of processing technologies and the following automation has reduced the savings in wages paid that make it economically advantageous to relocate production. This experience was the same for Ireland which had outsourced some material to Asia for the same reasons. However, depending on the type of production, relocation is still seen as a tool for companies to organize access to raw materials, processing and marketing appropriately.

Poland is one MS which accepts the supply of raw material to provide processing services. There has been a steady increase in material received since 2008 rising to over 32 thousand tonnes in 2018 a 97% increase from the figure (16.5 thousand tonnes) in 2008. The four main countries of origin are Norway (23%), China (15%), Sweden (10%) and Germany (9%). While China was the second highest importer in 2018 this is due to a large increase from 2017 figures when it only made up 3% of the total imports. The main species processed, in 2018, from these sources are Salmon (28%), Trout (21%) and Herring (19%).

Spain has invested in foreign production in situ. Large Spanish processors have made important investments in processing companies in third countries all over the world in the last two decades. Tuna, shrimp, groundfish, small pelagic and cephalopods are the main targeted species. These companies, located close to the main sources of raw material, undertake primary processing of semi elaborated fish products to be further processed in Spain before final consumption. Investments are mainly concentrated in South America and South Africa. Although South East Asia has already attracted the interest of large processors and some have already settled strategic alliances with local processors.

### *3. Increasing Industrial Concentration in the Demand and Supply*

Similar to many other industries the EU Fish Processing sector is experiencing the impact of increasing levels of concentration both on the demand side from the retail and food service sectors and within itself on the supply side.

Demand for fish products comes mainly from the retail sector. Food service firms are the other important source of demand. Data to understand the structure of the EU Food Service sector is limited. It is clear that there is increasing concentration in the retail sector and it is to be expected that the food service sector is following the trend of concentration and globalisation. In the year 2000 the ten largest grocery retailers enjoyed 26.0% of the EU market and this has increased to 30.7% by 2011 (European Commission, 2014). There is no reason to believe that the trend has abated or reversed since then.

Supermarketization of the fish market has been consolidated in the world in the last two decades. Currently, retail chains control the largest market share for fish in the EU, with quotas ranging from 65 to 80%. Large retail chains demand large volumes of product a condition not always easy to comply with by suppliers. Large processors easily adapted to the changing conditions, but many small companies have problems competing in a mass market with an undifferentiated product. Differentiation and cooperation along the value chain are useful tools for improving the competitiveness of medium and small fish processing companies.

The supply side remains relatively unconcentrated. In 2015 firms with 250 or more employees accounted for 32.3% of revenue from the sale of processed fish products. By 2017, this figure had risen to 37.9%.

The relative smallness of the bulk of firms in the processing sector means that they are in a weak bargaining position when trying to sell their products to the large retailers. Concentration is such in individual MS that it may be characterised as a position of oligopsony (where there are few buyers and many suppliers in a market) or even monopsony (where a single buying firm



effectively controls the price level in a market by playing off the many suppliers against each other).

#### 4. Certification

The question on the use of certifications and motivations in the fish processing industry was already discussed in the previous processing report (STECF 17-16), covering the period from 2008 to 2015. No significant changes have taken place since then.

Processing companies are well adapted to the certifications of industrial processes, whether internal or external aspects. However, certification of raw materials cannot be influenced directly by processors and the decision of sourcing certified products will depend on the economic incentives of using the certified raw materials. Fish processors will source certified products if and only if they are able to transfer any potential increase in their costs to the forthcoming actors in the value chain by means of price premiums. On this respect, customers, in special wholesale and retail actors, have the final influence on making certified raw materials profitable or not for processors.

At this point, not all the different certifications have the same value for traders. Certifications based on quality attributes, linked or not with geographic origin, are more demanded than other more specific types such as environmental or ethical. This does not mean that there is a lack of concern about these issues for traders, but simply they find it harder to transfer the increases in their costs to the prices paid by the final consumers. These differences across traders with regard the value of certifications is not just a matter of different preferences across MS's but is also related with the scale and market size of the retail companies.

Processors will source certified raw materials at customer's request. Since these requests may vary from one customer to another, it makes no sense to get involved, or specialized, in a given class of certification for the raw materials. It is just a matter of sourcing the kind of product the customer is willing to pay for.

Beyond potential premium prices, if any, there are several other incentives for retailers in sourcing certified products. Sustainability certifications, for instance, assure continuity in supply, prevent criticism from environmental groups and improve company's public perceptions. Certifications of origin are not only related to quality, but also to the company's commitment to the community. However, despite the benefits for processors and traders, the decision of certifying raw materials in the fishing industry remains in the hands of fishermen and farmers. SME's may also find benefits in certain certified products as a way of differentiation.

#### 5. Russian embargo

The embargo of Russia on European fish products had, and still has, substantial negative influences especially for the countries around the Eastern Baltic Sea. Russia extends food embargo until 2020: The food embargo will stay in force until December 31, 2020. Estonia, Finland and Lithuania report a substantial reduction in exports to Russia. However, also other countries like Italy or the UK are facing negative impacts of the ban e.g. negative price effects for pelagic species for UK and a decrease of exports of fish products toward Russia for Italy, mainly caviar; indeed, since 2016, China has replaced Italy as the main country of origin of caviar imported in Russia (EUMOFA, 2018 a).

#### 6. The Impact of Brexit

At the time of writing (end of November 2019), it is hard to exaggerate the level of uncertainty created by the proposed secession of the UK from the EU and the reaction of the UK Parliament to it. The reader will know the results of the General Election to be held in mid-December 2019 and may be able to eliminate some of the possibilities discussed below.

There are three possible general outcomes – the word “general” being important because within each of the three outcomes there is a multiplicity of situations. They are;

- leaving without a trade deal with the EU,
- leaving with a deal, and,
- abandoning the implementation of Article 50 of the Lisbon Treaty thereby choosing to remain a Member State after all.

EU imports of fish and fish products from the UK are running at a value of around EUR 1.7 billion (2017 and 2018) with exports at EUR 1.5 billion, a surplus of approximately EUR 200 million per annum. In 2015, Germany, for example, has exported over 51,000 tonnes to the UK while importing nearly 25,000 tonnes (Doering et al., 2017). The Exports were processed products while imports comprised of raw material. Another example: More than 30% of Irish fishing quotas are caught in English waters and the UK is one of Ireland’s main export (12%) destinations valued at EUR 81 million in 2018. Conversely Ireland’s imports an estimated EUR 219 million of seafood for direct retail and raw material, particularly salmon and whitefish. It will depend on the trade relations after the Brexit if there will be substantial changes in the trade balance between the UK and the EU member states.

Without a trade deal the imports would be subject to EU Autonomous Tariff Quotas at a variety of rates on limited quantities according to the exact products as set out from time to time in EU Regulations. The current regulation ([Regulation EU 2018/1977](#)) covers the period 2019-2020. Exports to the UK from EU countries would be subject to tariffs imposed by the UK under World Trade Organisation rules.

The impact of tariffs is to reduce international trade. They lower demand and raise prices in importing countries and increase supply, lowering prices, in the exporting country. The extent of these movements will vary with the individual products and the tariffs and quotas imposed. These impacts are too complex to analyse and sum with any precision, but the general direction of the effects holds. It follows therefore that Brexit, without a trade deal, will mean higher costs for fish processors and retailers facing tariffs on imports in both the EU and UK, with lower demand for their products reducing their sales revenue. Consumers will experience changes in prices according to whether their country is an importer (price increases) or exporter (decreases).

What materialises will depend on the complexion of the UK lower House of Parliament after the December 2019 General Election. It is unlikely that the upper House would challenge the lower House and ultimately any legislation desired by the lower House can be forced through the legislative process and into law without the approval of the upper House by resort to the Parliament Act.

The current Withdrawal Agreement between the EU and the UK, should it be ratified, by the new UK Parliament, provides for a two-year transition period when little is likely to change. Only in the event of the UK leaving the EU without the Withdrawal Agreement being ratified at the end of January 2020, or on some subsequently agreed date, might the effects discussed above come into effect. They may also come into effect should there be no trade deal agreed during the transition period.

For many MS, especially those outside the Euro zone, the exchange rate is an important driver for the performance of the fish processing industry. This is reported especially by Poland (Zloty to the Euro), Sweden (Krona to the Euro), and the UK (Pound Sterling to the Euro). The availability and prices of raw material are influenced by the exchange rate as companies may decide to source their fish elsewhere if prices increase due to an unfavourable exchange rate. Given that exchange rate changes of 20% are not at all uncommon over a relatively short period of years, it is conceivable that exchange rate fluctuations could be as important if not more important to the viability of the EU fish processing industry than Autonomous Tariff Quotas.

## 7. Outlook

The fish processing is under price pressure from wholesalers, as well as increasing prices for raw material. Prices at EU28 level has increased for past years according to EUMOFA, 2019 (+ 10% between 2013 and 2017), whereas prices of meat and of food in general remained essentially stable.

There is so far no clear detectable effect of the improvement in fish stocks within European waters. An increasing supply may have a price effect on the industry on one side, on the other side the demand for certified products increases and more fisheries seek certification. This is costly and, therefore, prices for raw material from certified fisheries may further increase. A positive effect on the industry is expected also from the change in consumers' attitude toward the consumption of fish products. Indeed, even if none of the EU countries spends more for fish and seafood than they do for meat (fish and seafood accounted for less than 1%, which was four times lower than the share of the amount spent on meat purchases by EU households), from 2017 to 2018, households in all EU countries, except Sweden, increased their expenditure for fish and seafood. In particular, processed fish and seafood consumed out-of-home through foodservice channels (restaurants or catering) reached their highest volumes since 2014 (EUMOFA, 2019).

Global seafood trade in 2017 and 2018 was characterised by high prices and significant growth, but formerly positive conditions have deteriorated in early 2019. Trade tensions between the United States of America and China have not been resolved and uncertainty is widespread. Adding to the unfavourable trade environment is the extension of the deadline for the United Kingdom's exit from the European Union, as previously stated, with no more consensus as to the most likely outcome of ongoing negotiations concerning a final deal.

## 2.4 Additional table on the non-main enterprises

**Table 2.4.1. Enterprises carrying out fish processing as non-main activity, number and turnover 2008-2018.**

Country	Number of enterprises											Average 2008/2018	Turnover (million €)											Average 2008/2018			
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018				
Belgium	193	205	204	197	193	194	195	193	218			199															
Bulgaria																											
Croatia				19	21	21	21	24	28	30		23			5.5	9.3	11.5	18.6	20.3	24.6	26.4						
Cyprus	13	12	10	14	9	5	7	2				9	9.8	8.7	7.6	8.1	5.7	3.1	3.3	2.8						6.1	
Denmark	3	6	5	5	5	5	4	5	7	6		5															
Estonia	12	13	13	12	11	11	15	12				12	1.1	1.2	1.1	2.0	4.7	1.7	1.2	0.6						1.7	
Finland	22	49	56	13	13	21	21	20	20	28		26	10.3	128.8	147.1	49.9	49.9	93.8	93.8	102.6	102.6	133.6				91.3	
France		115	111				120	112				115		694.2	694.2			520.0	1014.0							730.6	
Germany		95		80								88		30.0		50.0										40.0	
Greece					7	10	9	10	10	11		10				1.1	0.7	0.7	0.7	0.8	0.9					0.8	
Ireland		16	25	22	29	20	20	22	16	16		21		52.9	27.5	11.5	22.2	50.5	52.6	80.6	47.7	34.6				42.2	
Italy	162	177	233	227	231	185	205	208	208	214		205	252.7	191.4	228.1	198.4	222.3	383.8	501.8	550.6	552.0	583.3				366.5	
Latvia	4	4	2	2	2	2	2	2	2	2		2															
Lithuania	2	2	2	3	3	6	6	21	31	23	31	12			3.7	3.1	5.3	7.2	9.7	10.7	3.9	68.5				14.0	
Malta	0	0	0	0	2	0	2	2	2	2		1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					0.0	
Netherlands		398	451	97	99	97	101					207		2338.3	2670.9	2879.8	2548.3	3172.3	2959.6							2,761.5	
Poland	32	34	34	37	35	38	45	42	41	42	36	38	52.2	62.6	64.8	72.5	82.1	100.5	93.4	70.3	66.3	80.8	81.0			75.1	
Portugal	29		38					17				28	194.9		134.9				50.8							126.9	
Romania	30	30	43	29	24	24	14	18	12	15	13	23	93.4	103.8	6.9	2.9	4.3		3.6	0.5	6.6	6.8	7.7			23.6	
Slovakia																											
Slovenia	8	8	9	8	7	6	6	4	6	8		7	14.4	12.9	16.0	9.8	8.0	7.0	6.8	7.0	12.8	14.4				10.9	
Spain	1											1	2.8														2.8
Sweden	87	98	95	108	120	125	126	132	132	134		116	73.4	80.1	96.6	97.1	111.9	238.2	237.7	223.3	245.0	211.8				161.5	
United Kingdom	647	423	353	353	247							405	622.3	506.5	511.3	566.7	654.5									572.3	
<b>Total EU 28</b>												<b>1,552</b>														<b>5,044.5</b>	

### 3 SOCIO-DEMOGRAPHICS OF THE EU FISH PROCESSING SECTOR

The social variables that should be collected for the processing industry are listed in table 10 in the COMMISSION DELEGATED DECISION (EU) 2019/910, establishing the multiannual Union programme for the collection and management of biological, environmental, technical and socioeconomic data in the fisheries and aquaculture sectors.

As this is the first year of reporting on social data collection this report only presents a snapshot in time and cannot examine trends which will be possible in future reports.

The social variables that should be collected are: Employment by gender, Employment by age, Employment by education level, Employment by nationality, together with the other employment variables listed in table 10 in the regulation: Number of persons employed, FTE National, Unpaid labour and Number of hours worked by employees and unpaid workers.

Although the regulation gives no guidance on how the data should be collected the PGECON workshop report from Vilnius in 2017 and Athens, 2018 provides recommendations on the data collection. Although the Commission Decision does not require stratified data or combined variables PGECON recognised that reporting social variables at more disaggregated levels rather than at national totals and reporting combined variables would add value to the social analysis.

The following categories for social variables were recommended:

- Age categories: <=14, 15-24, 25-39, 40-64, >=65, unknown.
- Education categories: High, Low, Medium, unknown.
- Gender categories: Female, Male, unknown.
- Nationality categories: EEA, EU, national, non-EU/EEA, unknown.

PGECON recommended that social data should be reported (raised) for the total population and that the sampling strategy and size should be reported.

The following analysis of social variables include 2017 data provided by 17 countries under the 2019 DCF data call – Belgium<sup>12</sup>, Bulgaria, Croatia, Germany, Greece, United Kingdom<sup>13</sup>, Denmark, Finland, France<sup>14</sup>, Ireland, Italy, Lithuania, Latvia, Poland, Romania<sup>15</sup> Slovenia and Sweden. Due to the relative stability of the social data, the EWG 19-15 agreed to impute the social data provided by Belgium, France, Romania and United Kingdom regardless of reference year (2016 or 2018).

Member states collected social data at different levels. Some member states collected data at enterprise level, others at employee level. Similarly, to the economic data collection under DCF member states used different sampling strategies (e.g. census, probability sample survey or non-probability sample survey).

#### 3.1 Gender

In 2017, there were 130 664 people employed in the EU processing sector, equivalent to 118 110 FTEs.

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<sup>12</sup> Data refers to 2016.

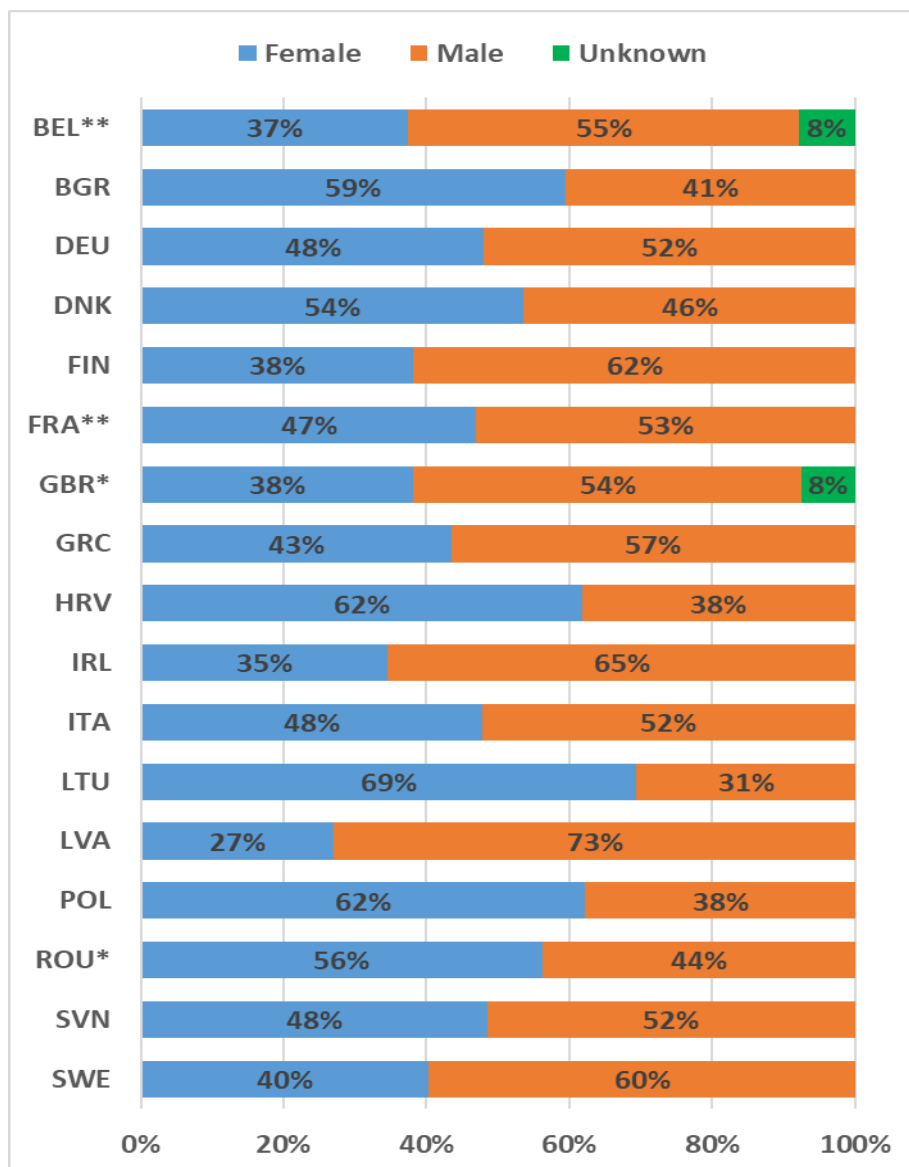
<sup>13</sup> Data refers to 2018.

<sup>14</sup> Data refers to 2016.

<sup>15</sup> Data refers to 2018.

The proportion of female and male in the enterprises was quite equivalent, respectively 51% were male, 48% were female and 1% was unknown.

Seventeen countries provided data for the gender of the employees in the processing sector. The percentage of female employees in the different MSs varied between 27% (Latvia) and 69% (Lithuania). In Slovenia, Denmark, Italy, Germany and France the proportion of male and female was almost equal. Only two countries submitted part of the data as unknown.

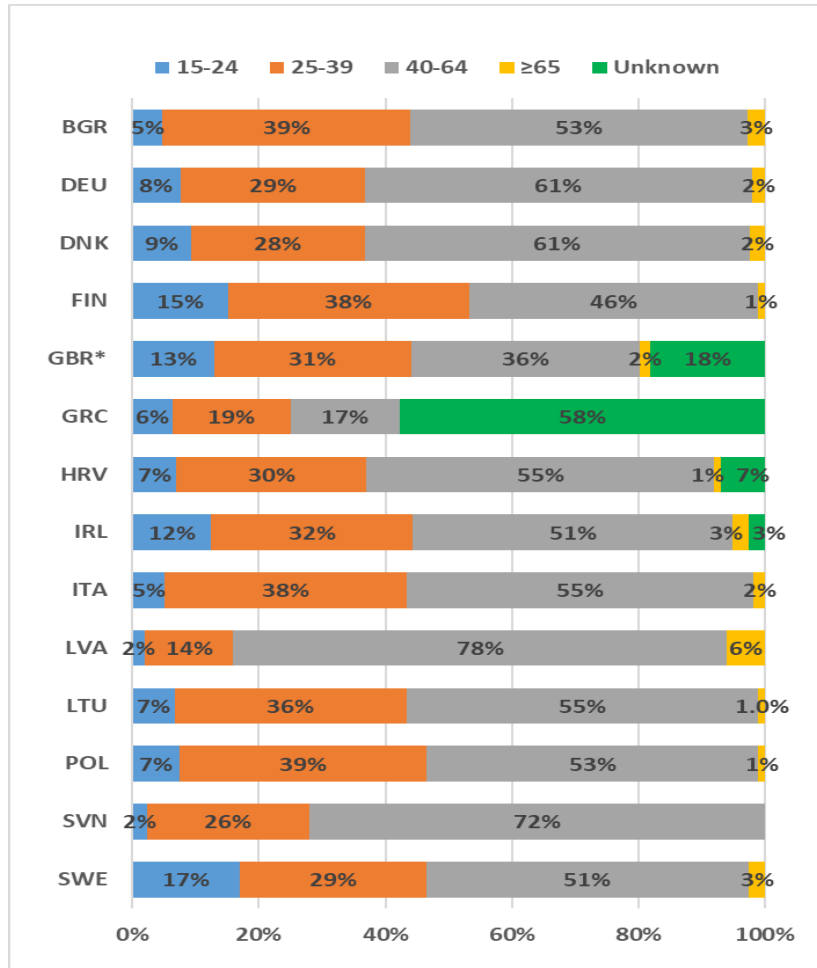


**Figure 3.1.1: Gender distribution by MS, 2017**

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG. \*Data refers to 2018, \*\*Data refers to 2016.

### 3.2 Age

While some member states collected age-data based on the proposed age categories some others collected actual ages of individuals and assigned employees to one of the age groups or used their own categories.



**Figure 3.2.1: Age distribution by MS, 2017**

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG. \*Data refers to 2018, \*\*Data refers to 2016.

Overall the 40-64 age class made up the largest proportion (50%) of people employed in the processing industry, followed by the 25-39 age class (33%). A further 9% were apportioned to the 15-24 age class, 2% to the over 65 years category and 7% were unknown.

The percentage of the age group 40-64 is highest in Slovenia (72%), Latvia (78%) and Denmark (61%). Over 40% of the employees in Finland, United Kingdom, Italy, Ireland, Lithuania and Sweden are below 39 years old. While Romania and France also provided the distribution by age, the age classes reported do not correspond to the age classes reported by most countries and, because of this, their data were not included in the EU analysis and comparison with other MSs (for further details see national chapters).

### 3.3 Education

Member states were required to report education aggregated by low, medium and high levels.

The education level categories required were based on the International Standard Classification of Education (ISCED) academic qualification classifications. For more information on the ISCED levels included in the age, categories see the Table 3.3.1.

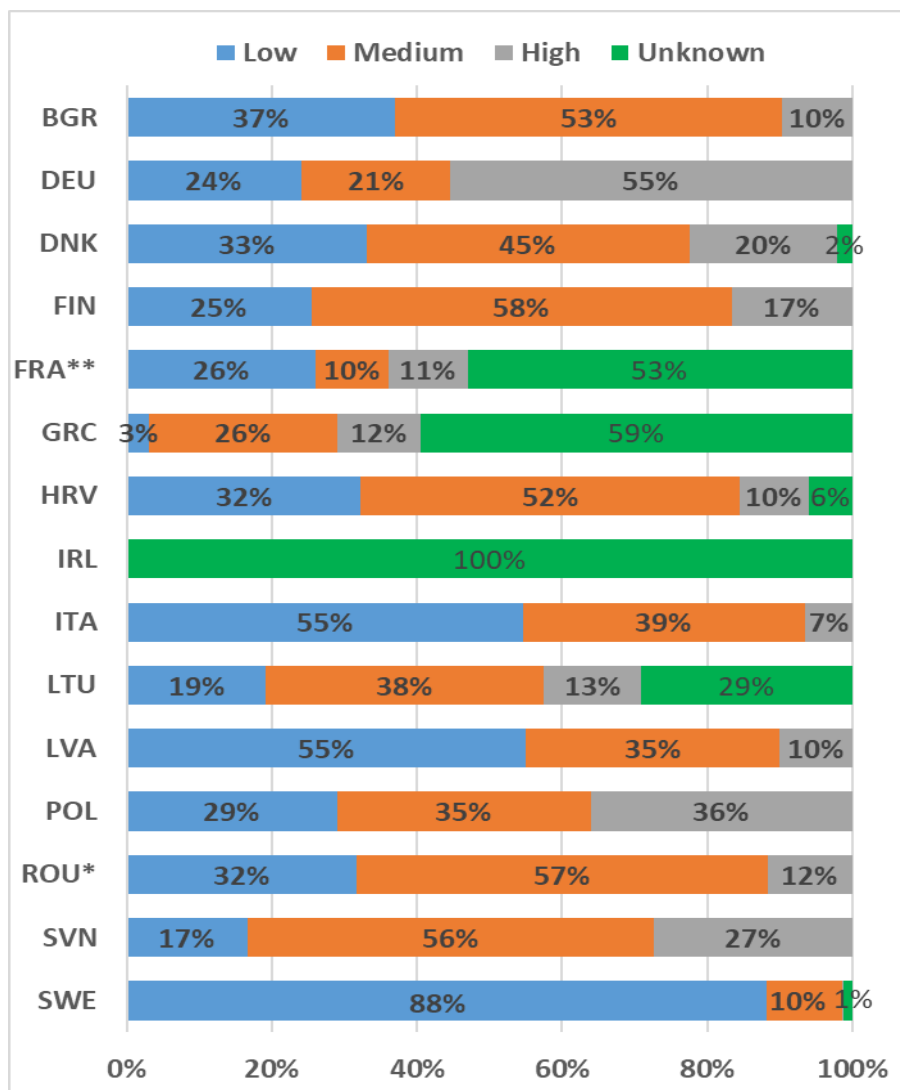
**Table 3.3.1: ISCED Academic qualification categories**

<b>ACADEMIC QUALIFICATIONS</b>		
<b>ISCED code</b>	<b>ISCED Educational attainment levels</b>	<b>Education Level</b>
1	Primary	Low
2	Lower Secondary School	
3	Upper Secondary School	Medium
4	Post-secondary non-tertiary education	
5	Short-cycle tertiary education	High
6	Bachelor's or equivalent level	
7	Master's or equivalent level	
8	Doctoral or equivalent level	

Overall the EU data demonstrates that 29% of people employed in the EU processing sector were educated up to a low level, followed by 26% with a medium level, 19% with higher education and 26% unknown.

The percentage of the higher education group is highest in Germany (55%), followed by Poland (36%), Slovenia (27%), Denmark (20%) and Denmark (61%). Over 88% of the employees in Sweden, 55% of Latvian and Italian employees had a low education level. More than 50% of the people employed in the processing sector in Slovenia, Romania, Croatia, Finland and Bulgaria have a medium level of education. United Kingdom also provided the distribution by education level; however, the classes do not correspond to data submitted by other MS but as reported, the largest share of FTE (35%) were low-skilled jobs.





**Figure 3.3.1: Education distribution by MS, 2017**

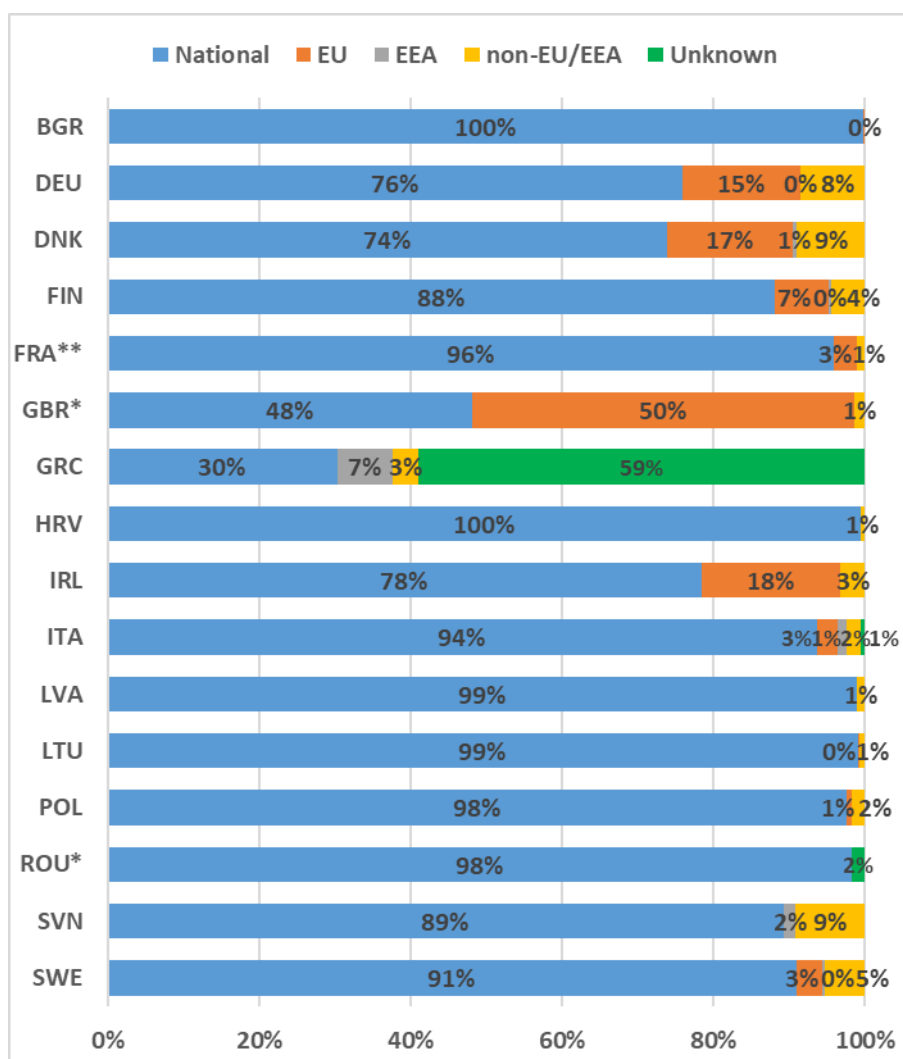
Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG \*Data refers to 2018, \*\*Data refers to 2016.

### 3.4 Nationalities

For all member states, it was recommended to report social data by nationality group. The nationality groups used were: nationals, EU, EEA, non-EU/EEA and unknown.

The majority (83%) of people employed in the EU fishing processing sector were nationals of their own country, followed by 13% from EU, 2% from non-EU/EEA nations, 0.1% from EEA and 1% were unknown.

In most of the MS the national employees are the main employees. The proportion of nationals varied from 99.9% in Bulgaria to 48.2% in United Kingdom. The other workers are mainly from EU MS. Only Greece provided more than 55% of unknown nationality.



**Figure 3.4.1: Nationality distribution by MS, 2017**

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG \*Data refers to 2018, \*\*Data refers to 2016.

### 3.5 Socio-demographics by size classes

The socio-demographic data broken down by company size was provided by only a few Member States (Table 3.5.1).

**Table 3.5.1: MS that provided the social data by size categories of the processing enterprises, 2017**

Country	Gender by size	Age by size	Education by size	Nationality by size
BEL**	Y			
BGR	Y	Y	Y	Y
DEU				
DNK	Y	Y	Y	Y
FIN				
FRA**				
GBR*				
GRC	Y	Y	Y	Y
HRV	Y	Y	Y	Y
IRL	Y	Y	Y	Y
ITA	Y	Y	Y	Y
LTU	Y	Y	Y	Y
LVA				
POL	Y	Y		
ROU*	Y	Y	Y	Y
SVN	Y	Y	Y	Y
SWE				

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG. \*Data refers to 2018, \*\*Data refers to 2016.

#### *Gender by enterprise size*

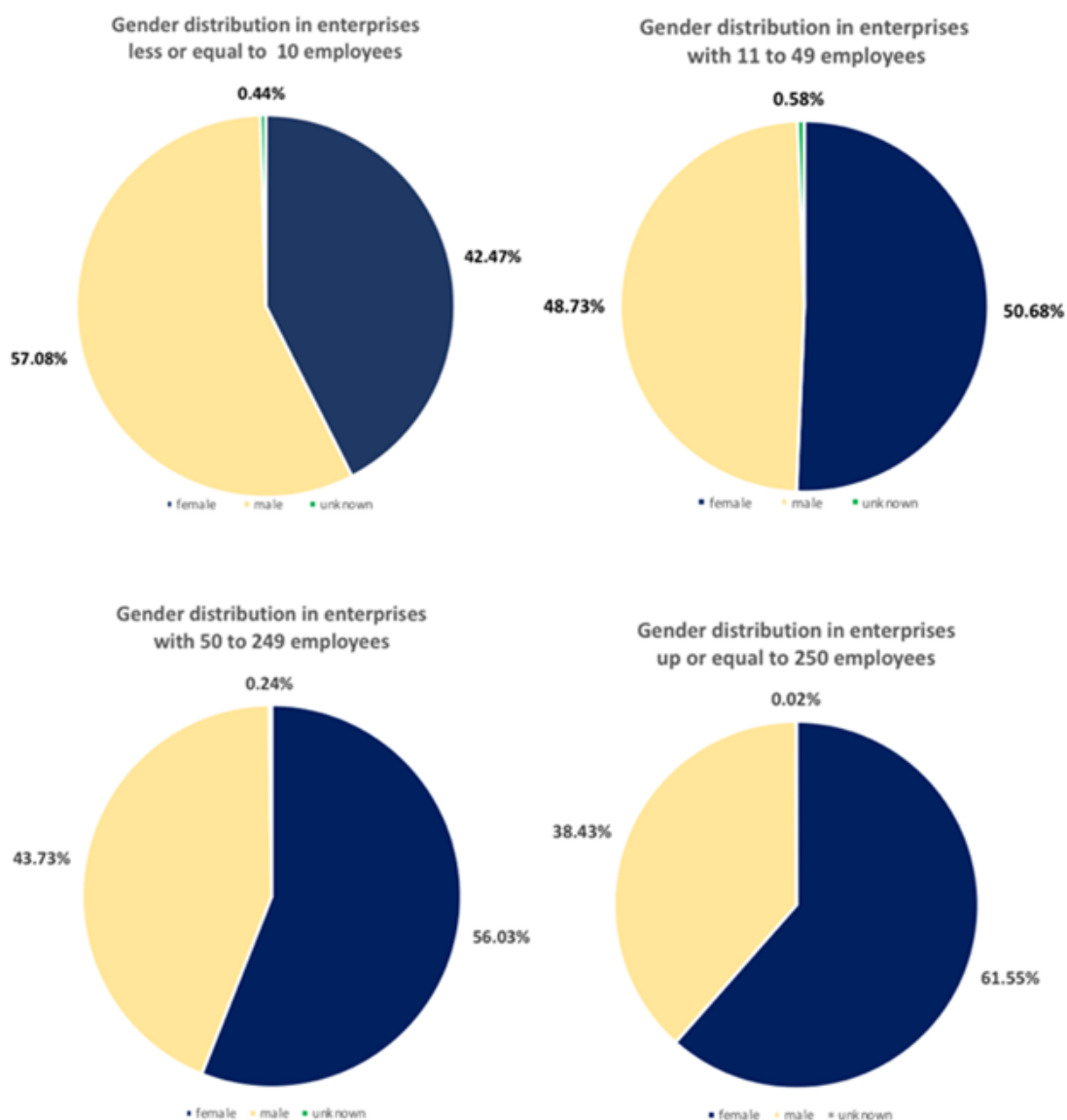
11 MS provided gender distribution by size categories of the enterprises – Belgium<sup>16</sup>, Bulgaria, Croatia, Denmark, Greece, Ireland, Italy, Lithuania, Poland, Romania<sup>17</sup> and Slovenia.

The biggest proportion of female employees was in the largest processing enterprises. Females made up 42% of the total people employed in smallest enterprises while reaching 61% in the biggest enterprises.

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<sup>16</sup> Data refers to 2016.

<sup>17</sup> Data refers to 2018.



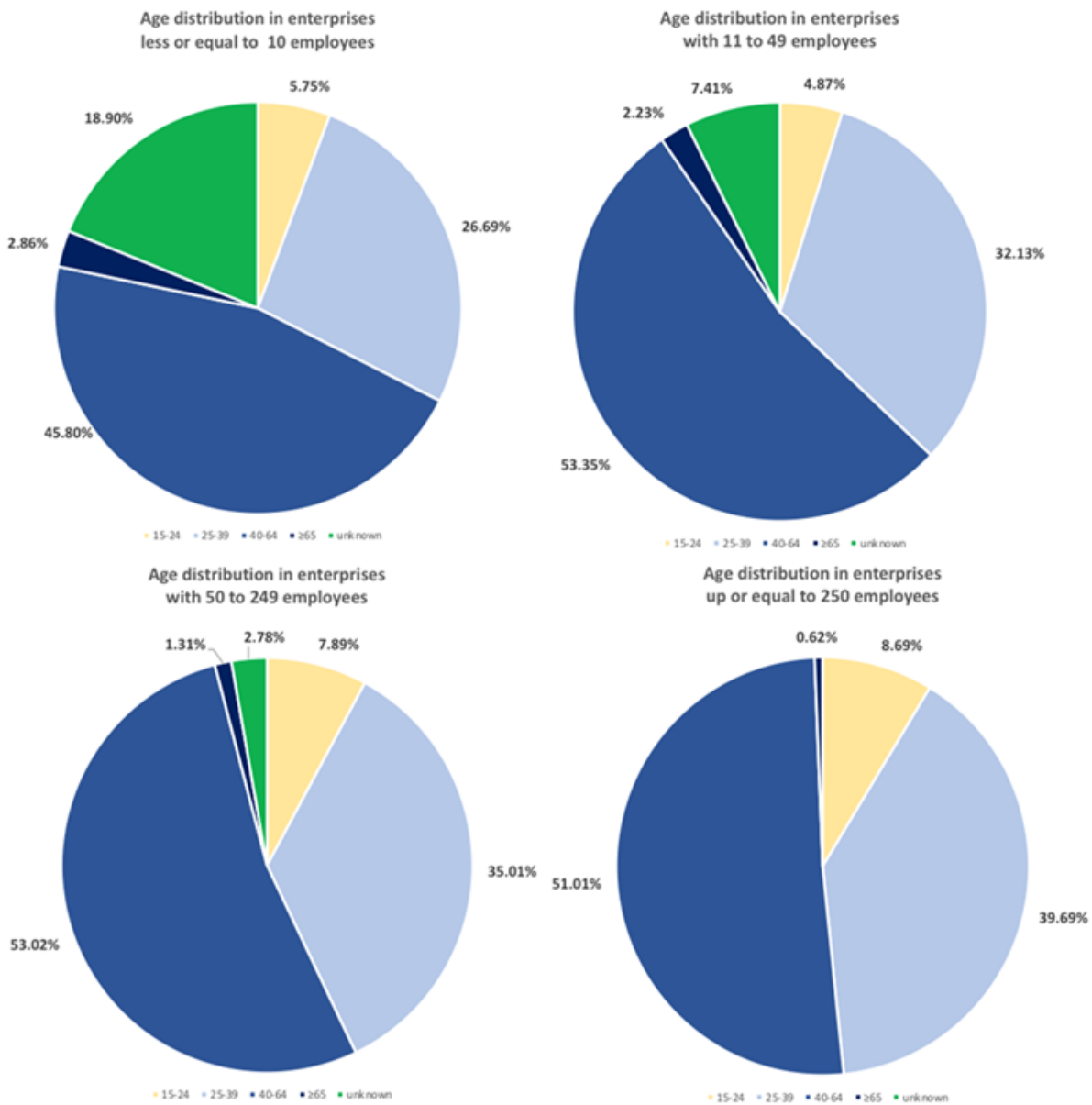
**Figure 3.5.1: Gender distribution by enterprise size, 2017**

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### Age by enterprise size

Ten MS provided gender distribution by size categories of the enterprises – Bulgaria, Croatia, Denmark, Greece, Ireland, Italy, Lithuania, Poland and Slovenia. Romania also provided the distribution by age and size enterprises categories in 2018, however the age classes do not correspond to other MS.

The structure of the age did not appear to be dependant on the size of the enterprise: the percentage of people between 40 and 64 years was very similar for all enterprises – between 48 and 53%. The youngest age categories do not represent more than 8.6% in any of the size categories (4.87% to 8.69%). The employees in the age group 25-39 were between 26% (in enterprises with less than 10 people) and 39% (in the largest enterprises with more than 250 employees).



**Figure 3.5.2: Age distribution by enterprise size, 2017**

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

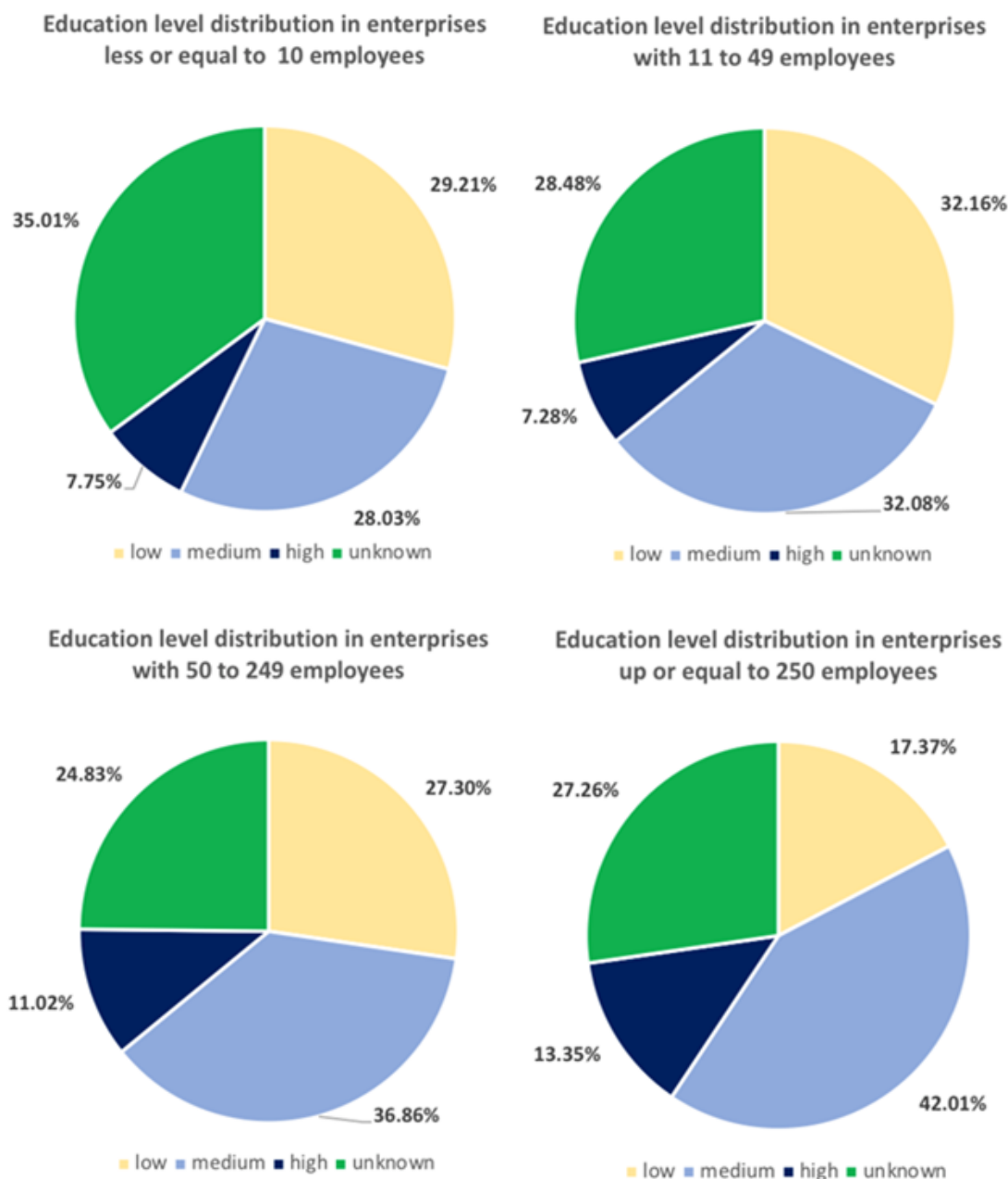
### *Education by enterprise size*

Nine MS provided education distribution by size categories of the enterprises – Bulgaria, Croatia, Denmark, Greece, Ireland, Italy, Lithuania, Romania<sup>18</sup>, and Slovenia.

In the processing enterprises with less than 10 and 11 to 49 employees, the distribution between the low and medium educated people is very similar (around 30%). In the both bigger enterprises the employees with medium level are between 36% (in 50-249) and 42%

<sup>18</sup> Data refers to 2018.

(more than 250 employees). The proportion of people whose education level was unknown was more than 24% in all the processing categories.



**Figure 3.5.3: Education distribution by enterprise size, 2017**

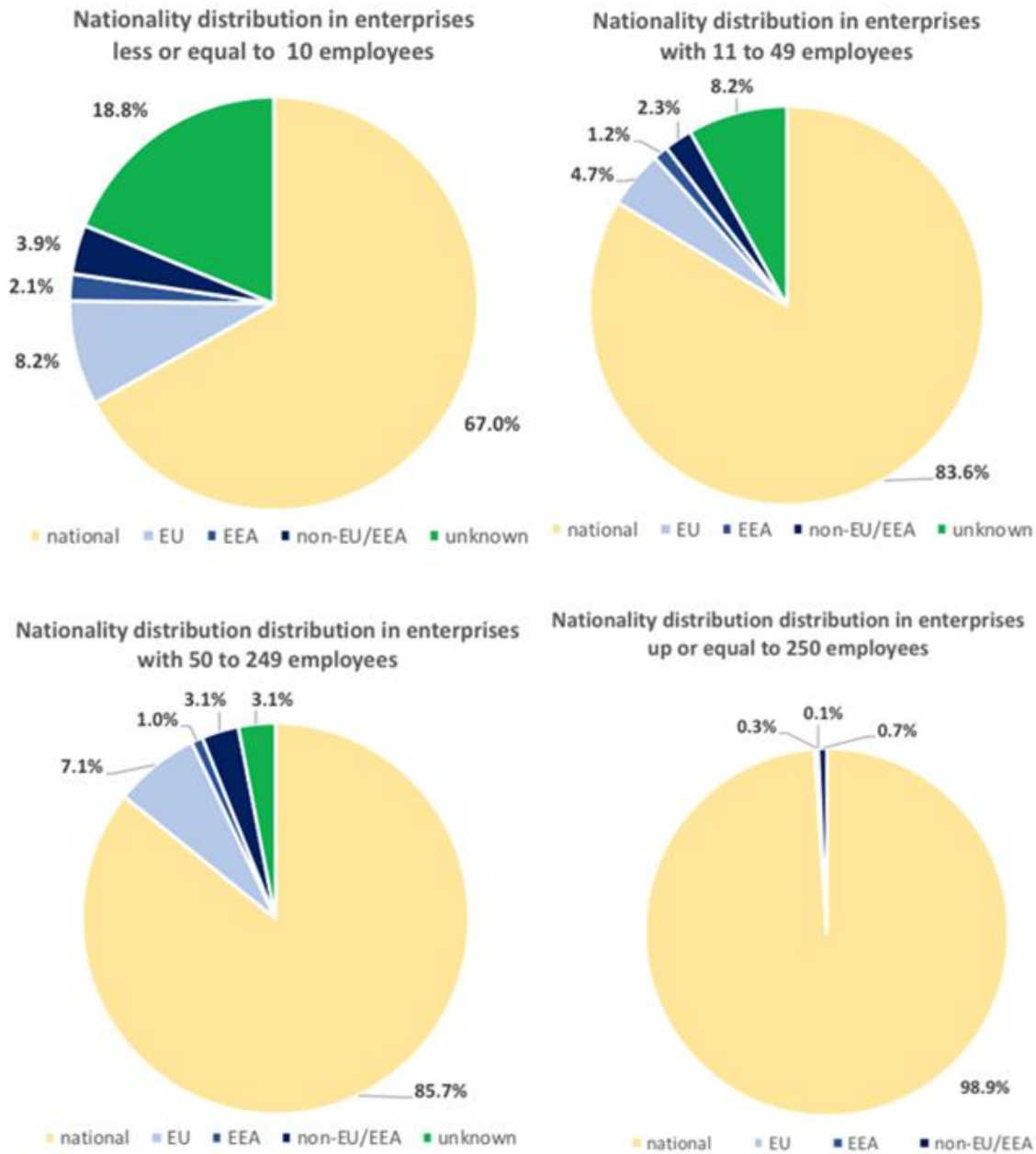
Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

#### Nationality by enterprise size

Nine MS provided nationality distribution by size categories of the enterprises – Bulgaria, Croatia, Denmark, Greece, Ireland, Italy, Lithuania, Romania<sup>19</sup>, Slovenia.

<sup>19</sup> Data refers to 2018.

The majority of employees were nationals for all size of the enterprises. The largest proportion of non-nationals was in the smallest enterprises – 8.2% EU, followed by 3.9% non-EU/EEA and 2.1% EEA.



**Figure 3.5.4: Nationality distribution by enterprise size, 2017**

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 3.6 Main conclusions and data issues

The main issues identified by the EWG 19-15 during the analysis of the first social data submitted for the fish processing sector under EUMAP are:

- The sector can be considered a gender equal sector as the proportion of female and male is quite equivalent; b) the 40-64 age class made up the largest proportion (50%) of people employed in the processing industry; c) an almost equal distribution of employees over educational levels if looking at the EU totals but with very high differences among MS and the share of unknown too high to provide average at EU levels and make comparison with other sectors d) the vast majority (83%) of people employed in the sector are EU nationals of their own country, being the rest mainly workers from other EU MSs
- Finland, France, Germany, United Kingdom, Latvia and Sweden did not provide data by size category but provided the total employees by size category in the main economic template. EWG 19-15 suggest MSs, wherever possible, to collect also social data by since classes as this would increase the accuracy of the analysis at EU level.
- Ireland provided 100% unknown for the education as survey returns for this variable were very low and no imputations could be made.
- Romania (2018 data) and France (2016 data) provided the age classes in different segmentation than the one recommended by PGECON and, for this, their data were not included in the EU overview. In order to provide an accurate EU analysis and comparison among MSs, EWG 19-15 concludes that it would be advisable that all MSs will submit data according to the age classes recommended by PGECON.
- EWG 19-15 also concludes that to provide an accurate analysis of the trends in the age population it would be advisable, for the future, to split the age group 40-64 into smaller groups (indeed, this group is the one with highest share of employment, for some MSs being higher than 70%).
- The UK (2018 data) provided education in different categories than agreed by PGECON. Again, EWG 19-15 concludes that for an accurate analysis of the trends in the educational levels of people employed in the fish processing industry, it would be advisable to have all MSs data harmonized to the PGECON suggested categories for educational attainments.



#### **4 SPECIAL CHAPTER ON RAW MATERIAL DATA COLLECTION AND USE**

Over the years, there have been on-going discussions on how to improve the economic report on the fish processing industry and its relevance in terms of policy advice in the context of the Common Fisheries Policy (CFP). Recommendations put forward in previous reports (EWG 14-15 and EWG 17-16) highlight the need of reporting the raw material of fish (input) going into the fish processing industry. Including information on raw material inputs would allow experts to analyse the whole value chain from the moment the fish is caught (or produced in aquaculture) until it is processed and ready for consumption. Furthermore, knowledge on the origin of the fish (imported or produced within EU) would reveal Member States dependencies on domestic landings, aquaculture production and/or imports and thereby connect the processing industry with the fleet and aquaculture producers. This would also allow assessing the overall impact of changes in domestic production due to limits on EU fleet landings (e.g. TAC) or constraints on aquaculture production on fish value chains.

Indeed, raw materials represent the most important input for the fish processing industry covering 60-80% of the total costs. The fish processing sector is also highly dependent on raw material imports. In 2017, EU self-sufficiency covered approximately 43% of the total raw material entering the EU (EUMOFA, 2019). This leaves the enterprise vulnerable to changes and developments on the world markets. Furthermore, the effects of the improved management of fish stocks and promotion of aquaculture production in the EU are, so far, not visible with respect to the availability of raw material for the EU processing sector.

Based on previous recommendations from the STECF reports on the fish processing sector, the collection of raw material data, in terms of volume was included in the data collection framework under the EU-MAP, on an optional basis. In particular, EU-MAP has provided MS with the possibility to carry out pilot studies investigating the feasibility of collecting raw material data (initiated on a voluntarily basis in 2017-2019). Some MS initiated a data collection within the previous program and have been collecting data on a regular basis. However, the quality and coverage are not always optimal and homogenous to make comparisons across MS.

In addition, the SECFISH project (Socio-economic data collection for fisheries, aquaculture and the processing industry at EU level), funded under DG MARE/2016/22 - Strengthening regional cooperation in the area of fisheries data collection - included a work package (WP5) aimed at establishing a common approach to data collection of raw material in the EU. WP5 also evaluated the feasibility of collecting data at species level, origin, production type (fisheries or aquaculture) and degree of processing in a cost-efficient manner.

STECF and PGECON suggested that the main findings of the SECFISH project as well as of the national pilot studies on the collection of raw material should be considered by EWG 19-15. The group was requested to report on the status quo of the raw material data collection, as well as, insights for future data collections.

The current section is, hence, based on data and information submitted by MS (pilot studies) in line with the official request (on a voluntary basis) and complemented with main findings from the SECFISH project and the PGECON 2019 report. Two case studies, Finland and Denmark, are also included to provide alternative methodologies for raw material data collection and analysis.

Two ad-hoc analyses on raw material related topics, produced by experts during the EWG, complement this section, namely:

- the potential use of waste products originating from both the primary production (fisheries and aquaculture) and the processing industry itself as input for the fish processing sector
- the impact of the Autonomous Tariff Quotas on the imports of raw material from fish processing enterprises, in accordance with the ToRs provided to the EWG.

#### **4.1 Raw material data delivered under the 2019 data call (EU-MAP)**

During the 2019 EU Fish Processing Industry data call (first data call under EU-MAP), MS were requested to provide voluntarily data on the weight of raw material per species and origin for firms with fish processing as main activity. The submitted data from the eight MS (Bulgaria, Croatia, Finland, Greece, Poland, Romania, Slovakia and Slovenia) are briefly described below.

Bulgaria provided raw material weight data for the years 2016-2018 disaggregated by firm size but without disaggregation by species and origin. Approximately 73 thousand tonnes of raw material were used by the industry during the three-year period (the corresponding yearly average value ranges from 1.54 EUR/kg to 1.64 EUR/kg).

Croatia provided raw material data on weight for the firms sampled in the years 2016 and 2017. The data are disaggregated by firm size category but not by species and origin. The sampled firms used 49 thousand tonnes of raw material in 2016 and 30 thousand tonnes of raw material in 2017.

Finland provided raw material weight data for 11 distinct species (including unspecified species) for the years 2016 and 2017. Approximately 80 thousand tonnes of raw material were used by the industry in each year. The data, however, include raw material for firms with fish processing not as main activity and hence, there is no direct link with the economic variables submitted. Approximately 40% of the raw material is imported every year. Five species which are sourced exclusively from domestic production account for 30% of the raw material used. The main species sourced from domestic production are Atlantic herring and rainbow trout while the main imported species is Atlantic salmon.

Greece provided raw material weight data for the years 2016 and 2017 disaggregated by firm size category but without disaggregation by species and origin. Approximately 62 thousand tonnes of raw material were used by the industry in both years (corresponding to an approximated average value of 2.6 EUR/kg and 2.8 EUR/kg for 2016 and 2017, respectively). Disaggregated unofficial data<sup>20</sup> suggest that more than 45 species were used by the industry in 2016 and 2017. Four species, two mainly imported molluscs (squid and octopus), and two finfish (anchovy and sardine) account for more than 27% of the raw material used.

Poland provided raw material weight data for the years 2016-2018 without disaggregation by species and origin. Approximately 2 million tonnes of raw material were used by the industry during the three-year period (the corresponding yearly approximated average value ranges from 2.84 EUR/kg to 3.50 EUR/kg). Disaggregated unofficial sample data<sup>21</sup> suggest that eighty-seven species were used by the industry during the three-year period, although, two mainly imported species, Atlantic salmon and Atlantic herring account for more than 50% of the raw material used.

Romania provided raw material weight data for the firms sampled and for eighty-nine distinct species (including unspecified species and fish eggs), also disaggregated by firm size category

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<sup>20</sup> Collected along with the processing data collection and provided by the expert from Greece at the EWG 19-15 meeting, though not uploaded during the data call.

<sup>21</sup> Collected along with the processing data collection and provided by the expert from Poland at the EWG 19-15 meeting, though not uploaded during the data call.

for the years 2016-2018. As the first data collection on raw material was launched during 2016, the quantities for this specific year are thought to be underestimated. Approximately 26 and 19 thousand tonnes of these species were used by the firms sampled in 2017 and 2018 respectively (the corresponding yearly approximated average value is 1.73 EUR/kg and 2.52 EUR/kg respectively). More than 85% of the raw material is imported each year. Atlantic mackerel, Atlantic salmon and fish eggs account for more than 60% of the imported raw material used. Raw material sourced from domestic production refer mainly to sea snails, cyprinids and trout.

Slovakia provided raw material weight data for two main categories, freshwater fish and marine fish, for the years 2008 to 2018 disaggregated by origin (own production, domestic purchases, imported from EU and imported from non-EU countries). On average, 6.2 thousand tonnes of raw material was used annually by the industry over the 11-year period, of which, 22% are freshwater fish (ranging from 10.2% in 2008 to 35.3% in 2016). As Slovakia is a land locked country, all the marine fish is imported.

Slovenia provided raw material weight data for the firms sampled and five distinct main species for the years 2016 and 2017, but not the total raw material weight used. Approximately 2.6 and 1.7 thousand tonnes of these five species were used by the firms sampled in 2016 and 2017, respectively. None of the main species used is sourced from domestic production. The main species imported is Atlantic mackerel.

Based on the data submitted, no further analysis could be performed due to non-homogenous data in terms of aggregation levels and since data were not extrapolated to the overall raw material use of the country. Some countries only report data obtained from enterprises within their sample. However, for the countries, which submitted disaggregated data by species and origin, data suggests that a vast amount of the raw material used in those countries is imported. Romania and Slovenia use Atlantic mackerel from catch based fisheries as the main species for raw material, while Finland and Poland use mainly Atlantic salmon, a product originating from aquaculture, as raw material.

#### **4.2 Pilot studies and raw material data collection: status quo**

As already mentioned, the EU-MAP provided MS with the possibility to carry out pilot studies investigating the feasibility of collecting raw material data.

In the following sections, a summary of the Italian pilot study, submitted officially as a background document, is reported as well as a summary of the status quo of the raw material data collection across MS, including other information and studies from the latest PGECON report (PGECON, 2019) and the SECFISH project.

##### *The Italian pilot-study*

The Italian pilot study was concluded in 2018 and followed the provisions of the National work plan. Based on the identification of the reference population (companies with ATECO code 10.20 as "main"), the study was undertaken through: (1) a desk survey using two databases, AIDA and MintItaly, for the analysis of financial features of companies, and (2) a survey questionnaire to a representative sample of processing companies specialised in deep-freezing/freezing and/or preserving/canning methods. A small group of experienced representatives of the Italian processing sector agreed and validated the selected sample of companies and the contents of the questionnaire.

The data requested through the questionnaire made it possible to find solutions so that national aggregate data can be released by FAO species, with indication of origin and, if possible, indication of GSA. The response rate for the questionnaire survey was around 14%

for companies with less than 50 employees and slightly below 14% for companies in the size class >50 employed. Regarding the main fish processing activity, 67% of companies mainly produced canned and preserved products, while the remaining part mainly produces frozen products. This distribution was found for both size classes.

According to industry representatives, the industrial production of canned fish is concentrated in a few Italian regions, namely: Lombardy, Sicily, Sardinia, Calabria, Campania and Emilia Romagna.

Responses on raw materials and the specific sub-categories (commodities) were largely inconsistent and considered insufficient to estimate raw material volumes by commodities. The sub-division of the processing sector between canning and freezing companies outlined a distinction of the main raw materials processed: 31% of the companies process blue fish (small pelagics, tuna) and 87% fall into the sub-category "canned fish companies". The most processed raw material among the blue fish was anchovy (*Engraulis encrasicolus*) followed by tuna. Anchovies are processed salted or in fillets in oil. Only 5% of the total processed anchovies are sold as a salted finished product. Regarding the type of commodities, the distinction is linked to the processed species: the commodities of small pelagic are mainly fresh while tuna is mainly frozen.

The study concludes that there are mainly two processed commodities: anchovies and tuna. Regarding the raw material "anchovies", the sample can focus on about 10 companies that produce over 80% of the volume of Italian anchovies' total production. The same methodology could be applied to collect data on "tuna" raw material. The variety of raw materials used increases in the size category <50 employees. In this case, volumes are lower but the species processed are numerous (cephalopods, clams, farmed products such as sea bass, sea bream and trout, prawns, etc.). A potential future data collection should be based on a sample that will guarantee the representativeness of the canning and freezing segments, extracted in a non-probabilistic way from the list of small-medium enterprises (Non-Probability Sample Survey).

During the pilot study, the greatest difficulties encountered were in contacting industry representatives, especially considering the relevance of their role in defining the methodology to be adopted. Without industry participation it is very difficult to collect data and provide data at the necessary level to conduct in-depth analysis.

#### *An overview summary on MS raw material data collection*

PGECON 2019 made an effort to report the status quo of the data collection of raw material data across MS. The statements provided from the PGECON 2019 report are combined with information from the SECFISH project.

- Austria does not collect data on raw materials for fish processing. The number of fish processing units in Austria is very low. Therefore, results from a survey or pilot study is not expected to provide a satisfactory representation of the industry. Thus, Austria is in favour of raw material data collection remaining voluntary and have no current plans for collecting raw material.
- Belgium did not do a pilot study on raw material. Furthermore, they are evaluating the existing data collection for processing industry, including the issue of collecting raw material data in the future. Currently, there is no plan for collecting raw material.
- Bulgaria is collecting total quantity of raw material by surveys, with response rates close to 100%. If more detailed data should be provided, it should be on a voluntary basis. It is difficult to get more detailed data from the companies.

- Czech Republic is in the process of preparing a data collection on raw materials for fish processing. They are trying to collect data for the years 2016 and 2017 and preparing to collect data for 2018.
- Croatia is collecting data on raw materials in the fish processing industry but only for total value and volume.
- Denmark conducted a pilot study on raw materials for the fish processing sector using qualitative interviews. The conclusion was that data exist on a detailed level due to the demand for traceability in the sector. However, enterprises are not interested to provide the data, mainly for two reasons. First, the data is not stored in a way that can be used for comparison at the EU level, which make it costly to provide the data in such a format. Secondly, price data is considered as confidential and the enterprises are not keen of sharing this information. Based on the information provided during the interviews within the pilot study, Denmark consider that the raw material data collection should be on a voluntarily basis, because the quality of the data will not be on a satisfactory level if the industry is not willing to participate. An alternative approach to collect data that can provide information on species used and product produced is included as a case study.
- Finland is collecting data on raw materials for fish processing sector by species, every second years. A more comprehensive description of the Finnish data collection is included as a case study.
- France has conducted a pilot study on raw materials on the fish processing industry, but results are not yet available.
- Germany conducted a pilot study for a raw material data collection as part of the SECFISH study. The industry has the data in accordance with the traceability regulation but was not willing to provide any data due to the extra workload and confidentiality issues.
- Greece is collecting data on raw materials for the fish processing industry. However, it is difficult to assess the coverage of the raw material data in regards to the whole industry.
- Hungary is collecting data on raw materials (by species, quantities and values) using questionnaires. Data collection was done using questionnaires during face-to-face interviews. They are planning to repeat the survey in 2020 and are also planning to develop a new statistical data collection program for the processing sector, including data collection on raw material.
- Ireland is not currently collecting data on raw materials for fish processing. They are in the middle of a review on processing data collection and plan to request data on raw material. However, it is expected that this data collection will be difficult to carry out and the response rate will be very low.
- Italy conducted a pilot study; however, the response rate was low. Thus, at present there will not be a data collection for raw material. The Italian data collection is presented as a separate section, as the pilot study has been submitted as requested officially by the data call.
- Latvia conducted a pilot study using a survey. However, the response rate was too low and the data could not be further analysed for meaningful results. The pilot study collected data for 2017 and covered 18 enterprises, corresponding to around 15% of the companies. An earlier attempt to collect data (for the DCR Regulation Central Statistical Bureau) was not successful due to the low response rate and the problem of double counting (distinguish between the same fish used several times as raw material for production). There are no plans for future data collection.

- Lithuania collects raw materials for the fish processing industry (by main species, fresh water or sea-based production). The data collection method is a census survey, which is approved by legal acts in order to implement the National official statistics program. Type of product in the questionnaire could be identified by CN code or group of CN codes, mainly representing the type of processing applied (smoked, salted, in brine, etc.) and products could be linked to the species or group of species (matrix of product and species). The data are collected along with the identification of whether the raw material is imported or of local origin and linked to species (matrix of import or local raw material and species). The data collection will be continued.
- Malta are attempting to collect the raw material data. Currently, the fish processing units are not willing to cooperate on a data collection, therefore the pilot study has not been a success.
- The Netherlands does not collect data on raw materials for fish processing (as well as no economic variables).
- Poland has been collecting raw materials in fish processing since 2006. The data are collected using questionnaires, census. The data collection will be continued.
- Portugal does not collect any data on the processing industry.
- Slovenia had a pilot study on collecting raw materials for the fish processing industry, however; it was unsuccessful, and it was decided to terminate the study. Slovenia collected raw material data for the processing industry in 2007, 2013 and 2014. The collection of data is based on species and degree of processing. Slovenia will continue to collect data for the processing industry in the future, based on the already developed questionnaire. However, it is very difficult to get information because the enterprises consider this information as a business secret.
- Spain do not have a data collection for raw material and will not have a data collection on this in the future.
- Sweden is conducting a pilot study for collecting raw material data in processing sector, however; they are looking into alternatives ways of providing the relevant data.
- The UK conducted a pilot studies on data collection of raw materials for fish processing. Attempts were made to engage the industry, however, they were not interested in participating. If the industry does not see a need for this kind of data collection, data will not be collected.

### **4.3 SECFISH results and main conclusions**

The aim of the SECFISH project work package 5 was to evaluate the possibility and constraints of a regular collection of data on raw material entering the EU processing industry (European NACE Code 10.20). The analysis examined the feasibility of collecting data on raw material input entering the fish processing industry by species, product form and origin including production method defined as fisheries or aquaculture. Finally, benefits and costs of establishing such a data collection on a regular basis, not necessarily annual, were estimated.

#### *Existing data sources*

Existing data sources in Denmark and Germany were examined with the aim of identifying the volume of fish and fish products going into the processing industry. From the existing data sources, it was not possible to determine the amount of raw material entering the fish processing industry. However, it was possible to establish a supply balance and apparent consumption in each case study MS ((catches for food-use + aquaculture + imports) – exports

= apparent consumption), even if import and export statistics and calculation of whole live fish can be very challenging and the difficulties in avoiding double counting.

Furthermore, the domestic trade flows of fish are very hard to follow since many fish products are traded without or with limited amount of processing both through traders but also internally between processors. Existing data sources on the product produced within the processing industry allowed some kind of estimates on species going into the industry, but without the knowledge of the product form entering the industry it is very difficult to estimate the volume of raw material used. Furthermore, from these data it was not possible to determine the origin of the raw material, the product form and prices of the raw material entering the industry. Thus, without more exact knowledge (data) the questions on the production environment, origin, product form and price cannot be answered from the existing data sources.

#### *Data harmonisation and a common methodology*

The Combined Nomenclature is a tool for classifying goods, used in the EU intra- and extra-trade statistics. The Commodity Number code, an 8-digit level code, enables identification of most species and product forms of raw material entering the EU fish processing industry. This also provides the possibility to compare prices by species and product forms of raw material between EU countries.

To be able to compare data between all EU Member States, a future data collection needs to be built on a common platform that is available in all countries. At the same time, the information included should contain information on species and product form of the raw material entering the processing industry. Thus, the common methodology chosen for the questionnaire developed within the SECFISH project was the Combined Nomenclature using the Commodity Number classification code at an 8-digit level.

Using the Combined Nomenclature and the Commodity Number classification code at an 8-digit level satisfied the data needs requested in this project. However, a main species and main product form approach in line with the Finnish data collection example could be used as an alternative.

#### *Development of questionnaire*

A preliminary questionnaire was developed and has been tested through qualitative interview with the fish processing industry, industry organizations and data collection experts in the following countries Belgium, Denmark, Finland, Germany, Netherlands, Ireland, Italy and UK. Furthermore, data collection experts commented on the feasibility of collecting raw material data using the questionnaire in the following countries Bulgaria, France, Greece, Hungary, Latvia, Lithuania, Poland, Slovenia and Spain. These interviews provided insights on whether it was feasible for the industry to deliver the raw material data on the described 8-digit Commodity Number code or if an alternative to this approach seemed more feasible for the industry.

The interviews revealed that the industry has all the information that was requested within this project on volume and value of species, production environment, origin and product form of the raw material purchased. However, the industry expressed great reservation in participating in such a data collection. The main issue for the industry was that it would be costly for them to organise and deliver data in a way that could be easily assessable and comparable between EU MS, such as the described 8-digit Commodity Number code. Enterprises often have many transactions, which are not always stored electronically (sometimes only on paper) or in a way that could easily be harmonized with the 8-digit Commodity Number code. Furthermore, the enterprises perceived the price information as confidential in many cases. Thus, from an

industry perspective, such a data collection would only induce extra costs without having any benefit for the industry.

A way forward, that would reduce the workload for the industry, could be to investigate if the data stored at the enterprise level according to the Control Regulation (traceability legislation) could be used for analysing the raw materials input for the EU processing industry.

### *Conclusions*

The feasibility study shows that the data requested within this SECFISH project are available at the enterprise level and that it is possible to gather the data at a CN 8-digit level (or species and product level), which makes it comparable at a species and product level within the EU.

On the other hand, the industry seems very reluctant to deliver the data, because it is an extra workload for them and therefore costly. Therefore, it might be challenging to collect and receive representative data. A way forward could be a coordination between the Control Regulation related to traceability of fish and a data collection of raw material. This could minimize the cost for the industry and at the same time provide the needed data for analysing the raw material use in EU. Furthermore, under the existing data collection an investigation on industry specialisation into species and product form may be conducted using the Industry Commodity Statistics for Sales and Purchase (Prodcom) by the STECF Expert Working Group for the processing industry.

#### **4.4 Data collection of raw material by species and origin: the Finnish case study**

Finnish statistics on raw material use in fish processing have been produced every other year since 1993 that provides comparable data on raw material use in fish processing since then. The statistics on fish processing present the amount of raw material used for production by end-product group and by raw material group both for domestic and imported fish. The results follow the Combined Nomenclature Commodity Number classification code and can be presented accordingly.

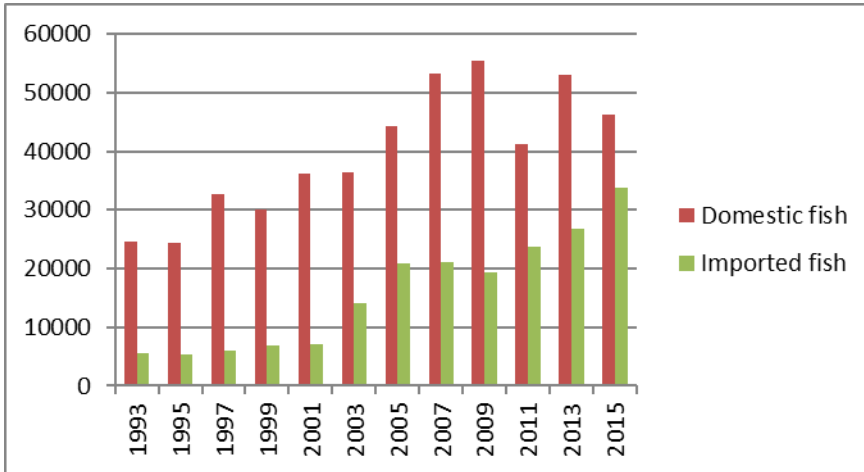
Finnish data collection is carried out with an overall survey on the frame population that covers all fish processing enterprises including enterprises that the primary activity is other than fish processing. The description of the data collection is available at: <https://stat.luke.fi/en/tilasto/4480/kuvaus/5653>. And the related questionnaire is available at: [https://stat.luke.fi/sites/default/files/luke-kalanjalostus\\_lomake\\_2017.pdf](https://stat.luke.fi/sites/default/files/luke-kalanjalostus_lomake_2017.pdf).

Main results from the Finnish data collection are reported as a good example in terms of coverage by species, commodities and origin.

