



CASE STUDY

PROCESSED ANCHOVY IN ITALY

PRICE STRUCTURE IN THE SUPPLY CHAIN



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Summary

Context

- Italy is the world's fourth-largest producer of anchovy with 37.511 t caught in 2015, Spain being the second-largest producer with 49.982 t in 2015. Spain and Italy account for 71% of EU anchovy consumption.
- In Italy, anchovy is consumed fresh or processed. Processed products are: salted anchovy, preserved anchovy in oil and marinated anchovy. Salted anchovy may be considered as a final product and as a raw material for the production of preserved anchovy in oil. The present study focuses on salted anchovy and preserved anchovy in oil.
- There are two scales of production of processed anchovy in Italy:
 - Small-scale production: processing of Italian anchovy, product is marketed regionally;
 - Industrial scale production: this industry is partly based on imports, in particular from non-EU countries such as Albania, Morocco and Tunisia.
- About a quarter of the prepared or preserved anchovy available in Italy (production + imports) is exported. Exports are spread among a set of destinations with 100-300 t each: the main destination market in volume terms is Australia, followed by the United States, Japan, Austria, Germany, Albania, France, Belgium and Canada.
- Supply balance of anchovy for Italy (2015):
 - imports: 26.288 t live weight equivalent (lwe), mainly prepared or preserved and salted anchovy;
 - availability: 63.799 t lwe, including 35% of prepared or preserved anchovy;
 - exports: 19.967 t lwe (fresh, prepared or preserved and salted anchovy);
 - apparent consumption: 43.832 t lwe, including 38% of prepared or preserved anchovy.

Price transmission analysis

- Three products are covered by this analysis: industrial production of anchovy preserved in olive oil (27,60 EUR/kg for final consumer), small-scale production in the Ligurian area of anchovy preserved in olive oil (52,50 EUR/kg), small-scale production in the Ligurian area of salted anchovy (30,00 EUR/kg)¹.
- For one kg of final products of processed anchovy (preserved in oil or salted), 1,9 to 2,3 kg of fresh anchovy are needed. There is an important loss of material during the production stages: salting, gutting, filleting. Fish accounts for 9% to 20% of the costs of the final product to consumer.
- Labour costs account for an important share of the final price (14%-16% of the final consumer price for small-scale production) due to:
 - filleting costs;
 - handling of product: salting in barrels, packaging.
- Distribution costs account for a large share of the final product: 28% to 53% of the final consumer price.

¹ Average price in 2017 for each product.

0 TASK REMINDER – Scope and content

0.1 Case study scope

Reminder

The study aims to analyse the price transmission and distribution of value for processed anchovy in the Italian supply chain. This covers European anchovy (*Engraulis encrasicolus*) which is the species fished in the European and Mediterranean areas, this may also cover other anchovy species imported from other areas.

The scope of the case study is described in the table below.

Product	Origin	Characteristics	Market and price drivers
Processed anchovy: <ul style="list-style-type: none"> • salted anchovy, • Preserved anchovy in oil 	Italy Some stages of the production may be operated in third countries	Salted anchovy Preserved anchovy in oil Industrial production and small-scale production in the Ligurian area	Fish price: depending on fish size and the origin of supply Processing costs and in particular labour costs: a large share of the production costs are related to labour costs (14-16% of price for final consumer of small-scale product)

Key elements of the analyses will concern:

Species - Products	Main MS (focus)	Other MS (overview)
Processed anchovy: <ul style="list-style-type: none"> • salted anchovy, • Preserved anchovy in oil 	Italy	/

In the context of this study, analyses are led in current prices.

0.2 Content of the document

In conformity with the methodology developed within the EUMOFA, the document includes:

- a description of the product;
- most relevant EU markets for processed anchovy;
- an analysis of the price transmission along the supply chain in Italy.

1 DESCRIPTION OF THE PRODUCT

1.1 Biological and commercial characteristics

The case study focuses on European anchovy.

Case study product

Name: European anchovy, “*acciuga*” or “*alice*” in Italian, (*Engraulis encrasicolus*)

FAO 3-alpha code: ANE

resentation: fresh whole, fillet, headed and gutted, processed (salted, preserved with oil, marinated)

Commercial size: minimum 9 cm (or 110 specimens / kg)², usually between 12 and 15 cm.

Biological parameters

Parameter	Characteristics
Habitat	European anchovy is mainly a marine, pelagic and coastal fish. It forms large schools. It is a euryhaline species which may enter lagoons, estuaries and lakes in some areas, in particular during spawning period.
Diet	Zooplankton and crustacean larvae
Spawning	Spawning period: from April to November with peaks usually in the warmest months.
Grow-out	5 years longevity maximum and 3 years longevity for most of the population.
Distribution in the wild (see following map)	Eastern North and Central Atlantic Mediterranean, Black and Azov seas Coast of West Africa to Angola Also recorded from St. Helena

Source: FAO and IFREMER

² Council Regulation (EC) No 1967/2006

Related codes

Anchovy is identified in several codes from combined nomenclature (CN8):

- Fresh anchovy:
 - Since 2012: CN code 03 02 42 00: “fresh or chilled anchovies “*engraulis spp.*””
 - Before 2012: CN code 03 02 69 55: “fresh or chilled anchovies “*engraulis spp.*””
- Frozen anchovy:
 - Since 2017: CN code 03 03 59 10: “frozen anchovies “*engraulis spp.*””
 - Between 2012 and 2016: CN code 03 03 89 45: “frozen anchovies “*engraulis spp.*””
 - Before 2012: CN code 03 03 79 65: “frozen anchovies “*engraulis spp.*””
- Dried:
 - Since 2017: CN code 03 05 54 50: “dried anchovy “*engraulis spp.*”, even salted, not smoked (excl. fillets and offal)”
 - Until 2016: CN code 03 05 59 50: “dried anchovy “*engraulis spp.*”, even salted, not smoked (excl. fillets and offal)”
- Salted or in brine: CN code 03 05 63 00: ““*engraulis spp.*” salted or in brine only (excl. fillets and offal)”
- Prepared or preserved: CN code 16 04 16 00: “prepared or preserved anchovies, whole or in pieces (excl. minced)

Anchovy is identified in one PRODCOM code: 10 20 25 60 “Prepared or preserved anchovies, whole or in pieces (excluding minced products and prepared meals and dishes)”.

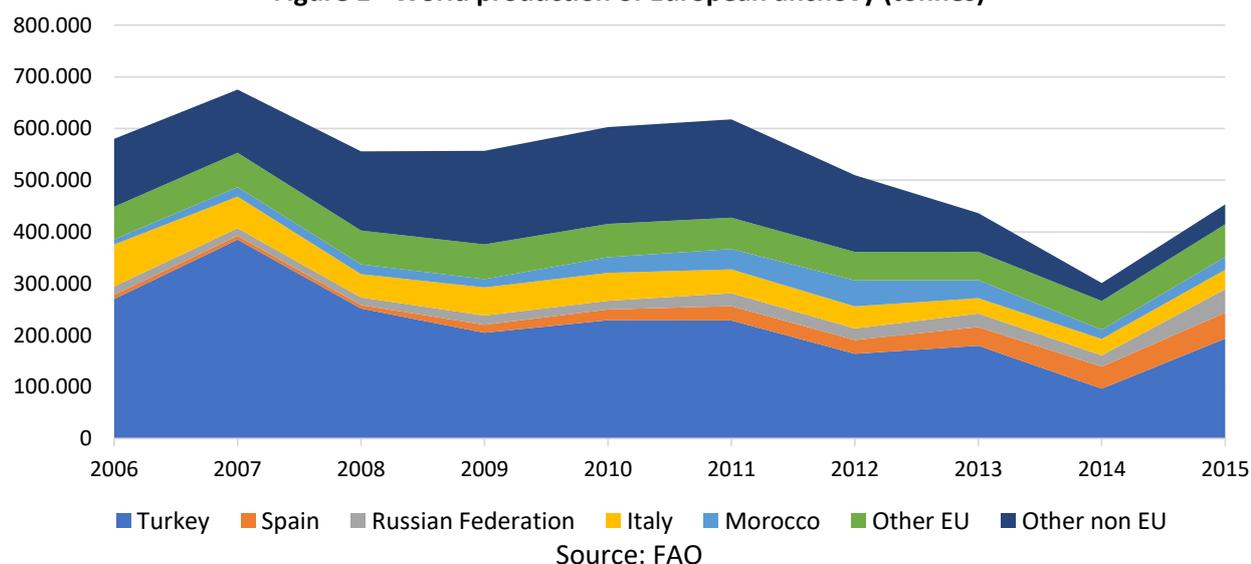
No code specifically covers European anchovy:

- the CN codes for fresh anchovy, frozen anchovy and dried anchovy cover “*engraulis spp.*”. This includes European anchovy, Argentine anchovy, Southern African anchovy, Japanese anchovy, Californian anchovy and Peruvian anchovy;
- the CN and PRODCOM codes for “prepared and preserved anchovy” are not specifically related to “*engraulis spp.*”. In the main commercial species nomenclature (MCS), “anchovy” covers “*engraulis spp.*” and other anchovy species (Bigscale anchovy, Atlantic sabretooth anchovy, etc.).

Catches in the European and Mediterranean areas are almost exclusively European anchovy; imports from other origins may cover other species.

1.2 Catches and availability of European anchovy

World catches for European anchovy reached 432.361 t in 2015 (-25% since 2006). Turkey is the largest producer with 45% of world catches (193.492 t in 2015, -28% since 2006). Spain is the second largest producer (49.982 t) with a large increase over the last decade (catches six times higher in 2015 compared to 2006). The third country is the Russian Federation with 45.683 t in 2015 (catches almost three times higher in 2015 compared to 2006). Italy is the fourth-largest producer with 37.511 t in 2015. Catches in Italy were more than two times higher in 2006 (81.174 t) than in 2015. Italian catches decreased sharply between 2006 and 2013 (29.664 t in 2013) but have been increasing since 2013. EU catches reached 129.159 t in 2015, accounting for 30% of world catches.

