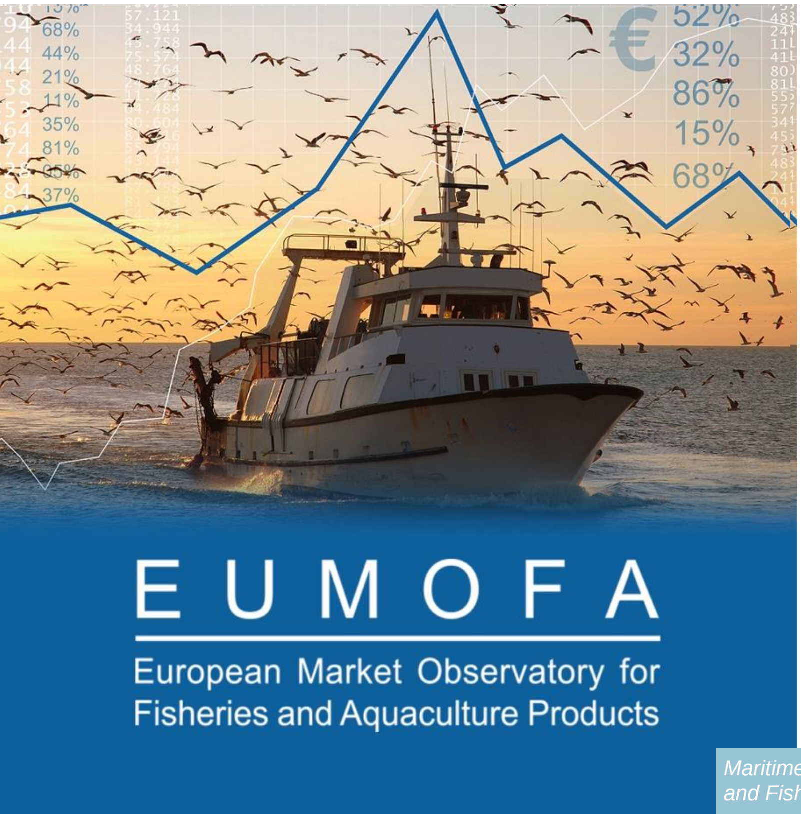
European Commission

CASE STUDY

FRESH PORTION TROUT IN POLAND

PRICE STRUCTURE IN THE SUPPLY CHAIN



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0. SUMMARY

Rainbow trout is the most farmed species of fish within the European Union, with production estimated at 240 000 tonnes gross weight equivalent in 2015 (FEAP[1]).

- Historically, the major EU producers were Denmark, France, Germany, Italy, and Spain. These key players have faced a decrease in their production in recent years while Poland has significantly developed its capacity.
- In the last decade, Turkey has become a major world producer of rainbow trout (its production increased by 70% from 2007 to 2015) and is a key supplier to the EU markets.

Polish trout farming is developing and Poland has become one of the most important markets for portion (250g – 400g) rainbow trout for human consumption.

- Polish trout farmers have significantly developed their production during the last decade. In 2016, 20 000 tonnes of rainbow trout were marketed by Polish farms, compared to 14 600 in 2004 (accession year to the EU).
- The development of trout farming in Poland is mostly due to an increase in consumption of portion trout by Polish consumers. The increase in the consumption of portion trout is due to both an overall increase in fish consumption and (principally) the effects of heavy and recurrent promotional actions (2011-2014) that succeeded in developing a positive image of trout as locally produced, environment-friendly and healthy.
- The market expansion was driven among other things by the introduction of chilled pre-packed trout products to supermarkets without a fresh fish counter, from 2012/2013.

The price of fresh portion rainbow trout has showed a positive trend in recent years (2012-2016), without any sign of major change in the sharing of value within the supply chain.

- The ex farm-price has increased in the last five years, in parallel with the increase of the domestic market and the improved image of Polish products in their home market,
- Despite the fact that Polish trout farmers consider the price of imported trout (fresh trout from Spain or Italy and frozen trout from Spain and Turkey) as some kind of "guide price" for buyers, there is no evidence of negative effects on the ex-farm price of fresh portion trout in recent years.

Price transmission analysis shows that trout farmers get a higher share in the value chain (52-53% of retail price). Logistic and processing costs (gutting and packaging) appear to have increased during the period, while retailers faced a decrease in their share of the value (from 44% of the value in 2012 to 40% in 2017).

[1] Federation of European Aquaculture Producers

1. TASK REMINDER – Scope and content

1.1 Case study scope

Reminder

- Rainbow trout (*Onchorynchus mykiss*) farming exists in these parts of the world.

- According to FAO data, world production of rainbow trout has grown exponentially since the 1950s, especially in Europe and more recently in Chile, Iran and Turkey. The annual production (2014-2016) is estimated circa 800 – 820 000 tonnes GWE[2].
- The EU production of farmed rainbow trout is estimated at 240 000 tonnes GWE in 2015 (FEAP).

Historically, the main EU producers were Denmark, France, Germany, Italy and Spain. These key players have seen a decrease in their production in recent years while Poland developed its capacities by 15% (PTBA).

In the last decade, Turkey has become a major world producer of rainbow trout (+70% from 2007 to 2015) and is a key supplier to the EU markets.

- The study focuses on one of the most dynamic markets: i.e. Poland, which means that the analysis is developed in detail only for this country;

  An overview of available information and preliminary analysis is proposed for the other EU relevant markets.

[2] GWE: Gutted Weight Equivalent

Product	Origin	Characteristics	Market and price drivers
Rainbow trout (Onchorynchus mykiss) Portion-sized	Aquaculture Poland and import (Turkey, Spain…)	Growing production and consumption in Poland Turkey is a key supplier of EU market	Price of feedstuff (ex-farm price) Competition with imported products

The key elements of the analyses are:

Species – products	Main focus	Other MS (overview)
Fresh portion-size rainbow trout, loose and packed	Poland	EU main producing MS and EU main markets.

1.2 Content of the document

In conformity with the methodology developed within EUMOFA and published on the website (https://www.eumofa.eu/documents/20178/0/Guidelines_Pricestructure.pdf/76af127b-7353-4526-a10d-e48a6c87a02e), the document includes:

- A description of the product;
- A description of the most relevant EU producers and markets for trout, with a special focus on the Polish market;
- An analysis of the price transmission along the supply chain in Poland for a portion of fresh rainbow trout.

2. DESCRIPTION OF THE PRODUCT

2.1 Characteristics of the product

The case study focuses on fresh portion rainbow trout, which is the main form of fresh trout available to Polish consumers.

Case study product

Name: Rainbow trout (*Onchorynchus mykiss*), pl. *pstrag tęczowy*

Presentation: Whole or gutted (mostly gutted), fresh or chilled, loose or pre-packed in modified atmosphere package (MAP). Frozen portion trout represents 15% of the market.

Commercial size: Portion-sized trout – decades ago the definition of portion trout was clear – 200-350 g, sold mostly as whole or gutted fish (the “portion”). Later, portion sized trout was (and is now) also larger trout 350 g+ (but still under 600 g). These are mostly gutted fish, sometimes fillets.

Other trout and salmonid species

Other most significant trout and related salmonids species farmed in Poland and sold for human consumption are:

- Brook trout (*Salvelinus fontinalis*), pl. *pstrag źródlany*
- Arctic char (*Salvelinus alpinus*), pl. *palia*
- Hybrid Brook trout x Arctic char (*Salvelinus fontinalis x Salvelinus alpinus*)

Other species, like Brown trout (*Salmo trutta m. fario*) and Sea trout (*Salmo trutta m. trutta*) are produced mostly for re-stocking, not for human consumption.

2.2 Presentation and conversion to live fish equivalent:

Portion rainbow trout is sold on the Polish market mostly as gutted head-on fish:

- chilled, loose (on ice mostly) - in hypermarket fish counters, traditional fish shops and farms selling direct to consumers
- chilled in MAP in supermarkets (discounts) and in small quantities in hypermarkets (including online stores).

10-15 years ago, whole fish was mostly sold on the market (on ice). Nowadays, this type of product is available sometimes only in traditional markets or traditional fish shops, while in supermarkets or hypermarkets only gutted fish or fillets are sold.

The Polish domestic market is dominated by rainbow trout, but it is also worth mentioning that, according to the results of focus groups (Success project 2016/2017 - Horizon 2020), Polish consumers often do not distinguish between different species of salmonids available, because of the high demand for trout and of an overall lack of promotion of other species. Consumers only differ between portion trout (called 'trout') and fillets from large trout (called 'salmon trout').

On the Polish market there is no price difference between rainbow trout and Arctic char (*Salvelinus alpinus*), but export prices are quite different (especially exports to France, Switzerland and Austria), as Arctic char has price premium. Trout species other than rainbow trout are mainly farmed in Polish aquaculture for technological reasons – e.g. resistance to some diseases (VHS).

Table 1 – Estimated yield and conversion rates for fresh trout

	Yield	Conversion rates
Live fish	100%	1.00
Gutted, head on	84%	1.19
Gutted, head off	No such form in trade	-
Fillet	42-48%*	2.08-2.38

Source : interview with farmers and processors in Poland

2.3 Related codes (COMEXT)

At 6-digit or 8-digit level the existing CN (Combined Nomenclature) codes cover all trout species, and distinguish different presentations:

- **03 01 91 - Live trout:** *(Salmo trutta, Oncorhynchus mykiss, Oncorhynchus clarki, Oncorhynchus aguabonita, Oncorhynchus gilae, Oncorhynchus apache and Oncorhynchus chrysogaster)*
- **03 02 11 - Fresh or chilled trout**: *Salmo trutta*, *Onchorynchus mikiss* (rainbow trout) and others *Onchorynchus nei*.
- **03 03 14 - Frozen trout**: *Salmo trutta*, *Onchorynchus mikiss* (rainbow trout) and others *Onchorynchus nei.*

Rainbow trout is distinguished in the Combined Nomenclature in 10 digit level, e.g.:

- **03 01 91 - Live trout:** *(Salmo trutta, Oncorhynchus mykiss, Oncorhynchus clarki, Oncorhynchus aguabonita, Oncorhynchus gilae, Oncorhynchus apache and Oncorhynchus chrysogaster)*
  - ✓ 03 01 91 10 – Species Onchorynchus apache or Onchorynchus chrysogaster
  - ✓ 03 01 91 90 – Others
    - o 03 01 91 90 11 – *Onchorynchus mykiss* up to 1.2 kg
    - o 03 01 91 90 19 – *Onchorynchus mykiss,* others

CN codes for smoked and processed trout products do not distinguish between trout species and trout sizes.

3. PRODUCTION AND AVAILABILITY OF FARMED TROUT IN THE EU

This chapter provides a synthesis of statistics on production of farmed trout in the EU and in Turkey considering the growing importance of Turkey in EU markets supply.

3.1 Overview of trout production in the EU and Turkey

Most rainbow trout produced by EU and Turkey aquaculture is portion trout sold for human consumption (sold fresh and gutted) and for re-stocking (live) of waters devoted to angling. Turkey is by far the largest producer, followed by Italy, Denmark, France and Poland.

