EUMOFA

European Market Observatory for
fisheries and aquaculture products

Metadata 3

Data analysis

Fisheries

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Contents

Fisheries

KEY NOTE TO THE DOCUMENT

Besides those analyses conducted on a routine basis for the compilation of the Monthly Highlights and The EU Fish market, two data analysis activities are carried out by the Observatory analysts:

1. Methodology for **assessing the origin of imports and exports** in terms of production methods (fishery *vs* aquaculture);

2. Development of the **Supply Balance** sheets for the calculation of the apparent consumption.

Both analyses are strongly linked since the assessment of the origin of imports and exports allows the calculation of shares of caught and farmed products in Imports and Exports within the Supply Balance.

Released date: 18th May, 2016.

1 Assessment of origin of imports and exports in terms of production methods

The assessment is made at EU level for the Main Commercial Species (MCS) for which CN-8 codes are available. There are 78 MCS for which CN-8 codes have been identified (see also Data management – Harmonisation of nomenclature).

The ERS codes that are chosen for the MCS grouping are based on aquaculture, capture, landings, and import-export data for the EU 27 Member States. Croatia is not included as it joined the EU in July 2013.

The division of fish into categories "farmed" and "captured" is based on what the predominant production is for different kinds of species. Only the FAO production data distinguishes clearly the two sources of origin.

Only extra-EU imports and extra-EU exports data are considered for the assessment and presentation and preservation state are not taken into consideration.

The trade and production data used in the calculations represent quantities (yearly aggregates).

The assessment is made 3-year time series for most recent publicly available data for production and trade.

The publicly available trade data (provided by EUROSTAT-COMEXT) are one year more recent than the production data (provided by FAO-Fishstat). At the time of writing the procedures (May 2016), the most recent publicly available COMEXT data include 2015, while the most recent available FAO data include 2013.

The methodological procedures used for the assessment involve three stages:

1. The **first stage** refers to the selection of the MCS that are going to be assessed; the corresponding procedures are common for both extra-EU imports and exports.

2. The **second stage** involves the calculation of coefficients which quantify the role of aquaculture in the extra-EU imports and extra-EU exports and which will be used for the Supply Balance sheet. For this stage two different methodologies are described, subject to the supply chain covered, extra-EU imports and extra-EU exports, respectively.

3. The **third stage** includes the consolidation of results, which is common for both extra-EU imports and extra-EU exports supply chains.

1.1 Selection of Main Commercial Species used for the assessment

This stage includes:

- Pre-selection of the MCS;
- Selection of the MCS that are assessed based on the production method (aquaculture and capture).

Pre-selection of the MCS based on the agreed list

There are N[1] MCS for which CN-8 codes are available; of these N1[2] MCS are not relevant for the assessment and they are excluded from the start from the assessment.

Selection of the MCS based on the production method

There are N2[3] MCS pre-selected for the assessment which are categorised in "farmed" and "capture" based on their production method.

The FAO-Fishstat production data (quantity only) is consulted[4] and species that have a corresponding item in the CN-8 code are identified. The result is a number N3[5] of MCS that originate from aquaculture which are selected for carrying out the assessment.

The MCS that are not found in the FAO-Fishstat aquaculture production data are excluded from the analysis, since they originate from capture.

1.2 Calculation of coefficients to quantify the role of aquaculture of Main Commercial Species of extra-EU imports

This stage involves the following procedures:

1.2.1 Calculation of extra-EU imports and production data of Main Commercial Species and selection of Main Partners

The Average Quantity of extra-EU imports for each MCS selected ($n3$) for 3-year time series at EU level is calculated: Ave QtyI = (QI1+QI2+QI3)/3.[6]

- All CN-8 codes corresponding to one MCS are considered in the calculations.[7]
- Regarding the MCS for which CN-8 codes have been enforced after 2009[8] only trade data from 2010 onwards are considered for the assessment.

- The Countries of Origin (CoO)[9] are identified and their contribution to the total extra-EU imports is calculated.