Figure 1 - World production of European anchovy (tonnes)

Table 1 - World production of European anchovy (tonnes)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Turkey	270.000	385.000	251.675	204.699	229.023	228.491	163.982	179.615	96.440	193.492
Spain	8.193	7.323	6.748	15.484	20.724	27.763	26.697	36.148	42.760	49.982
Russian Federation	16.120	14.742	14.720	17.887	16.848	24.961	22.336	26.224	21.745	45.683
Italy	81.174	61.216	45.039	54.388	54.095	46.237	42.800	29.664	31.842	37.511
Morocco	9.871	18.393	19.042	16.074	30.220	39.471	50.331	35.065	17.768	24.963
Greece	14.156	16.020	15.103	14.539	12.042	8.896	9.506	8.752	9.847	13.515
Croatia	11.850	13.200	13.054	15.456	15.224	14.387	8.290	8.904	8.594	12.340
Other EU	37.252	35.018	31.531	18.017	22.524	26.614	17.969	7.077	8.608	16.411
Other non-EU	131.339	122.211	153.200	181.027	187.366	190.298	148.542	74.662	34.635	38.464
Total	579.955	673.123	550.112	537.571	588.066	607.118	490.453	406.111	272.239	432.361
<i>Total EU</i>	<i>152.625</i>	<i>132.777</i>	<i>111.475</i>	<i>117.884</i>	<i>124.609</i>	<i>123.897</i>	<i>105.262</i>	<i>90.545</i>	<i>101.651</i>	<i>129.759</i>

Source: FAO

2 THE EU MARKET FOR ANCHOVY

2.1 Structure of the EU market

2.1.1 Apparent market by Member State

EU consumption of anchovy was 143.628 t in 2015³. Two Member States (MS) account for 71,3% of EU anchovy consumption: Spain (40,8%) and Italy (30,5%), with respectively 58.640 t and 43.830 t consumed in live weight equivalent. These MS are the highest producers and importers of anchovy. The next largest MS in terms of apparent consumption are Greece (10.000 t) and France (9.237 t). The apparent consumption in each other MS is below 4.000 t.

The following table provides the calculation of the apparent market of anchovy in the main MS and at EU level.

Table 2 – Balance supply of anchovy by MS in tonnes live weight equivalent (lwe) in 2015

	Catches (t)	Import (t lwe)	Export (t lwe)	Apparent consumption (t lwe)
ES	49.922	36.147	27.429	58.640
IT	37.511	26.288	19.969	43.830
EL	13.515	449	3.963	10.000
FR	5.653	9.612	6.029	9.237
UK	32	3.783	185	3.630
DE	26	3.982	839	3.169
DK	2.762	68	10	2.820
NL	2.129	1.092	682	2.539
HR	12.624	990	11.184	2.430
EU 28	126.909	51.175	34.456	143.628

Source: EUMOFA elaboration of EUROSTAT and EUROSTAT-COMEXT data

³ Apparent market is based on live weight equivalent (lwe). Live weight equivalents are calculated thanks to EUMOFA conversion factors: <https://www.eumofa.eu/documents/20178/24415/Metadata+2+-+DM+-+Annex+7+CF+per+CN8+%252707-%252714.pdf/7e98ac0c-a8cc-4223-9114-af64ab670532>

2.1.2 Imports

Main anchovy importers in live weight equivalent are Spain, Italy, France, Germany and the United Kingdom. Detailed information on imports of anchovy and anchovy-based products in each of these MS is provided in the table 3.

Prepared and preserved anchovy

Prepared and preserved anchovy is the largest product imported in terms of volume, accounting for 43% to 91% of the volume (lwe) imported in each of these MS in 2016. In most cases, products are imported from third countries: 89% to 94% of imports from third countries in Spain (mainly from Morocco and to a lesser extent from Peru), Italy (mainly from Morocco, Albania, Tunisia and Peru) and France (mainly from Morocco), 58% in Germany (mainly from Peru and Morocco), only 12% in the UK (imports mainly from Spain and France).

Fresh anchovy

Fresh anchovy is mainly imported in Spain, from intra-EU origins. Fresh anchovy imports reached 13.270 t in Spain in 2016 and accounted for 36% of anchovy imports to Spain (lwe). Fresh anchovy imported to Spain comes from Portugal, Italy and France. The next largest importers are Italy (3.591 t in 2015 and 2.772 t in 2016), Germany (792 t in 2016) and France (567 t in 2016).

Salted anchovy

Salted anchovy is mainly imported by Spain and Italy (respectively 4.899 t lwe and 4.313 t lwe in 2016). These imports to Spain and Italy come to a large extent from third countries (respectively 97% of the volume in Spain and 40% in Italy). In 2016, salted anchovy imported to Spain mainly came from Argentina and to a lesser extent from Peru and Morocco; salted anchovy imported to Italy mainly comes from Spain, Morocco, Croatia, Albania and Tunisia. The following importer of salted anchovy is France (478 t lwe in 2016, 87% from third countries). The imports in Germany and the UK are under 50 t lwe.

Frozen anchovy

Imports of frozen anchovy are significant in Spain and Germany only (respectively 2.351 t and 526 t imported in 2016). Imports mainly come from intra-EU (88% in Spain and 74% in Germany).

Dried anchovy

Imports of dried anchovy are significant only in the UK (902 t lwe in 2016), Italy (758 t lwe) and Spain (315 t lwe).

The following table indicates the volume of anchovy imported in main MSs. Volume are indicated in tonnes of final products and in live weight equivalent (lwe). Volumes in lwe are indicated in order to compare the different products and not to underestimate the importance of imports of processed products.

Table 3: Anchovy imports (tonnes of products and tonnes lwe) in the main MS in 2016

		Tonnes final product			Tonnes lwe
		Extra EU	Intra EU	Total	Total
ES	Fresh	35	13.235	13.270	13.270
	Frozen	291	2.060	2.351	2.351
	Prepared	7.283	491	7.774	15.548
	Salted	3.559	124	3.683	4.899
	Dried	22	72	95	315
	Total	11.191	15.982	27.173	36.383
IT	Fresh	0	2.772	2.772	2.772
	Frozen	8	99	107	107
	Prepared	7.234	512	7.746	15.492
	Salted	1.284	1.958	3.243	4.313
	Dried	10	218	228	758
	Total	8.536	5.559	14.095	23.442
FR	Fresh	0	567	567	567
	Frozen	0	9	9	9
	Prepared	4.583	541	5.124	10.248
	Salted	312	47	359	478
	Dried	0	0	0	0
	Total	4.896	1.164	6.060	11.303
DE	Fresh	0	792	792	792
	Frozen	137	389	526	526
	Prepared	779	561	1.340	2.681
	Salted	0	35	35	46
	Dried	2	4	6	21
	Total	918	1.781	2.699	4.066
UK	Fresh	0	21	21	21
	Frozen	43	13	56	56
	Prepared	155	1.106	1.261	2.522
	Salted	0	10	10	14
	Dried	33	238	271	902
	Total	231	1.388	1.619	3.515

Source: EUMOFA based on EUROSTAT/COMEXT

2.1.3 Exports

The main exporters are Spain, Italy, Croatia, France and Greece. Three products are highly exported: salted anchovy, fresh anchovy and prepared or prepared anchovy. The details of the exports for the main MS are displayed in table 4.

Salted anchovy

Salted anchovy is the most exported anchovy product by the five main exporters (ES, IT, HR, FR, EL). It totals 16.408 t lwe in 2016 for these five MS.

Spain, Croatia and Italy are all important exporters of salted anchovy: between 3.211 and 7.454 t lwe exported by each MS in 2016. Most of the exports are targeted to third countries: 72% to 95% of the volume are sent to non-EU countries (mainly Albania, Morocco and Tunisia) depending of the MS.

Fresh anchovy

Main exporters are Spain (5.360 t in 2016), Italy (5.210 t in 2016 and 9.639 t in 2015), France (2.476 t), Croatia (1.397 t) and Greece (1.057 t). Fresh anchovy is the main preservation of anchovy export from France, it accounts for 66% of the volume of anchovy products exported in 2016 (lwe). Fresh anchovy ranges between 15% (Spain) and 39% (Italy) of the total volume of anchovy exports in each MS in 2016. Fresh anchovy is mainly exported intra-EU (66% to 100%, depending of the MS).

Prepared and preserved anchovy

Prepared and preserved anchovy is one of the main product exported in terms of volume in 2016: 6.883 t lwe from Spain, 4.573 t lwe from Italy (5.744 t lwe in 2015), 1.159 t lwe from France, 980 t lwe from Croatia and 399 t lwe from Greece. Prepared and preserved anchovy is mainly exported intra-EU from Spain, Croatia, France and Greece. Only Italy is more oriented toward third countries (64% of the exports are destined to third countries).

Frozen anchovy

Three MS are important exporters of frozen anchovy: Spain (3.938 t in 2016), Croatia (1.440 t) and Greece (1.190 t). Frozen anchovy exports are limited from Italy and France.

Dried anchovy

Spain is the only significant exporter of dried anchovy: 806 t of product are exported from Spain in 2016 (2.682 t lwe).

Table 4: Anchovy exports (tonnes of products and tonnes lwe) in the main MS in 2016

		Tonnes final product			Tonnes lwe
		Extra EU	Intra EU	Total	Total
ES	Fresh	1.830	3.530	5.360	5.360
	Frozen	3.557	381	3.938	3.938
	Prepared	1.122	2.320	3.441	6.883
	Salted	4.623	982	5.604	7.454
	Dried	541	265	806	2.682
	Total	11.672	7.477	19.149	26.317
IT	Fresh	526	4.684	5.210	5.210
	Frozen	236	104	340	340
	Prepared	1.461	825	2.286	4.573
	Salted	2.294	120	2.414	3.211
	Dried	11	32	43	143
	Total	4.529	5.765	10.293	13.476

		Tonnes final product			Tonnes lwe
		Extra EU	Intra EU	Total	Total
HR	Fresh	217	1.180	1.397	1.397
	Frozen	217	1.223	1.440	1.440
	Prepared	1	489	490	980
	Salted	2.965	1.140	4.105	5.459
	Dried	0	0	0	0
	Total	3.400	4.032	7.432	9.277
FR	Fresh	0	2.476	2.476	2.476
	Frozen	42	33	74	74
	Prepared	36	544	580	1.159
	Salted	23	3	26	35
	Dried	0	0	0	1
	Total	101	3.054	3.156	3.744
EL	Fresh	304	753	1.057	1.057
	Frozen	1	1.189	1.190	1.190
	Prepared	23	177	199	399
	Salted	13	174	188	249
	Dried	0	1	1	3
	Total	341	2.293	2.634	2.897

Source: EUMOFA based on EUROSTAT/COMEXT

2.1.4 Production of prepared or preserved anchovy

Production statistics on processed anchovy are available for “prepared or preserved anchovy” from EUROSTAT/PRODCOM, this covers anchovy preserved in oil. Statistics from EUROSTAT/PRODCOM are ex-factory stage and allow to calculate the price of the product at this stage of the supply chain.