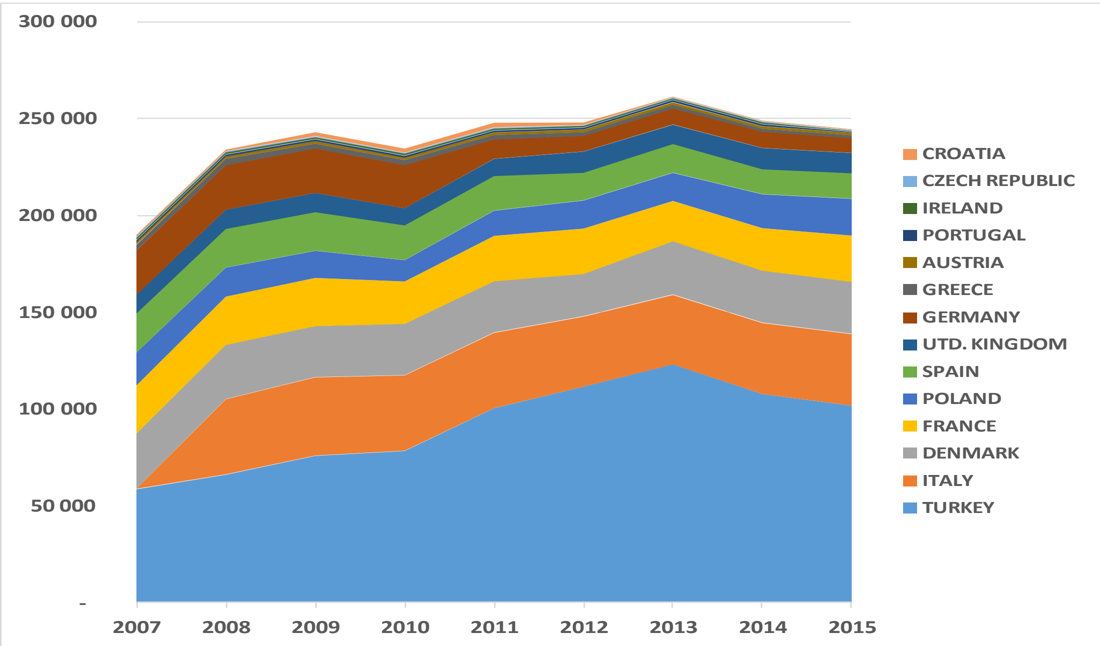
Table 2 – Production of portion-size trout (tonnes) in Europe and Turkey

country	2007	2008	2009	2010	2011	2012	2013	2014	2015
TURKEY	58 433	65 928	75 657	78 165	100 239	111 335	122 873	107 533	101 550
ITALY	39 000	38 900	40 500	39 000	39 000	36 300	36 000	36 800	37 000
DENMARK	28 527	28 050	26 374	26 538	26 538	21 895	27 591	26 925	26 925
FRANCE	25 000	25 000	25 000	22 000	23 500	23 500	20 870	22 000	23 947
POLAND *	17 000	15 000	14 000	11 000	13 000	14 500	14 500	17 500	19 000
SPAIN	20 000	20 000	20 000	18 000	18 000	14 400	15 000	13 000	13 260
UNITED KINGDOM	9 955	10 000	10 000	8 950	8 900	10 996	10 000	11 000	10 500
GERMANY	23 000	23 000	23 000	22 300	10 062	8 116	8 333	8 466	7 642
GREECE	2 820	3 420	2 588	2 712	2 389	1 967	2 014	1 611	1 611
AUSTRIA	1 671	1 200	1 250	1 200	1 270	1 337	1 322	1 277	1 277
PORTUGAL	937	941	936	951	900	900	1 000	1 000	410
IRELAND	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	500
CZECH REPUBLIC	623	614	526	476	580	388	439	426	368
CROATIA	800	800	2 000	2 095	2 358	1 232	350	361	400
TOTAL	228 766	233 853	242 831	234 387	247 736	247 866	261 292	248 899	244 390

** data refer to total production, including stocking material production. Production sold for direct human consumption is c. 20% lower.*

Source: Federation of European Aquaculture Producers (FEAP)

Figure 1 – Production of portion-size trout (tonnes) in Europe and Turkey



Most EU Member States saw a decrease in their production of farmed rainbow trout during the 2007-2015 period, while Turkey, Poland and, to a lesser extent, the UK saw a rise in their volumes. Turkish trout farmers increased their production by 40 000 tonnes over 8 years.

Figure 2: Changes (2015 compared to 2007) in portion rainbow trout production in Europe and Turkey (tonnes)

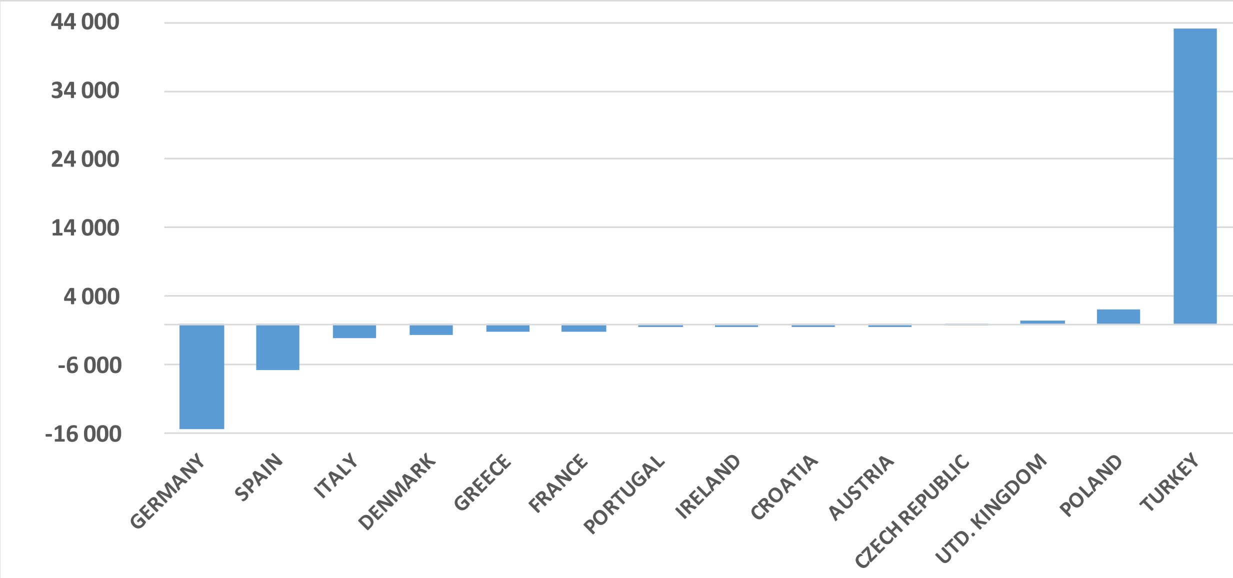
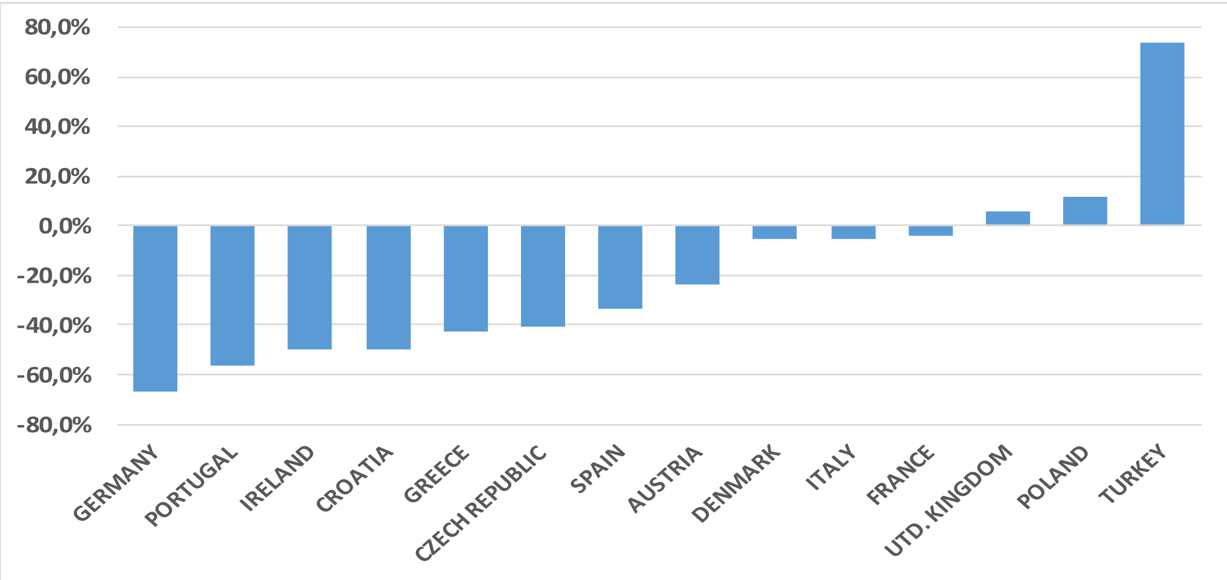


Figure 2: Changes (2015 compared to 2007) in portion rainbow trout production in Europe and Turkey (in %)



Source: Federation of European Aquaculture Producers

Currently all Polish production is declared as portion trout production, as this was the typical form of trout in Polish aquaculture for many years. No information on large trout production is available either in public statistics or in surveys by the Polish Trout Breeders Association (PTBA). This segment is growing, and probably amounts for more than 15% of the total production (own estimation based on September 2017 interviews).

According to interviews with Polish trout farmers, the demand for large trout is increasing in Poland and this trend is expected to continue in the next few years, mainly due to the high prices of Atlantic salmon, which is the main alternative salmonid species both for filleting and smoking.

The production of large trout for the processing industry (filleting and smoking) is however nowadays concentrated in Scandinavian countries. Norway is the main European producer (half of the volume) while Finland, Denmark and Sweden are other key players.

Table 3 – Production of large-size rainbow trout in Europe and Turkey (tonnes)

COUNTRY	2007	2008	2009	2010	2011	2012	2013	2014	2015
NORWAY	77 465	85 266	74 072	50 000	51 000	75 000	70 000	75 000	80 000
FINLAND	11 000	12 000	12 700	10 400	9 220	9 000	9 954	12 448	12 500
FRANCE	9 000	9 000	9 000	12 000	12 500	12 500	11 130	12 000	12 766
DENMARK	9 867	10 046	10 139	9 832	10 854	10 491	10 506	11 115	11 115
SWEDEN	4 366	5 789	6 413	7 854	10 745	10 499	9 757	9 436	9 436
TURKEY	2 740	2 721	5 229	7 079	7 697	3 234	5 186	4 812	5 450
UNITED KINGDOM	2 341	2 390	2 400	1 690	2 000	2 000	2 600	4 000	4 500
SPAIN	2 000	2 000	1 500	1 500	1 500	1 600	1 600	2 600	2 678
ITALY	600	500	600	1 000	2 000	1 500	2 000	2 000	1 000
GERMANY	1 250	1 250	1 250	1 250	1 200	1 278	1 267	1 471	1 506
ICELAND	11	6	75	88	226	422	113	603	728
IRELAND	1 000	1 000	1 000	434	434	434	450	400	500
PORTUGAL									290
FAROE ISLANDS	6 883	6 706	6 400	1 790	2 000	-	-	-	
Total	128 523	138 674	130 778	104 917	111 376	127 958	124 563	135 885	142 469

Source: FEAP (Federation of European Aquaculture Producers)

4. THE EU MARKETS FOR FRESH TROUT

4.1 Structure of the EU markets

4.1.1 Structure of the EU markets

Based on available statistics, the two main EU markets for trout are Italy and Poland with about 30 000 tonnes in 2015. They are followed by Germany, France, Denmark, UK and Spain, i.e. the main producing countries which have historically developed trout farming for their domestic markets.

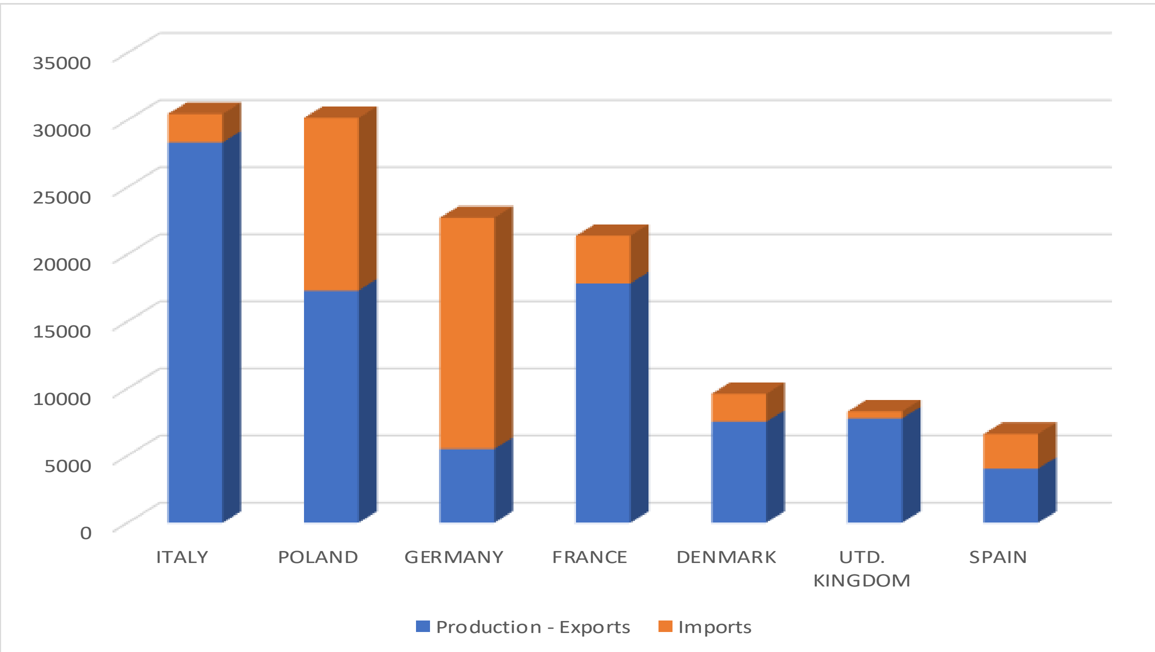
Table 4 – The EU main markets for trout in 2015

	Production	Import live trout	Import fresh or chilled trout	Import frozen trout	Export live trout	Export fresh or chilled trout	Export frozen trout	Apparent market
ITALY	37,000	18.9	1,128.6	968.0	4,262.3	4,273.1	119.4	30,460.7
POLAND	**19,000**	**880.6**	**9,957.0**	**2,021.3**	**581.7**	**1,021.7**	**87.3**	**30,168.2**
GERMANY	7,642	5,981.0	4,610.2	6,627.5	617.5	770.4	744.4	22,728.4
FRANCE	23,947	563.1	2,191.5	793.4	5,232.7	158.9	721.1	21,382.3
DENMARK	26,925	138.1	1,566.5	383.9	5,998.4	5,877.9	7,526.1	9 ,611.1
UTD. KINGDOM	10,500	3.1	338.0	176.4	3.0	2,626.8	89.1	8,298.6
SPAIN	13,260	136.2	2,168.1	286.8	5,045.7	3,472.9	713.7	6,618.8

Sources: FEAP & COMEXT - Apparent domestic market for each Member State is calculated in gross weight as follows: production – export + import.