#### *Results of fish processing raw material data collection for 2015*

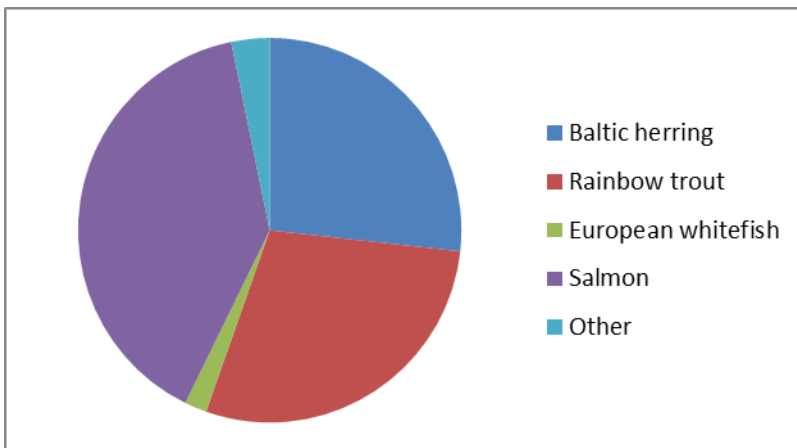
Finnish fish processing industry processed some 80 thousand tonnes of fish in 2015. A total of 46 million kilos of the processed fish were Finnish and 34 thousand tonnes were imported (Figure 4.4.1). The amount of domestic fish processed decreased by 13% while use of imported fish increased the corresponding amount with marked 25% increase compared to year 2013 (Figure 4.4.1).





**Figure 4.4.1: Amount of domestic and imported fish used for processing in tonnes, 1993–2015**

The change in the volume of Finnish fish was due to a decrease in the freezing of Baltic herring, after the Russian embargo on EU food stuff as a countermeasure to EU sanctions due to the Ukraine crisis in 2014. The increase in the volume of imported fish was due to the increasing use of Norwegian salmon.



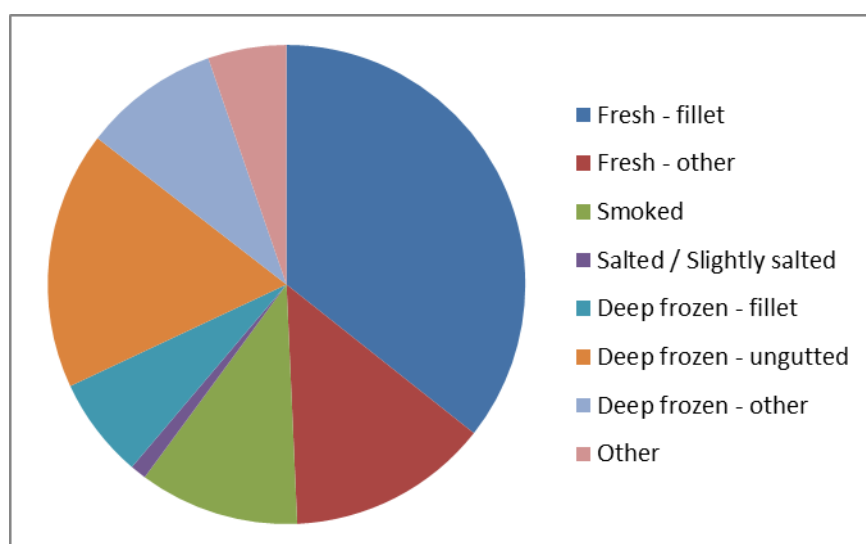
**Figure 4.4.2: Amount of fish used for all products, 2015**

Salmon was the most important species for processing in 2015 followed by rainbow trout and Baltic herring. Together these accounted for 97% of all fish used in the sector (Figure 4.4.2). Table 4.4.1 presents the raw material used in processing industry by species with the 95% confidence levels and coefficient of variation.

**Table 4.4.1: Raw material weight of domestic and imported fish used in fish processing, by species (in tonnes ± 95% confidence interval)**

Species	Domestic fish		Imported fish		Total		CV
Baltic herring and sprat	20,771	(5,344)	595	(766)	21,366	(5,398)	13%
Rainbow trout	22,879	(7,937)	-	-	22,879	(7,937)	18%
Salmon	153	(120)	31,409	(14,288)	31,561	(14,355)	23%
European Whitefish	851	(360)	642	(713)	1,493	(795)	27%
Vendace	362	(246)	-	-	362	(246)	35%
Perch	386	(222)	-	-	386	(222)	29%
Pikeperch	546	(319)	-	-	546	(319)	30%
Redfish	-	-	4	(5)	4	(5)	64%
Pike	148	(69)	-	-	148	(69)	24%
Mackerel	-	-	232	(289)	232	(289)	64%
Char	37	(22)	-	-	37	(22)	30%
Saithe	-	-	31	(38)	31	(38)	63%
Cod	-	-	49	(53)	49	(53)	55%
Roach	3	(2)	-	-	3	(2)	34%
Bream	1	(1)	-	-	1	(1)	51%
Other	78	(47)	702	(443)	780	(466)	30%
<b>Total</b>	<b>46,213</b>	<b>(12,259)</b>	<b>33,663</b>	<b>(16,102)</b>	<b>79,876</b>	<b>(23,960)</b>	<b>15%</b>

Figure 4.4.3 presents the raw material use by end-product form in 2015. Fresh fillet is the most common product form in processing. Fresh products account for half of the processed fish in 2015. Exported deep frozen un-gutted Baltic herring and sprat use to cover half of the total use of fish in the Finnish processing industry, however in 2015 it only covered 17%. Smoked products accounted for 11% of all fish use.



**Figure 4.4.3: Processed fish in raw material weight by end-product form**

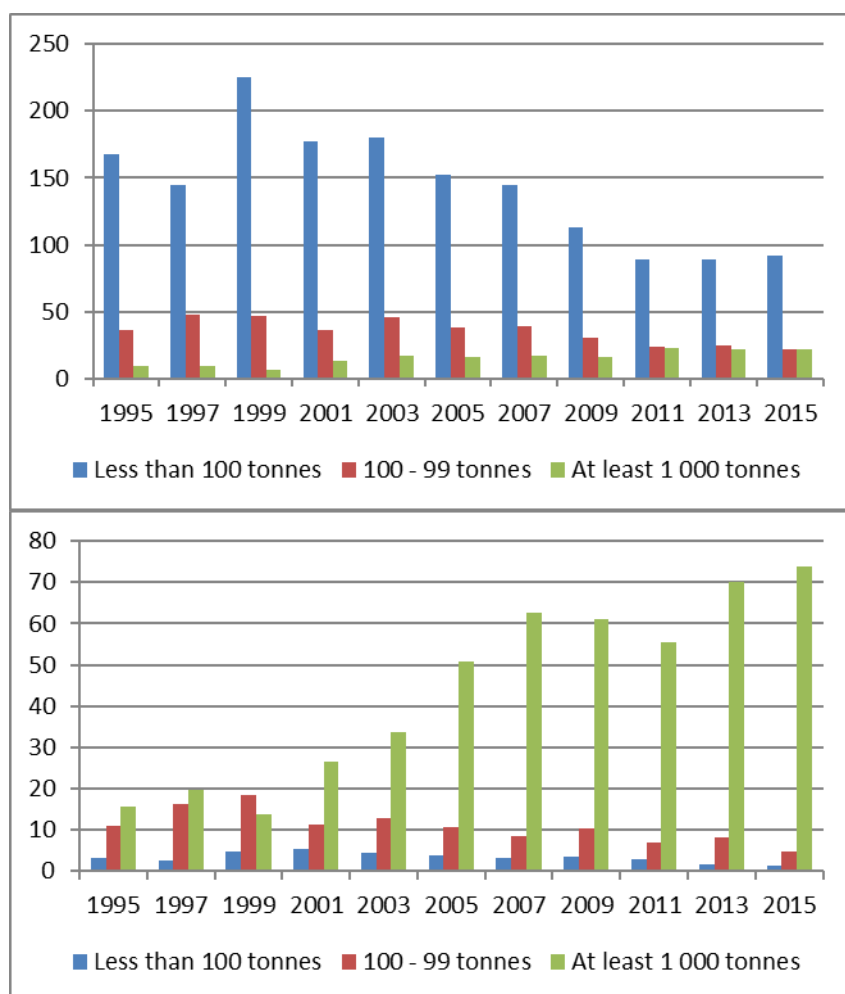
The processed fish by species and end-product is presented Table 4.4.2. All data is available online: <http://stat.luke.fi/en/fish-processing>. The database contains collected data on fish processing from 1993 to 2017 every second year.

**Table 4.4.2: Raw material weight (tonnes) of fish used in the fish processing industry (Species and End product, 2015)**

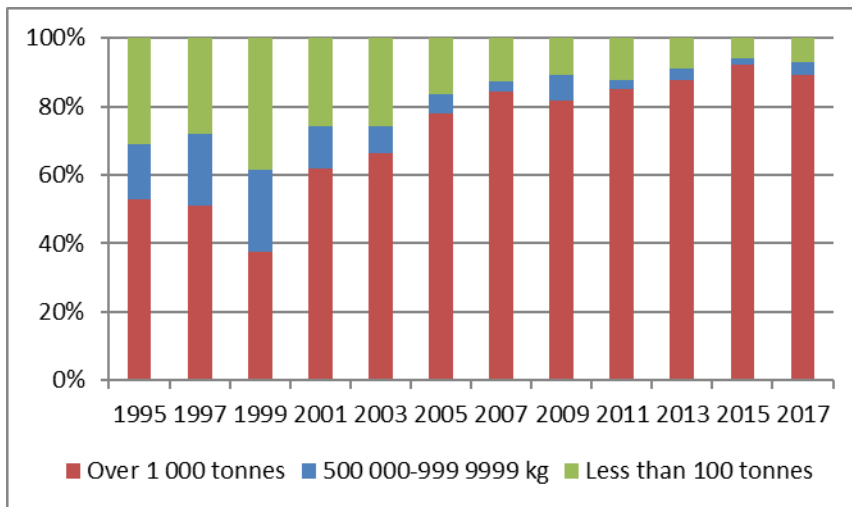
Species	Deep frozen			Fresh		Salted	Smoked	Cold smoked	Semi preserve	Preserve	Ready-to-eat food	Other	Total
	Ungutted	Fillet	Other	Fillet	Other								
Baltic herring & sprat	13 714	596	0	2 874	60	27	13	0	104	0	3	3 975	21 366
Rainbow trout	35	3 300	206	8 297	4 993	558	3 748	1 699	0	1	7	36	22 879
Salmon	124	1 315	6 977	15 795	4 888	252	1 702	439	0	2	3	65	31 561
Other	46	237	181	1 509	954	32	1 051	7	1	29	10	13	4 070
<b>TOTAL</b>	<b>13 919</b>	<b>5 448</b>	<b>7 364</b>	<b>28 475</b>	<b>10 895</b>	<b>869</b>	<b>6 514</b>	<b>2 145</b>	<b>105</b>	<b>32</b>	<b>23</b>	<b>4 089</b>	<b>79 876</b>

#### Structure of fish processing sector

In 2015, there were 136 enterprises engaged in fish processing in Finland. The production is highly concentrated. The development of concentration of production is presented in Figure 4.4.4.



**Figure 4.4.4: Number of enterprises by size group (upper) and production by size groups in terms raw material use in thousand tonnes (lower) 1995-2015**



**Figure 4.4.5: Concentration of Finnish fish processing in 1995-2017**

The concentration of the Finnish fish processing is illustrated in Figures 4.4.4 and 4.4.5: the share of the biggest producers in 1995 was 50% of total production while in 2017 the 22 biggest companies that processed more than one million kilos annually accounted for 92% of all fish processed. In 2017, the smallest 92 companies accounted for only 2% of the overall weight of fish in the processing industry.

#### **4.5 Alternatives methods for the collection of raw material data: Danish case study**

An alternative approach is used in Denmark based on the industry commodity statistics for sales and purchase (PRODCOM). This approach allows for dividing the industry into segments based on their production. This can reveal industry dependencies on species and, also, to some degree, imports if the commodity statistics are compared to the import statistics and other data sources like fleet landings and aquaculture production.

##### *Data on sales volume and value*

Statistics Denmark collects data covering the production industries commodity sales. The data includes the industry sales of commodities in weight and value on a ten-digit level (CN-10), which is harmonized according to EU needs for the production commodity statistics (PRODCOM). The sales statistics covers enterprises with more than 10 employees. Thus, the reported sales cover approximately 50% of the enterprises, however, enterprises with more than 10 employees cover more than 95% of the raw material purchased for production in 2015.

In cooperation with Statistics Denmark, the Department of Food and Resource Economics has developed a classification system for the processing industry based on their reported commodity sales. Thus, from the commodity statistics it is possible to divide the industry into sub- groups dependent on sales of different species, which naturally indicate their purchase of raw material of different species.

The data in Table 4.5.1 show how the Commodity Trade Statistics can be used to divide the industry into sub-branches based on the species used for production. Table 4.5.1 also show

the “purity” of these sub-branches in terms of species used for production. In most sub-branches, a “purity” of around 80% is revealed. From the table, it can be seen that the Danish industry seems to be highly specialized using only a limited amount of species within each of the subgroups identified. This information can be used if a future survey should be initiated, because extrapolate within some of these groups seems appropriate. However, this will also depend on the numbers of enterprises within each sub-branch and whether the enterprises within each sub-branch are homogenous in terms of production.

**Table 4.5.1: Percentage share of commodity production based on species, sub- branches, 2015**

Sub-branches	Cod and flat fish	Herring and mackerel	Shrimp and mussels	Salmonids	Other species	Fish for reduction	Total
Cod and flat fish	74	0	2	3	20	0	100
Herring and mackerel	1	78	0	15	5	2	100
Shrimp and mussels	2	0	82	9	7	0	100
Salmonids	1	16	2	78	4	0	100
Mixed processing	11	12	18	10	48	0	100
Fish meal and fish oil	0	0	0	0	0	100	100

Source: Statistics Denmark, Commodity Statistics.

In Table 4.5.2, the number of enterprises and their respective employment are shown based on these sub-branches.

**Table 4.5.2: The Danish industry divided on commodity production based on species, 2013-2015**

Sub-branch	Number of enterprises			Number of employees		
	2013	2014	2015	2013	2014	2015
Cod and flat fish	11	11	10	431	500	521
Herring and mackerel	9	10	10	426	539	503
Shrimp and mussels	11	10	10	394	277	275
Salmonids	39	39	46	901	1,017	1,045
Mixed processing	28	24	26	511	424	420
<b>For consumption</b>	<b>98</b>	<b>94</b>	<b>102</b>	<b>2,663</b>	<b>2,756</b>	<b>2,764</b>
Fish meal and fish oil	5	6	6	356	272	290
<b>Total</b>	<b>103</b>	<b>100</b>	<b>108</b>	<b>3,019</b>	<b>3,028</b>	<b>3,054</b>

Source: Statistics Denmark, National Account Statistics.

In Table 4.5.3, the production divided on main species is presented. From the table it can be seen which species that are the most important for the Danish fish processing industry. For consumption herring, salmon and codfish are the most important species in terms of volume.

Using the information provided in the commodity statistics an estimate of the input could be calculated based on the conversion factors for each commodity. However, an exercise on this in Denmark has shown that this approach does not give reliable results. The reason for this conclusion is that the commodity statistics do not provide information on which stage the

product was purchased (fresh, frozen, filets or further processing), which means that a valid conversion factor cannot be assigned to each commodity. Thus, the same fish can be sold by different companies in different stages of the production process, which results in double counting, which again lead to an over estimation of the raw material used within the processing industry.

**Table 4.5.3: Commodity produced based on different fish species (tonnes), 2012-2016**

<b>Species</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
Salmonids	36,050	28,696	39,484	38,437	36,433
Cod fish	27,511	28,482	25,857	25,369	27,522
Shrimp	16,283	16,941	16,185	15,216	12,976
Herring	46,893	49,444	51,435	49,956	50,433
Flat fish	655	1,058	629	562	638
Mackerel	12,195	10,701	10,822	11,341	11,468
Mussels	4,446	9,742	5,679	5,081	4,560
Other	21,740	23,324	21,047	21,642	26,040
<b>Consumption total</b>	<b>165,773</b>	<b>168,387</b>	<b>171,137</b>	<b>167,605</b>	<b>170,070</b>
Fish for reduction	278,500	301,165	280,993	281,751	247,599
<b>Total</b>	<b>444,273</b>	<b>469,552</b>	<b>452,130</b>	<b>449,356</b>	<b>417,670</b>

Source: Statistics Denmark, Commodity Statistics.

In conclusion, the commodity statistics can provide information that allows for a segmentation of the fish processing industry revealing the dependency on raw material originated from different fish species.

#### **4.6 Closing the loop: from wasted resources to re-usable raw materials for the fish processing industry**

##### *Scarcity of raw materials*

The fish processing industry in EU relies on a steady inflow of raw materials. However, most EU stocks are at the moment fully exploited and it is not expected that raw materials from EU fisheries will/or can be increased in the near future. Nevertheless, the EU aquaculture sector can, given the right framework condition, increase production. Unfortunately, the framework condition for the aquaculture industry, especially the regulatory settings and the industry structure are a hindrance for the development of a competitive and sustainable aquaculture sector and the sector has not increased its raw material output over the last 20 years. The EU fish market is increasingly relying on imports for a sufficient and steady supply of raw materials. As the fish consumption/processing based on landings and aquaculture is stagnating or even decreasing, the self-sufficiency level is quite low (around 40%) compared to the overall fish consumption/processing (EUMOFA, 2019; AIPCE-CEP, 2018). For some fish species, more than 90% of the consumption/processing is based on import (e.g. cod, Alaska pollock).

For industries that are relying on local/EU stocks a change in the availabilities of raw materials can heavily affect the industry income, production and employment. In 2017, the EU fish and seafood processing sector accounted for around 3 500 enterprises, 130 000 jobs and EUR 32

billion in turnover (details in the EU overview section). Within the EU, fish has a crucial role to guarantee food security (SDG2) as an important source (e.g. protein) for many inhabitants within and outside Europe. The total EU supply of seafood was 14.6 million tonnes, 60% consisting of imports (9.21 million tonnes) in 2017 (EUMOFA, 2019).

#### *High levels of waste from raw materials from fish processing*

In general, more than 50% of the caught or farmed fish is not consumed directly. Dependent of the fish species, the animal ends up as waste or by-product for a large part of the biomass. It is estimated that more than 50% of any finfish does not directly enter the human food chain. For instance, white fish as cod may generate even 60% waste while ocean fish like tuna even ends up with 70% waste of the total biomass (EUMOFA, 2018b). Furthermore, landings that are not suited for direct human consumption under the new landing obligation are valuable resources that could be used as an input to the industry, as it contain many high-value compounds that can be used for health and personal care, fishmeal and oil, and be converted into bioenergy. Instead of considering this as a waste product it could be turned into a valuable input creating value added for the industry. The EU fish market is globally well-known as a high-quality market for fish products. Despite the high economic efficiency by the enterprises within a global fierce competitive seafood market, there is still room for improvement. In particular when it comes to the **resource efficiency**. More than 30% of the European produced edible fish and seafood weight has been lost and wasted (FAO, 2011).

The use of waste materials are in line with the EU Commission focus on Blue Bioeconomy defined by the European Commission as: *"the production of renewable biological resources and the conversion of these resources and waste streams into value added products, such as food, feed, bio-based products and bioenergy"* (European Commission, 2012).

#### *How to close the loop: From waste to resources (maintained raw materials)*

The European Commission recently (2019) adopted an ambitious Circular Economy Package, which includes revised legislative proposals on waste to stimulate Europe's transition towards a circular economy, which will boost global competitiveness, foster sustainable economic growth and generate new jobs.

The Circular Economy Package consists of an EU Action Plan for the Circular Economy (European Commission, 2015) that establishes a concrete and ambitious action programme, with measures covering the whole cycle: from production and consumption to waste management and the market for secondary raw materials, especially to strive for SDG12 *'ensuring sustainable consumption and production patterns'*. Main achievements are described as well as future challenges to shape our economy to pave the way towards a climate-neutral, circular economy within planetary boundaries. This means minimized pressure on natural and freshwater resources as well as ecosystems. The proposed actions will contribute to "closing the loop" of product lifecycles through greater recycling and re-use and bring benefits for both the environment and the economy. With regarding to the EU Action Plan for the Circular Economy the European Commission has pledged (mentioned under number 4 in the EU Action Plan): *From waste to resources: boosting the market for secondary raw materials and water reuse: "The European Commission will further develop the recently launched Raw Materials Information System and support EU-wide research on raw materials flows"*.

As well as other sectors, the EU fish processing sector faces specific challenges in the context of the circular economy, because of the specificities of their products or value-chains, their environmental footprint or dependency on material from outside Europe. Key question is: *how and which scarce raw materials could be maintained and re-used to close the loop?*

For the fish processing regarding resource efficiency with raw materials the following lacunas in the existing research requires actions:

- Overview of data availability on raw material residuals in EU
- Overview of the quantity and quality of raw materials within the EU MS
- Specification and selection of the major raw material streams in terms of fish species and volumes within the EU fish processing.
- A value chain analysis providing information on which chains are suitable for different kind of waste material reuse
- An economic analysis on the potential for circular economy within the EU fish, aquaculture and fish processing sectors.

It is therefore highly recommended that studies on raw materials residual streams of the EU fish, aquaculture and fish processing sectors are initiated by the EU Commission in order to reach the goals of the adopted Circular Economy Package.

#### **4.7 Impact of ATQs on the supply of raw material for the EU fish processing industry: a first assessment**

Autonomous Tariff Quotas were put in play in the EU with the aim of ensuring the adequate supply to the domestic processing industry since 2010 with Council Regulation (EC) No 1062/2009. In order to improve the trade flows of imported raw materials duties are suspended temporary for a list of commodities until a given volume is completed. The quotas are fixed for a three-year term and assigned under a "first on arrival" basis. Once the quota volumes are covered the original tariff is applied to all incoming imports until the three-year term concludes. This section approaches the analysis of the ATQ's impact on the performance of the EU fish processing industry by studying the effects on the import's trade flows and prices along the period covered by the last regulation (Council Regulation (EU) 2015/2265 of 7 December 2015) opening and providing for the management of autonomous Union tariff quotas for certain fishery products for the period 2016-2018.

The data used for the analysis in this section come from the corresponding CN8 tariff codes in the ComExt database of external trade of the European Union (Eurostat database)<sup>22</sup>. The analysis uses monthly data, resulting in a sample size of 36 observation per period. Series of imported quantities and CIF prices are used as indicators of market evolution. The main limitation in the analysis lies in the lack of more detailed information about the amounts benefited with the duty suspension in every month and needs to be based on the assumption that importers will always try to avoid paying the tariff when they are eligible to do so. If so, all imports of the given tariff code will try to get the duty discount while this is available and the quota will be spent at the time the cumulative imported quantities reach the quota amount. Commodities with missing data or where the level of disaggregation does not clearly allow isolating the commodities for industrial purposes were excluded from the analysis.

At the import level, the ATQ system may affect the EU industry in two ways. By acting on the imported volumes domestic processors improve their supplies of raw materials in the months in which a suspended tariff may boost imports. On the other side, by decreasing import net prices, resulting in savings for the industry and potentially increase margins. Imported quantities are expected to rise when the quota is available, and prices are expected to drop. These shocks, however, should be corrected as soon as the quota is no longer available. The analysis focuses on testing whether the evolution of these figures changes when the quota is

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<sup>22</sup> <http://epp.eurostat.ec.europa.eu/newxtweb/>. Database: [EU Trade Since 1999 by HS2,4,6 and CN8 \(Daily Updated\)](#) (DS-057380).



still in play. A dummy variable is used indicating whether the quota is already spent or is still available in every month of the period covered. A change in the trends of any of the market variables depending on the value of the dummy would suggest a significant impact of the ATQ system on the EU fish processing market and, therefore, on the performance of the industry. Otherwise, if a change in the trends is rejected, the quota system would have no significant impact on the performance of the industry. In these cases, companies may randomly get any benefit from lower import costs, but this is almost unpredictable and may not significantly affect the future decision making of the company.

A first indication of the potential influence of the quota system on the performance of the EU fish processing industry is given by the relevance of the quota in terms of total market share of every commodity imported (Table 4.7.1). This is certainly limited since in most of the commodities covered the quota volumes represent a market share below 10% of the total imported quantities during the full period. Further, the small volumes under the quota system are completed within the first three months of the first year, corresponding to a frequency of 8.3% of the total period covered under the quota system. Such a limited number of critical observations, in which the quota is still available, not only increases the likelihood of biases but directly indicates none or minimal influence of the quota on the behaviour of import prices and quantities.

The relevance of the quota in terms of market share is, instead, important in species without or limited production within the EU such as Alaska pollock, blue grenadier or surimi, which represent around 33%, 26% and 44% respectively. These commodities also correspond to those in which the quota remains available for a longer period than one full year on average and provide the required minimum number of critical observations for a more detailed analysis.

In order not to exceed in complexity, the analysis will only test whether there is any significant statistical dependency between the imported quantities and prices and the values of the dummy variable indicating whether there is still quota remaining or not. Given normality of the series cannot be rejected in any case, a simple one-way ANOVA test, using the availability of the quota as explanatory factor. More sophisticated analysis will be performed in those cases in which the ANOVA test does reject independency across the involved variables. Rejection of the null hypothesis will conclude that the trends in prices or quantities, or both, do change when the quota is available. Thus, a significant impact on the performance of the EU processing industry can be expected.

Alaska pollock is the species with the largest quota in the observed period. The cumulated volume of imports reached the quota amount in January 2017, so it has been available, at least, during the first year of the period. The savings importers obtained with the duty suspension corresponds to 6% of the value of total Alaska pollock imports into the EU in the period between 2013 and 2016. The corresponding savings for blue grenadier and surimi are 2% and 6% respectively. These savings depend on the volumes traded and the tariff fee.

**Table 4.7.1: Relevance and time frame of the main ATQ commodities subject to quota under the period 1.1.2016-31.12.2018**

<b>Commodity</b>	<b>Quota in TM</b>	<b>% Total imports</b>	<b>Quota expiration</b>	<b>Months</b>
Cod and fish of the species <i>Boreogadus saida</i> , excluding livers and roes, fresh, chilled or frozen, for processing	75,000	11.2	Apr-16	4
Cod and fish of the species <i>Boreogadus saida</i> , salted or in brine, but not dried or smoked, for processing	4,000	2.71	Feb-16	2
Cod, frozen fillets and frozen meat, for processing	38,000	7.12	Feb-16	2
Blue grenadier, frozen fillets and other frozen meat, for processing	17,500	26.41	Oct-16	10
Shrimps and prawns of the species <i>Pandalidae</i> , in shells, fresh, chilled or frozen, for processing	10,000	6.8	Mar-16	3
Shrimps and prawns of the species <i>Pandalidae</i> , cooked and peeled, for processing	30,000	1.21	Jan-16	1
Shrimps and prawns of the species <i>Penaeus vannamei</i> and <i>Penaeus monodon</i> , whether in shell or not, fresh, chilled or frozen, not cooked, for processing	70,000	4.73	Mar-16	3
Hake and pink cusk-eel, frozen, for processing	15,000	5.65	Feb-16	2
North Pacific hake, frozen fillets and other meat, for processing	15,000	12.42	May-16	4
Anchovies, salted or in brine, but not dried or smoked, for processing	2,500	16.99	Apr-16	3
Herrings over 100 g per piece or flaps over 80 g per piece, excluding livers and roes, for processing	17,500	4.94	Feb-16	2
Herrings, spiced and/or vinegar-cured, in brine, preserved in barrels of at least 70 kg net drained weight, for processing	15,000	24.91	Nov-16	11
Fillets known as 'loins' of tunas and skipjack, for processing	25,000	6.45	Feb-16	2
Alaska pollock, frozen, frozen fillets and other frozen meat, for processing	300,000	33.91	Jan-17	13
Surimi, frozen, for processing	60,000	40.87	Apr-17	17
Hard fish roes, washed, cleaned of adherent organs and simply salted or in brine, for processing of caviar substitutes	3,000	25.61	Aug-16	8

Source: elaboration on the Annex of the Council Regulation (EU) 2015/2265.

Results from the ANOVA test (Box 4.7.1) show no significant changes for the imported quantities, concluding no effect from the quota on the usual market trend. The effect on prices is, however, significant, and so there is a different market trend in the periods with or without quota available. The effect of the quota on market prices indicates that these are higher when there is quota available and decrease after the quota volumes are reached. This could be explained if exporters in origin would agree in decreasing their prices to compensate the increase in the tariff. If so, the final price paid by importers would remain somehow unchanged along the period the ATQ system is in effect. More than influence the EU processing industry, it seems to affect exporter's price decisions. However, further clarification and deeper analysis is needed.

**Box 4.7.1 - ANOVA tests for Alaska pollock**

Analysis of Variance, response = Quantities, treatment = quota:

$F(1, 70) = 0.636865 / 0.990902 = 0.642713$  [p-value 0.4254]

Level	n	mean	std. dev
0	48	0.0665032	1.1447
1	24	-0.133006	0.58163

Grand mean = 0,000

Analysis of Variance, response = Price, treatment = quota:

Testing the relation between the availability of quota and the prices of Alaska pollock has been extended into a linear regression model (Box 4.7.2), to allow studying it in more detail. The resulting model allows explaining only 23% of the variance of prices according to the status of the quota, which represents a very poor relation although significant. Further, autocorrelation tests indicate a strong random walk component in the behaviour of prices series. The evolution of the prices corresponds to a long-term relation across the prices at different periods of time. This trend is sustained in the long term, depends mainly on structural market conditions, and is rarely affected by circumstantial events or policies.

### Box 4.7.2 – Regression model for Alaska pollock price

Dependent variable: Price

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
quota	0.488235	0.147515	3.310	0.0022	***
R-squared	0.238373	Adjusted R-squared		0.238373	
Log-likelihood	-45.67334	Akaike criterion		93.34668	
Schwarz criterion	94.93020	Hannan-Quinn		93.89937	
rho	0.917919	Durbin-Watson		0.235577	

On a final approach for clarifying whether the relation observed for Alaska pollock stands or is simply circumstantial, the sample was increased by including the previous three years period (2013 – 2015). The evolution of the three variables of interest can be graphically seen in Figure 4.7.1.



Figure 4.7.1: Evolution of quotas, imports and prices of Alaska pollock, 2013-2015

The evolution of prices appears to follow a cyclical trend, which do not always coincide in time with the availability of the quota but may be behind possible significant results in some periods. Results from the new ANOVA tests (Box 4.7.3) show no significance in either case. These final tests allow concluding that the market for Alaska pollock in the EU is not affected by the ATQ's when they are in play.

The tests with surimi and blue grenadier raised the same conclusions regarding prices, with even lower explanatory power in the cases of significant results and a strong random walk component. Thus, the conclusions derived from the Alaska pollock case can be extended to all commodities of species not produced in the EU.

**Box 4.7.3 - ANOVA tests for Alaska pollock extended series**

Analysis of Variance, response = Quantities, treatment = Quota

$F(1, 70) = 0.169832 / 0.996603 = 0.170411$  [p-value 0.6810]

Level	n	mean	std. dev
0	49	0.0326894	1.1068
1	23	-0.0714736	0.70605

Grand mean = -0.000

With the available data, the main conclusion of this approach is that ATQ's do not significantly affect the market conditions and the behaviour of imported quantities and prices do not change depending on the availability of quota. This can be due to a variety of factors not directly related with the ATQ system such as price cycles and other structural changes in the global markets. Further research is needed for being conclusive. Access to data at more disaggregated levels will enlarge the number of case studies. Also, specific information on the real operations under the suspended duty will provide better accuracy in the periods of availability.

Some aspects of the system could be considered to potentially achieve any kind of significant effect on the performance of the industry:

- Most quota volumes are so small for the actual market size and remain available for a very short period. It makes the potential benefits marginal, rather than a significant advantage in terms of profits and market performance.
- The "first on arrival" procedure also makes it difficult to assure that the imported product will be eligible for the special tariff. Thus, the likelihood of being benefited by the measure is completely random, not allowing companies to consider the potential benefits in their strategic decisions.
- Both issues may decrease the interest of industrial agents since the quota is not perceived as a secured source of benefits. Uncertainty may drive to discourage and so the prices and quantities in the period when the quota is available are not significantly affected.

## 4.8 Main conclusions

In the data call for the processing industry for 2019, data on raw material were provided by eight member states (Bulgaria, Croatia, Finland, Greece, Poland, Romania, Slovakia & Slovenia). This was the first time that these data have been provided and preliminary analysis show that:

- As only eight countries delivered data, an overall EU analysis is impossible.
- The data delivered was not organized in the same format, which makes comparison of the data reported difficult/impossible.
- Based on the data delivered only separate country analysis is possible.

Pilot studies as well as other studies (i.e. SECFISH) reveal that the data collection or raw material data is not easily carried out in a standard way (through survey) especially if taking into account the general reluctance of the industry.

The results that have been reported in this section, allow for some recommendations for future collections and reporting of raw material data:

- If data are provided, they should be organised within a comparable format, making cross-country analysis possible.
- Alternative ways of estimating the volume of raw materials used by main species could be further investigated for the purpose of providing an overview of the raw materials used in the EU fish processing sector.
- The Prodcom statistics (by commodity) can provide information that allows for a segmentation of the fish processing industry and insight into the dependency on raw material originating from different fish species. However, it cannot be used to estimate the total amount of raw material used in the fish processing, as the commodity statistics do not provide information on which stage the product was purchased (fresh, frozen, filets or further processing), which means that a valid conversion factor cannot be assigned to each commodity.
- The feasibility study shows that the data requested within the SECFISH project are available at the enterprise level and that it is possible to gather the data at a CN 8-digit level (or species and product level), which makes it comparable at a species and product level within the EU. Thus, a main species and main product form approach in line with the Finnish data collection example could be used as an alternative.
- On the other hand, the industry seems very reluctant to deliver the data because of the extra workload and costs incurred. Therefore, it might be challenging to collect and receive representative data. A way forward, could be to investigate if the data stored at the enterprise level according to the Control Regulation (traceability legislation) could be used for analysing the raw material input for the industry. This could minimize the cost for the industry and at the same time provide the needed data for analysing the raw material value chain within the EU fish processing sector.
- The EU fish processing sector faces specific challenges in the context of the circular economy because of the specificities of their products or value-chains, their environmental footprint or dependency on materials from outside Europe. Key questions are how and which raw materials could be re-used to close the loop in a circular context. It is therefore highly recommended that studies on raw materials residual streams of the EU fishing, aquaculture and fish processing sectors are initiated by the EU Commission in order to reach the goals of the adopted Circular Economy Package.
- With the available data, the main conclusion of this approach is that ATQ's do not significantly affect the market conditions and the behaviour of imported quantities and prices do not change depending on the availability of quota. This can be due to a variety of factors not directly related with the ATQ system such as price cycles and other structural changes in the global markets. Further research is needed for being conclusive. Access to

data at more disaggregated levels will enlarge the number of case studies possible. Also, specific information on the real operations under the suspended duty will provide better accuracy in the periods of availability.

## 5 EU NATIONAL CHAPTERS

### 5.1 Belgium

#### 5.1.1 Overview

In 2016, the fish processing industry in Belgium consisted of about 62 enterprises (excluding 218 seafood companies with fish processing not as main activity) with an estimated turnover of EUR 761 million, employing around 1 469 people (1 373 full-time equivalents). Activity of the Belgian fish processing industry includes the production of fresh and frozen fillets, smoked fish (salmon, halibut, haring, rainbow trout and others), pickled seafood and prepared dishes.

The enterprises have been classified by category according to the number of employees ( $\leq 10$ ; 11-49; 50-249;  $\geq 250$  employees). Table 5.1.1 gives an overview of the Belgian fish processing industry, including size of enterprise and level of employment. The sector is dominated by small and middle-sized enterprises. More than half of the Belgian enterprises had less than 10 full time employees in 2016. Furthermore, 22 enterprises had between 11 and 49 employees corresponding to almost 37% of the total. There were 3 enterprises with more than 50 employees and only one large enterprise with more than 250 employees appearing in this category in 2016. The inclusion or exclusion of this enterprise may influence total estimated results. The fluctuations in the number of businesses with less than 10 employees may be due to the uncertainties relating to the population data. However, it is likely that new companies have started a fish processing activity during the period while others have ceased processing. Another phenomenon is related to changing practices, moving away from processing towards trading activity, retail or specialising as importers or exporters. Some businesses may therefore no longer meet the definition of "fish processor". This switch to wholesale was also observed in the Netherlands. Average salary demonstrates a regular increase over the years. The value of unpaid labour in the Belgian fish processing industry is lacking so that no statement could be provided by the EWG either the MS.

The number of employees has fluctuated over the years without a particular trend (Table 5.1.1).

Table 5.1.1: Overview, Belgium, 2008-2016

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	$\Delta$ (2015-16)
<b>Structure (number)</b>										
Total enterprises	53	58	56	56	59	60	66	66	62	-6%
$\leq 10$ employees	29	33	32	34	37	37	38	37	35	-5%
11-49 employees	20	21	20	18	18	19	24	26	23	-12%
50-249 employees	4	4	4	4	4	4	4	3	3	0%
$\geq 250$ employees	0	0	0	0	0	0	0	0	1	0%
<b>Employment (number)</b>										
Total employees	1,298	1,441	1,546	1,522	1,497	1,489	1,487	1,529	1,469	-4%
FTE	1,221	1,373	1,439	1,442	1,417	1,385	1,377	1,423	1,373	-3%
<b>Indicators</b>										
Turnover (million €)	541	587	658	688	644	660	701	710	762	7%
FTE per enterprise	23.0	23.7	25.7	25.7	24.0	23.1	20.9	21.6	22.2	3%
Average wage (thousand €)	37.2	37.3	38.0	37.5	40.1	42.3	44.4	42.7	42.8	0%
Unpaid work (%)										
<b>Enterprises doing fish processing not as main activity</b>										
Number of enterprises	193	205	204	197	193	194	195	193	218	13%
Turnover attributed to fish processing (million €)										



Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.1.2 Economic performance

Table 1.1.2 demonstrates detailed income, costs and the overall economic performance for the Belgian processing industry for the period from 2008 to 2016.

For 2016, the total income of the Belgian fish processing industry was estimated at around EUR 761 million. The total income consists exclusively of turnover from processing fish. Subsidies represented EUR 1.8 million in 2008 and stay mainly consistent over the years; in 2016 operating subsidies were minimal with less than EUR 200 thousand.

Table 5.1.2: Economic performance indicators, Belgium, 2008-2016

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	Δ(2015-16)
<b>Income (million €)</b>										
Turnover	541.4	587.1	658.0	688.1	643.9	659.8	701.1	709.9	761.6	7%
Other income	4.9	4.9	9.8	6.6	8.4	4.2	14.7	12.3		
Operating subsidies	1.8	1.7	1.8	1.3	1.2	1.4	1.5	1.3	0.2	-86%
<b>Total Income</b>	<b>548.1</b>	<b>593.7</b>	<b>669.6</b>	<b>695.9</b>	<b>653.5</b>	<b>665.4</b>	<b>717.2</b>	<b>723.5</b>	<b>761.8</b>	<b>5%</b>
<b>Expenditure (million €)</b>										
Purchase of fish and other raw material for production	312.1	332.0	393.4	406.2	416.0	428.8	435.9	454.2	627.2	38%
Wages and salaries of staff	45.4	51.2	54.7	54.1	56.8	58.5	61.1	60.7	58.8	-3%
Imputed value of unpaid labour										
Energy costs	37.4	44.5	52.1	52.9	58.9	54.8	57.8	58.7	57.5	-2%
Other operational costs	3.1	2.3	2.7	6.2	5.1	3.2	2.5	2.2		
<b>Total production costs</b>	<b>398.1</b>	<b>429.9</b>	<b>503.0</b>	<b>519.5</b>	<b>536.8</b>	<b>545.4</b>	<b>557.2</b>	<b>575.8</b>	<b>743.5</b>	<b>29%</b>
<b>Capital Costs (million €)</b>										
Depreciation of capital	10.4	13.0	11.5	12.2	12.2	13.2	11.0	12.4	10.8	-13%
Financial costs, net	4.6	4.1	2.5	3.1	1.6	2.8	1.4	2.2	2.1	-3%
<b>Capital Value (million €)</b>										
Total value of assets	318.8	335.4	369.5	357.0	368.2	319.5	330.1	334.9	340.0	2%
Net Investments	14.8	14.5	12.9	6.7	8.9	9.7	8.3	9.7	8.0	-18%
Subsidies on investments									1.0	0%
Debt	200.8	201.4	234.5	220.1	221.7	207.3	195.2	200.2	200.1	0%
<b>Economic performance (million €)</b>										
Gross Value Added	193.6	213.3	219.6	229.3	172.2	177.1	219.6	207.1	76.9	-63%
Operating Cash Flow	150.0	163.8	166.6	176.5	116.6	120.0	160.0	147.7	18.3	-88%
Earning before interest and tax	139.6	150.8	155.1	164.3	104.4	106.8	149.0	135.3	7.5	-94%
Net Profit	135.1	146.8	152.6	161.2	102.8	104.0	147.5	133.1	5.4	-96%
<b>Productivity and performance Indicators</b>										
Labour productivity (thousand €)	158.6	155.3	152.6	159.0	121.5	127.9	159.5	145.6	56.0	-62%
Capital productivity (%)	60.7	63.6	59.4	64.2	46.8	55.4	66.5	61.8	22.6	
GVA margin (%)	35.4	36.0	32.9	33.0	26.4	26.7	30.7	28.7	10.1	
EBIT margin (%)	25.5	25.4	23.2	23.6	16.0	16.0	20.8	18.7	1.0	
Net profit margin (%)	24.6	24.7	22.8	23.2	15.7	15.6	20.6	18.4	0.7	
Return on Investment (%)	43.8	45.0	42.0	46.0	28.3	33.4	45.1	40.4	2.2	
Financial position (%)	37.0	40.0	36.5	38.3	39.8	35.1	40.9	40.2	41.1	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

The purchase of fish and other raw material appears to be far the most important expenditure and made up for 80% of the total production costs in 2016 (Table 5.1.2). This expenditure has regularly increased since 2012, showing a 38% rise between 2015 and 2016. This increase of fish

purchasing costs could be clarified by the increased landing prices of several flat fish (e.g. plaice, sole). Many North Sea & Eastern Channel fish species especially plaice and sole are important for Belgian processors. Resources are getting more and more scarce and will have a higher market value. Wages and salaries represented 10% of the expenditure and stayed rather constant over the years. Energy cost reduced in 2016 made up for 8% of the total costs, this expenditure was rather stable from 2008 to 2015 representing around 10% of the total production cost. Imputed value of unpaid labour is considered to be null over the years. The average price of raw material in 2016 on the global seafood market was higher than for other years, which could possibly be explained by the rise and drop of the purchase costs.

Economic performance of the sector is fluctuating over the years. However, in 2016 the economic performance decrease dramatically due to particular higher purchase prices for fish and raw material (plus 38% from 2015-2016), this could be due to some data issues.

The Gross Value Added (GVA) is calculated as the total income deducted by energy cost, fish and other raw material cost and other operational cost. The GVA reached a maximum of EUR 229 million in 2011 (30% of total income), this income has oscillated since that. However 2016 showed a major drop of 63% in GVA (EUR 77 million) compared to 2015 (EUR 207 million).

All in all, the profit margins decreased to 18% in 2016 where it was 21% in 2015; and below the average profit margin from the last 8 years (21%).

### 5.1.3 Socio-demographic structure

The distribution of gender among employees tends to be more balanced over the years but still in favour to male (estimated at 69% in 2011).

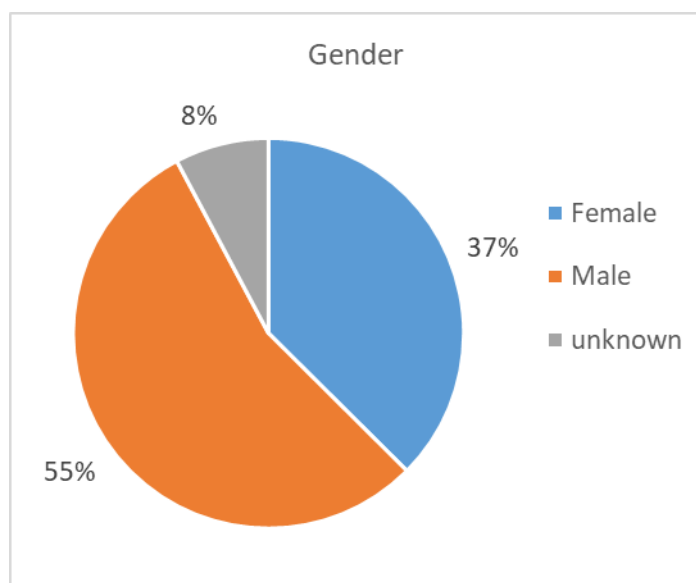


Figure 5.1.1: Socio-demographic characteristics, Belgium, 2016

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.1.4 Breakdown by company size

Table 1.2.3 gives an overview of the economic situation of the fish processing industry by size categories.

As stated in section 5.1.1, despite most enterprises are small (less than 10 employees) and provide the most employment they account for a small portion of the total turnover. However, the inclusion or exclusion of the single enterprise greater 250 employees is drastically changing the

overview by size company so that the analysis. The existence of data issues and inconsistencies between categories within the years doesn't allow the EWG to analyse the trends.

Table 5.1.3: Economic performance by size, Belgium, 2008-2016

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	Δ(2015-16)
<b>less than or equal to 10 employees</b>										
Total Income	102.7	92.3	100.9	115.4	110.8	113.8	146.8	128.7	60.7	-53%
Total production costs	27.4	22.3	21.8	33.6	34.1	31.5	24.0	19.4	59.7	208%
Gross Value Added	78.6	73.6	83.2	86.1	81.5	88.0	127.3	114.0	6.2	-95%
Operating Cash Flow	75.3	69.9	79.1	81.7	76.7	82.3	122.7	109.3	1.0	-99%
Earning before interest and tax	73.8	68.3	77.5	80.1	74.7	80.5	120.7	107.5	-0.5	-101%
Net Profit	73.1	68.2	77.4	80.0	74.7	80.4	120.5	107.4	-0.8	-101%
<b>between 11 and 49 employees</b>										
Total Income	131.7	174.8	224.3	221.9	187.9	181.4	214.7	271.1	338.2	25%
Total production costs	74.9	102.5	154.9	143.8	162.5	160.8	187.0	243.2	323.4	33%
Gross Value Added	70.4	87.6	86.7	94.3	42.6	38.6	49.1	52.6	38.6	-27%
Operating Cash Flow	56.8	72.3	69.3	78.1	25.4	20.6	27.7	27.8	14.8	-47%
Earning before interest and tax	52.1	66.9	63.2	72.7	19.9	15.6	22.9	21.9	9.1	-58%
Net Profit	51.1	64.9	61.6	70.8	18.1	14.6	21.6	20.6	7.8	-62%
<b>between 50 and 249 employees</b>										
Total Income	313.7	326.7	344.4	358.7	354.8	370.2	355.7	323.8	180.8	-44%
Total production costs	295.8	305.1	326.2	342.1	340.3	353.1	346.2	313.2	176.0	-44%
Gross Value Added	44.6	52.1	49.7	48.9	48.1	50.4	43.2	40.6	15.5	-62%
Operating Cash Flow	17.9	21.6	18.2	16.6	14.5	17.0	9.5	10.6	4.8	-55%
Earning before interest and tax	13.7	15.6	14.4	11.6	9.8	10.8	5.4	5.8	3.6	-38%
Net Profit	10.9	13.7	13.7	10.4	10.0	9.0	5.4	5.1	3.0	-42%
<b>greater than or equal to 250 employees</b>										
Total Income									182.2	
Total production costs									184.5	
Gross Value Added									16.6	
Operating Cash Flow									-2.3	
Earning before interest and tax									-4.7	
Net Profit									-4.6	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.1.5 Trends, drivers and outlook

Compared to 2008, the number of fish processing enterprises has increased about 15% (62 enterprises in 2016). The global demand for seafood products is increasing; this is one of the explanations for a growing number of fish processors. On the other hand the resources (unprocessed fish from the North Sea and Western Waters) becomes more and more scarce without real evaluation of the potential effect this situation can causes on the fish-processing sector. Because of the scarcity in landing volumes at Belgian harbours (e.g. plaice), many processors have started to process and trade other fish species like (imported) salmon. Currently flatfish is becoming less important for the seafood industry in Belgium, while salmon, cod, trout, herring, tuna and scallops are the most trades species. The latter is due to market diversification:

businesses have their own speciality assuring their reason for existence. For the purchase of fish and other raw material Belgium is almost completely reliant on other countries. Due to the large dependency, many enterprises have switched to resale. There is a general tendency to reduce primary processing. Together with a rising awareness of costs, a large amount of the fish are gutted and sliced directly after being caught in order to limit transport to the marketable parts only. However, these enterprises are not taken into account in this report as they figure under a different NACE code (fishing vessels code 05.01). This means that the number of enterprises taking part in primary processing activities (under NACE code 15.20) may decrease in the future as this would mean reducing investments in gut and filet machinery as well as personnel conducting these tasks. This is a logical trend considering that most enterprises in the sector consist of small businesses with less than 11 employees. More enterprises are therefore choosing to buy fish that has already been sliced to fillets, as this is what is most sold in the retail.

The larger enterprises on the other hand are investing more in the development of convenience products, such as marinated, seasoned and breaded fillets. They are also experimenting with prepared foods (burgers, lasagne, salads, snacks, etc.). However, these products are still marginal compared to the meat sector.

The price of fresh fish is instable due to decreasing landing volumes of many species (e.g. sole and plaice) due to a smaller number of fishing vessels, the weather conditions and unpredictability of the catch. This can cause the price of certain species to be very high during certain time periods. It can therefore be expected that the high dependency on import for raw material will continue.

#### *5.1.6 Data coverage and quality*

Belgium did not report 2017 in the data call related to the working group, since 2017 Belgian data will only be available by the end of 2019, as detailed in their national work plan.

Other income and other operational costs were not reported for 2016. Thus, economic performance estimates for 2016 may be slightly underestimated, even if both values tend to be minor compared to turnover and the other costs items.

For the social data, only the employment by gender could be provided in this report because data on employment by age, employment by education level, and employment by nationality were not submitted.

We expect that 2017 Belgian data will be available in future fish processing data calls and reports.

## 5.2 Bulgaria

### 5.2.1 Overview

In 2018, the Bulgarian processing sector showed an increase in the number of registered enterprises from 46 in 2017 to 49 in 2018. All of the enterprises are processing fish as their main activity. Based on the number of employees the units from the Bulgarian fish processing sector are in the three categories – less than 10 employees, 11-49 employees and 50-249 employees. For the period 2008-2018, there were no enterprises with more than 250 employees.

The total number of employees in 2018 decreased by 2% compared to 2017 and 3% compared to the period 2008-2017. In 2018, FTEs also decreased by 4% compared to 2017, probably because of the seasonality of the work of some of the enterprises. The average wage remains stable for the period 2008-2014 while from 2015 gradually increased and in 2017 reached EUR 5.8 thousand. There is a visible increase in the wages in 2017 and 2018 compared to the period 2008-2016 and even with small decrease in 2018 compared to 2017 the average wage in 2018 increased by 61% compared to the period 2008-2016.

The turnover and total income respectively marked a significant growth since 2015 compared to 2008-2014 period and from 2015 to 2018 both variables are quite stable. The structure of the costs remains the same for all year – the largest proportion is for the purchase of fish and other raw materials, followed by other operational costs and wages and salaries of staff.

Table 5.2.1: Overview, Bulgaria, 2008-2018

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Δ(2017-18)
<b>Structure (number)</b>												
Total enterprises	45	45	48	43	43	46	44	45	45	46	49	7%
≤10 employees	13	12	14	12	14	12	10	11	11	14	18	29%
11-49 employees	20	22	21	19	18	22	22	24	24	20	20	0%
50-249 employees	12	11	13	12	11	12	12	10	10	12	11	-8%
≥250 employees	0	0	0	0	0	0	0	0	0	0	0	0%
<b>Employment (number)</b>												
Total employees	1,704	1,538	1,917	1,749	1,650	1,725	1,879	1,907	1,904	1,756	1,715	-2%
FTE	1,651	1,419	1,821	1,667	1,565	1,653	1,744	1,671	1,618	1,490	1,427	-4%
<b>Indicators</b>												
Turnover (million €)	53.9	53.4	59.3	55.7	52.2	64.4	68.7	85.3	78.1	85.0	82.9	-3%
FTE per enterprise	36.7	31.5	37.9	38.8	36.4	35.9	39.6	37.1	36.0	32.4	29.1	-10%
Average wage (thousand €)	2.9	3.3	3.0	3.0	2.9	3.1	3.1	4.2	4.5	5.8	5.3	-9%
Unpaid work (%)	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	-100%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.2.2 Economic performance

The total income of the Bulgarian fish processing industry is stable during the last 3 years. In general, for the whole period 2008-2018 the situation is improving. The highest peak of the total income was in 2015 – EUR 90.4 million and until 2018 decrease to EUR 84.1 million. The total income in 2018 decrease by 2% compared to 2017 but compared to the average for the 2008-

2017 period increased by 21%. The main part of the Total income is the Turnover - approximately 98%. The Other income is decreasing in the last years – in 2014 it was EUR 3.7 million and in 2017 and 2018 it is EUR 1.0 and EUR 1.2 million respectively. There is 64% decrease in 2018 compared to the period 2008-2017. Regarding the subsidies, the highest value was in 2015 and in last years they are almost 0.

The total production costs were growing proportionally to the income. With 2% increase compared to 2016, the total costs in 2017 were EUR 57.9 million, which is also 38% more than the average for 2008-2016 period. In 2018, total production costs decreased by 14% compared to 2017 but increased compared to the average for 2008-2017 period. The largest % of the costs is the purchase of fish and other raw material for production – it is around 70% for last three years. The wages and salaries of staff represent approximately 13% of the costs in 2016 and 15% in 2017 and 2018, while the other operational costs are between 11.3% and 14.5% during the last three years. From all the costs which consist the total production costs, the energy costs are the most stable ones during the years but in 2016, 2017 and 2018 slightly decreased compared to the past occur. The value of unpaid labour is really negligible for the whole period. The largest value of this indicator was EUR 21 thousand for the whole sector in 2008. It is gradually decreasing and in 2017 it is EUR 0.5 thousand and in 2018 is EUR 0.

Table 5.2.2: Economic performance indicators, Bulgaria, 2008-2018

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Δ (2017-18)
<b>Income (million €)</b>												
Turnover	53.9	53.4	59.3	55.7	52.2	64.4	68.7	85.3	78.1	85.0	82.9	-3%
Other income	3.8	4.6	4.4	4.1	3.8	3.8	3.7	1.9	1.8	1.0	1.2	20%
Operating subsidies	0.2	0.1	0.2	0.3	0.1	0.9	0.6	3.2	0.0	0.0	0.0	877%
<b>Total Income</b>	<b>57.9</b>	<b>58.1</b>	<b>63.9</b>	<b>60.1</b>	<b>56.1</b>	<b>69.1</b>	<b>73.0</b>	<b>90.4</b>	<b>79.9</b>	<b>86.1</b>	<b>84.1</b>	<b>-2%</b>
<b>Expenditure (million €)</b>												
Purchase of fish and other raw material for production	26.1	27.3	27.4	25.7	24.1	28.7	31.9	38.2	40.6	39.7	35.1	-11%
Wages and salaries of staff	4.8	4.7	5.4	4.9	4.6	5.1	5.5	7.1	7.3	8.7	7.6	-13%
Imputed value of unpaid labour	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-100%
Energy costs	1.5	1.4	1.7	1.6	1.5	1.6	1.4	1.4	1.3	1.1	1.3	22%
Other operational costs	5.0	3.4	5.6	5.2	4.9	4.7	3.0	6.5	7.4	8.4	5.6	-33%
<b>Total production costs</b>	<b>37.5</b>	<b>36.8</b>	<b>40.1</b>	<b>37.3</b>	<b>35.0</b>	<b>40.2</b>	<b>41.9</b>	<b>53.2</b>	<b>56.6</b>	<b>57.9</b>	<b>49.7</b>	<b>-14%</b>
<b>Capital Costs (million €)</b>												
Depreciation of capital	7.9	7.1	7.5	6.8	6.4	5.4	5.0	6.0	5.6	8.4	8.3	-1%
Financial costs, net	0.2	0.1	0.2	0.2	0.2	0.9	1.0	0.8	0.8	-1.4	-2.6	-93%
<b>Capital Value (million €)</b>												
Total value of assets	20.0	23.1	25.3	23.9	22.7	28.5	31.4	38.0	34.5	29.3	35.0	19%
Net Investments	3.0	2.8	3.6	3.8	3.5	14.4	18.2	9.4	2.8	1.5	4.4	188%
Subsidies on investments									0.9	0.4	0.9	129%
Debt	1.1	2.6	5.1	4.8	4.5	5.6	5.6	9.8	12.2	9.0	20.0	123%
<b>Economic performance (million €)</b>												
Gross Value Added	25.1	25.9	29.0	27.5	25.6	33.2	36.1	41.1	30.6	36.9	42.0	14%
Operating Cash Flow	20.4	21.3	23.8	22.8	21.1	28.9	31.2	37.2	23.3	28.2	34.4	22%
Earning before interest and tax	12.5	14.1	16.3	16.0	14.7	23.5	26.1	31.2	17.7	19.8	26.1	32%
Net Profit	12.3	14.0	16.1	15.8	14.5	22.6	25.2	30.4	16.8	21.2	28.8	36%
<b>Productivity and performance Indicators</b>												
Labour productivity (thousand €)	15.2	18.2	15.9	16.5	16.4	20.1	20.7	24.6	18.9	24.7	29.4	19%
Capital productivity (%)	125.3	111.8	114.9	115.0	113.0	116.5	114.9	108.2	88.8	125.7	119.9	
GVA margin (%)	43.5	44.6	45.6	45.9	45.7	48.7	49.8	47.1	38.3	42.8	49.9	
EBIT margin (%)	21.6	24.3	25.5	26.6	26.1	34.0	35.8	34.5	22.1	23.0	31.1	
Net profit margin (%)	21.3	24.1	25.3	26.3	25.8	32.7	34.4	33.6	21.1	24.6	34.2	
Return on Investment (%)	62.4	61.0	64.6	67.0	64.7	82.4	83.3	82.0	51.2	67.5	74.6	
Financial position (%)	94.3	88.8	79.9	79.9	80.3	80.5	82.0	74.3	64.7	69.4	42.9	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

The depreciation of the capital only formed the capital costs in the last three years. In 2017, it increased by 48% from 2016 and in 2018 decreased by 1% compared to 2017 but if we compared 2018 to the average of 2008-2017 period it increased by 26%.

It is interesting that the number of enterprises remained almost the same for every year, but the total value of assets, for example, is quite different. This deviation can be explained by the fact that during the years some of the old enterprises were modernized or have ceased activity, while new ones were constructed and started working. In 2017, the total value of assets increased by 7% compared to the period 2008-2016 and in 2018 increase by 26% compared to 2008-2017. In 2018 total value of assets reach EUR 35 million and compared to 2017 increased by 19%.

The economic performance is also growing gradually. The Gross Value Added is increasing each year and in 2018 increased by 35% compared to the period 2008-2017. Similar is the situation with the operating cash flow and net profit. In 2018, the net profit increased by 36% compared to 2017 and by 52% compared to the average for 2008-2017 period.

The labour productivity is growing by 19% while the capital productivity is decreasing in 2018 compared to 2017. The GVA margin and the EBIT margin growing in last year which indicates profitability from the enterprises and a positive trend. The net profit margin and RoI were also increased over the last years. Unfortunately, the Future Expectation Indicator is unstable for the fish processing sector in Bulgaria. In 2016, it is -8.3% and in 2017 -23% while in 2018 is -11% and it is not clear is this could be a positive or negative sign.

### *5.2.3 Socio-demographic structure*

The collection of social indicators for the Bulgarian processing sector started in 2017. The provided data during the 2019 data call was for 2017 and 2018. The variables were included in the annual economic survey, which gave the opportunity of collecting Census data. All of the mandatory variables - age distribution, nationality, education and employment status were collected at enterprise level, so they were available also by size categories.

The majority employees involved in the processing sector in Bulgaria in 2017 were female (59%) followed by 41% male and 0% unknown. The proportion of female for each size category of enterprises is similar (57-61%).

The age groups used during the data collection were 15-24, 25-39, 40-64 and  $\geq 65$ .

54% of the of the total employed (937) were in the age group 40-64, followed by 35% representing people between 25-39 years, 6% for the age group  $\geq 65$  and 5% employees were below 24 years. The percentage distribution by age is similar to the total distribution in the all size categories, except that the youngest one are not presented in the smallest enterprises.

In terms of education the most common answer was high school/specialized high school corresponding to Medium education level (60% - 937 people), followed by primary school which is Low education level (32% - 650 people) and university degree equally to High (8% - 169 people).

The percentage of the people with low education is highest (41%) in the bigger enterprises (50-249 employees), while the percentage of the people with university degree is highest in the small enterprises with less than 10 employees.

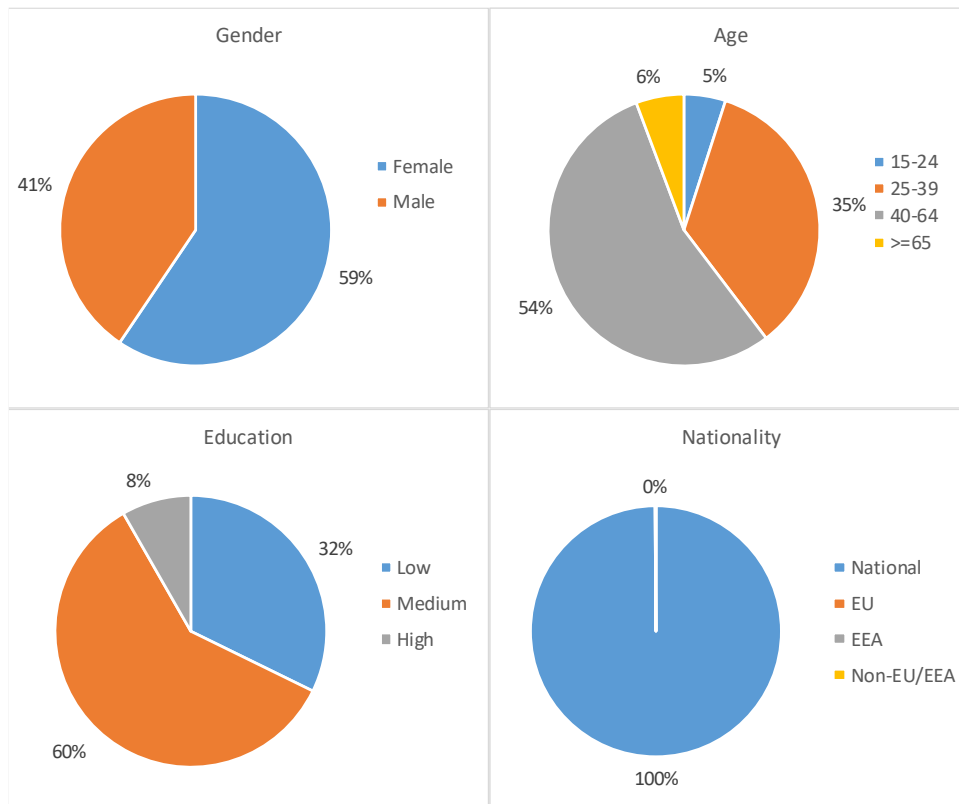


Figure 5.2.1: Socio-demographic characteristics, Bulgaria, 2017

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

The results showed that only 2 persons working in processing industry are from EU and all the others were Bulgarian citizens. The missing interest from employees from other countries could be due to the low monthly salary. The biggest enterprises employed the 2 employees from EU.

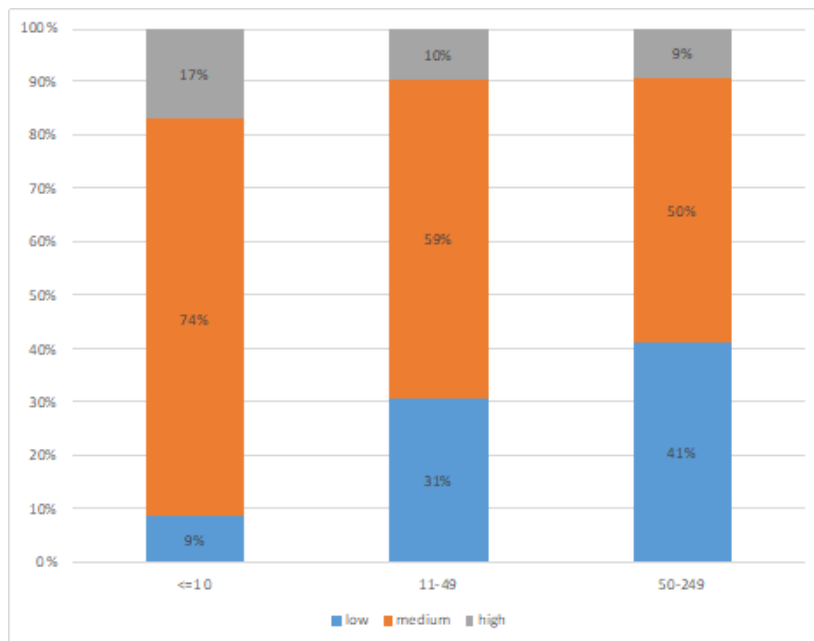


Figure 5.2.2: Distribution of the employees by enterprise size and education, Bulgaria, 2017.

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.



#### 5.2.4 Breakdown by company size

The structure of Bulgarian processing sector is quite consistent during the period 2008-2018. The number of enterprises varied between 43 and 49. There are no enterprises with more than 250 employees. From the other three categories, the largest (41%) is the size category with 11-49 employees. The fish processing units with less than 10 employees and between 50-250 represent 37% and 22%, respectively. The main differences in the economic variables during the years are due to the movement of enterprises from one category to another category based on the reduction or hiring of employees. This is one of the reasons for the small decrease in the number of enterprises with 11-49 employees, compensated with the increased number of units in the category with less than 10 employees.

In all size categories, the distribution of the turnover, other income and subsidies in the total income is similar to their distribution for the whole processing sector. The largest part of the income in last three years was delivered by the turnover, more than 95%.

Table 5.2.3: Economic performance by size, Bulgaria, 2008-2018

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Δ(2017-18)
<b>less than or equal to 10 employees</b>												
Total Income	1.7	2.0	2.3	2.5	2.8	5.4	5.8	16.6	17.0	3.8	19.6	415%
Total production costs	1.2	0.9	1.0	0.7	1.0	2.0	2.7	11.1	12.2	8.2	10.6	29%
Gross Value Added	0.6	1.3	1.5	2.0	2.1	3.2	3.0	5.9	5.2	-4.2	9.2	318%
Operating Cash Flow	0.4	1.1	1.3	1.9	1.9	3.4	3.1	5.5	4.8	-4.4	8.9	301%
Earning before interest and tax	0.1	0.9	1.1	1.9	1.7	2.9	2.5	4.9	4.7	-4.5	8.9	301%
Net Profit	0.1	0.9	1.0	1.9	1.6	2.6	2.1	4.8	4.6	-4.2	8.9	311%
<b>between 11 and 49 employees</b>												
Total Income	18.4	22.2	18.3	17.7	16.7	19.1	23.5	38.0	31.0	35.7	28.7	-20%
Total production costs	14.7	17.8	14.6	14.1	13.4	16.4	18.6	22.7	26.4	25.4	17.5	-31%
Gross Value Added	5.0	6.0	5.1	4.8	4.6	3.9	6.5	17.3	7.0	12.7	13.9	10%
Operating Cash Flow	3.7	4.4	3.7	3.6	3.4	2.7	4.9	15.2	4.5	10.3	11.2	10%
Earning before interest and tax	2.7	3.1	2.7	2.5	2.4	1.8	1.9	11.7	1.3	5.5	6.6	19%
Net Profit	2.7	3.0	2.7	2.5	2.4	1.6	1.9	11.0	1.4	5.6	7.8	39%
<b>between 50 and 249 employees</b>												
Total Income	37.9	33.8	43.3	39.9	36.6	44.6	43.7	35.8	31.9	46.6	35.9	-23%
Total production costs	21.6	18.1	24.4	22.6	20.7	21.8	20.5	19.4	18.0	24.3	21.6	-11%
Gross Value Added	19.5	18.6	22.4	20.7	19.0	26.1	26.6	17.9	18.4	28.4	18.9	-34%
Operating Cash Flow	16.3	15.7	18.8	17.4	15.9	22.9	23.2	16.5	13.9	22.4	14.2	-36%
Earning before interest and tax	9.7	10.1	12.6	11.6	10.6	18.8	21.8	14.6	11.7	18.7	10.7	-43%
Net Profit	9.6	10.0	12.4	11.5	10.5	18.3	21.2	14.5	10.8	19.8	12.2	-39%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

Regarding the distribution of the total costs – the main costs were for the purchase of fish and other raw material for production and for the size category with 50-249 employees the costs for wages and salaries of staff are 22%.

In last three years the economic performance of each size category of the Bulgarian fish processing sector can be described as fluctuating. The total income for enterprises with less than 10 employees has risen steadily between 2008 and 2016 and it decreased significantly in 2017.

The reason for this remarkable change is that a new enterprise started working. It should be also noted, that the enterprise generates a small income, and it also has larger total production costs. In 2018, the situation for the enterprise in this category significantly improved and total income reach EUR 19.6 million, 15% more compared to 2016. The gross value added and net profit for this size category increased extremely in 2018 compared to 2017 and also to the average for 2008-2017.

The largest category in the Bulgarian fish processing sector is with enterprises employed between 11-49 people. There is a visible positive trend in the period analysed related to the increase of the total income and net profit, and it also generated not so big amount of costs which explain overall profitability.

Enterprises with 50-249 employees were prosperous in the period 2008-2014, but there was a significant decrease in 2015 and 2016. The total income raised well to EUR 46.6 million in 2017 but dropped down again in 2018 to EUR 35.9 million. The same happened with earnings before interest and tax, GVA and net profit. Only the total production costs remain similar for the whole period.

### *5.2.5 Trends, drivers and outlook*

As a general comment on the trends in Bulgarian fish processing industry could be the aspect of a stabilization and increasing of the production limits (as volume and value). The number of enterprises in each size category during the period 2008-2018 is consistent or with minor changes. The bigger part of the enterprises with more than 11 employees has sufficient experience on the Bulgarian and international markets. It should be noted the average salary increased in the last years, but it is due to the rising of the minimum salary at the national level but in general is relatively low compared to other sectors.

After the positive influence for the sector by EFF and the Measure 2.6. "Investments in processing and marketing of fisheries and aquaculture products" where 17 enterprises were newly built or modernized with EUR 7.7 million (EUR 5.75 million from EFF and EUR 1.95 million from the National budget) the new Operational program for 2014-2020 period under EMFF also brings benefits to the people and companies involved in the sector.

Priority Axis "Fostering marketing and processing" under the new Operational program and EMFF provide opportunity for new investments in the sector. Until now 23 beneficiaries have contracts for founding of building of new facilities of modernization of existing. The total value of planed investments is EUR 20.1 million from which EUR 8.8 million is grant and EUR 11.3 million own financing.

In regards to the raw materials, the processing enterprises can be separate into 7 general types: units which are using as raw material fish caught from the Black sea (sprat and other small pelagic fish); units processing crustacean; units processing molluscs; units processing fish from aquaculture farms in Bulgaria (mainly rainbow trout, carp, catfish); processing enterprises for black caviar and enterprises for fisheries delicacies, enterprises producing canned fish.

The National Statistical Institute collects detailed data regarding the import and export of fishery products in the country, which is publicly available in the Annual agricultural report. Based on the data provided in the document, in 2017, totally 43 379 tonnes of fish and fish products have been imported, 15% more than the previous year.

44% of the imported fish products in 2017 were in the group frozen fish without fillets, followed by 12.4% of aquatic invertebrates. The other import of fishery products consists mainly from Fresh, refrigerated fish, Fish fillets molluscs and Crustaceans. Approximately 75% of all imported fish and fish products in 2017 were from EU Member States.

The total exports of fish, other aquatic organisms and fish products in 2017 amounted to 16 741 tonnes - 38% above the level of the previous year, with an increase in all types of products. This significant growth is explained by the increased catches of species of fish and aquatic organisms

with export orientation and increased aquaculture production in the country, as well as by the re-export of imported fish, crustaceans and molluscs.

The number of enterprises during 2017 and 2018 increased compared to 2016 and previous years. If there is any change, it is expected to be in favour of increasing their number due to the opportunities provided by the EMFF. Regarding the size categories, it is not expected that there will be enterprises with more than 250 employees because even in the sector between 50 and 249 employees the average FTEs per firm in last three years is less than 80. Based on the available data for 2018, there will be no major changes in the size categories with <10 and 11-49 employees.

The interest in catching and processing rapa whelk and baby clam is continuing. While rapa whelk consumption is relatively popular in Bulgaria, the consumption of baby clam is really negligible (if any) and both species are of interest mainly because of the possibility of exporting. The increase in the total income together with the GVA and EBID margins indicates a positive trend for the future improvement of the situation in the whole sector. The decrease of total employees and FTE on the other hand is sign for modernization. The consumption of fish and seafood per capita is approximately 6.2 kg, which is very low compared to the average fish consumption in the other member states. The processors are seeking to expand the variability mid and high-value products on the local market and also for export.

#### *5.2.6 Data coverage and quality*

The data is collected under the annual socio-economic survey by questionnaires, and Bulgarian data collection scheme is Census. All of the mandatory variables and all the required data was collected and provided by Bulgaria. In terms of data coverage and quality no issues were found.

## **5.3 Croatia**

### *5.3.1 Overview*

The Croatian fish processing industry was traditionally located along the coastline and on the islands close to important fishing areas in order to ensure a stable source of fresh raw material and expedite the process of production. In addition, processing plants offered job opportunities and a stable source of income to the local communities, which gradually developed a strong interdependence between socio-demographic indicators and processing industry. Since the turn of the century, the number of major processing plants on islands has declined due to changed market conditions, expenses and lack of the labour force. On the other hand, in recent years, along with an extensive process of infrastructure improvement (construction of highway A1), a sound process of moving fish processing plants to business zones in hinterlands of major fishing harbours has occurred. Also, access to pre-accession instruments, EU market opening after 2013 and later to EU funds (EMFF) brought a new momentum to the fish processing and provided the opportunity for the revival, foreign investments, technological improvement and innovations that ensured a steady growth of the fish processing industry in Croatia in a recent period.