Spain is the largest EU producer with 11.124 t for EUR 134 million in 2016 (+28% in volume and +27% in value since 2008); Italy is the second-largest EU producer with 3.951 t and EUR 37 million in 2016 (-40% in volume and -34% in value since 2008).

Based on EUROSTAT/PRODCOM data, the ex-factory price for prepared or preserved anchovy ranges between 1,24 EUR/kg (Croatia in 2014) and 28,64 EUR/kg (France 2015): this highlights the great diversity of products in this category. The prices range between 10,66 EUR/kg and 12,51 EUR/kg in Spain and between 8,43 EUR/kg and 12,37 EUR/kg in Italy (averaging at 9,37 EUR/kg in 2016).

The following figure displays the evolution of volume, value and price of the production of prepared or preserved anchovy in Italy and Spain between 2008 and 2016 (index evolution).

Figure 2: index evolution of volume, value and price of prepared or preserved anchovy in Spain between 2008 and 2016 (100=2008)

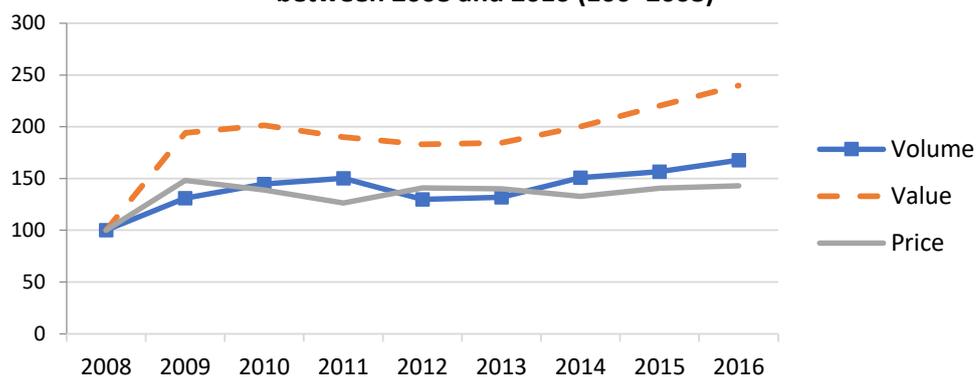
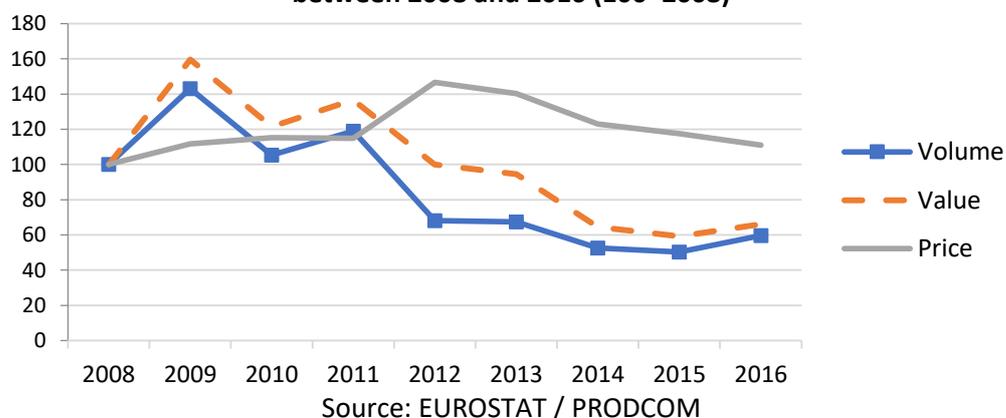


Figure 3: index evolution of volume, value and price of prepared or preserved anchovy in Italy between 2008 and 2016 (100=2008)



The table below details the data on volume, value and price (ex-factory stage) for prepared or preserved anchovy by MS (no data available for all MS).

Table 5: Volume, value and price of prepared or preserved anchovy by MS

Volume (t)	2008	2009	2010	2011	2012	2013	2014	2015	2016
ES	8.707	8.683	9.604	9.968	8.616	8.749	10.012	10.396	11.124
IT	6.633	9.489	6.993	7.893	4.520	4.470	3.482	3.340	3.951
GR	605	561	1.038	554	644	694	723	750	743
EE	na	na	0	0	2	105	99	992	208
FR	na	211	na	na	84	94	143	110	176
HR	2.195	19	4	40	0	49	700	329	24
UK	0	na	22	na	0	na	0	0	0
PT	39	35	63	35	na	na	na	6	15
BG	0	na	76	na	na	na	69	na	na

Value (1000 EUR)	2008	2009	2010	2011	2012	2013	2014	2015	2016
ES	105.954	108.636	112.603	106.286	102.414	103.237	112.041	123.220	134.237
IT	55.942	89.329	67.954	76.415	55.907	52.892	36.101	33.089	37.003
GR	2.606	3.630	4.768	3.466	3.221	3.484	3.653	4.248	4.033
EE	na	na	0	0	27	867	819	5.873	1.234
FR	na	1.862	na	na	1.286	1.522	2.028	3.152	na
HR	3.479	47	9	156	0	153	869	1.604	372
UK	0		191	na	0	na	0	0	0
PT	408	451	720	433	na	na	na	151	230
BG	0	na							

Price (EUR/kg)	2008	2009	2010	2011	2012	2013	2014	2015	2016
ES	12,17	12,51	11,72	10,66	11,89	11,80	11,19	11,85	12,07
IT	8,43	9,41	9,72	9,68	12,37	11,83	10,37	9,91	9,37
GR	4,31	6,47	4,59	6,26	5,00	5,02	5,06	5,66	5,43
EE	na	na	na	na	15,81	8,25	8,26	5,92	5,92
FR	na	8,81	na	na	15,34	16,16	14,23	28,64	na
HR	1,59	2,47	2,37	3,89	na	3,13	1,24	4,87	15,49
UK	na	na	8,71	na	na	na	na	na	na
PT	10,55	13,01	11,50	12,29	na	na	na	27,23	15,62
BG	na								

na: not available

Source: EUROSTAT / PRODCOM

2.2 Market segmentation for processed anchovy

The market segmentation is based on the following features:

- type of process;
- additional ingredients;
- scale of production;
- branding;
- specific quality scheme (geographical indication).

2.2.1 Type of process

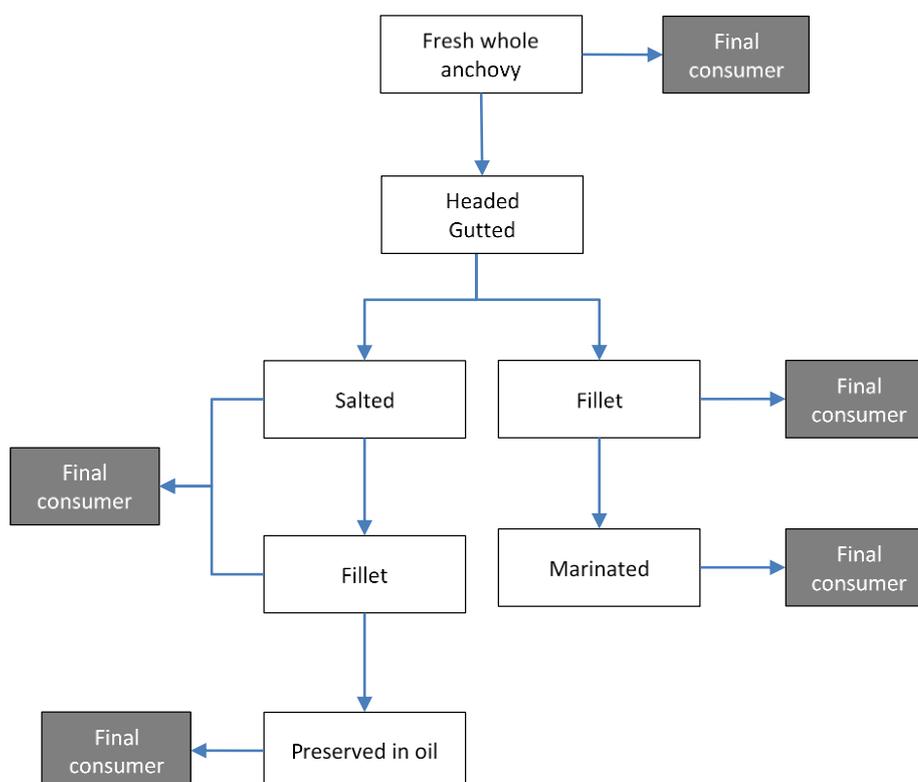
Anchovy may be consumed fresh or processed. The main processed products are:

- preserved in oil;
- salted anchovy;
- marinated anchovy.

The main processed anchovy product in Italy is preserved anchovy in oil, this is a semi-preserved product with 18 months shelf-life. This product is covered by the price structure analysis in the present study (both industrial and small-scale production). Salted anchovy may be used as raw material for the production of preserved anchovy in oil (stakeholders estimate that 95% of the volume of salted anchovy available are used for the production of preserved anchovy) and may be considered as a final product and marketed to consumer (estimated at 5% of the volume). Salted anchovy intended to final consumer is a traditional product in Italy and is also covered by the price structure analysis (small-scale production).

The following figure details the production stages for each kind of product.

Figure 4: Stages of production for the different types of processed anchovy



2.2.2 Types of ingredients

Different types of oil can be used for preserved anchovy in oil: olive oil and sunflower oil in particular. Furthermore, specific ingredients may be added for preserved anchovy in oil and in marinated anchovy. There is a large variety of possible ingredients: spices, aromatic herbs

2.2.3 Packaging

Processed anchovy is packaged in glass jars or metal cans.

2.2.4 Scale of production

The production of preserved anchovy is operated by different types of companies in Italy:

- industrial-scale companies: some or all stages of the production may be operated in third countries in the Mediterranean area such as Albania, Tunisia and Morocco (see import/export flows of anchovy products from/to Italy in section 2.3);
- small-scale production: a large number of small-scale companies produce processed anchovy all around Italy. They market their products mainly at regional level.

2.2.5 Branding

Several brands are present in the market. These are company brands and private labels (retailer brands).