Note: "apparent market" calculated in table 4 is a rough approximation considering that domestic production for human consumption is overestimated (it includes stocking material) and a large amount of trout is processed (fillets, smoked). A more reliable figure is provided for Poland in chapter 4.2.4.

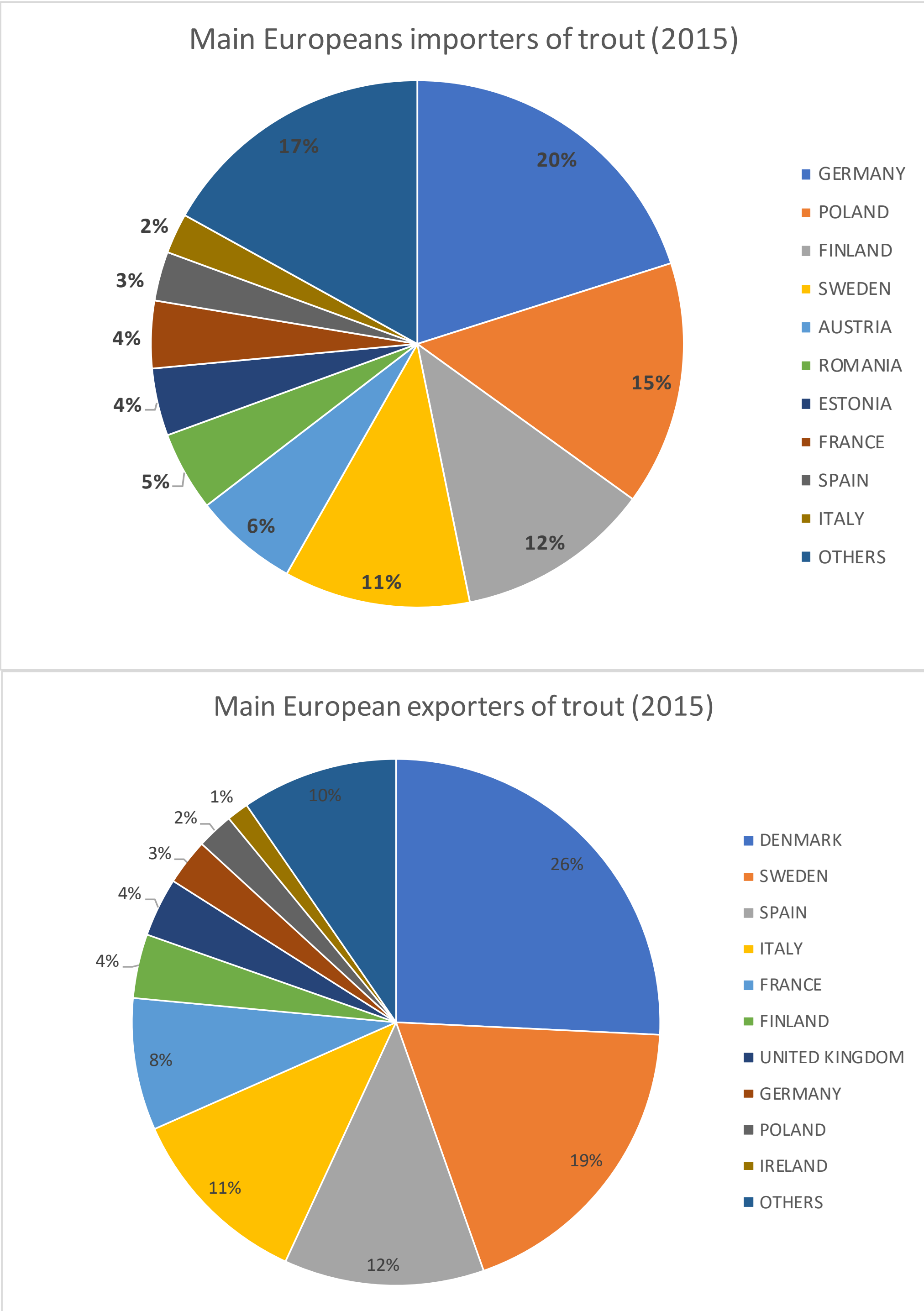
Figure 3 – Main apparent markets for trout in the E.U. (2015, volume in tonnes)



4.1.2 Main importing and exporting countries within the EU

Germany is the main importing Member State of the EU with 20% of total volume, followed by Poland (import of trout for processing), Sweden and Austria. These four Member States take more than 50% of EU imports of trout. Denmark and Sweden are the main exporters (large-size trout), followed by Italy and Spain (portion trout).

Figure 4 – Main European importers and exporters for Trout (2015)



Sources: Elaboration from COMEXT

4.2 The Polish market for fresh trout

As shown in the previous chapter, the Polish domestic market for fresh trout has been increasing over the last five years. In the same period, even though national aquaculture production increased, Poland imported growing volumes of trout due to the parallel development of processing for export, thus leading to a deficit in external trade.

4.2.1 The aquaculture sector in Poland

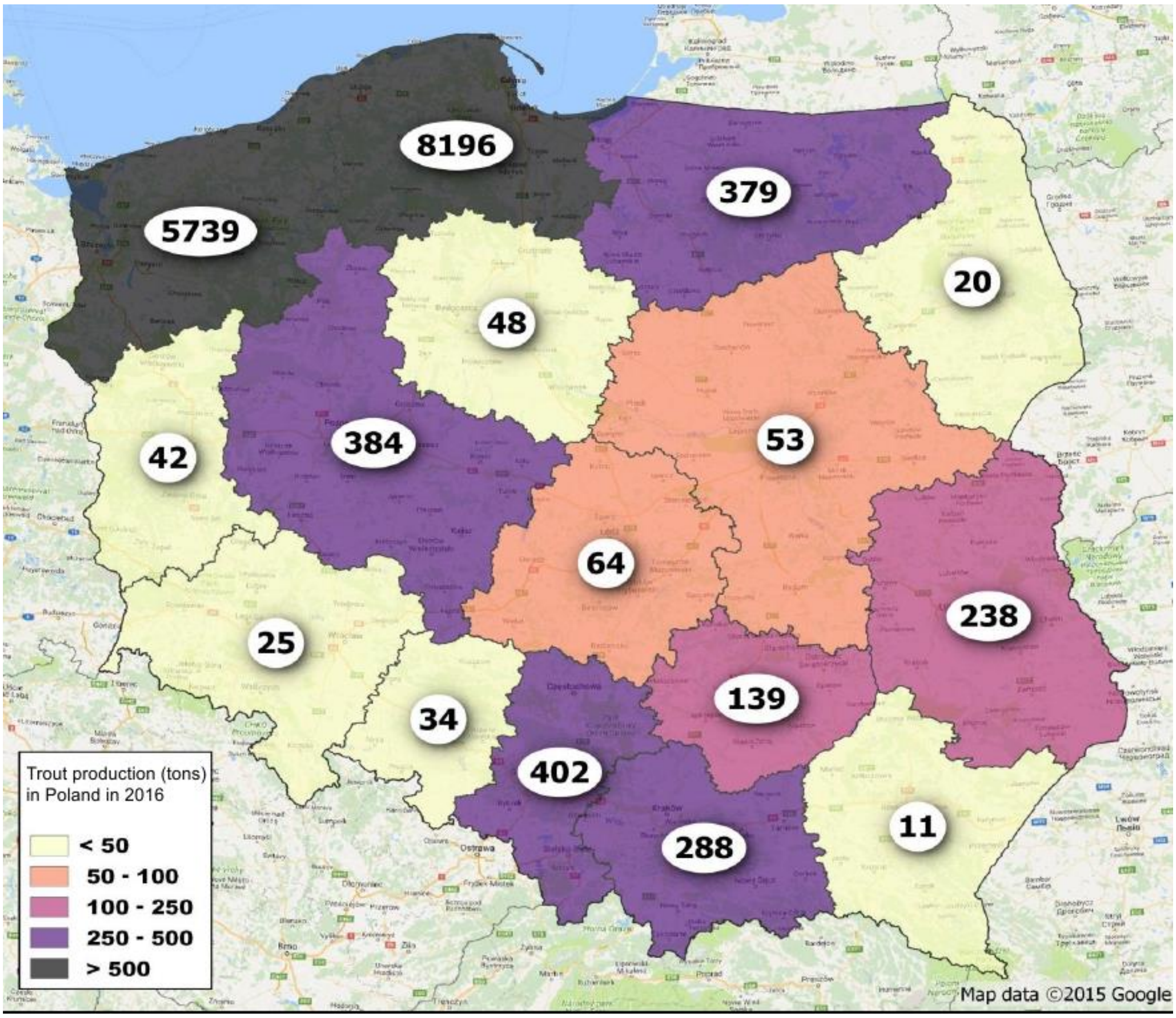
The aquaculture sector in Poland includes two main components:

- semi-intensive aquaculture in ponds, which produces mostly Common carp and additional species, such as Grass carp, Silver carp, Big-head carp and diverse coarse fish;
- intensive aquaculture, among which trout farming is the most important.

In 2016 there were around 160 intensive farming sites in Poland.

The most important area for trout production is located close to the Baltic coast, where about 70% of the national production is concentrated.

Map 1. Trout production in Poland (by regions) in 2016 (tonnes)



Sources: A. Lirski, L. Myszkowski, Inland Fisheries Institute, Obraz polskiej akwakultury w 2016 r.... Gdynia 2017.

Farms producing over 100 tonnes of trout per year are the most important for total production volume in Poland, covering about 86% of total national production.

Table 5 – Trout production by farm size

Farm size class (tonnes/year)	No. of farms	Total production share (%)
0-10	9	0,4
11-50	23	4,9
51-100	17	8,7
101-200	21	23,0
201-500	18	41,4
501 +	4	21,6

Sources: A. Lirski, L. Myszkowski, Inland Fisheries Institute, Obraz polskiej akwakultury w 2016 r.... Gdynia 2017.