The share of small pelagic fish in total catch of marine fish and other marine organisms in Croatia is the largest (mostly more than 80%) with the main destination being the fish processing industry. Although many companies tend to diversify production, Croatian fish processing industry is mostly dependent on domestic catches of mainly small pelagic fish, often having their own fishing fleet. However, the effort based management of small pelagic fish with temporary cessations of fishing affects the stable supply of raw material, which resulted in developing new strategies in business planning, diversification of production and ensuring stable raw material inflow from the global market for fish and fish products.

Croatia is one of the member states that exports fish more than it imports. According to Central Bureau of Statistics, the import of fish and fish products increased from 31 thousand tonnes in 2016 to 32 thousand tonnes in 2017 with 24% of increase from 2013 to 2017 while export, as expected, grew from 2015 to 2016 and then decreased from 47 thousand tonnes in 2016 to 46 thousand tonnes in 2017. However, compared to 2013, the export increased for 13 thousand tonnes, or 41% respectively. Almost 55% of fish and fish products imported in 2016 and 2017 came from Spain, Sweden and Netherlands and over 67% of the total export was exported to Italy, Spain and Slovenia. Other important trading partners, falling under 90% of total trade volume are Albania, France, Japan, Serbia, Poland, Argentina, New Zealand and Germany.

While traditional fish processing factories mostly carried out one activity and few types of products in the past, today most companies, to be more competitive and less dependent on the inflow of domestic raw material, also integrate trade, distribution and other food processing besides fish processing and develop diverse high value added products. Therefore, it is difficult to distinguish them from companies with the predominant activity of the fish processing industry.

In 2017, Croatian processing industry consisted of 34 companies with processing as a main activity, with majority of companies and employees in growing segment of 50-249 employees. Total number of employees increased from 1932 employees in 2016 to 2131 employees in 2017, which corresponds to a 10% rise in total number of employees and 6% of a rise in FTE (1572 in 2016 and 1672 in 2017). The total number of enterprises slightly varies from 2011 to 2017 but what is more important is a structure of the enterprises.

The average size of the enterprises measured by the number of full-time employees in 2017 was 49 employees, together with 51 in 2016, highest recorded since 2011. The average salary per FTE increased from EUR 9.2 thousand per year to EUR 11.3 thousand per year over the same period. The labour productivity in terms of gross value added per FTE after reaching a peak in 2015 with EUR 34.4 thousand decreased to EUR 23 thousand.

The reported value of unpaid labour in the Croatian fish processing industry is insignificant. In the years from 2011 to 2017, the value has been estimated to 0-0.1% of total amount of wages and salaries paid, since none of the enterprises confirmed that some of the employees are working on a volunteer basis. However, due to the family character of small companies, some share of unpaid labour could be considered as unreported.

Table 5.3.1: Overview, Croatia, 2008-2017

Variable	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>								
Total enterprises	35	35	37	38	35	31	34	10%
≤10 employees	17	18	20	20	18	10	11	10%
11-49 employees	6	4	4	6	3	5	7	40%
50-249 employees	11	11	10	11	13	16	16	0%
≥250 employees	1	2	3	1	1	0	0	0%
<b>Employment (number)</b>								
Total employees	1.635	1.565	1.953	1.815	1.800	1.932	2.131	10%
FTE	1.443	1.367	1.572	1.819	1.466	1.572	1.672	6%
<b>Indicators</b>								
Turnover (million €)	67,5	62,8	58,1	71,7	75,9	80,3	88,3	10%
FTE per enterprise	41,2	39,1	42,5	47,9	41,9	50,7	49,2	-3%
Average wage (thousand €)	9,2	9,2	8,2	9,0	10,7	10,7	11,3	6%
Unpaid work (%)	0,0	0,0	0,0	0,0	0,1	0,0	0,0	0%
<b>Enterprises doing fish processing not as main activity</b>								
Number of enterprises	19	21	21	21	24	28	30	7%
Turnover attributed to fish processing (million €)	5,5	9,3	11,5	18,6	20,3	24,6	26,4	7%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.3.2 Economic performance

Turnover in 2017 was more than EUR 88 million, which is EUR 8 million more than in 2016, which corresponds to a 10% rise. The total income consists of turnover (68% in 2016, 71% in 2017), other income (30% in 2016, 25% in 2017) and subsidies (2% in 2016, 1% in 2017). While subsidies did not play the main role in total income, they were important as one of the factors of the economic growth, especially for the enterprises from 11 to 49 and from 50 to 249 employees. Subsidies combined with foreign investments - important for trading and market know-how and for developing market network - along with opening of business zones with favourable conditions for buying land properties, resulted in major changes in the fish processing sector in recent years.

The most important cost component is the purchase of fish and other raw materials, which make up for 41% of the total cost in 2011 and 48% of total cost in 2015. Other operational costs gradually declined from 37% in 2011 to 29% in 2017, while wages and salaries remained stable around 17% in 2011 and 18% in 2017 due to the process of movement and enlargement as well as opening of new processing facilities. Energy cost makes up for 5% of the total production cost in 2011 so as in 2017.

The fluctuation of the amount of Gross Value Added (GVA) reflected the fluctuation of other operational costs. After reaching the record with the 45.4% in 2015 along with the lowest operational costs in the reference period, it declined to 38.4% in 2017.

Earnings before interests and tax (EBIT) decreased in 2017 compared to 2011 to EUR 12.9 million because of increasing costs (which belongs to OCF) of over EUR 33 million.

The amount of Gross Value Added (GVA) in 2011 was 34.3% of total income, and after reaching the peak in 2015, it declined to 31.4% in 2017. The lowest amount of GVA was 25.2% in 2014. While in the recent period remains stable between 31 and 32%, the recent period of 2016 and 2017 was remarked by trend of increasing net investments (47% of increase from 2016 to 2017) along with the increase of debt from EUR 64.5 million in 2016 to EUR 75.7 million or 17% respectively, which is certainly encouraged by EMFF funds.

Table 5.3.2: Economic performance indicators, Croatia, 2008-2017

Variable	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Income (million €)</b>								
Turnover	67,5	62,8	58,1	71,7	75,9	80,3	88,3	10%
Other income	33,3	23,2	21,5	29,5	35,2	35,3	34,3	-3%
Operating subsidies	5,4	5,6	4,2	2,0	3,8	2,6	1,3	-49%
<b>Total Income</b>	<b>106,1</b>	<b>91,6</b>	<b>83,8</b>	<b>103,2</b>	<b>114,9</b>	<b>118,3</b>	<b>124,0</b>	<b>5%</b>
<b>Expenditure (million €)</b>								
Purchase of fish and other raw material for production	32,5	29,8	28,6	43,7	42,4	43,9	49,1	12%
Wages and salaries of staff	13,3	12,5	12,8	16,4	15,7	16,9	19,0	12%
Imputed value of unpaid labour	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0%
Energy costs	3,9	4,1	3,9	3,7	3,9	3,9	4,7	20%
Other operational costs	30,0	29,7	25,6	28,2	14,4	30,3	30,4	0%
<b>Total production costs</b>	<b>79,7</b>	<b>76,2</b>	<b>71,0</b>	<b>92,1</b>	<b>76,4</b>	<b>95,0</b>	<b>103,1</b>	<b>9%</b>
<b>Capital Costs (million €)</b>								
Depreciation of capital	7,5	4,6	4,3	5,3	4,8	6,6	7,9	19%
Financial costs, net	4,4	4,8	3,4	3,0	0,7	0,4	0,3	-31%
<b>Capital Value (million €)</b>								
Total value of assets	98,2	116,6	138,9	148,4	129,4	122,6	160,1	31%
Net Investments	6,4	10,6	24,9	5,8	2,1	11,0	16,1	47%
Subsidies on investments						0,5	1,9	313%
Debt	100,3	103,4	114,1	111,6	74,9	64,5	75,7	17%
<b>Economic performance (million €)</b>								
Gross Value Added	34,3	22,4	21,5	25,6	50,4	37,5	38,4	2%
Operating Cash Flow	26,4	15,5	12,9	11,1	38,5	23,2	20,8	-10%
Earning before interest and tax	18,9	10,9	8,6	5,8	33,7	16,6	12,9	-22%
Net Profit	14,4	6,1	5,2	2,8	33,0	16,2	12,6	-22%
<b>Productivity and performance Indicators</b>								
Labour productivity (thousand €)	23,8	16,4	13,6	14,1	34,4	23,9	23,0	-4%
Capital productivity (%)	34,9	19,2	15,4	17,2	39,0	30,6	24,0	
GVA margin (%)	34,1	26,0	27,0	25,2	45,4	32,4	31,4	
EBIT margin (%)	17,8	11,9	10,2	5,6	29,3	14,0	10,4	
Net profit margin (%)	13,6	6,6	6,2	2,7	28,7	13,7	10,2	
Return on Investment (%)	19,2	9,4	6,2	3,9	26,0	13,5	8,1	
Financial position (%)	-2,1	11,3	17,9	24,8	42,1	47,4	52,7	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

From 2011 to 2014, net profit of Croatian fish processing industry gradually declined from EUR 14.4 million to EUR 2.8 million in. However, in 2015 net profit increased to EUR 33 million. The recent period of 2016 and 2017 recorded decline from 13% to 9.5%. The total income has declined 21% from 2011 to 2013 but then increased from EUR 83.8 million in 2013 to EUR 124 million in 2017.

A period between 2011 and 2015 was remarked with declining economic performance indicators along with declining costs and productivity and performance indicators. After 2015 a new investments resulted with a moderate recovery, with major results expected in an upcoming period. At the same time, capital value increased in total value of assets 61% from 2011 to 2016), net investments (almost 47% from 2016 to 2017) and debt (17% from 2016 to 2017).

On the other hand, the expenditures for the purchase of fish and raw material and other operational costs between 2011 and 2016 slightly declined. During this period, some larger companies invested in their own fishing vessels, which resulted in a decline of the cost of raw material. However, increased costs of raw material and supply from a global market caused an increase of price in 2017.

Due to investments, from 2015 the sector has become less profitable, especially in 2015 with the decrease of all economic profitability indicators. In 2016 the income continued the growth but could barely follow the increase of the costs combined with the extensive investments.

Fish consumption in Croatia accounts for 18.4 kg per capita in 2015. This number does not include fish that goes to tuna farms or sold during tourist season, but it does indicate that demand for local products is increasing. According to research from 2017, Croatian consumers are aware of the health benefits of fish and prefer domestic fish from wild catch. The most common species consumed in Croatian households are sardine and hake, bought preferably at a fish market due to general opinion of better quality and to support domestic production as well but also due to availability of the fresh products. There is significant regional diversification in total consumption of fish and in preferences on type of fish, but domestic aquaculture companies with a rapid trend of growth also helped to promote and popularize fish products in all regions by distributing it to large supermarkets and, step by step, introducing processed products with added value. According to data from Central Bureau of statistics, from 2011 to 2017 the production of *Frozen whole salt water fish* increased by 24% and *Frozen fish fillets* by 37% while the production of *Prepared or preserved sardines* decreased by 38%, which certainly implies trends in consumption and end user's needs.

### 5.3.3 Socio-demographic structure

The female labour force, in total, dominates the sector so as in FTE. Women are usually present at assembly line jobs, which are often prone to seasonality and on the other hand unpredictable in terms of given amount of work in a short period since most major processing plants still depend on the domestic catch. Considering that in some areas the number of available workers is limited due to depopulation and strong development of tourism, it could be expected that a certain number of overtime hours occurs, expressed through increased FTE compared with the total number of workers.

Processing industry is of great socio-economic importance especially for local communities, providing jobs for people in older age groups (55% in age group 40-64 years) for which is often harder to find their opportunity in the job market. Relatively high share of medium and low education is in line with the national standard but the share of high education imply that there is recognised need for specialized food technologists in order to implement new products and prepare them for the standards of the global market. There is a small share of unknown data on age and education due to companies' policies' not to collect and analyse data for the seasonal workers. Number of foreign workers in Croatian fish processing industry is negligible and is mostly related to seasonal third-country workers from Bosnia & Herzegovina and Serbia.

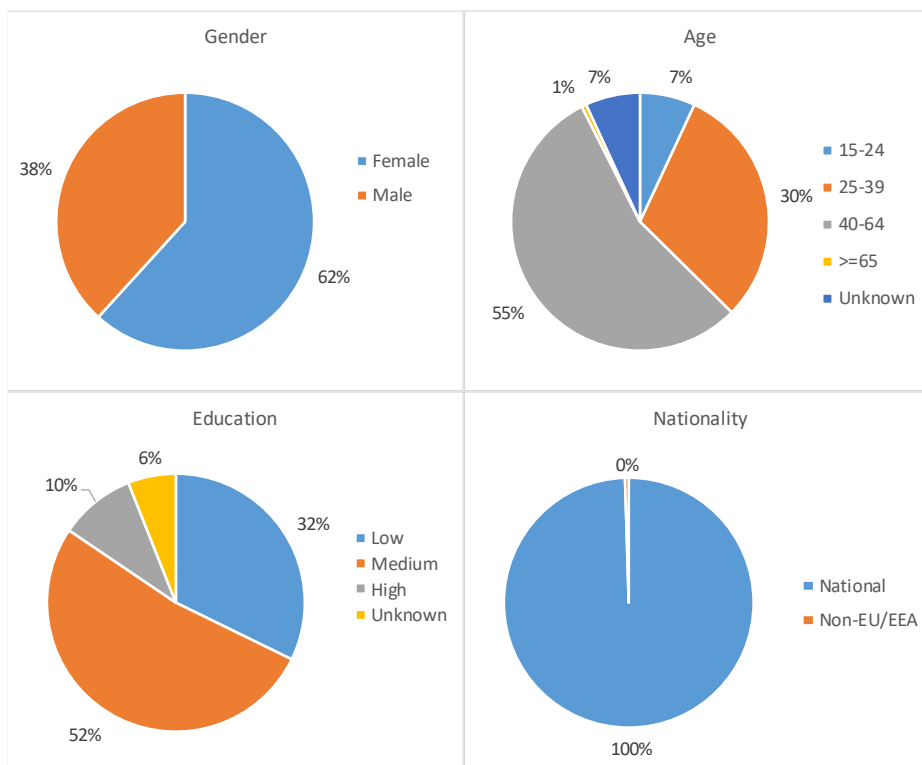


Figure 5.3.1: Socio-demographic characteristics, Croatia, 2017

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

#### 5.3.4 Breakdown by company size

In Croatia, the fish processing industry was divided into four segments in 2011 and dropped to three segment in 2017. In the reference period the segment with the most enterprises is the one with 50-249 employees represented with 11 enterprises in 2011 and 16 enterprises in 2017. The segment with less than 10 employees recorded a most significant decrease with 20 companies in 2014 and 11 companies in 2017. It is important to stress that small companies often combine activities with agriculture, fishing, tourism, which is the cause of the fluctuation in number of enterprises. Although they do not have a big economic influence in the Croatian fish processing industry, they are very important in local communities from a social standpoint and in preserving the tradition in fish processing. Also, small family businesses are often a platform for innovations and apart from mass production they have a tendency to create unique products with added value, such as smoked fish - local or imported.

In addition, some small enterprises kept their traditional procedures of basic fish processing with the main products such as frozen and packed fish, branded as domestic product. In both cases, one of the main challenges in fish processing could be to ensure a sustainable source of domestic raw material during the year.

Although total income for these enterprises increased from EUR 3.7 million in 2011 to EUR 15.5 million in 2015 and then dropped to EUR 4.2 million, some enterprises did not succeed in overcoming the economic crisis as they started businesses as middle-sized companies at the beginning of the 2000s and continued with minimal business activity and number of employees over the reference period. Although some of them recovered by the end of the period, many had to close the company. After a period of crises, only several small family companies in this category with a long tradition in fish processing managed to maintain fish processing activities as they have already established their market position and specialized for higher added-value products as smoked or dried fish.



Table 5.3.3: Economic performance by size, Croatia, 2008-2017

Variable	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>less than or equal to 10 employees</b>								
Total Income	4,1	4,7	5,5	9,5	15,5	2,9	4,2	47%
Total production costs	4,5	4,6	5,4	8,7	10,4	2,0	2,8	35%
Gross Value Added	0,1	0,9	0,8	1,5	5,9	1,3	1,9	52%
Operating Cash Flow	-0,4	0,1	0,1	0,8	5,2	0,8	1,5	75%
Earning before interest and tax	-0,8	-0,2	-0,4	0,4	4,9	0,7	1,3	97%
Net Profit	-0,9	-0,4	-0,6	0,3	4,7	0,8	1,2	42%
<b>between 11 and 49 employees</b>								
Total Income	10,5	3,8	4,1	11,0	1,9	2,9	2,8	-1%
Total production costs	7,7	3,4	3,0	6,7	1,5	2,8	2,8	1%
Gross Value Added	3,0	0,7	1,4	5,5	0,9	0,6	0,8	27%
Operating Cash Flow	2,9	0,5	1,1	4,3	0,4	0,1	0,0	-72%
Earning before interest and tax	2,5	0,3	1,0	4,1	0,4	0,0	-0,2	-3133%
Net Profit	2,2	0,1	0,9	4,0	0,4	0,0	-0,2	-398%
<b>between 50 and 249 employees</b>								
Total Income	79,6	58,8	53,3	60,6	70,8	112,5	116,9	4%
Total production costs	55,8	44,9	41,6	55,7	51,7	90,2	97,5	8%
Gross Value Added	29,2	16,6	16,8	13,8	27,4	35,7	35,8	0%
Operating Cash Flow	23,8	13,8	11,7	4,8	19,1	22,3	19,3	-13%
Earning before interest and tax	17,6	11,7	9,6	1,6	15,7	15,9	11,8	-26%
Net Profit	15,3	10,4	8,8	-0,5	15,2	15,4	11,6	-24%
<b>greater than or equal to 250 employees</b>								
Total Income			20,9					
Total production costs			20,9					
Gross Value Added			2,4					
Operating Cash Flow			0,1					
Earning before interest and tax			-1,6					
Net Profit			-3,9					

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

Due to the new investments, some new enterprises started their businesses in the meantime in this category, which positively affected the change in the net profit in 2014, 2015 and as well as moderately in 2016 and 2017. Finally, some of those companies started their business in 2015 and 2016 and soon as they realized the investments, hired more employees which moved them into 11-49 employees category.

Most enterprises in the size category between 11 and 49 employees are located in Istria peninsula and Zadar area, with frozen fish, mostly sardine and anchovy, and in smaller part salted anchovy as the main products. In this category, it is obvious that total income is based on turnover (96%) and in smaller percentage on other income. After reaching the record in 2014 on terms of number of enterprises and total income, the number of enterprises in this segment decreased from six in 2011 to three enterprises in 2015 and then increased to seven companies in 2017. Hence, the total income decreased from EUR 10.9 million in 2011 to EUR 1.9 million in 2015 and then increased to EUR 2.8 million in 2017. The segment is rather small and inconsistent

in terms of economic indicators; however, it has a great potential for growth. The period was characterized with fast growth of some small companies followed by large investments in processing technology and the opening of new processing plants. It is important to stress that these companies are aware of the importance of the education and they invest into education of the employees as well as into technology development.

The most important segment in Croatian fish industry is certainly the size category with 50-249 employees. The category contains the largest income, number of total value of assets, full-time employment and FTE. In 2011, there were 11 enterprises with main activity in this category and 16 in 2017. Also, 1161 employees were employed in this category corresponding to 71% of total in 2011 and 1966 (93% of total) in 2017. The main products of this segment were frozen sardine and anchovy and canned sardine. Very good quality of anchovy (spawning is 2-3 times a year) and catch restrictions on anchovy in some Mediterranean countries attracted investors from Spain and Italy. By the beginning of 2014, the situation on anchovy market stabilized and sardine took place as a main fish processing product. At the same time, production of anchovy dropped for 95% compared to record in 2014. Nevertheless, fish processors are being more focused on developing diverse products with added value including anchovy. Because of the modernized business processes, in case of the lack of raw material, there is still a possibility of import and transport of fresh fish in less than 24 hours, but with higher operational costs. Existence of fish processing plants on islands could not be possible for most of the producers, because of, as mentioned before, high expenses and lack of the labour force. Only the two processors kept their processing plants on islands easily accessible by ferry and close to the important fishing areas, while others with less favourable locations shut it down or moved their facilities to industrial/business zones or abroad.

#### *5.3.5 Trends, drivers and outlook*

After many initial problems related to the adjustment of new conditions of business and establishing markets, a structural improvement could be noticed in all segments. New markets, EU and national support and the modernization of the entire business brought some advantages compared to the previous period. Fish processing enterprises invested significant funds into building new processing plants, relocating from islands and coastline to the hinterlands which reflected in the decrease of the number of enterprises in segment with less than 10 employees and an increase in the number of enterprises in the segment with 50-249 employees. The main reason was low-cost land properties in business zones and availability of labour force and raw material. In addition, business zones have good connection with main roads and highways, which influence the distribution of the products as well as input of the raw material. In addition, major companies with a long tradition in fish processing invested in modernization and new technologies in order to improve technical standards and adapt production for EU market. These changes caused an increase in the total number of employees.

The sector is characterized by the dominance of female workers especially in large companies with assembly line jobs, which started some positive demographic new trends in depopulated rural areas. The new conditions of work reflected prominently to the production in terms of volume and value.

The most important product in terms of volume is frozen fish, predominantly whole fish, but in terms of value, the most important product is canned fish. While production of frozen fish is steadily rising from 2011 to 2017, production of canned sardine, anchovy and tuna decreased over the period.

Overall, except in the category of frozen fish, fish production fluctuated significantly from 2011 and 2013 and then remained stable with the annual production of 23 thousand tonnes. After 2013, there are some signs of recovery in all categories and moderate but steady growth expected in upcoming years.

Value of fish products decreased along with the volume but with visible recovery in 2014-2017 and expected growth in upcoming period, which implies the export of the higher added value

products. Regarding the increase of export in total, the trend from 2014-2015 is expected to continue. Through the reference period, EFF funds were available for fish processing, so the major investments are in the financing process.

Approximately 8% of total EMFF funds are allocated to the processing sector. So far, under the Measure IV.4. "Processing of fishery and aquaculture products", two tenders have been held in 2016 and 2017, through which about 35 small and middle-sized companies have requested support for the investment, which should improve their businesses in the next period. Moreover, for a significant number of these companies, fish processing was not considered as their main activity. In previous years, they were mostly involved in aquaculture or trade and distribution of fish products. Therefore, major funds go into construction investments and additional facilities for improvements of production processes. It is important to stress that due to different kind of main activity, these companies were not a part of the fish processing population so the total amount of subsidies on investment from the EMFF does not correspond to given data in national chapter.

Management measures already affected fish processing industry as most of the middle sized and large companies depend on the domestic raw material. It is important to say that in the future, connecting aquaculture and fish processing industry is one of the main tasks for fisheries development and it is already emerging as a trend in fish processing industry. Merging these two sectors is leading to increase of the domestic raw material for production in processing industry as well to decrease the cost of production.

During the next period, it is expected to agree on the project of certification of sardine through the FIP. This project is the first step to the certification of small pelagic fish, which could improve cooperation between fishery cooperatives and fish processing enterprises. The new Act on Aquaculture promotes an increase of production in aquaculture while respecting the principles of economic, social and ecological sustainability, which could have some positive effects on the collaboration of these sectors.

Although major processing companies in Croatia made some large investments in the previous period, diversity in companies' activities should be taken to account in order to assess the future expansion. Some investments of companies with processing as non-main activity are expected which could affect this indicator in the future.

#### *5.3.6 Data coverage and quality*

Data collection covered enterprises with fish processing as the main activity so as enterprises with processing as an additional activity. Since there are few companies in Croatia entirely committed to processing industry, the target population was determined through multiple approaches.

Companies that according to Veterinary Directorate have approved establishments for the processing of marine organisms were sent a questionnaire with the additional statement in case they did none of the processing activity in a reference year or considered processing as an additional activity. Additionally, after checking questionnaires, balance sheets were used to cross-check data. This approach resulted in some discrepancies of population size and economic indicators compared with EUROSTAT data but also compared to the list of users of subsidies on investment through measures targeting fish processing.

It has to be pointed out that in a few cases, processing activity was stated as the main activity in terms of employment and production at national level although other activities, for example aquaculture, generated larger income. In that case, a company was included in target population as its share in total production and economic performance was of extraordinary importance for the sector.

## 5.4 Denmark

### 5.4.1 Overview

The Danish fish processing industry is mainly located around the most important fishing harbours in Denmark, which are situated in the north and western parts of Jutland. Denmark is in top ten of the world largest importers and exporter of fish and fish products and the Danish processing industry produces a large variety of products based on many different species. Thus, the raw materials for the industry are purchased on the global market for fish and fish products and the dependency on domestic landing is limited. Nevertheless, the catches of cod, herring and mackerel are of some importance. Furthermore, some Danish regions and islands are depending on the local fisheries and processing industry, because alternative job opportunities in these areas are low.

The Danish fishmeal and -oil factories are also dependent on domestic catches; however, they are also receiving raw material from countries like Norway, Iceland, UK and Sweden. Salmon from Norway dominate the Danish import. A large amount of salmon is passing through Denmark destined for the European market, especially the market for fresh salmon in France and Germany. The industry processing salmon, which is using fresh raw materials, are for most part dependent on the aquaculture production in Norway and Scotland, however frozen raw material are for most part imported from Chile.

In Table 5.4.1, an overview of the development in the number of fish processing enterprises and the numbers of employees and full time employees are shown. The overall structural development in the sector can be characterized by a decline in the number of enterprise and employment.

In 2017, there were 99 enterprises in the Danish fish processing sector. From 2008 to 2017, the number of enterprises decreased from 117 to 99, corresponding to a 15% decrease. The sector is dominated by small and middle-sized enterprises. In Denmark, 45 enterprises have less than 10 full time employees, corresponding to 45% of the total number of enterprises. Furthermore, 32 enterprises have between 11 to 49 employees and 22 have between 50 to 249 employees. There is no large fish processing company with more than 250 full time employees.

Table 5.4.1: Overview, Denmark, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>											
Total enterprises	117	123	115	107	106	103	100	108	100	99	-1%
≤10 employees	56	63	56	54	57	53	47	54	48	45	-6%
11-49 employees	31	37	37	33	30	29	28	31	29	32	10%
50-249 employees	30	23	22	20	19	21	25	23	23	22	-4%
≥250 employees	0	0	0	0	0	0	0	0	0	0	0%
<b>Employment (number)</b>											
Total employees	4,379	4,227	3,791	3,704	3,409	3,453	3,613	3,614	3,761	3,757	0%
FTE	4,147	3,596	3,235	3,043	2,999	3,039	3,028	3,054	3,212	3,153	-2%
<b>Indicators</b>											
Turnover (million €)	1,703	1,693	1,829	1,859	2,010	2,230	2,269	2,489	2,726	2,610	-4%
FTE per enterprise	35.4	29.2	28.1	28.4	28.3	29.5	30.3	28.3	32.1	31.8	-1%
Average wage (thousand €)	48.8	55.8	58.6	59.4	57.0	61.3	62.9	65.6	63.1	65.0	3%
Unpaid work (%)	0.7	0.8	0.8	0.7	0.7	0.5	0.5	0.5	0.5	0.5	11%
<b>Enterprises doing fish processing not as main activity</b>											
Number of enterprises	3	6	5	5	5	5	4	5	7	6	-14%
Turnover attributed to fish processing (million €)											

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

In total, the Danish fish processing sector employed 3 757 persons in 2017, which was almost the same as the year before. From 2008 to 2017, the numbers employed decreased by 14%. The number of fulltime employees also decreased from 4 147 in 2008 to 3 232 in 2017, corresponding to a decrease of 22%. The average wage per FTE increased 3% from 2016 to 2017. From 2008 to 2017, the average wage increased from EUR 49 thousand to EUR 65 thousand, corresponding to an increase of 33%. The number of persons registered as unpaid labour is of minor importance in the Danish industry, constituting only 0.5% of the workers in 2017.

The number of enterprises processing fish outside the fish processing industry is limited. There were only six enterprises in this segment, in 2017. The number has been between three and seven enterprises from 2008 to 2017.

#### 5.4.2 Economic performance

In Table 1.2.2, the economic performance for the Danish processing industry for the period 2008 to 2017 is presented. In 2017, the total income for the Danish fish processing industry reached EUR 2.6 billion, which was a decrease of 4% compared to 2016. The total income consists of turnover, other income and subsidies of which turnover and other income make up for 99% and 1%, respectively. There are no registered subsidies in the Danish fish processing industry.

The total cost of production reached EUR 2.3 billion in 2017, which was a decrease of 11% compared to 2016. The most important cost component is the purchase of fish and other raw materials, which make up for 64% of the total cost. Other operational cost covers 26%, whereas wages and salaries cover 9%. Energy cost make up for 1% of the total production cost.

From 2016 to 2017, the depreciation of capital was reduced by 3%, whereas the net financial cost decreased to EUR 19.5 thousand, corresponding to a positive income increase of 205%. Total assets increased 7% together with the net debt that increased 4%. The net investment decreased by 41%, however; the investments in 2016 was unusually high. In 2017, the investments is back to the level seen in the previous years. There a now registration of investment subsidies in the Danish industry.

The Gross Value Added (GVA) is calculated as the total income deducted by energy cost, fish and other raw material cost and other operational cost. The GVA reached EUR 518 million in 2017, which was an increase of 53% from 2016, and the highest GVA generated over the period from 2008 to 2017.

In 2008, the Danish fish processing industry experienced a negative net profit, but since then the net profit has been positive. From 2016 to 2017, the net profit increase to EUR 298, which was an increase of more than 180%, compared to 2016 and the highest profit obtained by the sector from 2008 to 2017. In line with this result, also the EBIT and the operating cash flow improved from 2016 to 2017.

All the productivity and performance parameters have improved from 2016 to 2017. The labour productivity increased by 53%, and capital productivity, EBIT, GVA, and net profit margin all reached an all-time high in 2017.

All in all, the sector has become more profitable and is performing better after the global economic crisis. All the productivity and performance indicators increased from 2008 to 2017.

Table 5.4.2: Economic performance indicators, Denmark, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Income (million €)</b>											
Turnover	1,702.6	1,693.2	1,828.8	1,858.7	2,010.0	2,229.8	2,269.4	2,488.9	2,726.4	2,610.2	-4%
Other income	-5.3	-49.2	60.1	68.4	19.7	-22.0	23.3	78.2	31.0	24.2	-22%
Operating subsidies	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
<b>Total income</b>	<b>1,697.3</b>	<b>1,644.0</b>	<b>1,888.9</b>	<b>1,927.1</b>	<b>2,029.7</b>	<b>2,207.8</b>	<b>2,292.7</b>	<b>2,567.2</b>	<b>2,757.4</b>	<b>2,634.4</b>	<b>-4%</b>
<b>Expenditure (million €)</b>											
Purchase of fish and other raw material for production	990.9	953.2	1,041.0	1,146.9	1,177.1	1,361.1	1,397.7	1,616.7	1,632.6	1,486.0	-9%
Wages and salaries of staff	200.8	199.2	188.0	179.5	169.7	185.2	189.5	199.4	201.9	204.0	1%
Imputed value of unpaid labour	1.5	1.5	1.5	1.2	1.3	1.0	1.0	1.0	1.0	1.1	12%
Energy costs	33.2	30.0	35.3	36.0	30.5	33.8	34.7	38.9	25.2	21.8	-14%
Other operational costs	416.6	370.5	521.9	422.7	528.2	525.0	531.0	554.9	761.2	608.9	-20%
<b>Total production costs</b>	<b>1,643.0</b>	<b>1,554.4</b>	<b>1,787.7</b>	<b>1,786.4</b>	<b>1,906.7</b>	<b>2,106.1</b>	<b>2,153.9</b>	<b>2,410.9</b>	<b>2,621.9</b>	<b>2,321.8</b>	<b>-11%</b>
<b>Capital Costs (million €)</b>											
Depreciation of capital	41.0	40.1	35.7	33.6	35.5	33.4	31.0	32.1	35.6	34.5	-3%
Financial costs, net	41.1	35.9	9.5	12.4	9.3	11.0	-11.2	-1.5	-6.4	-19.5	205%
<b>Capital Value (million €)</b>											
Total value of assets	1,218.4	1,195.0	1,142.9	1,134.3	1,221.6	1,209.1	1,206.1	1,355.4	1,382.9	1,486.6	7%
Net Investments	42.0	37.9	7.9	39.2	31.2	40.5	37.2	44.4	70.8	41.7	-41%
Subsidies on investments									0.0	0.0	0%
Debt	915.6	870.0	813.6	628.5	700.7	715.9	668.0	706.5	768.1	799.2	4%
<b>Economic performance (million €)</b>											
Gross Value Added	256.6	290.3	290.8	321.5	293.9	287.9	329.3	356.7	338.3	517.7	53%
Operating Cash Flow	54.3	89.6	101.2	140.8	123.0	101.7	138.8	156.2	135.5	312.6	131%
Earning before interest and tax	13.3	49.5	65.5	107.2	87.5	68.2	107.8	124.1	99.8	278.1	179%
Net Profit	-27.7	13.6	56.0	94.8	78.2	57.2	119.0	125.6	106.3	297.7	180%
<b>Productivity and performance indicators</b>											
Labour productivity (thousand €)	61.9	80.7	89.9	105.7	98.0	94.7	108.8	116.8	105.3	164.2	56%
Capital productivity (%)	21.1	24.3	25.4	28.3	24.1	23.8	27.3	26.3	24.5	34.8	
GVA margin (%)	15.1	17.7	15.4	16.7	14.5	13.0	14.4	13.9	12.3	19.6	
EBIT margin (%)	0.8	3.0	3.5	5.6	4.3	3.1	4.7	4.8	3.6	10.6	
Net profit margin (%)	-1.6	0.8	3.0	4.9	3.9	2.6	5.2	4.9	3.9	11.3	
Return on Investment (%)	1.1	4.1	5.7	9.5	7.2	5.6	8.9	9.2	7.2	18.7	
Financial position (%)	24.9	27.2	28.8	44.6	42.6	40.8	44.6	47.9	44.5	46.2	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.4.3 Socio-demographic structure

In addition to the economic data, social data on gender, age, education and nationality are collected and integrated with the economic data using data from Statistics Denmark's "Register-Based Workforce Statistic" and "Labour Market Account Statistic". The collection of social indicators for the Danish processing sector cover the years 2016 and 2017, which is provided for the 2019 data call. The social variables were included in the annual economic survey, which enabled full coverage of the social variables for the Danish industry (census data) as totals for the industry as well as distributed on size categories.

In 2017, the majority of employees were female covering 54%, whereas male employees covered 46%. The proportion of female for each size category of enterprises was 63%, 58% and 52% for the segments 0-9, 10-49 and 50-249. The age groups collected were 15-24, 25-39, 40-64 and >= 65. For the overall industry, the age group 15-24 covered 9%, the group 25-39 covered 28%, the group 40-64 covered 61%, whereas the group >=65 only covered 2%.

The percentage distribution by age is almost similar to the total distribution in all the size categories, however; for the smallest enterprises, the age group between 15-24 cover 15% and the group between 25-39 only 20%, with the rest being the same. In terms of education, 33%

had a low education (primary school), 45% a medium education and 20% had a high education. Only 2% is covered by the category unknown.

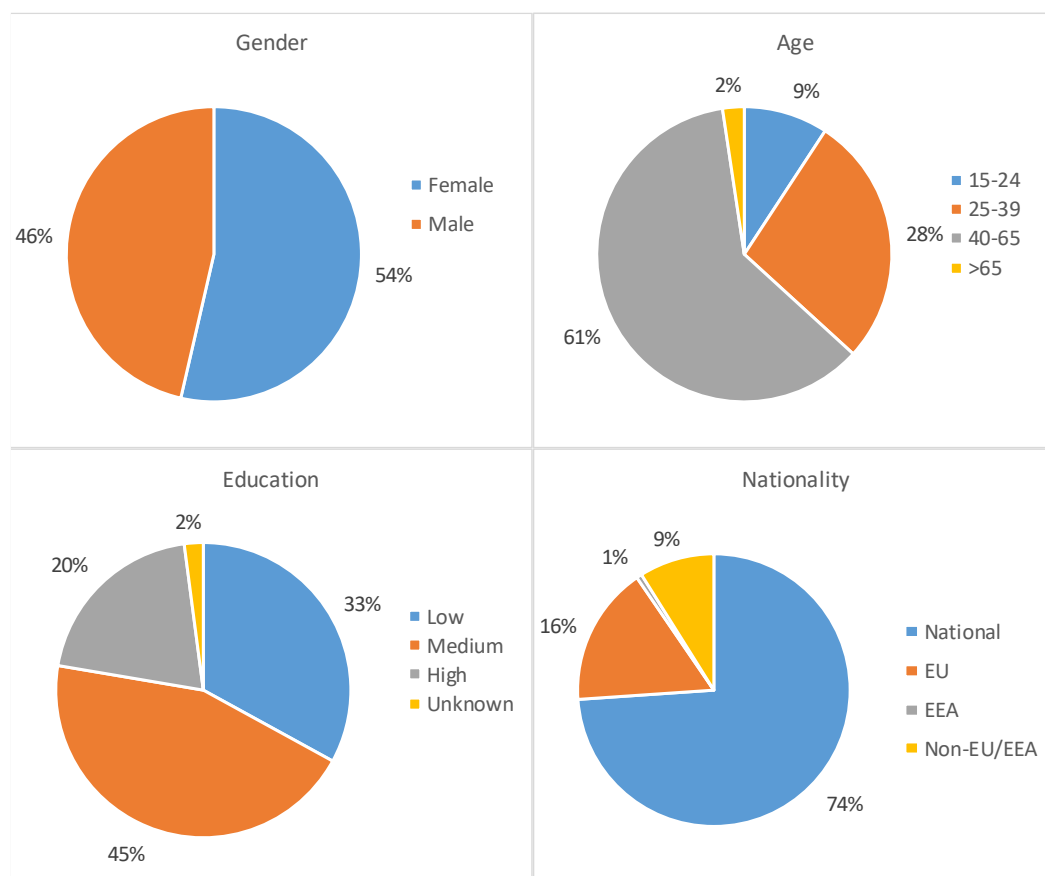


Figure 5.4.1: Socio-demographic characteristics, Denmark, 2017

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

The percentage of the people coming from other EU countries, EEA countries and other nationalities employed increases with the size of the enterprise, which can be seen from figure 2.

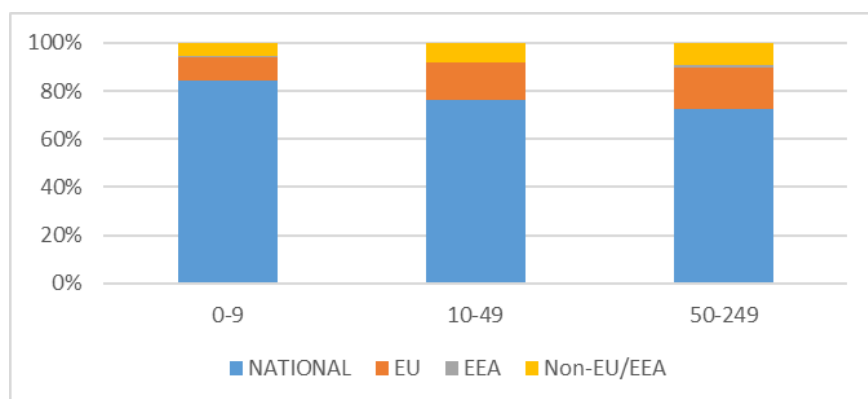


Figure 5.4.2: Distribution of the Nationalities by enterprise categories, Denmark, 2017

This result seems in accordance with what could be expected, since larger companies most often have a more international profile focusing on the international market, and they therefore need

employees with a broader international profile. On the other hand, smaller enterprises focus on the domestic market and therefore most often hire employees from the national labour force. All the required social data was collected and provided for the Danish processing industry and no special issues was encountered in relation to the data.

#### 5.4.4 Breakdown by company size

In Table 1.2.3, the numbers of enterprises distributed on size categories are shown. The segment containing enterprises with 10 or less employees is the largest in terms of number of enterprises (45), but are in economic terms the least important. In 2017, there are three enterprises less in this segment than in 2016, which have a significant effect on the results. The reason is believed to be that the largest enterprises in this segment has moved to the segment 10-49 employees, which have halved the economic income and costs for this group compared to 2016. The GVA was reduced from 13% to 9%, and operating cash flow and EBIT was reduced by 59% and 77%, respectively. On the other hand, the net profit was the highest ever achieved for this segment since 2008, showing a positive result of EUR 16 thousand in 2017.

Table 5.4.3: Economic performance by size, Denmark, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>less than or equal to 10 employees</b>											
Total Income	61	105	78	89	94	117	101	99	107	44	-59%
Total production costs	59	102	75	86	90	113	98	97	103	42	-59%
Gross Value Added	11	15	14	13	14	14	11	11	13	9	-28%
Operating Cash Flow	2	2	4	3	4	4	3	3	4	1	-59%
Earning before interest and tax	0	0	2	2	2	2	2	1	2	0	-77%
Net Profit	-1	-1	2	1	1	1	1	1	2	16	710%
<b>between 11 and 49 employees</b>											
Total Income	337	392	499	465	527	540	509	533	704	672	-5%
Total production costs	324	371	473	444	505	519	492	511	682	601	-12%
Gross Value Added	57	75	79	69	69	67	56	65	67	117	74%
Operating Cash Flow	13	22	26	21	22	21	17	22	23	71	216%
Earning before interest and tax	4	10	17	15	14	13	11	15	14	65	362%
Net Profit	-4	2	12	10	9	9	11	15	15	64	342%
<b>between 50 and 249 employees</b>											
Total Income	1,299	1,147	1,312	1,372	1,409	1,551	1,682	1,934	1,947	1,919	-1%
Total production costs	1,260	1,082	1,240	1,256	1,312	1,474	1,564	1,803	1,837	1,679	-9%
Gross Value Added	188	201	198	240	211	207	262	280	259	392	52%
Operating Cash Flow	39	65	71	116	97	77	118	131	109	240	119%
Earning before interest and tax	10	39	46	91	71	53	94	108	84	213	154%
Net Profit	-22	13	42	84	68	47	107	110	90	218	142%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

The segment with 11 to 49 employees also experienced a reduction in the total income and cost with 5% and 12%, respectively. However, the economic performance of this segment have improved. GVA increased with 74% from 2016 to 2017, operating cash flow and EBIT increased 216% and 362%, respectively. Finally, the net profit increased from EUR 15 thousand in 2016 to EUR 64 thousand in 2017, corresponding to an increase of 342%.



The largest enterprises in Denmark employing 50-249 are covering 73% of the total income and 72% of the total cost. For this segment, the income decreased 1% and the cost decreased with 9%, resulting in a net profit EUR 218 thousand, which was the highest achieved in the period from 2008 to 2017. From 2016 to 2017, the operating cash flow and EBIT increased 119% and 154%, respectively.

#### *5.4.5 Trends, drivers and outlook*

For the industry processing fish for consumption in Denmark, the salmon industry was the most important in 2017 in terms of value and volume. This industry is dependent on the Norwegian aquaculture industry and most of the imports of salmon are processed and exported to other EU countries.

The industry processing fish for fishmeal and –oil is important within the Danish fish processing industry in terms of volume and value. These enterprises are depending on local catches of small pelagic species from the Atlantic Ocean, however, they also import raw material from other countries like Norway, Iceland and Sweden. Furthermore, the fishmeal and –oil industry also use waste materials coming from the processing industry for human consumption.

The industry has outsourced some of the labour intensive activities to countries with lower salary costs, where especially the salmon industry has outsourced some of their activities to Poland. The filleting is for most part done in countries with lower salary cost than Denmark, whereas a larger part of the smoked and prepared products production is located in Denmark. Nevertheless, the number of enterprises has been quite stable from 2008 until 2017, and it seems that outsourcing is a less attractive solution for the enterprises than it has been earlier.

In general, the industry relies on a steady inflow of raw materials. For industries that are relying on local/EU stocks a change in the availabilities of these materials can severely affect the industry income, production and employment. This is especially true for the Danish fishmeal and –oil processors that are relying on Danish catches for some of their raw material. For industries that are less dependent on local/EU stocks, raw materials are purchased from all over the world. In these segments, the cod, herring and mackerel sectors are relying on Danish catches as well as raw material from countries fishing in the North Atlantic. The salmon processors are, on the other hand, solely dependent on the production originating from the aquaculture sector, especially Norway and Scotland. The shrimp processors are dependent on the shrimp caught in the North Atlantic by Greenland and Canada, however, the processing of warm water shrimp is mostly relying on shrimp produced in aquaculture outside the EU.

Most EU stocks are at the moment fully exploited (FAO) and it is not expected that raw materials from EU fisheries will/or can increase in the near future. However, the EU aquaculture sector can, given the right framework condition, increase production and it is considered that the EU aquaculture sector has an unleashed potential to increase production.

In terms of certification, most Danish stocks are managed in accordance with the Marine Stewardship Council (MSC) guidelines and labelled accordingly. Processing companies are dependent on selling their product to supermarket chains, which most often demand that the products can be labelled to attract consumers and avoid bad publicity for selling non-sustainable products. Thus, the processing industry applies to these demands from the supermarket chains. For the aquaculture sector in Denmark, the labelling scheme Aquaculture Stewardship Council (ASC) has been adopted, and more and more producers are following these guidelines. In Denmark, there is furthermore a governmental certification scheme for organic products, which can be applied for aquaculture products coming from both land based farms, marine sea cages farms and mussel producers.

Fish processing as non-main activity is rather limited in Denmark. More than 95% of the fish products that are processed in Denmark can be allocated to the enterprises within the NACE code 10.20, where fish processing is the main activity. There have only been identified between 3-7 companies outside NACE 10.20 over the period 2008 to 2017 that have fish processing, but not

as their main activity. These companies are identified if they have workplaces/production facilities doing fish processing, but the overall enterprise is not registered under the NACE 10.20. Unfortunately, the income from these companies cannot be reported do to confidentially reasons.

At the moment, a major concerns is the economic consequences for the Danish fishery following the United Kingdom's decision to leave the European Union (BREXIT). Estimation on the economic consequences for the Danish fishing fleet made by the Department of Food and Resource Economics reveals that compared to the initial situation landing value can be reduced with 45-57% and net profit with 66-82% for the vessels fishing in the UK zone depending on how fishers can adapt to the new situation. The vessels affected by BREXIT are primarily targeting species for reduction, herring and mackerel. Thus, the Danish processing industry relying on these catches will be affected. If the same volumes of fish are landed, the industry will probably be able to buy the fish from British fishers. However, if the British fishers are not able to catch the same amount of fish there will be a lack of raw material and prices will probably increase. It could also be that tariffs are placed on fish from UK, which will increase costs for Danish processing companies. In the end this could prevent the British fishers from landing in Danish harbours and the industry will then have to look for other sources to provide the raw material, which would probably increase costs.

A new regulation on aquaculture production has been implemented in Denmark, in 2012. Furthermore, a new plan for increasing aquaculture production was implemented in 2016/17 allowing for an increase in both land and sea based aquaculture production. However, in 2019 the opportunities of expanding the sea based was closed down again, thus only the land based production still seems to have the opportunity to expand. The production in the Danish aquaculture sector is expected to slightly increase in the coming years, providing more raw materials for the industry. This could potentially have a positive effect on the processing industry in Denmark, especially the sub branches processing trout and salmon.

#### *5.4.6 Data coverage and quality*

Data for the Danish fish processing industry is collected by Statistics Denmark. The data covers all enterprises in the business register covered by NACE 10.20. Data is processed to comply with the DCF and EU-MAP in cooperation with the Department of Food and Resource Economics. The data collected by Statistics Denmark follows the definition of the Structural Business Statistics (SBS) and is, therefore, comparable with Eurostat data and data from other member states that are using the SBS definition.

In Statistics Denmark, the Account Statistics are available approximately 20 months after the end of the reference year. Data can be disaggregated on to the 4 segment on numbers of employees as requested by the DCF and EU-MAP. To avoid problems with confidentiality, segments should in general include more than 10 enterprises. In Denmark, the enterprises covered by NACE 10.20 cover more than 95% of the fish processing in Denmark and is a very good estimate of the total income and production of Danish processing industry. The data collected and processed for the DCF and EU-MAP can be slightly different from the data that are being published by Eurostat on the processing industry. This is because the data for the DCF and EU-MAP are combined from two different statistics in Statistics Denmark; the Account Statistics and the Industry Commodities Trade Statistics, where data for Eurostat only covers data from the Account Statistics. The two statistics are combined too get more detailed information on the raw material use in the fish processing industry. Furthermore, combining the two statistics provide information on the species used in the processing industry.

Under the EMFF, initiatives that have supported the fish processing industry has been launched, however, there are no subsidies registered by Statistics Denmark for the processing industry. An explanation of the missing registration of these funds can be that it is paid to supporting industries and not directly to the enterprises that is registered as having fish processing as their main activity, such as, marketing firms or firm engaged in producing equipment for the

processing industry. Overall, the funding corresponds to less than 1% of the industries total income and is assessed to be rather insignificant to the Danish processing industry.

## 5.5 Finland

### 5.5.1 Overview

There were 136 fish processing enterprises operating in Finland in 2017 that recorded total turnover of EUR 353 million generating value added of EUR 49 million. The processing industry employed 760 FTEs or 966 persons. The fish processing industry in Finland is highly concentrated in the sense that 10 companies with the highest turnover produced around 85% of the total revenue generated by the industry in 2017. Majority of enterprises are small and medium sized enterprises that accounted for 12% of the total income of the industry.

In 2017, Fish processing enterprises used 79 thousand tonnes of fish as raw material, 51 thousand tonnes were domestic fish and 28 thousand tonnes were imported. Use of domestic fish dropped dramatically in 2015 due to Russian embargo for EU foodstuff in autumn 2014 as a counter measure to EU sanctions against Russia over Ukraine crisis. Despite significant increased amounts of domestic rainbow trout and Norwegian salmon processed there was a marked drop in turnover of the sector in 2015. The processing of Norwegian salmon decreased in 2017 together with increasing production of domestic deep frozen Baltic herring and sprat to new Eastern European markets.

Table 5.5.1: Overview, Finland, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>											
Total enterprises	143	137	143	143	143	147	137	136	134	136	1%
≤10 employees	131	125	131	127	124	128	113	113	112	116	4%
11-49 employees	9	9	9	13	15	19	19	23	19	16	-16%
50-249 employees	3	3	3	3	4	0	5	0	3	4	33%
≥250 employees	0	0	0	0	0	0	0	0	0	0	0%
<b>Employment (number)</b>											
Total employees	961	880	885	870	962	1,010	1,237	1,004	963	966	0%
FTE	682	742	742	777	775	808	1,072	803	751	760	1%
<b>Indicators</b>											
Turnover (million €)	160	195	236	263	265	356	397	300	310	353	14%
FTE per enterprise	4.8	5.4	5.2	5.4	5.4	5.5	7.8	5.9	5.6	5.6	0%
Average wage (thousand €)	34.8	36.4	35.5	36.1	40.1	50.1	39.4	39.6	41.2	40.4	-2%
Unpaid work (%)	3.9	3.2	3.9	3.3	3.1	4.2	3.6	4.8	4.1	3.4	-17%
<b>Enterprises doing fish processing not as main activity</b>											
Number of enterprises	22	49	56	13	13	21	21	20	20	28	40%
Turnover attributed to fish processing (million €)	10	129	147	50	50	94	94	103	103	134	30%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

The main species used in Finnish fish processing are Baltic herring, salmon and rainbow trout. The Finnish industry processed also European whitefish, vendace and various other freshwater fish species. Finnish fish processing statistics are collected every second year:

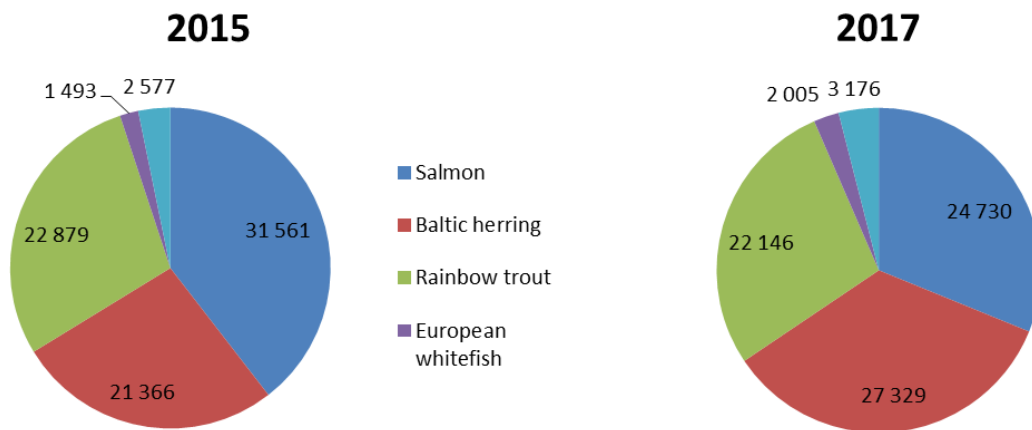


Figure 5.5.1: Main raw material used by species in tonnes, Finland, 2015 and 2017

Source: Natural Resource Institute Finland: Fish processing 2015, 2017

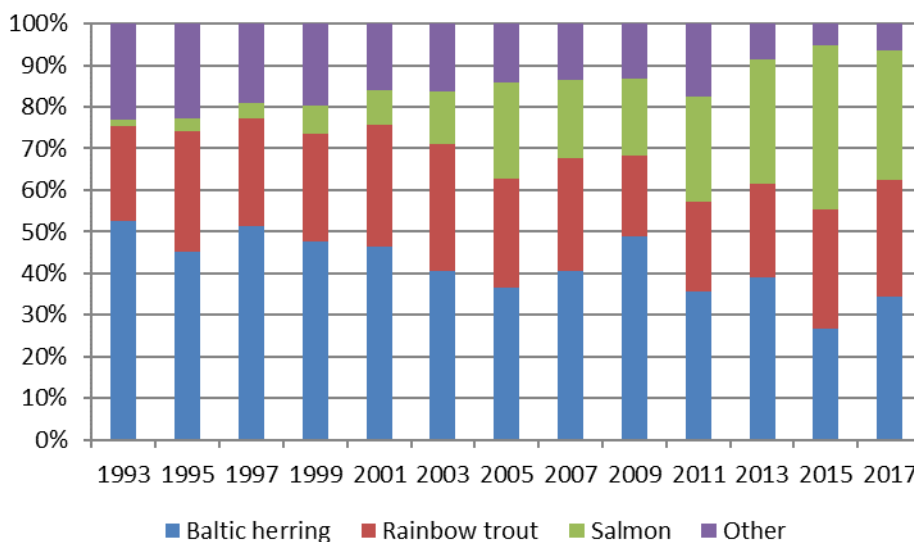


Figure 5.5.2: Main raw material used by species, Finland, 1993-2017

Source: Natural Resource Institute Finland: Fish processing 2017

Herring has traditionally been the most important species in Finnish fish processing in terms of weight. However the domestic consumption of herring has decreased significantly and salmon has become the most important species in terms of value. Together with rainbow trout they account for two thirds of the total weight of fish produced in 2017. Nowadays most of the processed herring and sprat are exported. The most important market for herring was Russia until the Russian embargo.

In 2017 deep frozen Baltic herring and sprat was the most important processed product in terms of weight. Production of Norwegian salmon together with domestic rainbow trout reached 47 thousand tonnes in 2017. Increased price of salmon due to decreased production in Norway and Chile in 2016 led to a marked decrease in salmon processing; there was 22% decrease from 2015 in the use of Norwegian salmon. Salmon is mostly processed to fresh fish market as fillets and other fresh product forms. Also smoked products are important.

### 5.5.2 Economic performance

Finnish processing sector was booming with over 10% annual growth rate from 2010 until 2015 when the turnover dropped by 24%. Turnover remained at the lower level in 2016 but increased by 14% in 2017. Total costs follow the total income closely; the main reason is that the raw material makes up majority of the costs, some 80% of the total operating costs. In general, the sector is operating with low operating profit margin: an average 5% of the total income resulting low but constantly positive EBIT margin around 3%.

Therefore, the economic performance of the sector follows the income. The gross value added of processing industry increased steadily up to EUR 63 million in 2014 but dropped with turnover in 2015 by 30%. The profitability improved in 2017 and the sector was making EUR 10.2 million net profits, more than double of that the year before. The sector investments were high in 2015 and 2016 and the improved profitability increased the return on investments in 2017 increased to 8.2%.

Table 5.5.2: Economic performance indicators, Finland, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Income (million €)</b>											
Turnover	160.0	195.4	236.1	262.8	264.7	356.0	396.8	299.8	309.8	353.3	14%
Other income	1.2	1.0	3.3	1.4	1.7	1.9	1.8	1.9	0.8	1.0	25%
Operating subsidies	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	-3%
<b>Total Income</b>	<b>161.3</b>	<b>196.5</b>	<b>239.5</b>	<b>264.2</b>	<b>266.5</b>	<b>358.1</b>	<b>398.9</b>	<b>301.8</b>	<b>310.7</b>	<b>354.4</b>	<b>14%</b>
<b>Expenditure (million €)</b>											
Purchase of fish and other raw material for production	107.6	131.7	168.4	189.3	185.8	248.1	278.2	220.0	229.3	266.0	16%
Wages and salaries of staff	22.8	26.1	25.3	27.1	30.1	38.8	40.7	30.3	29.7	29.7	0%
Imputed value of unpaid labour	0.9	0.9	1.0	0.9	1.0	1.7	1.5	1.5	1.3	1.0	-18%
Energy costs	2.3	2.7	3.3	3.2	3.0	4.0	4.3	3.5	2.3	2.4	6%
Other operational costs	18.3	22.7	25.4	29.7	32.8	46.8	53.0	33.7	34.8	36.9	6%
<b>Total production costs</b>	<b>151.9</b>	<b>184.1</b>	<b>223.4</b>	<b>250.3</b>	<b>252.6</b>	<b>339.4</b>	<b>377.8</b>	<b>289.1</b>	<b>297.3</b>	<b>336.1</b>	<b>13%</b>
<b>Capital Costs (million €)</b>											
Depreciation of capital	3.5	4.2	5.1	4.8	5.7	7.4	9.7	5.9	6.5	6.3	-3%
Financial costs, net	2.2	1.7	1.8	1.8	1.9	1.0	0.0	1.1	1.2	1.8	51%
<b>Capital Value (million €)</b>											
Total value of assets	73.6	86.7	103.5	108.3	120.2	169.9	161.5	134.2	139.0	147.8	6%
Net Investments	3.1	7.6	4.9	5.0	14.2	3.3	5.9	9.3	11.3	2.7	-76%
Subsidies on investments									3.5	0.1	-97%
Debt	56.7	67.1	74.3	74.4	85.3	112.9	100.6	89.0	89.5	93.7	5%
<b>Economic performance (million €)</b>											
Gross Value Added	33.0	39.3	42.4	41.9	44.8	59.0	63.1	44.4	44.2	48.9	11%
Operating Cash Flow	9.4	12.4	16.2	13.9	13.9	18.7	21.1	12.7	13.4	18.3	37%
Earning before interest and tax	5.9	8.2	11.0	9.2	8.2	11.3	11.4	6.8	6.9	12.1	75%
Net Profit	3.6	6.4	9.2	7.3	6.3	10.3	11.4	5.7	5.7	10.2	80%
<b>Productivity and performance Indicators</b>											
Labour productivity (thousand €)	48.5	53.0	57.1	53.9	57.9	73.1	58.9	55.3	58.8	64.4	9%
Capital productivity (%)	44.9	45.3	40.9	38.7	37.3	34.7	39.1	33.1	31.8	33.1	
GVA margin (%)	20.5	20.0	17.7	15.9	16.8	16.5	15.8	14.7	14.2	13.8	
EBIT margin (%)	3.6	4.2	4.6	3.5	3.1	3.2	2.9	2.3	2.2	3.4	
Net profit margin (%)	2.3	3.3	3.8	2.8	2.4	2.9	2.8	1.9	1.8	2.9	
Return on Investment (%)	8.0	9.4	10.7	8.5	6.8	6.7	7.1	5.1	5.0	8.2	
Financial position (%)	23.0	22.6	28.2	31.3	29.0	33.5	37.7	33.7	35.6	36.6	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.5.3 Socio-demographic structure

The employment of the processing industry was increasing steadily from 2008 until 2014 both in numbers of employees and full time equivalent. In 2015 and 2016, the employment measured in FTE clearly decreased. In 2017 the employment was 760 full time equivalent, which was 1% increase from previous year. An average processing enterprise in 2017 employed 6 FTEs with an average wage of EUR 40.4 thousand per employee. Labour productivity has increased by 33% since 2008: in 2017 the GVA per FTE increased by 9% to EUR 64.4 thousand.

Almost two thirds of employees in the processing sector are male, mostly at the age of 40-64 years. Over half (58%) of the employees have medium level education and 88% of the employees are Finnish citizens. Small share of the labour force comes from other EU member states (7%) or from non-EU/EEA countries (5%).

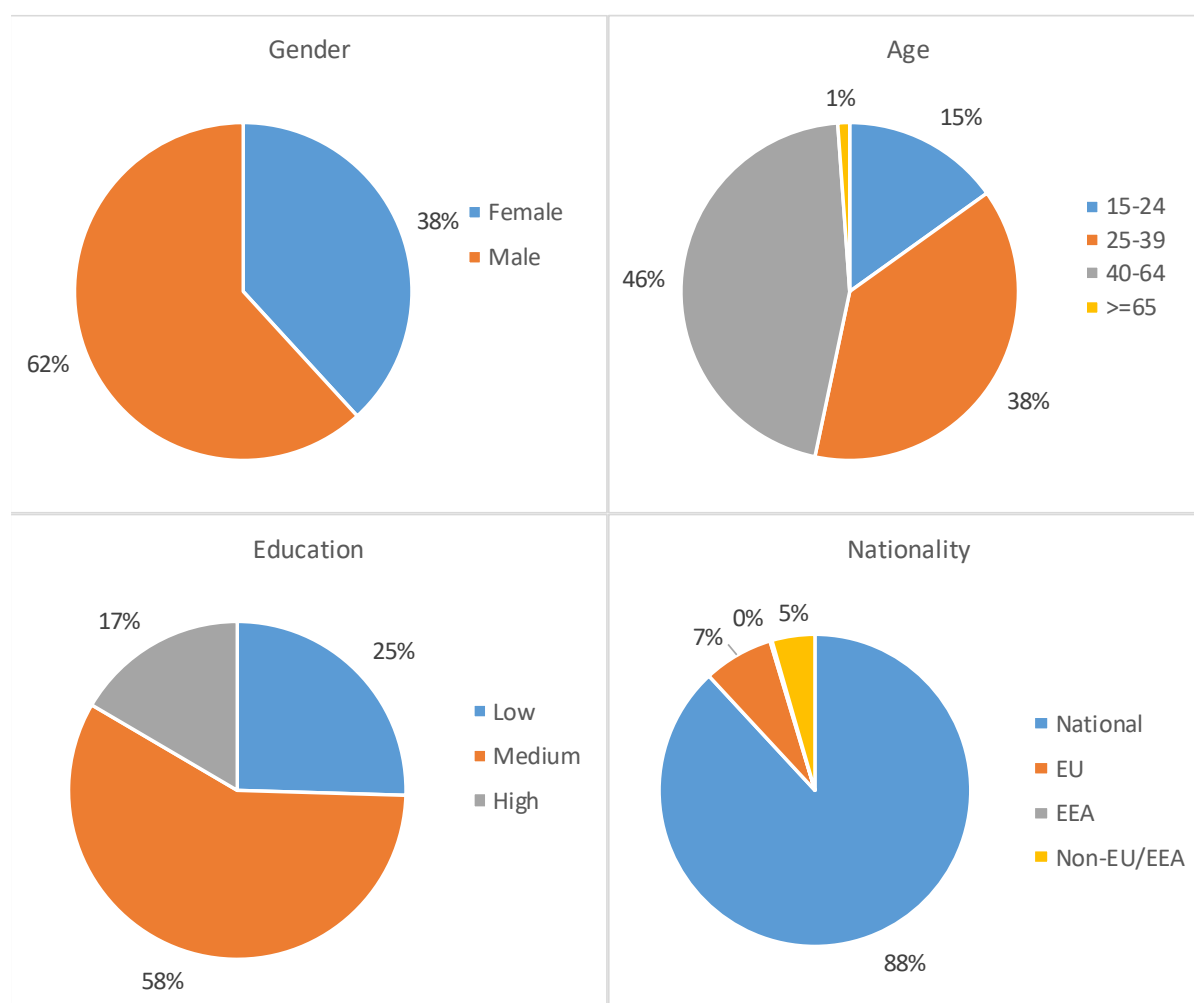


Figure 5.5.3: Socio-demographic characteristics, Finland, 2017

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.5.4 Breakdown by company size

The Finnish fish processing sector is dominated by micro enterprises employing less than 10 persons. There were 116 micro enterprises in the sector in 2017 and they amounted to 85% of all the main activity enterprises in the industry. However these micro enterprises contributed only one tenth of the total production of the sector. The 4 medium-sized enterprises accounted for

over half of the production value and 16 small enterprises one third. Similarly the small and medium sized enterprises dominated the sector also in terms of employment and economic performance.

The profitability of the small and medium sized enterprises was at the same level while the micro enterprises were less profitability, however, making profits in 2017 after making losses for several years.

The Russian food embargo hit heavily the medium sized enterprises and the turnover almost halved in 2015. After that the turnover has increased rapidly and the segment was making good profits in 2017.

Table 5.5.3: Economic performance by size, Finland, 2012-2017

Variable	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>less than or equal to 10 employees</b>							
Total Income	41.2	44.2	33.3	28.7	36.0	40.6	13%
Total production costs	38.8	43.8	32.5	28.3	35.0	38.5	10%
Gross Value Added	9.7	9.0	7.2	6.3	6.7	7.4	11%
Operating Cash Flow	2.4	0.4	0.8	0.4	1.0	2.0	97%
Earning before interest and tax	1.0	-0.8	-0.4	-0.6	0.1	1.2	1245%
Net Profit	0.5	-0.9	-0.7	-0.8	-0.1	1.0	-969%
<b>between 11 and 49 employees</b>							
Total Income	110.8	313.9	134.1	144.2	121.5	111.4	-8%
Total production costs	102.5	295.6	127.8	137.3	116.2	105.5	-9%
Gross Value Added	21.5	50.0	19.0	22.1	19.3	16.8	-13%
Operating Cash Flow	8.4	18.3	6.3	6.9	5.3	5.9	12%
Earning before interest and tax	5.9	12.2	3.4	4.2	2.7	3.8	41%
Net Profit	5.2	11.2	3.0	3.3	2.2	3.4	56%
<b>between 50 and 249 employees</b>							
Total Income	114.5		231.4	128.9	153.2	202.4	32%
Total production costs	111.3		217.4	123.5	146.1	192.0	31%
Gross Value Added	13.6		36.9	16.0	18.2	24.7	36%
Operating Cash Flow	3.2		14.0	5.4	7.0	10.4	48%
Earning before interest and tax	1.3		8.4	3.3	4.1	7.1	72%
Net Profit	0.5		9.1	3.3	3.6	5.8	59%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.5.5 Trends, drivers and outlook

Salmon prices continued to remain high in 2018 impacting the outlook for the Finnish processing. The Finnish aquaculture strategic plan aims at doubling the domestic production by 2022. This would improve the sourcing the raw material for Finnish processing industry in the future as the current shortage of supply together with increased prices has impacted on the processing industry. However at the time the target production growth seems to be unattainable.

Also the Russian embargo continued to restrict the Baltic herring export even though there is some increase in new export markets in Eastern Europe. There is demand for the domestic wild fish, however, the supply has been limited for past years. In 2016, the first fishmeal plant started operation with estimated annual production of 30-40 thousand tonnes Baltic herring as raw



material for fishmeal and oil that will be further processed as fish feed for fish farming. In 2017, the fishmeal production accounted for a quarter of Finnish herring and sprat catches.

The investment was supported by EFF funding and has important role in the Finnish blue growth strategy creating demand for domestic fish and providing opportunity for nutrient neutral growth in fish farming.

#### *5.5.6 Data coverage and quality*

The economic data is compiled by combining data from the Structural Business Statistics from Statistics Finland (SF) and survey data from the Natural Resources Institute Finland (Luke). Economic data is based on financial statement statistics and regional and industrial statistics of SF. Financial data covers all enterprises having fish processing as their main activity in Business Register of Statistics Finland in 2017. Luke carries out a survey on processed fish production every second year. The latest information available for the report is for 2017. The production survey is carried out as a stratified survey with a target population including all enterprises operating in fish processing, including also enterprises that do not have fish processing as their main activity.

## 5.6 Germany

### 5.6.1 Overview

In 2017, the German processing sector consisted of 244 enterprises with fish processing as their main activity. Enterprises with more than 20 employees made up 90% of both turnover and employment in the sector. Moreover, though there is a small number of large enterprises (just 7, Table 5.6.1) these firms concentrate 42% of the employment and 52% of the turnover. The large number of small enterprises have a very reduced size, with an average of two employees each (including the owner) and together generate only a 4% of the total industry turnover. Due to this industry structure and given that under the Structural Business Statistic Regulation data is already collected for enterprises with 20 and more employees Germany only presents detailed data for the aggregated segment of 20 and more employees.

Table 5.6.1: Overview, Germany, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>											
Total enterprises	281	263	265	265	250	253	258	248	247	244	-1%
≤10 employees	197	184	186	183	171	176	178	164	157	154	-2%
11-49 employees	55	52	51	58	56	54	56	54	60	61	2%
50-249 employees	21	20	22	17	15	15	16	22	23	22	-4%
≥250 employees	8	7	6	7	8	8	8	8	7	7	0%
<b>Employment (number)</b>											
Total employees	8,441	7,566	7,031	6,780	7,010	6,751	6,561	6,665	6,255	6,141	-2%
FTE	7,995	7,212	6,786	6,544	6,664	6,476	6,251	6,373	5,876	5,885	0%
<b>Indicators</b>											
Turnover (million €)	2,367	2,034	1,973	1,966	2,040	2,060	1,983	2,091	2,080	2,173	4%
FTE per enterprise	28.5	27.4	25.6	24.7	26.7	25.6	24.2	25.7	23.8	24.1	1%
Average wage (thousand €)	33.9	34.7	35.5	35.6	36.2	36.0	38.4	37.6	39.7	40.8	3%
Unpaid work (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
<b>Enterprises doing fish processing not as main activity</b>											
Number of enterprises		95		80							
Turnover attributed to fish processing (million €)		30		50							

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

Compared to the relatively small size of the German fleet in the European context, the German processing industry plays a stronger role in the EU, with a 5<sup>th</sup> position by turnover and a 6<sup>th</sup> by employment. In some key sub-segments of the industry, as fish finger production, Germany is a player of worldwide relevance. Regarding geographical distribution the highest turnover and employment from processing concentrate in Bremerhaven, in the North Sea coast, where three out of five top employers are fish processing industries<sup>23</sup>. In other coastal areas of the North Sea such as Cuxhaven fish processing is the third economic sector by employment, with 1400 employees when considering also its subsidiary sectors<sup>24</sup>.

<sup>23</sup>Bremerhaven Gesellschaft für Investitionsförderung und Stadtentwicklung mbH, 2018. Daten und Fakten 2018 [https://www.bis-bremerhaven.de/sixcms/media.php/631/DatenFakten\\_2018\\_April.pdf](https://www.bis-bremerhaven.de/sixcms/media.php/631/DatenFakten_2018_April.pdf) (Last retrieved 21.11.2019).

<sup>24</sup> Agentur für Wirtschaftsförderung Cuxhaven, Ernährungs- und Fischwirtschaft <http://www.afw-cuxhaven.de/staticsite/staticsite.php?menuid=57&topmenu=7> (Last retrieved 21.11.2019).

The total number of processing firms has decreased in the last years, after a small recovery in 2013-2014. Medium sized firms decreased the most proportionally (4% in 2017) after they attained the highest point in the series in 2016. In absolute terms the decrease of the microenterprises was the strongest, as they have lost a total of 43 firms since the beginning of the series. On the contrary, large firms remained stable in 2016-2017, with very little variation in previous years, and small firms increased slightly in 2017 attaining the highest level of the series (61 firms). The total number of employees decreased in 2% in 2017, following a steady trend only slightly interrupted in 2012 and 2015.