2.2.6 Quality scheme (geographical indications)

There are two geographical indications (GIs) registered in the EU and covering anchovy, both are protected geographical indications (PGI):

- PGI “*Acciughe sotto sale del Mar Ligure*” (Italy, registered in 2008),
- PGI “*Anchois de Collioure*” (France, registered in 2004).

These two PGIs cover processed anchovy. Based on information collected in the context of this study, there has been no sales under the PGI *Acciughe sotto sale del Mar Ligure* in 2017 (less than 1 t sold under PGI in 2015 and 2016), this is due to the low size of anchovy fished in Ligurian Sea which does not comply with the PGI specifications.

Figure 5: PGI logo



2.3 The Italian market

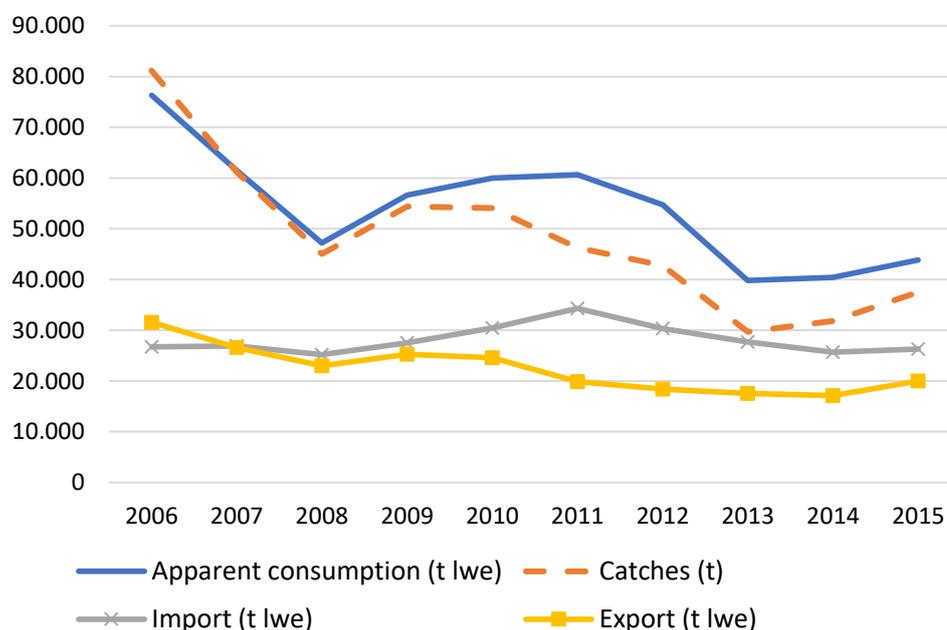
2.3.1 Supply balance

The apparent consumption for anchovy in Italy is estimated at 43.832 t lwe in 2015. The apparent consumption decreased significantly between 2006 and 2015 (-43%, from 76.307 t in 2006). This is due to a large decrease in the catch: consumption decreased by 32.476 t lwe while catches decreased by 43.663 t over the period. The self-sufficiency rate ranges between 75% (2013) and 106% (catches higher than apparent consumption in 2006), self-sufficiency is 86% in 2015.

Imports remained relatively stable (-2% in volume lwe between 2006 and 2015) but exports showed important decrease in relation to the diminution of catches (-37%).

The following figure displays evolutions of catches, imports, exports and apparent consumption of anchovy between 2006 and 2015.

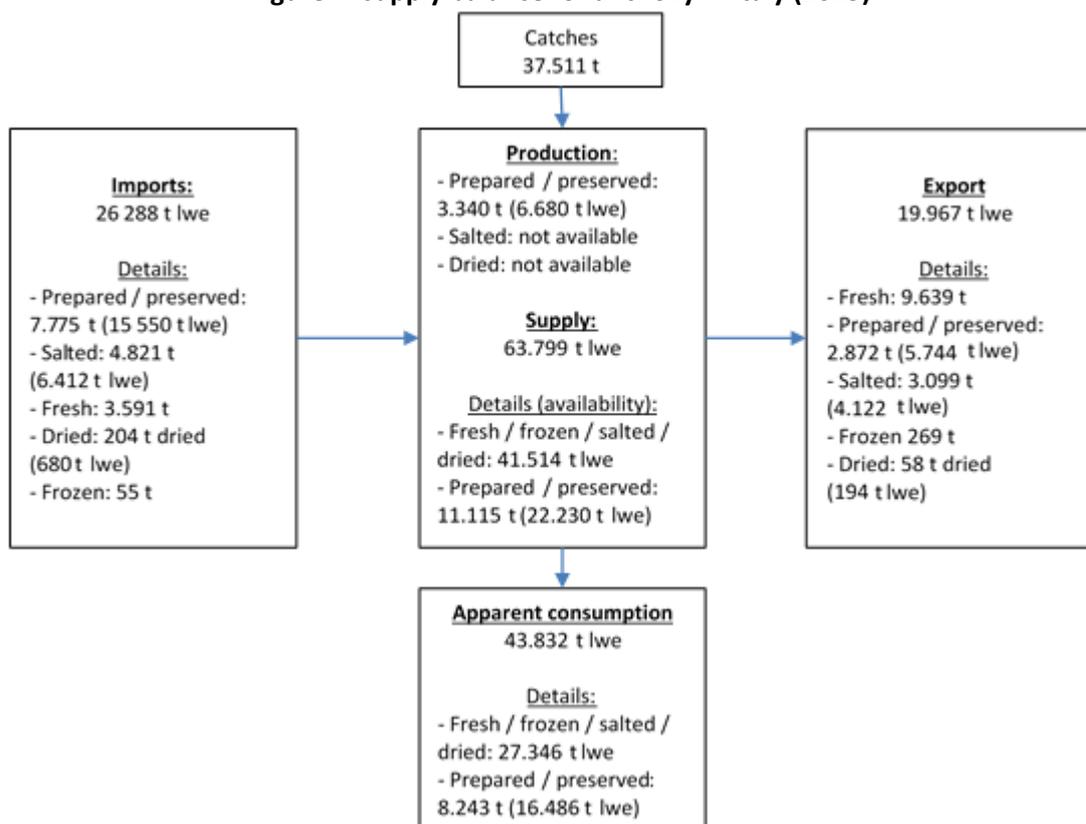
Figure 6: Evolution of catches, imports (lwe), exports (lwe) and apparent consumption (lwe) in Italy between 2006 and 2015



Source: EUMOFA elaboration of EUROSTAT and EUROSTAT-COMEXT data

The following figure provides detailed information on the supply balance for anchovy in Italy.

Figure 7: supply balance for anchovy in Italy (2015)

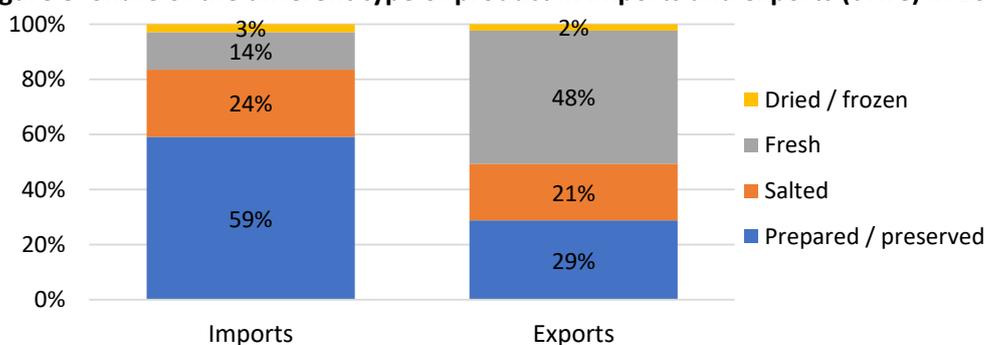


Source: EUMOFA elaboration of EUROSTAT and EUROSTAT-COMEXT data

Prepared / preserved anchovy accounts for 38% of the anchovy apparent consumption in Italy (2015). Three quarters (74%) of the prepared / preserved anchovy available (production + imports) are consumed on the national market and one quarter (26%) is exported.

Imports (26.288 t lwe in 2015) are higher than exports (19.967 t lwe). Imports are mainly composed of prepared / preserved anchovy (59% of volume in lwe) and salted anchovy (24%). Exports also include a significant share of fresh anchovy (48%).

Figure 8: Share of the different type of product in imports and exports (t lwe) in 2015



Source: EUMOFA elaboration of EUROSTAT-COMEXT data

2.3.2 Production

The production of prepared / preserved anchovy in Italy is 3.340 t in 2015 and 3.951 t in 2016 (source: EUROSTAT / PRODCOM). Based on interviews with stakeholders, between 8 and 10 industrial companies operate about 75-80% of national production (2.500 t - 3.000 t of industrial production), the 20-25% remaining are operated by small-scale companies (500 t - 1000 t of small-scale production). No information is available on the volume of production of salted anchovy in Italy.

Both industrial and small-scale producers reported concerns regarding the size of anchovy and the sustainability of stocks. Higher sizes are easier to process (filleting stage in particular) and allow better valorisation on the market. For industrial producers, 10-12 cm is a good size for processed anchovy. Regarding the PGI “*Acciughe sotto sale del Mar Ligure*”, the specifications state that the minimum size for anchovy is 12 cm and the maximum size is 20 cm (35-50 fishes/kg)⁴. Based on interviews, the absence of sales under PGI in 2017 is due to the lack of volume of anchovy with the minimum size in the protected area.

2.3.3 Consumption

Limited information is available on the consumption of processed anchovy in Italy. Some information has been collected through qualitative interviews with the stakeholders of the supply chain:

- the national market for processed anchovy increased in the last years (+2-3% / year);
- processed anchovy is mainly consumed at festive events such as Christmas and Easter, based on an interview with a processor;
- the consumption of processed anchovy is mainly for preserved anchovy in oil; stakeholders estimate that 95% of salted anchovy is used as raw material for preserved anchovy in oil.

2.3.4 Imports

Prepared and preserved products (7.746 t; EUR 64,8 million; 8,36 EUR/kg in 2016; source: EUROSTAT/COMEXT)

In terms of live weight equivalent, prepared and preserved anchovy accounts for 59% of the total imports of anchovy in Italy. The imports reached EUR 64,8 million and 7.746 t in 2016.