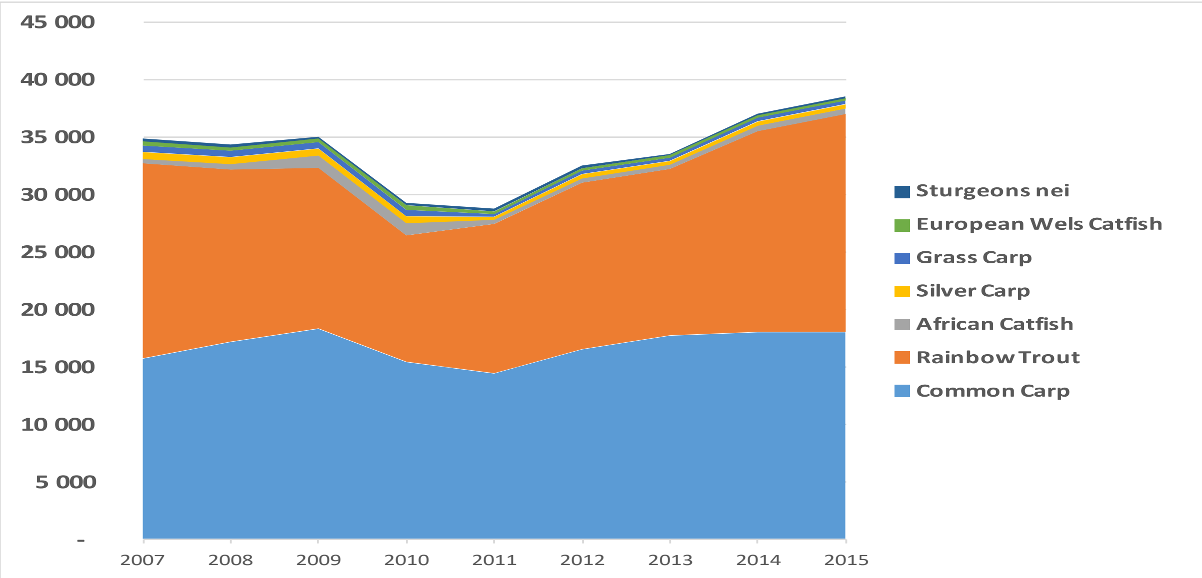
In 2016, the 160 intensive aquaculture farms produced ca. 20 100 tonnes of trout (and 2 tonnes of red caviar), 280 tonnes of Atlantic salmon (1 site, full RAS), 340 tonnes of African catfish, 530 tonnes of sturgeons (and 16 tonnes of black caviar). There are 400 water recirculation systems (semi-RAS), which have been set up by adapting flow-through systems.

Table 6 – Production of Polish Aquaculture (tonnes)

Species	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Rainbow trout	17,000	15,000	14,000	11,000	13,000	14,500	14,500	17,500	19,000	20, 100
Common carp	15,698	17,150	18,300	15,400	14,400	16,500	17,700	18,000	18,000	18,775
African catfish	400	500	1,100	1,100	400	400	400	500	500	400
Silver carp	600	600	600	600	260	374	320	360	360	n/a
Grass carp	550	550	550	550	225	290	270	320	310	n/a
European catfish	400	300	350	400	220	219	250	250	250	n/a
Sturgeons	250	270	148	200	240	241	95	140	170	400
Atlantic salmon	0	0	0	0	0	0	0	0	n/a	280
Total	34,898	34,370	35,048	29,250	28,745	32,524	33,535	37,070	38,590	n/a

Sources: FEAP (Federation of European Aquaculture Producers) and Polish producers (2016)

Figure 5 – Trends in Polish aquaculture production by species (tonnes) – source FEAP



4.2.2 Estimation of trout production for human consumption

For trout production in Poland there are two main sources of information:

- public statistics (official annual obligatory survey collected by Inland Fisheries Institute for the national administration);
- surveys and estimations of the Polish Trout Breeders Association (PTBA)

Other sources of information, based on above mentioned sources, e.g.:

- FEAP report based on PTBA survey;
- Eurostat and FAO data based on public statistic.

In 2016, for the first time, data on total production (including fry) by public statistics and PTBA were almost the same (+-2%).

Table 7 –Trout production in Poland (1000 t) - sources and type of data - (RT = rainbow trout)

Data source / year	Type of data	2012	2013	2014	2015	2016
PTBA	Total production with stocking material	17.5	16.7	17.7	18.5	20.2
Public statistics (Inland Fisheries Institute analysis for Ministry of Maritime Economy)	Production of consumption fish (without stocking material)	12.0 (RT - 10.9)	13.7 (RT - 11.5)	16.1 (RT - 11.5)	15.8 (RT - 13.2)	16.4 (RT - 14.4)
	Production of trout sold for human consumption	**10.9**	**12.4**	**14.7**	**14.5**	**15.7**
	Production of rainbow trout sold for human consumption	n/a	10.3	n/a	13.2	13.7

Sources: Inland Fisheries Institute & Polish Trout Breeders Association (PTBA)

While for total production the FEAP and PTBA dataset is used, it is worth noting that for market analysis only the data of sold production of fish for direct human consumption should be considered. Thus, for the purposes of this study, public statistic data for 2016 are used (**15 700 tonnes of trout sold, including 13 700 tonnes of rainbow trout**).

Polish farmers have experience and knowledge on production methods and, at the same time, they are of the opinion that there is capacity to increase production. Nonetheless, in their view, the main constraints in developing production are:

- diseases (like VHS);
- lack of financial support for new investments (limited funds from EFF 2007-2013 and large delay in EMFF 2014-2020 implementation);
- lack of new sites for flow-through farms;
- imported fresh trout from Italy and Spain, and frozen trout from Turkey in previous years, as potential limitation factor for price development in Poland (not production itself).

Furthermore, according to farmers, increase in trout production is possible and expected, considering:

- new investments in semi-recirculating systems in farms (under EMFF 2014-2020);
- the introduction of new forms of trout partially resistant to diseases.

Therefore, expected production growth may limit the deficit in trout trade.

Polish aquaculture generated a value close to 92 Mio EUR in 2016, of which 45 Mio (50%) is from trout farming. Carp is the other main contributor with about 40 Mio.

Table 8 –Polish aquaculture production in value (2016)

	Value in (million PLN)	Value in (million EUR)*
Trout	197.3	45.23
Carp	172.6	39.56
Other Species	29.4	6.74
Total	399.3	91.53

(*) Exchange rate used: 1 EUR = 4.3625 PLN (NBP, Polish National Bank)

Sources: Inland Fisheries Institute

4.2.3 Imports-exports and trade balance

Imports

Poland imported ca. 10 000 tonnes of live and fresh trout (including large size trout from mariculture) in 2015-2016. Imported trout is destined mostly for fish processing for re-export. In recent years, due to domestic market growth, some imported trout are in direct competition with trout produced from local farms, which for the time being don't have the capacity to deliver more quantities to the market due to limited investment capacity, growing environmental standards and lack of new location for flow-through farms.

Table 9 - Trout import to Poland 2012-2016 (tonnes, product weight)

Import / product	2012	2013	2014	2015	2016
live	1 083	1 113	869	881	975
fresh	2 867	5 231	8 264	9 957	10 479
frozen	2 727	3 683	3 953	2 021	2 659
fillet fresh	878	1 435	391	270	183
fillet frozen	208	149	223	353	187
smoked	30	194	182	22	28

Sources: Comext-Eurostat

In 2016, around 75% of the volume of fresh rainbow trout imported in Poland - mostly large-sized trout supplying the smoking industry - came from Norway and Sweden. Portion trout is imported from Spain and Italy and, for a minor but growing share, from Turkey. EU suppliers account for 44% of the import volumes.

Table 10 - Import of fresh trout to Poland by supplier (tonnes, product weight)

Origin	2012	2013	2014	2015	2016
All origins	2 867	5 231	8 264	9 957	10 479
- Norway	1 410	2 644	4 542	6 058	5 258
- Denmark	851	1 238	1 740	1 604	2 453
- Spain	253	577	1 432	988	1 346
- Italy	72	145	192	770	855
- Turkey	0	309	147	60	114

Turning to the import of frozen products, of the 2.600 tonnes of frozen portion trout imported in Poland in 2016, Turkey supplied about 60% (1.660 tonnes).

Exports

Poland mostly exports smoked trout products (3.000 to 4.000 tonnes over the last 5 years) and about 1.000 tonnes/year of fresh portion trout. Germany is by far the main destination, absorbing 90% of Polish exports of smoked trout.

Table 11 - Trout export from Poland 2012-2016 (tonnes, product weight)

Import / product	2012	2013	2014	2015	2016
live	590	709	462	582	932
fresh	143	435	1 025	1 022	1 162
frozen	176	122	88	87	221
fillet fresh	232	352	192	501	669
fillet frozen	202	203	513	407	600
smoked	3 043	3 634	4 346	3 929	3 292

Sources: Comext-Eurostat

A growing deficit in the trade balance is observed for fresh trout (mostly large-size) and frozen trout (table 12 and fig 6, next page); while a surplus is observed for processed products – smoked trout and fillets. The two data combined confirm that Poland is a key-player in the EU for salmon and trout processing (cf; EUMOFA case study – "Smoked salmon in France" https://www.eumofa.eu/price-structure).

Table 12 – Trade balance for different trout products - 2012-2016 (tonnes, product weight)

Live trout (tonnes)	2012	2013	2014	2015	2016
Export	590	709	462	582	932
Import	1 083	1 113	869	881	975
Balance	-493	-404	-407	-299	-43

Fresh trout (tonnes)	2012	2013	2014	2015	2016
Export	143	435	1 025	1 022	1 162
Import	2 867	5 231	8 264	9 957	10 479
Balance	-2 724	-4 796	-7 239	-8 935	-9 317

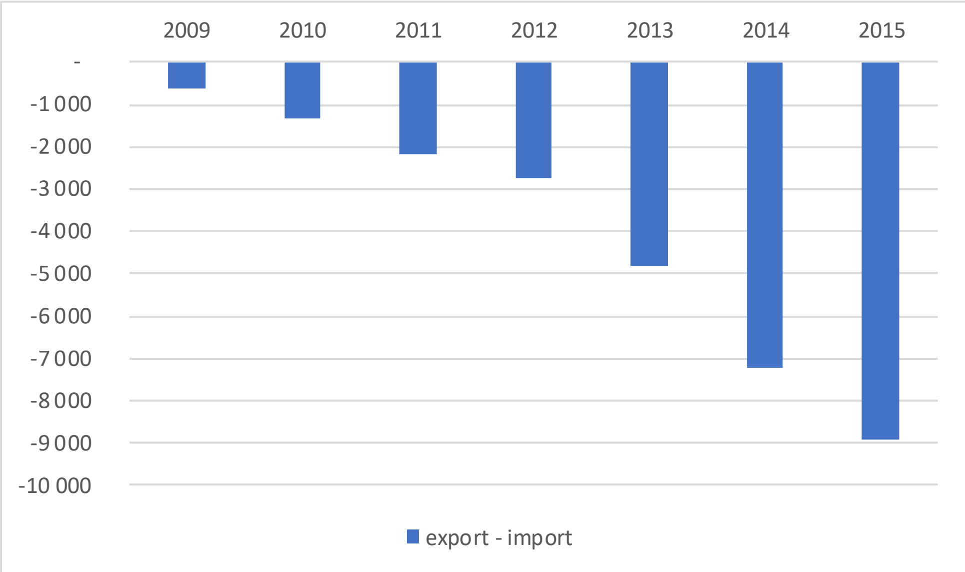
Frozen trout (tonnes)	2012	2013	2014	2015	2016
Export	176	122	88	87	221
Import	2 727	3 683	3 953	2 021	2 659
Balance	-2 551	-3 561	-3 865	-1 934	-2 438

Trout fillets (tonnes)	2012	2013	2014	2015	2016
Export	434	555	705	908	1 269
Import	1 086	1 584	614	623	370
Balance	-652	-1 029	91	285	899

Smoked trout (tonnes)	2012	2013	2014	2015	2016
Export	3 043	3 634	4 346	3 929	3 292
Import	30	194	182	22	28
Balance	3 013	3 440	4 164	3 907	3 264