## 5.6.2 Economic performance

Table 5.6.2: Economic performance indicators, Germany, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Income (million €)</b>											
Turnover	2,366.5	2,034.0	1,972.7	1,966.5	2,040.4	2,059.7	1,982.9	2,091.4	2,079.8	2,172.6	4%
Other income	6.7	4.4	4.3	5.1	11.4	6.2	9.7	16.1	7.2	7.5	5%
Operating subsidies	1.2	1.0	0.4	0.3	0.1	0.0	0.0	0.0	0.1	0.1	40%
<b>Total Income</b>	<b>2,374.4</b>	<b>2,039.4</b>	<b>1,977.5</b>	<b>1,971.9</b>	<b>2,051.8</b>	<b>2,066.0</b>	<b>1,992.6</b>	<b>2,107.4</b>	<b>2,087.0</b>	<b>2,180.2</b>	<b>4%</b>
<b>Expenditure (million €)</b>											
Purchase of fish and other raw material for production	1,433.5	1,297.5	1,181.7	1,208.2	1,282.8	1,260.3	1,212.3	1,237.2	1,281.6	1,359.3	6%
Wages and salaries of staff	270.8	250.5	240.8	232.9	241.1	233.4	239.8	239.4	233.4	240.1	3%
Imputed value of unpaid labour	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
Energy costs	38.8	36.4	36.7	39.3	44.9	47.0	45.8	44.4	35.2	34.6	-2%
Other operational costs	540.8	387.6	378.7	398.1	456.4	413.2	427.7	479.1	434.6	434.9	0%
<b>Total production costs</b>	<b>2,284.0</b>	<b>1,972.0</b>	<b>1,837.9</b>	<b>1,878.5</b>	<b>2,025.3</b>	<b>1,954.0</b>	<b>1,925.6</b>	<b>2,000.1</b>	<b>1,984.8</b>	<b>2,069.0</b>	<b>4%</b>
<b>Capital Costs (million €)</b>											
Depreciation of capital	40.8	38.2	34.0	36.1	40.8	41.0	32.9	37.4	32.8	35.9	9%
Financial costs, net	19.0	14.4	11.1	13.4	13.4	11.9	10.1	8.1	4.5	4.0	-11%
<b>Capital Value (million €)</b>											
Total value of assets	586.2	410.1	403.5	402.7	392.3	952.7	915.5	932.5	982.9	961.1	-2%
Net Investments	50.9	31.6	33.2	25.7	28.4	25.7	25.0	29.1	42.7	33.5	-22%
Subsidies on investments									0.6	1.5	156%
Debt	316.5	221.4	184.6	223.4	222.8	802.7	765.5	746.8	541.8	431.8	-20%
<b>Economic performance (million €)</b>											
Gross Value Added	360.1	316.8	379.9	325.9	267.6	345.4	306.8	346.7	335.6	351.2	5%
Operating Cash Flow	90.4	67.4	139.6	93.4	26.5	112.0	67.0	107.4	102.2	111.2	9%
Earning before interest and tax	49.7	29.2	105.6	57.3	-14.3	71.0	34.1	70.0	69.3	75.3	9%
Net Profit	30.7	14.8	94.5	43.9	-27.7	59.1	24.1	61.9	64.8	71.3	10%
<b>Productivity and performance Indicators</b>											
Labour productivity (thousand €)	45.0	43.9	56.0	49.8	40.2	53.3	49.1	54.4	57.1	59.7	5%
Capital productivity (%)	61.4	77.3	94.2	80.9	68.2	36.3	33.5	37.2	34.1	36.5	
GVA margin (%)	15.2	15.5	19.2	16.5	13.0	16.7	15.4	16.5	16.1	16.1	
EBIT margin (%)	2.1	1.4	5.3	2.9	-0.7	3.4	1.7	3.3	3.3	3.5	
Net profit margin (%)	1.3	0.7	4.8	2.2	-1.3	2.9	1.2	2.9	3.1	3.3	
Return on Investment (%)	8.5	7.1	26.2	14.2	-3.6	7.5	3.7	7.5	7.1	7.8	
Financial position (%)	46.0	46.0	54.2	44.5	43.2	15.7	16.4	19.9	44.9	55.1	0%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### Profits and costs

Net profit of the German processing industry has increased an 11% in 2017, with the highest value in ten years excepting for 2010 (Table 6.5.2). The raw material costs have risen 6% in 2017, reaching the highest level since 2008 and the highest proportion of production costs since 2009 (a 66%). Wages and energy costs remain almost constant in relation to production costs, but wages increase in absolute terms (3%) while energy costs decrease (2%).

Though some up and downs have occurred in the last years the turnover increased a 4% in 2017 to reach 2172 million euro, the highest level since 2008. This growth is not regularly distributed among the firms, with some of the largest firms having a decrease in their turnover in 2017 while one large firm had a two digit increase in the same year.

#### Economic indicators

Gross value added of German processing amounted to EUR 351 million in 2017, with a growth of 5% (see Table 6.5.2). Net profits grew even more, with a 10% increase adding up to EUR 71 million in the last year of the series. Both these indicators are at the highest level since 2010.

The most recent data show a positive evolution of productivity indicators. Labour productivity grew 5% in 2017, with EUR 59 700 of gross value added per employee (in full time equivalent). Capital productivity increased in two percentage points to 36.5% in 2017 but it is still far from the productivity in the period 2008-2012.

#### 5.6.3 Socio-demographic structure

The socio-demographic data for the German processing sector was collected for the year 2017. Most variables were included in a survey that also asked for some economic variables (those which were not available from secondary sources). The nationality variable was mostly obtained from the employment agency data, which is a census. Only the EEA category of the nationality variable was obtained from the survey. The data was not available for all variables at enterprise level, and it is therefore only displayed at general level.

From the gender perspective, the majority of workers in the German firms of 20 employees or more were male (57%, see Figure 6.5.1). The difference is smaller when taking into account the employees of all firm sizes, where there is a 52 % of male workers.

Regarding the age of the workforce, the categories used in the survey were 0-15, 15-24, 25-39, 40-64 and  $\geq 65$  years of age. The largest age group was that of 40-64 (61%) followed by the 25-39 years old with 29% (see Figure 5.6.1). The younger generation (15-24) counted for only an 8%. The largest age group also showed the most similar gender distribution (54% male employees). The gender differences increase as we move down the age categories, with only 36% female employees in the 15-24 age group, and it is particularly large among the oldest workers ( $>65$ ), with a 78% of male employees.

The education level of the processing workforce is mostly high (55% of workers), which includes all kinds of university studies but also professional qualifications. About one quarter of employees has low or no qualification, and one fifth of them have secondary education (see Figure 6.5.1). The gender distribution is equal for the lowest education level, but the proportion of men tends to rise towards the higher education levels (56% in the middle and 61% in the high)

Finally, the nationality of the workforce is split between national, EU, EEA and non EU/non EEA workers, with a clear majority of national workers (76%). EU workers represent a 16% of the workforce, with non EU workers being half of that proportion and the amount of EEA workers being negligible. The distribution of genders by nationality is almost 50-50 in all nationality groups.

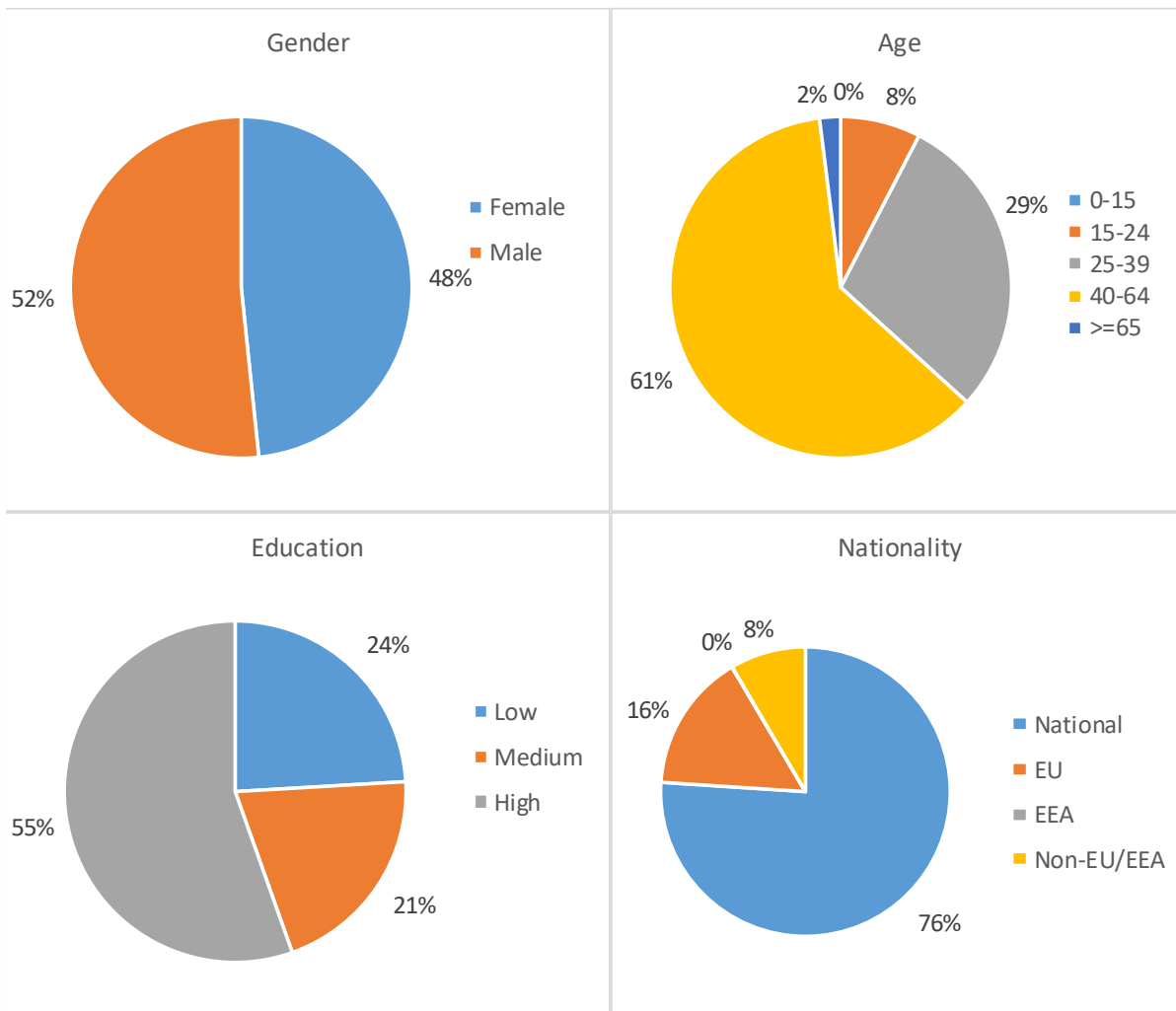


Figure 5.6.1: Socio-demographic characteristics, Germany, 2017

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

#### 5.6.4 Trends, drivers and outlook

##### *Trends*

The German processing industry depends mostly on imports (86% of fish in the German market in 2017<sup>25</sup>) and this dependency has only very slowly decreased from 90% in 2012. The main contribution of imports to the German fish market in terms of value consisted of freshwater fish and sea fish to almost the same proportion (25-22% respectively), and crustaceans in a 17% and fish products in a 36%. The main species for imported sea products are tuna, herring, sardines and mackerel.

Regarding the demand, per capita fish consumption has remained steady between 13-14 kg in the last four five years, departing from the 15kg that were consumed in 2009-2011. This per capita consumption is below the EU average but it is partly compensated by the large size of the

<sup>25</sup> Fischwirtschaft: Daten und Fakten, 2018.

German population. More concretely, in 2017, a lower volume (401 000 tonnes) would be balanced by a higher value of the consumed goods (EUR 3 900 million)<sup>26</sup>.

The composition of this demand has hardly changed, with a very slight increase of fresh fish and conserves. Modified atmosphere packaging (MAP) was more broadly used in 2017.

### *Trade partners*

The main trade partners of Germany for imported products are Poland, The Netherlands and Denmark, in the EU, and Norway and China outside the EU. Of these partners Poland alone takes up an 18.3% of the imports.

The main import partners of Germany change if we consider product groups. In this way, Poland is the main origin of herring conserves and Denmark of mackerel, while the Philippines are the main providers of canned tuna and Morocco of sardines.

### *Outsourcing*

Investments in Poland in 2016 and 2017 continue the outsourcing trend. One of the largest German firms increased its investments in Poland in 2016 and 2017, growing its production capacity in that country in a 50%, according to firm sources<sup>27</sup>. By means of scale, this factory would employ almost 600 workers, which is approximately a 10% of the total employment in fish processing in Germany. The extended Polish facility would also process innovative products and attain the same certifications as the firm's German facilities (with the possible exception of ecological product labels). There are earlier examples of this outsourcing, as the acquisition of a Polish firm in 2007, which, again according to the German firm acquiring it, represented over 3 000 employees and a production of over 60 000 tonnes per year<sup>28</sup>.

### *Certification*

Germany is the largest market referring to MSC certified products, with 5 700 labelled products in 2016<sup>29</sup>. The market consolidates in the 20<sup>th</sup> year of the label, with big retail players as Lidl having all its fish products MSC certified since January 2017. In addition to consolidation innovative labels are appearing, as most recently the fair trade label<sup>30</sup>.

The herring fishery in the Baltic lost its MSC certification in 2018<sup>31</sup> due to the bad state of the stock, which might affect some vertically integrated firms as well as small scale processing facilities in the Baltic coast. Larger processing enterprises would not be affected, as they source their herring from larger stocks e.g. those in the North Sea.

### *Outlook*

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<sup>26</sup> Fisch Daten und Fakten 2018.

<sup>27</sup> <https://www.frosta-ag.com/en/company/production-plants/> (Last retrieved 19.11.2019)

<sup>28</sup> <https://www.laschinger.de/unternehmen.html>

(Last retrieved 22.11.2019)

<sup>29</sup> <https://www.foodnavigator.com/Article/2016/02/24/Certified-sustainable-seafood-reaches-record-numbers>  
(Last retrieved 22.11.2019)

<sup>30</sup> <https://www.intrafish.com/marketplace/german-seafood-supplier-launches-msc-fair-trade-certified-tuna/1-1-1219157> (Last retrieved 22.11.2019)

<sup>31</sup> <https://www.fischmagazin.de/newsartikel-seriennummer-5145-Ostsee+Hering+verliert+voraussichtlich+MSCZertifizierung.htm> (Last retrieved 22.11.2019).

The situation of the fish processing industry is to remain stable in 2018 and 2019 according to preliminary data. However, there are some trade and biological issues that introduce uncertainty in its evolution: the development of the fish stocks in the Baltic Sea and the Brexit.

The future implementation of Brexit presents difficulties considering its indirect impact through the catching sector the UK, its role as provider of sea products (with a 2% of the value, just before Spain). A possible effect of the exit of the UK in the import contingent also increases the uncertainty for the German processing industry.

The bad situation of the herring stock in the Baltic Sea could lead to difficulties for fishers that have fish processing as a secondary activity, and maybe to small firms processing herring. This bad situation of the catch sector would not affect the large firms processing herring as they source their fish in other areas with larger herring stocks, mostly the North Sea.

#### *5.6.5 Data coverage and quality*

A pilot study has been conducted in cooperation with the European research project SECFISH. Through interviews with the enterprises the types of traceability data stored at the firms have been explored. As a result, a broad variety of data disaggregation levels and data storage means which make a standardised data collection difficult were identified. Some firms delivered data to different extents, but not enough to avoid confidentiality issues. In order to improve the data collection contacts with the industry are to be further developed.

As mentioned above, the economic data refers to a population of firms having twenty employees or more. This population is also the reference for the social variables, with the exception of nationality. Nationality refers to the broader population of all firms, including those below twenty employees. This broader population has been used because nationality data was available at this level in a census from the employment agency. Therefore the social variables of age and education are comparable with the economic variables, as they refer to the population of firms of twenty employees or more. The nationality variable gives information about the broader population of all firms. The gender variable is both available for the population of firms of twenty employees or more and for the broader population of all firms.

## 5.7 Greece

### 5.7.1 Overview

In Greece, the fish processing sector includes activities such as: freezing, processing (filleting, salting, drying, smoking, marinating, cooking, canning) and deshelling of shellfish, while processing units have been developed in proximity to large urban centres to ensure ease of access and distribution of products. For 2017, 169 enterprises demonstrated fish processing as main activity, showing an increase compared to the 159 enterprises of the year 2016 (a 6% increase).

In Greece, the sector is comprised mostly of very small companies, (76% for both years) and includes no large enterprises. The enterprises with less than 10 employees also showed a 7% increase in 2017 compared to 2016. This is a continuous increase for the last 6 years with only 2014 as exception. Additionally, while the small enterprises category remained generally the same, the number of enterprises with 50-249 employees almost doubled during 2016-2017, compared to the 2014-2015 years. The surveys of 2016-2017 showed that several companies in both categories demonstrated a considerable increase of fish processing activity while operating a significant secondary activity as well.

For 2016, the 159 enterprises employed 2 277 employees, 2 033 in FTE number while in 2017, the 169 enterprises employed 2 392 employees, 2 130 in FTE numbers, a 5% increase, (also 5% in FTE).

Table 5.7.1: Overview, Greece, 2008-2017

<b>Structure (number)</b>								
Total enterprises	152	147	144	133	145	159	169	6%
≤ 10 employees		107	111	100	112	121	129	7%
11-49 employees		34	27	29	29	31	32	3%
50-249 employees		6	6	4	4	7	8	14%
≥ 250 employees		0	0	0	0	0	0	0%
<b>Employment (number)</b>								
Total employees	2,505	2,330	2,183	1,964	2,062	2,277	2,392	5%
FTE	2,265	2,055	1,763	1,606	1,690	2,033	2,130	5%
<b>Indicators</b>								
Turnover (million €)	268	233	195	214	239	251	296	18%
FTE per enterprise	14.9	14.0	12.2	12.1	11.7	12.8	12.6	-1%
Average wage (thousand €)	13.2	10.9	12.8	13.2	15.8	13.2	15.9	21%
Unpaid work (%)	5.2	3.3	4.5	4.4	4.4	4.6	3.1	-33%
<b>Enterprises doing fish processing not as main activity</b>								
Number of enterprises		7	10	9	10	10	11	10%
Turnover attributed to fish processing (million €)		1.1	0.7	0.7	0.7	0.8	0.9	12%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

Turnover for 2016 was EUR 250.9 million for the 159 companies. In 2017, the 169 companies of the sector reported EUR 295.8 million as turnover, an 18% increase.

FTE per enterprise demonstrated a slight 1% decrease, from 12.8 in 2016 to 12.6 in 2017.



The average salary for the fish processing industry in Greece for 2016 was EUR 13.2 thousand, while for 2017 rose to EUR 15.9 thousand, a 21% increase, very close to the 2015 value. This can be attributed to the fact that in 2015-2016 a decrease in the minimum wage in Greece was administered along with a cut of several benefits. Also, several longstanding enterprises with high salaries suspended their activities and were replaced in the survey by new ones that benefited from the new employment law and new contract fees. In 2017, new enterprises entered the sector along with several remerging companies under new management with new recruits, higher wages but more eligible work contracts.

The percentage of unpaid work for the sector rose to 4.6% from the constant 4.4% for the 2014-2015 period, dropping to 3.1% for 2017, due to the reasons mentioned in the previous paragraph.

### 5.7.2 Economic performance

Table 5.7.2: Economic performance indicators, Greece, 2008-2017

Variable	2011	2012	2013	2014	2015	2016	2017	Δ (2016-17)
<b>Income (million €)</b>								
Turnover	268,3	232,9	195,2	214,3	238,8	251,0	295,9	18%
Other income	0,0	0,0	2,4	2,2	1,7	118,4	153,1	29%
Operating subsidies	0,6	0,8	2,0	1,9	0,4	0,0	0,0	
<b>Total Income</b>	<b>268,9</b>	<b>233,6</b>	<b>199,6</b>	<b>218,3</b>	<b>240,9</b>	<b>369,4</b>	<b>449,0</b>	<b>22%</b>
<b>Expenditure (million €)</b>								
Purchase of fish and other raw material for production	139,1	140,8	139,6	143,3	156,9	159,8	177,6	11%
Wages and salaries of staff	28,3	21,6	21,6	20,2	25,5	25,5	32,9	29%
Imputed value of unpaid labour	1,5	0,7	1,0	0,9	1,2	1,2	1,0	-15%
Energy costs	12,1	12,2	11,9	7,5	13,3	28,7	35,7	24%
Other operational costs	36,8	29,7	14,3	8,0	19,0	143,0	168,5	18%
<b>Total production costs</b>	<b>217,8</b>	<b>205,1</b>	<b>188,4</b>	<b>179,9</b>	<b>215,9</b>	<b>358,2</b>	<b>415,7</b>	<b>16%</b>
<b>Capital Costs (million €)</b>								
Depreciation of capital	14,1	6,6	6,7	11,2	5,9	7,3	8,1	12%
Financial costs, net	17,2	23,3	27,2	26,3	12,3	8,1	11,0	36%
<b>Capital Value (million €)</b>								
Total value of assets		510,6	435,5	397,7	315,7	233,4	323,9	39%
Net Investments	9,3	1,4	14,9	6,9	-0,6	0,7	2,8	324%
Subsidies on investments						0,4	0,1	-84%
Debt	199,1	294,0	409,3	419,1	254,4	206,0	280,1	36%
<b>Economic performance (million €)</b>								
Gross Value Added	80,3	50,1	31,8	57,7	51,2	37,9	67,2	77%
Operating Cash Flow	51,1	28,5	11,3	38,4	24,9	11,2	33,3	198%
Earning before interest and tax	37,0	21,9	4,5	27,3	19,0	3,9	25,1	546%
Net Profit	19,8	-1,3	-22,7	0,9	6,7	-4,2	14,1	432%
<b>Productivity and performance Indicators</b>								
Labour productivity (thousand €)	35,5	24,4	18,0	35,9	30,3	18,6	31,6	69%
Capital productivity (%)		9,8	7,3	14,5	16,2	16,2	20,8	
GVA margin (%)	29,9	21,5	16,1	26,7	21,3	10,3	15,0	
EBIT margin (%)	13,8	9,4	2,3	12,5	7,9	1,1	5,6	
Net profit margin (%)	7,4	-0,6	-11,3	0,4	2,8	-1,1	3,1	
Return on Investment (%)		4,3	1,0	6,9	6,0	1,7	7,8	
Financial position (%)		42,4	6,0	-5,4	19,4	11,8	13,5	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

The fish processing industry in Greece demonstrated an 18% increase of turnover in 2017, EUR 295.9 million from EUR 251 million in 2016. Other income too increased 29% in 2017 compared to 2016. A result of a change in the structure of the sector, which is explained in the previous section, that led to new or recurring companies joining in with multiple activities and many amplified their secondary activity, with a significant rise of the reporting other income value compared to the years before 2016.

Purchase of fish value increased 11% in 2017 demonstrating the highest value in the 7 years of data report. Other production costs increased significantly too, like wages (29%), energy cost (24%) and other operational costs (18%) resulting in a 16% increase of total production costs in 2017.

Capital costs demonstrated an increase as well, with 12% increase rate of depreciation of capital and 36% increase rate of financial costs. This is a result of a 36% increase of debt in the sector due to increase of loans and of loan costs. The new and recurring companies in the fish processing sector for 2017 brought a 39% increase in total value of assets and a high value of net investments (EUR 2.8 million in 2017 compared to EUR 0.7 million in 2016). The new investments did not come from subsidies only, since subsidies on investments had an 84% reduction in 2017.

All economic performance values demonstrated an increase in 2017 compared to 2016 and while in 2016 recorded losses, (net profit value was EUR -4.2 million), 2017 demonstrated net profit of EUR 14.1 million.

Labour productivity in 2017 also had a significant increase compared to 2016, returning to previous years' levels.

### *5.7.3 Socio-demographic structure*

For Greece, social data was added in the data collection survey of the fish processing sector and the census method was applied for both 2016 and 2017 years and all four parameters (age distribution, nationality, education and employment) were collected.

For 2016, the male employees were 1296 and the female 981. In 2017, the respective numbers were 1353 and 1039 demonstrating a 4.4% raise in the male employees' number and 5.9% raise in the female category.

For 2017, most of the fish processing industry employees were male with a percentage of 59% followed by 41% female employees.

The sector's age classification categories were 15-24 with 15%, 25-39 with 44% and 40-64 with a 41% percentage

Regarding the education levels of the sector's employees, medium level (high school) is the major category with a percentage of 65%, followed by high (university) with 27%, and low (primary school) with 7%. The 50-249 segment has the higher percentage of high education (30%).

Regarding the nationality, 72% of the employees are Greek citizens, 17% are from EEA and 8% from other countries.

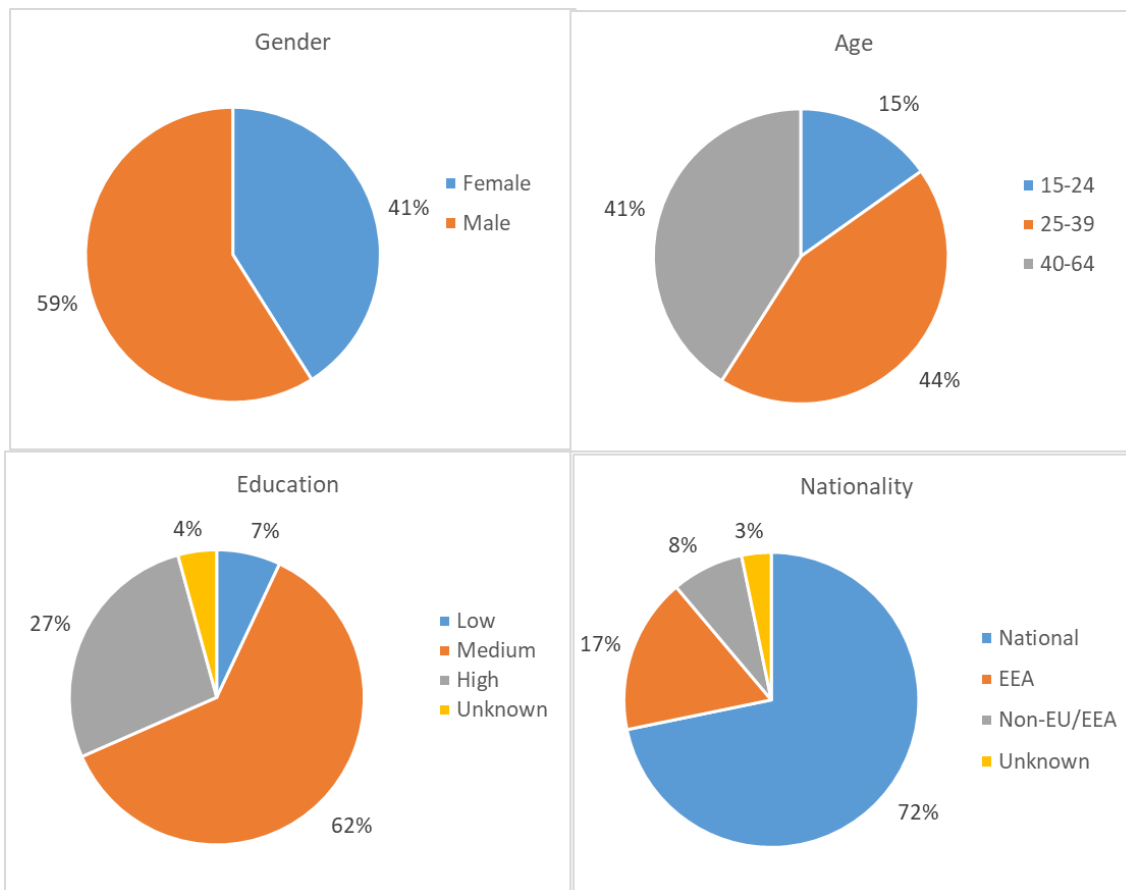


Figure 5.7.1: Socio-demographic characteristics, Greece, 2017

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

#### 5.7.4 Breakdown by company size

The economic performance by size report shows that the less than 10 segment performed best in 2017 compared to previous years. Companies that belong to the segment of <10 employees, total income has more than doubled (125%) in 2017 compared to 2016. Since production costs only increased by 16%, all variables EUR significantly improved compared to the negative values in 2016, resulting to a profit of 39.6 million while 2016 demonstrated losses of EUR -15.6 million.

The 11-49 category with a 3% total income increase but a 13% production cost increase, also demonstrated profits but with a 48% drop. The 50-249 segment continued reporting losses in 2017 as it did in 2016 with a small raise of total income (5%) and an 18% increase in total production costs. All the productivity and performance indicators in this segment have negative values, a fact that demonstrates the 50-249 category underperformance.

Table 5.7.3: Economic performance by size, 2008-2017

Variable	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>less than or equal to 10 employees</b>							
Total Income	28.3	33.7	20.5	39.3	52.8	119.1	125%
Total production costs	36.1	32.2	33.3	37.9	66.8	77.8	16%
Gross Value Added	-3.6	6.6	-9.9	7.3	-6.5	50.8	887%
Operating Cash Flow	-7.8	1.5	-12.8	1.4	-14.0	41.3	395%
Earning before interest and tax	-9.5	-2.5	-19.5	0.7	-14.9	40.5	371%
Net Profit	-14.8	-20.9	-33.9	-0.1	-15.6	39.6	353%
<b>between 11 and 49 employees</b>							
Total Income	98.3	62.4	82.1	94.6	142.7	147.4	3%
Total production costs	96.4	85.3	69.7	91.5	115.0	130.4	13%
Gross Value Added	10.5	-14.9	19.6	12.4	35.3	27.0	-24%
Operating Cash Flow	1.9	-22.9	12.5	3.1	27.7	17.0	-39%
Earning before interest and tax	0.2	-23.7	11.6	0.5	26.3	15.1	-43%
Net Profit	-2.7	-24.2	7.3	-2.9	25.3	13.1	-48%
<b>between 50 and 249 employees</b>							
Total Income	107.0	103.5	115.7	107.0	173.9	182.5	5%
Total production costs	72.6	70.8	76.9	86.5	176.4	207.5	18%
Gross Value Added	43.2	40.1	48.0	31.6	9.0	-10.6	-217%
Operating Cash Flow	34.4	32.7	38.8	20.4	-2.5	-25.0	-891%
Earning before interest and tax	31.3	30.7	35.2	17.8	-7.4	-30.4	-309%
Net Profit	16.2	22.5	27.5	9.7	-13.9	-38.6	-178%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.7.5 Trends, drivers and outlook

#### Trends and drivers

Most of the products of the fish processing sector are placed mainly on the Greek market, while a small percentage is recorded as exports to EU countries, mainly in the freezing activity sector. The small comparative export rate is due to the strong competition of products from third countries (Ecuador, Morocco, etc.) due to the particularly low price of frozen products from these countries.

In terms of percentage share based on total sales of products by sector, for 2017, the largest share in the Greek market is owned by the companies in the freezing sector (79.02%), the companies in the processing sector (20.11%), and a very small percentage (0.87%) held by the deshelling (mainly mussel).

This trend holds for the 2011-2017 period of Greek fish processing industry data collection since the corresponding average percentages are 76% freezing, 23.1% processing and 0.9% deshelling.

Regarding the raw material data, for 2016, the purchased raw material for fish processing industry in Greece 61.8 tonnes derived from domestic sources, (17.6 thousand tonnes, 28.5%), EU countries, (12.2 thousand tonnes, 19.8%) and non-EU countries (31.9 thousand tonnes, 51.6%). The corresponding values for 2017 were 63.4 thousand tonnes: domestic sources, (19.6 thousand tonnes, 31%), EU countries, (12.4 thousand tonnes, 20%) and non-EU countries (31.1 thousand tonnes, 49%).

The main species processed by the industry for 2017 were: squid, (6.1 thousand tonnes), sardine (3.8 thousand tonnes), octopus (3.7 thousand tonnes), anchovy (3.7 thousand tonnes), shrimp (3.1 thousand tonnes), cod (2.2 thousand tonnes), sea bream (2.1 thousand tonnes), salmon (2 thousand tonnes), mussel (1.1 thousand tonnes) with approximately 40 species complementing the rest of processed raw material.

The distribution of the raw material among the fish processing activities for the two-year period are as follows: For 2016, 46.7 thousand tonnes were used by freezing, (valued 129.2 million), 13.6 thousand tonnes by processing, (28.2 million) and the rest 1.5 thousand tonnes for deshelling (1.24 million). For 2017, 49.1 thousand tonnes were used by freezing, (valued 147.15 million), 12.6 thousand tonnes by processing (29.36 million) and 1.3 thousand tonnes by deshelling (1.12 million).

As for the final product production structure, in Greece, the fish processing industry for the years 2016-17 produced approximately in yearly values, 42.5 thousand tonnes of frozen products (75%), valued 197.1 million, 13.7 thousand tonnes fishery products processed (24%), valued 74.2 million and deshelling of mussels produced 0.6 thousand tonnes (1%) valued 3.4 million. The fishery products processed, segmented, are: canned, (35%, 4.8 thousand tonnes, valued approximately 16.8 million), filleted (26%, 3.6 thousand tonnes, 23.7 million), smoked (22%, 3 thousand tonnes, 20.1 million), salted (10%, 1.4 thousand tonnes, 8.2 million), marinated/cooked ready to eat (5% 0.7 thousand tonnes 3.7 million) and finally fish packaging (2%, 0.2 thousand tonnes valued 1.6 million)

## Outlook

The overall improvement of the productivity and performance indicators for 2017 of the fish processing industry in Greece, especially in the <10 employees segment, does not guarantee the sector's upturn continuation. Worrying signs of insurmountable financial obstacles in the fisheries product freezing sector, that appeared in previous years, unfortunately begun to materialize as the increase of production costs and debt values show. An already existing recession in the frozen sector accelerated in 2015, which, due to increases in VAT, combined with overall economic uncertainty, pushed sales further downwards. The transfer of many food categories in the summer of 2015 from the low VAT rate of 13% to 23% and later its increase to 24% caused a decline in demand for many foods. Frozen food sales in 2016 fell by 6.9% in value. Since in Greece, the sector of frozen fish is comprised mostly by medium-sized enterprises, the impact was noticed during 2016-2017 data collection, where a few medium sized companies with historically significant product volumes and sales of frozen fisheries products demonstrated a decline of revenues and a rise of loans and loan costs. During 2018 and 2019 the situation did not improve and therefore a significant enterprise of freezing activity in the vicinity of 40 million euros sales is expected to either go bankrupt or be put under special administration by banks in 2019-20, with a similar one following closely.

The high lending for new production investments purposes, just before the crisis erupted, and a decrease in domestic consumption of frozen fish when the recession hit Greek households, coupled with competition from imported products, created additional financial troubles for the affected enterprises in the fish processing sector.

It must be pointed out that in Greece, fish processing companies with financially important secondary activity, especially fresh fish sales, withstood the financial crisis' impact using the sales income to support the process activity.

The impact of the economic crisis in Greece is reflected in reduced cash flow due to the very limited access of companies to new bank lending and the increase in lending rates by financial institutions. The lack of available cash flow leads to low profit raw material purchase agreements due to the lack of down payments and a reduced possibility of new investments. The increase in production costs due to price increases of the raw material and higher energy costs lead to a reduction of financial profits and a reduced company ability, therefore, to successfully claim new loans.

According to most company owners, in order to address the fish processing industry problems, a new approach of them is needed that can be comprised of increasing competitiveness through the reconstruction of the production process and productivity increase, focusing on innovative technology, elaboration of new business plans and production of new culinary products of high added value, in order to access new markets, and diversification of the products produced in order to cover all evolving consumer standards. Also, improvement of the production process is needed in order to provide the highest possible value by limiting losses and discards along with introduction and application of new technologies for the production and maintenance of food with the primary objective of increasing the quality of the products produced (Omega-3 fats, pre-cooked foods of high quality, etc.)

#### *5.7.6 Data coverage and quality*

The 2016-2017 data collection for fish processing sector was implemented by the Hellenic Agricultural Organisation-Demeter (HAO Demeter) of the Greek Ministry of Rural Development and Food. The majority of the socio-economic data of the SA and Ltd companies operating under the International Financial Reporting Standards (IFRS), was derived from the published annual balance sheets and the yearly financial statements of the companies, while the additional required information regarding social data and detailed production cost structure, was provided by questionnaires completed by the companies and the replies were combined with onsite visits and interviews. For the small enterprises the data collection was achieved mainly from the completed questionnaires and the onsite visits and interviews.

The collected data were supplemented and cross checked by data from Prefectural Chambers of Commerce, Industry and Trade, Prefectural Directorates of Fisheries and Veterinary Services, as well as the National Food Control Agency (EFET), Hellenic Ministry of Rural Development and Food business and professional online data bases.

The methodology for the data collection of the fish processing sector was census with high achieved sample rate, so estimation was limited to only a few variables, mainly for the production cost structure of the very small companies and unpaid labour.

For social data, all companies provided data under gender segmentation. For 2017, 54 companies provided the extra segmentation regarding age, education and nationality but the information given is not linked in segments, the data is given as total per segment i.e., 30 females, 20 with high education etc. and the provided data corresponds to 47.55% of the total sector employees (1013 out of 2130). Reporting social variables at personal, more disaggregated level could not be achieved due to company refusal.

## 5.8 Ireland

### 5.8.1 Overview

There was a total of 158 fish processing enterprises in Ireland in 2017 down 2% from 2015 (161) and continuing an overall 9-year declining trend being down 8.2% from 2008. Turnover in 2017, EUR 679 million, was down 1% from 2016 (EUR 685 million) and up by 1.2% from 2008, following a gradual 9-year increasing trend.

In 2017, there were approximately 3138 FTEs employed in the fish processing industry which was made up of 2 113 Male FTEs and 1 025 Female FTEs. This is an overall 5.9% increase on 2015 Male employees continue to represent around 67.3% of the total employees a relatively constant trend. Investment in the seafood industry has led to an increase in the numbers employed through the provision of grant aid in specific schemes and programmes influencing the number of FTE.

The industry comprised of whitefish, pelagic, shellfish, smoked and whitefish operators. Whitefish, shellfish and salmon (smoked) processors accounted for the largest number companies in Ireland, while the 25 largest processors specialising in whitefish and pelagic dominate output by weight and value. At least 95 companies in Ireland specialised in more than one species in 2017.

The processing sources its raw material from domestic and foreign landings into Irish ports, aquaculture production and imports. In 2017, there were 224 thousand tonnes of seafood landed by the offshore domestic fleet into Irish ports with an estimated value of EUR 270 million. The primary landing ports in 2017 were Killybegs, Castletownbere, Dingle, Dunmore East, Ros a Mhil, Kilmore Quay, Howth, Greencastle, Union Hall, and Clogherhead. The top fisheries species landed in 2017 in order of value were Atlantic mackerel, Norway lobster, Brown crab, Horse mackerel, monkfish, megrim, hake, blue whiting, tuna and Whiting.

Aquaculture production in 2017 was 45.7 thousand tonnes with an overall value of EUR 200 million. The primary species-cultures, in order of output value are; caged salmon (All organically certified), farmed oysters, rope and bottom cultured mussels. The majority of aquaculture is carried out along the western seaboard.

Table 5.8.1: Overview, Ireland, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>											
Total enterprises	172	169	169	168	164	165	162	161	164	157	-4%
≤10 employees	93	98	96	97	87	86	84	92	88	86	-2%
11-49 employees	58	60	60	57	58	57	55	47	49	45	-8%
50-249 employees	21	11	13	14	19	22	23	22	27	26	-4%
≥250 employees	0	0	0	0	0	0	0	0	0	0	0%
<b>Employment (number)</b>											
Total employees	2,867	3,020	3,064	3,200	3,342	3,534	3,688	3,797	3,949	4,076	3%
FTE	2,596	2,633	2,677	2,761	2,678	2,789	2,874	2,963	3,029	3,138	4%
<b>Indicators</b>											
Turnover (million €)	571	538	545	559	656	613	655	686	630	679	8%
FTE per enterprise	15.1	15.6	15.8	16.4	16.3	16.9	17.7	18.4	18.5	20.0	8%
Average wage (thousand €)	32.2	30.5	27.5	29.5	28.2	32.6	32.5	33.2	26.3	31.2	18%
Unpaid work (%)	5.8	6.0	5.2	4.7	4.9	3.4	3.4	3.4	4.1	3.2	-21%
<b>Enterprises doing fish processing not as main activity</b>											
Number of enterprises		16	25	22	29	20	20	22	16	16	0%
Turnover attributed to fish processing (million €)		53	28	11	22	50	53	81	48	35	-27%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

The number of businesses declined overall from 2016 (164) to 2017 (157). The decline occurring in the <10 and 10-49 employment categories, while the 50-249 category has remained relatively constant, reducing by one from 2016. Total Employment and FTE meanwhile has increased over the two years to 4076 and 3138 persons from 3949 and 3029 in 2016 and is part of a 9-year trend of gradual business consolidation and employment increase.

Average wages and salaries have remained relatively consistent since 2008 (EUR 32 200). A dip was estimated in 2016 (EUR 25 240) and a recovery to EUR 30 164 in 2017, 6.8% less than that of 2008. The ratio of total employment to FTE has remained consistent from 2015 to 2017; 78%, 76.7% and 76.9%, respectively. Labour productivity, estimated at EUR 47 237 in 2017 is comparable with a relatively stable trend from 2010, though 2016 indicated a drop to EUR 26 033, down 36.1% from 2015 estimates. The proportion of unpaid work declined steeply to 2017 (-27%) and is part of a continuous decline from 2012. However, data on unpaid labour is sparse and the trends may be an artifact of the sample size and estimation process. The number of non-main activity processing enterprises remained constant, though turnover for this group declined by 27% in 2017

### 5.8.2 Economic performance

Table 5.8.2: Economic performance indicators, Ireland, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ (2016-17)
<b>Income (million €)</b>											
Turnover	571.5	537.9	544.8	558.7	656.5	613.3	655.3	685.8	630.0	679.0	8%
Other income	4.0	1.3	0.9	2.8	7.8	37.5	118.3	71.2	2.4	9.1	275%
Operating subsidies	5.9	4.7	3.8	3.5	3.3	1.7	3.8	3.7	0.4	0.3	-26%
<b>Total Income</b>	<b>581.4</b>	<b>543.9</b>	<b>549.5</b>	<b>564.9</b>	<b>667.6</b>	<b>652.6</b>	<b>777.5</b>	<b>760.8</b>	<b>632.8</b>	<b>688.4</b>	<b>9%</b>
<b>Expenditure (million €)</b>											
Purchase of fish and other raw material for production	282.5	270.3	355.2	388.5	463.0	418.7	524.0	524.4	479.7	527.6	10%
Wages and salaries of staff	78.8	75.4	69.8	77.7	71.9	87.7	90.3	95.2	76.5	94.7	24%
Imputed value of unpaid labour	4.9	4.8	3.9	3.8	3.7	3.0	3.2	3.3	3.3	3.2	-3%
Energy costs	13.1	12.6	15.1	8.8	10.5	8.2	12.5	11.4	10.1	12.0	19%
Other operational costs	9.6	9.2	73.4	69.5	80.0	92.7	114.7	100.7	63.8	0.3	-100%
<b>Total production costs</b>	<b>388.9</b>	<b>372.2</b>	<b>517.3</b>	<b>548.2</b>	<b>629.1</b>	<b>610.4</b>	<b>744.8</b>	<b>735.0</b>	<b>633.3</b>	<b>637.7</b>	<b>1%</b>
<b>Capital Costs (million €)</b>											
Depreciation of capital	15.4	17.8	20.2	14.3	15.9	10.9	13.3	15.6	12.3	25.7	109%
Financial costs, net	3.3	3.2	3.9	3.3	3.6	2.4	3.2	2.9	2.5	12.4	394%
<b>Capital Value (million €)</b>											
Total value of assets	270.5	258.8	233.0	177.2	199.6	179.0	298.1	403.0	327.5	554.3	69%
Net Investments	8.6	8.3	19.6	17.6	19.4	11.1	18.4	40.5	12.0	19.5	63%
Subsidies on investments									2.0	2.0	1%
Debt	206.0	197.1	98.9	75.7	75.6	40.9	85.3	70.8	103.6	105.1	1%
<b>Economic performance (million €)</b>											
Gross Value Added	270.3	247.2	102.0	94.7	110.8	131.2	122.4	120.6	78.9	148.2	88%
Operating Cash Flow	192.5	171.7	32.2	16.7	38.4	42.2	32.7	25.8	-0.5	50.7	10194%
Earning before interest and tax	177.1	153.9	12.0	2.4	22.6	31.3	19.3	10.2	-12.8	25.0	295%
Net Profit	173.8	150.8	8.1	-0.9	18.9	28.9	16.2	7.4	-15.3	12.6	182%
<b>Productivity and performance Indicators</b>											
Labour productivity (thousand €)	104.1	93.9	38.1	34.3	41.4	47.1	42.6	40.7	26.0	47.2	81%
Capital productivity (%)	99.9	95.5	43.8	53.5	55.5	73.3	41.1	29.9	24.1	26.7	
GVA margin (%)	47.0	45.8	18.7	16.9	16.7	20.2	15.8	15.9	12.5	21.5	
EBIT margin (%)	30.5	28.3	2.2	0.4	3.4	4.8	2.5	1.3	-2.0	3.6	
Net profit margin (%)	29.9	27.7	1.5	-0.2	2.8	4.4	2.1	1.0	-2.4	1.8	
Return on Investment (%)	65.5	59.5	5.1	1.4	11.3	17.5	6.5	2.5	-3.9	4.5	
Financial position (%)	23.9	23.9	57.6	57.3	62.1	77.2	71.4	82.4	68.4	81.0	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.



The amount of total income generated by the Irish fish processing industry in 2017 was EUR 688.4 million, up 9% from EUR 632 million in 2016. Turnover makes up 98.6% of total income. Total income has continued its decreasing trend from 2014, down a total of 11.5% since then. Turnover recorded its first decline in 2016; under EUR 630 million or 8.1% down from 2015. Turnover recovered in 2017 but is still down 1% from 2015 value of EUR 679 million.

The cost structure continues to be dominated by raw material costs, which experienced a 10% increase from 2016 and represents 82.7% of the total production costs. Raw material costs were 76.6% of the total income in 2017. Labour costs, the next largest component, made up 14.9% of total costs in 2017. Other operational costs were estimated as 9.7% of total in 2016, a drop of 3.3% on 2015, but drops significantly in 2017 indicating a possible data quality issue.

Gross Value Added (GVA) in 2017 is up 18.7% from 2015. GVA was very low in 2016 indicating that data estimations are problematic for this year. Operating Cash Flow in 2017 is up by 96.5% on 2015 and had followed a previous drop by over 100% in 2016, indicating again a data quality issue for 2016. Earnings before Interest in 2017 was estimated at EUR 24.97 million, an increase from EUR 10.2 million in 2015. Again, estimates for 2016 indicated a severe drop in value. Net profit in 2017 was estimated as EUR 21.8 million, an increase from EUR 7.4 million in 2015. Again, a catastrophic value drop is estimated for 2016. Labour productivity is up by 22.2% on 2015 and 2016 aside, is part of a trend increase from 2011.

Total net investment decreased by 107% on 2015, though is above average (EUR 16 million) for the period from 2008.

### *5.8.3 Socio-demographic structure*

The collection of social variables for the Irish processing sector started in 2019, collecting data for 2017. Data was requested via an annual random sample economic survey. As the Irish survey is currently voluntary for clients, the quality of the results is dependent on client goodwill and level of response rate. Survey returns for the newly launched survey for 2017 data were low. As a result, the data presented below, for each of the social indicators, has been estimated with the use of known proportionalities of each business to the sectoral whole for such variables as turnover, FTE and total employment. Applying the survey proportionalities across all variables and the entire sector may be problematic and without a complete census of these variables cautions must be taken when interpreting these data.

The majority of employees involved in the processing sector in Ireland in 2017 were male (65%) followed by 35% female. The gender balance for each size category of enterprises is similar ranging from 29-45% for female workers. The age group aggregations used during the data collection were 15-24, 25-39, 40-64 and  $\geq 65$ , 50% of the of the total employed (2,059) were in the age group 40-64, followed by 32% (1,303) representing people between 25-39 years, 12% (505) for the age group below 24 years and 3% employees were below over 65 years and another 3% unknown. The percentage distribution by age differs by size categories (Figure 5.8.2). Most notably there are no 15-24 presented in the <10 segment although this also has a high number of unknown age categories which could be made up of this age group. However, the smaller enterprises to have the highest proportion of the >65 year age category.

There wasn't sufficient data reported for education level to be able to report raised national totals for this variable. Overall the majority (79%) of workers are Irish with 18% being from the EU and remainder 3% being Non-EU/EEA workers. There is variation in the nationality proportions by segment with the smaller enterprises having no workers (based on survey data) from non-EU/EEA and a higher percentage of EU workers at 41% compared to 10% and 18% for the 11-49 and 50-249 segments, respectively.

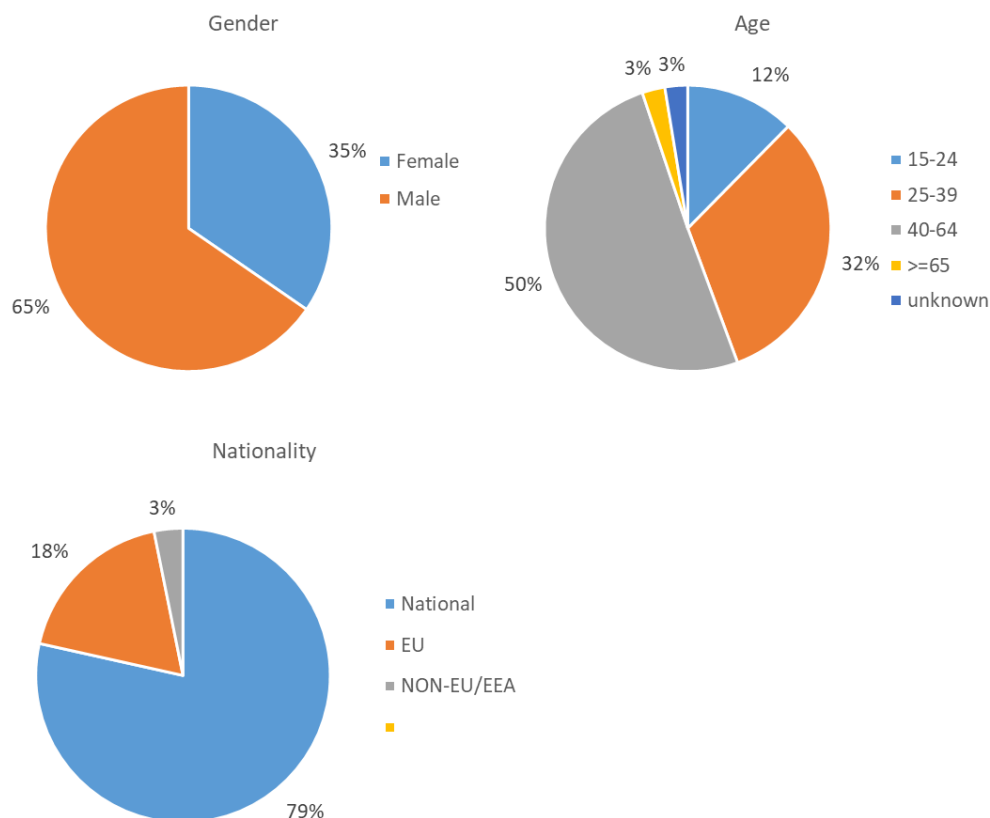


Figure 5.8.1: Socio-demographic characteristics, Ireland, 2017

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

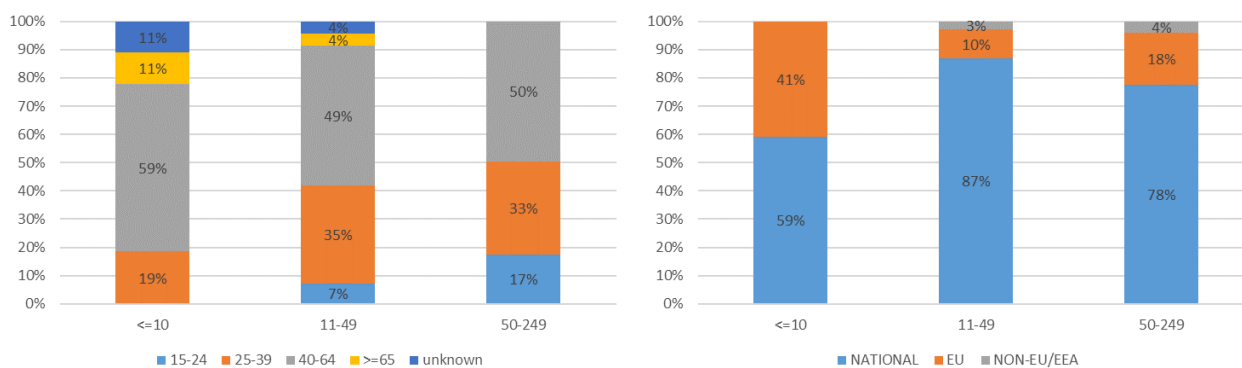


Figure 5.8.2: Socio-demographic characteristics, Ireland, 2017 by segment.

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

#### 5.8.4 Breakdown by company size

There were 157 main processing enterprises operating in 2017, divided into categories <10, 10-49 and 50-249 employed. Enterprise number is down 7 from 2016 and down 4 from 2015, part of an overall consolidation since 2008 (172 enterprises). This consolidation continued into 2017 for the two smaller categories while the 50-249 employed category showed a modest expansion to 26 enterprises from 22 in 2015. Turnover dipped in 2016 and showed some recovery in the 10-49

and 50-249 categories (by 7% and 11% respectively) in 2017, while remaining below 2015 level overall.

The increasing employment trend since 2008 continued in 2016 and 2017; 4076 up 3% and specifically within the 10-49 and 50-249 categories (6% and 3% respectively on 2016 while declining by 2% for the <10 category enterprises. The trends are more pronounced for the category FTEs. The imputed value and number of unpaid labour is down 4%, specifically within the 10-49 category (8%). Number of hours worked is up 3%, particularly within the 10-49 category (8%).

Overall increase in personnel costs by 23.8% between 2016 and 2017 occurred particularly in the 50-249 category which increased by 77.4%, while the overall increase in raw materials; 10% was evenly spread across all categories. Energy and other operational cost trend estimates appear erratic and of uncertain accuracy for 2016 and 2017. Assets to debt ratios across all categories remains strongly asset positive. Net gross investment showed the strongest increase in the <10 category.

Table 5.8.3: Economic performance by size, Ireland, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ (2016-17)
<b>less than or equal to 10 employees</b>											
Total Income	44.7	41.8	43.8	43.2	35.8	29.3	31.9	34.1	79.7	78.5	-2%
Total production costs	32.1	31.0	38.6	47.0	41.2	33.6	48.1	46.8	85.7	86.0	0%
Gross Value Added	20.8	19.0	12.9	12.4	7.0	7.8	-2.1	2.5	12.1	5.7	-53%
Operating Cash Flow	12.5	10.8	5.2	-3.9	-5.4	-4.3	-16.2	-12.7	-6.0	-7.5	-25%
Earning before interest and tax	11.3	9.4	-1.3	-6.3	-7.3	-5.6	-16.8	-13.2	-9.6	-10.4	-9%
Net Profit	11.1	9.2	-2.4	-6.8	-7.6	-5.9	-17.2	-13.9	-9.8	-11.9	-22%
<b>between 11 and 49 employees</b>											
Total Income	323.8	303.0	304.4	315.2	367.5	320.1	336.2	281.4	194.3	209.5	8%
Total production costs	215.5	206.4	299.3	308.1	348.2	310.9	380.9	266.7	195.0	172.6	-11%
Gross Value Added	150.6	137.7	46.6	45.2	53.3	47.6	-13.4	47.8	29.7	66.2	123%
Operating Cash Flow	108.3	96.6	5.1	7.2	19.3	9.2	-44.7	14.7	-0.7	36.9	5596%
Earning before interest and tax	99.7	86.7	-2.2	-1.7	9.5	3.8	-52.5	6.3	-3.8	29.1	862%
Net Profit	97.9	85.0	-3.4	-3.6	8.0	3.1	-54.3	5.3	-4.2	25.5	705%
<b>between 50 and 249 employees</b>											
Total Income	212.9	199.2	201.3	206.6	264.3	303.3	409.4	445.3	358.7	400.3	12%
Total production costs	141.2	134.9	179.4	193.2	239.7	266.0	315.7	421.5	352.6	379.1	8%
Gross Value Added	99.0	90.5	42.5	37.2	50.5	75.9	137.9	70.3	37.0	76.4	106%
Operating Cash Flow	71.7	64.3	21.9	13.4	24.5	37.3	93.6	23.8	6.2	21.3	246%
Earning before interest and tax	66.0	57.8	15.4	10.4	20.4	33.1	88.7	17.1	0.6	6.3	942%
Net Profit	64.8	56.7	14.0	9.5	18.5	31.7	87.7	16.0	-1.4	-1.0	29%
<b>greater than or equal to 250 employees</b>											
Total Income	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total production costs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Gross Value Added	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Operating Cash Flow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Earning before interest and tax	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Net Profit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.8.5 Trends, drivers and outlook

#### *Trends, drivers and outlook*

According to Ireland's Ocean Economy Report 2019 the seafood processing industry experienced a difficult year in 2018 with estimates of turnover for the sector decreasing by 6.5% from 2016 to 2018 to a value of EUR 563 million. Estimated GVA also decreased by 6.5%, giving a total GVA value of EUR 161 million in 2018. The economic downturn in the industry is partially associated with rising raw material costs which affected many small seafood processing enterprises in 2018, leading to a 3% decline in the number of enterprises in the sector. The fall in production from the Irish aquaculture industry in 2018 also has had a knock-on effect on the seafood processing industry.

Developing greater processing scale to capitalise on the increased supply of output from aquaculture and landings into Ireland from other countries, is considered a key driver for growth in the industry. Water pollution, waste management, and carbon dioxide emissions associated with intensive energy and fuel use for the transportation of products, are the major environmental challenges faced by the seafood processing sector. In light of the environmental sustainability concerns for the seafood sector, Bord Iascaigh Mhara (BIM), Ireland's Seafood Development Agency, launched a certification standard (Responsibly Sourced Seafood standard) in March 2017, which compliments Bord Bia's Origin Green sustainability initiative.

#### *Brexit*

More than 30% of Irish fishing quotas are caught in Irish waters and the UK is one of Ireland's main export (12%) destinations valued at EUR 81 million. Conversely Ireland's imports an estimated EUR 219m of seafood for direct retail and raw material, particularly salmon and whitefish. Specifically, prepared seafood exports to the UK (excl. filleted) consist mainly of Flours, Meals and Pellets (33%), Salmon (7%) and Dublin Bay Prawn (6%). Brexit will have many implications and challenges for the Irish seafood sector including currency volatility, tougher UK trade and more competition from UK processors. There may also be implications for supply chain management and tariffs.

Post Brexit there is the potential for tariffs on imports and exports. Higher estimates of tariffs could be based on third country rates for the European Union and would be as follows: Crab, 8%, Nephrops 12%, Whitefish, (Monkfish fresh, 15%; Haddock fresh, 8%; Cod fresh, 12%) Pelagic (Tuna prepared 24%; Herring prepared 20%; Mackerel prepared 25%; Horse mackerel frozen, 15%) and Fish oils 11%.

Additional time delays/costs are one of the most significant potential impacts, with wide reaching effects. Depending on the outcomes of Brexit negotiations, there may be an increased number of customs, border controls and product checks. This would have a range of potential time delays and increased costs for products being shipped to, through or imported from the UK. Additional time required to process paperwork, customs for Irish seafood being transported into or through the UK customs would increase "time to market". This will impact Irish companies costs, product quality and customer base. Short shelf-life products such as fresh live Irish mussels may be exposed to significant delays, which may result in the shipment of these and similar products becoming economically unviable.

### 5.8.6 Data coverage and quality

Data collection over the DCF period to 2016 is impacted by inconsistencies in methodology. Collection has been done indirectly and directly for different variables and indirectly via the datasets of other agencies such as the Central Statistics Office, using the codification of the Sea Fisheries Protection Authority, resulting in frame population disparities. In addition, the response rate for the under 10 employed segment the largest by number of businesses, has been low for surveys. The estimated data for this segment and its associated figures therefore may be

under/over representative of the industry and caution should be taken with interpretation of the data for this segment for all years.

The collection and collation of data for 2016-2017 relied on the use of voluntary questionnaires augmented with data from audited accounts from the Companies Registration Office (CRO). Survey target rates vary between employment categories with a high achievement of sampling targets for certain variables and an under achievement of targets for others. The achieved sample rates for 2016 and 2017 were very low. This effected the estimations of the total variables and care must be taken when interpreting these.

As mentioned previously, the sample data collected from the industry are raised to total population level. As such, there is variation associated with estimated variables from sample data and this may have introduced sample bias and affected the final raised data sets.

## 5.9 Italy

### 5.9.1 Overview

The sector in the last 3 years shows an increase in total turnover, that is equal (2017) to more than EUR 2.6 billion directly produced by 433 companies (NACE Code 10.20) which carry out the processing of fish as the main activity. The decrease of turnover since 2016 is not a real decrease but is due to the extrapolation of turnover attributable exclusively to the processing of fish products (the rest put in "other income" as suggested by PGECON). Indeed, the total turnover is increasing in the last two years. Furthermore, a contraction of the number of enterprises since 2016 is observable (in particular those belonging to the first size class) but, again, this is not a real re-sizing of the sector (due to contingent reasons) but a review of the methodology (applied under the EUMAP programme) for the definition of the actual population of enterprises carrying out fish processing as main activity (see data issues section for details). However, a real decrease on the total number of enterprises is observable in 2017 compared to 2016.

The number of employed persons is over 5.9 thousand, an increase of +1% compared to the previous year, but by 10% in the last 10 years. Indirect indicator of the evolution of companies by size of employees, unpaid work: the value is gradually decreasing over time: 5.4% in 2017 decreased by -24% compared to the previous year. If the number of employee's changes, a defined and regulated occupational structure is increasingly frequent, collective labour contracts are used and there is a greater possibility of monitoring social variables as well. The percentage of unpaid labour is physiological for companies that are industrial, in terms of capital intensive, but referring to production, they are much more similar to artisanal/family businesses, where human input is necessary and unavoidable and is often not "converted" into direct wage and salary, but is transfused into the "added value" of the offer processed.

Table 5.9.1: Overview, Italy, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>											
Total enterprises	376	414	547	530	537	587	574	577	445	433	-3%
≤10 employees	192	221	347	375	372	444	430	447	321	295	-8%
11-49 employees	152	166	175	136	144	127	126	112	106	117	10%
50-249 employees	31	27	24	18	21	16	18	18	18	21	17%
≥250 employees	1	0	1	1	0	0	0	0	0	0	0%
<b>Employment (number)</b>											
Total employees	5,425	5,285	5,950	6,109	6,197	6,292	5,628	5,926	5,905	5,968	1%
FTE	4,573	4,454	5,015	5,148	5,223	5,426	4,422	4,778	4,572	4,568	0%
<b>Indicators</b>											
Turnover (million €)	2,906	2,201	2,623	2,281	2,557	2,287	2,235	2,243	2,196	2,109	-4%
FTE per enterprise	12.2	10.8	9.2	9.7	9.7	9.2	7.7	8.3	10.3	10.6	3%
Average wage (thousand €)	50.9	46.2	47.4	39.8	42.7	40.3	47.0	43.1	50.0	49.8	0%
Unpaid work (%)	3.8	3.8	7.9	3.8	4.4	8.0	8.1	8.2	7.4	5.4	-27%
<b>Enterprises doing fish processing not as main activity</b>											
Number of enterprises	162	177	233	227	231	185	205	208	208	214	3%
Turnover attributed to fish processing (million €)	253	191	228	198	222	384	502	551	552	583	6%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

The evolution of the number of companies by employee size could be generated by the following main reasons: a) small processing companies do not have economies of scale such as to make the offer competitive on the global market; b) companies with more employees can guarantee

internal control of increasingly important aspects, first of all the qualification of raw materials, the standardization of quality; c) medium-large companies (up to 249 employees) have opportunities both to anticipate new fish-processed and "made in Italy" food models, and to reach agreements with other foreign countries to outsource part of their processing or have commercial agreements for the supply of raw materials, traced from the sea to the table.

The Italian agri-food production structure is characterized by many companies processing fish, but not as a main activity (that is, which significantly affects annual turnover). For these non-main companies, Italy provides a good estimate of turnover, which was around EUR 585 million, referring to 214 companies (that declared NACE code 10.20 as second or third activity) in 2017.

The agri-food sector (NACE Code 10 plus 11) produced EUR 137 billion in 2017 and exceeded EUR 140 million in 2018, therefore it represents the first manufacturing sector in the country.

The average consumption of sea-food per capita in 2017 was 28, also due to the accessibility of canned tuna and other canned fish and frozen products. In fact, only canned tuna in Italy recorded a value of EUR 1.3 billion in 2017 (ANCIT data), with a national production of 75 800 tonnes and a consumption of 155 000 tonnes (+ 3% compared to 2016) equal to at about 2.5 kg per capita. While on the one hand it considers a constant growth of the Italian agri-food sector and on the other an increase in the per capita consumption of the fish product, it can be said that the Italian processing sector has good margins for future growth.

### *5.9.2 Economic performance*

In 2018, the Italian economy was characterized by not particularly significant results, in fact, the Gross Domestic Product (GDP) increased by 0.9%, thus remaining lower than the European average (+1.8%); the labour market dynamics led to an increase in the employment level although the unemployment rate was 10.6%. And inflation has increased compared to the previous year +1.2%.

The total turnover of the industry (turnover "main"+ other income) has increased by 1%. Other income is linked to companies structured and often provide with internal resources, to the downstream phases of production such as: wholesale distribution, large-scale retail trade, retail, Ho.Re.Ca, marketing and communication activities, import / export, too. Total operating costs decreased by -2%. The costs for raw materials are those that have the greatest impact on the total costs of the operational management. The cost of labour increased, instead a contraction is observable for the unpaid labour value. The gross value added has been EUR 316.5 million and confirms an increasing trend since 2015 (+12% compared to 2015 and +34% compared to 2016). The specialization and organization of job, determining that labour productivity confirms the positive trend of the previous three years and is equal to around EUR 199 thousand.

Table 5.9.2: Economic performance indicators, Italy, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Income (million €)</b>											
Turnover	2,906.1	2,201.2	2,623.4	2,281.2	2,557.0	2,287.3	2,234.9	2,243.0	2,195.7	2,108.5	-4%
Other income	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	404.3	525.0	30%
Operating subsidies	5.6	4.7	4.8	17.6	23.8	5.8	4.0	6.3	0.0	4.5	0%
<b>Total Income</b>	<b>2,911.7</b>	<b>2,205.9</b>	<b>2,628.2</b>	<b>2,298.9</b>	<b>2,580.8</b>	<b>2,293.1</b>	<b>2,238.9</b>	<b>2,249.3</b>	<b>2,600.0</b>	<b>2,638.0</b>	<b>1%</b>
<b>Expenditure (million €)</b>											
Purchase of fish and other raw material for production	2,125.3	1,435.1	1,952.7	1,653.4	1,752.1	1,657.0	1,596.1	1,613.0	1,985.1	1,938.1	-2%
Wages and salaries of staff	223.9	197.9	218.9	197.2	213.1	201.4	191.1	188.9	211.7	215.0	2%
Imputed value of unpaid labour	9.0	7.9	18.8	7.9	9.8	17.5	16.8	16.9	16.9	12.4	-27%
Energy costs	119.8	93.2	87.7	97.5	92.3	81.4	79.4	78.5	141.3	103.3	-27%
Other operational costs	406.7	361.1	385.9	276.6	319.9	285.0	304.2	268.0	238.2	275.6	16%
<b>Total production costs</b>	<b>2,884.6</b>	<b>2,095.2</b>	<b>2,664.0</b>	<b>2,232.5</b>	<b>2,387.3</b>	<b>2,242.4</b>	<b>2,187.5</b>	<b>2,165.4</b>	<b>2,593.2</b>	<b>2,544.4</b>	<b>-2%</b>
<b>Capital Costs (million €)</b>											
Depreciation of capital	45.5	60.5	69.1	61.5	65.6	49.3	49.1	53.4		50.4	
Financial costs, net	51.7	28.5	19.4	27.1	31.3	27.8	30.4	26.1		17.9	
<b>Capital Value (million €)</b>											
Total value of assets	2,164.8	2,166.0	2,607.2	2,118.4	2,247.8	1,976.5	1,811.8	1,724.3	1,284.2	1,905.1	48%
Net Investments	225.9	-96.2	183.7	121.7	-7.2	-19.6	55.0	55.9	44.9	52.4	17%
Subsidies on investments									0.0	0.0	0%
Debt	1,485.4	1,425.6	1,597.9	1,444.7	1,569.0	2,281.5	1,245.8	1,174.3	951.5	1,278.8	34%
<b>Economic performance (million €)</b>											
Gross Value Added	254.3	311.7	197.1	253.8	392.7	263.9	255.2	283.5	235.4	316.5	34%
Operating Cash Flow	27.0	110.7	-35.8	66.3	193.5	50.8	51.4	83.9	6.8	93.6	1276%
Earning before interest and tax	-18.5	50.2	-104.9	4.9	127.9	1.5	2.2	30.5		43.2	
Net Profit	-70.2	21.7	-124.3	-22.2	96.6	-26.4	-28.2	4.4		25.3	
<b>Productivity and performance Indicators</b>											
Labour productivity (thousand €)	55.6	70.0	39.3	49.3	75.2	48.6	57.7	59.3	51.5	69.3	35%
Capital productivity (%)	11.7	14.4	7.6	12.0	17.5	13.4	14.1	16.4	18.3	16.6	
GVA margin (%)	8.7	14.2	7.5	11.1	15.4	11.5	11.4	12.6	9.1	12.0	
EBIT margin (%)	-0.6	2.3	-4.0	0.2	5.0	0.1	0.1	1.4		1.6	
Net profit margin (%)	-2.4	1.0	-4.7	-1.0	3.7	-1.2	-1.3	0.2		1.0	
Return on Investment (%)	-0.9	2.3	-4.0	0.2	5.7	0.1	0.1	1.8		2.3	
Financial position (%)	31.4	34.2	38.7	31.8	30.2	-15.4	31.2	31.9	25.9	32.9	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.9.3 Socio-demographic structure

Data on social variables were finalized in 2019 and refer to 2016-17. All mandatory data has been collected. No additional non-mandatory data has been provided. The social aspect in the processing industry has a weight in terms of the country's identity. The fish processing industry, more than others in the agro-food sector, is very much influenced by Italian heritage, mainly in coastal areas. The sector expresses approximately 5.6 thousand employees, and almost all (94%) are Italian citizens. The typicality of fish processing, the delicacy of meat and processed raw materials, require gentleness and wisdom of workers' manipulations. This reflects the composition of the employed according to the gender they belong to over 48% of those employed are women.

The levels of education are much lower than the trend of the Italian agri-food industry: only 7% have a high degree. Specifically, there are small differences between the 3 size classes where the 50-249 class absorbs 8% of graduated professionals. The distribution, on the other hand, of the employees by age, shows that the 40-64 class is the one that most commonly unites the three industrial segments, going from 50% in the 50-249 class to 60% in the previous class (10-49). It



would seem that there is a correlation between age and educational level, in fact the age group 40-64 would seem to be the one with a low schooling level.

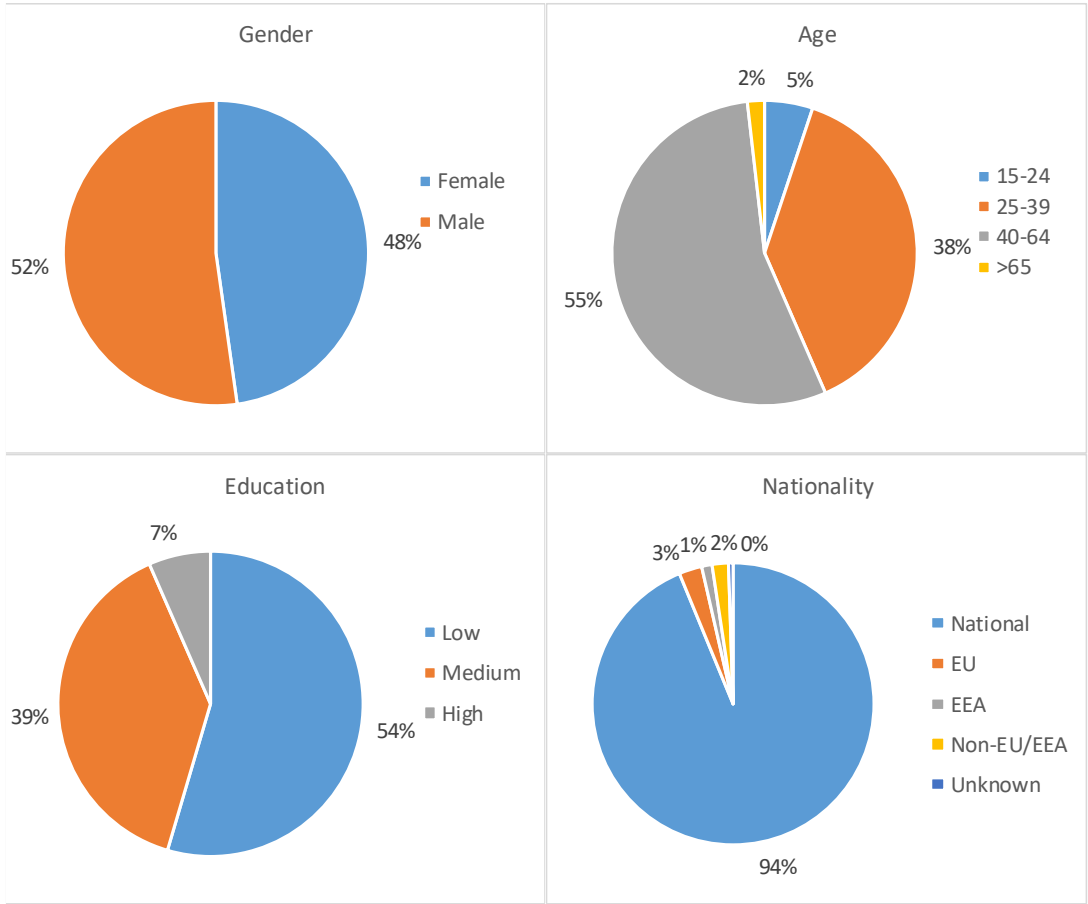


Figure 5.9.1: Socio-demographic characteristics, Italy, 2017

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

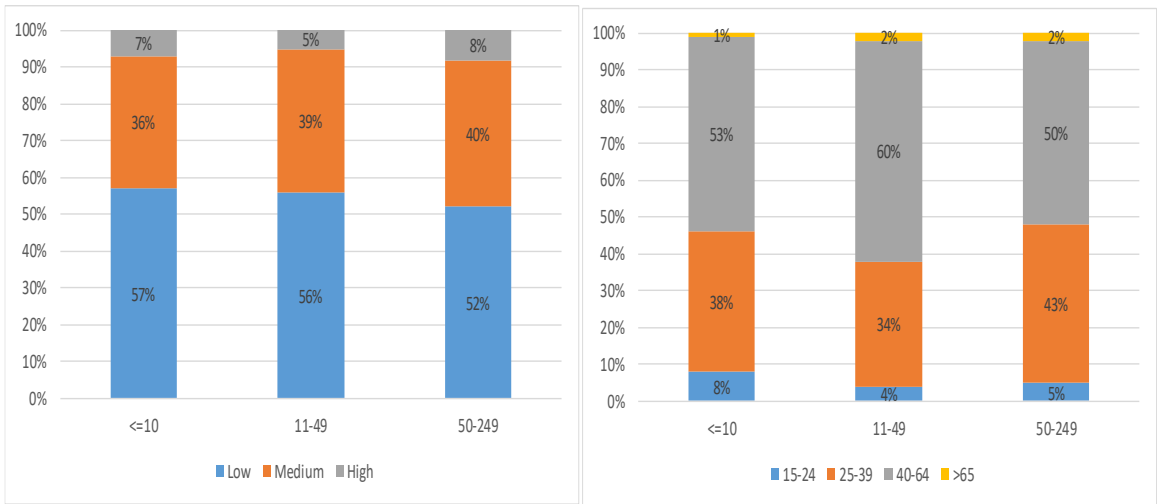


Figure 5.9.2: Distribution of the employees by enterprise size and education, Italy, 2017

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

The analysis finds that: the volume of turnover, the level of growth of the workforce and the possibility of increasing the supply of Italian processed product, must be supported by a greater presence of qualified figures who can internally ensure quality standards, respect labelling is better to strategically orientate the sector.