⁴ Source: http://images.ge.camcom.gov.it/f/prodotti_tipici/acciughe_igp/di/disciplinare_acciughe.pdf

Morocco and Albania account for almost two thirds of imports (64% of both volume and value imported), Tunisia is the third supplier with 15% of volume imported. Over the last decade, imports peaked in 2012 at 9.794 t due to an increase of Moroccan imports (4.683 t imported from Morocco in 2012 compared to 2.715 t in 2016). Import prices were low during this peak, in particular for products from Morocco (5,12 EUR/kg in 2012 for Moroccan products). Average prices increased over the last years, remaining under 6,00 EUR/kg between 2006 and 2012 and reaching 8,36 EUR/kg in 2016.

Based on interviews, final products may be retailed on the national market under Italian brands.

Salted products (3.243 t; EUR 13,6 million; 4,20 EUR/kg in 2016; source: EUROSTAT/COMEXT)

Salted anchovy may be used as a final product (5% of the volume, based on estimates by stakeholders) or as raw material for prepared / preserved anchovy (95% of the volume, based on estimates).

In 2016, salted products accounted for 24% of the Italian imports in terms of live weight equivalent. Imports reached 3.242 t of product (4.313 t lwe) and EUR 13,6 million.

Three countries account for 84% of the volume imported in 2016: Spain (1.286 t; 40%), Morocco (814 t; 24%) and Croatia (638 t; 20%).

Croatia had a stronger position until 2012 with imports to Italy reaching 5.597 t (68% of salted anchovy imported). It collapsed since this period (-89% between 2012 and 2016). Price increased from 2,23 EUR/kg in 2012 to 4,25 EUR/kg in 2016. This collapse of Croatian imports coincided with a decrease in Croatian anchovy catches (between 11.000 t and 15.500 t caught each year between 2006 and 2011, 8.000-9.000 t between 2011 and 2014 and increase to 12.340 t in 2015, source: FAO)

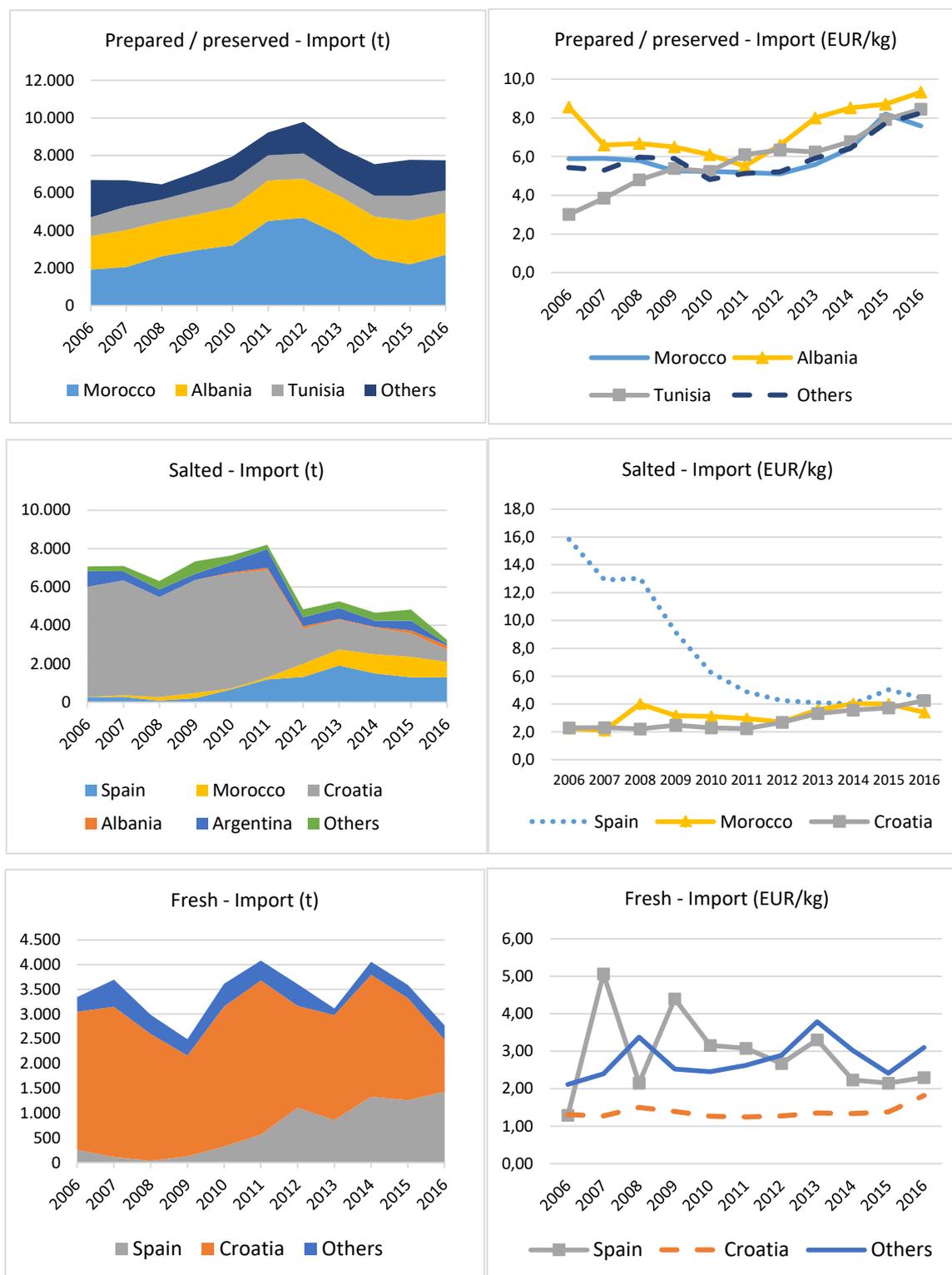
We can identify two periods between 2006 and 2016:

- 2006-2011: a high level of imports (between 7.000 to 8.200 t imported each year) with Croatia accounting for at least two-thirds of the volume imported (between 68% and 84% of the volume imported);
- 2012-2016: decrease of the total volume of imports (between 3.200 and 5.300 t), due to a large decrease of Croatian imports (638 tonnes imported in 2016); even if imports from Spain and Morocco increased (respectively 1.286 t and 814 t imported in 2016).

Fresh anchovy (2.772 t; EUR 6,6 million; 2,20 EUR/kg in 2016; source: EUROSTAT/COMEXT)

Fresh anchovy accounts for 14% of anchovy imports in Italy in 2016. Spain and Croatia are the main origins for fresh anchovy imported to Italy, these two MS accounting for 90% of the imports (respectively 1.434 t and 1.047 t in 2016). Imports peaked at 4.082 t in 2011 and dropped to 2.772 t in 2016. Over the period 2006-2016, the Croatian share decreased significantly (83% of volume imported from Croatia in 2006 and 38% in 2016), while the volume from Spain increased sharply (8% in 2006 and 52% 2016). The price of Spanish anchovy remained higher than the price of Croatian anchovy over the period (1,24 – 1,82 EUR/kg for Croatian anchovy versus 1,29 – 5,06 EUR/kg for Spanish anchovy).

Figure 9: Volume (t) and prices (EUR/kg) of import to Italy of anchovy and anchovy products by country of origin between 2006 and 2016



Source: EUMOFA based on EUROSTAT/COMEXT

2.3.5 Exports

Fresh anchovy (5.210 t; EUR 11,5 million; 2,22 EUR/kg in 2016; source: EUROSTAT/COMEXT)

Export of fresh anchovy from Italy decreased significantly between 2006 and 2016: -74% in volume to reach 5.210 t in 2016 (19.719 t in 2006). The export price is 2,22 EUR/kg in 2016, the highest since 2006 (minimum at 1,38 EUR/kg).

Spain and Germany account for 70% of the fresh anchovy exported from Italy. The trade to Spain has decreased significantly (18.460 t in 2006 versus 2.522 t in 2016). This decrease was simultaneous with a large increase in anchovy fisheries in Spain: 8.193 t caught in 2006 and 49.982 t in 2016 (these changes in Spain are related to the state of stocks and implementation of management measures for anchovy in the Gulf of Biscay). Spain is the second-largest country globally for anchovy fishing in 2016 (Italy was the second-largest world producer until 2011, and the fourth-largest in 2016).

Prepared / preserved anchovy (2.286 t; EUR 26 million; 11,39 EUR/kg in 2016; source: EUROSTAT/COMEXT)

The export of prepared / preserved anchovy fell by 18% between 2006 and 2016 in volume but grew by 7% in value (2.794 t, EUR 15,2 million in 2006 compared to 2.286 t and EUR 26,0 million in 2016). This is related to a strong increase in price (5,45 EUR/kg in 2006 and 11,39 EUR/kg in 2016).

There are a number of markets with similar volumes of exports, between 100 and 300 tonnes in 2016: the first is Australia, followed by the United States, Japan, Austria, Germany, Albania, France, Belgium and Canada. Prices were between 6,40 EUR/kg for Albania and 14,13 EUR/kg for Japan. Exports to Albania were much higher until 2015 and peaked in 2008 at 1.585 t (with low price: 2,36 EUR/kg).