Sources: Comext-Eurostat

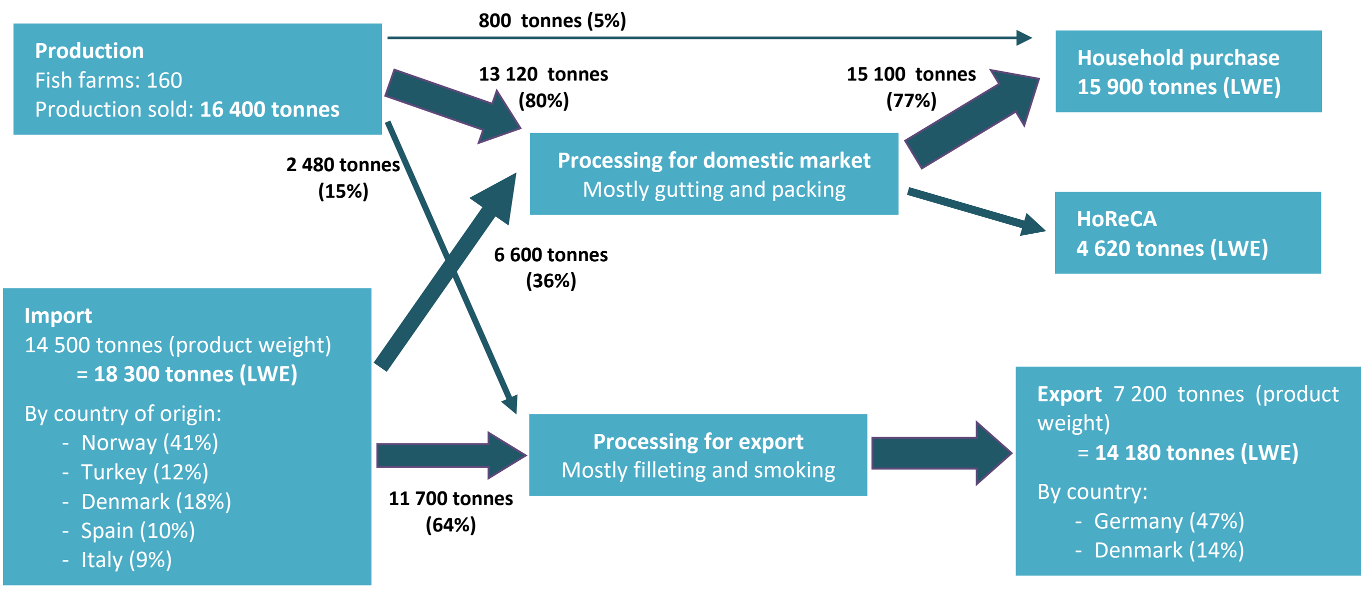
Figure 6 – Trend in trade balance of fresh trout in Poland (product weight in tonnes)



4.2.4 Supply balance for trout in Poland

Estimating a reliable supply balance for trout marketed for human consumption in Poland necessitates making some extrapolations from the available raw statistics. According to PTBA, the volume sold by Polish trout farms is only 16 400 tonnes (82%, excluding stocking material and trout for re-stocking) and volumes imported and processed have to be converted in live weight equivalent (LWE). The processors interviewed consider 64% of imported products are large-size trout and frozen product mostly supplying the processing industry for export. Based on this approach the apparent market for trout is estimated at about 20 000 tonnes (figure 7 and table 13).

Figure 7: The Polish supply balance for fresh rainbow trout (2016)



<u>**Sources:**</u> Elaborated from Polish Statistics, Comext and interviews with stakeholders. LWE = live weight equivalent

4.2.5 Trout Consumption

Polish trout consumption, and more widely fish consumption, increased by 20% during the 2012-2016 period.

Table 13 - Domestic market for trout in Poland in 2012-2016 (tonnes, live weight equivalent)

Total market for trout	2012	2013	2014	2015	2016
(tonnes)	17 100	19 000	20 900	20 100	20 520

Source: Institute of Agricultural and Food Economics National Research Institute. Apparent consumption is calculated as production + import – export. All elements expressed in live weight equivalent.

Table 14 - Trout apparent consumption per capita in Poland (2012-2016), in live weight equivalent

Domestic consumption	2012	2013	2014	2015	2016
kg per capita /year	0,45	0,50	0,55	0,53	0,54

Sources: Institute of Agricultural and Food Economics National Research Institute. Apparent consumption is calculated as production + import – export. All elements expressed in live weight equivalent.

The main reasons for this trend are identified as follows:

- introduction of MAP packed chilled trout products in the main supermarket chains;
- promotional campaigns on freshness and healthy benefits;
- general good perception of trout (especially among 55 years+ consumers);

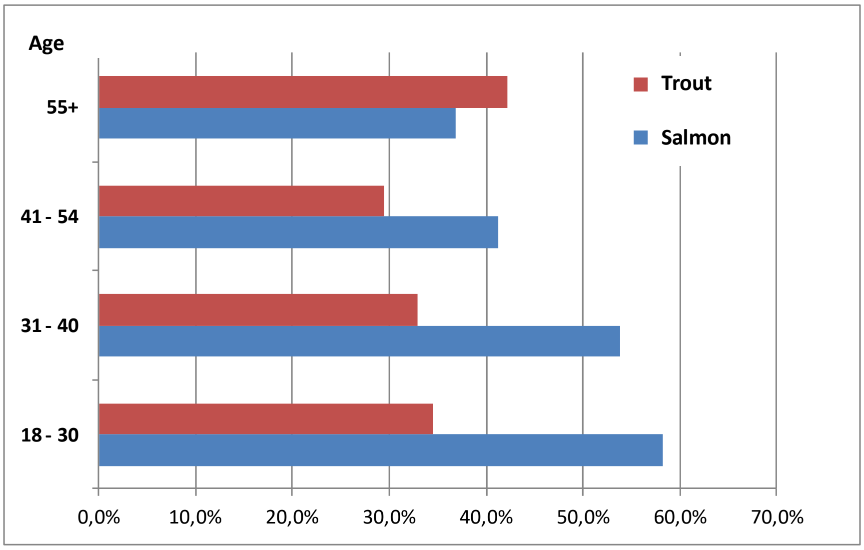
In Poland, the average annual fish consumption was estimated at 11,8kg/capita in 2012 by the Polish institute of agricultural and foods economics, which is significantly below the average fish consumption in the EU. National authorities implemented a series of measures to increase domestic fish consumption, targeting young consumers. For example, the government launched fish promotion campaigns “Fish influences all”, “Mr. Carp”, “Fish products from Poland”, and “Now – trout!”.

The Polish Trout Breeders Association was responsible for the nationwide promotional campaign for trout with the main slogan “Teraz Pstrąg!” (Now – trout!) in the period 2011-2014.

The main objective of these promotional campaigns was to increase consumption of trout through higher awareness by Polish consumers of the health benefits and culinary diversity of trout. The promotional campaigns included various themes such as “Health values” (2011), “Barbeque” (2012), “Always and everywhere” (2013) and “Party and fun” (2014).

Another element explaining the increase in Polish demand is that trout is popular among different socio-demographic groups because it has a positive, healthy image. This is especially true among older people (55+).

Figure 6: Healthy image of salmon and trout in Poland, in different socio-demographical groups
(% of people who believe in pro-healthy values of trout or salmon)



Sources: National Marine Fisheries Research Institute (MIR-PIB), ProHealth project

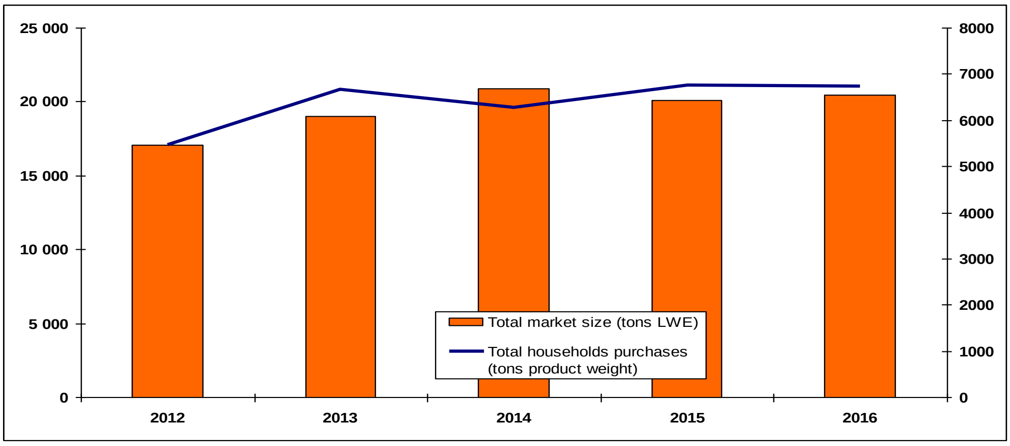
The general positive trend in consumption of trout in Poland is confirmed by Europanel data for household purchases (the data are of product weight and do not include out-of-home consumption), which increased by 23% in the years 2012-2016.

Table 15 - Trout purchase by households in Poland in 2012-2016 (tonnes, product weight)

Total households purchases	2012	2013	2014	2015	2016
(tonnes)	5,468	6,664	6,282	6,754	6,741

Sources: Europanel for EUMOFA

Figure 7 - Comparison of trout consumption data in Poland in 2012-2016 obtained by different methodologies - calculation of apparent market (left hand scale - tonnes live weight) and household panel (right hand scale - tonnes product weight)



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4.3 Segmentation of the market

In the Polish market rainbow trout is sold under two main presentations and four forms:

- chilled gutted head-on portion-size trout or chilled fillets (portion-size or large "salmon trout") – loose on ice (the main presentation in hypermarkets, cash and carry and traditional fish shops)
- chilled pre-packed gutted head-on fish or chilled fillets (the main presentation in supermarkets).

According to Europanel data (provided to Polish Trout Breeders Association), up to 45-50% of the fresh trout market are sold in supermarkets, which means 45-50% of retail is pre-packed gutted fish or pre-packed fillets. Interviewed farmers and traders spoke of a significant increase in fillet sales, but there is no public statistic or panel data available to confirm this trend.

Frozen trout is a marginal product – comprising less than 1% of frozen fish retail sales in Poland.

Smoked trout constitutes c. 5% of smoked fish market in Poland (ca. 1200 tonnes). In recent years the dominant forms were:

- chilled warm-smoked gutted head-on trout (sold in hypermarkets, traditional fish shops, tourist shops, fish farms; this represents c. 70% of the smoked trout market)
- chilled pre-packed warm-smoked portion-size trout fillets (sold in supermarkets, representing c. 30% of the smoked trout market)

Table 16 - Distribution patterns for trout on Polish retail market (expept HoReCa):

Type of seller	Availability (rating)	Availability (forms)	% of Sales (GfK Polonia data and interviews)
Hypermarkets	Excellent	Fresh gutted trout in ice, fresh fillets on ice, smoked trout (gutted)	15%
Supermarkets	Excellent	MAP packed gutted trout; MAP packed trout fillets; MAP or vacuum packed smoked trout fillets	55%
Fishmongers	Very good	Fresh trout chilled, smoked trout gutted	23%
Fish farms	Moderate (39% of trout farms have direct sales to consumers, except for the biggest ones; farms are located mostly in Northern Poland)	Whole fish, gutted fish, smoked fish	5%
Grocery stores	Very bad		2%
Special commercial angling pond and agro-tourism	Good	Whole fish, smoked gutted trout	

Since 2016/2017, due to high prices of salmon, a new product was introduced in supermarkets:

- chilled pre-packed cold-smoked large-size trout sliced fillet (this product is considered by farmers to be in direct competition to cold-smoked salmon sliced fillets - both farmed and wild).

Before that, some processed products of rainbow trout were introduced, mostly in the years 2012-2014 in the context of promotional campaigns, using the increasing popularity of trout. Examples are: canned trout, trout pâté trout in jelly, salads with trout.

Most trout products are marketed without a producer's brand. Only pre-packed trout is sometimes sold under a producer's brand, but in most cases they are sold under private labels (supermarkets brands).

The only existing certificate for trout quality is one retailer's quality brand (available on the market for many years) - "Quality from Nature". However, it is worth noting that there were some trials to introduce premium prices of gutted pre-packed Arctic char (under the "De Luxe" brand at Lidl).

4.4 Key drivers of the market

The retail market of fresh portion rainbow trout is considered by stakeholders to be quite a specific part of the fish market in Poland. Trout has a strong specific image of a fresh, healthy and convenient product (for example: one person portion, ready to cook, easy to grill) It is worth noting that other fresh portion fish (like sea-bass or sea-bream) has marginal importance in Poland. Portion fish in Poland is mostly portion trout.