#### 5.9.4 Breakdown by company size

The Italian production structure represents an industrial plant with important investments towards new technologies, but which makes use of the human resource and Italian know-how to characterize the offer of processed fish products made in Italy.

The turnover of companies with size 11-49, equal to EUR 1.2 billion, accounts for 46% of the total turnover of the Italian processing industry, while the segment up to 10 employees expresses EUR 230 million, equal to 9% of the total turnover. The negative performance is recorded mainly in the segment with employees up to 10, where the net profit is EUR - 4 million, the loss is shown by the suffering of the sector to mitigate production costs that are higher than the total income. Although for the two segments of size 11-49 and 50-249, profit showed a tendency to increase, already started in the previous period, it is underlined that over 96% of operating costs is covered with total income.

Table 5.9.3: Economic performance by size, Italy, 2008-2017

Variable	2013	2014	2015	2016	2017	Δ(2016-17)
<b>less than or equal to 10 employees</b>						
Total Income	455.7	347.9	369.3	286.6	294.1	3%
Total production costs	444.2	349.8	351.7	284.6	286.5	1%
Gross Value Added	58.3	31.0	50.9	33.6	38.3	14%
Operating Cash Flow	11.4	-1.9	17.5	2.1	7.6	271%
Earning before interest and tax	-2.7	-13.0	5.2	-6.0	-0.6	90%
Net Profit	-11.6	-20.2	-1.6	-7.5	-3.9	48%
<b>between 11 and 49 employees</b>						
Total Income	1,042.9	905.0	857.5	925.2	1,183.8	28%
Total production costs	1,011.3	886.9	843.9	904.3	1,147.0	27%
Gross Value Added	127.6	99.4	86.1	94.5	122.2	29%
Operating Cash Flow	31.6	18.1	13.6	21.0	36.8	75%
Earning before interest and tax	14.4	-0.9	0.0		18.5	
Net Profit	3.6	-12.5	-8.1		8.9	
<b>between 50 and 249 employees</b>						
Total Income	794.6	986.0	1,022.5		1,160.1	
Total production costs	786.9	950.9	969.7		1,111.0	
Gross Value Added	78.0	124.8	146.4		156.0	
Operating Cash Flow	7.7	35.1	52.8		49.2	
Earning before interest and tax	-10.2	16.1	25.4		25.3	
Net Profit	-18.4	4.4	14.1		20.2	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.9.5 Trends, drivers and outlook

Consumption of fish products in Italy increased in volume from 2014 to 2018 by 9.2% and in 2018 increased by over 3 percentage points over 2017<sup>32</sup>, the consumption value (2018) increased of 4,7%. The driving segment of consumed fish products is that of processed products, primarily canned tuna. In 2018, Italy is the second EU country to produce processed tuna, mainly canned. Italian imports of fish products in 2018 exceeded 1 million tonnes, up 1.2% compared to 2017 and 10.1% compared to 2010. The increase in imports has been for both fresh and processed products. The value of imports in the 2010-2018 period grew by 46% to around EUR 6 million. Specifically, the value of processed products increased by 51.1% (ISTAT). In the 2010-18 period, exports decreased by 10.4%, equal to a volume of 120 thousand tonnes exported in 2018, less than 2.7% compared to 2017. The negative export performance is linked to a contraction of the fresh fish volume of exported while in the same period exports of processed products increased by 50.3%. The value of exports in 2018 increased by 32.9% compared to 2010, while the value in 2018 compared with the previous year decreased slightly, +0.2%. The processed products, considering the long period, have been the driving forces behind exports both in volume (+85.7%) and in value (+11.1%). The balance between import and export of processed products (2018) was negative at -223.4 thousand tonnes equal to EUR -987.1 million. Cuttlefish and squid frozen, smoked, dried, salted or in brine plus tuna preparations and tuna represent about 23% by volume of imported products, and less than 20% in value. Imported volumes of tuna preserves and preparations were over 100 thousand tonnes, worth over EUR 566 million, up 14.3% on volume and 15% on value compared to 2017. The main suppliers of canned tuna are Spain, Ivory Coast and Ecuador. The main products exported were (2018, ISTAT) tuna and bonito preparations (20.3% of volumes and 24.8% of values), followed by sardines. In the last 10 years the Italian sociological conformation has radically changed, and the average cultural rise is determining epochal transformations. Elements such as attention to the environment, ecology and food have changed the lifestyle of most Italian consumers. Moreover, in the last 3 years, the waste crisis and climate change have made the choices and measures to be taken to safeguard the health and safety of citizens even more stringent. In same period, the processing industry has increased the production of a differentiation of product offering with reference to new trends and requests both from the side of consumers and wholesalers. In particular, it refers to certifications of environmental sustainability and biodiversity (for example MSC ASC). The trend with strong ethical connotations, is that in Italy the purchases of processed fish increase, but there is a more conscious choice that favours quality processed, eco-friendly products, and care is taken to reduce waste. At the industry level there is a need to purchase quality raw materials, traceable and sustainable ones. On the consumer side, the processing sector is pushing towards communication campaigns: the consumers care about the storytelling behind processing seafood products. The Italian sector is expected to grow, driven above all by the need to integrate the Omega 3 -based consumer diet. At the same time there will also be surges in the growth of the processing equipment sector. The short-term prospects are:

- strengthen vertical integration and the use of innovative processing technologies,
- to introduce eco-sustainable materials that can meet the need to reduce packaging waste,
- investing in professionalization: currently there is a gap between workers and top management: strengthening the sector by offering medium-management professional figures.

### 5.9.6 Data coverage and quality

The Work Plan (WP) for the collection of the fish processing data for the period 2017-2019 included some changes versus previous programmes, in order to be in line with the general approach of EU policies to avoid duplication in data collection at EU level, as also recalled by

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<sup>32</sup> BMTI – MIPAAFT, Annual Report on Fishery Market, 2018.

EUMAP. In line with this approach the Italian WP for the collection of economic data for the fish processing sector set that SBS data for the 10.20 activity sector would be used for providing data on industries having more than 10 employees and exerting fish processing as main activity. On the other hand, economic data for enterprises with less than 10 employees, representing in 2014 75% of the whole sector, would be collected through the implementation of a specific survey.

It has to be highlighted that 2016 was considered a test year for the new methodology. Indeed, the check on data sources during the first months highlighted some critical issues, most of them already reported in the 2018 Annual Report. The main arised issues are related to the lack of some important variables, not available under Eurostat statistics, as well as the lack of data for some size classes, due to confidentiality reasons. These are the main reasons why, for 2016, data for some variables or for some size classes are missing.

Furthermore, the use of the test methodology has not allowed the release of data at the geographical breakdown level based on NUTS2, region administrative. The SBS data are not available, in fact, at this level of geographical disaggregation.

These criticalities have represented a significant loss of information, compared to the previous programmes. Because of this the old methodolgy (ad-hoc survey) has been restored in 2019 for the collection of 2017, with the necessary adaptmets due to the change in EUMAP vs. DCF and to PGECON recommendation (e.g. extrapolation of turnover attrributable exclusively to the processing and fish products and attributing the rest of turnover to "other income").

Since 2016, a refinement of the methdology has been applied as far as a better definition of the population, i.e. enterprises actually doing fish processing as main acitivity.

## 5.10 Latvia

### 5.10.1 Overview

Fish processing is a well-developed old tradition in Latvia. The processing sector is based on the local natural resources and also on the imported raw materials for production from the neighbouring countries. The most of fish processing enterprises are located in Riga and Roja cities. Large amount of the enterprises is also situated along the Latvian coast and in the Kurzeme region territory. Some of them are in Tukums, Engure, Carnikava and Kekava cities. The small enterprises with less than 10 employees have dominated in the sector with the share around 58% in 2017. These enterprises usually are situated near the fishermen settlements. Some of the fishers have smokehouses and sell the smoked, salted and brine fish to the tourists. Very often small fish processing enterprises are a family business.

There were 113 registered economic active fish processing enterprises in 2017 with a total turnover of EUR 183.2 million. The number of enterprises has increased by 16% from 2008 to 2017. Investments to the new technologies, equipment and improvement of the working conditions for employees between 2008 and 2017 assisted in increase of the labour productivity by 11% during the same period.

The average wage showed the increasing by 14% from 2016 to 2017 and was EUR 742 per month in 2017. However, the average wage per month in fish processing sector was 22% lower than the average wage in the country in 2017.

All fish processing enterprises operate according to European Union standards. The enterprises which export its production are certificated in accordance with the standards of the buyer's country. The most common certifications are:

- IFS (International Food Standard);
- MSC Chain of Custody Standard is a traceability and segregation standard that is applicable to the full supply chain from a certified fishery or farm to final sale;
- GOST standard is a system of certification maintained by the Euro-Asian Council for Standardization, Metrology and Certification (EASC), a regional standard operating under the auspices of the Commonwealth of Independent States (CIS).

The fish processing sector production has important share in total Latvian export and also supplies domestic market. The fish products were exported to 63 countries and imported from 46 countries in 2017. The total volume and value of exported production were 100.5 tonnes and EUR 190.5 million in 2017. Total export value increased by 10% or 9.7 thousand tonnes from 2016 to 2017. The export volumes to EU and non-EU countries increase by 7% and 16% respectively from 2016 to 2017. The most important countries for the production export in 2017 were Lithuania, Ukraine, Denmark and Estonia contributing 21%, 17%, 13% and 8% respectively to the total export volume and in turns of exported value Denmark, Lithuania, Estonia and Poland contributing 30%, 30%, 25% and 20% respectively. The main countries for the production import were Lithuania, Poland, Sweden, Estonia and Norway. These countries contributed 72% to the total import volume in 2017. The main type of the production imports by volume were "Fresh or chilled fish, excluding fish fillets and other fish meat" and "Frozen fish, excluding fish fillets and other fish meat". These types of products have share of 38% and 37% respectively from the total imports volume in 2017. "Prepared or canned fish" was the main product type for the export with the share of 28% and 39% respectively from the total export volume and income in 2017. The raw materials for the exporting production are mainly being made Baltic Sea and the Atlantic Ocean catches obtained by the Latvian fishing vessels or imported from the neighbouring countries. The fish species range in catches of the Latvian vessels is not very wide. The main species are sprat, herring and cod. North Sea and North East Atlantic herring and scomber

imported from Norway also were used as the raw material for the production of canned fish. The biggest fish markets are concentrated in the Riga, Daugavpils, Liepaja and Jelgava cities.

Table 5.10.1: Overview, Latvia, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>											
Total enterprises	95	91	104	101	101	116	106	114	114	113	-1%
≤10 employees	27	33	44	44	48	56	56	59	59	66	12%
11-49 employees	26	37	36	34	29	36	30	36	38	28	-26%
50-249 employees	37	16	18	16	18	17	12	15	16	17	6%
≥250 employees	5	5	6	7	6	7	8	4	1	2	100%
<b>Employment (number)</b>											
Total employees	5,792	4,684	5,015	5,399	5,781	6,223	5,558	4,169	3,783	3,522	-7%
FTE	5,592	4,174	4,681	4,992	5,357	5,285	5,132	3,580	3,273	3,125	-5%
<b>Indicators</b>											
Turnover (million €)	215	153	154	171	227	255	222	172	153	183	20%
FTE per enterprise	58.9	45.9	45.0	49.4	53.0	45.6	48.4	31.4	28.7	27.7	-4%
Average wage (thousand €)	5.7	4.3	4.9	5.5	6.1	6.9	6.9	7.6	7.8	8.9	14%
Unpaid work (%)	0.6	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
<b>Enterprises doing fish processing not as main activity</b>											
Number of enterprises	4	4	2	2	2	2	2	2	2	2	0%
Turnover attributed to fish processing (million €)											

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.10.2 Economic performance

The total turnover decrease by 22% from 2014 to 2015 due to the fish processing sector was influenced by the embargo on the import of key food groups from the European Union imposed by Russia from 7 August 2014. Russian embargo had been applied to beef, pork, fruits, vegetables, poultry, cheese, milk products and also fish and fish products, although the embargo list did not include sprat, canned meat and fish. The second important reason was that the Russian food safety authority Rosselkhoznadzor temporary banned import of all fish and fish products from Latvia and Estonia from 4 June 2015. In the result in Latvia suffered around 40 enterprises which exported their production to the Russian market. Based on 2017 results is observed that the situation in fish processing has improved again from 2016 to 2017 and the total turnover increase by 20% due to the increase in total export value by 10%. The main reason was increase of exported volume for the trading partners' countries such as Lithuania, Great Britain, Canada, Germany, Bulgaria and Japan.

The total production costs share was 95% of total fish processing sector income. The share of purchase of raw material for production made up of 59% of the total income in 2017. Furthermore, the value of total production costs demonstrated increasing by 22% from 2016 to 2017 due to the increase in price for the raw material. In turns, the Purchase of fish and other raw material for production increased by 26%.

It can be observed that Gross Value Added decreased by 3% from 2016 to 2017 and Operating Cash Flow have decreased by 36% during the same period. The decrease for Operating Cash Flow could be explained by the decrease in subsidies by 35% from 2016 to 2017. Due to the reasons mentioned above the economic situation improved in 2016 the Earnings before interest and tax as well as Net Profit has a significant increase by 44% and 51% respectively between 2016 and 2017 and was around EUR 6.7 million in 2017. However, the Net profit in 2017 is not conducive to a prosperous economic situation and it does not exceed it level in 2008, 2012 and 2013. Nevertheless, the positive ROI values from 3.7% to 5.6% between 2016 and 2017 indicate that

extraordinary profit is being generated and positive return of investments ensures the segment profitability in the long-term.

Table 5.10.2: Economic performance indicators, Latvia, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Income (million €)</b>											
Turnover	214.9	152.8	153.8	170.8	226.7	255.1	221.6	172.3	153.2	183.2	20%
Other income	9.1	5.2	6.7	6.5	9.5	5.7	6.3	3.9	4.2	3.5	-15%
Operating subsidies	0.1	1.5	2.3	1.0	1.7	2.2	2.7	3.6	4.5	3.0	-35%
<b>Total Income</b>	<b>224.0</b>	<b>159.5</b>	<b>162.8</b>	<b>178.2</b>	<b>238.0</b>	<b>263.0</b>	<b>230.5</b>	<b>179.8</b>	<b>161.8</b>	<b>189.7</b>	<b>17%</b>
<b>Expenditure (million €)</b>											
Purchase of fish and other raw material for production	120.2	96.0	93.3	103.2	128.1	141.7	125.5	96.0	88.2	111.0	26%
Wages and salaries of staff	31.5	17.7	23.0	27.6	32.9	36.5	35.3	27.2	25.5	27.8	9%
Imputed value of unpaid labour	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
Energy costs	9.4	7.6	7.6	8.3	9.5	13.8	10.2	6.2	4.6	4.6	-1%
Other operational costs	40.1	32.0	31.1	34.4	42.7	47.2	41.8	32.0	29.4	37.0	26%
<b>Total production costs</b>	<b>201.3</b>	<b>153.4</b>	<b>154.9</b>	<b>173.5</b>	<b>213.2</b>	<b>239.2</b>	<b>212.8</b>	<b>161.3</b>	<b>147.7</b>	<b>180.4</b>	<b>22%</b>
<b>Capital Costs (million €)</b>											
Depreciation of capital	8.4	6.0	4.5	4.3	6.2	9.9	10.5	9.1	8.4	1.0	-88%
Financial costs, net	1.9	1.9	2.0	2.1	2.2	2.1	2.0	2.9	1.3	1.6	20%
<b>Capital Value (million €)</b>											
Total value of assets	111.9	100.6	101.3	114.8	143.4	163.9	163.4	152.8	157.6	147.7	-6%
Net Investments	6.7	5.3	3.5	13.2	20.6	17.1	9.8	8.4	4.6	3.0	-35%
Subsidies on investments									0.0	0.0	0%
Debt	83.6	82.5	79.9	90.4	104.3	123.7	125.1	114.9	121.4	122.5	1%
<b>Economic performance (million €)</b>											
Gross Value Added	54.2	22.5	28.6	31.4	55.9	58.1	50.4	42.0	35.2	34.2	-3%
Operating Cash Flow	22.7	6.1	7.9	4.7	24.7	23.8	17.7	18.4	14.1	9.3	-34%
Earning before interest and tax	14.3	0.1	3.5	0.4	18.6	13.9	7.1	9.4	5.8	8.3	44%
Net Profit	12.4	-1.8	1.4	-1.7	16.3	11.8	5.1	6.5	4.5	6.7	51%
<b>Productivity and performance Indicators</b>											
Labour productivity (thousand €)	9.7	5.4	6.1	6.3	10.4	11.0	9.8	11.7	10.7	10.9	2%
Capital productivity (%)	48.5	22.3	28.3	27.3	39.0	35.4	30.8	27.5	22.3	23.1	
GVA margin (%)	24.2	14.2	17.8	17.7	23.7	22.3	22.1	23.8	22.3	18.3	
EBIT margin (%)	6.4	0.1	2.1	0.3	7.8	5.3	3.1	5.2	3.6	4.4	
Net profit margin (%)	5.5	-1.1	0.9	-0.9	6.9	4.5	2.2	3.6	2.8	3.6	
Return on Investment (%)	12.8	0.1	3.4	0.4	12.9	8.5	4.4	6.1	3.7	5.6	
Financial position (%)	25.3	18.0	21.1	21.3	27.3	24.5	23.5	24.8	23.0	17.1	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.10.3 Socio-demographic structure

Fish processing as a type of economic activity is very important for Latvian agriculture and for employment especially in the coastal areas. The majority of employees or 78% is a local Latvian inhabitant older than 40 years old. Total number of employees was 3,522 in 2017 consisting of 3,125 FTE. The number of males was by 73% more than females and was 2,571 and 951 employees, respectively. Number of FTE's decreased by 5% from 2016 to 2017 and was in average 28 FTE per enterprise in 2017. Only 10% of employees have a high education and 55% have primary or secondary education. The most popular areas for the 43% of employees with the high education were business, economic, administration and finance in turn 23% of employees choose the education in agriculture, forestry and fisheries. Other 34% of employees have education in other areas. The 96% of employees have indefinite type of contract and 55% employed in the fish processing sector more than 6 years.

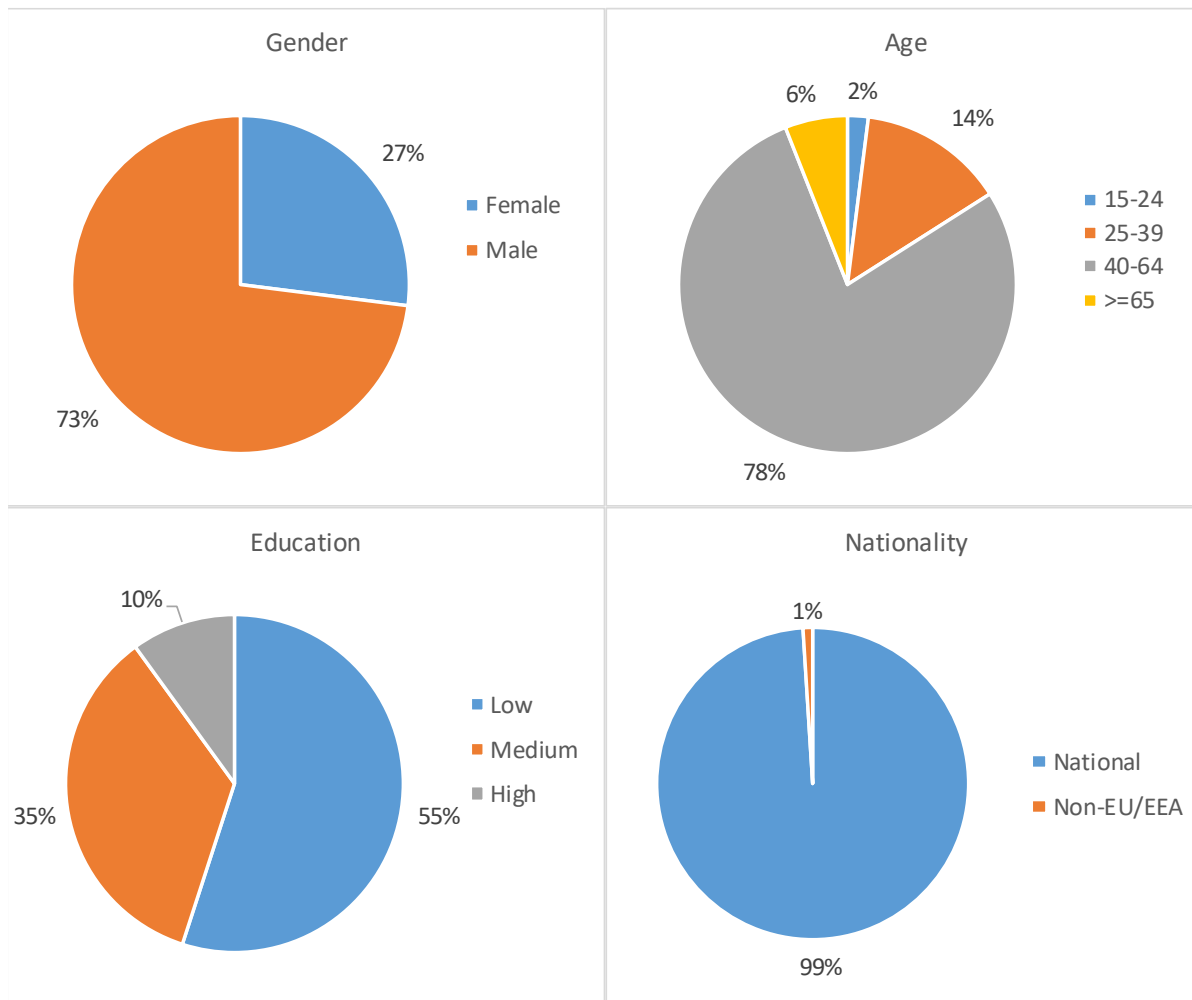


Figure 5.10.1: Socio-demographic characteristics, Latvia, 2017

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

#### 5.10.4 Breakdown by company size

The number of fish processing enterprises stayed relatively stable during last few years and consisted of 113 enterprises in 2017. The economic situation in the fish processing sector was very dependent on the enterprise size and its strategy at the market. There were only 2 big enterprises which have more than 250 employees in 2017. For the data confidentiality protection, the data for the two segments cannot be published - for the enterprises which have more than 250 employees and for the segment with less than 10 employees. There were 28 enterprises included in the segment 11-49 employees and the segment 50-249 employees had consisted of 17 enterprises in 2017.

The segments 11-49 employees and 50-249 employees show the positive performance in 2017. The most profitable segment in 2017 was the segment with 11-49 employees contributing EUR 43.0 million to the total segment income and EUR 6.3 million to the total fish processing sector Net profit. The segment with the 11-49 employees predominantly support local markets and is important for the employment in the coastal cities. The segment with 50-249 employees had the highest total income EUR 121.9 million in 2017 and contributed 63% in the total income. The segment reported loss EUR 0.9 million and EUR 6.3 million respectively in 2013 and 2014. However, the Net profit for the segment 50-249 employees had a sharp increase in four times generated EUR 2.9 million in 2017. The segments 50-249 employees and more than 250 employees are exporting abroad a significant share of their production. Segment with less than



10 employees and also the segment with more than 250 employees had loses for 2016 and 2017 what in terms decrease the total Net profit for the fish processing sector by 27%.

Table 5.10.3: Economic performance by size, Latvia, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>less than or equal to 10 employees</b>											
Total Income	2.2	2.5	3.6	3.0	6.2	4.3	3.8	3.9			
Total production costs	2.1	2.7	3.2	2.6	4.9	4.1	3.3	3.5			
Gross Value Added	0.5	0.2	0.8	0.6	1.7	0.6	1.0	0.8			
Operating Cash Flow	0.1	-0.2	0.5	0.4	1.3	0.2	0.5	0.4			
Earning before interest and tax	-0.3	-0.6	0.1	-0.3	0.9	-0.2	0.3	0.1			
Net Profit	-0.3	-0.6	0.1	-0.4	0.8	-0.2	0.3	0.1			
<b>between 11 and 49 employees</b>											
Total Income	35.0	37.5	35.5	23.4	38.5	46.1	47.8	49.9	51.2	43.0	-16%
Total production costs	31.4	34.1	32.2	19.8	33.0	37.8	41.8	42.4	42.8	35.9	-16%
Gross Value Added	8.5	6.2	5.6	7.1	9.2	11.5	9.4	11.4	11.8	10.6	-10%
Operating Cash Flow	3.6	3.4	3.3	3.6	5.5	8.2	6.0	7.4	8.4	7.2	-15%
Earning before interest and tax	1.7	1.0	2.1	3.3	4.4	6.3	3.9	4.9	6.2	6.7	7%
Net Profit	1.0	0.3	1.4	2.5	3.9	5.6	3.2	3.5	5.6	6.3	13%
<b>between 50 and 249 employees</b>											
Total Income	108.5	70.3	60.1	70.2	98.0	87.1	47.3	86.2	95.7	121.9	27%
Total production costs	102.3	70.5	57.5	67.3	91.0	82.5	48.0	78.8	89.3	117.8	32%
Gross Value Added	20.9	7.0	10.8	12.2	19.0	16.0	6.3	18.7	21.5	20.2	-6%
Operating Cash Flow	6.2	-0.1	2.7	2.9	7.0	4.6	-0.8	7.4	6.3	4.1	-36%
Earning before interest and tax	2.6	-1.7	1.1	0.9	3.7	-0.2	-5.7	2.9	1.7	4.0	131%
Net Profit	1.6	-2.3	0.3	0.2	2.7	-0.9	-6.3	1.7	1.0	2.9	177%
<b>greater than or equal to 250 employees</b>											
Total Income	78.4	49.2	63.5	81.6	95.3	125.5	131.7	39.8			
Total production costs	65.5	46.1	62.1	83.7	84.3	114.7	119.8	36.5			
Gross Value Added	24.3	9.1	11.4	11.4	26.0	30.0	33.7	11.0			
Operating Cash Flow	12.9	3.1	1.5	-2.1	11.0	10.8	12.0	3.3			
Earning before interest and tax	10.3	1.4	0.2	-3.5	9.5	8.0	8.6	1.4			
Net Profit	10.1	0.9	-0.3	-4.0	8.9	7.3	7.9	1.2			

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

#### 5.10.5 Trends, drivers and outlook

The fish processing sector continue to develop and several fish processing companies due to availability of the EMFF, had a benefited from the good investment possibilities that have been used for modernization and obtaining of new processing equipment to diversify products, improve quality of the production and increase productivity.

The seven biggest Latvian enterprises are members of "Company RĪGAS ŠPROTES". The association is the owners of the trademark canned „Riga Sprats in Oil” and control the quality of the products produced by the members of the association. Latvian fish production is focused on quality and it has a high achievement at the international level. The fish processing enterprises

take part in different multinational exhibitions where their production received rewards for the exclusive canned fish production in the different nominations. The canned fish has a different designs and volumes for the packing. The produced production of the canned fish annually is export around 60 countries all over the world. The products have high demand at the markets of neighbouring countries. The main regions for the sales are the former CIS (Commonwealth of Independent States) and neighbour European Union countries where canned fish "Rigas Sprats in Oil" has a high demand from country inhabitants.

The new sales markets for the Latvian production in 2017 and 2018 were found in Kenia, Lebanon, Columbia, Bosnia and Hercegovina. The export restarted to the Thailand, Vietnam and Russian Federation. Nonetheless, the amount of export to these countries in low and it is still premature to predict how long the cooperation will last. Some of the fish processing enterprises for the straighten the cooperation at the European Union markets started the process of the new certifications such as BRC (the British Retail Consortium - Technical Standard for Companies Supplying Retailer Branded Food Products) and EFC (is a UKAS accredited and internationally recognized provider of high quality customer focused independent third-party certification).

Therefore, fish processing companies has to look for raw material imports to ensure the demand for fish products. However, it results in higher prices for the consumers. Another negative side effect is the export of frozen sprat, which also negatively influences the availability of raw materials for local processing of canned fish. Therefore, Latvia faces the challenge how to motivate the producers for production of high value products in Latvia not to export the useful raw material abroad.

Potentially, if the production volumes will increase the lack of employees at the sector could be observed. In recent years, companies are faced with the problem to find qualitative employees for the work at the conveyer, engineers, and electricians. Some of the employees are coming to work from the outermost regions in Latvia. The main reason is the low average wage in the fish processing sector which does not exceed the national level of the average wage.

#### *5.10.6 Data coverage and quality*

Economic variables of processing sector are based on the information provided by Central Statistical Bureau of Latvia (CSB). CSB collects economic data basing on the questionnaires/statistical forms and administrative sources. Questionnaires/statistical forms are distributed by CSB to the owners of processing enterprises. All economic active enterprises are involved in the survey. The participation in the survey for the enterprises with more than 10 employees is obligatory according to the Latvian national legislation. The data for small segment with less than 10 employees were requested from Latvian Revenue Service. Some variables are obtained from the government databases or registers.

There are only few enterprises in Latvia where processing is not the main activity. For these enterprises the data about turnover could not be reported for confidentiality reasons.

The social data for fish processing was collected by the survey for 2017. The aim of the survey was to obtain information which characterise employment in the fishing industry by gender, age, education level, employment status and nationality. The type of data collection was census or 100% for the coverage rate with achieved sample rate 23%. The results were raised from sample to the population based on the total number of employees in the sector. The collected social data could be used for the overall analysis in the fish processing sector. Furthermore, the received social data could be included into a subsequent forecast for the development of Latvian fisheries. The optimal frequency for the survey could be once in three years due to the absence of significant changes in the social area of the fisheries.

## 5.11 Lithuania

### 5.11.1 Overview

Lithuanian national chapter will focus on the 2018 data with comparison to the year 2017. In 2018, Lithuanian fish processing industry consisted of 41 enterprises with the main activity of fish processing. The size of the sector remained stable with a minor deviation compare to 2017 and 2016. In 2018, the total income of Lithuanian processing industry, consisting of turnover from processing and other income, was EUR 551.2 million with 0.7% annual increase compare to 2017. However, turnover from the fish processing increased by 3.8% in 2018, whereas other income declined around 35%. In 2018, number of fish processing companies with non-main activity increased to 31, compare to 23 in 2017. Turnover, attributed to non-main activity fish processing enterprises in 2018 increased to EUR 68.5 million. Lithuanian processing industry is highly dependent from imported raw material. In 2018, around 95% (85.6 thousand tonnes) of total quantity of raw material was imported. In 2018, Lithuanian companies with main activity of fish processing produced 144.5 thousand tonnes of production (including products not intended for human consumption) and compare to 2017 it increased by 2.3%. The largest commodities, produced by Lithuanian fish processing industry is surimi and smoked fish including smoked fillets, contributing almost equally to the total weight of production. In 2018 surimi were accounted for 27% of total production, whereas smoked fish including smoked fillets – 24%. However, value of production was significantly higher for smoked fish and smoked fillets, contributing to 51.6% of total production value, compare to 12.4% coming from surimi production. Concerning production structure by species in 2018, the most important was Atlantic salmon which contributed by 62.1% of total production value and 36.4% of total production weight. Around 11.5% of total production weight was from processed Atlantic herring (mostly salted in brine) and 8.1% from Atlantic cod (mostly frozen fillets).

Table 5.11.1: Overview, Lithuania, 2008-2018

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Δ(2017-18)
<b>Structure (number)</b>												
Total enterprises	37	33	32	32	31	30	34	51	42	39	41	5%
≤10 employees	6	3	3	3	0	0	3	20	14	12	15	25%
11-49 employees	12	13	13	14	14	14	14	12	11	11	10	-9%
50-249 employees	12	13	12	10	12	11	11	12	11	10	10	0%
≥250 employees	7	4	4	5	5	5	6	7	6	6	6	0%
<b>Employment (number)</b>												
Total employees	5,013	4,489	4,351	4,445	4,451	4,471	5,165	5,373	4,743	4,855	4,984	3%
FTE	2,912	2,948	3,240	3,615	3,536	3,502	3,868	4,132	3,673	3,744	3,469	-7%
<b>Indicators</b>												
Turnover (million €)	195	231	283	305	291	319	419	443	457	504	523	4%
FTE per enterprise	78.7	89.3	101.3	113.0	114.1	116.7	113.8	81.0	87.5	96.0	84.6	-12%
Average wage (thousand €)	7.9	10.1	8.4	7.9	8.5	10.4	10.7	9.0	13.1	14.0	17.0	22%
Unpaid work (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	68%
<b>Enterprises doing fish processing not as main activity</b>												
Number of enterprises	2	2	2	3	3	6	6	21	31	23	31	35%
Turnover attributed to fish processing (million €)	0	0	0	4	3	5	7	10	11	4	68	1676%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

From 2008, Lithuanian fish processing industry constantly increasing sales in the internal market. It is driven by the growing consumption of fishery products. For example, in 2018 sales in the internal market increased to 113.5 thousand tonnes, compare to 70.6 thousand tonnes in 2017

and 23.0 thousand tonnes in 2010. In 2018, exports from the industry decreased by 11.9% to 34 thousand tonnes. Significant decline in exports was observed in 2017 compare to 2016 (-37%). Around 85% of exported production in 2018 was sold in EU countries. In 2018, Lithuanian processing industry employed 4 984 persons and compare to 2017 it remained stable. In terms of FTE, 2018 data shows 7.3% annual decline to 3 468.6. From 2008 to 2015 Personnel costs has a relatively stable trend, whereas from 2015 to 2018 it increased significantly. In 2018, annual wages per FTE were improved by 19.5% to EUR 17.2 thousand. For the comparison, according to the employment data from the National Statistical Department, the average annual gross salaries in Lithuania were EUR 11.1 thousand.

### 5.11.2 Economic performance

Lithuanian fish processing industry has continuous increase in turnover. Compare to 2017 turnover attributed to fish processing in 2018 further increased by 3.8% to EUR 523.2 million and was a record high.

Table 5.11.2: Economic performance indicators, Lithuania, 2008-2018

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Δ (2017-18)
<b>Income (million €)</b>												
Turnover	194.9	231.0	283.5	305.1	290.8	318.7	419.2	443.1	457.0	504.2	523.2	4%
Other income	28.2	26.3	14.6	9.8	56.8	44.2	66.3	78.2	35.7	44.0	28.6	-35%
Operating subsidies	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.1	0.1	-56%
<b>Total Income</b>	<b>223.0</b>	<b>257.3</b>	<b>298.1</b>	<b>314.9</b>	<b>347.6</b>	<b>362.9</b>	<b>485.5</b>	<b>522.1</b>	<b>492.8</b>	<b>548.3</b>	<b>551.8</b>	<b>1%</b>
<b>Expenditure (million €)</b>												
Purchase of fish and other raw material for production	111.0	147.4	177.9	178.5	217.8	222.6	305.5	341.4	361.8	368.9	371.2	1%
Wages and salaries of staff	23.1	29.8	27.1	28.7	30.1	36.4	41.5	37.3	48.1	52.3	58.9	13%
Imputed value of unpaid labour	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	89%
Energy costs	4.6	5.5	5.6	7.3	7.4	7.1	8.1	7.6	7.1	8.1	7.9	-1%
Other operational costs	35.6	39.7	48.4	49.0	69.1	61.4	109.3	85.1	79.8	73.1	81.4	11%
<b>Total production costs</b>	<b>174.3</b>	<b>222.4</b>	<b>259.1</b>	<b>263.5</b>	<b>324.5</b>	<b>327.6</b>	<b>464.4</b>	<b>471.4</b>	<b>496.8</b>	<b>502.4</b>	<b>519.5</b>	<b>3%</b>
<b>Capital Costs (million €)</b>												
Depreciation of capital	6.9	5.6	5.3	5.9	6.7	22.6	8.5	10.1	9.0	8.8	9.8	11%
Financial costs, net	8.3	2.9	1.6	0.1	-1.0	1.9	1.7	3.1	-0.9	3.0	0.8	-73%
<b>Capital Value (million €)</b>												
Total value of assets	159.2	115.5	151.2	174.3	186.2	193.6	231.5	243.4	252.5	302.1	301.4	0%
Net Investments	23.6	9.2	9.4	9.9	9.1	19.3	17.5	4.7	7.1	6.5	12.3	89%
Subsidies on investments									0.1	0.1	0.8	480%
Debt	107.6	95.3	85.7	93.6	112.9	135.5	148.5	161.2	174.3	166.1	180.8	9%
<b>Economic performance (million €)</b>												
Gross Value Added	71.8	64.7	66.1	80.1	53.3	71.8	62.6	87.3	44.1	98.1	91.2	-7%
Operating Cash Flow	48.7	34.9	39.0	51.4	23.2	35.3	21.1	50.7	-5.5	44.3	31.5	-29%
Earning before interest and tax	41.9	29.2	33.7	45.5	16.5	12.7	12.6	40.6	-14.5	35.5	21.7	-39%
Net Profit	33.6	26.3	32.2	45.4	17.5	10.8	10.9	37.5	-13.6	32.5	20.9	-36%
<b>Productivity and performance Indicators</b>												
Labour productivity (thousand €)	24.7	21.9	20.4	22.2	15.1	20.5	16.2	21.1	12.0	26.2	26.3	0%
Capital productivity (%)	45.1	56.0	43.7	46.0	28.6	37.1	27.1	35.9	17.5	32.5	30.3	
GVA margin (%)	32.2	25.1	22.2	25.5	15.3	19.8	12.9	16.7	8.9	17.9	16.5	
EBIT margin (%)	18.8	11.4	11.3	14.4	4.7	3.5	2.6	7.8	-2.9	6.5	3.9	
Net profit margin (%)	15.1	10.2	10.8	14.4	5.0	3.0	2.2	7.2	-2.8	5.9	3.8	
Return on Investment (%)	26.3	25.3	22.3	26.1	8.9	6.6	5.4	16.7	-5.7	11.8	7.2	
Financial position (%)	32.4	17.5	43.3	46.3	39.4	30.0	35.8	33.7	30.9	45.0	40.0	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

The production cost structure remained almost unchanged compare to average of previous years. In 2018 purchase of raw material accounted for 70% in total cost structure, 15% other

operational costs, 11% wages and salaries of staff and 4% for the rest of costs. Recent increase in costs of raw material and personnel costs were the main driver having the impact on the sector profitability. In 2018 fish processing sector generated EUR 91.2 million of GVA, but compare to 2017 it declined by 7.1%. Decline in GVA was driven by 11.3% growth of other operational costs. However, labour productivity in terms of GVA/FTE remained unchanged compare to 2017 and was EUR 26.3 thousand. Net profit generated by processing industry was EUR 20.9 million in 2018, but compare to 2017 it declined by 35.6%. However, taking into account that in 2016 industry obtained net losses, recovery to the net profits in 2017 and 2018 indicates sustainable sector growth. Net profit margin in 2018 was 3.8% and declined from 2017 when 5.9% was achieved. In 2018 decline in the net profit was related to the significant decline of other income and increase of other operating costs. Whereas raw material costs were stable. Net losses in 2016 were related to the substantial growth of the prices of raw material, mostly Atlantic salmon.

In 2018, investments in fish processing increased significantly, to EUR 12.3 million, compare to EUR 6.5 million in 2017. Return on the tangible assets was 7.2% in 2018 and compare to 2017, it declined by 4.6 percentage points. Capital productivity for fish processing was 30.3% in 2018. Financial position for companies in fish processing industry was 40% in 2018.

### 5.11.3 Socio-demographic structure

According to 2017 pilot study data the majority employees involved in the processing sector in Lithuania in 2017 were female (69%) followed by 31% male.

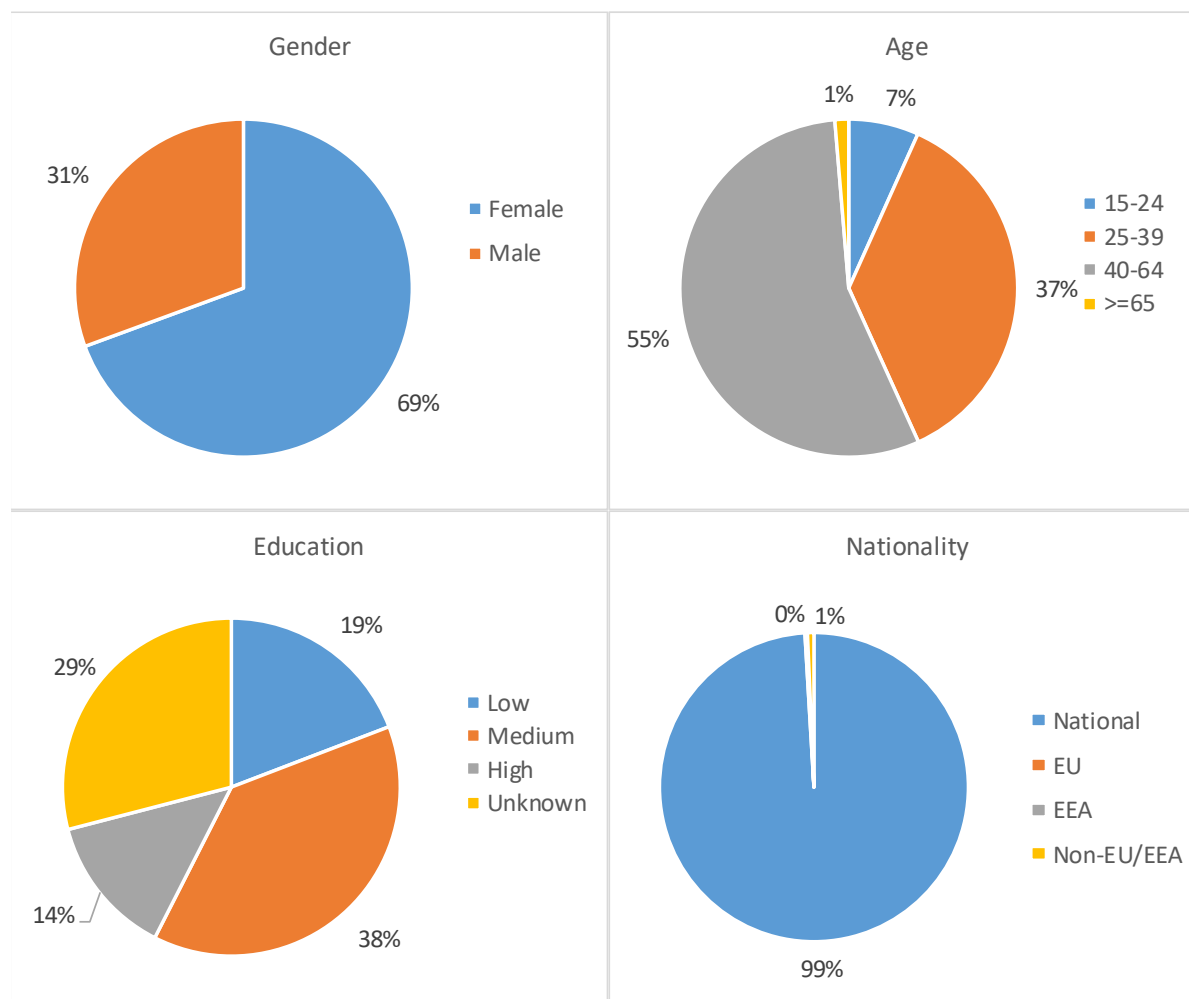


Figure 5.11.1: Socio-demographic characteristics, Lithuania, 2017

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

The distribution of employees by gender in different size categories were different. For example, in large companies (250+ and 50-249) female workers were accounted for around 70% of total employees, whereas gender composition in smaller units (11-50 and <10) were almost equal – 57% female and 43% male.

The age groups used during the data collection were 15-24, 25-39, 40-64 and  $\geq 65$ . The dominant age class for the industry was 40-64 corresponding to 55%, second largest age class was 25-39 with 37% in total population. The distribution of age in different size categories were not significantly different.

In Lithuanian fish processing sector, the medium education was dominant among employees, following by low education. Such distribution of education levels was similar in all size categories.

Around 99% of total employees had a Lithuanian nationality.

#### *5.11.4 Breakdown by company size*

National economic performance of Lithuanian fish processing sector is mostly represented by large scale enterprises. For example, companies, employing more than 250 people in 2018 generated 79% of national turnover and 60% of total persons employed. In 2018 companies greater than or equal to 250 employees generated EUR 65.5 million GVA with EUR 27.2 thousand labour productivity expressed in GVA/FTE. GVA and GVA/FTE decreased by 17.7% and 13.3% respectively compare to 2017. Net profit in 2018 was EUR 15.1 million with 3.5% net profit margin. Companies in this size category employed 2990 employees corresponding to 2295 FTE. Return of fixed tangible assets in 2018 was 7.0%.

Fish processing enterprises between 50 and 249 employees contributed by 17.5% to the total turnover of the sector in 2018. Compare to 2017, turnover decreased by 3%. Companies in this size category generated EUR 24.3 million GVA with EUR 27.7 thousand GVA/FTE labour productivity. Net profit in 2018 reached EUR 4.6 million with average 4.4% net profit margin, compare to 2017 when EUR -0.37 million net loss was generated. Number of employees in this size category increased by 3.4% to 1607 persons corresponding to 877.7 FTE in 2018. ROFTA was 5.9% in 2018.

Smaller size fish processing enterprises between 11 and 49 employees generated EUR 17.0 million turnover with 14.7% growth compare to 2017. In 2018 this size category generated EUR 3.8 million GVA with EUR 16.2 thousand GVA/FTE. GVA and GVA/FTE declined by 15% and 27% compare to 2017. Net profit was EUR 1.2 million, with 6.8% net profit margin. ROFTA declined to 14%, – 16 percentage points compare to 2017. 2018 data shows, that 11-49 employees size category outperformed large scale size categories by the profitability and capital returns. Companies in this size category employed 302 persons corresponding to 234 FTE. Number of employees increased by 15.7% compare to 2017.

Enterprises with less than 10 employees generated EUR 2.1 million in 2018 with 16.4% increase compare to 2017. The smallest size category in 2018 generated EUR 0.56 million GVA with EUR 9.2 thousand GVA/FTE labour productivity. Profitability was improved significantly when after losses in 2016 – 2017 period companies generated EUR 43.0 thousand net profit in 2018 with 2.0% net profit margin. ROFTA in 2018 was 5%, however, the lowest in all size categories. Employment in 2018 increased by 13.3% to 85 employees corresponding to 61FTE.

Significant difference of the remuneration was observed among size categories of fish processing industry. For example, in 2018 the highest wages were in the enterprises of size category 50-249 employees – EUR 18.65 thousand, enterprises more than 250 employees had an annual wage around EUR 17.8 thousand. Smaller size companies, less than 10 employees and 11-49 employees paid EUR 7.1 thousand and EUR 9.1 thousand per year respectively. As the main part of fish processing enterprise has JSC status, the unpaid labour was insignificant. Total personnel

costs were composed from 98.6% of wages, paid for the employed personnel, around 1.3% were payment for external agency workers and only 0.1% of unpaid labour.

Table 5.11.3: Economic performance by size, Lithuania, 2008-2018

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Δ(2017-18)
<b>less than or equal to 10 employees</b>												
Total Income	0.3	0.4	4.2	3.4	0.0	0.0	0.6	1.9	2.4	1.8	2.1	19%
Total production costs	0.5	0.7	4.1	3.3	0.0	0.0	0.5	1.7	2.4	2.1	2.0	-3%
Gross Value Added	-0.1	-0.2	0.3	0.2	0.0	0.0	0.1	0.4	0.3	0.0	0.6	-2746%
Operating Cash Flow	-0.2	-0.3	0.1	0.1	0.0	0.0	0.0	0.2	0.0	-0.3	0.1	-129%
Earning before interest and tax	-0.2	-0.3	0.0	0.0	0.0	0.0	0.0	0.2	-0.1	-0.4	0.0	-112%
Net Profit	-0.2	-0.3	0.0	0.0	0.0	0.0	0.0	0.2	-0.1	-0.6	0.0	-107%
<b>between 11 and 49 employees</b>												
Total Income	9.2	15.0	17.0	20.5	17.1	14.3	15.4	14.7	15.4	17.2	17.6	3%
Total production costs	8.0	14.5	16.0	21.7	16.0	12.7	14.0	12.3	13.2	14.4	15.8	10%
Gross Value Added	2.0	2.8	3.0	2.0	4.2	4.5	4.5	3.8	3.9	4.5	3.8	-15%
Operating Cash Flow	1.2	0.5	0.9	-1.2	1.1	1.7	1.4	2.4	2.2	2.7	1.7	-37%
Earning before interest and tax	0.9	0.1	0.4	-1.8	0.5	1.1	1.1	2.0	1.7	2.3	1.3	-43%
Net Profit	0.3	-0.2	0.4	-1.9	0.5	1.1	1.0	2.0	1.7	2.3	1.2	-47%
<b>between 50 and 249 employees</b>												
Total Income	60.6	65.4	54.5	51.9	54.6	85.6	115.9	134.9	105.2	112.4	103.7	-8%
Total production costs	49.1	59.0	47.1	46.7	54.6	57.3	93.9	111.2	112.5	109.4	95.7	-12%
Gross Value Added	20.5	16.9	16.9	12.3	7.5	35.5	30.5	32.8	5.2	17.7	24.3	37%
Operating Cash Flow	11.4	6.4	7.4	5.3	0.0	28.3	22.1	23.7	-7.3	3.0	7.9	161%
Earning before interest and tax	9.4	4.9	5.9	3.7	-2.0	11.0	19.5	20.5	-9.6	1.1	5.6	428%
Net Profit	7.4	4.3	5.6	3.4	-2.2	9.9	19.0	19.4	-10.4	-0.4	4.6	-1343%
<b>greater than or equal to 250 employees</b>												
Total Income	152.9	176.5	222.4	239.1	275.9	263.0	353.6	370.6	369.8	416.9	428.4	3%
Total production costs	116.6	148.2	191.9	191.8	253.8	257.7	356.0	346.2	368.7	376.5	405.9	8%
Gross Value Added	49.4	45.1	45.9	65.6	41.7	31.8	27.5	50.3	34.7	76.0	62.5	-18%
Operating Cash Flow	36.4	28.3	30.6	47.3	22.1	5.4	-2.4	24.3	-0.4	38.9	21.7	-44%
Earning before interest and tax	31.8	24.5	27.4	43.6	17.9	0.6	-8.1	17.9	-6.5	32.5	14.8	-55%
Net Profit	26.1	22.5	26.2	43.9	19.3	-0.2	-9.1	15.9	-4.8	31.2	15.1	-52%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.11.5 Trends, drivers and outlook

The main drivers for processing industry at the cost level are supply and price of raw material, labour costs, whereas at the income level are demand for exports of final production and consumption in the internal market. EU policy concerning trade with third countries also plays important role as a driver in the sector viability.

During 2016-2017, average import price for fresh Atlantic salmon increased by 32%, from 4.81 EUR/kg to 6.38 EUR/kg. In the period of 2016-2018 Atlantic salmon import prices stabilized. Import price for surimi raw material in 2017 declined by 13%, but recovered back by 13.9% in 2018. Average import price for frozen Atlantic herring steadily decreased from 2016, around 10% in 2017 and 14.4% in 2018.

Around 5% of raw material in 2018 were supplied from the local aquaculture farms and landings from Baltic Sea and inland waters. Local raw material is mostly processed by the companies which processing is not main activity: aquaculture farms which has fish processing facilities and smokeries in coastal area. In 2018, industry processed around 1.6 thousand tonnes local raw material. The biggest part of local raw material from aquaculture were carps - 447 tonnes, African catfish - 200 tonnes and rainbow trout – 90 tonnes. Around 700 tonnes were processed from landings of inland waters and both from aquaculture, Processing of aquaculture production (mostly African catfish, is mostly carried out in aquaculture units which installed processing lines using the EMFF support.

The main challenge for the competitiveness is the increasing labour costs, however recent increase in labour productivity during 2016-2018 gives a positive outlook for the labour cost optimisation. Increase in the consumption of fish products in the internal market gives a good outlook from the demand side. However, decrease in the exports from the fish processing industry in 2017-2018 period indicates warning signs for the further sector growth as capacity of internal market is limited.

Concerning outlook for 2019, trade data indicates that average import price for fresh Atlantic salmon declined by 6%. Average price for surimi raw material and frozen Atlantic herring increased by 19% and is 4% respectively, compare to 2018. According to the preliminary production data in 2019, prices of the processing production were adjusted by the changes in the raw material costs.

Concerning the salaries and wages in 2019, preliminary data for the first half of 2019 shows the significant growth of average salaries. According to monthly data of National Statistical Department average annual gross salaries has increased to EUR 15.1 thousand, compared to EUR 11.1 thousand in 2018. Substantial increases in personnel costs will likely decrease the profitability levels of the sector.

#### *5.11.6 Data coverage and quality*

Population of commercial fish processing units for data collection is derived from Lithuanian State Food and Veterinary Service, register of entities, producing food of animal origin, activity fish processing. Data collection scheme is census for all enterprises which has a veterinary number and licence to produce fishery products. Based on production NACE code enterprises are divided to main activity (NACE code 10.20) and non-main activity of fish processing. Semi-annual production report contains information on used raw material by species, and origin, whereas production section disaggregated by type of product, species, weight and value as well as employment. For the main activity enterprises, layout of data allows to separate the income from fish processing and for other activities separately. In 2015, population increased significantly by 50%. Increase in size of sector was mainly due to the higher number of small fish processing units (size category less than 10 employees) included into Register of State Food and Veterinary Service according to new requirements to obtain veterinary number and permission to carry out fish processing activities. Social data for 2017 were collected by the pilot census survey. The population was chosen fixed date (December of 2017) according to the PGECON 2017 recommendation, whereas regular economic census survey asks for the average annual employment in the sector. Therefore, number of employees in regular economic data collection and survey of social data differs by 1.3%.



## 5.12 Malta

### 5.12.1 Overview

While during 2008 and 2009, the number of enterprises in the Maltese fish processing industry amounted to 7 and 10 respectively and during 2010 and 2011, the number of enterprises remained stable with 8 enterprises in the industry, it has decreased to 5 enterprises in the year 2017. Such decrease can also be reflected in total turnover of the processing sector. For 2017, the total turnover amounted to EUR 24 million, a 35% decrease from 2008's EUR 37 million turnover. It should be emphasized that 60% of the enterprises in Malta's fish processing industry belong to the smallest enterprise segment ( $\leq 10$  employees).

Despite the fact that a subsidy scheme was available for enterprises in the Maltese fish processing industry, the subsidy income has always been reported as zero since 2008.

In the Maltese fish processing sector was 85 employees in 2017. According to the FTE there were 72 FTE employees in 2017. The level of employment increased between 2008 and 2017, with total employed increasing by 52% while the number of FTEs increased by 80% over the period.

An interesting fact is that for the period 2008 to 2012, employment per enterprise has increased by 55% while the average wage has decreased by 56%. However, the average wage increased from 2011 by 104% and amounted EUR 33 thousand in 2017.

Table 5.12.1: Overview, Malta, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	$\Delta(2016-17)$
<b>Structure (number)</b>											
Total enterprises	7	10	8	8	6	6	6	5	5	5	0%
≤10 employees	6	5	8	8	4	3	3	3	3	3	0%
11-49 employees	1	5	0	0	2	3	3	2	2	2	0%
50-249 employees	0	0	0	0	0	0	0	0	0	0	0%
≥250 employees	0	0	0	0	0	0	0	0	0	0	0%
<b>Employment (number)</b>											
Total employees	56	131	19	32	56	114	114	82	85	85	0%
FTE	40	116	15	28	53	109	109	71	72	72	0%
<b>Indicators</b>											
Turnover (million €)	37	37	23	38	30	46	36	23	23	24	3%
FTE per enterprise	5.7	11.6	1.9	3.5	8.8	18.2	18.2	14.2	14.4	14.4	0%
Average wage (thousand €)	33.2	20.1	18.7	16.2	14.7	22.9	26.2	31.8	32.4	33.0	2%
Unpaid work (%)	9.5	11.9	19.8	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0%
<b>Enterprises doing fish processing not as main activity</b>											
Number of enterprises	0	0	0	0	2	0	2	2	2	2	0%
Turnover attributed to fish processing (million €)	0	0	0	0	0	0	0	0	0	0	0%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.12.2 Economic performance

The total amount of income generated by the Maltese fish processing industry, in 2017, was EUR 24.1 million.

Between 2008 and 2017 the turnover has decrease by 35%, while the profit has decreased by more than 160% in the same period. GVA and OCF have also decreased for 83% and 123%, respectively, in the same period. Maltese fish processing industry recorded also decreasing of EBIT by 148% in the period from 2008 to 2017.

Total operating cost decreased by 20% in the period 2008-2017 and amounted EUR 25.3 million in 2017. The cost of raw material (fish) are the most important cost item covers 85% of the total operating cost (-1% from 2008-2017). Wages and salaries of staff is the second most important input in the processing industry, and covers 9% of the total running cost. Wages and salaries of staff increase by 100% from 2008 to 2017. Other operational costs cover 5% and Energy costs 1% of total operating costs in 2017. Other operational costs decreased by 88% while Energy cost increased by 33% in the period 2008-2017.

GVA per employee was EUR 15.7 thousand in 2017, a decrease of 90% from 2008.

The Maltese fish processing industry had an estimated value of assets of EUR 7.8 million and a return on investment of - 20.6%.

Table 5.12.2: Economic performance indicators, Malta, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ (2016-17)
<b>Income (million €)</b>											
Turnover	37.0	37.4	23.0	37.7	29.6	46.2	35.6	22.7	23.5	24.1	3%
Other income	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Operating subsidies	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Total Income</b>	<b>37.0</b>	<b>37.4</b>	<b>23.0</b>	<b>37.7</b>	<b>29.6</b>	<b>46.2</b>	<b>35.6</b>	<b>22.7</b>	<b>23.5</b>	<b>24.1</b>	<b>3%</b>
<b>Expenditure (million €)</b>											
Purchase of fish and other raw material for production	21.8	39.4	0.0	31.7	17.9	27.1	31.2	20.3	21.1	21.6	3%
Wages and salaries of staff	1.2	2.1	0.2	0.5	0.7	2.5	2.9	2.3	2.3	2.4	2%
Imputed value of unpaid labour	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Energy costs	0.3	0.4	0.3	0.6	0.6	0.3	0.3	0.2	0.4	0.4	7%
Other operational costs	8.5	11.6	0.7	1.0	1.9	2.1	1.6	0.9	1.0	1.0	2%
<b>Total production costs</b>	<b>31.9</b>	<b>53.8</b>	<b>1.4</b>	<b>33.8</b>	<b>21.2</b>	<b>32.0</b>	<b>35.9</b>	<b>23.7</b>	<b>24.7</b>	<b>25.3</b>	<b>3%</b>
<b>Capital Costs (million €)</b>											
Depreciation of capital	1.8	3.8	0.5	0.5	0.3	0.4	0.5	0.3	0.3	0.4	6%
Financial costs, net	0.9	1.5	0.1	0.3	0.1	-0.1	-0.1	0.0	0.0	0.0	-9%
<b>Capital Value (million €)</b>											
Total value of assets	8.6	14.0	2.7	5.1	7.7	15.4	12.3	7.5	7.6	7.8	3%
Net Investments	1.3	0.3	1.3	1.4	8.5	1.3	0.9	0.3	0.3	0.3	4%
Subsidies on investments									0.0	0.0	
Debt	17.9	31.3	2.3	3.8	5.7	16.6	13.8	9.5	8.6	8.5	-1%
<b>Economic performance (million €)</b>											
Gross Value Added	6.4	-14.0	21.9	4.3	9.2	16.7	2.6	1.2	1.1	1.1	1%
Operating Cash Flow	5.1	-16.3	21.6	3.9	8.4	14.2	-0.3	-1.0	-1.2	-1.2	-3%
Earning before interest and tax	3.3	-20.1	21.2	3.4	8.1	13.8	-0.8	-1.3	-1.5	-1.6	-4%
Net Profit	2.4	-21.6	21.0	3.1	8.0	13.9	-0.7	-1.3	-1.6	-1.6	-4%
<b>Productivity and performance indicators</b>											
Labour productivity (thousand €)	160.3	-120.8	1,461.9	154.8	172.8	153.2	23.5	17.5	15.6	15.7	1%
Capital productivity (%)	74.5	-100.1	817.6	85.0	118.9	108.1	20.8	16.6	14.8	14.5	
GVA margin (%)	17.3	-37.5	95.3	11.5	31.0	36.2	7.2	5.5	4.8	4.7	
EBIT margin (%)	9.0	-53.7	92.0	8.9	27.4	29.8	-2.3	-5.8	-6.6	-6.7	
Net profit margin (%)	6.5	-57.8	91.4	8.2	27.1	30.0	-2.1	-5.7	-6.7	-6.7	
Return on Investment (%)	38.5	-143.7	789.1	66.0	105.3	89.1	-6.6	-17.6	-20.4	-20.6	
Financial position (%)	-107.5	-123.4	13.9	25.6	26.0	-7.5	-12.5	-26.2	-13.8	-9.6	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.12.3 Breakdown by company size

During 2017, 3 enterprises were categorised under segment 1 (enterprises employing less than 10 employees) while the other 2 enterprises were categorised under segment 2 (enterprises employing between 11 and 49 employees).

- **Sector less or equal 10 employees**

The total amount of income generated by this sector, in 2017, was EUR 9.7 million. Total income decrease for almost 55% over the period 2008-2017.

The value of Total production costs decreased by more than 40% from 2008 to 2017 and amounted EUR 9.8 million in 2017.

In the period between 2008 and 2017 the net profit has decreased by little less than 110%. GVA decreased for more than 90% in 2017 while OCF decreased for 104% in the same period. We recorded also decreasing of EBIT by 107% in the period from 2008 to 2017.

- **Sector 11-49 employees**

The total amount of income generated by this sector, in 2017, was EUR 14.4 million. Total income decrease for 8% over the period 2008-2017.

The value of Total production costs increased by more than 40% from 2008 to 2017 and amounted EUR 15.5 million in 2017.

In the period between 2008 and 2017 the net profit has decreased by 26%, but it was still negative. GVA and OCF have decreased for 30% and 375% in the same period. We recorded also decreasing of EBIT by almost 20% in the period from 2008 to 2017.

Table 5.12.3: Economic performance by size, Malta, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>less than or equal to 10 employees</b>											
Total Income	21.4	24.4	23.0	37.7	21.5	11.6	10.1	8.8	9.2	9.7	4%
Total production costs	16.6	28.5	1.4	33.8	15.6	7.7	10.0	8.9	9.4	9.8	4%
Gross Value Added	5.4	-2.9	21.9	4.3	6.5	4.5	0.8	0.4	0.4	0.4	3%
Operating Cash Flow	4.8	-4.2	21.6	3.9	6.0	3.9	0.2	-0.1	-0.2	-0.2	-8%
Earning before interest and tax	4.4	-5.5	21.2	3.4	5.7	3.8	0.1	-0.2	-0.2	-0.3	-8%
Net Profit	4.3	-6.1	21.0	3.1	5.7	3.8	0.1	-0.2	-0.2	-0.3	-8%
<b>between 11 and 49 employees</b>											
Total Income	15.6	13.1			8.0	34.6	25.5	13.9	14.3	14.4	1%
Total production costs	15.3	25.2			5.6	24.2	26.0	14.8	15.3	15.5	1%
Gross Value Added	1.0	-11.1			2.6	12.3	1.7	0.8	0.7	0.7	0%
Operating Cash Flow	0.4	-12.2			2.4	10.3	-0.5	-0.9	-1.0	-1.1	-2%
Earning before interest and tax	-1.1	-14.6			2.4	10.0	-0.9	-1.1	-1.3	-1.3	-3%
Net Profit	-1.9	-15.6			2.4	10.1	-0.8	-1.1	-1.3	-1.4	-3%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG

#### 5.12.4 Trends, drivers and outlook

The Maltese fish processing sector is mostly represented by enterprises, whose main products are preserving and processing of tuna, shrimps, other marine fish and other products. The processed seafood is mainly exported to the Great Britain and Italy. However Malta exports processed fish to several other EU member states and Extra EU countries such as Denmark, Spain, The Netherlands, Belgium and Libya.

In recent years, the trend in processing sardines has been decreasing while the trend for processing shrimps has been increasing. The trend for caviar, mackerel and salmon remained stable.

Due to change in demand and production, in 2012, some enterprises in the Maltese fishing process industry have replaced their old equipment with the latest technology. Such modernization is helping these enterprises to diversify their products, improve quality of the production and increase productivity. Hence the Maltese fish processing enterprises will be able to beat the challenges of foreign competition.

#### *5.12.5 Data coverage and quality*

No social data were provided.

## 5.13 Poland

### 5.13.1 Overview

In 2018, there were 247 companies involved in fish processing in Poland. 163 of them defined the primary production under the NACE Code 10.20. In the period 2008-2018 there was rather the downward trend in the number of processing plants as a result of consolidation and changes in the companies already working, also liquidation, as well as the uncertainties relating to population. The share of enterprises for which fish processing was not the main activity represented 14-20% of the total number of processing firms.

In terms of the number of processing plants, the Polish processing industry with the fish production as the main activity is dominated by small and medium sized firms. In 2018, the largest number of plants (39% of the total) employed between 11 and 49 persons, then 31% between 50 and 249, 21% less or equal to 10, and 9% employed greater or equal employed 250 persons.

The distribution of processing activity across Poland remained consistent with previous years. There is a continued dominance of processing activity in the coastal region in Pomorskie and Zachodniopomorskie region where about over 50% of Polish fish processing industry was located.

The Polish fish processing industry was highly concentrated. In 2018, most of production (72% of value) was concentrated in large fish processing companies with more than 250 employees. In 2018, despite the decrease in the number of enterprises, the average number of employees increased to 18 902 by an increase of 1% compared with the previous year and an increase of 22% compared to 2008. Most employees worked full-time and FTE amounted to 18 264 FTE demonstrated an increasing tendency from 2012. The average size of the enterprises measured by the number of FTE was 112 employees and increased by 8.6% FTE from the previous year and by 35.6% FTE from 2008. The average salary per employee (in FTE) per year reached EUR 15.2 thousand and increased by 7% and and by over 50% compared to 2008.

The value of turnover since 2012 has been growing annually, reaching EUR 2.9 billion in 2018, which is an increase of 5% over the previous year.

Table 5.13.1: Overview, Poland, 2008-2018

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Δ(2017-18)
<b>Structure (number)</b>												
Total enterprises	190	191	188	185	184	183	180	185	181	170	163	-4%
≤10 employees	57	53	49	46	49	49	51	52	35	31	35	13%
11-49 employees	68	75	76	82	73	78	65	68	77	72	63	-13%
50-249 employees	49	47	48	44	46	43	50	53	57	53	50	-6%
≥250 employees	16	16	15	13	16	13	14	12	12	14	15	7%
<b>Employment (number)</b>												
Total employees	15,489	15,357	15,176	14,809	15,090	14,783	16,775	17,743	18,947	18,633	18,902	1%
FTE	14,509	14,359	14,392	13,848	13,940	13,974	16,042	16,937	17,873	17,578	18,264	4%
<b>Indicators</b>												
Turnover (million €)	1,462	1,439	1,634	1,749	1,883	2,128	2,252	2,503	2,514	2,760	2,911	5%
FTE per enterprise	76.4	75.2	76.6	74.9	75.8	76.4	89.1	91.6	98.7	103.4	112.0	8%
Average wage (thousand €)	10.1	8.8	10.2	10.5	11.0	12.2	12.0	12.7	13.1	14.2	15.2	7%
Unpaid work (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	5%
<b>Enterprises doing fish processing not as main activity</b>												
Number of enterprises	32	34	34	37	35	38	45	42	41	42	36	-14%
Turnover attributed to fish processing (million €)	52.2	62.6	64.8	72.5	82.1	100.5	93.4	70.3	66.3	80.8	81.0	0%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.13.2 Economic performance

In 2018, the economic performance of the fish processing industry in Poland was good especially for big companies, which translated into an increase in the profitability of enterprises. The total income increased to EUR 3.38 billion, an increase of 11% compared to the previous year and 129% compared to 2008. Turnover created a significant part of the total income (86%), other income (13.7%) and the share of subsidies did not exceed 1%.

Total production costs increased to EUR 2.8 billion, an increase of 9% compared to the previous year and 110% compared to 2008. The greatest amount of total production costs (75%) was represented by the purchase of raw materials and other products needed for the production. The second cost item was represented by other operational costs (14.3%). The third by labour costs (9.7%), and the last by energy costs (1.2%).

The share of labour costs seems lower in comparison to the other EU countries and explains why Danish, Germans or French companies located their fish processing in Poland. In the period 2008-2018 all production cost groups increased significantly. The fastest rate of growth of production costs were costs of fish and other raw material, an increase of 127% compared to 2008 and 8% by 2017. The rising cost of raw materials for processing fish was determined mainly by increases in the prices of raw materials on world markets. The energy costs increased by 94% compared to 2008 and by 15% compared to 2017. The rate of growth of labour costs increased by 89% and 11%, respectively to 2008 and 2017. Other operational costs increased by 62% and 12%, respectively to 2008 and the previous year.

Table 5.13.2: Economic performance indicators, Poland, 2008-2018

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Δ(2017-18)
<b>Income (million €)</b>												
Turnover	1,462.5	1,438.6	1,634.4	1,749.1	1,883.0	2,127.7	2,251.8	2,503.3	2,514.1	2,760.2	2,911.0	5%
Other income	12.5	11.7	13.0	13.1	8.6	15.7	20.8	19.5	383.7	289.3	464.7	61%
Operating subsidies	5.7	7.0	7.3	9.6	9.7	8.8	9.4	10.5	11.1	9.4	8.8	-6%
<b>Total income</b>	<b>1,480.8</b>	<b>1,457.2</b>	<b>1,654.7</b>	<b>1,771.8</b>	<b>1,901.2</b>	<b>2,152.1</b>	<b>2,282.0</b>	<b>2,533.4</b>	<b>2,908.9</b>	<b>3,058.8</b>	<b>3,384.4</b>	<b>11%</b>
<b>Expenditure (million €)</b>												
Purchase of fish and other raw material for production	936.6	953.9	1,125.9	1,217.6	1,309.7	1,567.1	1,602.5	1,768.5	2,166.3	1,964.6	2,129.5	8%
Wages and salaries of staff	146.8	126.4	146.7	146.0	153.7	169.8	192.8	214.3	234.1	249.2	277.7	11%
Imputed value of unpaid labour	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.3	0.3	17%
Energy costs	17.4	22.0	22.6	24.8	22.6	26.2	26.4	27.7	28.2	29.4	33.8	15%
Other operational costs	251.7	234.1	275.2	275.2	323.8	298.1	309.7	361.6	382.3	361.8	407.0	12%
<b>Total production costs</b>	<b>1,352.5</b>	<b>1,336.3</b>	<b>1,570.4</b>	<b>1,663.6</b>	<b>1,809.8</b>	<b>2,061.2</b>	<b>2,131.4</b>	<b>2,372.2</b>	<b>2,811.0</b>	<b>2,605.3</b>	<b>2,848.4</b>	<b>9%</b>
<b>Capital Costs (million €)</b>												
Depreciation of capital	32.2	31.1	34.8	38.4	41.8	46.0	51.1	54.6	55.2	64.5	61.1	-5%
Financial costs, net	28.8	19.8	5.9	35.2	7.0	9.1	18.2	-17.2	-68.4	48.3	11.2	-77%
<b>Capital Value (million €)</b>												
Total value of assets	1,017.9	881.4	1,120.5	1,169.6	1,194.2	1,307.3	1,321.8	1,420.7	1,669.4	1,896.9	1,748.1	-8%
Net Investments	52.7	43.3	56.0	87.9	50.1	82.6	90.4	73.1	79.3	87.7	101.7	16%
Subsidies on investments									0.0	0.0	5.0	
Debt	686.4	564.2	709.6	708.9	725.1	819.1	817.4	872.9	1,074.4	1,023.8	1,039.3	2%
<b>Economic performance (million €)</b>												
Gross Value Added	269.3	240.4	223.7	244.6	235.5	252.0	334.0	365.1	321.0	693.7	805.3	16%
Operating Cash Flow	128.2	121.0	84.2	108.1	91.4	90.9	150.6	161.2	98.0	453.6	536.1	18%
Earning before interest and tax	96.0	89.9	49.4	69.8	49.6	45.0	99.5	106.6	42.8	389.0	475.0	22%
Net Profit	67.2	70.2	43.6	34.6	42.6	35.9	81.3	123.8	111.2	340.7	463.8	36%
<b>Productivity and performance Indicators</b>												
Labour productivity (thousand €)	18.6	16.7	15.5	17.7	16.9	18.0	20.8	21.6	18.0	39.5	44.1	12%
Capital productivity (%)	26.5	27.3	20.0	20.9	19.7	19.3	25.3	25.7	19.2	36.6	46.1	
GVA margin (%)	18.3	16.6	13.6	13.9	12.4	11.8	14.7	14.5	11.1	22.7	23.9	
EBIT margin (%)	6.5	6.2	3.0	3.9	2.6	2.1	4.4	4.2	1.5	12.7	14.0	
Net profit margin (%)	4.5	4.8	2.6	2.0	2.2	1.7	3.6	4.9	3.8	11.1	13.7	
Return on Investment (%)	9.4	10.2	4.4	6.0	4.2	3.4	7.5	7.5	2.6	20.5	27.2	
Financial position (%)	32.6	36.0	36.7	39.4	39.3	37.3	38.2	38.6	35.6	46.0	40.5	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

Economic development indicators point to further dynamic development of Polish enterprises in the fish processing industry. It can be observed that Gross Value Added increased by 16% from 2017 to 2018 and Operating Cash Flow has increased by 18% during the same period. The increase for these indicators could be explained by the faster growth of revenues than costs from 2017 to 2018.