- The Main Partners (MP) are selected: they are CoO whose exports to the EU represent more than 3% (in quantity) of the total extra-EU imports.

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[1] N = 78 MCS.

[2] N1 = 7 MCS (Surimi; Caviar, liver and roes; Other products; Non-food use; fishmeal, fish oil).

[3] N2 = N-N1 = 71 MCS.

[4] FAO-fishstat database includes over 700 fish species which are produced worldwide by aquaculture.

[5] N3 = 36 MCS (calculated for 2010, 2011 and 2012 production and trade data).

[6] QI1-QI3 represent the total quantities of the MCS extra-EU Imported for the 3-year time series, as per Comext.

[7] For each MCS there are two or more CN-8 codes that are considered. For example, for MCS 'Carp' there are three different CN-8 codes, i.e. 03019300 (carp live), 03026911 (carp fresh or chilled) and 03037911 (carp frozen) while for other MCS such as 'Cod', there are 21 different CN-8 codes.

[8] See EC Regulation No. 948/2009 of 30 September 2009.

[9] Countries outside EU/third countries that export to the EU.

Fisheries

- The average production data for the selected MP for 3-year time series for both aquaculture and capture is calculated (in quantity).

When discrepancies are observed for the selected MP (e.g. missing data - lack of correlation between trade and production data) a case-by-case analysis for each MCS by MP is done to examine to what extent these discrepancies may influence the overall result of the assessment.

1.2.2 Calculation of aquaculture share of Main Commercial Species of extra-EU imports

Calculation of aquaculture share in the production of MCS by MP

For the MP for which MCS production data is available the aquaculture share is calculated by dividing the average aquaculture production data by the total average production data (aquaculture plus capture).

Aquaculture share MP = Aquaculture production MP / (Aquaculture production MP + Capture production MP)

For the MP for which MCS production data is not available[10] and the origin of MCS Imported cannot be assessed, the share of aquaculture at world-wide level production is assigned.

The aquaculture share at world-wide level is calculated for 3-year time series by dividing the total average aquaculture production data by the total average production data (aquaculture plus capture) for all the fish species that belong to the MCS and for all countries in the world, as they are registered by FAO-Fishstat.

Aquaculture share MP/World = Aquaculture production total World / (Aquaculture production total World + Capture production total World)

Calculation of coefficients quantifying the role of aquaculture of MCS of extra-EU imports at EU level

The weighted average for each MP is calculated by multiplying the corresponding MP market share/contribution to Imports with the corresponding MCS aquaculture share (calculated above).

WeAveImpMP = ImpMktShMP x MCSAquaShMP

The weighted average at EU level is calculated which represents the sum of all MP weighted averages. The result represents the coefficient which is quantifying the role of aquaculture of the extra-EU imports at EU level and which is used for the Supply Balance sheet.

WeAveImpEU = Σ (WeAveImpMP1 + WeAveImpMP2 + WeAveImpMP1 + …)

The coefficient is expressed as percentage number which is ≥ 0% ≤ 100%.

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[10] E.g. trade data shows that EU imports MCS from MP, while the production data (aquaculture and capture) of the MCS for the MP reveals that MCS is not produced by the respective MP. In this situation it may be assumed that the MCS which is imported into the EU has been imported beforehand by the MP and then re-exported to the EU; another cause may be that a mistake has been made by the reporting MP, however this assumption cannot be checked.

Fisheries

1.3 Calculation of coefficients to quantify the role of aquaculture of Main Commercial Species of extra-EU exports

This stage involves the following procedures:

1.3.1 Calculation of extra-EU exports and production data of Main Commercial Species and selection of EU Main Reporting Countries

- The Average Quantity of extra-EU exports for each of the MCS selected (N3) for 3-year time series at EU level is calculated: Ave QtyE = (QE1+QE2+QE3)/3.[11]

All CN-8 codes corresponding to one MCS are considered in the calculations.[12]

Regarding the MCS for which CN-8 codes have been enforced after 2009[13] only trade data from 2010 onwards are considered for the assessment.