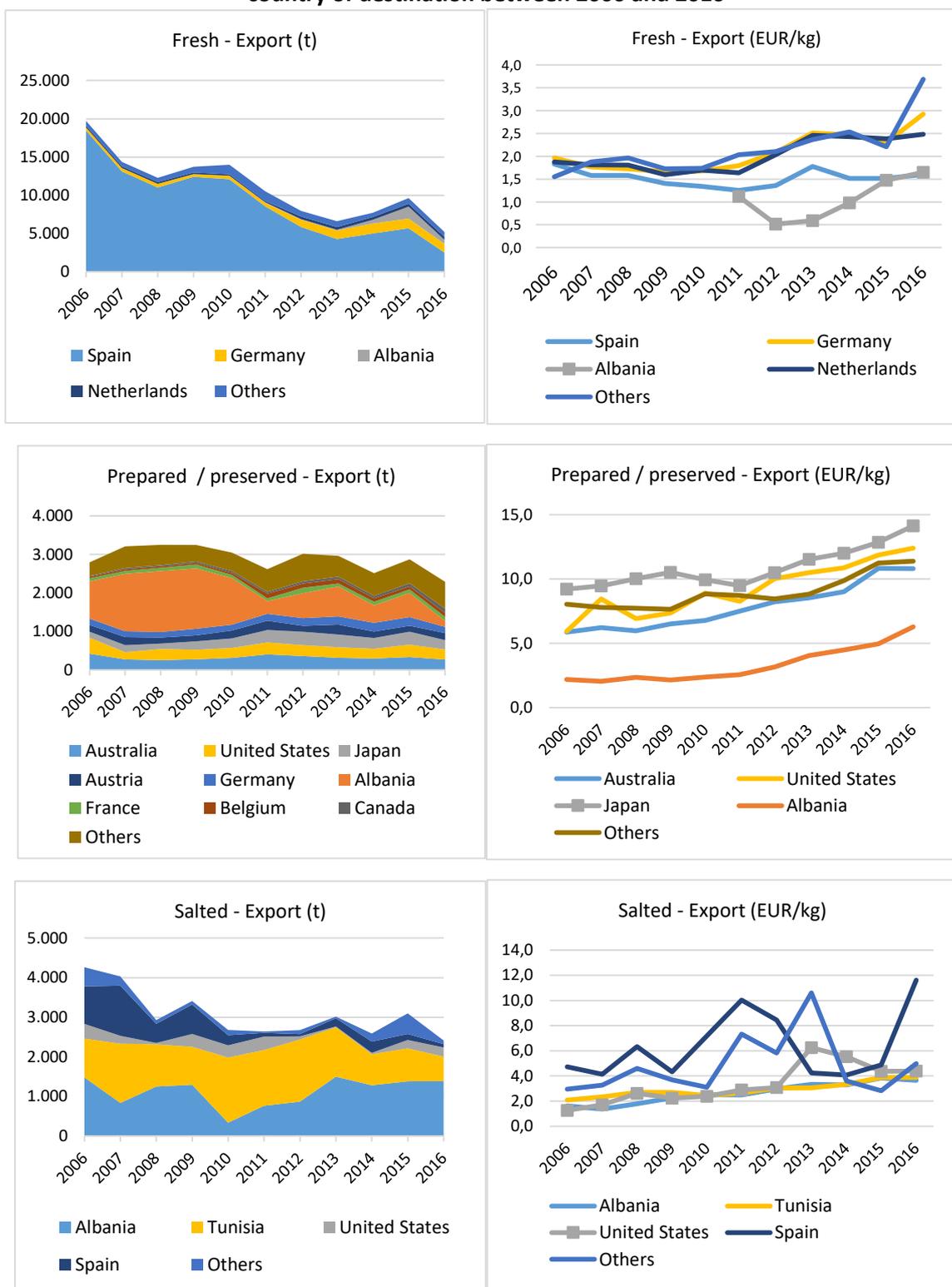
Salted anchovy (2.414 t; EUR 9,9 million; 4,11 EUR/kg in 2016; source: EUROSTAT/COMEXT)

The export of salted anchovy dropped by 43% in volume between 2006 and 2016 (2.414 t in 2016), this decrease is however less important in terms of value (-7% between 2006 and 2016, EUR 9,9 million in 2016) due to an increase in price (2,54 EUR/kg in 2006 and 4,11 EUR/kg in 2016).

Albania is the largest destination with 1.387 t exported in 2016 (3,65 EUR/kg), followed by Tunisia (619 t; 3,88 EUR/kg) and the United States of America (232 t; 4,38 EUR/kg).

Salted anchovy may be marketed as a final product for some destinations (for instance United States of America) and raw material for the production of prepared / preserved anchovy for other destinations (for instance in Albania and Tunisia which produce prepared / preserved anchovy).

Figure 10: Volume (t) and prices (EUR/kg) of export from Italy of anchovy and anchovy products by country of destination between 2006 and 2016



Source: EUMOFA based on EUROSTAT/COMEXT

3 PRICES DOWNSTREAM IN THE SUPPLY CHAIN

This chapter analyses prices and trends at various stages of the supply chain of processed anchovy in Italy, with the objective of setting a framework for price transmission analysis (chapter 4).

3.1 Price information sources

Prices are available at different stages of the anchovy supply chain (landing, wholesale stage, import/export, ex-factory, consumption). No statistical information is publicly available at retail stage; however, we shall note that processed anchovy is covered by panels at retail stage. The following table details the sources of information on prices for the anchovy supply chain in Italy.

Table 6: Sources for prices in Italy at the different stages of the supply chain

Supply chain stage	Type of price	Frequency	Source
First sale	First sale price	Weekly, monthly, Yearly	EUMOFA
First sale	First sale price	Weekly, monthly, Yearly	ISMEA
Wholesale	Wholesale price	Weekly, monthly, Yearly	ISMEA
Processing	Apparent price for prepared / preserved anchovy (this does not cover salted anchovy)	Yearly	EUMOFA EUROSTAT/PRODCOM
Import / export	Import (Free On Board)/ export prices (Cost Insurance and Freight) Fresh, frozen, prepared / preserved, salted, dried	Monthly, yearly	EUMOFA EUROSTAT/COMEXT
Retail	Consumer price	Monthly, yearly	Panel companies Not publicly available
Household consumption	Fresh anchovies consumed by a panel of Italian households	Monthly, yearly	EUMOFA based on EUROANEL

Landing price

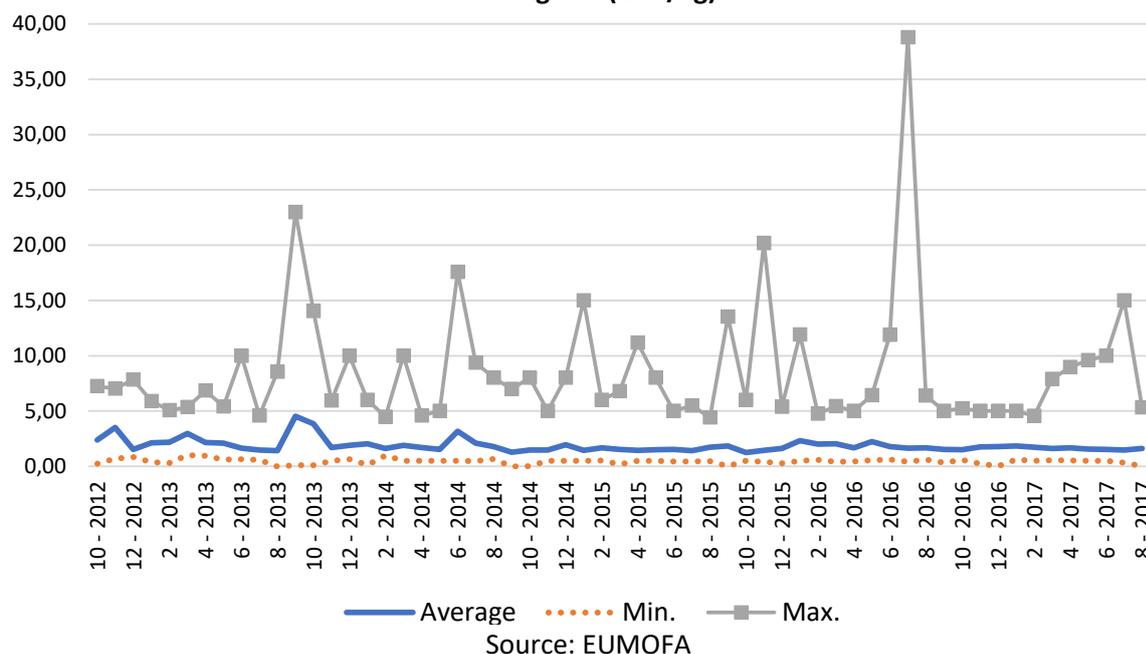
The average weekly price of anchovy landed at a national level ranges between 1,35 EUR/kg (September 2013) and 4,54 EUR/kg (October 2015). Average yearly price ranges from 1,70 to 2,29 EUR/kg. Price depends on the size of the anchovy landed and the volume landed compared to the demand.

Detailed data by landing site show large differences among areas, between October 2012 and August 2017, the average of the lowest weekly prices among the different landing sites is 0,45 EUR/kg and the average of the highest prices among the different landing sites is 8,54 EUR/kg. Maximum prices were higher than 20,00 EUR/kg at three points: in Pescara in September 2013, in Civitavecchia in July 2016 and in Viareggio in November 2015.

The following graph presents the landing price of anchovy in Italy between October 2012 and August 2017:

- average: average weekly price for all landing sites at national level,
- minimum: lowest weekly price at landing site level
- maximum: highest weekly price at landing site level

Figure 11: Anchovy average weekly price at first sale in Italy and minimum and maximum price by landing site (EUR/kg)

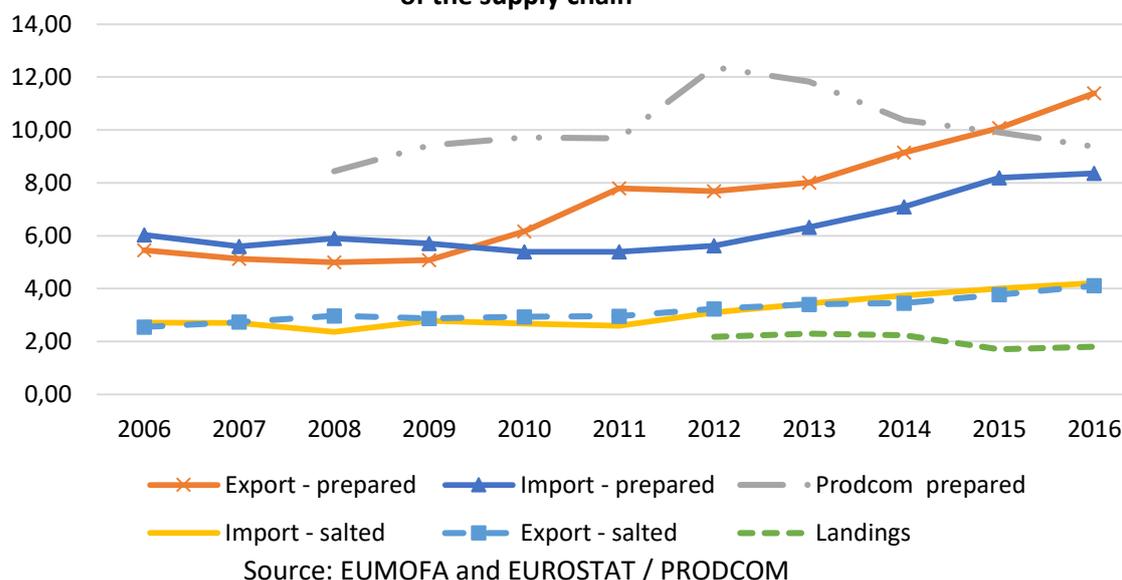


Synthesis of the prices at the different stages of the supply chain

The following figure indicates the price:

- **At landing stage (national average):** price ranges from 1,70 to 2,18 EUR/kg between 2012 and 2016;
- **Import and export prices for salted anchovy** (this may cover final product and raw material for the production prepared / preserved anchovy): import and export prices follow the same trends (respectively +55% and +61% between 2006 and 2016) and reach 4,20 and 4,11 EUR/kg in 2016;
- **Import and export prices for prepared / preserved anchovy:** export prices remain higher than import prices since 2010 (respectively 11,39 EUR/kg and 8,36 EUR/kg in 2016);
- **Production price** (EUROSTAT / PRODCOM): it peaked at 12,37 EUR/kg in 2012, then decreased to reach 9,37 EUR/kg in 2016.