Also EBIT and Net profit increased. This translated into the value of the indicator like EBIT margin and Net Profit margin to reach levels accordingly 14% and 12.1%. These are the best results achieved in the years 2008-2018. The main reason for the Net Profit increase was the decrease of financial cost by 44%. For comparison, net profit margin for food processing in Poland in 2018 reached 3.8%<sup>33</sup>.

The labour productivity increased compared to 2017 and to 2008, respectively by 12% and 137%. Both the average salary and labour productivity seems lower in comparison to the old EU countries.

The other economic productivity indicators such as return on investment, indicating the sector's ability to innovate, reached a very satisfactory level for investors 27.2%, one year earlier this indicator was at a level 20.5%.

Financial position has decreased to a level of 46% in 2017, compared to 40.5% in 2018, but the Polish fish processing enterprises still have a stable financial situation.

### *5.13.3 Socio-demographic structure*

The majority of employees involved in the processing sector in Poland in 2017 were female 63% followed by 37% male. The proportion of female for each size category of enterprises is similar (56-67%), with the least women ratio i.e. 56% working in micro enterprises, and the most in large enterprises as much as 67%.

54% of the of the total employed (18.902) were in the age group 40-64, followed by 38% representing people between 25-39 years, 7% for the age group 15-24 and only 1% of employees were over 65. The percentage distribution by age is similar to the total distribution in all size categories, the youngest are most often employed by medium-sized enterprises, and those most of over 65 years of age are micro-enterprises.

In terms of education the most common answer was a university degree (36% - 6,805 people), high school/specialized high school corresponding to Medium education level (35% - 6,615 people) and primary school which is low education level (29% - 5,482 people), so the distribution is very similar.

The results showed that only 2 % persons working in the processing industry are from the EU, 1% came from Non-EU/EEA and all the others (97%) were Polish citizens.

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<sup>33</sup> Industry – results of activity in 2018, GUS, Warsaw 2019.

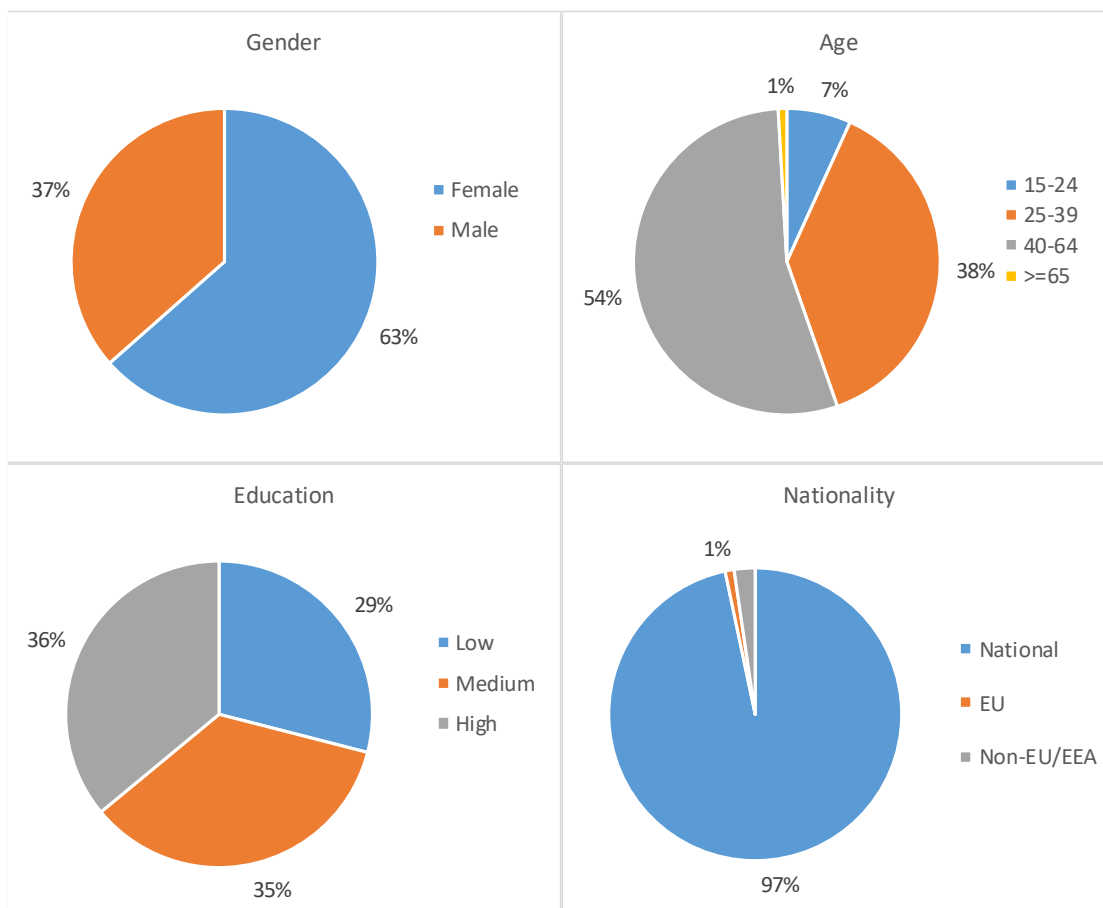


Figure 5.13.1: Socio-demographic characteristics, Poland, 2017

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

#### 5.13.4 Breakdown by company size

The economic performance of the Polish fish processing sector is mostly represented by large scale enterprises. The largest enterprises generated almost 71% of the total income (EUR 2.4 billion) and 72.5% of total cost production. For this segment, the income increased 22% and the cost increased by 21%, resulting in a net profit EUR 294 million (63% increase compared to 2017), which was the highest achieved period from 2008. From 2017 to 2018, the operating cash flow and EBIT increased 27% and 31%, respectively.

Fish processing enterprises with between 50 and 249 employees achieved by 21.6% (EUR 729 million) of the national total income. Compared to 2017, total income and total production costs decreased respectively by 11% and 15%. Companies in this size category generated EUR 217 million GVA with EUR 153 million operation CF. Net profit in 2018 reached EUR 130.9 million, which increased by 7% compared to 2017, despite the decrease in revenues.

Smaller size fish processing enterprises between 11 and 49 employees generated 6.8% (EUR 231 million) of the total income. Total income and total production costs decreased in 2018 compared to 2017, respectively by 5% and 7%. A greater decrease in costs than revenues caused that the GVA increased to EUR 51.5 million, this is an increase of 7%. Net profit in this group of enterprises reached the value of EUR 30 million.

Enterprises with less than 10 employees generated almost 1% (EUR 22.6 million) of total income in 2018 with a 1% increase compared to 2017. The smallest size category in 2018 generated EUR 10.9 million GVA with EUR 9 million operating CF. Net profit increased by 1% reaching EUR 8.5 million.



In 2018, all enterprise groups were profitable.

Table 5.13.3: Economic performance by size, Poland, 2008-2018

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Δ (2017-18)
<b>less than or equal to 10 employees</b>												
Total Income	21.6	19.9	19.5	26.9	27.3	23.2	25.0	26.8	17.6	22.3	22.6	1%
Total production costs	20.1	19.1	18.8	25.9	25.7	21.4	22.1	23.6	14.1	13.4	13.6	1%
Gross Value Added	3.2	2.1	2.2	2.9	3.5	4.2	4.6	5.0	4.3	10.6	10.9	2%
Operating Cash Flow	1.5	0.8	0.7	1.0	1.6	1.8	3.0	3.2	3.5	8.9	9.0	1%
Earning before interest and tax	1.1	0.4	0.1	0.4	1.0	1.2	2.5	2.6	3.2	8.5	8.5	0%
Net Profit	1.0	-0.9	0.0	0.2	0.8	1.1	2.4	2.8	3.2	8.4	8.5	1%
<b>between 11 and 49 employees</b>												
Total Income	149.6	136.2	156.7	193.6	194.0	229.0	177.5	199.7	210.2	242.2	231.1	-5%
Total production costs	136.0	125.1	147.7	180.3	181.2	211.8	165.3	181.8	195.6	208.3	193.6	-7%
Gross Value Added	24.5	20.3	19.3	26.2	25.3	31.9	24.7	30.3	26.7	48.3	51.5	7%
Operating Cash Flow	13.6	11.1	9.0	13.2	12.8	17.2	12.1	17.9	14.6	34.0	37.5	10%
Earning before interest and tax	10.7	8.3	5.8	8.7	8.0	11.5	6.9	12.0	8.1	26.5	30.3	14%
Net Profit	10.1	7.5	6.0	6.9	7.2	9.6	5.7	10.9	8.3	28.6	30.0	5%
<b>between 50 and 249 employees</b>												
Total Income	384.5	340.4	423.0	475.2	442.4	487.4	578.8	728.9	797.7	823.5	729.5	-11%
Total production costs	335.1	315.2	390.7	442.5	417.5	448.8	528.5	677.1	771.1	676.9	576.4	-15%
Gross Value Added	92.3	59.0	72.6	72.9	64.3	81.4	100.0	114.5	89.7	211.6	217.1	3%
Operating Cash Flow	49.3	25.2	32.3	32.7	24.8	38.6	50.4	51.8	26.5	146.6	153.1	4%
Earning before interest and tax	38.8	16.8	21.8	20.8	13.9	23.5	32.9	34.4	9.0	124.4	136.2	9%
Net Profit	31.8	10.1	17.9	14.9	11.5	19.4	27.1	28.6	1.0	122.8	130.9	7%
<b>greater than or equal to 250 employees</b>												
Total Income	925.0	960.7	1,055.4	1,076.1	1,237.6	1,412.5	1,500.7	1,578.0	1,883.5	1,970.8	2,401.2	22%
Total production costs	861.3	876.9	1,013.2	1,014.9	1,185.4	1,379.2	1,415.6	1,489.6	1,830.1	1,706.8	2,064.7	21%
Gross Value Added	149.3	159.0	129.5	142.6	142.3	134.5	204.7	215.3	200.3	423.2	525.8	24%
Operating Cash Flow	63.7	83.8	42.2	61.2	52.2	33.3	85.1	88.4	53.4	264.1	336.5	27%
Earning before interest and tax	45.4	64.5	21.8	39.9	26.8	8.7	57.3	57.6	22.5	229.6	300.0	31%
Net Profit	24.3	53.5	19.7	12.6	23.2	5.8	46.0	81.6	98.7	180.8	294.4	63%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.13.5 Trends, drivers and outlook

For 15 years of membership in the EU Poland has been developing in a sustainable way, at a rate of about 4% per year. As a result GDP per capita currently amounts to 70% of the EU average (in 2004 it was about 50%). Private consumption remains a particularly important factor in GDP growth, which is influenced by the favorable situation in the labor market, from the employees' point of view, which allows maintaining high dynamics of the payroll fund. Low interest rates, and the associated limited credit costs, have a positive effect on domestic demand.

Fish processing enterprises are one of the fastest growing food sectors in Poland. Presented figures show a developing Polish fish processing industry, with the ability of generating profits for the companies, and jobs and incomes for the involved workers.

As in the previous years in 2018 a key driver of fish processing sector development was growing exports. Imports played a dominant role in the supply of raw materials because of limited ability to harvest fish domestically from the Baltic Sea, and the limited production of Polish aquaculture. A large role of foreign trade in the fish processing industry means that its economic and financial

results are largely dependent on the exchange rate of the Polish zloty against other currencies, and trends in prices on international markets.

In 2018, in terms of the number of processing plants, Polish processing industry with the fish production as the main activity was dominated by small and medium sized firms. But most of the employed worked in the largest plants (63%) and also most of production (72% of value) was concentrated in large fish processing companies with more than 249 employees. On the Polish fish processing market, further market consolidation can be observed over the last three years. In 2016, there were 12 entities employing over 249 people on the market, currently there are 15. A further increase in employment can be observed, which indicates a positive assessment of the business climate in the fishing industry.

In 2018, the production of the fish processing industry defined as the main activity increased to 556.3 thousand tonnes (by 10.3% compared to 2017) and reached EUR 2.75 billion (increased by 6.9% compared to 2017). The increase in both the quantity and value of production is a consequence of significant technological progress in processing, a number of innovations and the introduction of an increasing group of products with a high degree of processing. The fish processing industry is an example of a perfect adaptation to the new conditions resulting from Poland's accession to the EU, and an exemplary use of the created development opportunities.

While the fish processing industry in Poland is constantly developing and the volume of production is increasing, the processing plants are facing the problem of access to labor. This is one of the main problems of today's processing. The plants attract employees from abroad, mainly from the Ukraine. The reason for this situation is the level of unemployment in Poland, which has been falling for several years, and the unattractive remuneration offered to direct production workers.

In 2019, there is still a strong increase in private and public consumption. However, there is currently some slowdown in the domestic economy, which is due to a marked slowdown in GDP growth in the euro area, especially in the German economy.

Enterprises plan to increase employment and expect an increase in prices of products delivered to the market. A positively assessed business climate in manufacturing allows forecasting about a 5% increase in production volume with a simultaneous about 9% increase in the value of production of fish processing enterprises in 2019. In 2020, Polish enterprises may face the problem of a significant increase in production costs, mainly energy and employment prices.

#### *5.13.6 Data coverage and quality*

Economic and social variables of processing industry are based on the information provided with questionnaires. The study was a census and questionnaire with economic variables, it was sent to all fish processing companies approved by the General Veterinary Inspectorate:

- to intra-community trade according to Council Regulation (EC) no. 853/2004 of April 29, 2004, which sets forth detailed requirements regarding hygiene in foodstuffs of animal origin, Appendix III Section VIII Fishery Products.
- to make direct sales in accordance with the regulation of the Minister of Agriculture and Rural Development of December 29, 2006 regarding veterinarian requirements during the production of products of animal origin for direct sale (Journal of Laws of 2015 No. 0 pos. 1703).

Answering the questionnaire is mandatory but the response rate was 87.7% in 2018 for companies defined the primary production under the NACE Code 10.20.

Data on the nationality and educational level of employees should be treated as estimates, due to the very low response rate.

## 5.14 Romania

### 5.14.1 Overview

In 2017 year, the Romania fish processing industry registered a decrease of productive enterprises in number up to 17 companies' main activity fish processing, comparing with 2016 – 19 companies, and 18 companies in 2018. The structure based on the number of employees was slightly changed, as per the table 1.2.1., namely two companies having < 10 employees, 11 between 11-49 and 4 units having 50-249 employees. Should be observed comparing with 2009 the increased total number of companies from 13 to 17, as number, and, the increased number of companies from the second segment 11-49 employees, as number, followed by companies 50-249 employees – 4 units, and only two less than 10 employees. It could be appreciated as a small trend to concentrate the capital in bigger production units, the segment 50-249 totalising 736 FTE, and the second - 260 FTE, that counted for more than 99% from total 1006 FTE in the country fish processing industry in 2017. The data recorded and transmitted by member state, as from companies issuing, as a main activity (subject of data collection) is showing the actual changed situation, due to the fact that, those producers operated significant modifications in the structure of the companies trying to keep, trying to meet consumers, whose consumption habits have increased and are changing. The number of the employees reported increased from to 564 to 1 006 as FTE, corresponding to a number of 572 in 2009 and 1025 in 2018, as number of persons.

Table 5.14.1: Overview, Romania, 2009-2018

Variable	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Δ(2017-18)
<b>Structure (number)</b>											
Total enterprises	13	18	22	14	7	10	8	19	17	18	6%
≤10 employees	3	2	7	2	0	0	1	5	2	1	-50%
11-49 employees	5	9	7	7	5	7	4	7	11	9	-18%
50-249 employees	5	5	8	5	2	3	3	7	4	8	100%
≥250 employees	0	2	0	0	0	0	0	0	0	0	0%
<b>Employment (number)</b>											
Total employees	572	1,598	1,181	780	438	510	483	1,203	1,015	1,255	24%
FTE	564	1,591	1,178	780	438	510	483	1,203	1,006	1,006	0%
<b>Indicators</b>											
Turnover (million €)	31.9	816.6	44.5	30.4	19.6	15.8	14.7	31.9	98.8	98.8	0%
FTE per enterprise	43.4	88.4	53.5	55.7	62.6	51.0	60.4	63.3	59.2	55.9	-6%
Average wage (thousand €)	3.1	4.0	4.6	3.2	1.7	2.8	4.0	3.7	7.1	10.0	41%
Unpaid work (%)	23.5	3.9	5.3	5.4	11.1	4.0	1.7	4.6	4.2	4.2	1%
<b>Enterprises doing fish processing not as main activity</b>											
Number of enterprises	30	43	29	24	24	14	18	12	15	13	-13%
Turnover attributed to fish processing (million €)	104	7	3	4		4	1	7	7	8	13%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

Due to the decreased number of companies by 13% in 2017 over 2016, the number of FTE per enterprise slightly decreased by 2.53 %, from 63.3 in 2016 to 59.2 employees per enterprise in 2017. The average wage was increased as a result of the increase in the level of the minimum wage per economy imposed by the government, which has generated the corresponding increase of wages for the other categories of employees, resulting in a total wage average increase in the processing industry with around 41%, up to 7.1 thousand € in 2017, and reaching EUR 10 million

in 2018 – both because increasing minimum salary level and the number of employees up to 1 225 persons.

Should be observed that, the unpaid labour decreased from 4.6% in 2016 to a percentage of 4.2 in 2017, having the same level in 2018, as, see Table 5.14.1.

#### 5.14.2 Economic performance

Starting with 2017 data collection for processing industry in Romania, on voluntary bases, was improved. Considering the measures took by member state the qualitative level of collecting data increased, so the economic tableau shows in 2017, a level of EUR 98.8 million in turnover, the level reported for 2018 being significantly equal to that of 2017, as per Table 5.14.2.

Table 5.14.2: Economic performance indicators, Romania, 2008-2017

Variable	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Δ(2017-18)
<b>Income (million €)</b>											
Turnover	31.9	816.6	44.5	30.4	19.6	15.8	14.7	31.9	98.8	98.8	0%
Other income	0.3	60.2	23.3	13.0	0.0	0.2	9.4	0.7	2.0	5.8	188%
Operating subsidies	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
<b>Total Income</b>	<b>32.3</b>	<b>876.9</b>	<b>67.9</b>	<b>43.4</b>	<b>19.6</b>	<b>16.1</b>	<b>24.1</b>	<b>32.6</b>	<b>100.8</b>	<b>104.6</b>	<b>4%</b>
<b>Expenditure (million €)</b>											
Purchase of fish and other raw material for production	6.4	18.5	12.2	13.2	9.7	7.4	1.9	22.7	45.3	49.0	8%
Wages and salaries of staff	1.3	6.1	5.2	2.4	0.7	1.4	1.9	4.2	6.8	9.7	41%
Imputed value of unpaid labour	0.4	0.2	0.3	0.1	0.1	0.1	0.0	0.2	0.3	0.4	43%
Energy costs	0.3	2.3	0.7	0.4	0.1	0.3	0.3	0.3	0.9	1.2	39%
Other operational costs	1.4	72.9	0.5	0.7	0.1	0.1	0.2	3.1	24.3	30.2	24%
<b>Total production costs</b>	<b>9.7</b>	<b>99.9</b>	<b>18.8</b>	<b>16.7</b>	<b>10.6</b>	<b>9.3</b>	<b>4.3</b>	<b>30.5</b>	<b>77.7</b>	<b>90.5</b>	<b>16%</b>
<b>Capital Costs (million €)</b>											
Depreciation of capital	0.6	44.6	2.3	0.8	0.6	0.5	0.4	0.6	3.2	3.1	-1%
Financial costs, net	7.0	161.6	0.0	0.0	0.2	0.2	0.3	3.5	1.2	-2.2	-281%
<b>Capital Value (million €)</b>											
Total value of assets	19.0	1,022.0	29.4	20.0	16.7	15.9	16.0	13.1	47.4	50.6	7%
Net Investments	3.4	15.3	1.0	1.1	0.2	0.5	0.6	0.5	3.8	7.9	108%
Subsidies on investments								0.1	0.0	0.8	14721%
Debt	15.9	469.9	24.1	16.6	11.5	1.1	12.5	9.4	35.2	39.5	12%
<b>Economic performance (million €)</b>											
Gross Value Added	24.3	783.2	54.5	29.1	9.8	8.2	21.7	6.5	30.2	24.2	-20%
Operating Cash Flow	22.6	777.0	49.0	26.6	9.0	6.8	19.8	2.1	23.1	14.1	-39%
Earning before interest and tax	21.9	732.4	46.7	25.8	8.4	6.3	19.4	1.4	19.9	10.9	-45%
Net Profit	15.0	570.8	46.7	25.8	8.2	6.1	19.1	-2.0	18.7	13.1	-30%
<b>Productivity and performance Indicators</b>											
Labour productivity (thousand €)	43.1	492.3	46.3	37.3	22.3	16.1	45.0	5.4	30.1	24.0	-20%
Capital productivity (%)	128.2	76.6	185.3	146.0	58.5	51.8	135.4	49.6	63.8	47.7	
GVA margin (%)	75.3	89.3	80.3	67.1	49.8	51.3	90.3	19.9	30.0	23.1	
EBIT margin (%)	68.0	83.5	68.9	59.6	43.0	39.3	80.4	4.4	19.8	10.5	
Net profit margin (%)	46.4	65.1	68.9	59.5	41.8	37.9	79.3	-6.2	18.6	12.5	
Return on Investment (%)	115.8	71.7	158.9	129.5	50.6	39.6	120.7	11.0	42.0	21.6	
Financial position (%)	15.9	54.0	18.1	17.0	30.9	93.2	21.9	28.6	25.7	22.0	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

As mentioned above, due the improved data collection, namely more accurate registration and compilation of data, achieved by member state, the analyses could be done are leading to a

consolidation sign of the industry and more stability, in terms of turnover, employees and wages level.

Total production costs are at level and percentage considerable close to the level of total incomes, as turnover and other income for the last two reported years, 2017 and 2018.

The total missing of subsidies, excepting the amount of around EUR 0.1 million granted in 2016, probably for direct small investment, is totally insignificant. The inconsistency of policies to grant such kind of subsidies, is illustrated in Table 5.14.2., no amount reported in 2017, and only EUR 0.8 million in 2018.

The enterprises are taken on their one investment operations, and this is illustrated by the level of net investments EUR 3.8 million in 2017 and EUR 7.9 million in 2018. Also the gross value of assets is considerable for the limited companies number, reaching a total of EUR 47.4 million in 2017 and EUR 50.6 million in 2018. An observation could be made in the support of last assumption looking at the level of debts EUR 35.2 million in 2017 and EUR 39.5 million in 2018 – Table 5.14.2, underlining the aspect of exclusively private actions, from own money or from other sources, are allocated by the companies to improve the quality of the production, and of way to promote and to present the products for sale.

The structure of costs respect the importance owed by boarding staff of the companies to purchases of fish and other raw material for production, followed by other operational costs, both costs categories representing around 90 % in 2017 and also in 2018 in total production costs. Having a reduce total number of employees, the wages and salaries for staff amount counts only for 8.7% in 2017 and for around 8.8% in 2018 – see Table 5.14.1.

Labour productivity was slightly decrease in 2018 versus 2017 because of the increase of salaries and wages from EUR 6.8 million to EUR 9.7 million, corresponding with an increase in the number of employees from 1 015 in 2017, to 1 255 in 2018, as persons number.

Net profit was 14.7% in 2017, while in 2018 decreased to 4.1%, mostly to the total costs increase, as in amount, as well as percentage in total income, in 2018 versus 2017. Especially the total production costs increased from EUR 77.7 million in 2017 up to EUR 90.5 million in 2018. In the same way the capital productivity decreased from 63.8% in 2017 to 47.7% in 2018, as well GVA from EUR 30.2 million in 2017 to EUR 24.2 million in 2018.

Net profit margin was also decreased from 14.6% to 3.9%, but this doesn't affect the financial position decreased from 25.7% in 2017 to 22.0% in 2018.

The variety of products is not essential changed, the industry offering mainly smoked fish, fillets, marinated fish and fish eggs salads, as main categories. As raw material there is a dependency of imported fish, dominated by the fish from other marine origin and oceans, which are not available in the Black Sea where the national fleet is operating. The species imported mainly, are: salmon, cod, mackerel, hake, and sea food – comprising: sea-shells, squid, and shrimps, as well as some varieties of Asian cyprinids. From the local fish production they using mainly trout, cyprinids, and fish-eggs and, as a new raw material Rapa whelk from Black Sea waters of Romania caught by national fleet.

We could consider, as a general view the fish processing industry is under a trend to stabilise his position in the local economy, but still having a lot of opportunities to develop it, the total production having a low level.

### *5.14.3 Socio-demographic structure*

Despite the fact that the age segments are different from the recommended ones, the analyse reveal that the young people counts for 21% (less than 30 years old), the predominant groups being those of 40-50 years – 35% and 30-40 years for 26%, and a significant percentage – 18% over 50 years old.

By the educational level, 56% of the employees have a medium educational level, 32% low educational level and only 12% high educational level. The issue should be in the attention in the future for the national authorities to promote such public policies to encourage the young people to come in the sector ensuring its development.

As per the nationality of the people hired in processing industry, it could be observed that 98% is EU citizenship, more precise Romanian one, despite the just 2% recorded as unknown. This aspect is due to the high level of correctness of those who processed the data from the questionnaires, ensuring a high level of accuracy.

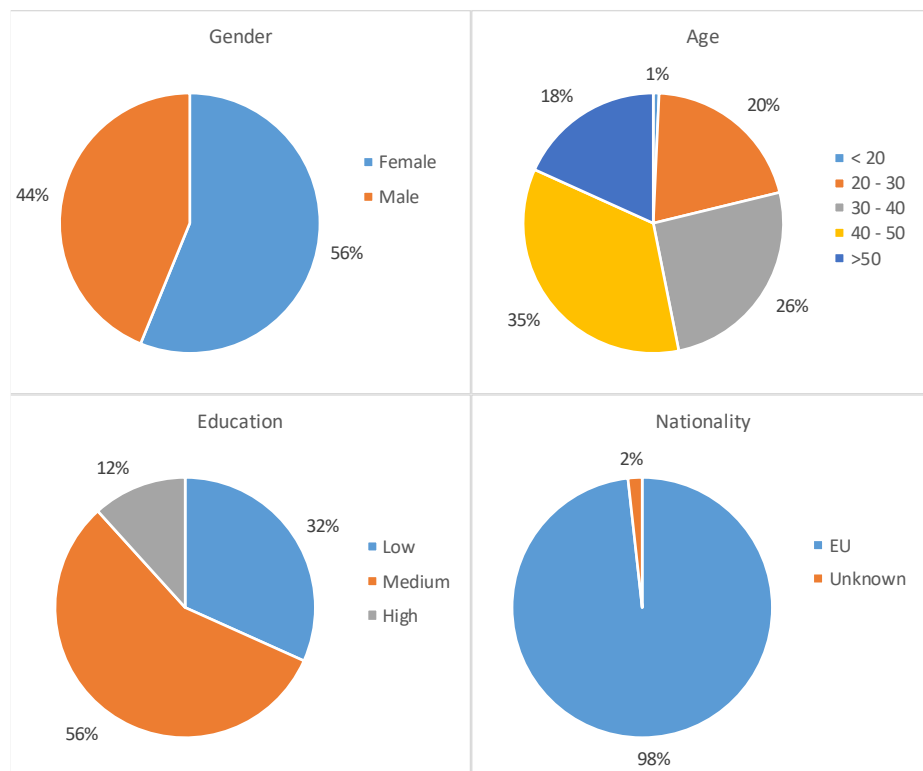


Figure 5.14.1: Socio-demographic characteristics, Romania, 2017

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

#### 5.14.4 Breakdown by company size

The decreasing trend of the number of companies with less than 10 employees is the single explanation of the reduce amount of total income recorded, amounting just EUR 1 million in 2017 and EUR 0.8 million in 2018. Total production costs in 2017 represent 30% from the total income in 2017 and around 60% in 2018, due to the impact of salaries increase governmental policies. But the totals for the registered figures are smaller in 2018 than in 2017 due to the reduced number of the companies, at 2 in 2017 and only one in 2018, so that the GVA is in decline from EUR 1.1 million to EUR 0.3 million, as well as the operational cash flow from EUR 1 million to EUR 0.3 million and net profit from EUR 0.7 million to EUR 0.2 million.

The segment of less than 10 employees is not representative for the industry.

The segment of companies 11-49 employees most representative as number in 2017 reaching 11 productive units, comparing with 7 in 2016, and 9 in 2018. Despite its importance the segment counts only for EUR 14.1 million as total income in 2017, and EUR 11.6 million in 2018. The continuing reduction of number as companies was determinate by the negative profit reported by those company, namely EUR -7.2 million in 2016, EUR -2 million in 2017, and this situation

explain the trend of reducing number. The situation was improved in 2018, the profit being EUR 0.9 million.

The segment of bigger companies 50-249 employees is the second as number of productive units counting 4 companies in 2017, versus 7 in 2016, and finally 8 companies in 2018. The GVA in 2017 calculated for these companies is EUR 25.1 million, while in 2018 this is EUR 20.9 million, mainly to the increased total production costs from EUR 66 million in 2017, up to EUR 80 million in 2018. This is the made cause leading to decreased values for operating cash flow from EUR 19.4 million in 2017 to EUR 12.3 million in 2018, as well as a net profit decrease from EUR 16 million in 2017 to EUR 2.9 million in 2018. It could be observed a decreased number of companies in 2017 versus 2016, and an increased number in 2018 versus 2017; this can be interpreted as a search for the sector to determine the optimal dimensions, in an attempt to cope with the competition of supermarkets and small businesses that offer to the population whole fish for sale. There is still a high level of consumption for whole fish, which is more affordable than fish products.

Table 5.14.3: Economic performance by size, Romania, 2008-2017

Variable	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Δ(2017-18)
<b>less than or equal to 10 employees</b>											
Total Income	2.3	0.5	0.3	0.5	0.0	0.0	0.1	1.1	1.3	0.8	-42%
Total production costs	1.5	0.1	0.1	0.6	0.0	0.0	0.0	0.8	0.3	0.5	52%
Gross Value Added	1.3	0.5	0.2	-0.1	0.0	0.0	0.0	0.4	1.1	0.3	-72%
Operating Cash Flow	0.9	0.5	0.2	-0.1	0.0	0.0	0.0	0.3	1.0	0.3	-73%
Earning before interest and tax	0.8	0.5	0.2	-0.2	0.0	0.0	0.0	0.1	1.0	0.3	-74%
Net Profit	0.8	0.5	0.2	-0.2	0.0	0.0	0.0	-0.1	1.3	0.2	-80%
<b>between 11 and 49 employees</b>											
Total Income	10.1	5.4	8.5	11.3	2.3	3.4	1.8	4.9	14.1	11.6	-18%
Total production costs	1.4	2.6	3.1	4.3	2.0	2.2	1.4	8.8	11.4	10.0	-12%
Gross Value Added	9.2	3.3	6.0	7.5	0.8	1.9	0.6	-3.1	4.1	3.0	-28%
Operating Cash Flow	8.7	2.8	5.4	6.9	0.3	1.1	0.4	-3.9	2.7	1.5	-43%
Earning before interest and tax	8.4	2.0	5.0	6.6	0.1	0.9	0.3	-4.0	2.0	1.3	-34%
Net Profit	8.2	0.8	5.0	6.6	0.1	0.9	0.3	-7.2	0.1	1.6	2075%
<b>between 50 and 249 employees</b>											
Total Income	19.8	48.3	59.1	31.6	17.3	12.7	22.3	26.7	85.4	92.3	8%
Total production costs	6.8	17.1	15.7	11.8	8.6	7.0	2.9	21.0	66.0	80.0	21%
Gross Value Added	13.8	34.7	48.3	21.6	9.0	6.4	21.0	9.2	25.1	20.9	-17%
Operating Cash Flow	13.0	31.2	43.4	19.8	8.7	5.6	19.4	5.7	19.4	12.3	-37%
Earning before interest and tax	12.8	29.5	41.6	19.4	8.4	5.4	19.1	5.3	16.9	9.4	-45%
Net Profit	6.0	28.2	41.6	19.4	8.1	5.1	18.8	5.3	17.4	11.3	-35%
<b>greater than or equal to 250 employees</b>											
Total Income	822.6										
Total production costs	80.1										
Gross Value Added	744.6										
Operating Cash Flow	742.5										
Earning before interest and tax	700.4										
Net Profit	541.3										

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

#### *5.14.5 Trends, drivers and outlook*

The processing industry in Romania has to count more and more for the domestic fishery production, to reduce the costs of purchase of fish, mainly, as well as to have a consolidated professional organization representing the productive units in the dialog with national authorities and to the decision making process.

The fluctuating number of companies from year to year is conducting to contradictory economic results, the sector have enough margin to develop. There are not, yet, powerful investors, only few companies having a constant production among more than 10 years. This is a structural issue for the fish processing industry in member state, not yet correctly addressed by investors.

The less qualified staff is one of other challenge for sector development.

Considering the assortments of products offered for sale, despite the increase amount invested, could be observed the preference to product salads, smoked and marinated fish, which are very easy to be sold. Also, these products ensure a good profitability because the recipes are simple and the ingredients used, other than fish, are not high priced.

The import of fish is still high, covering the needs of ocean/sea fish demand on the market, due to the fact the Romanian fishing fleet is acting only in the Black Sea waters of national jurisdiction, and catches are not exceeding 9 000 tonnes per year.

Is still persisting the huge challenge from super markets chains, dominating the national market, the contribution of the sector to the national GDP is insignificant, as the whole fishing sector in the country.

#### *5.14.6 Data coverage and quality*

The transmitted data for the last 2 years, 2017 and 2018, shows an improvement of data collection organization, ensuring a better analyse of the sector, in terms of coverage. Working on the quality of data is recommended to allow a most accurate picture of the industry and its connection with local activities, such as fishery (inland and marine) and aquaculture, mainly. More cross checks are needed, example given: nationality of employees declared unknown for the last data call. Also member state is to transmit number of hours worked, despite the fact this data is not used in the analysis.

As a final remark, no significant data issues were encountered, so the analysis are sound and reflecting the evolution of the industry in the analysed period during 2009-2019 years.



## 5.15 Slovakia

### 5.15.1 Overview

Slovakia as a landlocked country has no marine fisheries or registered fleets of fishing vessels, nor any areas suitable for industrial inland fishing. However, Slovakia has a long tradition of commercial fish farming and recreational fishing. The larger part of production is sold through single-phase marketing, but recent years have seen a gradually increasing trend for end consumers to buy fish directly from fish farms. The fish processing sector produces around 320 tonnes of high-quality freshwater fish and 5 200 tonnes of seafood products every year<sup>34</sup>.

According to submitted data, in 2017, Slovakia's fish processing industry consisted of 8 enterprises with the main activity of fish processing, of which 50% were considered small and medium-sized-companies regarding employment. In 2017, the total income of processing industry was EUR 94.6 million with 11% annual decrease. Their capacity is higher than their production.

In 2017, the total amount of imported fish and fishery products was worth USD 104.5 million, with Czech Republic, Poland, Germany and Spain as main suppliers. In 2017, exports of fish and fishery products were valued at USD 10.7 million, with the bulk (48%) exported to Czech Republic<sup>35</sup>.

Table 5.15.1: Overview, Slovakia, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>											
Total enterprises	11	12	11	11	11	13	10	9	9	8	-11%
≤10 employees	1	2	2	2	2	3	1	1	1	1	0%
11-49 employees	4	4	4	5	5	6	5	4	4	4	0%
50-249 employees	6	6	5	4	4	4	3	4	3	2	-33%
≥250 employees	0	0	0	0	0	0	1	0	1	1	0%
<b>Employment (number)</b>											
Total employees	1,095	958	830	703	683	754	818	657	736	632	-14%
FTE											0%
<b>Indicators</b>											
Turnover (million €)	95.61	72.36	70.80	68.46	71.32	76.64	80.09	85.81	89.60	92.41	3%
FTE per enterprise											
Average wage (thousand €)*	8.7	7.9	8.4	8.9	8.7	9.4	10.7	10.5	9.1	10.5	15%
Unpaid work (%)											

\* calculated on total employment

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

<sup>34</sup> [https://ec.europa.eu/fisheries/sites/fisheries/files/docs/body/op-slovakia-fact-sheet\\_en.pdf](https://ec.europa.eu/fisheries/sites/fisheries/files/docs/body/op-slovakia-fact-sheet_en.pdf)

<sup>35</sup> <http://www.fao.org/fishery/facp/SVK/en>

### 5.15.2 Economic performance

In 2017, the total income for the Slovakian fish processing industry reached almost EUR 94.6 million, which was a decrease of 11% compared to 2016. The total income consists of turnover, other income (not reported) and subsidies of which turnover makes up for 97.7%.

The total amount of production costs by the Slovakian fish processing industry in 2017 was almost EUR 96.8 million. Compared to 2016, the total production costs decreased by 10% in 2017. Personnel costs accounted 6.8% and other operational costs 0.4% of expenditures.

Slovakia submitted only consumption of fixed capital from all capital costs variables. In 2017, consumption of fixed capital reached EUR 2.7 million, an 8% decrease compared to 2016.

Table 5.15.2: Economic performance indicators, Slovakia, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Income (million €)</b>											
Turnover	95.61	72.36	70.80	68.46	71.32	76.64	80.09	85.81	89.60	92.41	3%
Other income											
Operating subsidies	0.00	0.00	0.00	0.00	0.10	0.03	0.04	0.03	0.00	0.00	
<b>Total Income</b>	<b>107.97</b>	<b>81.81</b>	<b>79.62</b>	<b>76.40</b>	<b>83.84</b>	<b>91.25</b>	<b>96.05</b>	<b>103.51</b>	<b>106.43</b>	<b>94.56</b>	<b>-11%</b>
<b>Expenditure (million €)</b>											
Purchase of fish and other raw material for production											
Wages and salaries of staff	9.55	7.57	7.00	6.25	5.97	7.09	8.72	6.88	6.67	6.61	-1%
Imputed value of unpaid labour											
Energy costs											
Other operational costs									0.47	0.39	-17%
<b>Total production costs</b>	<b>108.08</b>	<b>83.16</b>	<b>79.91</b>	<b>77.57</b>	<b>84.48</b>	<b>90.39</b>	<b>94.86</b>	<b>102.17</b>	<b>107.10</b>	<b>96.87</b>	<b>-10%</b>
<b>Capital Costs (million €)</b>											
Depreciation of capital		3.73	2.73	2.60	2.60	2.74	2.66	2.44	2.95	2.72	-8%
Financial costs, net											
<b>Capital Value (million €)</b>											
Total value of assets	53.92	47.85	38.62	37.69	37.78	44.47	51.08	51.42	65.53	50.42	-23%
Net Investments	5.04	3.63	2.50	2.73	2.48	1.84	3.13	0.45	14.74	14.76	0%
Subsidies on investments	0.52	0.14	0.38	0.36	0.96	0.23	0.64	0.00	0.00	0.21	
Debt	19.47	14.30	13.22	12.83	15.03	17.91	12.83	14.53	29.29	32.84	12%
<b>Economic performance (million €)</b>											
Gross Value Added	9.4	6.2	6.7	5.1	5.2	7.9	9.9	8.2	6.0	4.3	-28%
Operating Cash Flow	-0.1	-1.3	-0.3	-1.2	-0.6	0.9	1.2	1.3	-0.7	-2.3	-242%
Earning before interest and tax	-0.1	-5.1	-3.0	-3.8	-3.2	-1.9	-1.5	-1.1	-3.6	-5.0	-39%
Net Profit											
<b>Productivity and performance Indicators</b>											
Labour productivity (thousand €)*	8.62	6.49	8.09	7.23	7.66	10.50	12.07	12.47	8.14	6.81	-16%
Capital productivity (%)	17.5	13.0	17.4	13.5	13.9	17.8	19.3	15.9	9.1	8.5	-7%
GVA margin (%)	8.7	7.6	8.4	6.7	6.2	8.7	10.3	7.9	5.6	4.5	-19%
EBIT margin (%)	-0.1	-6.2	-3.8	-4.9	-3.9	-2.1	-1.5	-1.1	-3.4	-5.3	-56%
Net profit margin (%)											
Return on Investment (%)											
Financial position (%)	63.9	70.1	65.8	66.0	60.2	59.7	74.9	71.7	55.3	34.9	-37%

\* calculated on total employment

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

According to submitted data on costs, the valued added produced by the industry is decreasing in last years (since 2015 almost halved) and, in 2017, still a decrease of -28% if compared to the previous year, mostly due to the decrease in the total income. A larger decrease is observable in the operating cash flow and in the earning before interests and tax, even if capital costs (only depreciation) is considered for the calculation of the latter indicator.

All the other productivity and performance indicators show a worsening trend.

### 5.15.3 Socio-demographic structure

Slovakia submitted only employment by gender. In 2017 there were 632 workers employed in fish processing plants, of which 60% were females and 40% males. From 2008 trend for number of persons employment is decreasing.

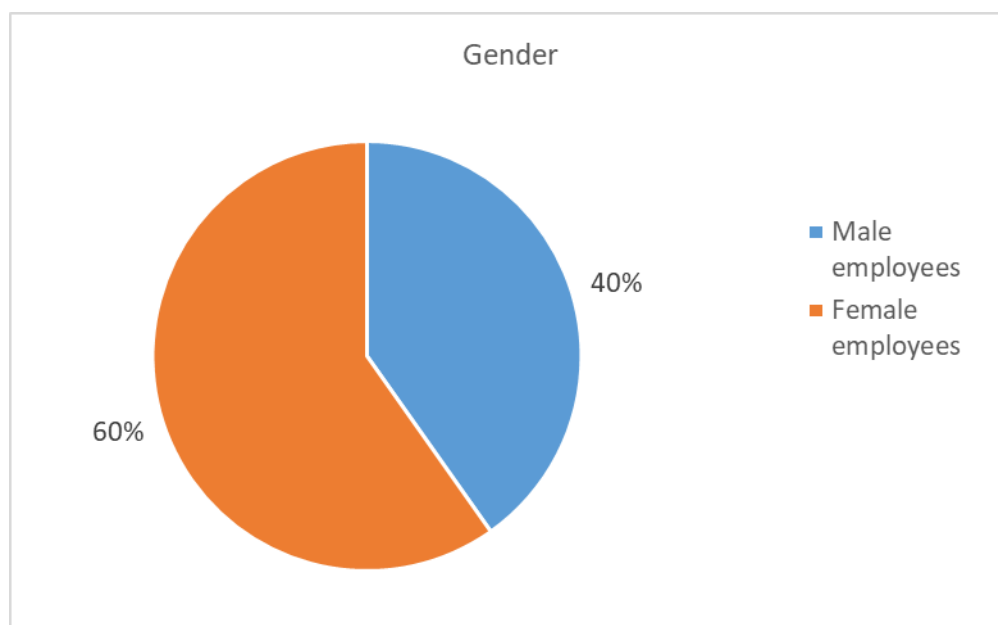


Figure 5.15.1: Socio-demographic characteristics, Slovakia, 2017

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.15.4 Trends, drivers and outlook

Through enhanced communication with consumers, Slovakia aims to boost current low domestic consumption of fish throughout the year, and thereby also address the seasonality of fish consumption in the country.

Through EMMF<sup>36</sup>, Slovakia aims to:

- modernise and increase productivity of the processing sector,
- contribute to energy savings and improved safety, hygiene, health and working conditions,
- improve market organisation,
- increase profitability and sustainability of the entire market chain

<sup>36</sup> [https://ec.europa.eu/fisheries/sites/fisheries/files/docs/body/op-slovakia-fact-sheet\\_en.pdf](https://ec.europa.eu/fisheries/sites/fisheries/files/docs/body/op-slovakia-fact-sheet_en.pdf)

- organise targeted communication and promotional campaigns designed to raise Slovak public awareness of sustainable fishery and aquaculture products.

EMFF funding will also support marketing measures aimed at finding new markets and improving conditions for market placement of fishery and aquaculture products.

#### *5.15.5 Data coverage and quality*

Slovakia submitted fish processing data for the first time, but they have tried to cover also the time period under the previous data collection programme. Indeed, a data series for 2008-2018 has been provided.

Slovakia submitted some economic and raw material data but not in the format requested for official data submission. Data for non-main activity companies and social data (beside gender) have not been submitted but it is in line with the Slovakia Work plan.

Income and cost items are reported, where possible, detailed, according to data submitted. Other income were submitted but the inconsistency between the total income and the details of income items provided let think that other income are higher than what provided.

Data for 2018 were omitted in the analysis because of some inconsistency with the series (e.g. most likely partial data).

In cross-checking data submitted with other sources (i.e. Eurostat SBS) experts observed that the turnover submitted could represent total turnover (not only turnover from the processing of fish products). An attempt to obtain more information from people in charge of data collection in Slovakia was done, but with no results.

## 5.16 Slovenia

### 5.16.1 Overview

In 2017, there were 18 companies in the Slovenian fish processing sector. In 2017, Slovenia had 14 companies with less than 10 employees and four companies with 11-49 employees. Among them are 8 companies with fish processing as not main activity. These companies generate EUR 14.4 million of turnover from fish processing, which representing 43% of all turnover from fish processing activities.

In 2017 the turnover was EUR 32.9 million. Between 2008 and 2017 the turnover of Slovenian fish processing industry increased by 13% (see Table 5.16.1).

The value of raw material decreased by 34% from 2008 to 2017 and amounted EUR 10.9 million in 2017.

Table 5.16.1: Overview, Slovenia, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>											
Total enterprises	12	13	13	14	15	14	13	12	16	18	13%
≤10 employees	7	9	8	8	10	9	7	7	11	14	27%
11-49 employees	4	3	3	3	2	2	4	3	5	4	-20%
50-249 employees	1	1	2	3	3	3	2	2	0	0	0%
≥250 employees	0	0	0	0	0	0	0	0	0	0	0%
<b>Employment (number)</b>											
Total employees	250	223	266	379	354	351	221	209	122	132	8%
FTE	211	210	234	351	306	325	211	209	112	130	17%
<b>Indicators</b>											
Turnover (million €)	29.0	26.1	28.6	35.4	32.3	30.0	24.4	25.7	30.9	32.9	7%
FTE per enterprise	17.6	16.2	18.0	25.1	20.4	23.2	16.2	17.4	7.0	7.2	4%
Average wage (thousand €)	21.4	21.5	26.4	22.8	17.1	22.4	26.9	24.9	26.6	24.9	-6%
Unpaid work (%)	4.2	3.6	1.1	0.7	0.4	0.3	0.5	0.5	0.0	0.0	0%
<b>Enterprises doing fish processing not as main activity</b>											
Number of enterprises	8	8	9	8	7	6	6	4	6	8	33%
Turnover attributed to fish processing (million €)	14.4	12.9	16.0	9.8	8.0	7.0	6.8	7.0	12.8	14.4	12%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

In the Slovenian fish processing sector there were 132 employees in 2017. According to the FTE there were 130 FTE employees in 2017. The level of employment decreased between 2008 and 2017, with total employed decreasing by 47% while the number of FTEs decreased by 38% over the period.

Mean wage per employee in the Slovenian fishing processing industry amounted EUR 24.9 thousand in 2017 and it was 28% higher from average wage in Slovenia in the same year, which was EUR 19.5 thousand. Mean wage in fish processing sector increased by 16% from 2008 to 2017.

Slovenian fish processing industry mainly depends on imports of raw materials. The raw material for fish processing industry is traded from all over the world, but most of the raw material comes from the EU, especially from Spain, Italy and Croatia.

In 2018 Slovenia imported 18.6 thousand tonnes of fish and fish products, while the Slovenian volume of landings for this year amounted 120 tonnes. In the same year

Slovenian aquaculture sector has produced 1.7 thousand tonnes of fish and shellfish.

The main products in Slovenian fish processing industry are various fish cans, Tuna pate, dried cod spread, and products from cephalopods, Atlantic salmon and hake filet. Turnover from the Fish cans and tuna pate represents 75% of all turnovers from Slovenian fish processing sector.

In the period 2010-2017, especially from 2010-2013, Slovenian fisheries processing sector underwent major structural changes. Small businesses are brought together in larger companies which have more impact on the market. Some of the larger companies that are dealing with different types of processing activities, separated fish processing from other activities formed a new smaller companies which are exclusively engaged in the processing of fish and other marine organisms. Consequently, the share of other costs (packing costs, insurance costs etc.) in total costs has increased significantly in the period 2008-2017 (+240%). The structural changes made in Slovenian fish processing sector had impact also in Slovenian employment trends in period 2008-2017.

Most of the Slovenian fish processing companies were located on the Slovenian coast before structural changes was made in the period 2010-2013. Now we can notice even distribution of fish processing companies throughout the country.

#### *5.16.2 Economic performance*

The total amount of income generated by the Slovenian fish processing industry, in 2017, was EUR 220.2 million. This consists of EUR 32.9 million in turnover and EUR 187.3 million in other income.

Slovenia has just a few processing companies that are entirely committed to fishery products. Most companies do have different types of processing activities, of which fish may be one, but not necessarily the most important one. That is the reason for large share of other income in total income. Other income of companies with less than 50% activities in fish processing (8 companies) amounted EUR 183.9 million in 2017 which is 98% of all other income in 2017. Most of this share, EUR 164.4 million or 88% of all other income, contributed just one company which is, on the other hand, one of the largest fish processing companies and thus of great important for Slovenian fish processing industry.

In the period 2008 - 2017 Slovenian fisheries processing sector underwent major structural changes. Small businesses are brought together in larger companies which have more impact on the market. Some of the larger companies that are dealing with different types of processing activities, separated fish processing from other activities formed a new smaller companies which are exclusively engaged in the processing of fish and other marine organisms. There was also a general tendency to reduce primary processing so some enterprises also switched to resale.

Between 2008 and 2017 the turnover has increase by 13%, while the profit has decreased by 25% in the same period and remains negative. GVA and OCF have also decreased for 13% in the same period. We recorded also decreasing of EBIT by 13% in the period from 2008 to 2017.

The decreased value of performance indicators are mainly due a large increased value of other operational costs, as a result of structural changes made in Slovenian fish processing sector. Other operational costs increased significantly in the period 2008-2017 (+240%). However the increase was not observed in all companies equally. In 2010, one middle size company, with very high operation costs (around 8 millions) entered in fish processing. Furthermore the significantly increase of other operational costs (+450% in the period 2008-2017) was recorded in another fish processing company. The reason for that increase is mainly due higher packing costs.

Total operating cost increased by 36% in the period 2008-2017 and amounted EUR 35.7 million in 2017. Other operational costs are the most important cost item covers almost 60% of the total operating cost (+240% from 2008-2017). The cost of raw material (fish) is the second most important input in the processing industry, and covers 30% of the total running cost. Raw material costs decrease by 34% from 2008 to 2017. Two main species used in Slovenian fish

processing sector are mackerel and tuna. Wages and salaries of staff cover 9% and energy costs less than 2% of total operating costs in 2017. Wages and salaries and energy cost decreased in the period 2008-2017 by 23% and 16%, respectively.

GVA per employee was EUR 29.6 thousand in 2017, which is below the Slovenian GVA per employee average of the same year – EUR 43.1 thousand.

The Slovenian fish processing industry had an estimated value of assets of EUR 37.9 million and a return on investment of - 1.5%.

Table 5.16.2: Economic performance indicators, Slovenia, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Income (million €)</b>											
Turnover	29.0	26.1	28.6	35.4	32.3	30.0	24.4	25.7	30.9	32.9	7%
Other income	209.6	176.6	178.6	186.8	217.5	216.7	211.3	222.3	178.0	187.2	5%
Operating subsidies	0.4	0.0	0.1	0.0	0.1	0.0	0.0	0.4	0.0	0.0	0%
<b>Total Income</b>	<b>29.5</b>	<b>26.1</b>	<b>28.7</b>	<b>35.4</b>	<b>32.3</b>	<b>30.0</b>	<b>24.4</b>	<b>26.1</b>	<b>208.8</b>	<b>220.2</b>	<b>5%</b>
<b>Expenditure (million €)</b>											
Purchase of fish and other raw material for production	16.5	15.6	11.1	12.2	11.2	8.3	7.7	8.8	11.0	10.9	-1%
Wages and salaries of staff	4.3	4.4	6.1	8.0	5.2	7.2	5.6	5.2	3.0	3.3	9%
Imputed value of unpaid labour	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0%
Energy costs	0.6	0.9	0.9	1.1	1.4	1.5	1.0	1.2	0.3	0.5	35%
Other operational costs	4.6	2.4	6.6	15.2	12.5	14.5	11.1	13.1	14.8	21.1	43%
<b>Total production costs</b>	<b>26.2</b>	<b>23.5</b>	<b>24.7</b>	<b>36.5</b>	<b>30.3</b>	<b>31.5</b>	<b>25.5</b>	<b>28.4</b>	<b>29.0</b>	<b>35.7</b>	<b>23%</b>
<b>Capital Costs (million €)</b>											
Depreciation of capital	1.3	1.4	1.3	1.4	1.3	1.1	0.9	1.0	1.3	1.2	-6%
Financial costs, net	2.4	0.4	0.4	0.7	0.7	0.6	0.3	0.2	0.0	-0.1	674%
<b>Capital Value (million €)</b>											
Total value of assets	53.0	28.0	22.5	32.2	27.7	32.1	22.2	25.7	34.3	37.9	11%
Net Investments	0.8	0.5	0.3	0.3	0.4	0.3	0.5	4.1	1.0	0.6	-36%
Subsidies on investments									0.3	0.0	-100%
Debt	41.2	12.8	11.4	14.0	17.5	20.2	11.1	11.8	15.0	17.5	17%
<b>Economic performance (million €)</b>											
Gross Value Added	7.4	7.2	10.1	6.9	7.2	5.8	4.6	2.5	4.8	0.5	-90%
Operating Cash Flow	3.3	2.7	4.0	-1.1	2.0	-1.5	-1.1	-2.3	1.8	-2.8	-251%
Earning before interest and tax	2.0	1.3	2.7	-2.5	0.7	-2.5	-2.0	-3.3	0.6	-3.9	-811%
Net Profit	-0.4	0.9	2.2	-3.2	0.0	-3.2	-2.2	-3.5	0.6	-3.8	-770%
<b>Productivity and performance Indicators</b>											
Labour productivity (thousand €)	34.9	34.2	43.1	19.7	23.5	17.9	21.7	12.1	42.9	3.8	-91%
Capital productivity (%)	13.9	25.6	44.7	21.5	25.9	18.1	20.5	9.8	14.0	1.3	
GVA margin (%)	3.1	3.5	4.9	3.1	2.9	2.4	1.9	1.0	2.3	0.2	
EBIT margin (%)	0.8	0.6	1.3	-1.1	0.3	-1.0	-0.8	-1.3	0.3	-1.8	
Net profit margin (%)	-0.2	0.4	1.1	-1.4	0.0	-1.3	-1.0	-1.4	0.3	-1.7	
Return on Investment (%)	3.8	4.6	11.8	-7.8	2.5	-7.9	-8.9	-12.7	1.6	-10.4	
Financial position (%)	22.2	54.3	49.6	56.4	36.8	37.2	50.2	54.0	56.3	53.8	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

In the table above all data regarding Other Income are presented, but for the calculation of economic performance indicators (GVA, OCF, labour productivity etc.) only other income from companies which fish processing is the main activity was used.

### 5.16.3 Socio-demographic structure

The collection of social indicators for the Slovenian processing sector started in 2017. The variables were included in the annual economic survey, which gave the opportunity of collecting Census data. All of the mandatory parameters - age distribution, nationality, education and employment status were collected at enterprise level, so they were available by size categories.

The majority employees involved in the processing sector in Slovenia in 2017 were male, representing 52% off all employees. Employment by gender for each size category of enterprises is similar than for all sector.

The age groups used during the data collection were 15-24, 25-39, 40-64 and  $\geq 65$ .

72% of the of the total employed (95) were in the age group 40-64, followed by 26% representing people between 25-39 years and 2% for the age group below 24 years. No employees were in age group  $\geq 65$  in 2017. The percentage distribution by age is similar to the total distribution in all size categories of Slovenian fish-processing companies.

In terms of education the most common answer was high school/specialized high school corresponding to Medium education level (56% - 74 people), followed by university degree equally to High education level (27% - 36 people) and primary school which is Low education level (17% - 22 people). Also in terms of education level by size category distribution is similar than for total population.

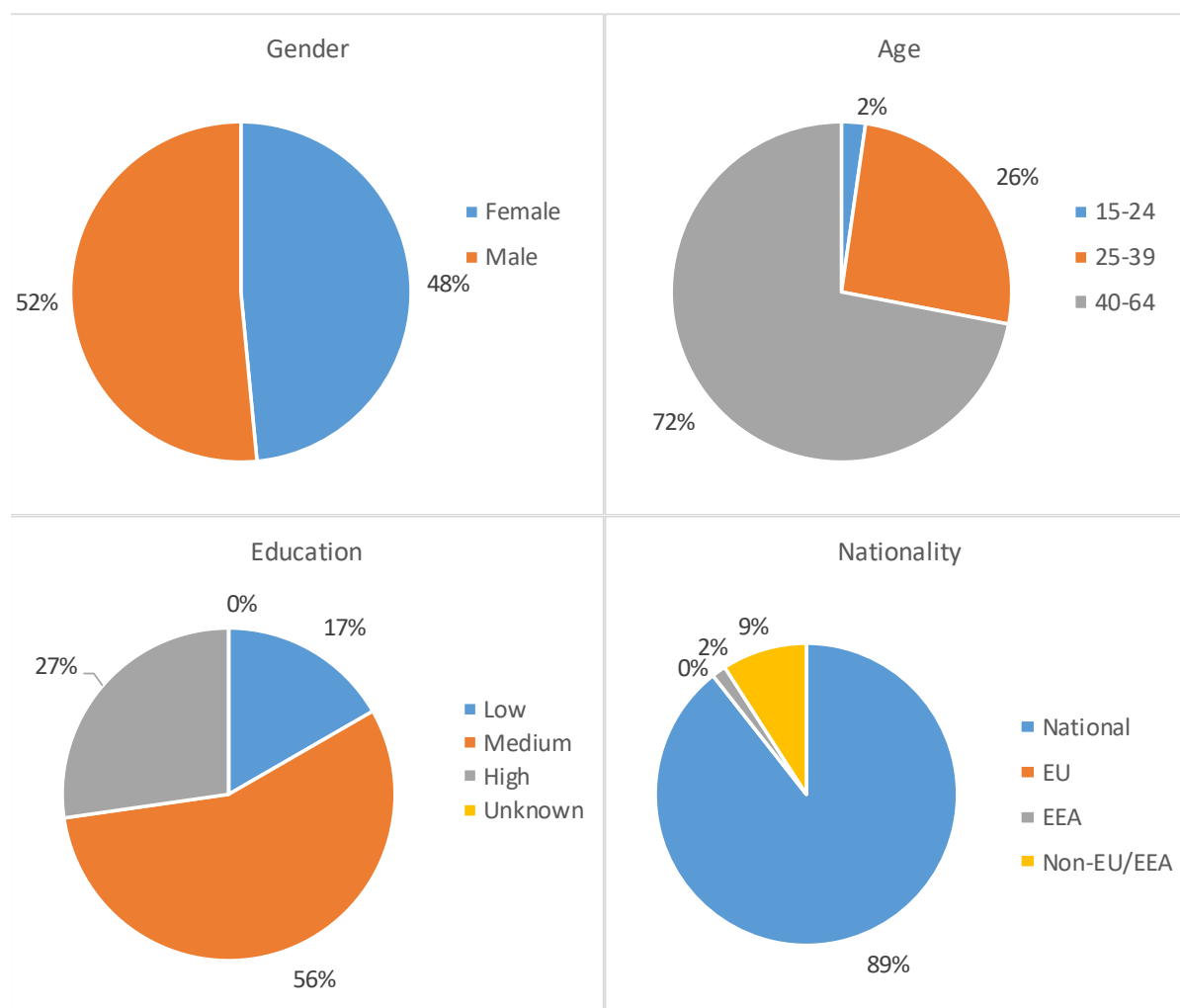


Figure 5.16.1: Socio-demographic characteristics, Slovenia, 2017

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.



#### 5.16.4 Breakdown by company size

In 2017, there were 18 companies in the Slovenian fish processing sector. Among them were 14 companies with less than 10 employees and four companies with 11-49 employees. In Slovenia there is no middle or large fish processing company with more than 50 employees.

- **Sector less or equal 10 employees**

The total amount of income generated by this sector, in 2017, was EUR 37.9 million. This consists of EUR 16.2 million in turnover and EUR 21.7 million in other income. Total income increase for almost 50% over the period 2008-2017.

The value of Total production costs increased by 487% from 2008 to 2017 and amounted EUR 18.2 million in 2017. Increase of total production cost is mainly due to the entry of one company, with high other operation costs, into this segment in 2017.

In the period between 2008 and 2017 the net profit has increased by 300%. GVA increased for more than 240% in 2017 while OCF increased for 230% in the same period. We recorded also increasing of EBIT by 100% in the period from 2008 to 2017.

The main products in the present sector are various fish cans, dried cod spread and products from cephalopods.

Table 5.16.3: Economic performance by size, Slovenia, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ (2016-17)
<b>less than or equal to 10 employees</b>											
Total Income	3.4	4.0	3.7	3.3	2.4	2.2	1.6	2.0	3.5	16.2	361%
Total production costs	3.1	3.6	3.7	3.2	2.3	2.5	1.5	1.9	3.4	18.2	440%
Gross Value Added	0.7	1.2	0.7	0.5	0.6	0.3	0.4	0.6	0.8	-0.7	-180%
Operating Cash Flow	0.3	0.5	0.1	0.0	0.2	-0.3	0.0	0.4	0.1	-2.0	-1503%
Earning before interest and tax	0.2	0.3	-0.1	-0.2	0.1	-0.4	0.0	0.3	0.0	-2.6	-5353%
Net Profit	0.1	0.3	-0.2	-0.2	0.0	-0.5	0.0	0.2	-0.1	-2.6	-2692%
<b>between 11 and 49 employees</b>											
Total Income	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	0%
Total production costs	13.3	9.0	4.3	3.2	2.1	3.0	4.3	4.3	25.7	17.5	-32%
Gross Value Added	4.2	3.0	0.3	0.6	0.9	0.3	0.3	0.4	4.0	1.2	-71%
Operating Cash Flow	2.1	1.4	-0.4	0.0	0.5	-0.2	-0.6	-0.2	1.7	-0.7	-144%
Earning before interest and tax	1.6	0.9	-0.5	-0.1	0.4	-0.4	-0.8	-0.4	0.6	-1.3	-318%
Net Profit	1.0	0.5	-0.5	-0.1	0.4	-0.4	-0.8	-0.4	0.7	-1.2	-280%
<b>between 50 and 249 employees</b>											
Total Income	10.3	11.7	21.1	29.0	27.3	25.1	19.1	19.7			
Total production costs	9.8	10.9	16.8	30.1	25.9	26.0	19.7	22.2			
Gross Value Added	2.4	3.0	9.1	5.8	5.7	5.2	3.9	1.5			
Operating Cash Flow	0.9	0.8	4.3	-1.1	1.3	-0.9	-0.6	-2.4			
Earning before interest and tax	0.3	0.1	3.3	-2.3	0.3	-1.7	-1.2	-3.1			
Net Profit	-1.5	0.0	3.0	-2.9	-0.4	-2.3	-1.4	-3.3			

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

In the table above all data regarding Other Income are presented, but for the calculation of economic performance indicators (GVA, OCF, labour productivity etc.) only other income from companies which fish processing is the main activity was used.

- **Sector 11-49 employees**

The total amount of income generated by this sector, in 2017, was EUR 182.3 million. This consists of EUR 16.7 million in turnover and EUR 165.6 million in other income. Total income decrease for 10% over the period 2008-2017.

The value of Total production costs increased by more than 30% from 2008 to 2017 and amounted EUR 17.5 million in 2017.

In the period between 2008 and 2017 the net profit has decreased by 190%. GVA and OCF have decreased for 64% and 120% in the same period. We recorded also decreasing of EBIT by 160% in the period from 2008 to 2017.

The main products in the present sector are tuna pate, dried cod spread and products from Atlantic salmon and trout.

#### *5.16.5 Trends, drivers and outlook*

Higher turnover, lower raw material costs and higher other operating costs, were the main driving forces behind the overall improved trend in Slovenian fish processing sector. Between 2008 and 2017 the turnover has increase by 13%, while the profit has decreased by more than 200% in the same period. The decreased value of performance indicators are mainly due a large increased value of other operational costs, as a result of structural changes made in Slovenian fish processing sector. Other operational costs increased significantly in the period 2008-2017 (+240%).

The Slovenian seafood trade balance is relatively stable over the years and it is significantly negative. Slovenia is a net importer of fish and fish products. In 2018, imports were approximately five times larger than export and amounted to 18 608 tonnes (EUR 99 million) of fish and other fish product. On the other hand, export amounted to 5 361 tonnes (EUR 31 million) in the same year. The majority of the imported fish and fish products come mainly from European Union. The largest Slovenian seafood import partners are Italy, Spain and Croatia. Concerning export, the largest partners are Austria, Croatia and Bosnia and Herzegovina.

In general, the Slovenian processing sector relies on a steady inflow of raw materials. For industries that are relying mainly on EU stocks a change in the availabilities of these materials can heavily affect the industry income, production and employment.

Slovenian market for marine products is fragmented and disorganized. A large number of producers and dealers are unorganized and acting individually. Most of the products are sold directly to known customers.

Slovenia consumes around 11 kg of fish per year per capita, which is well below the European average of around 25.5 kg. However, fish consumption per capita in Slovenia is growing due to increasing awareness of healthy lifestyles. So in the future we can expect further development of the fisheries processing industry in Slovenia and therefore higher revenues from this sector. Because of the increased number of enterprises in the future and resulting increased competition we can expect a fall in prices of fish products and thus lower profits.

#### *5.16.6 Data coverage and quality*

Slovenia reported data also from companies with fish processing not as main activity to avoid confidentiality issues and because these companies are of great importance for Slovenian processing industry. In this case there is a high proportion of other income.

Because of the large differences between turnover and total income, mainly because of high value of other income, only other income from companies which fish processing is the main activity and turnover was used in calculating the economic performance indicators (GVA, OCF, labour productivity etc.).

Target populations in Slovenia for collecting economic data are all companies who have, according to the data from Veterinary Administration of the Republic of Slovenia (VURS), a license for the processing of maritime organisms and the processing involved in practice. The number of such enterprises in Slovenia in 2017 was 18. In June 2018, the questionnaires were sent to all enterprises.

In cases where a questionnaire, as the only source, was used the response rate was 87%. In cases where the data from annual accounts of business enterprises was used the response rate was 100%, because we have economic reports for all investigated companies.

Slovenia has a few processing companies that are entirely committed to fishery products. Most companies do have different types of processing activities, of which fish may be one, but not necessarily the most important one. This was taken into account when we putting together the questionnaires and in the subsequent analysis of the data provided. Therefore all the provided data refers just to fish processing part of all companies activities.

## 5.17 Spain

### 5.17.1 Overview

The seafood processing industry in Spain is a very relevant socio-economic activity, which supports work creation and the development of industry structures, particularly in coastal regions. Although it has not a significant role in the agri-food industry in the country as a whole, it is an essential activity in the seafood industry, since it constitutes the step that generates more value added along the seafood value chain.

Nowadays, the industry has evolved towards more technology-intensive processes, and a segment of large companies has emerged and which in many cases become international companies, both in production activities and in commercialization. These large companies have developed a diversification strategy, based on the production of different products in terms of species, quality and markets. At the same time, there is a large number of SME's producing high value-added products. These companies usually use a high quality national raw material, but there are also examples in which they obtain a differentiated product based on the quality and degree of processing, which makes them less dependent on the volatility of the national supply. Some of these companies have taken a step forward, and have begun to export part of their production, looking for markets in which their products get a better price. Finally, in recent years there are examples of fishery and aquaculture producers that have integrated the processing in their activities as a way of increase their competitiveness in the value chain.

Table 5.17.1: Overview, Spain, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>											
Total enterprises	572	585	552	513	487	640	542	598	600	606	1%
≤10 employees	239	234	215	209	178	356	258	320	310	301	-3%
11-49 employees	247	267	253	218	229	203	201	196	202	219	8%
50-249 employees	75	75	76	77	71	72	74	71	76	75	-1%
≥250 employees	11	9	8	9	9	9	9	11	12	11	-8%
<b>Employment (number)</b>											
Total employees	19,737	19,331	18,581	18,390	18,324	18,448	18,340	19,033	20,497	20,367	-1%
FTE	19,095	18,449	17,590	17,701	17,398	17,592	17,564	18,052	19,873	19,826	0%
<b>Indicators</b>											
Turnover (million €)	4,148	4,112	4,256	4,646	4,533	4,634	4,605	4,944	5,752	6,050	5%
FTE per enterprise	33.4	31.5	31.9	34.5	35.7	27.5	32.4	30.2	33.1	32.7	-1%
Average wage (thousand €)	23.6	25.0	26.0	25.1	25.1	25.6	26.2	25.3	26.4	27.1	3%
Unpaid work (%)	0.7	6.5	6.1	0.9	0.8	2.8	5.3	1.0	1.5	2.1	39%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

The Spanish fish processing industry comprised 606 enterprises in 2017, with a turnover of EUR 6.05 billion, 22% higher compared to 2015. Although 2017 has not been the year with the maximum number of companies, their activity generated the highest turnover recorded throughout the period considered. The distribution by size segments (number of employees as a proxy variable of size) shows a fragmented industry composed mainly by small firms. The 86% of the industry are companies below 50 workers, and companies under 10 employees represent 50%. The number of companies have grown 12% since 2014, confirming the positive trend in the

evolution of this industry structure. However, the evolution varies throughout the period analysed across size segments. Different from 2015, during 2016 and 2017 the number of micro-companies (less than 10 employees) has decreased by 6%, while small businesses between 11 and 50 workers have led the growth of the industry and their number has increased by 12%. The data seems to indicate that the reduction in small businesses could not only responds to a negative evolution of their results, but also in some case due to an increase in production activity and economic results that allowed them to grow. Despite this recent evolution, the long-term analysis shows a growth in the number of companies with less than 50 workers and stability in the number of large companies.

In spite of being a fragmented industry, main companies accumulate a large part of the activity. As an example, in 2015, the 10 largest companies accumulated EUR 4.17 billion in sales and employed 24 591 people (MAPAMA, 2017)<sup>37</sup>. It is also necessary to highlight that these companies are diversified and vertically integrated and develop not only processing, but also production (fishing and aquaculture), distribution and marketing activities. These large companies has its own fleet, particularly the freezer industry. Moreover, they started to be involved in aquaculture activities and also have fishery subsidiaries in those countries with the main fishing grounds for their targeted species (MAPAMA, 2018)<sup>38</sup>.

According to the latest analysis on the production and distribution chain of seafood products industry in Spain, the sector has evolved into four large models of companies, depending on the phases of production that they integrate, the size and the portfolio of products (MAPAMA, 2019)<sup>39</sup>. Firstly, there is a small number of large freezer companies, which have vertically integrated raw material production, and develop significant exporting activities. They have productive and commercial subsidiaries in third countries. More recently, there are examples in which they have increased the degree of processing and the number of products ready to eat, thus generating a greater value added that increases their competitiveness. This enterprise model has a great dependence on few products: hake, squid, shrimp and prawns. There is also a large number of medium-sized companies that produce frozen products. Most of these companies have their own brand and some of them have their own retail shops. They usually develops activities of packing. Large canning companies includes three companies that accumulate around 90% of the production volume. They are vertically integrated backwards and control part of the supply. They also have production subsidiaries in third countries. As in the case of frozen companies, they are specialize in a small number of species; anchovy, cephalopods, cockle, mackerel, mussel, sardine and tuna. Finally, there are canneries and salted companies differentiated through high quality product and artisanal processing. Within this business model, there are a large number of small and medium enterprises. The production of salted fish is composed of three very well differentiated segments in the Spanish industry: cod, anchovies and other salted fish.