- The EU Main Reporting Countries (MRC) are selected.
- These are EU Member States which export more than 3% (in quantity) of the total extra-EU exports.
- The average production data for the selected MRC for 3-year time series for both aquaculture and capture is calculated (in quantity).

1.3.2 Calculation of aquaculture share of Main Commercial Species of the extra-EU exports

Calculation of aquaculture share in the production of MCS by MRC.

This is done according to the origin of production for each MCS.

In cases where the production data (aquaculture and capture) are available for MCS and it matches the trade data it is obvious that the MCS has been produced in the EU.

For MCS that are produced in the EU[14] the aquaculture share is calculated by dividing the average aquaculture production data by the total average production data (aquaculture plus capture).

Aquaculture share MRC = Aquaculture production MRC/ (Aquaculture production MRC + Capture production MRC)

In cases when there is no production data available (aquaculture and capture) for MCS to match the trade data it is concluded that the respective MCS is (mostly) produced outside the EU[15]. For these MCS that are produced outside the EU, which have been imported beforehand and then exported, the share of aquaculture at world-wide level production is assigned (as calculated for the extra-EU imports).

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[11] QE1-QE3 represent the total quantities of the MCS extra-EU exported for the 3-year time series, as per Comext.

[12] For each MCS there are two or more CN-8 codes that need to be considered. For example, for MCS 'Seabass' there are two different CN-8 codes, i.e. 03026994 (seabass fresh or chilled) and 03037700 (seabass frozen) while for other MCS such as 'Trout', there are 13 different CN-8 codes.

[13] See EC Regulation No. 948/2009 of 30 September 2009.

[14] E.g. mussels, oysters, seabass, salmon, eel, etc

[15] E.g. tropical shrimp, pangasius, Nile perch, etc

Fisheries

The aquaculture share at world-wide level is calculated for 3-year time series by dividing the total average aquaculture production data by the total average production data (aquaculture plus capture) for all the fish species that belong to the MCS and for all countries in the world, as they are registered by FAO-Fishstat.

Aquaculture share World = Aquaculture production World/ (Aquaculture production World + Capture production World)

Calculation of coefficients quantifying the role of aquaculture of MCS of extra-EU Exports at EU level.

The weighted average for each MRC is calculated by multiplying the corresponding MRC market share/contribution to exports with the corresponding MCS aquaculture share (calculated above).

WeAveExpMRC = ExpMktShMRC x MCSAquaShMRC

The weighted average at EU level is calculated which represents the sum of all MRC weighted averages. The result represents the coefficient which is quantifying the role of aquaculture of the extra-EU exports at EU level and which is used for the Supply Balance sheet.

WeAveExpEU = Σ (WeAveExpMRC1 + WeAveExpMRC2 + WeAveExpMRC3 + …)

The coefficient is expressed as percentage number which is ≥ 0% ≤ 100%.

1.4 Consolidation of results

The coefficients for quantifying the MCS share of aquaculture in the extra-EU imports and exports at MCS and EU level are summarised for the 36 MCS analysed and the conclusions are reported.

Considering that total fishery production (capture and aquaculture) represents 100%, the share of capture in the extra-EU imports and exports at MCS and EU level is calculated by subtracting from 100% the calculated aquaculture share.

The Table 1 below summarises the assessment results for 36 MCS at EU level for extra-EU imports.

Table 1 - Assessment results for MCS for extra-EU imports

MCS	Share of aquaculture (%)	Share of capture (%)
Eel	99,3	0,7
Carp	100,0	0,0
Nile perch*	4,4	95,6
Pangasius	100,0	0,0