Nonetheless, alternative products to fresh portion trout are principally[3]:

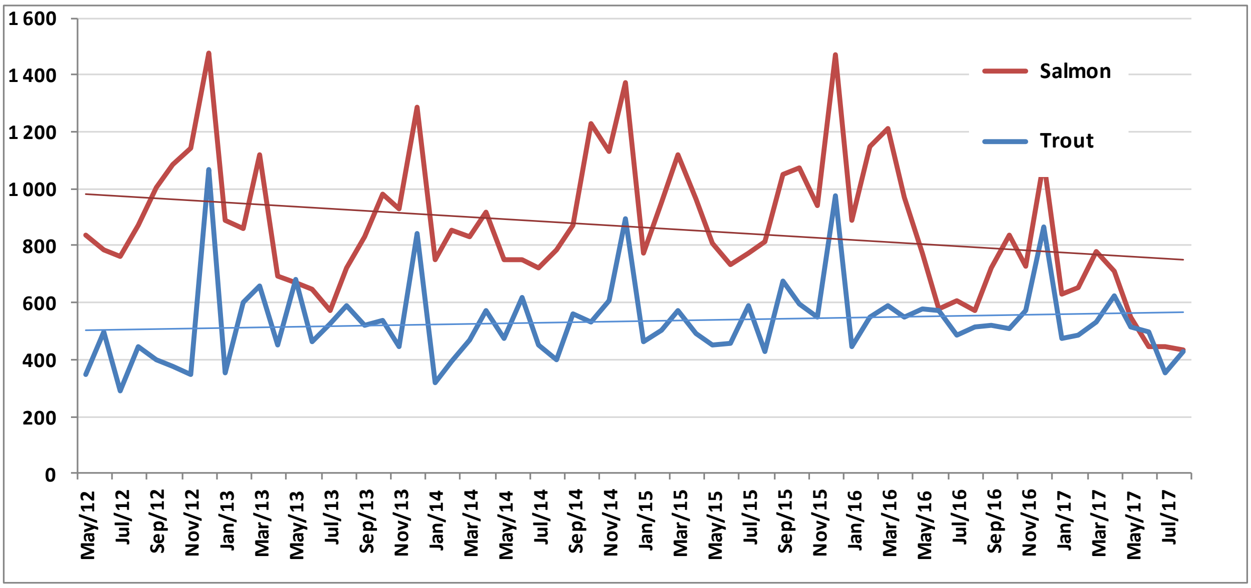
- Atlantic salmon - especially in the forms of cut portions (pl. *dzwonka*) — mostly during the grilling season;
- Common carp (whole, portions, fillets) — only in December, before Christmas;
- Atlantic (Baltic) cod

Alternatives to fresh portion rainbow trout in HoReCa are mostly Atlantic cod fillet, gutted flounder, halibut portions and, seasonally, with other freshwater fish like pike, pike-perch and whitefish (*Coregonus albula*).

Frozen portion trout, imported from Turkey is not really in an alternative for consumers of fresh portion trout, but rather a substitute for other frozen fish used for processing and re-exports.

In the last five years growth in the trout market has been seen, in parallel to that for carp (the carp market is very specific in Poland, with 90% of sales concentrated in December). While the salmon market decreased in parallel to the increase in the trout market, there is no strong evidence of correlation or even link between the prices of the two products.

Figure 10: Trend in monthly purchase of fresh salmon and fresh trout in Poland (tonnes/month)



Sources: Europanel for EUMOFA

[3] [sources of the information: Focus Groups (Success project, 2016-2017); trout farmers interview]

Price competitiveness

Rainbow trout is cheaper than other portion-size salmonids (brook trout and arctic char) and not so expensive compared to carp (+ 29%).

Table 17 – Ex-farm prices for fish species from Polish aquaculture (year 2016)

	in PLN/kg (without VAT)	in EUR/kg * (without VAT)
Rainbow trout	12.34	2.83
Brook trout	12.82	2.94
Arctic char	14.16	3.25
Carp	9.92	2.27

*Exchange rate used: 1 EUR = 4.3625 PLN (NBP, Polish National Bank)

Source: (Polish) Inland Fisheries Institute

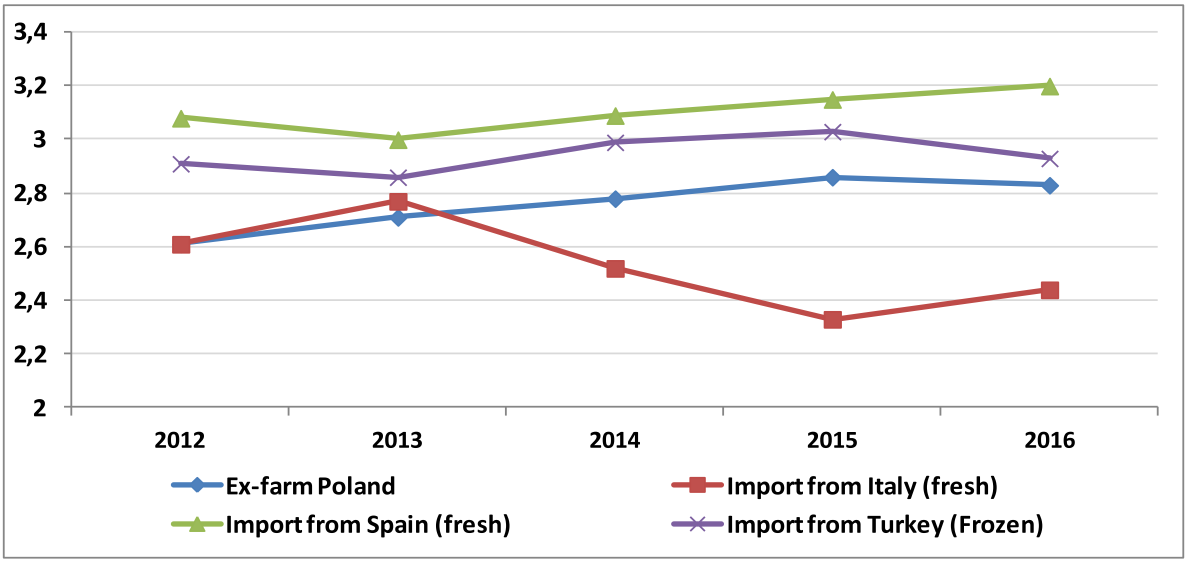
Ex-farm prices (in local currency) for rainbow trout decreased in 2012 by 3.5% and then constantly increased by 13% between 2012 and 2016 (average yearly growth rate: +3.3%). This is considered by farmers to be a result of the promotional campaigns in favour of trout developed on the 2011-2014 period.

Table 18 – Ex-farm prices for fresh trout in Poland

Year	Ex-farm price (without VAT), PLN	EUR/PLN conversion rate	Ex-farm price (without VAT), EUR
2011	11.31	4.12	2.75
2012	10.92	4.19	2.61
2013	11.38	4.20	2.71
2014	11.64	4.19	2.78
2015	11.96	4.18	2.86
2016	12.34	4.36	2.83

Source: Inland Fisheries Institute, Polish National Bank

Figure 11: Ex-farm and import price for fresh portion trout (EUR)



Source: Inland Fisheries Institute and Comext

The price of fresh gutted portion trout from Polish aquaculture appears higher than that of imported fresh trout from Italy (from 2014) and lower than that of fresh portion trout imported from Spain (-12% in 2016) and that of frozen portion trout from Turkey (-3%). According to Polish farmers, the slight decrease in the ex-farm price observed in 2016 is likely to be partly due to the decrease in price of frozen trout from Turkey, mainly since processors have a dominant position and do not want to pay more for local products. The price of fresh trout imported from Denmark and Norway are significantly higher, but are mostly large-size fish imported by the smoking industry (see table below).

Table 19 – Ex farm price and import price for trout in Poland – (Comext and PTBA)

Product and origin /year	2012	2013	2014	2015	2016
Ex-farm Poland	2.61	2.71	2.78	2.86	2.83
Import from Italy (fresh – portion size)	2.61	2.77	2.52	2.33	2.44
Import from Spain (fresh- portion size)	3.08	3.00	3.09	3.15	3.20
Import from Denmark (fresh –large size)	3.00	3.73	3.31	2.97	3.80
Import from Norway (fresh –large size)	3.93	5.39	5.13	4.17	5.71
Import from Turkey (frozen – portion size)	2.91	2.86	2.99	3.03	2.93

Source: Inland Fisheries Institute and Comext

The increase in the ex-farm price is generally considered by stakeholders to be a consequence of higher prices of other substitutive fish species (salmon, fresh cod, imported trout). This results in an increased profitability of trout farming. The ex-farm price increase is also partly affected by increasing production costs. The main production costs in trout farming are, by rank of importance:

- First, **feed** purchases, which represented in average **41.8%** of the total cost in trout production;
- Second, **employment costs**, which amounted to **20.5%**;
- Third, **stock material (fry)** accounting for **9.9%**;
- Other costs are **depreciation of capital** (**5.8%**), **energy (4.5%)**, treatment, prevention and **veterinary** care (0.9%). The **other costs** (oxygen, fishery goods, advertising and promotion) represent in aggregate **16.6%** (oxygen purchase is the most important).

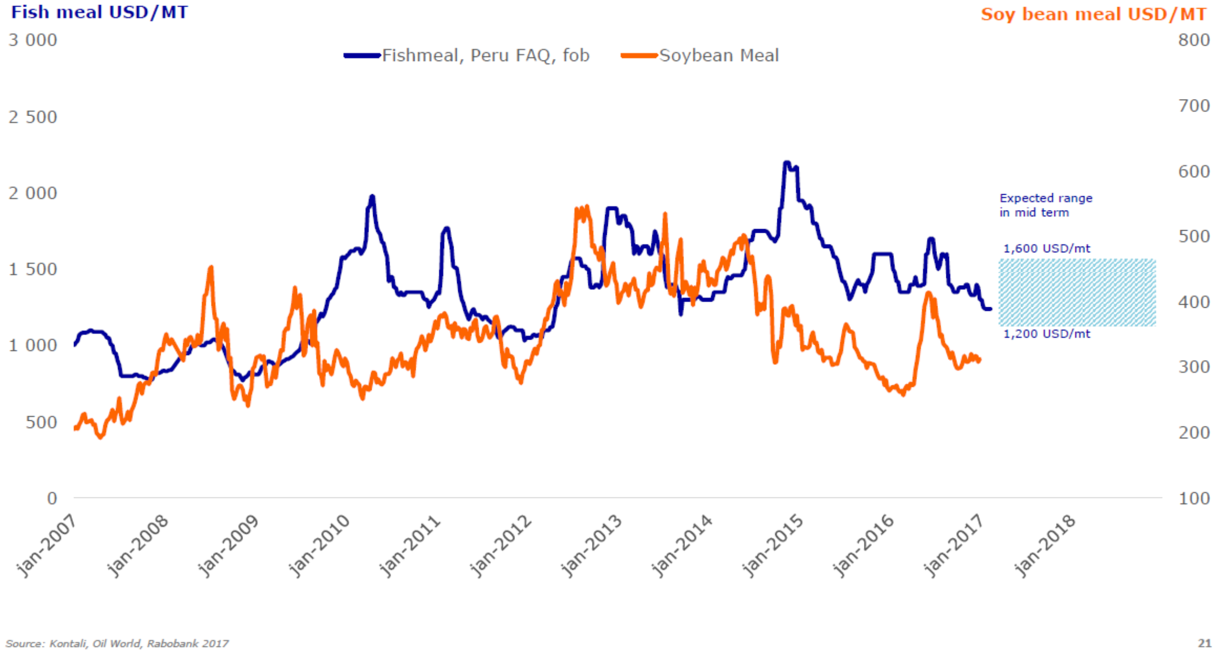
The average profitability index in the analyzed farms was 9.4% in 2014[4].

Although labour costs in Poland are still very low compared to EU average, significant increases in labour cost have been observed in recent years, probably also linked to the "no hands to work" in fish processing and fish farming phenomenon. Increasing employment of foreigners has partly alleviated these problems.

Feed prices seems not to be the main cost driving factor, even though a significant increase is observed from 2010 to 2015 (figure 12) in main protein sources price (fishmeal/soybean meal), considering that ex-farm prices continued to grow in 2016 while there was a downturn in feed price (due to a decrease in the price of proteins).

[4] (**Source:** A. Wołos, A. Lirski, T. Czerwiński, *Sytuacja ekonomiczno-finansowa rybactwa śródlądowego w 2014 roku*, Olsztyn 2015)

Figure 12 : Fish meal and soybean meal prices in 2007-2017



Sources: Rabobank, Kontali, Oil World

It is also worth mentioning that inflation in Poland in the last five years has been low and did not significantly affect ex-farm prices in local currency. In 2013 inflation rate was 3.7%, in the years 2013-2016 was between 0.9% in 2013 and -0.6% in 2016 (deflation).

5. PRICES ALONG THE SUPPLY CHAIN

This chapter aims to analyse price data and price trends at different levels of the fresh trout supply chain in Poland, with the objective of setting the framework for price transmission analysis (chapter 6).