Employment increased 7% in number of employees and almost 10% in terms of FTE from 2015. This evolution continues the positive trend started in 2012. This evolution is a consequence and is in line with the increase in the number of companies, production and sales. The companies with less than 50 employees represent 86% of industry structure in 2017. However, this segment only employs 30% and 28% of total employees and FTEs respectively. On the other hand, only 18% of companies employs more than 50 person, but creates 70% of employment. In the long term, employment in large companies has increased while in small companies has decreased. This evolution is consistent with a greater concentration of production volumes in large companies.

The Spanish fish processing industry provides, in general, full time jobs as the number of employees in full time equivalent shows. In 2017, the proportional increase in the total number of

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<sup>37</sup> Informe Sector Industria del Pescado del MAPAMA (abril 2017), a partir del Informe anual Publicaciones Alimarket 2016 - Conservas de Pescado y Salazones, Pescado Refrigerado y Congelados.

<sup>38</sup> Diagnóstico sobre la situación de la mujer en la transformación de productos pesqueros y acuícolas. Ministerio de Agricultura, Pesca y Alimentación del Reino de España. Enero 2018.

<sup>39</sup> Análisis de la cadena de producción y distribución del sector de derivados del pescado. Ministerio de Agricultura, Pesca y Alimentación del Reino de España. 2019.

employees was lower than the rise in the FTE. This evolution can be explained by several reasons such as a reduction in part-time jobs, an increase in the activity of part-time workers, and that part of the new job positions created between 2015 and 2017 were full-time positions. Despite the increase in the number of employees and full-time work, the industry still suffers a high degree of temporary contracts. The most recent data shows an increase in contracting and workers-rotation. The number of contract registered for the category "Fish industry workers" was 25 626 in 2016. This number of contracts was made to 10 986 people. The full-time contracts were 19 816 while part-time contracts were 6 100. However, only 1 058 contracts were of indefinite duration, compared to 24 568 temporary contracts. These data confirm the high degree of seasonality in the employment of this industry (SEPE, 2016)<sup>40</sup>

Regarding gender distribution of labour, the Spanish processing industry has been traditionally intensive in the use of female employees as a result of technical division of work in the coastal areas. Manual tasks at processing of fishery products were traditionally carried out by women. The increasing use of technology in the processing processes did not imply a great change in the labour structure, which is rather the result of sociodemographic and cultural issues. Women participation in the fish processing industry (Code 102: CNAE-2009) was 62% in 2017, while in the total industry was 26% (INE, 2019)<sup>41</sup>. The distribution of contracts by gender in 2016 shows that 61.9% corresponded to women (SEPE, 2016).

When analysing the relative FTE per enterprise there is not a clear tendency. After a period of volatility, when from 2008 to 2012 the indicator followed a positive trend (increase of 7%) followed by a negative evolution until 2015, in the last four years it has remained stable around 32 FTE. In the case of the average salary, it seems that the positive evolution of the production and the incomes of the industry has also increased salaries since 2015. In 2017, the average salary was almost 15% higher compared to 2008.

#### *5.17.2 Economic performance*

The national processing industry has demonstrated in recent years its capacity to specialize and adapt its strategy to the strong changes in the seafood value chains and consumer behaviour. In the last two years, large enterprises consolidate the new levels of production, new management strategies and commercialization, and they strongly increased their activity in foreign markets, in a context in which the domestic demand has contracted. In fact, the improvements in terms of total incomes were clearly led by the large companies. The augmented focus on foreign markets with high value added products has reduced reliance on domestic demand.

More than 99% of the Spanish fish processing industry's incomes come from turnover, what states that the total incomes clearly depends on the main activity. Turnover has followed a positive trend during the period analysed resulting in an increase of 45% between 2008 and 2017, which was more accentuated since 2015, when it grew by 22% in only two years. This evolution shows a strong positive tendency in the economic results of the processing activities. The increase in turnover has not been caused by an increase in production volume, which has decreased by 4% since 2015 (INE, 2016 and 2017). Instead, the increase in incomes has been generated largely by the rise in prices. The strong increase in exports has been also one of the drivers for the increase in turnover. The promotion of more processed and value added products can also explain in part the improvement in industry incomes. Direct subsidies account for 0.39% of total income and decreased from 2015. The low dependence of total incomes on subsidies and other incomes is an indicator of the competitiveness of the processing companies.

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<sup>40</sup> Informe Anual de Mercado de Trabajo por Ocupación 2016 / Observatorio de las Ocupaciones, SEPE. From Diagnóstico sobre la situación de la mujer en la transformación de productos pesqueros y acuícolas. Ministerio de Agricultura, Pesca y Alimentación del Reino de España. Enero 2018.

<sup>41</sup> Estadística estructural de empresas del sector industrial. Instituto Nacional de Estadística. 2019. ([www.ine.es](http://www.ine.es)).

The number of enterprises whose main activity is not fish processing reported by Spain is zero. However, in recent times, there are many examples of small-medium scale companies, particularly fish and aquaculture producers, which has integrated fish processing in their activities or collaborate with fish processing companies. In a context of growing competitiveness in the seafood value chain, this behaviour can have several explanations. This strategy of forward vertical integration helps to overcome the bottle-necks generated by their lower bargain power with wholesalers and big retailers. It is also a way to find new alternative distribution channels, and also allow producers to obtain a higher part of the value added to the product along the value chain.

Table 5.17.2: Economic performance indicators, Spain, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ (2016-17)
<b>Income (million €)</b>											
Turnover	4,148	4,112	4,256	4,646	4,533	4,634	4,605	4,944	5,752	6,050	5%
Other income	29	28	23	23	45	25	15	14	21	26	27%
Operating subsidies	25	28	28	28	25	27	21	27	22	24	7%
<b>Total Income</b>	<b>4,202</b>	<b>4,168</b>	<b>4,307</b>	<b>4,697</b>	<b>4,604</b>	<b>4,687</b>	<b>4,641</b>	<b>4,985</b>	<b>5,795</b>	<b>6,100</b>	<b>5%</b>
<b>Expenditure (million €)</b>											
Purchase of fish and other raw material for production	2,433	2,283	2,503	2,744	2,727	2,708	2,754	3,449	3,991	4,212	6%
Wages and salaries of staff	447	431	430	441	433	438	436	452	518	527	2%
Imputed value of unpaid labour	3	30	28	4	4	12	24	4	8	11	42%
Energy costs	69	68	71	83	82	78	76	76	69	74	6%
Other operational costs	477	488	470	508	493	506	511	555	620	640	3%
<b>Total production costs</b>	<b>3,429</b>	<b>3,299</b>	<b>3,502</b>	<b>3,781</b>	<b>3,738</b>	<b>3,743</b>	<b>3,802</b>	<b>4,537</b>	<b>5,206</b>	<b>5,465</b>	<b>5%</b>
<b>Capital Costs (million €)</b>											
Depreciation of capital											
Financial costs, net	107	95	51	85	54	74	66				
<b>Capital Value (million €)</b>											
Total value of assets											
Net Investments	205	126	113	80	89	81	94	77	72	109	52%
Subsidies on investments											
Debt											
<b>Economic performance (million €)</b>											
Gross Value Added	1,198	1,301	1,235	1,333	1,277	1,367	1,278	877	1,092	1,150	5%
Operating Cash Flow	773	869	805	917	865	944	839	448	589	636	8%
Earning before interest and tax											
Net Profit											
<b>Productivity and performance Indicators</b>											
Labour productivity (thousand €)	62.7	70.5	70.2	75.3	73.4	77.7	72.8	48.6	55.0	58.0	6%
Capital productivity (%)											
GVA margin (%)	28.7	31.4	28.9	28.6	27.9	29.3	27.7	17.7	18.9	18.9	
EBIT margin (%)											
Net profit margin (%)											
Return on Investment (%)											
Financial position (%)											

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

The main operational cost of the Spanish fish processing industry is the purchases of raw materials, which in 2017 accounted 77% of the total production costs. This cost has increased 73% during the observed period, and a 22% in 2017 compared to 2015. This evolution in a context in which the quantities produced have been reduced, seems to indicate a new rise in the price of raw materials. The parallel increase in the price of products suggest a certain capacity of the industry to transfer the cost to their customers.

Wages and salaries raised 17% in 2017 compared to 2015. The relevance of the labour cost in this industry operational cost structure achieved less than 10%, while in 2008 was 13%. The

amount of labour cost has increased along time, but this grow was proportionally lower than the one of the rest of production costs, particularly the raw material. This evolution is consistent with an industry that in general makes more and more use of technology. Considering also the value of the unpaid work, the average salary raised only 7% that year. Energy cost accounts less than 2% of the total cost in 2017. In 2017, the energy cost increased 6%, while the price of electricity for industrial use during this period decreased (MINETAD, 2019). The evolution of the energy cost helps to confirm the argument of an increase in the production activities during the period analysed. The greater weight of large companies in industry production, which make a more intensive use of technology, may be another cause of the increase in energy costs. Finally, other operational costs, mostly associated with external services, have not followed a clear trend, with increases and decreases from year to year. However, these cost raised 3% in 2017. In the long term, the relevance of these other cost in the cost structure of these companies has increased. Again, the growing importance of large companies can be one of the explanations, since they have a greater knowledge about economics and business management, and they designate resources to finance vital aspects of business activity such as marketing, promotion, logistics, access to international markets, etc.

The reduction in the net investment since 2011 can have several causes, and it does not necessary mean a reduction in the modernization of the industry. In recent years, Spanish large fish processing enterprises developed several initiatives of relocation of production activities in third countries, what means also a relocation of a part of the enterprise investments not in the Spanish industry, but in the subsidiaries located at these countries. Apart from this general context for the period considered, it is necessary to highlight an increase of more than 50% in the net investment in 2017. The positive evolution of the activity and the orientation to more processed products in large companies can be the reason for new purchase of assets. At the same time, the worst evolution of the results in small companies could have made them to extend the life of part of their assets. The great increase also can be explained in part by a change in the calculation of this variable in EUMAP. Depreciation of assets are not considered under EUMAP.

The only available economic performance indicators to assess the evolution of the performance in the Spanish seafood processing industry are the gross value added and the operating cash flow. These indicators may not be enough to develop a detailed analysis of the profitability and performance. GVA evolution between 2008 and 2017 reflects fluctuations, but in general a stable trend, except 2015, when it felt 31%. In 2017, GVA accounted less than 20% of the total income. While it is true that the industry continues to create value added, its contribution has been significantly reduced, mainly due to the increase in raw material costs. Because data on capital depreciation is not available, it is not possible to calculate the missing indicators. Labour productivity has increased but still is lower than the average of the period considered.

### *5.17.3 Socio-demographic structure*

Socio-demographic data collection was not planned in Spain. This means that there are not data available. Nevertheless, we have access to additional sources of information, mainly qualitative, than help us to provide a general overview of the situation at the fish processing industry, particularly in the gender dimension<sup>42</sup>.

Considering the Public Employment Services (SEPE) data about contracting in the occupational group "Workers in the fish industries" in 2016 (25 626 contracts to 10 986 people), 15 863 contracts correspond to women, but the unemployment rate among women was much higher. Within the 2 608 unemployed in 2016 who demanded this occupation, 88% were women. By age, the highest number of contracts in this occupation (30.2%) was given to people between 30 and 39 years old; followed by workers over 40 years old (28.8% of the contracts). However, the

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<sup>42</sup> Diagnóstico sobre la situación de la mujer en la transformación de productos pesqueros y acuícolas. Ministerio de Agricultura, Pesca y Alimentación del Reino de España. Enero 2018.



greatest number of unemployed people who apply for this occupation was among those over 44 years old (64.2% of total unemployed claimants).

SEPE analysed certain labour and training aspects of the occupational group “Workers of the fish industries”, based on 2015 data on 130 published job offers. The information extracted is interesting in order to characterize the labour market in these industries. The average profile of the job seeker in the fish processing industry is predominantly a woman over 44 years old, who has had previous employment. On the other hand, the average profile of the hired person is that of a woman over 30 years of age, who mostly has basic education to which a full-time temporary contract is offered.

#### *5.17.4 Breakdown by company size*

The analysis of the information by segments shows a positive evolution of the income in all the segments except in the companies of less than 10 workers. However, the increase in operating costs has caused the evolution in performance indicators to vary according to the size of the companies. Small and medium companies have seen their economic performance reduced. In the last two years, the improvement in the performance indicators of the industry has been clearly led by large companies. In 2017, large processing companies have increased their GVA and Operating Cash Flow by 11% and 17%, respectively.

Table 5.17.3: Economic performance by size, Spain, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>less than or equal to 10 employees</b>											
Total Income	168	148	134	171	173	198	111	172	141	135	-4%
Total production costs	137	115	117	117	140	153	94	156	124	120	-4%
Gross Value Added	58	53	35	74	50	66	32	28	29	27	-9%
Operating Cash Flow	32	33	17	54	33	45	17	15	16	16	-3%
Earning before interest and tax											
Net Profit											
<b>between 11 and 49 employees</b>											
Total Income	1,034	983	996	1,017	894	822	1,017	1,053	965	1,052	9%
Total production costs	829	784	782	836	786	689	863	960	885	984	11%
Gross Value Added	328	325	337	284	219	242	265	197	185	188	2%
Operating Cash Flow	205	199	214	181	108	132	154	93	80	68	-15%
Earning before interest and tax											
Net Profit											
<b>between 50 and 249 employees</b>											
Total Income	1,793	1,949	2,020	2,188	1,916	2,063	1,879	1,918	2,029	2,118	4%
Total production costs	1,393	1,462	1,618	1,759	1,558	1,579	1,473	1,683	1,926	2,020	5%
Gross Value Added	575	678	599	624	534	665	601	419	303	296	-2%
Operating Cash Flow	400	487	401	428	358	484	406	234	103	98	-5%
Earning before interest and tax											
Net Profit											
<b>greater than or equal to 250 employees</b>											
Total Income	1,207	1,087	1,158	1,323	1,621	1,604	1,634	1,843	2,660	2,795	5%
Total production costs	1,071	938	985	1,069	1,254	1,321	1,372	1,737	2,271	2,341	3%
Gross Value Added	237	246	265	351	473	393	380	234	575	640	11%
Operating Cash Flow	136	150	173	254	367	283	262	106	389	454	17%
Earning before interest and tax											
Net Profit											

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.17.5 Trends, drivers and outlook

The main industry trends can be grouped into four categories, business concentration, vertical integration, supply of raw materials and product diversification. The process of concentration in freezer and canned companies is growing and it is significantly advanced. Medium-sized canning companies are being absorbed. At the same time, a consolidated group of canning companies has opted for differentiation in quality with good results. More and more companies are moving to differentiation as a competitive strategy. There is a tendency of the processing industry to verticalization into fisheries and aquaculture. In recent years, the tendency of large companies to establish extractive, aquaculture and processing subsidiaries in those countries where the raw material is found has been consolidated. The commitment that large companies are making for aquaculture is significant. As for the raw material, frozen is consolidated as a supply for the canning industry, and there is a growing contribution of aquaculture. Seafood processing companies, in general, are expanding the range of final products in order to reduce the excessive dependence of a small number of products, and the availability of the raw materials they need for them. Freezer and canning companies are entering the market for ready meals. As part of this diversification strategy, there are companies that have begun to manufacture pet food.

The drivers of the industry are related with the relevance of the different products (processing techniques and species), domestic consumption, the changes in the value chain structure, the increasing importance of external trade and the role of certifications.

The fish processing industry in Spain produced 896 084 tonnes in 2017, which was a 4% less than 2015<sup>43</sup>. The 10% of this production was not intended for human consumption, but fishmeal and wastes. The distribution by type of product when intended to human consumption was as follows: prepared and preserved fish (41.3%), frozen fish (23.9%), frozen molluscs and invertebrates (14%), prepared and preserved mollusc and invertebrates (8.80%), frozen crustaceans (5%), dried, salted and smoked fish (4.4%), fresh fish (2%) and prepared and preserved crustaceans (0.59%). Regarding the evolution of the quantities produced in each segment, there were not significant changes compared to 2015, apart from the continuous increase of the relevance of frozen products within the industry. The prepared and preserved products grouped 50.6% of the production. The main species produced in this segment are tuna, sardines, squids, mussels, anchovies, and mackerel in order of importance. Frozen products represented 42.9% of total production. The most relevant species used as raw material were cephalopods, tuna prawns and octopus.

Although the consumption of fish continues a downward trend in Spain since 2010, domestic market continues demanding large quantities of fish products. Household consumption in 2017 fell by 3.3% compared to 2016, although in terms of value it increases slightly (0.9%) because of the increase in the average price of 4.4%. Households allocated 13.3% of food and beverage expenditure to the purchase of fish, and per capita consumption achieved 23.7 kg, 6.9% less than in 2016. The distribution by type of product was led by fresh fish (44.4%), followed by prepared and preserved (18.6%), fresh mollusc and crustaceans (14.8%), frozen fish (10.5%), frozen mollusc and crustaceans (9.2%) and boiled mollusc and crustaceans (2.4%). The 62.2% of seafood products were sold in supermarkets and hypermarkets.

The recent changes in the value chain of seafood products in Spain with a general increase in competition has continued during 2016 and 2017 (MAPAMA, 2017<sup>44</sup>). The concentration of distribution in large retailers (supermarkets and hypermarkets) increased again in 2017. Large retailers accumulate the 61.3% of frozen fish, 61.8% of shellfish and 70% of canned products. Furthermore, the average price of the products in the retail channels increased, 6.2% in frozen fish, 5.4% in shellfish and 3.8% in canned products<sup>45</sup>. This tendency allows big retailers to accumulate a greater bargain power with the previous agents of the chain of value, between, which are the fish processors. Large retail chains demand large volumes of product and boost white brands. All of this means that Spanish fish processing companies need to produce large volumes and reduce their average production costs in order to be competitive. Small processing companies have problems competing in a mass market with an undifferentiated product. Therefore, there is a growing trend in this segment towards diversification, product differentiation, the commitment to own brands, the search for alternative distribution channels, shortening them and product innovation with a higher level of processing. In recent years, there are an increasing number of collaborations between producers and processors. There is also a tendency for fish and aquaculture producers to integrate fish processing among their tasks as a strategy to obtain a greater proportion of the value added to the final product.

The increase in imports is not only relevant in terms of greater competition for Spanish companies, but also in the case of imports of raw materials to meet the demand of processing companies. Imports of the fish processing industry in Spain reached a value of EUR 7 billion in 2017, 58% more than in 2015. This evolution reinforces the growing trend observed in previous years (MAPAMA 2019<sup>46</sup>). The value of exports was EUR 4 billion in 2017, 53% higher than in

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<sup>43</sup> Encuesta industrial anual de productos. Instituto Nacional de Estadística. España.

<sup>44</sup> Informe del consumo de alimentación en España 2017. Ministerio de Agricultura Pesca y Alimentación del Reino de España.

<sup>45</sup> Informe del consumo de alimentación en España 2017. MAPAMA.

<sup>46</sup> Informe Anual de la Industria Alimentaria. Periodo 2017-2018. MAPAMA.

2015. These data confirm that export markets are a clear driver in the competitive strategy of this industry and a key element to understand the growth in the activity.

During the last years, there has been an increasing use of certifications, mainly associated with the origin of the raw material. In the case of large companies, certification in most cases occurs to meet the demand of retail customers. In the case of small businesses, as a tool to differentiate their product.

According to the recent evolution in the market, and the improvement in competitiveness achieved by the industry, it is expected that companies continue utilising these two main business models, the concentration in large companies, and the differentiation based on the quality of medium-sized companies. Also, there is an increasing tendency to the diversification of production to reduce the risk in raw materials supply. The decreasing trend in seafood consumption in the domestic market is expected to continue, mainly due to rising prices, as data available for 2018 suggest. The negative evolution in the domestic market does not mean that the production of the industry or its income will decrease. Everything will depend on the evolution of operating costs, especially the cost of raw materials, and also on the behaviour of exports, which in recent years have been the engine of the industry. The fish processing industry external trade data for 2018 shows that the trend of increasing exports and imports continues.

#### *5.17.6 Data coverage and quality*

Fish processing industry data comes from the Spanish National Institute of Statistics (Instituto Nacional de Estadística). Depreciation of capital, total value of assets, subsidies on investments and debt are not available for all the period. Financial income and financial expenditures are not available for 2016, and 2017. The explanation provided by the MS was that the data were not collected by the main survey source. This issue does not allow us to estimate beyond the GVA and the Operational Cash Flow indicators. Furthermore, socio-demographic and raw material data are not available since these data collection were not planned in Spain.

## 5.18 Sweden

### 5.18.1 Overview

The fish processing industry sector in Sweden is very heterogeneous with small family businesses processing their own landings as well as larger enterprises with large-scale industrial production. It is mainly located along the west and south coasts of Sweden, as are major parts of the fishing fleet. In the recent period many fish processing companies has been bought by companies from third countries, primarily from Norway and China.

In 2017, there were 341 enterprises in total processing fish of which 209 had fish processing as their main activity and 132 processed fish but not as their main activity. The number of enterprises having fish processing as non-main activity increased successively from 2008 to 2015 but has been stable since. In 2013 one of the largest fish processing companies in Sweden merged and changed its activity from main to non-main, which have an impact on data and indicators presented in the report. This company is included in the statistics for main activity for some months in 2013, but after that the enterprise is only included in enterprises in which fish processing is not their main activity. Please note that the rest of this chapter concerns enterprises that have fish processing as their main activity. The number of enterprises having fish processing as their main activity has also been quite stable. However over the last two years (2016 and 2017) there has been a reduction in the number of enterprises by 7% which is partly due to mergers and acquisitions.

A large proportion of the enterprises processing fish are quite small. Many of them are financially connected to the fishery operations since they often process their own landings. In 2017, 82% of the enterprises had less than 10 employees. Companies with 50 employees or more decreased from 8 to 5 in 2017 and only accounted for 2% of the total number of companies.

The total number of employees decreased by 4% between 2016 and 2017 but have been fluctuating over time. The average wage level have been quite stable for a couple of years but increased by 5% between 2016 and 2017.

Table 5.18.1: Overview, Sweden, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>											
Total enterprises	214	217	219	219	223	222	224	224	213	209	-2%
≤10 employees	181	186	183	186	190	185	188	183	177	171	-3%
11-49 employees	26	26	30	26	25	29	28	33	28	33	18%
50-249 employees	7	5	6	7	8	8	8	8	8	5	-38%
≥250 employees	0	0	0	0	0	0	0	0	0	0	0%
<b>Employment (number)</b>											
Total employees	2,165	1,991	2,007	2,126	2,135	2,199	2,174	2,171	2,113	2,022	-4%
FTE	1,773	1,736	1,807	1,837	1,831	1,658	1,587	1,662	1,650	1,591	-4%
<b>Indicators</b>											
Turnover (million €)	520	467	568	599	613	542	500	512	565	590	4%
FTE per enterprise	8.3	8.0	8.3	8.4	8.2	7.5	7.1	7.4	7.7	7.6	-2%
Average wage (thousand €)	43.9	39.3	45.4	48.3	50.2	48.5	45.8	45.0	44.9	47.2	5%
Unpaid work (%)	1.3	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
<b>Enterprises doing fish processing not as main activity</b>											
Number of enterprises	87	98	95	108	120	125	126	132	132	134	2%
Turnover attributed to fish processing (million €)	73	80	97	97	112	238	238	223	245	212	-14%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.18.2 Economic performance

The performance of the Swedish fish processing industry is highly dependent on the prices of raw material, which amounted to approximately 55-60% of total production costs during the studied period. The industry is dependent on raw material of the right quality and quantity. If such materials cannot be found within the Union the industry has to import it from third countries. According to our processing industry approximately 90% of the raw material is imported from another EU member state or from countries outside EU and then mainly from Norway. Generally speaking, smaller enterprises are more dependent on local landings, and larger enterprises with industrial production depend more on imported raw material. Therefore, in addition to variations in the prices of raw material and tariff rates, the industry is also sensitive to fluctuations in exchange rates.

Table 5.18.2: Economic performance indicators, Sweden, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Income (million €)</b>											
Turnover	519.8	467.2	567.5	599.4	613.2	542.0	499.8	512.5	565.1	590.4	4%
Other income	3.7	3.6	3.9	3.4	8.7	13.6	4.2	4.6	5.2	4.9	-5%
Operating subsidies	0.3	0.3	0.5	0.5	0.8	1.0	0.5	0.3	0.7	1.5	111%
<b>Total Income</b>	<b>523.8</b>	<b>471.1</b>	<b>571.9</b>	<b>603.3</b>	<b>622.7</b>	<b>556.6</b>	<b>504.6</b>	<b>517.4</b>	<b>571.0</b>	<b>596.9</b>	<b>5%</b>
<b>Expenditure (million €)</b>											
Purchase of fish and other raw material for production	271.9	272.8	327.1	360.8	358.6	342.3	313.2	309.3	328.7	322.5	-2%
Wages and salaries of staff	76.8	66.4	82.0	88.8	92.0	80.4	72.6	74.8	74.0	75.1	1%
Imputed value of unpaid labour	1.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
Energy costs	7.4	6.5	8.5	7.6	6.4	7.9	7.0	6.3	6.6	7.0	7%
Other operational costs	148.3	103.6	130.9	126.0	134.5	108.7	102.9	117.7	154.1	190.2	23%
<b>Total production costs</b>	<b>505.4</b>	<b>451.1</b>	<b>548.6</b>	<b>583.2</b>	<b>591.5</b>	<b>539.3</b>	<b>495.7</b>	<b>508.1</b>	<b>563.4</b>	<b>594.9</b>	<b>6%</b>
<b>Capital Costs (million €)</b>											
Depreciation of capital	12.3	10.5	12.5	12.7	13.3	11.9	9.7	9.7	9.1	9.7	6%
Financial costs, net	0.8	-0.1	0.6	-1.7	5.3	2.3	48.7	5.6	-3.3	-1.8	-47%
<b>Capital Value (million €)</b>											
Total value of assets	401.3	344.5	355.8	441.8	409.7	394.9	335.1	289.8	317.7	311.2	-2%
Net Investments	9.5	9.8	11.4	12.4	8.9	7.8	15.1	9.6	16.3	4.6	-72%
Subsidies on investments									0.2	0.3	97%
Debt	254.8	206.0	233.7	246.0	251.7	218.2	188.2	183.4	203.0	207.8	2%
<b>Economic performance (million €)</b>											
Gross Value Added	96.0	88.0	104.8	108.4	122.4	96.7	81.0	83.8	80.9	75.5	-7%
Operating Cash Flow	18.4	19.9	23.3	20.1	31.3	17.3	8.9	9.3	7.6	2.0	-74%
Earning before interest and tax	6.1	9.5	10.8	7.4	18.0	5.3	-0.8	-0.4	-1.5	-7.6	409%
Net Profit	5.3	9.6	10.2	9.0	12.8	3.0	-49.5	-5.9	1.8	-5.9	-419%
<b>Productivity and performance Indicators</b>											
Labour productivity (thousand €)	54.1	50.7	58.0	59.0	66.9	58.3	51.0	50.4	49.0	47.5	-3%
Capital productivity (%)	23.9	25.5	29.5	24.5	29.9	24.5	24.2	28.9	25.5	24.3	
GVA margin (%)	18.3	18.7	18.3	18.0	19.7	17.4	16.1	16.2	14.2	12.7	
EBIT margin (%)	1.2	2.0	1.9	1.2	2.9	1.0	-0.2	-0.1	-0.3	-1.3	
Net profit margin (%)	1.0	2.0	1.8	1.5	2.0	0.5	-9.8	-1.1	0.3	-1.0	
Return on Investment (%)	1.5	2.7	3.0	1.7	4.4	1.4	-0.2	-0.1	-0.5	-2.5	
Financial position (%)	36.5	40.2	34.3	44.3	38.6	44.8	43.8	36.7	36.1	33.2	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

The table below clearly shows that the development of the financial result of the processing industry was effected by the merger of one of the largest processing companies in 2013 which meant that it has since not been part of companies having fish processing as its main activity. It

is therefore not relevant to look at the development for the entire reported period. It is also clear that the financial result for the sector deteriorated between 2016 and 2017. During this period the total income of the sector increased by EUR 25.9 million (5%) but it was not enough to offset an increase of production costs of EUR 31.5 million (6%). Above all, other operational costs increased and in particular acquisition costs for goods sold without further processing. Wages and salaries as well as energy costs also increased between 2016 and 2017 but to a much lower extent. Please note that the development of the economic performance would be different if it was presented in Swedish krona, especially for the year 2009 when the Swedish krona was weak<sup>47</sup>.

A smaller proportion of the sector's income come from operational subsidies. When it comes to subsidies from the EMFF, the Swedish processing industry has mainly received subsidies under Article 69 (investments in processing of fisheries and aquaculture products), and to lesser extent support from articles 42 (Added value, product quality and use of unwanted catches) and 68 (Marketing measures) during the period 2014-2017.

The processing industry has shown a great interest in these subsidies and the amount of approved and received subsidies varies considerably. By the end of 2017, the average subsidy for investments in processing was about EUR 47 thousand while the largest amount was nearly EUR 200 thousand, and the lowest amount was nearly EUR 5.5 thousand. Most public support is for subsidies that increase production capacity and modernize facilities. Examples of investments include cold storage, sorting machines, facilities for fish handling, packaging machines, ice machines, and traceability systems for fish products. For the other two possible measures (articles 42 and 68) there are examples of support for different forms of product certifications and developments of fish handling and new types of products.

Financial costs and net investment increased significantly in 2014 and 2016 from very low values. The increase can be explained by large investments in new production facilities and in new machines.

### *5.18.3 Socio-demographic structure*

The total number of employees within the Swedish fish processing sector in 2017 was 2022 persons. Most of them (91%) were Swedish citizens. Five percent of the employees came from countries outside EU and EES-countries.

The level of education among the employees within the fish processing industry is generally on a low level (88%). Only 2% of the employees are classified as having a high education level. The average age of the employees is comparatively high with 51% in the age between 40-65 years, 29% between 25-39 years and 17% between 16-24 years.

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<sup>47</sup> The exchange rates used in this chapter are for €1: SEK 9.6055 in 2008, SEK 10.6213 in 2009, SEK 9.5413 in 2010, SEK 9.0355 in 2011, SEK 8.7053 in 2012, SEK 8.6494 in 2013, SEK 9.0968 in 2014 and SEK 9.3562 in 2015 9.4704 in 2016 and 9.6326 in 2017.

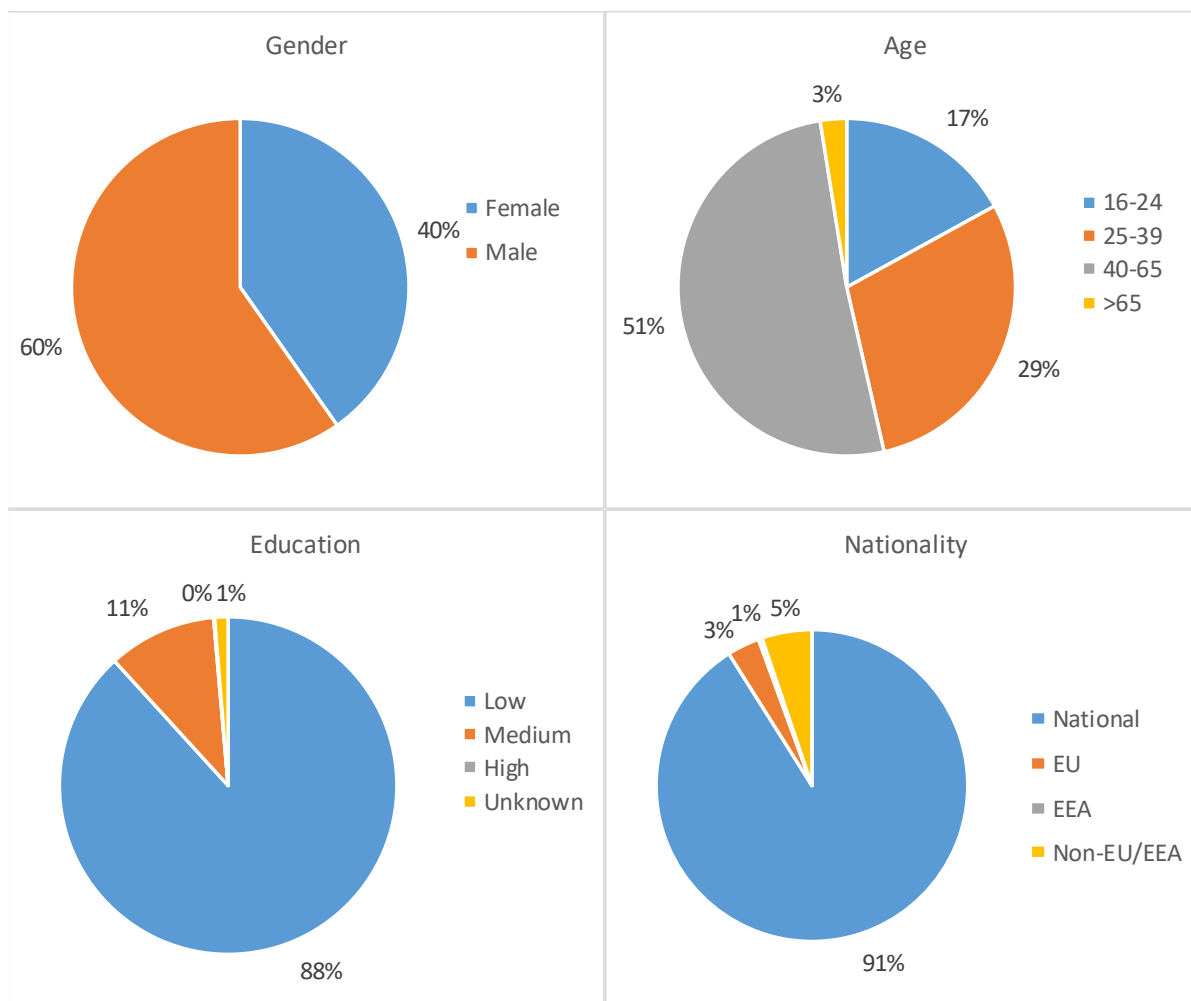


Figure 5.18.1: Socio-demographic characteristics, Sweden, 2017

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

#### 5.18.4 Breakdown by company size

The Swedish data covers three segments and the data in the third segment also includes firms with more than 250 employees for confidentiality reasons. Also note that data and performance indicators for this segment is affected by the merger of one of the largest processing enterprises in 2013 as mentioned earlier.

The vast majority of the Swedish fish processing enterprises belong to the segment with 0-10 employees. Between 2016 and 2017 the economic performance for this segment, expressed as net profit and earnings before interest and tax, increased while for the segment with 11-49 employees and the segment with more than 50 employees it decreased. The decrease was greatest, both in absolute terms and in percentage, for the middle segment. It can be noted that for the segment with 50 employees or more net profit and earnings before interest and tax (EBIT) has been negative and decreasing gradually since 2014 (the year after the merger of the largest processing company and the change of its activity from main to non-main). When it comes to gross value added it has been relatively stable the last years. However it can be worth noting that it decreased by EUR 8.7 million or 26% in 2017 compared to 2016 for the segment with 50 employees or more.



Table 5.18.3: Economic performance by size, Sweden, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>less than or equal to 10 employees</b>											
Total Income	91.3	77.9	85.3	92.7	95.8	98.8	94.9	84.4	76.3	81.5	7%
Total production costs	89.0	75.8	80.9	87.2	92.0	94.1	88.8	79.7	72.2	77.0	7%
Gross Value Added	14.5	14.3	16.3	19.8	18.9	20.0	20.8	17.0	16.3	16.2	-1%
Operating Cash Flow	2.3	2.2	4.4	5.5	3.8	4.7	6.1	4.7	4.0	4.4	10%
Earning before interest and tax	-0.2	-0.2	2.3	2.9	1.4	1.9	3.9	2.6	2.2	2.6	21%
Net Profit	-1.8	-1.8	1.1	2.4	0.5	-1.7	-46.3	-4.6	6.8	7.4	9%
<b>between 11 and 49 employees</b>											
Total Income	173.1	164.0	199.9	198.1	176.8	196.9	178.5	194.8	209.6	268.9	28%
Total production costs	172.6	159.5	193.3	192.4	172.6	191.4	175.6	189.4	204.3	268.1	31%
Gross Value Added	22.3	25.5	33.0	29.8	27.7	30.7	25.5	31.9	30.6	34.0	11%
Operating Cash Flow	0.5	4.5	6.5	5.7	4.2	5.5	2.9	5.4	5.3	0.8	-84%
Earning before interest and tax	-2.3	2.1	3.2	2.8	1.1	3.0	0.5	3.0	2.9	-3.1	-207%
Net Profit	-1.2	2.5	3.5	3.6	0.0	3.7	1.0	4.0	2.3	-5.4	-337%
<b>between 50 and 249 employees</b>											
Total Income	259.4	229.2	286.7	312.5	350.1	260.9	231.2	238.2	285.2	246.5	-14%
Total production costs	243.8	215.9	274.3	303.6	326.8	253.8	231.3	239.0	286.9	249.7	-13%
Gross Value Added	59.1	48.1	55.6	58.7	75.8	46.1	34.7	34.9	34.0	25.3	-26%
Operating Cash Flow	15.6	13.3	12.3	8.9	23.3	7.1	-0.1	-0.8	-1.7	-3.3	-91%
Earning before interest and tax	8.6	7.6	5.3	1.7	15.6	0.4	-5.2	-5.9	-6.6	-7.1	-9%
Net Profit	8.2	8.9	5.5	3.0	12.2	1.0	-4.2	-5.3	-7.2	-7.9	-9%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.18.5 Trends, drivers and outlook

The Swedish fish processing companies are acting on a global market and they are highly dependent on imported raw material. High demand within Sweden and other EU member states for the most important species drives up prices and affects the industry. In Sweden relatively few species are consumed which increases the vulnerability for price increases.

In recent years many mergers, acquisitions and large investments have been carried out. It is mainly small and medium sized companies that have been acquired by larger ones. The trend is towards large business groups with many branches or towards smaller niche companies. It is likely that this development will continue.

In 2019, a national digital traceability system was introduced. The new system have had, and will continue to have, an impact on the processing industry as well as the other actors within the value chain in terms of set-up costs and system administration costs.

Environmental and sustainability issues are important drivers. According to the industry the discussion primarily concerns the relationship between vegetarian food and fish, health aspects concerning environmental toxins versus nutrition as well as animal welfare in aquaculture. It can also be noted that the public opinion and Swedish consumers are sensitive to information about the sustainability of stocks and the impact of fishery and aquaculture on the environment. It can also be mentioned that environmental certifications is important to get market access in Sweden. Environmental and climate issues will continue to impact the industry, e.g. the effects of climate change can cause fish stocks to move which in turn creates new countries of origin for the raw material.

Continued population growth and increased income in certain countries are expected to lead to increased demand for fish and seafood. As the opportunities to increase production in the catch fishery is limited aquaculture is expected to supply the increased market demand.

Brexit is another factor that might have an impact on our industry in the future, directly by influencing raw material supply for companies processing pelagic fish that today is caught in British water in the North Sea and indirectly by influencing market prices for fish and fishery products. However as long as the conditions for future trade and fishing in each other's water has not been negotiated we do not know the magnitude of the eventual effects.

#### *5.18.6 Data coverage and quality*

There are no major data issues in the Swedish DCF data. The Swedish data in this report was bought by the Swedish Board of Agriculture from Statistics Sweden and reported by the Swedish Board of Agriculture. The reported data are consistent with the data reported to Eurostat by Statistics Sweden. The calculations of indicators from the data collected under the data collection framework may however slightly differ from figures reported to Eurostat, due to different methods of calculation or different exchange rates.

## 5.19 United Kingdom

### 5.19.1 Overview

It is estimated that in 2017 there were 341 UK companies deriving the majority of their income from fish processing, a reduction of 35% compared with 2008 figures. Underlying the continued contraction in industry size since 2008 was a pronounced decline in the number of businesses with 10 or fewer FTEs (a 35% decrease since 2008) and businesses with 11-49 FTEs (a 41% decrease since 2008) which continued to 2017. Full time equivalent jobs (FTEs) supported by majority processing companies in the UK has stayed relatively constant since 2010 at around 19 thousand (19.1 thousand FTEs in 2017). In 2017 the number of FTEs per enterprise was approximately 56, a 39% increase since 2008, suggesting a continued trend of consolidation over time. The most recent data suggests that in 2017 the largest 13 fish processing enterprises accounted for 4% of total enterprises and 49% of industry employment.

The combined turnover of the 341 processing companies (turnover from all activities, not just fish processing activity) was approximately EUR 3.9 billion in 2017, a decrease of 14% compared the previous year (in nominal terms), and 29% lower than in 2008. Production costs in 2017 were 18% lower than in 2016, driven largely by a 15% reduction in total estimated cost of fish and other raw materials for production between years. In 2017 net profit improved on 2016 values but labour productivity decreased slightly (3%). The industry continues to face challenges relating to the political uncertainty surrounding EU Exit, particularly in relation to seafood markets and trade, future regulatory requirements, and access to labour.

Table 5.19.1: Overview, United Kingdom, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>											
Total enterprises	525	482	420	408	383	389	375	371	355	341	-4%
≤10 employees	252	223	190	177	154	167	172	166	179	165	-8%
11-49 employees	188	171	147	146	144	138	127	129	112	111	-1%
50-249 employees	74	76	69	72	73	70	62	63	51	52	2%
≥250 employees	11	12	14	13	12	14	14	13	13	13	0%
<b>Employment (number)</b>											
Total employees	22,988	22,583	21,057	20,754	20,073	20,541	20,126	20,111	19,444	20,233	4%
FTE	20,612	20,631	19,606	19,405	18,858	19,142	18,618	18,778	18,331	19,118	4%
<b>Indicators</b>											
Turnover (million €)	5,554	4,518	4,928	5,078	5,525	5,065	5,315	5,306	4,575	3,935	-14%
FTE per enterprise	39.3	42.8	46.7	47.6	49.2	49.2	49.6	50.6	51.6	56.1	9%
Average wage (thousand €)	19.6	25.6	29.1	31.1	34.8	33.3	34.7	35.6	32.9	24.6	-25%
Unpaid work (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
<b>Enterprises doing fish processing not as main activity</b>											
Number of enterprises	647	423	353	353	247						
Turnover attributed to fish processing (million €)	622	507	511	567	655						

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.19.2 Economic performance

The combined turnover of the 341 processing companies (turnover from all activities, not just fish processing activity) and total income were approximately EUR 3.9 billion in 2017, both a 14% decrease from 2016 (in nominal terms).

Total production costs in 2017 are estimated to have been around EUR 3.5 billion, accounting for about 88% of total income. Production costs in 2017 were 18% lower than in 2016. The decrease in costs between 2016 and 2017 was primarily driven by a 15% reduction in industry spending on purchasing fish and other raw materials for production between years. In 2017, raw materials accounted for around 78% of production costs and 69% of total income. Labour remuneration accounted for 13% of production costs and 12% of total income in 2017. Operational costs (excluding energy costs) were approximately 7% as a proportion of production costs and 7% as a proportion of total income in 2017. Industry energy costs were estimated to account for less than 2% of both total income and production costs in 2017.

The gross value added (GVA) of the industry stood just under EUR 1 billion in 2017, a 1% increase from 2016. Though both total income and total production costs decreased between 2016 and 2017, industry net profit is estimated to have increased during this time. Labour productivity decreased an estimated 3% between 2016 and 2017.

Table 5.19.2: Economic performance indicators, United Kingdom, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Income (million €)</b>											
Turnover	5,554.1	4,517.6	4,927.7	5,078.0	5,525.2	5,064.5	5,315.5	5,305.7	4,575.1	3,934.9	-14%
Other income	8.5	16.2	100.8	13.7	25.5	164.9	13.1	25.5	3.3	5.6	69%
Operating subsidies	0.0	0.0	0.0	0.0	1.1	0.2	4.7	4.6	0.5	3.6	698%
<b>Total Income</b>	<b>5,562.5</b>	<b>4,533.8</b>	<b>5,028.4</b>	<b>5,091.7</b>	<b>5,551.9</b>	<b>5,229.7</b>	<b>5,333.3</b>	<b>5,335.7</b>	<b>4,578.8</b>	<b>3,944.1</b>	<b>-14%</b>
<b>Expenditure (million €)</b>											
Purchase of fish and other raw material for production	3,123.6	3,244.3	3,426.0	3,626.5	3,912.1	3,575.5	3,727.5	3,505.6	3,199.8	2,707.0	-15%
Wages and salaries of staff	404.5	527.6	570.1	603.6	655.6	637.8	646.2	668.1	603.4	469.8	-22%
Imputed value of unpaid labour	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
Energy costs	66.5	36.8	45.1	40.4	50.9	46.4	78.7	38.2	62.2	46.3	-25%
Other operational costs	520.2	523.1	614.0	553.0	556.6	472.7	562.7	504.0	400.7	259.3	-35%
<b>Total production costs</b>	<b>4,114.8</b>	<b>4,331.9</b>	<b>4,655.3</b>	<b>4,823.6</b>	<b>5,175.2</b>	<b>4,732.4</b>	<b>5,015.1</b>	<b>4,716.0</b>	<b>4,266.0</b>	<b>3,482.4</b>	<b>-18%</b>
<b>Capital Costs (million €)</b>											
Depreciation of capital	62.8	72.9	79.7	86.6	109.1	85.0	104.4	93.7	76.5	69.3	-9%
Financial costs, net	30.0	88.6	77.4	56.0	61.6	57.4	25.1	19.0	19.2	-23.2	-221%
<b>Capital Value (million €)</b>											
Total value of assets	1,697.2	1,937.8	2,174.5	3,182.3	3,461.5	2,952.1	3,545.1	3,233.5	2,949.2	1,215.1	-59%
Net Investments	0.0	18.7	26.0	61.1	39.6	131.1	68.9	0.0	63.6	52.9	-17%
Subsidies on investments									0.3	2.3	630%
Debt	231.0	508.7	281.4	323.6	399.0	402.4	486.1	281.7	318.9	219.0	-31%
<b>Economic performance (million €)</b>											
Gross Value Added	1,852.3	729.6	943.3	871.7	1,031.1	1,134.8	959.6	1,283.3	915.7	927.8	1%
Operating Cash Flow	1,447.7	202.0	373.2	268.1	376.6	497.3	318.2	619.8	312.8	461.7	48%
Earning before interest and tax	1,384.9	129.1	293.4	181.5	267.6	412.3	213.8	526.1	236.3	392.4	66%
Net Profit	1,354.9	40.5	216.1	125.6	205.9	354.9	188.7	507.0	217.1	415.6	91%
<b>Productivity and performance Indicators</b>											
Labour productivity (thousand €)	89.9	35.4	48.1	44.9	54.7	59.3	51.5	68.3	50.0	48.5	-3%
Capital productivity (%)	109.1	37.7	43.4	27.4	29.8	38.4	27.1	39.7	31.0	76.4	
GVA margin (%)	33.3	16.1	18.8	17.1	18.6	21.7	18.0	24.1	20.0	23.5	
EBIT margin (%)	24.9	2.8	5.8	3.6	4.8	7.9	4.0	9.9	5.2	9.9	
Net profit margin (%)	24.4	0.9	4.3	2.5	3.7	6.8	3.5	9.5	4.7	10.5	
Return on Investment (%)	81.6	6.7	13.5	5.7	7.7	14.0	6.0	16.3	8.0	32.3	
Financial position (%)	86.4	73.7	87.1	89.8	88.5	86.4	86.3	91.3	89.2	82.0	

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.19.3 Socio-demographic structure

The collection of social indicators for the UK processing sector started at the end of 2017<sup>48</sup>, following a successful pilot study earlier in the year<sup>49</sup>. Data presented here are for 2018 only and were collected at the end of 2018 in conjunction with the biennial census data collection. All of the mandatory parameters - age distribution, nationality, skill-level and employment status were collected and provided at enterprise level by the UK.

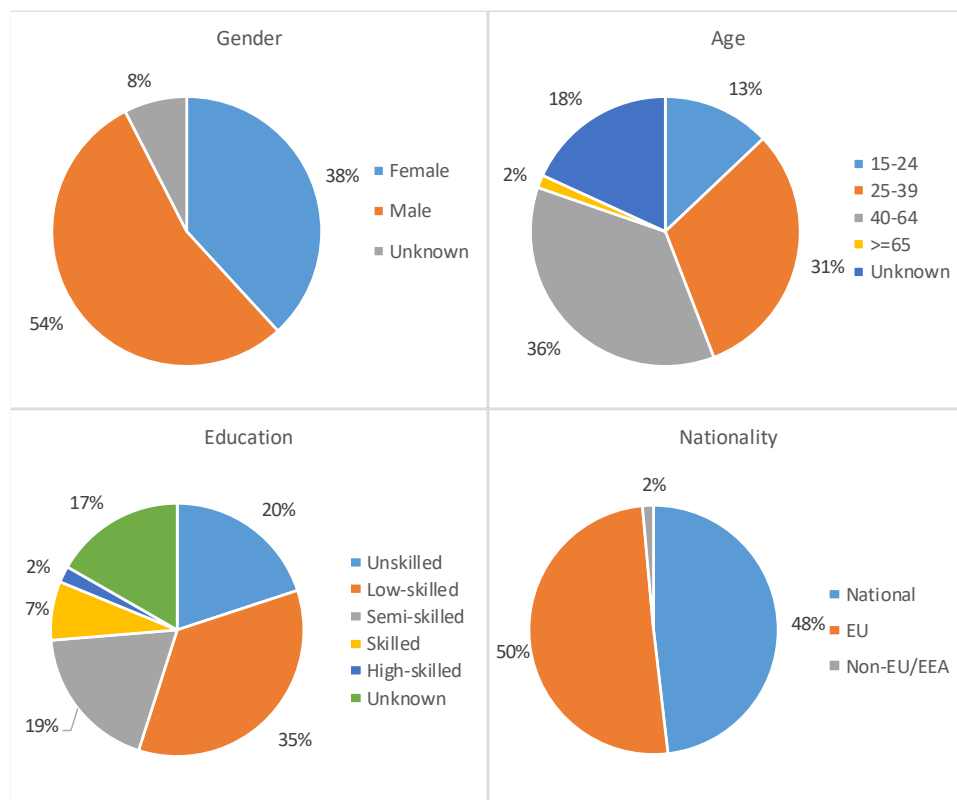


Figure 5.19.1: Socio-demographic characteristics, United Kingdom, 2018

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

The majority of employees working in the UK processing sector in 2018 were male (54%) followed by female (38%) and 8% unknown.

The age groups used during the data collection were 15-24, 25-39, 40-64 and >= 65. An estimated 36% of the of the total FTEs (19 191) were in the age group 40-64, followed by 31% in the age group 25-39, 13% 15-24, and 2% >=65 (18% unknown or unreported).

In terms of skill-level (education<sup>50</sup>), the largest share of FTE jobs (35% - 6 715 FTEs) were low-skilled jobs, followed by unskilled (20% - 3 829 FTEs) and semi-skilled (19% - 3 598 FTEs), then skilled (7% - 1 441 FTEs) and high-skilled (2% - 400 FTEs), with 17% unknown or unreported.

<sup>48</sup> Seafish UK Seafood Processing Sector Labour report 2018.

[https://seafish.org/media/Publications/2018\\_Seafood\\_Processing\\_Sector\\_Labour\\_Report.pdf](https://seafish.org/media/Publications/2018_Seafood_Processing_Sector_Labour_Report.pdf)

<sup>49</sup> Seafish UK Seafood Processing Sector Labour report 2017.

[https://seafish.org/media/Publications/FINAL\\_Seafood\\_Processing\\_Sector\\_Labour\\_Analysis\\_FINAL\\_20170925\\_F.pdf](https://seafish.org/media/Publications/FINAL_Seafood_Processing_Sector_Labour_Analysis_FINAL_20170925_F.pdf)

<sup>50</sup> For data collection purposes, skill level was considered more relevant than education for processing jobs.

Skill level was defined based on UK National Qualification Frameworks (NQF) <sup>51</sup>:

- High skilled (NQF 6+): requiring a degree or higher professional qualification
- Skilled (NQF 5-6): requiring a Higher National Diploma (HND) and experience
- Semi-Skilled (NQF 3-4): requiring experience and training
- Low-skilled (NQF2): requiring some training or experience
- Unskilled (below NQF 2): requiring little or no training or experience

It is estimated that 50% of FTE jobs in the UK fish processing sector are filled by EU workers, with reliance varying by region and company size<sup>52</sup>. During interviews processing businesses reported that they have difficulty recruiting and retaining suitably skilled British staff for a number of reasons<sup>53</sup>, such as undesirable working patterns and environment, insufficient pay, and low levels of local unemployment.

Some processors did not hold detailed information on staff employed through agencies meaning that some companies were unable to provide data for all variables. In these instances, data were recorded as unknown or unreported.

#### *5.19.4 Breakdown by company size*

There were an estimated 165 fish processing companies employing up to 10 FTEs in 2017, representing 48% of the total number of enterprises and under 5% of total FTEs in 2017. The overall reduction in number of enterprises between 2016 and 2017 is almost entirely driven by this segment. The relative economic position of this size category remains low at an estimated 3% of total industry income in 2017.

In 2017, the number of enterprises employing between 11 and 49 FTEs was 111, representing 33% of the total number of processors and 14% of total FTEs in 2017. Companies in the 11-49 FTEs category produced approximately 13% of total industry income, a 31% decrease from 2016.

In 2017, there were 52 processors employing between 50 and 249 FTEs, representing 15% of processing companies and 32% of FTEs. Between 2008 and 2017 the 50-249 FTEs size category saw an increase in its share of total industry income (from 29% to 38%).

In 2017, 13 processing companies employed more than 250 FTEs, representing 4% of the total number of processors and 49% of FTE jobs in the industry. In 2008 there were 11 such companies, which represented 2% of the total number of processors and 38% of FTEs in the industry. The relative importance of this largest size category has increased between 2008 and 2017, both in terms of its share of total number of enterprises (up 2%) and in terms of its share of industry employment (up 11%). Concurrently this industry segment has experienced a 2% increase in its share of total income to an estimated 45% of total income in 2017.

Absolute changes in financial performance across the different size categories reveal additional nuances of recent industry developments, with larger companies performing better on average.

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<sup>51</sup> List of qualifications available on the UK government website here: <https://www.gov.uk/what-different-qualification-levels-mean/list-of-qualification-levels> [Accessed 20 November 2019].

<sup>52</sup> Seafish UK Seafood Processing Sector Labour report 2019. [https://seafish.org/media/1565949831-2019\\_A2\\_Q5\\_Processing\\_Sector\\_Labour\\_Report.pdf](https://seafish.org/media/1565949831-2019_A2_Q5_Processing_Sector_Labour_Report.pdf)

<sup>53</sup> Seafish UK Seafood Processing Sector Labour report 2018. [https://seafish.org/media/Publications/2018\\_Seafood\\_Processing\\_Sector\\_Labour\\_Report.pdf](https://seafish.org/media/Publications/2018_Seafood_Processing_Sector_Labour_Report.pdf)

Table 5.19.3: Economic performance by size, United Kingdom, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>less than or equal to 10 employees</b>											
Total Income	260	126	135	138	184	120	104	87	179	135	-25%
Total production costs	213	125	112	122	148	114	92	72	172	127	-26%
Gross Value Added	63	16	35	30	51	18	29	27	28	26	-6%
Operating Cash Flow	47	1	23	17	36	7	13	15	7	8	6%
Earning before interest and tax	45	0	22	15	34	6	12	13	6	5	-7%
Net Profit	44	-1	22	15	34	6	12	13	5	4	-13%
<b>between 11 and 49 employees</b>											
Total Income	1,303	1,401	1,141	1,123	1,162	719	698	886	739	508	-31%
Total production costs	1,198	1,345	1,036	1,084	1,085	628	633	831	709	477	-33%
Gross Value Added	203	174	207	152	195	195	149	159	127	109	-14%
Operating Cash Flow	106	56	105	39	77	91	65	55	30	31	5%
Earning before interest and tax	91	41	96	28	65	79	53	39	18	22	19%
Net Profit	80	34	91	23	60	74	50	35	15	21	33%
<b>between 50 and 249 employees</b>											
Total Income	1,595	1,797	1,885	2,205	2,214	2,395	2,714	2,384	1,889	1,516	-20%
Total production costs	1,121	1,672	1,692	1,996	2,017	2,195	2,484	2,178	1,734	1,357	-22%
Gross Value Added	680	342	412	456	447	474	518	469	384	330	-14%
Operating Cash Flow	474	125	193	209	197	200	230	206	155	159	3%
Earning before interest and tax	444	95	164	175	147	163	174	169	116	127	9%
Net Profit	428	85	155	166	136	149	154	159	108	131	21%
<b>greater than or equal to 250 employees</b>											
Total Income	2,404	1,210	1,868	1,626	1,991	1,996	1,817	1,979	1,772	1,785	1%
Total production costs	1,582	1,191	1,816	1,621	1,925	1,796	1,807	1,635	1,651	1,521	-8%
Gross Value Added	905	198	289	233	338	448	263	628	377	463	23%
Operating Cash Flow	822	19	52	4	65	200	10	344	121	264	118%
Earning before interest and tax	805	-7	12	-36	21	164	-25	305	97	239	147%
Net Profit	802	-78	-52	-78	-23	126	-28	301	89	260	193%

Source: MS data submissions under the 2019 Fish processing data call and elaboration by the EWG.

### 5.19.5 Trends, drivers and outlook

The UK fish processing industry has consolidated over time. This trend continued to 2017, with a year on year increase in the average number of FTEs per enterprise between 2008 and 2017. While the number of FTE jobs has oscillated around 19 thousand jobs since 2010, the number of enterprises has steadily declined, with most of the reduction driven by a decrease in the number of the smallest companies (those with less than 10 FTEs). The contraction in total FTEs since 2008 can be explained in part by increased mechanisation as well as continued industry consolidation, requiring fewer FTEs. Broadly speaking, concentration has taken place through a combination of: business consolidation (mergers and take-overs); market exits (e.g. retirement without succession or cessation due to loss of market share); and independent increases in average firm size.

Data collected during the latest UK processing census suggests that the total number of enterprises continued to decline between 2016 and 2018. This reduction was largely driven by a further decrease in the number of enterprises in the smallest segment (1-10FTEs), suggesting a

continued trend of consolidation over time<sup>54</sup>. Number of FTE jobs, however, increased slightly during this period. Some of the change in FTEs between 2016 and 2018 is likely due to seasonality of the workforce. Censuses prior to 2018 were carried out at the end of summer (July - August), while the 2018 census was carried out at the end of the year (November - December). Depending on the type of processing activity, employment can vary considerably during the year and may partially explain this change. In the lead up to Christmas, for example, some processors may have employed more seasonal staff.

Women continue to make up an important component of the fish processing workforce in the UK. The share of male to female FTEs remained steady between 2008 and 2017 at approximately 60% male, 40% female.

UK unemployment has continued to decline since 2012 which could make it more difficult for UK processors to fill job vacancies with British workers without increasing wages or investing in other ways to make jobs more attractive, thereby increasing production costs<sup>55</sup>. Interviews with processors carried out from 2017 to 2019 on the subject of labour confirmed that low local unemployment rates often make it difficult to recruit and retain British staff<sup>56</sup>. Furthermore, during these same interviews, processors reported that uncertainty around EU Exit has made it increasingly difficult to recruit and retain EU staff, on which some companies heavily rely.

The UK fish processing industry continues to rely heavily on trade with a variety of countries in a multitude of currencies. Foreign market developments and exchange rate fluctuations are therefore crucial to the future health of the industry. The pound-euro exchange rate, for example, is still particularly important for UK imports and exports. Following a high in 2015 the value of the Pound Sterling dropped against the Euro and has continued to decline reaching a low in August 2017 and again in August 2019<sup>57</sup>. If the value of the Pound Sterling remains low, UK processors could continue to struggle to attract foreign labour due to unfavourable exchange rates and face increased production costs for imported raw materials. On the other hand, the de-valuation of the Pound Sterling could strengthen UK export competitiveness and potentially make UK assets more attractive for foreign capital investors. While the long-term impacts of permanent exchange rate adjustments are unavoidable, the extent to which exchange rate fluctuations affect businesses' short-term financial performance depends heavily on the financial instruments businesses utilise to hedge those risks. Generally speaking, larger companies have better access to bespoke financial services. Therefore, if the average company size continues to increase in the coming years, short-term financial performance volatility associated with exchange rate fluctuations could be expected to decrease, despite the uncertain financial climate surrounding EU Exit.

In 2018 landings value and volume into the UK and abroad by UK vessels were slightly lower than in 2017 (-1.5% value and -4.7% volume)<sup>58</sup>. The overall increase in the average value per tonne of landings by UK vessels suggests that the cost of raw material inputs may have increased between 2017 and 2018; however this financial data is not yet available for analysis. Considering seafood imports into the UK in 2017 compared to 2018, both estimated live weight equivalence

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<sup>54</sup> Seafish Processing Enquiry Tool 2019.

[https://public.tableau.com/profile/seafish#!/vizhome/ProcessingEnquiryTool/IndustryOverview\\_HR](https://public.tableau.com/profile/seafish#!/vizhome/ProcessingEnquiryTool/IndustryOverview_HR)

<sup>55</sup> Office for National Statistics (ONS) Unemployment rate (aged 16 and over, seasonally adjusted) timeseries

<https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/unemployment/timeseries/mgsx/lms>  
[Accessed 20 November 2019].

<sup>56</sup> Seafish UK Seafood Processing Sector Labour report 2018.

[https://seafish.org/media/Publications/2018\\_Seafood\\_Processing\\_Sector\\_Labour\\_Report.pdf](https://seafish.org/media/Publications/2018_Seafood_Processing_Sector_Labour_Report.pdf)

<sup>57</sup> European Central Bank euro reference exchange rate: Pound sterling (GBP)

[https://www.ecb.europa.eu/stats/policy\\_and\\_exchange\\_rates/euro\\_reference\\_exchange\\_rates/html/eurofxref-graph-gbp.en.html](https://www.ecb.europa.eu/stats/policy_and_exchange_rates/euro_reference_exchange_rates/html/eurofxref-graph-gbp.en.html) [Accessed 20 November 2019].

<sup>58</sup> Marine Management Organisation (MMO) UK Sea Fisheries Statistics 2018.

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/833880/UK\\_sea\\_fisheries\\_statistics\\_2018.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/833880/UK_sea_fisheries_statistics_2018.pdf)



and value of imports were lower in 2018 with higher average value per tonne of estimated live weight of imports in 2018, further supporting this hypothesis.

Looking ahead, access to and cost of raw materials for UK enterprises will be impacted by the final agreed access arrangements to EU-UK stocks as well as trading arrangements. Some supplies may become cheaper if the UK fleet has an excess landings capacity; however other materials which were previously caught in non-UK waters or were imported from or through EU countries could become more expensive or otherwise less accessible after EU Exit. On the other hand, future economic performance could be improved through increased access to export markets and supplies of raw materials from abroad through new trade agreements. A new trade environment may also allow access to other sources of labour which current trade agreements do not provide.

The UK processing industry continues to address issues securing a smooth supply of raw materials with improved freezing and storage capacity and increased vertical integration both with the supply base and with customers. The UK's reputation for high quality sourced and imported raw materials with various certifications such as the Marine Stewardship Council (MSC) label and the continued improvement of the environmental status of the majority of UK supply chain fisheries has allowed the UK industry to build good relationships with clients and suppliers globally<sup>59,60</sup>. Finally, while some UK processors continue to suffer from restricted access to resources or markets due to their remote locations, the increasing global demand for seafood products has created opportunities for many processors to expand their product and client base. In the domestic market for seafood, for example, the growth in the number of 'metro stores' selling seafood has increased the number of sales outlets for seafood, providing an opportunity for growth and innovation within the industry<sup>61</sup>. Other trends in recent years, such as the increase in "lifestyle" dietary changes, particularly from younger consumers in the UK, towards vegan, vegetarian and pescatarian diets due to health and ethical concerns around animal proteins could impact local markets and demand for seafood products either positively (as a perceived healthy alternative to other animal proteins) or negatively (as a perceived unethical or unsustainable protein source)<sup>62</sup>.

#### *5.19.6 Data coverage and quality*

To collect financial data, questionnaires were sent to all companies identified in the population of majority fish processors in the UK<sup>63</sup>. Multisite companies with at least one majority seafood processing site were asked to submit financial information. Response rates are relatively low as data provision is voluntary. The target sample rates each year are set at 10% or three companies per segment, whichever is greater. Segments are based on number of FTE jobs (company FTE size band). Issues with coverage of smaller sites remain. Specifically, sample bias arising from self-selection and the fact that only accounts for larger companies are publicly available may skew the data in some ways, as data for smaller companies is more limited. Other limitations result from the inconsistency of companies in the sample used for the estimation each year. In some FTE bands there is a great deal of variation in terms of which particular companies are included in the sample in each year (e.g. in some cases less than 50% of the sample from the previous year is included again in the next year). Furthermore, based on our definition of majority

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<sup>59</sup> Seafish Seafood Processing Industry Report 2016.

[https://www.seafish.org/media/publications/2016\\_Seafood\\_Processing\\_Industry\\_Report.pdf](https://www.seafish.org/media/publications/2016_Seafood_Processing_Industry_Report.pdf)

<sup>60</sup> Seafish Cutting Edge 2019. [https://issuu.com/seafishuk/docs/cutting\\_edge\\_issue\\_1](https://issuu.com/seafishuk/docs/cutting_edge_issue_1)

<sup>61</sup> Seafish Seafood Processing Industry Report 2016.

[https://www.seafish.org/media/publications/2016\\_Seafood\\_Processing\\_Industry\\_Report.pdf](https://www.seafish.org/media/publications/2016_Seafood_Processing_Industry_Report.pdf)

<sup>62</sup> Protein consumption and recent trends in the UK 2019.

[https://www.seafish.org/media/Protein\\_consumption\\_march\\_2019.pdf](https://www.seafish.org/media/Protein_consumption_march_2019.pdf)

<sup>63</sup> Seafish Seafood Processing Methodology Report 2019.

[https://seafish.org/media/Seafood\\_Processing\\_Methodology\\_Report.pdf](https://seafish.org/media/Seafood_Processing_Methodology_Report.pdf)

processors, some companies may come in and out of the population if the proportion of their annual turnover from fish processing activity fluctuates around 50% from year to year.

To collect social data, all majority fish processors were invited to complete the 2018 annual survey on workforce composition. Processors were sent survey forms by email and invited to complete surveys electronically. Some companies were also contacted and surveyed by phone in January 2019 to ensure a good level of coverage across all company size bands and in all regions of the UK. Seafish collected data from 119 individual processing sites operated by 111 processing companies in the 2018 annual labour survey. The processing sites in the sample submitted data for a total of 10 730 people employed across saltwater and freshwater fish processing in 2018. According to the 2018 processing sector census, the companies that responded to the annual labour survey accounted for 6 684 FTEs in 2018 (or 36% of FTEs in the sector in 2018). Similar to the financial survey, responses may be skewed towards larger companies due to coverage issues with smaller sites.

Since the last processing report, improvements in data collection, management, estimation methods and increasing the robustness of definitions mean that direct comparisons with data for earlier years (2008-2015) and those used in previous reports may not always be possible, even where seemingly comparable figures have been previously published. However, general trends are believed to be reflective of actual business activity. The UK government intends to continue sampling the processing sector under the new data collection framework, rather than relying on Eurostat structural business statistics.

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## **7 DATA COVERAGE AND QUALITY**

As foreseen in the Regulation No 2017/1004, the Commission asked Member States to provide aggregated scientific data from within their National Data Collection programs to support scientific advice.

The data requested refers to 2016 and 2017, with 2018 on a voluntary basis; while previous years (2008-2015) could be submitted or resubmitted in cases where the already submitted data are considered incomplete or require correction. Data requested for 2016 and 2017, in accordance within their National Data Collection programs, can be provided under the provisions of Regulation 2017/1004. Previous years' data can be provided under the provisions of Regulation 199/2008.

Under the provisions of Commission Decision 2010/93/EU (Appendix XII), there are requested the variables: Income (turnover, subsidies and other income), Personnel costs (Wages and salaries of staff and Imputed value of unpaid labour), Energy costs, Purchase of fish and other raw material for production, Other operational costs, Capital costs (depreciation of capital and financial costs), Extraordinary costs, Total value of assets, Net Investments, Debt, Employment (Number of persons employed, gender and FTE national) and number of enterprises pertaining to the EU fish processing sector. Moreover, for enterprises that carry out fish processing but not as a main activity, it is mandatory to collect the Number of enterprises and Turnover attributed to fish processing, in the first year of each programming period. Member States who have decided to follow the extended programme are invited to submit the previously mentioned data following the segmentation by size category set out in the Commission Decision 2010/93/EU. The segmentation is set out in the Appendix XII of the Commission Decision.

Under the provisions of Council Regulation 2017/1004, there are requested the economic variables for the aquaculture sector detailed in Table 11 of the Commission Decision (EU) 2016/1251. In particular, Income (gross total sales, operating subsidies and other income), Personnel costs (Personnel costs and Imputed value of unpaid labour, and optionally Payment for external agency workers), Energy costs, Purchase of fish and other raw material for production, Other operational costs, Capital costs (consumption of fixed capital), Financial income and Financial expenses, Total value of assets, Net Investments, Subsidies in investments, Debt, Employment (Number of persons employed their FTE national, number of unpaid labour and their FTE, and Number of hours worked by employees and unpaid labour) and number of enterprises pertaining to the EU fish processing sector. Moreover, for enterprises that carry out fish processing but not as a main activity, it is possible to report the Number of enterprises and Turnover attributed to fish processing. Member States who have decided to follow the extended programme are invited to submit the previously mentioned data following the segmentation by size category set out in the Commission Decision 2010/93/EU. Moreover, it is requested to report employment by gender, age, education level and nationality.

The Data Collection Framework (DCF) and EU-MAP requires data quality assurance by Member States. Data checks were performed by the JRC through the comprehensive analysis of the data submitted and by experts attending the meeting to elaborate this report. As a consequence of these data checks data has been resubmitted by some of the countries after the deadline and during the EWG meeting. There have also been a few countries resubmitting data after the meeting due to discrepancies found during the meeting.

This was the sixth call for data on the EU fish processing sector. Although overall data quality was rather good, there are still issues that have to be improved by the Member States. On the other

hand, the coverage has decreased from previous data calls (see Table 7.1), as under the EU-MAP, the fish processing sector data collection is done on a voluntary basis.

All countries submitted the data before the deadline, with the only exceptions of Slovakia and France that did it shortly after. Only minor data resubmissions took place afterwards, and before the deadline to correct the initial data sets. The dedicated STECF expert working group took place from 18 to 22 November 2019.

#### *Coverage main economic data*

Bulgaria, Lithuania, Poland, Romania and Slovakia reported 2018 data on a voluntary basis.

Belgium did not report 2017 data, since 2017 Belgian data will only be available by the end of 2019, as detailed in their national work plan.

Cyprus, Estonia, Netherlands and Portugal decided not to collect fish processing data under the EU-MAP.

**Table 7.1: Coverage of the economic data for the companies doing fish processing as main activity (Y means reported), 2008-2018**

Country	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Belgium	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Bulgaria	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Croatia				Y	Y	Y	Y	Y	Y	Y	
Cyprus	Y	Y	Y	Y	Y	Y	Y	Y			
Denmark	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Estonia	Y	Y	Y	Y	Y	Y	Y	Y			
Finland	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
France	Y	Y	Y	Y	Y	Y	Y	Y			
Germany	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Greece				Y	Y	Y	Y	Y	Y	Y	
Ireland	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Italy	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Latvia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Lithuania	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Malta	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Netherlands	Y	Y	Y	Y	Y	Y	Y				
Poland	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Portugal	Y	Y	Y	Y	Y	Y	Y	Y			
Romania		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Slovakia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Slovenia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Spain	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Sweden	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
United Kingdom	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

France submitted only the total number of enterprises and turnover for 2016 and 2017, as well as some employment data. Moreover, serious concerns were raised for these data that it was decided not to consider for this analysis.

Slovakia only submitted partial data for the main economic activity, with several inconsistencies. However, it should be noticed that Slovakia, as well as other landlocked countries were never in the whole period 2008-2017 obliged to report fish processing data.

#### *Coverage main economic data by size category*

Cyprus, Estonia, Germany and Slovakia never reported data by size category. France stopped reported data by size category in 2012, while the Netherlands and Portugal did it with the change to the EU-MAP.

**Table 75.19.2: Coverage of the economic data for the companies doing fish processing as main activity by size category (Y means reported), 2008-2018**

Country	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Belgium	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Bulgaria	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Croatia				Y	Y	Y	Y	Y	Y	Y	
Cyprus											
Denmark	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Estonia											
Finland					Y	Y	Y	Y	Y	Y	
France	Y	Y	Y	Y	Y	Y					
Germany											
Greece					Y	Y	Y	Y	Y	Y	
Ireland	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Italy						Y	Y	Y	Y	Y	
Latvia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Lithuania	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Malta	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Netherlands	Y	Y	Y	Y	Y	Y	Y				
Poland	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Portugal	Y	Y	Y	Y	Y	Y	Y	Y			
Romania		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Slovakia											
Slovenia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Spain	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Sweden	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
United Kingdom	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

#### *Coverage data on enterprises that carry out fish processing but not as a main activity*

For the enterprises that carry out fish processing but not as a main activity, it was requested to report the Number of enterprises and Turnover attributed to fish processing. These data are to be reported at least once per programming period.