Figure 12: Synthesis of the prices available for anchovy and processed anchovy at the different levels of the supply chain



4 PRICE STRUCTURE IN THE SUPPLY CHAIN

We propose to analyse the price structure for three products:

- Preserved anchovy in oil (glass jar) – industrial scale;
- Preserved anchovy in oil (glass jar) – small-scale production,
- Salted anchovy (glass jar) – small-scale production.

The analysis is based on qualitative interviews with producers (industrial scale and small-scale), data from *Associazione Nazionale Conservieri Ittici e delle Tonnare* (ANCIT) and other available sources (see data listed in section 3).

4.1 Preserved anchovy in oil (glass jar) – industrial scale

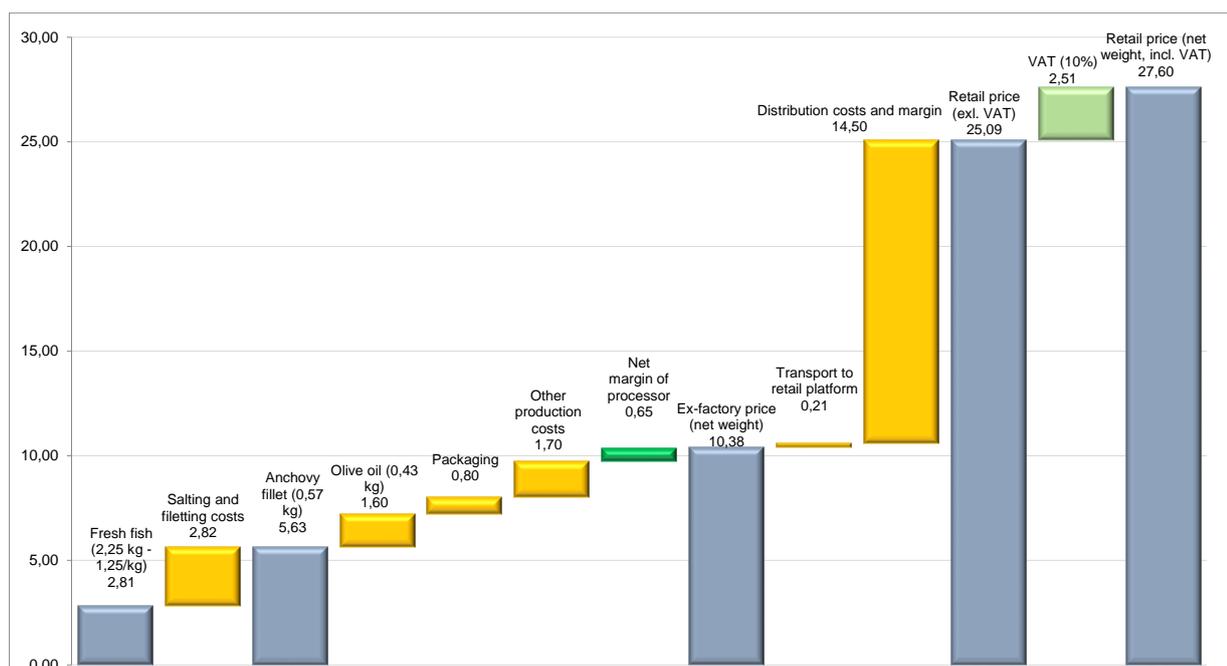
The production of 1 kg of final product of preserved anchovy in oil involves 2,25 kg of fish. There is a significant loss of weight due to salting and filleting: 20-25% yield between the fresh anchovy and the salted fillet (25% for the price structure analysis below). In the hypothesis below, there are 57% of anchovy and 43% of oil in the final product. The price for fresh fish is 1,25 EUR/kg (between 1,00 and 1,50 EUR/kg based on interviews). The anchovy used for industrial production may come from Italy and also from other origins.

This analysis covers production led in Italy and third countries and intended to the Italian market. The price range of preserved anchovy is very large in the Italian market. The price for this analysis is based on data from panels on Italian market (hypermarket + supermarket) for preserved anchovy.

Information on some specific costs has been provided (packaging, anchovy, olive oil), other costs have been aggregated in “other production costs”, this covers fixed costs, labour costs, etc.

Figure 13: Price structure of preserved anchovy in oil – industrial scale in Italy

	Average (EUR/kg)	% final price
Fresh fish (2,25 kg - 1,25 EUR/kg)	2,81	10%
Salting and filleting costs	2,82	10%
Anchovy fillet (0,57 kg)	5,63	20%
Olive oil (0,43 kg)	1,60	6%
Packaging	0,80	3%
Other production costs	1,70	6%
Net margin of processor	0,65	2%
Ex-factory price (net weight)	10,38	38%
Transport to retail platform	0,21	1%
Distribution costs and margin	14,50	53%
Retail price (excl. VAT)	25,09	91%
VAT (10%)	2,51	9%
Retail price (net weight, incl. VAT)	27,60	100%



Source: EUMOFA survey

4.2 Preserved anchovy in oil (glass jar) – small-scale production in the Ligurian area

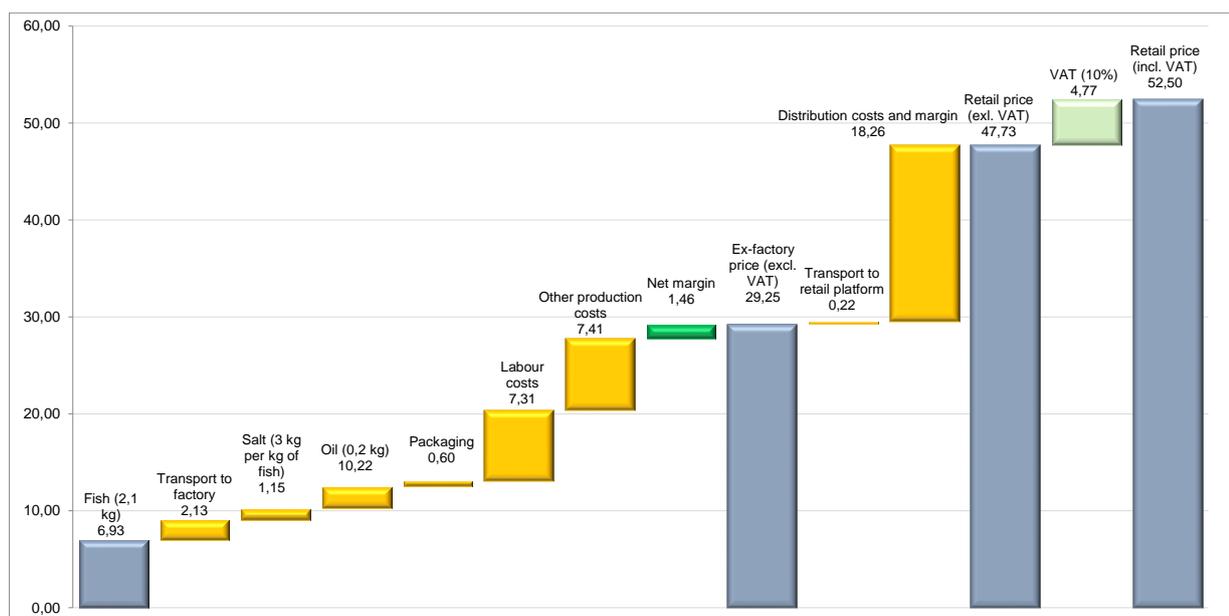
The production of 1 kg of final product of preserved anchovy in oil involves 2,1 kg of fish. There is an important loss of weight due to salting and filleting (35% yield between fresh anchovy and fillet). In the hypothesis below, there is 80% of anchovy and 20% of oil in the final product.

The price for fresh fish is 3,25 EUR/kg (between 3,00 and 3,50 EUR/kg based on interviews). This price is higher to the national average. Based on interviews, this is due to the size of fish (11-12 cm which is considered as medium-large size for anchovy) and to the area of supply (Ligurian area) where first sale prices for anchovy may be higher than price in other areas (in Italy or abroad) for the same size of fish.

Information on some specific costs has been provided (packaging, anchovy, oil, labour costs), other costs have been aggregated in “other production costs”, this covers fixed costs and other variable costs. Labour costs covers wages of people directly involved in the production of processed anchovy.