5.1 Ex-farm prices

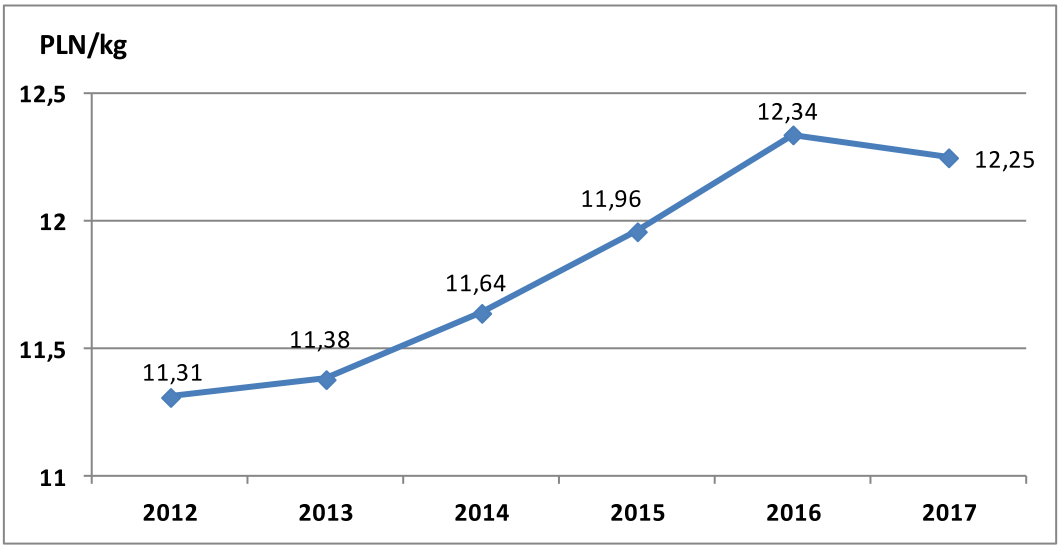
The ex-farm price (in national currency) of Polish fresh rainbow trout increased by 9.1% in the period 2011-2016 and faced a light decrease in the first nine months of 2017. In Euros, the increase is only + 2,9%, due to currency rates changes.

Table 20 – Ex-farm prices for fresh trout (whole) in Poland

Year	2011	2012	2013	2014	2015	2016	2017
Ex-farm price (without VAT), PLN	11.31	10.92	11.38	11.64	11.96	12.34	12.25
EUR/PLN conversion rate	4.12	4.19	4.2	4.19	4.18	4.36	4.22
Ex-farm price (without VAT), EUR	2.75	2.61	2.71	2.78	2.86	2.83	2.90

Source: Inland Fisheries Institute - first nine months of 2017

Figure 13 : Trend in ex-farm price for whole rainbow trout



Source: Inland Fisheries Institute

5.2 Import and export prices

The following table provides a calculation of the apparent price calculated from Comext data (Total value/total volume). In Euros, an increase in export price of fresh trout is observed from 2009 to 2012.

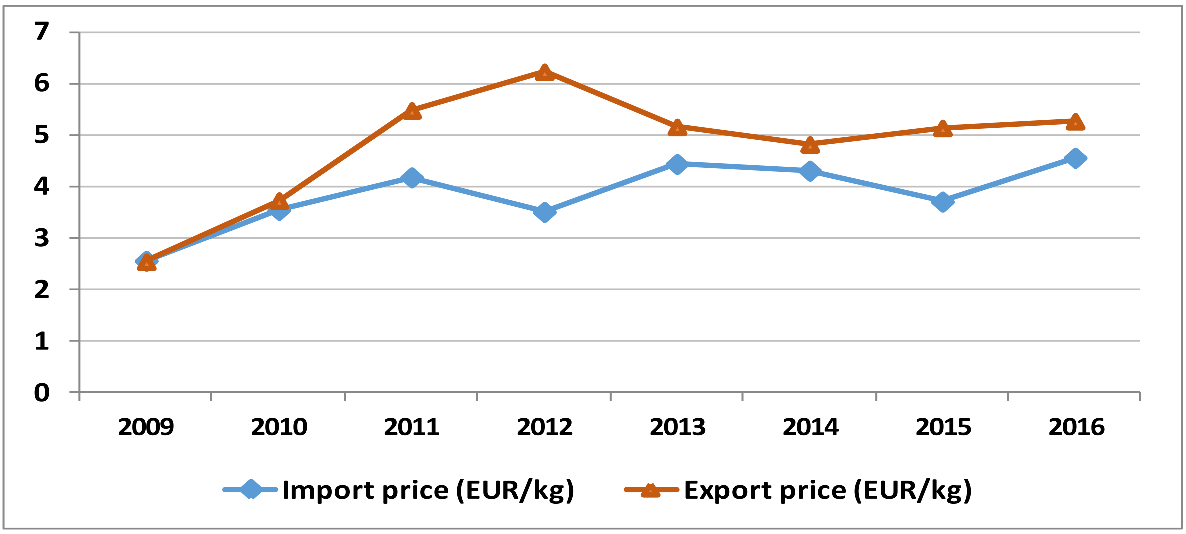
Price of fresh (gutted) rainbow trout imported to Poland fluctuates from 3,5 to 4,5 Euro/Kg on the period.

Table 21 – trend in apparent price for fresh trout imported and exported from Poland (EUR/kg)

Fesh trout	2009	2010	2011	2012	2013	2014	2015	2016
Import price (EUR/kg)	2,56	3,55	4,18	3,51	4,44	4,31	3,71	4,56
Export price (EUR/kg)	2,54	3,73	5,48	6,23	5,16	4,82	5,14	5,27

Source: Comext

Figure 14. Evolution of import and export prices of fresh trout in Poland (EUR/kg)



Source: Elaboration from COMEXT – Yearly value / yearly volume (imported or exported)

5.3 Wholesale prices

Fresh whole trout

The Polish Main Statistical Office provides monthly data on price at wholesale level for whole fresh rainbow trout (table below). On average, during the 2012-2017 period, the apparent gross margin of wholesalers (wholesale price/retail price) was 11%.

Table 22 – Price of fresh trout at wholesale level

	2012	2013	2014	2015	2016	2017 (1)
Whole fresh trout (PLN/kg)	12.31	12.62	12.82	13.53	13.67	14.06
EUR/PLN conversion rate	4.19	4.2	4.19	4.18	4.36	4.22
Whole fresh trout (EUR/kg)	2.94	3.00	3.06	3.24	3.13	3.33

Source: Polish Main Statistical Office – (1) 9 months for 2017 – Jan-Sept.

Fresh gutted trout

Most of the trout sold in supermarkets is gutted. But, there are no public statistics available on price at wholesale level for this presentation.

A professional source (Fish Industry magazine) provides bi-monthly information on prices for Makro Cash and Carry (deliverer to HoReCa). Between Feb. 2013 and Aug. 2017 the price fluctuated between 12.60 and 24.74 PLN per 1 kg. The average price from January to August 2017 was 4% lower than in January to August 2013 (table 23, next page).

Table 23 – Price* of fresh gutted trout in Makro Cash and Carry Poland (wholesale level)

Year	2013	2014	2015	2016	2017 (1)
Gutted trout price incl. VAT (PLN)	19.47	19.64	18.76	20.74	19.04
EUR/PLN conversion rate	4.12	4.19	4.2	4.19	4.18
Gutted trout price incl. VAT (EUR)	4.73	4.69	4.47	4.95	4.56

Source: Fish Industry Magazine. * unweighted average from bi-monthly survey, Polish National Bank- (1) 9 months

5.4 Retail prices

Average retail price of whole trout (all retailing channels)

The Polish Main Statistical Office provides monthly data on price at retail level for whole fresh rainbow trout (annual average in table below). This price encompasses all type of retailing channels – direct sales, fishmongers and supermarkets. Annual average retail prices appear to be relatively steady 2012-2016, with an increase of 6% in the first nine months of 2017.

Table 24 – Price of fresh whole rainbow trout at retail level

	2012	2013	2014	2015	2016	2017
Whole fresh trout (PLN/kg)	21.95	22.04	22.20	22.33	22.82	23.31
EUR/PLN conversion rate	4.19	4.2	4.19	4.18	4.36	4.22
Whole fresh trout (EUR/kg)	5.24	5.25	5.30	5.34	5.23	5.52

Source: Polish Main Statistical Office

Retail price of gutted trout in supermarket

The bi-monthly price survey (professional magazine) in one large retailing company in Poland show significant variations in price. Retail price for gutted trout fluctuate from 14.99 to 24.99 PLN per 1 kg, between February 2013 and August 2017. In 2016 and 2017, the annual price of gutted trout in Auchan's outlet show a significant increase compared to 2013-2015, and is close to average retail price observed by the Main Statistical Office (table 24, above).

Table 25 – Price* of fresh gutted trout in Auchan (retailer — hypermarket)

Year	2013	2014	2015	2016	2017
Gutted trout price incl. VAT (PLN)	18.79	17.58	19.49	21.97	22.50
EUR/PLN conversion rate	4.12	4.19	4.2	4.19	4.22
Gutted trout price incl. VAT (EUR)	4.56	4.20	4.64	5.24	5.33

Source: Fish Industry Magazine. * unweighted average from bi-monthly survey

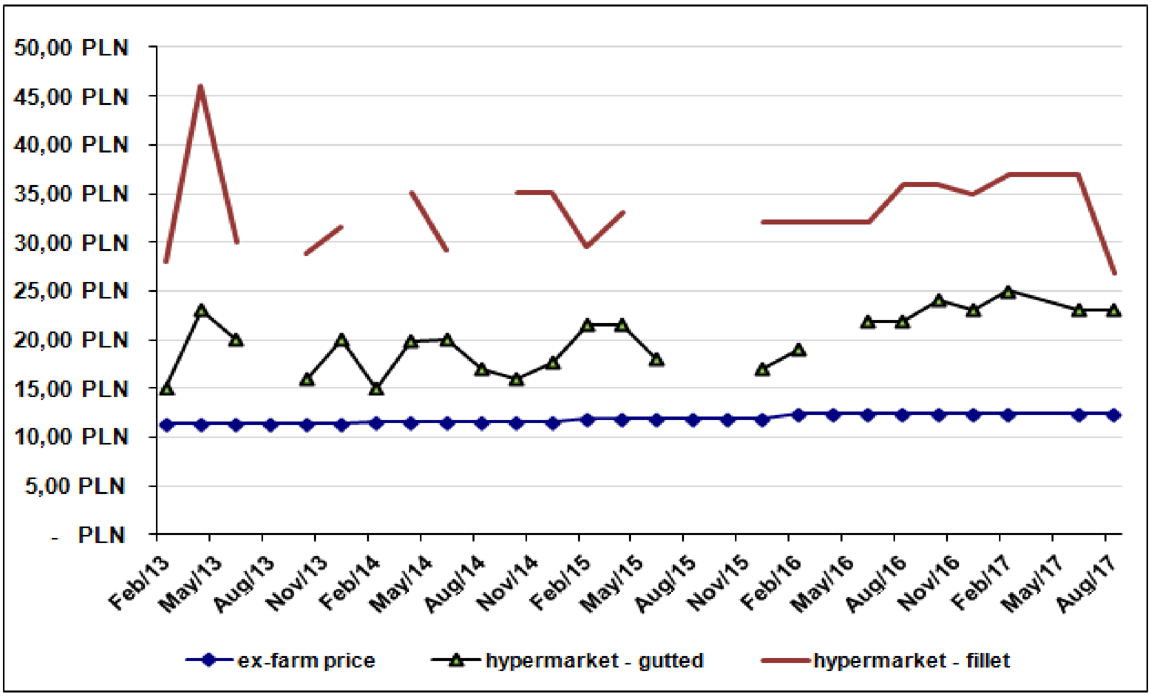
6. PRICE TRANSMISSION IN THE VALUE CHAIN

6.1 Trends in prices and sharing of value between actors

It is worth mentioning that retail prices have been much more unstable than ex-farm prices. Between February 2013 and August 2017 ex-farm prices increased by c. 10% (from 11,38 PLN in 2013 to 12,50 PLN in 2017). According to Europanel data, between February 2013 and June 2017 average price of fresh trout purchased by households increased by 12%.

Price surveys in shops are not reliable sources for analyzing price transmission. It only suggests that there is no direct link between current ex-farm price and current retail price, that price is much more variable and probably more linked to promotional campaigns and fluctuation of price of alternative products (as fresh salmon).