Bulgaria, Slovakia and Spain did not submit the Number of companies and Turnover of the enterprises that do fish processing but not as main activity for the whole period 2008-2017.

Belgium did not report Turnover of the enterprises that do fish processing but not as main activity for the whole period 2008-2017.

Of the countries reporting EU-MAP data, France, Germany and the United Kingdom did not report any data on the Number of companies and Turnover of the enterprises that do fish processing but not as main activity for the EU-MAP period 2016-2017.

**Table 7.3: Coverage of the data on companies doing fish processing not as main activity, 2008-2018**

Country	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Belgium	P	P	P	P	P	P	P	P	P		
Bulgaria											
Croatia				Y	Y	Y	Y	Y	Y	Y	
Cyprus	Y	Y	Y	Y	Y	Y	Y	Y			
Denmark	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Estonia	Y	Y	Y	Y	Y	Y	Y	Y			
Finland	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
France		Y	Y				Y	Y			
Germany		Y		Y							
Greece					Y	Y	Y	Y	Y	Y	
Ireland		Y	Y	Y	Y	Y	Y	Y	Y	Y	
Italy	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Latvia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Lithuania	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Malta	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Netherlands		Y	Y	Y	Y	Y	Y				
Poland	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Portugal	Y		Y					Y			
Romania	Y	Y	Y	Y	Y	P	Y	Y	Y	Y	Y
Slovakia											
Slovenia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Spain											
Sweden	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
United Kingdom	Y	Y	Y	Y	Y						

#### *Coverage social data*

The reporting of the social data (employment by gender, age, education level and nationality) started under the EU-MAP and one year (2017) was required to be reported.

Bulgaria, Denmark, Finland, Greece, Italy and Poland even reported social data for more than one year.

Of all the countries that submitted EU-MAP data (for the period 2016-18), only France, Malta, Spain and Slovakia did not submit social data.

Belgium only reported the employment by gender.

**Table 7.4: Coverage of the social data, 2016-2018**

Country	2016	2017	2018
Belgium	Y		
Bulgaria		Y	Y
Croatia		Y	
Denmark	Y	Y	
Finland	Y	Y	
Germany		Y	
Greece	Y	Y	
Ireland		Y	
Italy	Y	Y	
Latvia		Y	
Lithuania		Y	
Poland	Y	Y	Y
Romania			Y
Slovenia		Y	
Sweden		Y	
United Kingdom			Y

*Coverage data on raw materials*

The reporting of the weight of raw material in kg per species and origin started under the EU-MAP and is optional.

Bulgaria, Croatia, Finland, Greece, Poland, Romania, Slovakia and Slovenia reported data on raw materials (see Table 7.5). The number in Table 7.5 indicates the number of products reported each year.

**Table 7.5: Coverage of the raw materials data, 2016-2018**

Country	2016	2017	2018
Bulgaria	4	4	4
Croatia	3	3	
Finland	15	16	
Greece	3	3	
Poland	1	1	1
Romania	41	99	104
Slovakia	8	8	8
Slovenia	4	3	

*Other issues*

Other relevant issues affecting quality and coverage of the data:

- Belgium: Missing data on Imputed value of unpaid labour for all the period considered (2008-2016). Missing Other income and Other operational costs for 2016.



- Romania: Missing data on Number of hours worked by employees and the number of unpaid workers.
- Slovakia: Missing data on Purchase of raw material, Energy costs and Unpaid labour. Missing some income items over time. Inconsistency between the sum of income items delivered and the total income. Data on FTE by gender refer to the number of persons employed
- Spain: Missing data on Depreciation of capital, Total value of assets, Subsidies on investments, Debts, Financial income and Financial expenditures.

## 8 CONTACT DETAILS OF EWG-19-15 PARTICIPANTS

<sup>1</sup> - Information on EWG participant's affiliations is displayed for information only. In any case, Members of the STECF, invited experts, and JRC experts shall act independently. In the context of the STECF work, the committee members and other experts do not represent the institutions/bodies they are affiliated to in their daily jobs. STECF members and experts also declare at each meeting of the STECF and of its Expert Working Groups any specific interest which might be considered prejudicial to their independence in relation to specific items on the agenda. These declarations are displayed on the public meeting's website if experts explicitly authorized the JRC to do so in accordance with EU legislation on the protection of personnel data. For more information: <http://stecf.jrc.ec.europa.eu/adm-declarations>

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## **9 LIST OF BACKGROUND DOCUMENTS**

Background documents are published on the meeting's web site on:  
<http://stecf.jrc.ec.europa.eu/web/stecf/ewg1915>

List of background documents:

EWG-19-15 – Doc 1 - Declarations of invited and JRC experts (see also section 8 of this report – List of participants)

EWG-19-15 – Doc 2 – Electronic data annexes

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## 10 ANNEXES

### 10.1 Annex 1 – EU National Mini-Chapters (Member States not submitting data under 2019 data call)

#### 10.1.1 Austria

According to Eurostat data, in 2017, the fish processing industry in Austria consisted of 8 enterprises with an estimated total income of EUR 46.7 million (EUR 42.3 million turnover) employing 137 people corresponding to 117 full time equivalent. The number of employees has fluctuated over the years independently in relation to the increased number of enterprises. The unpaid labour in 2016 was estimated to be 6 persons representing 4.4% of the total employees.

As being a land-locked country, the activity of the Austrian fish processing industry mainly includes locally products from aquaculture (trout and carp) and inland lake fisheries. Many other species have to be imported mainly from Germany, Netherlands, Denmark, Italy, and Turkey (Eurostat source).

Table 10.1.1 is giving an overview of the Austrian fish processing industry. The expenditures are mainly driven by the purchases of raw materials including non-processing goods and services that counts for 86.8% of the total costs in 2017 (EUR 36.9 million over EUR 42.5 million total costs). These costs have increased of 3% between 2016 and 2017 and have grown since 2008 (EUR 23.5 million representing 72.7% of the total costs).

The amount of net investment in tangible goods for 2017 is EUR 0.2 million and represent 0.5% of the total costs; investment in tangible goods have significantly decreased since 2008 (EUR 4.5 million representing 13.9% of the total costs), this represents a decrease of 80% from 2016 and 2017.

The economic performance of Austria fish processing industry has constantly increased from 2008 to 2016 in line with the development of the number of enterprises. However, in 2017 the performance in economic terms has decreased; the GVA was EUR 9.4 million (-18% from 2016 to 2017) and the gross profit was 4 million (-31% from 2016 to 2017). The primary reason was the increase in production costs for purchasing raw materials and goods/services (plus 3%) from 2016-2017.

Table 10.1.1: Overview, Austria, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>											
Total enterprises	6	5	6	5	5	6	9	10	9	8	-11%
Total employees	139	128	122	137	132	129	122		145	137	-6%
Unpaid labour	4	2	3	2	2	5	8		8	6	-25%
FTE	130	120	107	121	117	111	105		124	117	-6%
<b>Income, expenditure and investments (million €)</b>											
Turnover	18.4	21.0	32.5	33.7	34.6	35.0	36.4		41.9	42.3	1%
Total income	31.8	34.4	37.6	39.2	40.2	39.4	41.8		46.7	46.7	0%
Total purchases of goods and services	23.5	27.0	29.6	30.4	30.4	30.1	32.8		35.7	36.9	3%
Personnel costs	4.3	4.1	4.5	4.7	4.7	5.0	4.8		5.7	5.4	-5%
Net investment in tangible goods	4.5	2.6	1.5	1.3	0.2	0.3	0.6		1.0	0.2	-80%
<b>Economic performance (million €)</b>											
Gross Value Added	8.7	9.8	8.4	9.4	9.8	9.3	9.3		11.5	9.4	-18%
Gross profit	4.4	5.6	4.0	4.8	5.1	4.3	4.6		5.8	4.0	-31%

*Source: Eurostat, 2019.*

*Data coverage and quality*

No data were submitted by Austria. For that reason, the EWG prepared a national mini-chapter with limited analyses based on publicly available data (Eurostat).

### 10.1.2 Czechia

According to Eurostat data, in 2017, there were 21 enterprises whose main activity was fish processing in Czechia (Table 10.1.2). Compared to the previous year the total number of enterprises remained stable. The total number of employees in the Czechian fish processing industry was 762, corresponding to 757 FTEs. The number of unpaid persons was 22. Compared to 2016, the total number of employees and FTEs increased 2% in 2017.

The total income was EUR 88.7 million in 2017 of which the turnover from the principal activity formed EUR 76.7 million. If the total income had a slight rise by 3% compared to 2016, then the turnover from the principal activity increased significantly by 172%. The value of total purchases of goods and services decreased by 2% to EUR 71.9 million. On the other hand, the personnel costs increased by 15% to EUR 11.5 million. The net investment in tangible goods increased from EUR 3 million in 2016 to EUR 7.3 million in 2017, a growth of 143%.

Comparing the economic performance indicators between 2016 and 2017, then GVA increased by 20% to EUR 17.6 million in 2017. Gross profit underwent a great rise and reached to EUR 6.2 million.

According to the data of Prodcom<sup>64</sup>, the Czechian fish processing industry sold 16 536 tonnes of fishery products in 2017 (7 200 tonnes in 2016). Bulk of this quantity was frozen fish fillets (60%). The main products in value were frozen fish fillets, prepared or preserved herrings, smoked fish, and fresh or chilled fish fillets and fish meat.

**Table 10.1.2: Overview, Czechia, 2008-2017**

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>											
Total enterprises	20	24	22	22	24	22	20	20	21	21	0%
Total employees	342	341	842	836	709	677	718	750	745	762	2%
Unpaid labour	:	26	24	17	27	23	25	30	24	22	-8%
FTE	333	333	837	833	703	673	710	742	741	757	2%
<b>Income, expenditure and investments (million €)</b>											
Turnover	18.8	23.0	28.1	47.9	34.1	23.6	27.8	29.1	28.2	76.7	172%
Total income	34.4	41.1	101.7	93.0	83.9	83.6	82.9	84.7	85.9	88.7	3%
Total purchases of goods and services	30.8	37.2	86.8	81.4	71.5	71.5	69.8	71.0	73.0	71.9	-2%
Personnel costs	3.1	3.0	11.0	10.8	9.8	9.0	9.0	9.4	10.0	11.5	15%
Net investment in tangible goods	0.3	0.2	3.1	2.8	2.6	2.8	1.8	1.8	3.0	7.3	143%
<b>Economic performance (million €)</b>											
Gross Value Added	4.3	4.7	16.5	13.9	13.2	13.6	13.7	14.8	14.7	17.6	20%
Gross profit	1.2	1.7	5.5	3.1	3.4	4.7	4.7	5.4	4.7	6.2	32%

Source: Eurostat, 2019.

#### Data coverage and quality

No data were submitted by Czechia. For that reason, a national mini-chapter has been prepared by the EWG with limited analyses based on public Eurostat available data.

<sup>64</sup> <https://ec.europa.eu/eurostat/web/prodcom>



### 10.1.3 Estonia

In 2017, there were 66 enterprises whose main activity was fish processing in Estonia (Table 10.1.3). Compared to the previous year the total number of enterprises decreased by two units (3%). The total number of employees in the Estonian fish processing industry was 1 376, corresponding to 1 348 FTEs. The number of unpaid labour was 9. Compared to 2016, the total number of employees and FTEs decreased 12% in 2017.

The total income was EUR 126.8 million in 2017 of which the turnover from the principal activity formed EUR 116.7 million. Both variables remained stable compared to 2016. The value of total purchases of goods and services increased by 2% to EUR 106.4 million. On the other hand, the personnel costs decreased by 10% to EUR 18.4 million. The net investment in tangible goods decreased from EUR 5.1 million in 2016 to EUR 3.8 million in 2017, a drop of 25%.

Comparing the economic performance indicators between 2016 and 2017, then GVA increased by 6% to EUR 23.4 million in 2017. Gross profit underwent a great rise and reached to EUR 5 million.

Table 10.1.3: Overview, Estonia, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>											
Total enterprises	59	56	58	69	64	55	57	70	68	66	-3%
Total employees	2,101	1,822	1,766	1,909	1,961	1,896	1,837	1,881	1,570	1,376	-12%
Unpaid labour	5	9	6	7	0	3	4	14	13	9	-31%
FTE	2,072	1,730	1,741	1,871	1,912	1,862	1,803	1,844	1,536	1,348	-12%
<b>Income, expenditure and investments (million €)</b>											
Turnover	104.9	97.1	110.9	128.7	133.2	147.3	156.9	162.9	117.2	116.7	0%
Total income	123.6	110.2	124.6	148.6	151.3	164.3	168.4	171.5	126.6	126.8	0%
Total purchases of goods and services	99.5	85.3	98.8	127.9	125.7	138.7	143.9	129.4	104.6	106.4	2%
Personnel costs	19.4	15.8	16.2	18.0	20.1	21.4	22.4	23.0	20.4	18.4	-10%
Net investment in tangible goods	6.7	4.6	7.5	11.4	3.5	3.1	6.1	7.7	5.1	3.8	-25%
<b>Economic performance (million €)</b>											
Gross Value Added	25.2	22.9	26.5	25.9	29.1	29.6	27.5	25.3	22.0	23.4	6%
Gross profit	5.9	7.1	10.2	7.9	9.1	8.3	5.1	2.4	1.6	5.0	213%

Source: Eurostat, 2019

The majority of Estonian fish processing enterprises are medium, as their average number of employees is less than 50. Baltic herring and sprat caught by trawlers from the Baltic Sea are the most important local raw material for the Estonian fish processing enterprises. Estonian coastal fishing provides reasonably large volumes of expensive freshwater fish like perch, pikeperch and pike which are used as raw material for fillets. Salmon from northern countries is imported for processing<sup>65</sup>. Due to its small size, the fish markets and processing enterprises do not depend on

<sup>65</sup> Expert knowledge based on catch data, import data and production output of processing companies. Information on catches can be found on the website of the Ministry of Rural Affairs: <https://www.agri.ee/et/eesmargid-tegevused/kalamajandus-ja-kutseline-kalapuuk/puugiandmed>. Information on fishery products based on Prodcom data: <https://ec.europa.eu/eurostat/web/prodcom>. The foreign trade info comes from the statistical database of Statistics Estonia which also sends its data to Eurostat: [http://pub.stat.ee/px-web.2001/I\\_Databas/Economy/databasetree.asp](http://pub.stat.ee/px-web.2001/I_Databas/Economy/databasetree.asp).

domestic aquaculture production<sup>66</sup>. According to the data of Prodcom<sup>67</sup>, the Estonian fish processing industry sold 53 998 tonnes of fishery products in 2017 (54 102 tonnes in 2016). Bulk of this quantity was frozen whole salt-water fish (57%), which mainly was exported to Ukraine. The main products in value were frozen fish fillets, fresh or chilled fish fillets and fish meat, and fish fillets in batter or breadcrumbs including fish fingers.

One of the major fish processing companies in Estonia, which had been accused of tax fraud, was declared bankrupt in 2017. In 2015, the sales revenue of that company had accounted for as much as 30% of the total sales revenue of companies whose main business is fish processing. Thus, the bankrupt company had a significant impact on the economic indicators of the sector between 2015 and 2017: among others decline took place in values of the total sales revenue, the number of employees and export. The proportion of exports in the total sales revenue of companies whose main business is fish processing accounted for 58% in 2017 (72% in 2015)<sup>68</sup>. The production was exported to 53 countries. The main Estonian export countries for fish and fisheries products in value were Finland, Ukraine, Sweden and Denmark in 2017.

#### *Data coverage and quality*

No data was collected nor submitted by Estonia in 2019. For that reason, a national mini-chapter has been prepared by the EWG with limited analyses based on public Eurostat available data and expert knowledge.

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<sup>66</sup> According to Statistics Estonia the production volume of fish farms was only 870 tonnes in 2017 and thus aquaculture was not a significant source of raw material. Estonian fish processing industry sold 53,998 tonnes of fishery products in 2017. [http://pub.stat.ee/px-web.2001/I\\_Databas/Economy/10Fishing/10Fishing.asp](http://pub.stat.ee/px-web.2001/I_Databas/Economy/10Fishing/10Fishing.asp)

<sup>67</sup> <https://ec.europa.eu/eurostat/web/prodcom>

<sup>68</sup> Expert assessment based on the knowledge of the sector (financial statements source).

#### 10.1.4 France

According to Eurostat data, the French fish processing industry sector encompasses 311 enterprises 2017. The selection criterion for identifying the enterprises whose main activity is fish processing has encountered several changes during the last years: this is the reason why no trend analysis can be provided from these data and the chapter is based only on publicly official Eurostat data for the NACE sector 10.20. In 2017, the industry accounts for 12 003 employees corresponding to 11 021 FTE. Unpaid labour affected 51 people who represent 0.4% of the total number of employees. The total turnover was estimated at EUR 2.90 billion in 2017 and the total income at EUR 4.46 billion. The expenditures are mainly driven by the purchases of goods and services, including raw material for processing, which count for 85.9% of the total costs in 2017 (EUR 3.73 billion over EUR 4.35 billion total costs). In 2017, the personnel costs, which reach EUR 528.6 million, represent 12% of the total costs. The amount of net investment in tangible goods for 2017 is EUR 84.8 million and represent 1.9% of the total costs. In term of economic performance, the French fish processing industry has shown in 2017 a GVA of EUR 699.1 million for a Gross profit of EUR 170.4 million. GVA has continuously increased since 2011 while Gross profit appears to be more fluctuating.

**Table 10.1.4: Overview, France, 2008-2017**

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ(2016-17)
<b>Structure (number)</b>											
Total enterprises	348	314	310	318	317	351	327	380	495	311	-37%
Total employees	11,594	11,104	12,780	11,779	11,990	13,282	12,480	12,073	13,641	12,003	-12%
Unpaid labour	:	:	34	40	33	42	62	49	53	51	-4%
FTE	10,525	9,842	11,367	10,995	11,056	11,661	10,954	11,218	12,665	11,021	-13%
<b>Income, expenditure and investments (million €)</b>											
Turnover	2,551.0	2,468.3	2,517.8	2,731.1	2,779.2	2,880.7	2,854.7	2,882.6	3,421.3	2,895.2	-15%
Total income	3,140.3	3,028.5	3,148.6	3,411.9	3,516.3	3,646.1	3,511.5	3,676.8	4,172.5	4,455.1	7%
Total purchases of goods and services	2,554.7	2,385.1	2,573.8	2,856.5	2,935.0	2,999.4	2,896.4	2,995.2	3,541.0	3,732.0	5%
Personnel costs	:	410.5	437.1	448.8	462.5	491.0	470.0	477.9	540.2	528.6	-2%
Net investment in tangible goods	:	20.9	84.3	93.9	128.1	36.5	64.6	21.0	55.0	84.8	54%
<b>Economic performance (million €)</b>											
Gross Value Added	555.5	560.0	565.2	555.6	568.6	603.5	599.0	625.1	651.9	699.1	7%
Gross profit	137.4	149.6	128.1	106.8	106.1	112.5	129.0	147.2	111.6	170.4	53%

Source: EUROSTAT, 2019

#### Products

The French processing industry is highly diversified. According to Prodcom data, the industry is dominated by frozen products (whose turnover reaches EUR 697 million in 2017) and by the prepared crustaceans and molluscs (valued at EUR 648 million in 2017). The dried salted and smoked products (valued at EUR 598 million in 2017), which include mainly smoked salmon, and the prepared dishes (EUR 594 million) are also important. The last subsectors are represented by prepared and canned fishes (valued at EUR 353 million in 2017) and the surimi and fish sticks (EUR 252 million). Between 2012 and 2017, the total production decreased by 12% in volume, but remained relatively stable in value at EUR 3.2 billion. However, the distribution of the production experienced significant changes between 2012 and 2017. Although the frozen products decreased by 40% in quantity, their value decreased only by 10% what allowed them to remain the most valued sub-sector. The dried, salted and smoked products decreased by 35% in volume but also by 20% in value, which explains why they fell from the second to the third

position. This decrease is mainly due to a drop of the smoked salmon production in 2013, when the biggest company of the sub-sector relocated part of its activity outside France. The most important increase has been shown by the prepared crustaceans and molluscs sub-sector, whose production skyrocketed by 62% in value (and by 24% in volume): this allowed it to progress from the fourth to the second rank. The prepared dishes, although relatively stable, have thus lost one rank. The canned products are relatively stable, but the canned tuna products segment increased by 12% in volume and by 16% in value. At last, the surimi and fish stocks sub-sector increased its production by 18% in volume and 12% in value, but still occupy the last rank.

### *Consumption*

According to Kantar Worldpanel, whose data cover 80% of the consumption of the French households (despite high disparities among products), the consumption of seafood products per inhabitant is almost stable over the last 15 years and ranged from 33.3 to 34.2 kg/inhabitant (live weight equivalent) between 2012 and 2016. Although the French household purchases of processed seafood products dropped by 8% from 459 thousand tonnes to 423 thousand tonnes between 2012 and 2017, their value increased by 4% from EUR 4.7 billion to EUR 4.9 billion. Processed seafood products represent 67% of the value of total seafood consumption, a share which is stable since 2010. In 2017, frozen products represented 26% of the consumption in value against 31% in 2012, canned products and smoked and salted fishes remained unchanged at 22% and 17% respectively, and the share of other refrigerated products increased from 15% to 20%. Between 2012 and 2017, the purchase value of frozen products decreased by 13%, and the one of other refrigerated products increased by 36%, what is mainly explained by the positive trend of prepared dishes (+25%). As regards other products, the value of purchases increased by 12% for prepared shrimps (9% market shares in 2017) and decreased by 13% for surimi (6% of 2017 consumption).

### *Data coverage and quality*

The data from the survey operated under the supervision of FranceAgriMer, which were of very good quality and reached a high level of precision until 2010, appear to be less reliable in the latest years. During the "fish processing industry" expert meeting of January 2018, numerous data inconsistencies were detected regarding the years 2011, 2012 and 2013 which prevented the interpretation of some indicators; as regards 2014 and 2015 data, "other operating costs" appeared to be wrong and needed to be corrected twice.

The dataset for the year 2016 and 2017 shown high inconsistencies, which made it useless for the EWG 19-15 report. According to these data, the total turnover of the French fish processing sector was supposed to have reached EUR 12.7 billion in 2016, what would mean that it would be three times higher than the previous years. The 2017 data show a normal pattern as regards turnover, however the number of enterprises falls by 30% between 2015 and 2017. Thus, it appears that the methodology for including companies in the database and estimating missing data has changed several times without stable repository and should therefore be clarified.

As a result, the French chapter in this report is limited to the use of alternative databases whose accuracy is lower than a specific industry ad-hoc survey. These databases are the Eurostat data for the industry structure and economic performances, the Prodcom data for the industry production and the Kantar world panel data for consumption. In 2018, FranceAgriMer carried out a pilot study on the use of raw material in 2016.

### 10.1.5 Hungary

According to Eurostat data, in 2017, there were 8 enterprises whose main activity was fish processing in Hungary (Table 10.1.5). Compared to the previous year the total number of enterprises remained stable. The total number of employees in the Hungarian fish processing industry was 18 which, corresponding to 14 FTEs. The number of unpaid labour was 3. Compared to 2016, the total number of employees and FTEs increased 125% and 75% in 2017, respectively.

The total income was EUR 0.7 million in 2017 of which the turnover from the principal activity formed EUR 0.5 million. If the total income increased by 17% compared to 2016, then the turnover from the principal activity remained stable. The value of total purchases of goods and services increased by 20% to EUR 0.6 million. The personnel costs and the net investment in tangible goods had no significant changes in 2017. According to the data the net investment in tangible goods was zero.

Comparing the economic performance indicators between 2016 and 2017, then GVA increased by 100% to EUR 0.2 million in 2017. The enterprises did not make any profit.

According to the data of Prodcom<sup>69</sup>, the Hungarian fish processing industry sold 80 tonnes of fishery products in 2017 (130 tonnes in 2016). Bulk of this quantity was frozen fish meat (89%). The main products in value were frozen fish meat, frozen fish fillets, and fresh or chilled fish livers and roes.

**Table 10.1.5: Overview, Hungary, 2008-2017**

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ (2016-17)
<b>Structure (number)</b>											
Total enterprises	13	10	11	10	11	10	9	9	8	8	0%
Total employees	57	76	68	61	50	12	49	7	8	18	125%
Unpaid labour	4	2	1	1	4	6	3	3	4	3	-25%
FTE	52	70	61	56	37	11	47	6	8	14	75%
<b>Income, expenditure and investments (million €)</b>											
Turnover	2.6	2.7	2.7	2.0	0.9	0.6	0.1	0.6	0.5	0.5	0%
Total income	3.4	4.7	4.0	3.9	1.1	0.7	0.6	0.8	0.6	0.7	17%
Total purchases of goods and services	2.9	4.1	3.3	3.5	1.1	0.6	0.6	0.6	0.5	0.6	20%
Personnel costs	0.4	0.5	0.5	0.5	0.2	0.1	0.0	0.0	0.0	0.1	0%
Net investment in tangible goods	0.0	0.0	0.1	1.7	0.7	0.0	0.0	0.0	0.0	0.0	0%
<b>Economic performance (million €)</b>											
Gross Value Added	0.5	0.6	0.7	0.6	0.1	0.0	0.1	0.0	0.1	0.2	100%
Gross profit	0.1	0.1	0.3	0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0%

Source: Eurostat, 2019

#### Data coverage and quality

No data were submitted by Hungary. For that reason, a national mini-chapter has been prepared by the EWG with limited analyses based on public Eurostat available data.

<sup>69</sup> <https://ec.europa.eu/eurostat/web/prodcom>

### 10.1.6 Netherlands

The Dutch fish processing and wholesaling industry, as a whole, has an important function as trading hub for other EU countries. The seafood companies' function is an essential main port and linchpin for the rest of the Europe. The Dutch seafood companies have a major role in the food security (SDG2) within the EU, as on average 80% of the Dutch export value of fish products is generated within the EU market<sup>70</sup>. The growing diversity of fish products on the EU market, have resulted in growing imports of fish products. In particular, in the last two years (2017-2018) there was a scarcity for raw materials. The importance of sourcing to have sufficient raw materials for fish processing and circular re-use into high value-added products is increasing. Almost 2/3 of the total Dutch seafood production volume is imported however still 1/3 comes from landings from the North Sea. The demand for seafood products is evidently larger than the supply by landings at Dutch harbors. The landings of fish (e.g. flatfish like plaice and sole), Brown shrimps and mussels next to pelagic species (e.g. herring and mackerel) from the North Sea are still crucial for the profitability of many fish processors reliant on these species. In particular, fish processors with large capital investments in specialized processing machineries and production lines, are hardly able in the short term to shift towards other species to process. For instance, flatfish fileting machines could not (easily) be utilized to process species like salmon as well. With all the challenges for the fisheries at the North Sea (Brexit, pulse ban, closing fishing areas and landing obligation) there is a high need for more opportunities to import (ATQs) and innovation for circular processing in aim to efficient (re)use the scarce raw materials.

Table 10.1.6: Overview, Netherlands, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ (2016-17)
<b>Structure (number)</b>											
Total enterprises	115	121	126	122	134	147	141	144	150	153	2%
Total employees	3.757	3.256	3.150	3.145	3.116	3.172	3.109	3.072	3.123	3.182	2%
Unpaid labour	67	79	91	94	94	90	88	90	87	94	8%
FTE	2.630	2.312	2.237	2.202	2.181	2.126	2.114	2.181	2.186	2.227	2%
<b>Income, expenditure and investments (million €)</b>											
Turnover	:	585,5	665,1	733,6	638,9	707,8	797,5	764,3	823,8	864,9	5%
Total income	:	677,4	798,3	856,7	827,1	879,7	935,4	915,2	965,4	977,8	1%
Total purchases of goods and services	:	551,9	642,1	673,8	690,7	734,7	779,3	747,0	809,8	834,4	3%
Personnel costs	:	82,6	98,2	100,3	95,9	98,9	113,2	106,9	102,9	101,6	-1%
Net investment in tangible goods	32,2 :		13,1	22,0	12,1	13,4	15,8	15,4	22,6	21,9	-3%
<b>Economic performance (million €)</b>											
Gross Value Added	:	138,5	154,5	154,7	143,4	151,2	174,2	170,1	167,1	155,4	-7%
Gross profit	:	55,9	56,3	54,4	47,4	52,4	61,0	63,2	64,2	53,8	-16%

Source: Eurostat, 2019.

According to Eurostat data, in 2017, more than 400 enterprises in the Netherlands were registered at the Netherlands Food and Consumer Product Safety Authority for processing fish or fish products<sup>71</sup>. The size of the industry, in terms of number of the enterprises with fish processing as main activity, is dependent on the selection criteria. In the past (until 2014), the data collection on the Dutch seafood companies referred to around 80-90 fish processing enterprises. Based on Eurostat data, there were 153 enterprises in 2017 (see Table 10.1.6). More

<sup>70</sup> Hoekstra, G. (2019). Visverwerkende industrie en visgroothandel in Nederland. Wageningen Economic Research. Rapport 2019-079f.

<sup>71</sup> Netherlands Food and Consumer Product Safety Authority for processing fish or fish products. <https://www.openbare-inspectieresultaten.nvwa.nl/bedrijfsinspecties/visver-visverwerkende-bedrijven>. Consulted at 19-11-2019

and more seafood companies integrate fish processing and wholesale activities. Therefore, the distinction between either a fish processing, traders and fish wholesale company is not always that clear. Another reason that complicates the distinction between processing and wholesale or trading is the trend of consolidation which means joint ventures as well as vertical integration upstream and downstream the value chain. The total turnover was estimated at EUR 865 million in 2017. This was a small increase of 5% compared to the previous year. In general, there is a trend of upscaling in terms of production volumes last years.

Several fish processors had economically spoken challenging years by scarcity in resources (raw materials). Landings for important flatfish species (e.g. plaice) decreased in volume which resulted in higher purchasing prices for processors since 2017. The total costs of purchasing fish and other raw material for production has increased by 3% to a total of EUR 834 million in 2017 compared with one year before. For unknown (ecological) reasons there was a decrease of landing volumes for certain species (in particular flatfish) from the North Sea<sup>72</sup>. On the contrary, there are historical large stocks for many fish species in the North Sea like plaice and sole according to the scientific stock assessments by ICES<sup>73</sup>. Personnel costs and net investments in intangible goods remained stable more or less relatively to previous years. Costs for purchasing the raw materials (e.g. landed or imported fish etc.) including non-processing goods and services dominated with 87% of the total costs in 2017. Personnel costs counted for 11% with rounded EUR 102 million of the total expenditures and costs. Despite less enterprises the number of employees was relatively stable last 5 years. The total number of employees in the 153 fish processing enterprises increased with 2% to 3 182 persons (2 227 FTE) from 2016-2017. It could be explained by higher customization requested for the product by clients that means more additional working tasks.

Regarding the economic performance the Gross Value Added (GVA) decreased with 7% in 2016-2017 to a total of EUR 155 million (in 2017). The gross profit decreased (-16%) from estimated EUR 64 million to EUR 54 million between 2016 and 2017. The lower economic performance in 2017 compared to the previous year could be mainly declared by higher production costs for purchasing fish as raw material due higher landing prices. The scarcity in resources (unprocessed fish as raw materials) resulted into underutilization of production capacity. Especially for the upscaling processing companies in terms of increasing number of labor forces and investments in larger production assets (e.g. storage, cooling techniques, machines etc.), unpredictable flows in supplies of landings are challenging. With more imports this effect could be stabilized to a certain extent. The total value of imported seafood increased from EUR 2.2 billion (2013) to EUR 2.8 billion (2018) corresponding to 811 thousand tonnes and 836 thousand tonnes respectively. The exported value increased with 46%: from EUR 2.6 billion (2013) to EUR 3.8 billion (2018). The exports increased from 817 thousand tonnes to 1 143 thousand tonnes in these years.

### *Outlook*

For the nearby future the availability of raw materials and resources is the main challenge for the Dutch fish processing industry. Since the demand for seafood products is larger than the supply by landings the industry becomes more dependent on imports. The importance of increasing autonomous tariff quotas (ATQs) are crucial for the Dutch fish processing enterprises. An ATQ allows a certain quantity of a product to be imported into the EU at a reduced tariff rate (see the section on Raw material) and to stay competitive with fish processors from outside the EU, a level playing field is an important condition for enterprises Non-EU member states are subject to fewer regulations and are, therefore, more competitive compared to fish processors in the Netherlands and in the EU. At the supply side by fisheries' landings there are many challenges that could limit

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<sup>72</sup> STECF (2019). *The 2019 Annual Economic Report on the EU Fishing Fleet (STECF 19-06)*. Ispra, Italy.: <https://stecf.jrc.ec.europa.eu/documents/43805/2483556/STECF%2019-06%20-%20AER%20-%202019.pdf>

<sup>73</sup> Fiskerforum, 2019. ICES quota fisheries advice for 2020 for the North Sea per species: <https://fiskerforum.com/increased-north-sea-plaice-and-sole-quotas-advised/>. Consulted at 20-11-2019.

the availability of raw materials. The first main challenge is Brexit. From the landing value by Dutch demersal fisheries 30% comes from British waters. For the Dutch pelagic fisheries this is even 60%. If the Brexit means that there is no access anymore to British waters to fish this will have large impact on the landings. Next to the landings, for multiple fish species the UK is an important market with the import and export of for instance flatfish like plaice. Another challenge is the ban of the innovative pulse fisheries technique announced by the European Parliament in 2019. This ban will negatively impact the economic viability of the Dutch fisheries since there are higher fuel costs when these vessels have to return to the conventional beam trawl technique. It is also expected that less sole could be caught by the ban considering equal days at sea to fish. Furthermore, there is the challenge for sufficient raw from less fishing area due to the expansion of offshore windfarms and nature protected areas.

#### *Data coverage and quality*

In 2017, no data for the processing industry was collected as, for the period 2017-2019, the Netherlands decided not to collect data on the fish processing industry anymore. Therefore, only data until 2014 was available for this report and used for the general EU overview, while this section is based on published Eurostat data updated at 2017. It is highly recommended to collect the national data again (as the Netherlands did till 2015/2016), to accurately monitor the development of the economic performance of the industry and the needs by the fish processing sectors to support the development of appropriate EU regulations and policy.



### 10.1.7 Portugal

Portuguese domestic market is a large final consumer of fish and fish products, the biggest within EU in per capita consumption, with around 57 Kg/person/year in 2016<sup>74</sup>.

According to Eurostat (2019) data, in 2017 there were 168 fish processing enterprises in Portugal with a total generated turnover of EUR 1.27 billion (Table 10.1.7). After some years of a decreasing number of enterprises (203 in 2008, 153 in 2014) there was since 2014 a growth of fish processors with 5% more companies from 2016-2017. The turnover increased with 4% between 2016 and 2017, mainly by the growing number of fish processors.

Most enterprises are located in the north and in the centre of the country and around 15 in the outermost regions of Azores and Madeira. Traditionally, there are three main segments in fish processing in Portugal: frozen and fresh industry; cannery and preparation; salting and drying, each with their own national and international market and specificity.

Table 10.1.7: Overview, Portugal, 2008-2017

Variable	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ (2016-17)
<b>Structure (number)</b>											
Total enterprises	203	192	180	169	166	154	153	157	160	168	5%
Total employees	6.932	7.044	7.059	7.071	6.679	6.414	6.790	6.936	7.244	7.439	3%
Unpaid labour	64	53	317	376	488	312	278	212	208	229	10%
FTE	6.918	7.040	7.037	7.065	6.666	6.380	6.774	6.913	7.221	7.415	3%
<b>Income, expenditure and investments (million €)</b>											
Turnover	1.057,0	1.002,8	1.076,9	1.122,7	1.063,4	1.113,1	1.120,0	1.151,3	1.215,0	1.268,3	4%
Total income	1.158,5	1.064,6	1.075,2	1.145,0	1.132,8	1.129,3	1.130,5	1.167,6	1.230,1	1.285,8	5%
Total purchases of goods and services	1.029,4	879,4	908,7	996,3	988,7	999,1	918,4	1.032,2	1.058,5	1.133,6	7%
Personnel costs	96,9	98,8	101,1	103,4	94,8	95,2	98,6	103,3	109,8	116,0	6%
Net investment in tangible goods	45,9	50,2	31,6	30,1	40,8	19,1	42,1	74,0	15,1	39,5	162%
<b>Economic performance (million €)</b>											
Gross Value Added	162,2	157,3	158,7	164,6	151,4	168,2	172,3	174,3	182,4	195,3	7%
Gross profit	65,3	58,5	57,6	61,2	56,6	73,0	73,7	71,0	72,5	79,3	9%

Source: Eurostat, 2019.

As far as the first segment, the main products are frozen desalted cod and frozen hake and fillets. In general, frozen industry depends on a high import of raw material. Production is mostly directed to supply national market, but also has a high export value component. As far as the salting and drying sector, the main product of this segment of the industry is salted dried cod. This production is mostly concentrated near the port of Aveiro (Ílhavo) and the final product is mainly for domestic consumption within the national market. The raw material is mainly imported. As far as the canning and preserving sector, main products include preparation and cannery of sardine, mackerel, horse mackerel and tuna. This industry is concentrated near major ports specialized on pelagic fisheries, such as Matosinhos (North), Peniche (Center) and Olhão (South). One of the reasons for this situation is the high dependency of the national small pelagic

<sup>74</sup> EUMOFA, 2018. The EU Fish market – edition 2018.

production. This is the only segment of the Portuguese fish processing industry that is more exported than home consumed, and with increased figures on exports<sup>75</sup>.

In total there were 7 439 persons working in the Portuguese fish processing industry in 2017. This is corresponding to 7 415 FTE. Almost all employees are working on a full-time contract and compared to many other EU member states the Portuguese fish processors do have more labour force per enterprise on average. Among those employees there were 229 unpaid persons working in the fish processing. The number of employees has fluctuated over the years independently of the development in the number of enterprises.

Table 10.1.7 is giving an overview of the Portuguese fish processing industry, the expenditures are mainly driven by the purchases of raw materials including non-processing goods and services that counts for 88% of the total costs in 2017 (EUR 1.13 billion over EUR 1.27 billion total costs). These purchasing costs have increased with 7% between 2016 and 2017. The amount of net investment in tangible goods for 2017 is EUR 39.5 million and represent 3% of the total costs (EUR 1.29 billion). The investment costs strongly fluctuate during the years primarily due to renewing or expanding production facilities. These investments are not annually made but rather for the longer term (e.g. 20-year time period). The total costs consisted of 9% personnel costs (EUR 116 million) in 2017.

The economic performance of Portuguese fish processing industry has increased from 2008 to 2017 while the number of enterprises fluctuated. Apparently, there was an increasing efficiency with more production volume and/or higher product prices. The GVA was EUR 195 million (+7% from 2016 to 2017) and the gross profit was EUR 79 million (+9% from 2016 to 2017).

#### *Data coverage and quality*

No data was collected nor submitted by Portugal in 2019. For that reason, a national mini-chapter has been prepared by the EWG with limited analyses based on public Eurostat available data. Eurostat and DCF data series are consistent.

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<sup>75</sup> STECF, 2018. EWG 17-16 - Scientific, Technical and Economic Committee for Fisheries (STECF) – Economic report of the EU fish processing sector 2017 (STECF-17-16). Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-79-67495-2, doi:10.2760/24311 JRC111988.

## 10.2 Annex 2 – Data collected under DCF and EU-MAP

This report is the first report on the EU fish processing to contain data from the former DCF program for the period 2008 to 2015 and from the latest implemented EU-MAP program for the period 2016 to 2018. Below the requested variables for both programs are listed.

### 10.2.1 Main economic parameters requested under the DCF

The economic variables to be collected for the fish processing sector under the Data Collection are specified in section B of the Chapter IV and in Appendix XII of Commission Decision 2010/93/EC of the 18th of December 2010, on Adopting a multiannual Community programme pursuant to Council Regulation (EC) No 199/2008 establishing a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the common fisheries policy.

**Table 10.2.1: DCF data requirements, 2008-2015**

Variable Group	Variable	Unit
Income	Turnover	Euro
	Subsidies	Euro
	Other Income	Euro
	Total Income	Euro
Personnel Costs	Wages and salaries	Euro
	Imputed value of unpaid labour	Euro
Operational Costs	Energy Costs	Euro
	Purchase of fish and other raw material for production	Euro
	Other operational costs	Euro
Capital Costs	Depreciation of capital	Euro
	Financial Costs, net	Euro
Extraordinary Costs	Extraordinary Costs, net	Euro
Capital Value	Total Value of Assets	Euro
Investments	Net Investments	Euro
Debt	Debt	Euro
Employment	Male employees	Number
	Female employees	Number
	Total employees	Number
	Male FTE	Number
	Female FTE	Number
	Total FTE	Number
Number of enterprises	Number of enterprises	Number

Following DCF the statistical unit for the fish processing sector data collection is defined as enterprise, which is the lowest legal entity for accounting purposes. The population refers to enterprises whose primary activity is defined according to the EUROSTAT definition under NACE Code C.10.20: 'Processing and preserving of fish, crustaceans and molluscs'. More detailed definitions of parameters can be found in the glossary (section 10.3).

#### 10.2.2 Main economic parameters requested under the EUMAP

Under the provisions of Council Regulation 2017/1004, there are requested the economic variables for the aquaculture sector detailed in Table 11 of the Commission Decision (EU) 2016/1251.

**Table 10.2.2: EUMAP data requirements, 2016-2018**

<b>Variable Group</b>	<b>Variable</b>	<b>Unit</b>
Income	Gross sales (total)	Euro
	Operating Subsidies	Euro
	Other Income	Euro
Personnel Costs	Wages and salaries	Euro
	Imputed value of unpaid labour	Euro
	Payment for external agency workers (optional)	Euro
Operational Costs	Energy Costs	Euro
	Purchase of fish and other raw material for production	Euro
	Other operational costs	Euro
Capital Costs	Consumption of fixed capital	Euro
	Financial Income	Euro
	Financial Expenditure	Euro
Capital Value	Total Value of Assets	Euro
Investments	Net Investments	Euro
	Subsidies in investments	Euro
Debt	Debt	Euro
Employment	Number of persons employed	Number
	FTE national	Number
	Number of hours worked by employees and unpaid labour	Number
	Unpaid labour	Number
Number of enterprises	Number of enterprises	Number

### **10.3 Annex 3 – Glossary of variables and indicators reported under the DCF and EUMAP**

#### *10.3.1 Parameters requested under the DCF*

##### Turnover:

“Turnover” comprises the totals invoiced by the observation unit during the reference period, and this corresponds to market sales of goods or services supplied to third parties.

Turnover includes all duties and taxes on the goods or services invoiced by the unit with the exception of the VAT invoiced by the unit vis-à-vis its customer and other similar deductible taxes directly linked to turnover.

It also includes all other charges (transport, packaging, etc.) passed on to the customer, even if these charges are listed separately in the invoice. Reduction in prices, rebates and discounts as well as the value of returned packing must be deducted. Income classified as other operating income, financial income and extraordinary income in company accounts is excluded from turnover. Operating subsidies received from public authorities or the institutions of the European Union are also excluded (Structural Business Statistics (SBS) Code 12 11 0, Commission Regulation (EC) No 2700/98).

##### Subsidies:

“Subsidies” are the financial assistance received from public authorities or the institutions of the European Union which are excluded from turnover.

It includes direct payments, e.g. compensation for stopping trading, refunds of fuel duties or similar lump sum compensation payments; excludes social benefit payments and indirect subsidies, e.g. reduced duty on inputs such as fuel or investment subsidies.

##### Other income:

“Other income” refers to other operating income included in company accounts which are excluded from turnover; income coming from other activities than aquaculture, e.g. the licensing of ponds for recreational fishery purposes.

##### Wages and salaries:

“Wages and salaries” is equivalent to “Personnel costs” on the Structural Business Statistics.

“Personnel costs” are defined as the total remuneration, in cash or in kind, payable by an employer to an employee (regular and temporary employees as well as home workers) in return for work done by the latter during the reference period. Personnel costs also include taxes and employees' social security contributions retained by the unit as well as the employer's compulsory and voluntary social contributions.

Personnel costs are made up of:

- wages and salaries
- employers' social security costs

All remuneration paid during the reference period is included, regardless of whether it is paid on the basis of working time, output or piecework, and whether it is paid regularly or not. Included are all gratuities, workplace and performance bonuses, ex gratia payments, thirteenth month pay (and similar fixed bonuses), payments made to employees in consideration of dismissal, lodging, transport, cost of living and family allowances, commissions, attendance fees, overtime, night work etc. as well as taxes, social security contributions and other amounts owed by the employees and retained at source by the employers. Also included are the social security costs for the employer. These include employer's social security contributions to schemes for retirement pensions, sickness, maternity, disability, unemployment, occupational accidents and diseases, family allowances as well as other schemes. These costs are included regardless of whether they are statutory, collectively agreed, contractual or voluntary in nature. Payments for agency workers are not included in personnel costs. (Structural Business Statistics (SBS) Code 13 31 0, Commission Regulation (EC) No 2700/98).

**Wages and salaries:** Wages and salaries are defined as "the total remuneration, in cash or in kind, payable to all persons counted on the payroll (including homeworkers), in return for work done during the accounting period." regardless of whether it is paid on the basis of working time, output or piecework and whether it is paid regularly or not. Wages and salaries include the values of any social contributions, income taxes, etc. payable by the employee even if they are actually withheld by the employer and paid directly to social insurance schemes, tax authorities, etc. on behalf of the employee. Wages and salaries do not include social contributions payable by the employer. Wages and salaries include: all gratuities, bonuses, ex gratia payments, "thirteenth month payments", severance payments, lodging, transport, cost-of-living, and family allowances, tips, commission, attendance fees, etc. received by employees, as well as taxes, social security contributions and other amounts payable by employees and withheld at source by the employer. Wages and salaries which the employer continues to pay in the event of illness, occupational accident, maternity leave or short-time working may be recorded here or under social security costs, depending upon the unit's accounting practices. Payments for agency workers are not included in wages and salaries. (Structural Business Statistics (SBS) Code 13 32 0, Commission Regulation (EC) No 2700/98).

**Social security costs:** Employers' social security costs correspond to an amount equal to the value of the social contributions incurred by employers in order to secure for their employees the entitlement to social benefits. Social security costs for the employer include the employer's social security contributions to schemes for retirement pensions, sickness, maternity, disability, unemployment, occupational accidents and diseases, family allowances as well as other schemes. Included are the costs for all employees including homeworkers and apprentices. Charges are included for all schemes, regardless of whether they are statutory, collectively agreed, contractual or voluntary in nature. Wages and salaries which the employer continues to pay in the event of illness, occupational accident, maternity leave or short-time working may be recorded here or under wages and salaries, dependent upon the unit's accounting practices. (Structural Business Statistics (SBS) Code 13 33 0, Commission Regulation (EC) No 2700/98).

**Imputed value of unpaid labour:**

Unpaid workers normally refer to persons who live with the proprietor of the unit and work regularly for the unit, but do not have a contract of service and do not receive a fixed sum for the work they perform. This is limited to persons who are not included on the payroll of another unit as their principal occupation.

Thus, imputed value of unpaid labour estimates the value of the salaries that these unpaid workers would have received if their work was remunerated.

The chosen methodology to estimate this imputed value of unpaid labour should be explained by the Member State in their national programme.

#### Energy costs:

"Energy costs" corresponds to the "Purchases of energy products (in value)" on the Structural Business Statistics.

Purchases of all energy products during the reference period should be included in this variable only if they are purchased to be used as fuel. Energy products purchased as a raw material or for resale without transformation should be excluded. This figure should be given in value only. (Structural Business Statistics (SBS) Code 20 11 0, Commission Regulation (EC) No 2700/98).

#### Other operational costs:

Other operating costs should comprise outsourcing costs, property or equipment rental charges, the cost of raw materials and supplies that cannot be held in the inventory and have not been already specified (i.e. water, small items of equipment, administrative supplies, etc.), insurance premiums, studies and research costs, external personnel charges, fees payable to intermediaries and professional expenses, advertising costs, transportation charges, travel expenses, the costs of meetings and receptions, postal charges, bank charges (but not interest on bank loans) and other items of expenditure.

On the Structural Business Statistics is included inside 13 11 0 "Total purchases of goods and services".

#### Depreciation of capital:

Depreciation refers to the decline in value of the assets. In accounting, it is used as the allocation of the cost of tangible assets to periods in which the assets are used, in order to reflect this decline in their value.

The chosen methodology to allocate these costs over periods should be explained in the national programme. ESA (6) 6.02 to 6.05 European System of Accounts 1995 (Regulation (EC) No 2223/96, Regulation (EC) No 1267/2003, Eurostat ESA 1995 manual).

#### Financial costs, net:

"Financial costs, net" should be calculated as costs, coming from financial activity of the enterprise, minus the financial income.

#### Extraordinary costs, net:

"Extraordinary costs, net" is the difference between "Extraordinary charges" and "Extraordinary income".

"Extraordinary income" and "Extraordinary charges" are the income and costs that arise otherwise than in the course of the company's ordinary activities (Article 29 of the Fourth Council Directive 78/660/EEC of 25 July 1978).

Total value of assets:

This parameter corresponds to the Balance sheet total of the Structural Business Statistics and the Capital value in the European System of Accounts.

Balance sheet total consists of the sum of items 1 to 16 of the asset side of the balance sheet or of the sum of items 1 to 14 of the liability side of the balance sheet. (Structural Business Statistics (SBS) Code 43 30 0, Commission Regulation (EC) No 2700/98).

Capital value is the total accumulated value of all net investments in the enterprise at the end of the year. ESA 7.09 to 7.24 European System of Accounts 1995 (Regulation (EC) No 2223/96, Regulation (EC) No 1267/2003, Eurostat ESA 1995 manual).

Net Investments:

“Net investments” refers to the difference between Purchase (Gross investment in tangible goods) and Sale (Sales of tangible investment goods) of assets during the year.

Gross investment in tangible goods is the Investment during the reference period in all tangible goods. Included are new and existing tangible capital goods, whether bought from third parties or produced for own use (i.e. Capitalised production of tangible capital goods), having a useful life of more than one year including non-produced tangible goods such as land. The threshold for the useful life of a good that can be capitalised may be increased according to company accounting practices where these practices require a greater expected useful life than the one-year threshold indicated above.

All investments are valued prior to (i.e. gross of) value adjustments, and before the deduction of income from disposals. Purchased goods are valued at purchase price, i.e. transport and installation charges, fees, taxes and other costs of ownership transfer are included.

Own produced tangible goods are valued at production cost. Goods acquired through restructurations (such as mergers, take-overs, break-ups, split-off) are excluded. Purchases of small tools which are not capitalised are included under current expenditure. Also included are all additions, alterations, improvements and renovations which prolong the service life or increase the productive capacity of capital goods. Current maintenance costs are excluded as is the value and current expenditure on capital goods used under rental and lease contracts. Investment in intangible and financial assets are excluded. Concerning the recording of investments where the invoicing, delivery, payment and first use of the good may take place in different reference periods, the following method is proposed as an objective:

i) Investments are recorded when the ownership is transferred to the unit that intends to use them. Capitalised production is recorded when produced. Concerning the recording of investments made in identifiable stages, each part-investment should be recorded in the reference period in which they are made.

In practice this may not be possible and company accounting conventions may mean that the following approximations to this method need to be used:

- i) investments are recorded in the reference period in which they are delivered,
- ii) investments are recorded in the reference period in which they enter into the production process,
- iii) investments are recorded in the reference period in which they are invoiced,
- iv) investments are recorded in the reference period in which they are paid for.

Gross investment in tangible goods is based on Gross investment in land (15 12 0) + Gross investment in existing buildings and structures (15 13 0) + Gross investment in construction and



alteration of buildings (15 14 0) + Gross investment in machinery and equipment (15 15 0). (Structural Business Statistics (SBS) Code 15 11 0, Commission Regulation (EC) No 2700/98).

Sales of tangible goods includes the value of existing tangible capital goods, sold to third parties. Sales of tangible capital goods are valued at the price actually received (excluding VAT), and not at book value, after deducting any costs of ownership transfer incurred by the seller. Value adjustments and disposals other than by sale are excluded. (Structural Business Statistics (SBS) Code 15 21 0. Commission Regulation (EC) No 2700/98).

Debt:

Financial assets created when creditors lend funds to debtors, either directly or through brokers, which are either evidenced by non-negotiable documents or not evidenced by documents.

Short-term loans: loans whose original maturity is normally one year or less, and in exceptional cases two years at the maximum, and loans repayable on demand.

Long-term loans: loans whose original maturity is normally more than one year, and in exceptional cases more than two years at the minimum.

"Debts" account for provisions and long- and short-term debt (STECF meeting SGECA 06-01).

Number of persons employed (Total employment):

This indicator refers to the number of people employed (including full-time and part-time employees) (SGECA-09-03). It corresponds to the Number of people employed of the Structural Business Statistics.

The number of persons employed is defined as the total number of persons who work in the observation unit (inclusive of working proprietors, partners working regularly in the unit and unpaid family workers), as well as persons who work outside the unit who belong to it and are paid by it (e.g. sales representatives, delivery personnel, repair and maintenance teams). It includes persons absent for a short period (e.g. sick leave, paid leave or special leave), and also persons on strike, but not those absent for an indefinite period. It also includes part-time workers who are regarded as such under the laws of the country concerned and who are on the pay-roll, as well as seasonal workers, apprentices and home workers on the pay-roll. The number of persons employed excludes manpower supplied to the unit by other enterprises, persons carrying out repair and maintenance work in the enquiry unit on behalf of other enterprises, as well as those on compulsory military service. Unpaid family workers refer to persons who live with the proprietor of the unit and work regularly for the unit, but do not have a contract of service and do not receive a fixed sum for the work they perform. This is limited to those persons who are not included on the payroll of another unit as their principal occupation. (Structural Business Statistics (SBS) Code 16 11 0, Commission Regulation (EC) No 2700/98).

The number of employees should be reported by gender.

FTE National:

"FTE national" is the number of employees converted in full time equivalents (calculation methodologies vary between countries).

It corresponds to the "Number of employees in full time equivalent units" of the Structural Business Statistics.

The number of employees converted into full time equivalents (FTE). Figures for the number of persons working less than the standard working time of a full-year full-time worker, should be converted into full time equivalents, with regard to the working time of a full-time full-year employee in the unit. Included in this category are people working less than a standard working day, less than the standard number of working days in the week, or less than the standard number of weeks/months in the year. The conversion should be carried out on the basis of the number of hours, days, weeks or months worked. (Structural Business Statistics (SBS) Code 16 14 0, Commission Regulation (EC) No 2700/98).

Reporting the number of FTE national by gender is optional.

Number of enterprises:

The "Number of enterprises" parameter corresponds to a count of the number of enterprises active during at least a part of the reference period (SGECA-09-03).

A count of the number of enterprises registered to the population concerned in the business register corrected for errors, in particular frame errors. Dormant units are excluded. This statistic should include all units active during at least part of the reference period. (Structural Business Statistics (SBS) Code 11 11 0, Commission Regulation (EC) No 2700/98).

Both definitions are similar. However, there are often some divergences with Eurostat data. This is mostly due to the use of the Veterinary list (which is necessary to trade with food products) to update the business register and so companies that are dormant or focusing on other products have been excluded.

Moreover, under the DCF regulation, the number of companies should be disaggregated by the number of persons employed (in  $\leq 5$ ; 6-10 and  $>10$  FTE) (Structural Business Statistics (SBS) Code 16 14 0, Commission Regulation (EC) No 2700/98).

### 10.3.2 Indicators calculated under the DCF

Average wage:

The average salary or mean wage estimates the salary an employee working full time is receiving on this sector. It includes the salaries themselves, the social security costs and imputed value of unpaid labour.

$$\text{Mean wage} = (\text{Wages and salaries} + \text{Imputed value of unpaid labour}) / \text{FTE}$$

Gross Value Added (GVA):

Gross Value Added measures the contribution of the sector to the economy.

The Gross Value Added indicator calculated in this report is similar, but does not fully correspond to the Value added at factor cost of the Structural Business Statistics.

Value added at factor cost as defined in the Structural Business Statistics is the gross income from operating activities after adjusting for operating subsidies and indirect taxes. It can be calculated from turnover, plus capitalised production, plus other operating income, plus or minus the changes in stocks, minus the purchases of goods and services, minus other taxes on products which are linked to turnover but not deductible, minus the duties and taxes linked to production. Alternatively, it can be calculated from gross operating surplus by adding personnel costs. Income and expenditure classified as financial or extra-ordinary in company accounts is excluded from

value added. Value added at factor costs is calculated "gross" as value adjustments (such as depreciation) are not subtracted. (Structural Business Statistics (SBS) Code 12 15 0, Commission Regulation (EC) No 2700/98).

Thus, Gross Value Added is calculated on this report as:

$$GVA = \textit{Turnover} + \textit{Other Income} - \textit{Energy costs} - \textit{Purchase of fish and other raw material for production} - \textit{Other Operational costs}.$$

GVA margin or GVA to Revenues:

Gross value added to revenue ratio - indicates the share of revenue that contributes to the economy through factors of production (returns to labour and returns to capital). Indicator is calculated as the ratio between gross value added and revenue (the sum of Turnover and Other Income). Expressed as a percentage.

$$GVA \textit{ to Revenue} = \frac{GVA}{\textit{Turnover} + \textit{Other Income}} 100\%$$

Earnings Before Interest and Tax (EBIT):

"Earnings before interest and taxes (EBIT)" or "Operating profit" is a measure of a firm's profitability that excludes interest and income tax expenses.

$$EBIT = \textit{Turnover} + \textit{Other Income} + \textit{Subsidies} - \textit{Energy costs} - \textit{Wages and salaries} - \textit{Imputed value of unpaid labour} - \textit{Purchase of fish and other raw material for production} - \textit{Other Operational costs} - \textit{Depreciation of capital}$$

Net profit:

"Net profit" is a measure of a firm's profitability that includes the results of financial activity of the enterprise.

$$\textit{Net profit} = EBIT - \textit{Financial\_costs\_net}$$

Net profit margin:

Net profit margin is a measure of the economic performance of a sector or enterprise expressed in relative terms. It is a difference between total income and all incurred costs (operating, capital and financial). Expressed in percentage.

$$\textit{Net profit margin} = \frac{\textit{Net profit}}{\textit{Total Income}} 100\%$$

Return on Investment (ROI):

Return on investment is a performance measure to evaluate the profitability (efficiency) of an investment.

During the SGECA-10-04 meeting it was decided that it was more appropriate to calculate the Return on Investment using the "Earnings Before Interest and Tax (EBIT)", rather than the Net profit.

$$ROI = \frac{EBIT}{Total\_Value\_of\_Assets} * 100\%$$

Earnings Before Interest and Tax (EBIT) margin:

"Earnings before interest and taxes (EBIT) to revenue ratio" measures the margin of the companies' profit. Expressed in percentages.

$$EBIT\ to\ Revenue = \frac{EBIT}{Total\ Income} * 100\%$$

Labour productivity:

Labour productivity is calculated as the average output per worker or per time unit. It can be calculated as Gross Value Added (GVA) divided by Full Time Equivalents (FTE). This indicator describes the value added to the economy from the activity, in this case the value added to the economy by one FTE.

$$Labour\_productivity = \frac{GVA}{FTE}$$

When a MS cannot report the level of employment in FTEs, the number of employees is used as a second best alternative. However, this alternative compromises the comparison and should be clearly stated in the report.

Capital productivity:

Capital productivity is calculated as the average output per unit of capital. It can be calculated as Gross Value Added (GVA) divided by Capital value (total value of assets) in percentage. The indicator describes the value added to the economy by one unit of capital.

$$Capital\ productivity = \frac{GVA}{Total\ value\ of\ assets} 100\%$$

### 10.3.3 Parameters requested under the EUMAP

Turnover: corresponds to the DCF variable "Turnover".

Operating Subsidies: corresponds to the DCF variable "Subsidies". It refers to direct payments which general government or the institutions of the European Union make to resident producers. (ESA D.3).

Other Income: corresponds to the DCF variable "Other Income".

Wages and salaries: corresponds to the DCF variable "Wages and salaries".

Imputed value of unpaid labour: corresponds to the DCF variable "Imputed value of unpaid labour".

Energy Costs: corresponds to the DCF variable "Energy Costs".

Purchase of fish and other raw material for production: corresponds to the DCF variable "Purchase of fish and other raw material for production".

Other operational costs: corresponds to the DCF variable "Other operational costs".

Consumption of fixed capital: corresponds to the DCF variable "Depreciation of capital".

Total Value of Assets: corresponds to the DCF variable "Total Value of Assets".

Net Investments: corresponds to the DCF variable "Net Investments".

Debt: corresponds to the DCF variable "Debt".

Persons employed: corresponds to the DCF variable "Total employees".

Persons employed FTE: corresponds to the DCF variable "Total FTE".

Financial Expenditure minus Financial Income: corresponds to the DCF variable "Financial Costs, net".

Payment for external agency workers: is an optional new variable to account for the costs of outsourced labour.

Subsidies in investments: Direct payments which general governments or the institutions of the European Union make to resident producers to finance all or part of the costs of their acquiring assets related to the company.

Number of hours worked by employees and unpaid labour: The aggregate number of hours worked by the persons employed and the unpaid labour during the reference period.

Unpaid labour: Number of workers that have not received compensation in the form of wages, salaries, fees, gratuities, piecework pay or remuneration in kind.

#### 10.3.4 Indicators calculated under the EUMAP

Average wage:

The average salary or mean wage estimates the salary an employee working full time is receiving on this sector. It includes the salaries themselves, the social security costs and imputed value of unpaid labour.

Under the EUMAP, the indicator is calculated as follows:

*Mean wage = (Wages and salaries + Imputed value of unpaid labour) / (Persons employed FTE + Unpaid labour FTE)*

$$\text{Mean wage} = \frac{\text{Wages and salaries} + \text{Imputed value of unpaid labour}}{\text{Persons employed FTE} + \text{Unpaid labour FTE}}$$

Gross Value Added (GVA):

Gross Value Added measures the contribution of the sector to the economy.

The Gross Value Added indicator calculated in this report is similar, but does not fully correspond to the Value added at factor cost of the Structural Business Statistics.

Value added at factor cost as defined in the Structural Business Statistics is the gross income from operating activities after adjusting for operating subsidies and indirect taxes. It can be calculated from turnover, plus capitalised production, plus other operating income, plus or minus the changes in stocks, minus the purchases of goods and services, minus other taxes on products which are linked to turnover but not deductible, minus the duties and taxes linked to production. Alternatively, it can be calculated from gross operating surplus by adding personnel costs. Income and expenditure classified as financial or extra-ordinary in company accounts is excluded from value added. Value added at factor costs is calculated "gross" as value adjustments (such as depreciation) are not subtracted. (Structural Business Statistics (SBS) Code 12 15 0, Commission Regulation (EC) No 2700/98).

Thus, under the EUMAP, the indicator is calculated as follows:

$$\text{GVA} = \text{Gross sales (total)} + \text{Other Income} - \text{Energy costs} - \text{Purchase of fish and other raw material for production} - \text{Other Operational costs.}$$

GVA margin or GVA to Revenues:

Gross value added to revenue ratio - indicates the share of revenue that contributes to the economy through factors of production (returns to labour and returns to capital). Indicator is calculated as the ratio between gross value added and revenue (the sum of Turnover and Other Income). Expressed as a percentage. Under the EUMAP, Gross Value Added is calculated as under the DCF:

$$\text{GVA to Revenue} = \frac{\text{GVA}}{\text{Turnover} + \text{Other Income}} 100\%$$

Earnings Before Interest and Tax (EBIT):

“Earnings before interest and taxes (EBIT)” or “Operating profit” is a measure of a firm's profitability that excludes interest and income tax expenses. Under the EUMAP, the indicator is calculated as follows:

$$EBIT = \text{Turnover} + \text{Other Income} + \text{Operating Subsidies} + \text{Subsidies on Investments} - \text{Energy costs} - \text{Wages and salaries} - \text{Imputed value of unpaid labour} - \text{Payment for external agency workers} - \text{Purchase of fish and other raw material for production} - \text{Other Operational costs} - \text{Consumption of fixed capital.}$$

Net profit:

“Net profit” is a measure of a firm's profitability that includes the results of financial activity of the enterprise. Under the EUMAP, the indicator is calculated as follows:

$$\text{Net profit} = EBIT - (\text{Financial Expenditure} - \text{Financial Income})$$

Net profit margin:

Net profit margin is a measure of the economic performance of a sector or enterprise expressed in relative terms. It is a difference between total income and all incurred costs (operating, capital and financial). Expressed in percentage. Under the EUMAP, the indicator is calculated as follows:

$$\text{Net profit margin} = \frac{\text{Net profit}}{\text{Turnover} + \text{Other Income} + \text{Operating Subsidies} + \text{Subsidies on Investments}} * 100\%$$

Return on Investment (ROI):

Return on investment is a performance measure to evaluate the profitability (efficiency) of an investment.

During the SGECA-10-04 meeting it was decided that it was more appropriate to calculate the Return on Investment using the “Earnings Before Interest and Tax (EBIT)”, rather than the Net profit. Under the EUMAP, the indicator is calculated as under the DCF:

$$ROI = \frac{EBIT}{\text{Total Value of Assets}} * 100\%$$

Earnings Before Interest and Tax (EBIT) margin:

“Earnings before interest and taxes (EBIT) to revenue ratio” measures the margin of the companies’ profit. Expressed in percentages. Under the EUMAP, the indicator is calculated as follows:

$$EBIT \text{ to Revenue} = \frac{EBIT}{\text{Turnover} + \text{Other Income} + \text{Operating Subsidies} + \text{Subsidies on Investments}} * 100\%$$

Labour productivity:

Labour productivity is calculated as the average output per worker or per time unit. It can be calculated as Gross Value Added (GVA) divided by Full Time Equivalents (FTE). This indicator describes the value added to the economy from the activity, in this case the value added to the economy by one FTE. Under the EUMAP, the indicator is calculated as follows:

$$\text{Labour productivity} = \frac{\text{GVA}}{\text{Persons employed FTE} + \text{Unpaid labour FTE}}$$

When a MS cannot report the level of employment in FTEs, the number of employees is used as a second best alternative. However, this alternative compromises the comparison and should be clearly stated in the report.

Capital productivity:

Capital productivity is calculated as the average output per unit of capital. It can be calculated as Gross Value Added (GVA) divided by Capital value (total value of assets) in percentage. The indicator describes the value added to the economy by one unit of capital. Under the EUMAP, the indicator is calculated as under the DCF:

$$\text{Capital productivity} = \frac{\text{GVA}}{\text{Total value of assets}} 100\%$$



#### **10.4 Annex 4 – Quality and Coverage checking procedures on the data submitted under the 2019 fish processing sector economic data call**

Although the quality and coverage of the data reported under the Data Collection Framework (DCF) are a responsibility of the EU Member States, JRC (European Commission) has undertaken quality and coverage checking procedures on the data submitted, some carried out during the data uploading phase and some afterwards. The quality and coverage of the data has also been checked by national experts during the STECF EWG 19 15 meeting on the EU Fish Processing Sector: Economic Report which took place in Italy, during the week 18 to 22 November 2019.

Fish processing data submitted under the 2019 data call and used for the STECF report have been checked in four subsequent steps. This section provides a synthetic description of each of them. More information of the quality and coverage checking procedures undertaken on DCF fish processing data are available in the JRC technical report available at:

<http://datacollection.jrc.ec.europa.eu/>

Step 1- Data checks before and during uploading procedure to the JRC database

Several data checks are already embedded in the excel templates which the Member States are required to use for uploading data on their national aquaculture sector. In specific cells of these files, the data entry is restricted to certain records (e.g. acceptable codes, value types and ranges).

Furthermore, during the data uploading procedure, a number of automatic syntactic checks are carried out on the data before it is accepted by the database hosted by JRC. Syntactic checks are carried out without any specific knowledge of what the data contains or its meaning. They tell if the data is present or not and in the correct format. These checks automatically reject data that do not confirm to specific restrictions, such as ensuring textual data is validated against defined parameters lists. In addition, numeric data are checked to make sure they contain numbers and not strings.

Step 2 - Results of the data quality checks/analyses are assessed by JRC experts

Once the datasets with the fish processing data are successfully uploaded, JRC produces different analyses on the data submitted in order to facilitate the assessment of its quality and coverage. Some of these analyses are presented in interactive online dashboards created using the software Tableau. The same software is also used for analyses not specifically related to data quality, i.e., analyses on the structure and economic performance of the EU aquaculture sector and overviews of the uploading status of DCF aquaculture data.

All the analyses performed by JRC in Tableau are available in interactive online dashboards, which are refreshed every morning and are accessible (only after authentication), on the following link:

<https://datacollection.jrc.ec.europa.eu/data-analysis/proind>

Besides developing the checks and analyses, JRC experts actively participate in the analysis of their results. All quality issues (e.g. inconsistencies, outliers and missing data) concerning the data submitted, identified through the analyses performed in Tableau or with manual checks are listed by JRC in excel files, including the most relevant information concerning the problems identified (e.g. description of the problem, structural and economic indicators affected and assessed impact on the analyses of the final STECF report), together with comments and actions recommended by JRC to solve the issues.

Step 3 – National correspondents receive a list of data transmission issues and may resubmit revised data

The information on the data quality issues (and including JRC experts' comments and opinions on the action to undertake) are sent to the national correspondents or the data uploaders (each of them receives information only about the country he/she represents).

MS are requested to consider the potential anomalies listed in the excel file, amend and re-submit the data as necessary. They are also requested to go over the quality analyses performed in order to detect additional (if any) problems and add them to the list. Finally, they are asked to provide feedback (i.e. whether or not the problem has been resolved, which actions have been taken and possible comments) in designated columns of the excel file.

Step 4 – The quality and coverage of the data have been checked by the STECF Expert Working Groups

In addition to being analysed by JRC's experts, the quality and coverage of fish processing data submitted under the DCF and EU-MAP are also checked by national experts during the STECF EWG meeting. Data submitted under the 2018 aquaculture economic data call has been checked during the EWG meeting 19-15 which took place during the week 18 to 22 November 2019.

At the beginning of the meeting, the experts are made aware of the data transmission issues of the MS assigned to them. Moreover, MS have been contacted whenever an inconsistency was found and the expert attending the meeting could not solve it by resubmitting data. Furthermore, all experts have been given access to the tableau dashboards. This has allowed them to visualise changes in the data whenever the MS have uploaded revised data during the meeting or submitted new templates.

The experts reported in the Data Transmission Monitoring Tool the relevant data coverage and quality issues that remained unsolved by the end of the STECF EWG.

## 10.5 Annex 5 – Estimation protocol used by EWG 19-15 for the 2019 report

### *Estimation/imputations for data missing countries*

Missing data for some countries, because of the voluntarily of the data collection for the fish processing sector under EUMAP has, in previous reports, caused the inclusion (or exclusion) of some Member States in EU totals. For the 2019 report a special attention has been paid to maintain a homogeneous number of Member States when aggregating national indicators to obtain the EU totals.

The compilation of EU aggregates required the use of imputations/estimation for some Member States, in line with the protocol approved by the STECF 19-02.

Certain Member States (namely Cyprus, Estonia, Netherlands and Portugal) have submitted economic data on fish processing until 2014 or 2015. For these countries the missing data for 2015-2017 was imputed either using data from previous year (for Belgium and Cyprus) or combining growth rates from Structural Business Statistics (SBS) with the submitted EU-MAP data (for Netherlands, Portugal, Estonia, France). The same approach was used for including France in the EU overview, because of strong data inconsistencies for 2016 and 2017.

Variables' specific growth rates were calculated based on SBS time series for turnover, energy costs, wages and salaries, gross investments, fte, number of employees and number of enterprises. Imputation of number of enterprises by size category was performed using SBS growth rate for number of enterprises. Growth rate for turnover from SBS was used for imputing all other EU-MAP variables which are not represented in the SBS.

Due to the high number of missing data for the variables to be provided for enterprises carrying out fish processing as a non-main activity, an estimation of the average by country has been provided, considering the period 2008-2018. The EU totals are based on these countries average.

For the EU aggregates some assumptions have also been made on data for Slovakia, submitting only total income and costs and lacking in submitting detailed income and cost items. For the EU aggregates (e.g. total income and profit indicators) these totals have been considered and, due to this assumption, calculating total EU income or total EU costs cannot be done by summing EU income items or EU cost items, but only summing total incomes or total costs of all the Member States.

For the EU totals, as well under the national overview, Slovenia calculation of profit indicators is based only on turnover and not on total income, as for other Member States, as other income represent turnover from other activities that are deemed to be preponderant for the Slovenian fish processing sector.

### *Definition of countries' group for the EU overview*

Thanks to this estimation approach, the EU overview analysis is based on the aggregation of a full dataset for 24 Member States (all the Member States collecting data under DCF and/or EUMAP).

The EU 24 set is composed by 2 sub-set of countries, namely:

- sub-total EU 19: all the countries submitting complete or partial dataset under the 2019 data call (Belgium, Bulgaria, Croatia, Denmark, Finland, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom);
- other DCF MSs: Cyprus, Estonia, France, Netherlands and Portugal, submitting data under DCF, until previous data call;

There are some member states which are not covered by obligation under DCF/EUMAP but have a fish processing industry, namely Austria, Hungary and Czech Republic. These countries were included as an aggregate in the first table of the EU overview under the sub-total acronym of "non-DCF MSs" but have been excluded from all the remainder sections on the economic performance, based exclusively on the EU 24 aggregate.

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## STECF

The Scientific, Technical and Economic Committee for Fisheries (STECF) has been established by the European Commission. The STECF is being consulted at regular intervals on matters pertaining to the conservation and management of living aquatic resources, including biological, economic, environmental, social and technical considerations.

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