Fisheries

Freshwater catfish	100,0	0,0
Tilapia	98,2	1,8
Other freshwater fish	60,6	39,4
Salmon	99,9	0,1
Trout	99,8	0,2
Other salmonids	58,2	41,8
Cod	1,3	98,7
Other groundfish*	0,0	100,0
Other flounders*	0,0	100,0
Atlantic halibut	45,0	55,0
Other halibuts*	0,0	100,0
Sole	0,0	100,0
Turbot	75,6	24,4
Bluefin tuna	23,6	76,4
Gilthead seabream	96,7	3,3
Other seabreams	0,3	99,7
European seabass	100,0	0,0
Other seabass*	0,0	100,0
Cobia*	9,2	90,8
Other marine fish	8,5	91,5
Crab	42,0	58,0
Freshwater crayfish	30,6	69,4
Rock lobster and sea crawfish*	0,0	100,0
Tropical shrimp	81,0	19,0
Miscellaneous shrimps	23,2	76,8
Mussel *Mytilus* spp.	99,3	0,7
Other mussels	96,7	3,3
Scallop	24,6	75,4
Oyster	92,7	7,3
Clam	25,5	74,5
Other molluscs and aquatic invertebrates	61,1	38,9
Seaweed and other algae	96,3	3,7

*MCS for which the aquaculture share at the world-wide level exists

Of the 36 MCS analysed that are **imported** by the EU from third countries/Main Partners it can be concluded that most of them have a relatively small share of aquaculture from a marketing point of view, namely:

- 10 MCS have aquaculture share between 0% and 50%;

- 18 MCS have aquaculture share over 50%;

- 8 MCS have the aquaculture share of 0% at the EU level; however, the aquaculture share at the world-wide level exists.

Fisheries

The table 16 below summarises the assessment results for 36 MCS at the EU level for extra EU-exports.

Table 16 - Assessment results for extra-EU exports for MCS

MCS	Share of aquaculture (%)	Share of capture (%)
Eel	70,3	29,7
Carp	83,5	16,5
Nile perch*	4,4	95,6
Pangasius*	98,6	1,4
Freshwater catfish	94,0	6,0
Tilapia	100,0	0,0
Other freshwater fish	20,9	79,1
Salmon	99,7	0,3
Trout	97,1	2,9
Other salmonids	50,8	49,2
Cod*	0,0	100,0
Other groundfish*	0,0	100,0
Other flounders*	0,0	100,0
Atlantic halibut*	0,0	100,0
Other halibuts*	37,2	62,8
Sole	1,4	98,6
Turbot	71,2	28,8
Bluefin tuna*	0,0	100,0
Gilthead seabream	99,1	0,9
Other seabreams	2,5	97,5
European seabass	90,8	9,2
Other seabass	0,3	99,7
Cobia*	86,5	13,5
Other marine fish*	0,0	100,0
Crab*	0,0	100,0
Freshwater crayfish	0,4	99,6
Rock lobster and sea crawfish*	0,0	100,0
Tropical shrimp	0,6	99,4
Miscellaneous shrimps	2,5	97,5
Mussel *Mytilus* spp.	97,4	2,6
Other mussels	100,0	0,0
Scallop*	0,0	100,0
Oyster	96,6	3,4
Clam	52,8	47,2
Other molluscs and aquatic invertebrates	4,0	96,0
Seaweed and other algae	0,4	99,6

*MCS for which the aquaculture share at the world-wide level exists

Fisheries

Of the 36 MCS analysed that are exported from the EU to third countries 7 MCS are not produced in aquaculture or the aquaculture production is marginal in the EU and 13 MCS originate only or mostly from capture. Of these, the majority has a small share of aquaculture from a marketing point of view, namely:

• 13 MCS with aquaculture share over 50%;

• 11 MCS with aquaculture share below 50%;

• 12 MCS with aquaculture share of 0% at the EU level. However the aquaculture share at the world-wide level exists.

Fisheries

2 Methodology for updating the Supply Balance sheet

Supply Balance Sheet is aimed at providing a yearly assessment of the main structural features and of the medium-long term trends of the EU market for fishery and aquaculture products, by means of exhaustive and consolidated data. Only EUROSTAT data can be used to feed the Supply Balance calculation.