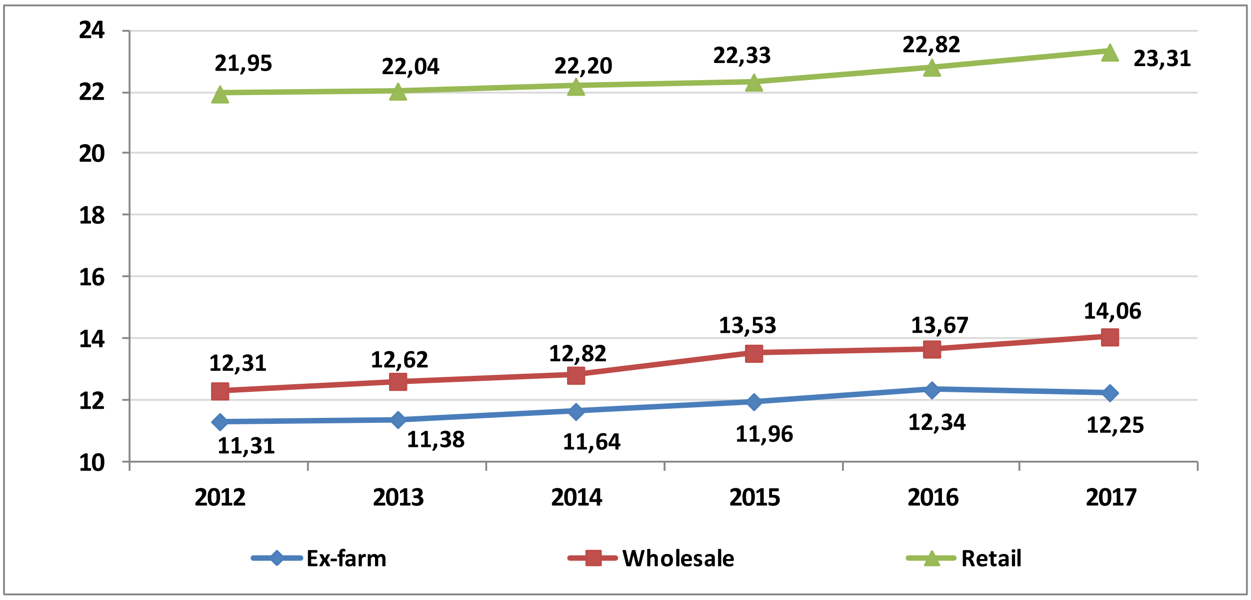
Figure 16 - Average prices along the supply chain (ex-farm: annual prices, retail: bi-monthly prices)



source: ex-farm price – IRS, retail prices - Fish Industry Magazine survey

Statistical sources (figure 15) provide more reliable data on price (yearly price) at different levels of the value chain for analyzing price transmission for fresh portion rainbow trout. A relative “correlation” is observed between price series ay different level: from 2012 to 2017 (nine months), ex-farm price increased by 8,3%, wholesale price by 14% and retail price by 6,2%. The average ratio retail price/ex-farm price is 190% on the period and remains quite steady (185%-195%).

Figure 15. Evolution of price of fresh portion trout at different levels of the value chain (PLN/kg)



Source: Polish Inland Fisheries (ex-farm); Institute and Polish Main Statistical Office (wholesale and retail)

The sharing of value between actors of the chain fluctuates from one year to another, but the share of trout farmers remains over 50% (52-54%) and the apparent share of retailers was over 42% until 2014, decreased to 40 % from 2015.

Table 26 – Distribution of the value between actors of the chain (fresh whole rainbow trout)

	2012	2013	2014	2015	2016	2017
Trout farmers	51,5%	51,6%	52,4%	53,6%	54,1%	52,5%
Wholesalers	4,5%	5,6%	5,3%	7,0%	5,8%	7,8%
Retailers	43,9%	42,8%	42,3%	39,4%	40,1%	39,7%

Source: Polish Inland Fisheries (ex-farm); Institute and Polish Main Statistical Office (wholesale and retail)

6.2 Costs and margins in the fresh trout supply chain

The analysis is focused on the main retail channel, namely large-scale retailers (supermarkets and hypermarkets).

Based on interviews with trout farming and processing chain actors, we estimate that processing costs amount to 2.50 PLN per 1 kg of product during gutting operations (final product: iced gutted fish). It includes: labour cost and other processors cost as well as processing margin. When final product is pre-packed gutted fish, processing cost are higher — 2.90 PLN per 1 kg plus 1.00 PLN material costs (packaging materials, gas, absorbent).

Logistic costs between farmer and processor, and then between processor and the logistic center of the hypermarket chains, are at average 1.30 PLN per 1 kg of product. When trade with supermarket (pre-packed fish), logistics costs are on average 1.00 PLN per 1 kg of product (due to a higher efficiency of transport). The logistic cost includes not only transport, but also chilling, storing cost.

Comparison of ex-factory prices and retail prices suggests that the margins in retail are between 12 and 14%. However, processors and farmers believe it is up to 20%. Furthermore, both processors and retailers confirm that 90% of product (gutted trout) is sold in "normal" (standard) price, while only 10%

are unsold (losses) or sold at discount prices (25-50% lower than "normal" price). According to one stakeholder's opinion, this is likely to affect the overall margin of retailers on the whole quantity of fresh trout sold. The price transmission analysis developed hereafter is nevertheless for a "standard" value chain, not taking into account losses and discount price.

Considering the relevance of the two main different kind of market presentation of the product, separated price transmission analysis is in the following paragraphs.

Following tables (23 & 24) and graphs (17 & 18) present:

- First, **fresh gutted trout sold loose in fresh fish counter of a large scale retailer**, namely an Hypermaket of Auchan group;
- Second, **fresh gutted trout sold pre-packed (MAP) in a discount supermarket** without fresh fish counter.

The difference between the two presentations induces extra processing costs for pre-packed trout; labour cost, for putting fish in package and filming and stamping it; raw material costs (package, film) and energy costs (packaging machines).

The final price surplus of packed fresh portion trout compared to a loose trout is 0,91 EUR/kg which represents + 4%.

Table 27 - Price transmission for fresh trout (gutted – loose) in hypermarket

Costs and margins	EUR/kg	% of ex factory price	% of retail price
Raw material (ex-farm price) (1)	**2.90**	**68.3%**	**54.4%**
Processing yield on raw material (2)	0.60	10.9%	8.7%
Processing costs, incl. labour cost, processing margin (3)	0.58	13.7%	10.9%
Logistic cost (4)	0.30	7.1%	5.65%
Ex factory price (5)	**4.25**	**100.0%**	**79.6%**
Costs and margins of retailing (6)	0.74		13.9%
VAT (7%) (7)	0.35		6.5%
Retail price (incl. VAT) (8)	**5.33**		**100.0%**

Sources:
(1) Ex-farm average price for fresh trout (September, 2017) - farmers interview
(2, 3, 4, 5) - interviews with Polish processors
(2) Loss of weight due to gutting of whole fish, interviews with Polish processors
(3) Processing cost – labour costs and margin of processor
(4) Logistic cost – transport from processing unit to retailer's outlets, interviews with Polish processors
(5) Ex-factory price (purchase price of retailers), interviews with Polish processors
(6) Costs (labour costs and losses) and margins of retailers (interviews with Polish processors and retailers)
(7) VAT rates for food products in 2017 (7%)
(8) Current retail price (hypermarket chain Auchan), data from Fish Industry Magazine survey

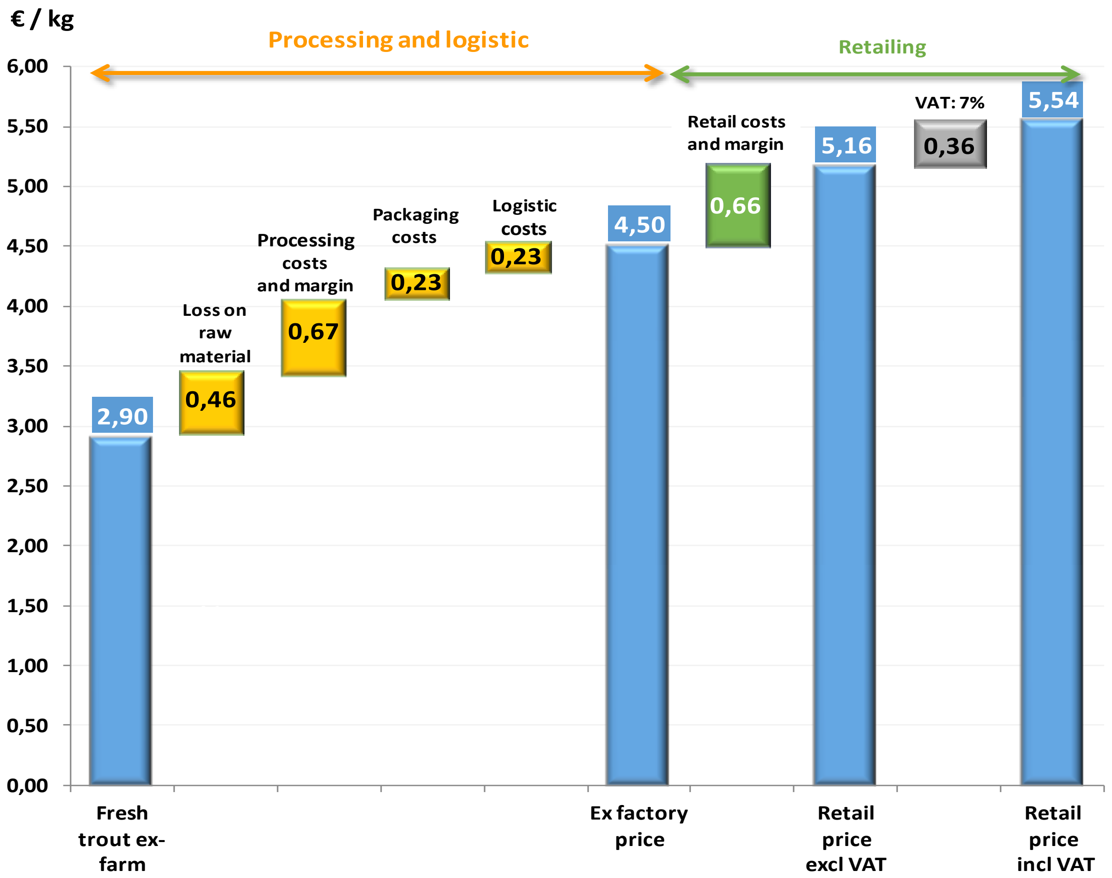
Figure 17 – Price transmission (2017) – fresh portion trout, loose, in hypermarket

Table 28 - Price transmission for fresh trout gutted – packed (MAP) in supermarket

Costs and margins	EUR/kg	% of ex factory price	% of retail price
Raw material (ex-farm price) (1)	2.90	64.43%	**52.3%**
Processing yield on raw material (2)	0.46	10.31%	8.4%
Processing costs, incl. labour cost and processing margin (3)	0.67	14.95%	12.1%
Packaging cost (4)	0.23	5.15%	4.2%
Logistic cost (5)	0.23	5.15%	4.2%
Ex factory price (6)	4.50	100.00%	4.2%
Costs and margins of retailing (7)	0.66		**81%**
VAT (7%) (8)	0.36		11.9%
Retail price (incl. VAT) (9)	5.54		**100%**

Sources:
(1) Ex-farm average price for fresh trout (September, 2017) - farmers interview
(2, 3, 4, 5, 6) interviews with Polish processors
(2) Loss of weight due to gutting of whole fish (interviews with Polish processors)
(3) Processing cost – labour costs and margin of processor
(4) Packaging material cost
(5) Logistic cost – transport from processing unit to retailer's outlets (interviews with Polish processors)
(6) Ex-factory price (purchase price of retailers), (interviews with Polish processors)
(7) Costs (labour costs and losses) and margins of retailers (interviews with Polish processors and retailers)
(8) VAT rates for food products in 2017 (7%)
(9) Current average retail price (supermarkets chains Lidl and Biedronka), data from Fish Industry Magazine survey

Figure 18 – Price transmission (2017) – fresh portion trout, packaged, in Supermarket



7. ANNEXES

7.1 Stakeholders met during the field survey

Institution	CONTACTS
Inland Fisheries Institute	Department of Pond Culture
Institute of Agricultural and Food Economics National Research Institute	Market Research Department
National Marine Fisheries Research Institute Gdynia	Fisheries Economic Department
Polish Trout Breeders Association	Individual farmers
	Office Director Chairman
Supermarket chain	Quality Manager
GfK Polonia (Europanel)	Development Director

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