Figure 14: Price structure of preserved anchovy in oil – small-scale production in the Ligurian area in Italy

	Average (EUR/kg)	% final price
Fish (2,1 kg)	6,93	13%
Transport to factory	2,13	4%
Salt (3 kg per kg of fish)	1,15	2%
Oil (0,2 kg)	2,25	4%
Packaging	0,60	1%
Labour costs for processor	7,31	14%
Other production costs	7,41	14%
Net margin of processor	1,46	3%
Ex-factory price (excl. VAT)	29,25	56%
Transport to retail platform	0,22	0%
Distribution costs and margin	18,26	35%
Retail price (excl. VAT)	47,73	91%
VAT (10%)	4,77	9%
Retail price (incl. VAT)	52,50	100%



Source: EUMOFA survey

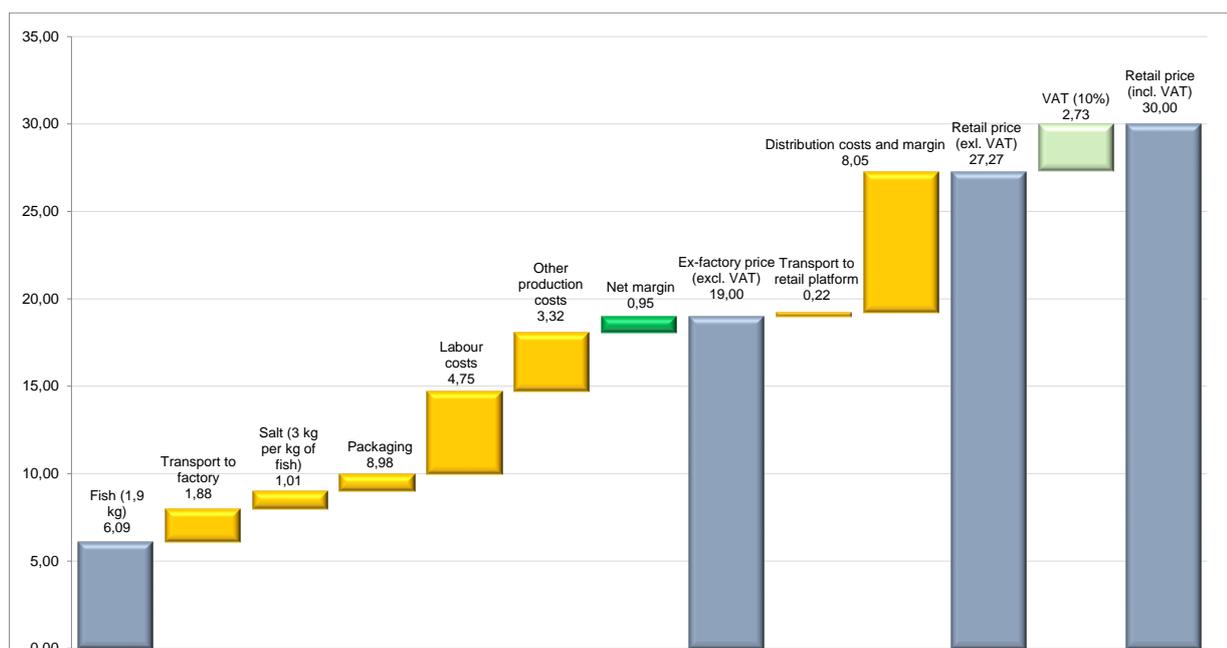
4.3 Salted anchovy (glass jar) – small-scale production in Ligurian area

The production of 1 kg of final product of salted anchovy involves 1,9 kg of fish. There is a significant loss of weight due to salting (40% yield), backbone is maintained in the fish.

As for small-scale production of salted anchovy, the price for fresh fish is 3,25 EUR/kg (between 3,00 and 3,50 EUR/kg based on interviews).

Figure 15: Price structure of salted anchovy– small-scale production in the Ligurian area in Italy

	Average (EUR/kg)	% final price
Fish (1,9 kg)	6,09	20%
Transport to factory	1,88	6%
Salt (3 kg per kg of fish)	1,01	3%
Packaging	1,00	3%
Labour costs	4,75	16%
Other production costs	3,32	11%
Net margin of processor	0,95	3%
Ex-factory price (excl. VAT)	19,00	63%
Transport to retail platform	0,22	1%
Distribution costs and margin	8,05	27%
Retail price (excl. VAT)	27,27	91%
VAT (10%)	2,73	9%
Retail price (incl. VAT)	30,00	100%



Source: EUMOFA survey

4.4 Comparison of the price structure for the different products

The study covers different products in terms of process (preserved in oil versus salted), organisation (industrial scale operated in Italy and abroad versus small-scale production operated in Ligurian area) and markets (national market versus regional market). We propose to compare the price structures for:

- the two preserved products: industrial versus small-scale in the Ligurian area;
- the two small-scale products from Ligurian area: preserved in olive oil versus salted anchovy.

Details are provided in table 7 and figure 18.

Preserved anchovy in olive oil: comparison of industrial and small-scale products

The retail prices for preserved anchovy in olive oil is almost two times higher for Ligurian small-scale production (52,50 EUR/kg) compared to industrial production (27,60 EUR/kg). The comparison of the price structures shows important differences; the main factors for these differences are:

- **Raw material costs** (including transport to processing site) are much higher for small-scale production (9,07 EUR/kg, 17% of final price) compared to industrial production (2,81 EUR/kg, 10% of final price). This is due to fish price and transport costs:
 - **Fish price** are higher for small-scale production (6,93 EUR/kg vs 2,81 EUR/kg) due to the size of fish and the origin of the supply. Indeed, anchovy used for Ligurian small-scale production is from the Ligurian area while industrial production relies on anchovy from a larger range of origins (national and international). However, the volume of fish involved for 1 kg of final product is relatively similar for both products (2,3 kg for industrial production vs 2,1 kg for small-scale production).
 - For small-scale production, **transport costs to the processing site** account for 2,13 EUR for each kg final product. These costs are high (1,00 EUR for the transport of 1 kg of fresh fish) due to low volumes involved (transport costs tend to increase when volume transported decreases).
- **Production costs** are higher for small-scale production operated in Italy compared to industrial production for which some stages are operated in third countries (respectively 20,18 EUR/kg and 7,57 EUR/kg). For small-scale production, a large share of production costs are for labour (7,31 EUR/kg).

- **Distribution costs (ex-factory stage to retail stage)** are lower for industrial product than for small-scale production (14,71 EUR/kg vs 18,48 EUR/kg). This accounts for 53% of the price of industrial product and 35% of the price of small-scale product.

Based on interviews, 75-80% of the national production is at industrial scale while small-scale production accounts for 20-25% of the national production.

Small-scale products in the Ligurian area: comparison of preserved anchovy in olive oil and salted anchovy

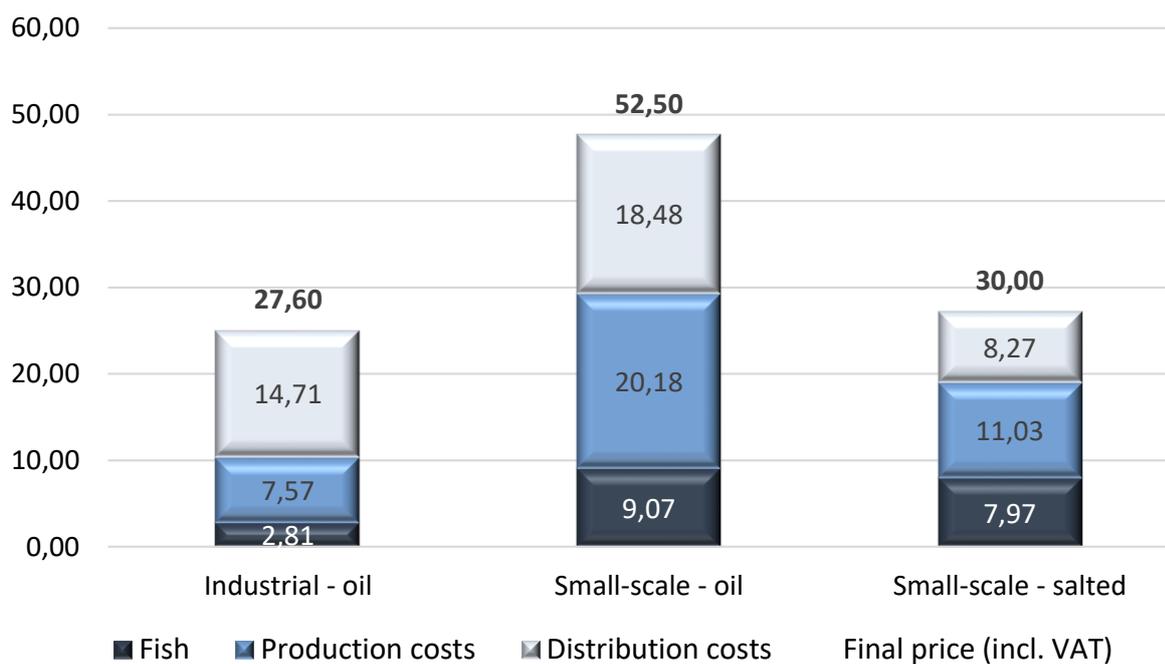
The retail price of salted product is lower (30,00 EUR/kg) than the price of preserved anchovy in olive oil (52,50 EUR/kg). The main factors for these differences are:

- **The volume of fresh fish** used for 1 kg of final product is a bit lower for salted product (1,9 kg) compared to preserved product (2,1 kg). this is due to:
 - a higher yield for salted product (40% vs 37,5%);
 - a lower share of anchovy in the final product (75% for salted anchovy and 80% for preserved anchovy in oil).
- **Production costs** are higher for preserved anchovy in oil (20,18 EUR/kg versus 11,03 EUR/kg for salted anchovy) due to additional processing stages, in particular the removal of anchovy backbone which is made by hand (this increases labour costs).
- **Distribution costs** account for 28% to 35% of the final product price. There are much higher for preserved anchovy (with higher retail price) than for salted anchovy, respectively 18,48 EUR/kg and 8,27 EUR/kg.

Table 7: Comparison of the price structure for the three different products of processed anchovy

		Industrial – oil	Small-scale - oil	Small-scale - salted
EUR/kg final product (net weight)	Final price (incl. VAT)	27,60	52,50	30,00
	VAT (10% of price excluding taxes)	2,51	4,77	2,73
	Distribution costs and VAT (from ex-factory stage to final consumer)	14,71	18,48	8,27
	Production costs (from the factory entry to ex-factory stage)	7,52	20,18	11,03
	Fish (including transport costs to factory)	2,81	9,07	7,97
% final price	Final price (incl. VAT)	100%	100%	100%
	VAT (10% of price excluding taxes)	9%	9%	9%
	Distribution costs and VAT (from ex-factory stage to final consumer)	53%	35%	28%
	Production costs (from the factory entry to ex-factory stage)	27%	38%	37%
	Fish (including transport costs to factory)	10%	17%	27%
Volume of fresh fish / kg final product		2,3	2,1	1,9

Figure 16: Comparison of the price structures for the three different products of processed anchovy



Source: EUMOFA survey

5 ANNEXES

5.1 Sources used

- EUMOFA
- EUROSTAT/COMEXT
- EUROSTAT/PRODCOM
- FAO
- ISMEA

5.2 Interviews

- Associazione Nazionale Conservieri Ittici e delle Tonnare (ANCIT)
- Camera di Commercio di Genova
- Processing companies (industrial and small-scale)

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