It has to be highlighted that:

1) Supply Balance is designed to provide an estimate of the supply available for human consumption, both as total consumption and as per capita consumption;

2) Supply Balance calculation should not include variables that do not add much to the overall informative content, while increasing the level of uncertainty of results (changes in stocks, losses, withdrawals, distant fishing);

3) The results obtained provide useful insights on time trends of market demand, but cannot be considered as accurate estimates for its absolute value, since they should be considered as **proxies** for actual market demand.

Supply Balance sheets are often designed to provide an estimate of the <u>supply available for human consumption</u>, both as apparent consumption and as per capita consumption. Apparent consumption is then obtained as the residual of a commodity's total annual available supply after subtracting non-food uses.

Therefore the calculation of the Supply Balance sheet will be based on the following equation, considering that all variables are available in live weight equivalent:

apparent consumption = catches + aquaculture + Imports - Exports

All data used for feeding the equation will be taken from EUROSTAT's data as follows:

- Production: EUROSTAT catches + aquaculture
  a. **Catches**: Catches - Total all fishing areas (fish_ca_00)
     i. FISHREG: Total fishing areas
     ii. GEO: European Union (27 countries);
     iii. SPECIES: all species, excluding "F" codes.

  b. **Aquaculture:** Aquaculture production - Quantities (Tonnes live weight): 1984 onwards (fish_aq_q)
     i. AQUAENV: Total;
     ii. FISHREG: Total fishing areas;
     iii. GEO: : European Union (27 countries);
     iv. SPECIES: all species, excluding "F" codes;

- Import and Export: EUROSTAT COMEXT;
  a. Import and Export
     i. Declarant: EU 27;
     ii. Partner Country: all extra-EU Countries;
     iii. PRODUCT_NC: all CN-8 items identified in the handbook DM-2;

To carry out a consistent calculation, **a standardized unit must be used for all selected items**. EUROSTAT already provides data in live weight on Production, while Import/Export data from COMEXT are provided in net weight. For this reason, <u>conversion factors</u> from net weight to live weight are used by the EUMOFA for

harmonising volumes in live weights equivalent (see Metadata regarding ***Data Management – Conversion factors***).

2.1 Supply Balance sheets geographical scope and commodity coverage

The informative content and consistency of Supply Balance results depend on the aggregation level of data used to carry out the calculations. The EUMOFA will deliver Supply Balance at the following levels:

- **at EU level for 11 Commodity Groups** (Freshwater fish, Salmonids, Groundfish, Flat fish, Small pelagics, Tuna and tuna-like species, Other marine fish, Crustaceans, Cephalopods, Bivalves and other molluscs and aquatic invertebrates, Miscellaneous aquatic products). Furthermore, at Production, Import, Export and Apparent Consumption stages the share of farmed and caught products should be calculated by using the coefficients.

- **at EU level for the top consumed 10 Main Commercial Species** (these Main Commercial Species will be selected case by case, according to the results of the calculation).

<u>**For the calculation of per-capita consumption**</u>: according to the methodological documents published by EUROSTAT, the population to be considered for a balance established for a calendar year is that as of the 30th of June (the statistics refer to the resident population as of this date). However data can refer to population on 1 January or the average population during the year as well. Data can be obtained from New Cronos database.

2.2 Supply Balance sheets dissemination

The Supply Balance sheets are available only within the "Structural data" section on a yearly basis and are disseminated only through the pre-packaged report (yearly report) and the structured queries, in the following forms:

a. **In the pre-packaged report:**

1) **Supply Balance sheet of 11 COMMODITY GROUPS at EU level**;

2) **Import dependency ratio at EU level for 11 COMMODITY GROUPS**;

3) **Supply Balance time series at EU level for 11 COMMODITY GROUPS** – for the latest three years available;

4) **Apparent consumption time series at EU level for 11 COMMODITY GROUPS** – for the last three years available;

5) **Supply Balance at EU level for the top 10 consumed MCS by per capita consumption**;

b. **In the structured queries:**

1) Supply Balance at EU level for 11 COMMODITY GROUPS and apparent consumption (at EU level).

Fisheries