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Commission



THE CAVIAR MARKET

Production, trade and consumption
in and outside the EU



E U M O F A

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1 Objective and methodology

1.1 Introduction

The study, which concerns only caviar and not sturgeon, covers the following topics:

1. Production of caviar in each European Union (EU) Member State per species and per year;
2. EU production and other main producing regions / continents;
3. Consumption of caviar in each Member State per species and per year and, if available, details on place of sales (supermarkets, HORECA, premium retailers ("gourmet shops"));
4. Consumption in the EU and in other regions / continents;
5. Imports and exports per year and species (intra and extra-EU).

1.2 Methodology

This study is based on available literature and research on available data sources. In addition, during the Seafood Expo Global 2018 in Brussels, some interviews were carried out with stakeholders in the caviar industry.

Below, general descriptions of the data sources and assessments made to use them are presented.

1.2.1 Data

For this study, three main data sources regarding sturgeon and caviar production have been used: FAO for the aquaculture and wild capture of sturgeon, EUROSTAT/EUMOFA for sturgeon aquaculture and caviar trade and CITES Trade Database for trade in caviar, eggs¹ and live eggs (used as reference regarding sturgeon aquaculture). In addition, "FEAP European Aquaculture Production Report 2008-2016" have been used to collect information on FEAP's members' production of sturgeon and caviar.

In a global point of view, production of sturgeons, and especially of caviar, is very small. Generally, as the volumes get smaller, the data deviations in relative terms increase and consequently are harder to interpret. There are large deviations both between and within the different sources. It is not within the scope of this study to confirm one or the other source or to establish a benchmark for the sturgeon and caviar markets. Instead, the different sources are presented as they are following the below-mentioned methodologies.

FAO

FAO global capture and aquaculture data for the period 1950-2016 and the taxonomic family "Acipenseridae" have been used without any adjustments or adaptations.

¹ The term "caviar" was first used in CITES Trade Database in 2007, prior to this, the term was "eggs". In the following years both terms are used.

Eurostat/EUMOFA

Eurostat (Comext) data available through EUMOFA is a potential data source which can be used to analyse and monitor trade flows within the EU and with non-EU countries. Data is available on monthly basis and in the initial scouting the following CN-8² codes potentially included data on caviar:

- 03029100 - Livers, roes and milt, fresh or chilled;
- 03039190 - Other livers, roes and milt (excl. 0303 91 90), frozen;
- 03052000 - Livers, roes and milt, dried, smoked, salted or in brine;
- 16043100 – Caviar;
- 16043200 - Caviar substitutes.

Based on literature and studies, contacts with stakeholders and own analyses, the CN code 16043100 contains caviar from sturgeons. Stakeholders (producers and distributors) contacted during the Seafood Expo Global 2018 indicated a price range from a “floor price” of 300 EUR/kg to 500 EUR/kg for caviar – depending on the species from which the caviar was produced, origin and volume.

As for extra-EU trade data, the volumes and price trends were according to the expectations and inputs received from stakeholders and literature. The trade is dominated by few MS. In the data there were some transactions with unit price less than 1 EUR/kg. These transactions are regarded as either errors or other products than caviar from sturgeon.

As for intra-EU trade statistics, the data showed caviar trade (exports) far higher than EU production. Analyses of the data showed significant share of the trade was made at low prices which indicates that other products than sturgeon caviar is included in this item.

Based on the data, we made 4 different tests on the data to arrive at reasonable trade volumes regarding sturgeon caviar. The tests were made with different minimum floor prices:

- No floor price;
- Floor price of 100 EUR/kg;
- Floor price of 200 EUR/kg;
- Floor price of 300 EUR/kg.

While stakeholders indicated a floor price of 300 EUR/kg for their caviar products, the actual floor price is lower. From 2014 to 2017 average EU import price for caviar (mainly of Chinese origin) has dropped from more than 400 EUR/kg to just above 200 EUR/kg. This indicate transactions below 200 EUR/kg. Other sources also report pressure on prices with prices for caviar from hybrids lower than indicated by stakeholders.

Following an overall assessment based on the above-mentioned arguments, for this study we have disregarded transactions with a unit price lower than 100 EUR/kg. The floor price used could of course be subject for discussion.

² Combined Nomenclature at 8 digits.

GTA/EUMOFA

Foreign trade data is publicly available at HS-6³ level for selected third countries on the EUMOFA webpage. This database has been used when assessing consumption in other regions (chapter 4.3). In line with the methodology used for EUROSTAT data, CN code 160431 has been used in the analysis.

In an effort to exclude caviar products most likely from other species than sturgeon, import from countries with yearly average prices of less than 100 EUR/kg has been disregarded.

CITES Trade Database⁴

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement between governments aimed at ensuring that international trade in specimens of wild animals and plants does not threaten their survival. CITES consists of 183 parties⁵ who have all implemented the convention. CITES provides a legal framework for regulating international trade in species threatened or potentially threatened by that trade. The framework is based on a system whereby permits and certifications are issued for international trade in specimens listed in the appendices of the agreement.

Each partner of the agreement must designate a "management authority" that is responsible for issuing permits and compiling annual reports on their international trade in the listed species. The annual reports regarding countries' trade are due October 31st the following year and are entered into the CITES Trade Database upon submission. The data can be extracted from an online database.⁶

For this analysis, data for the trade of "caviar" and "eggs" as well as for "eggs (live)" for all countries over the period 2010-2017 regarding all species (taxons) in the family *Acipenseridae* (sturgeons) have been downloaded in comparable table format. In the comparable tables all reported records with identical taxon, term, importer, exporter, country of origin, purpose of transaction, source of specimen and the year in which the trade occurred are summarized. Variables in the comparable tables includes inter alia exporter, importer, importer reported quantity, exporter reported quantity, purpose (e.g. commercial or personal) and source (e.g. animals bred in captivity, confiscated or seized specimens and specimens taken from the wild).

The dataset regarding "caviar" and "eggs" consists of 9.570 observations. Quantities are reported in kilograms, grams, milligrams, micrograms and other non-standard units (including blanks). Observations reported in non-standard units including blanks (288 observations) are disregarded as they cannot be standardized to kilograms. Furthermore, 6 observations in micrograms are regarded as lower range outliers and are also disregarded.

Through working with the data, 10 upper range outliers have been identified. In 5 cases it is possible to identify the likely reporting error and the observation has been adjusted or partially deleted. In the remaining 5 cases the observation has been deleted.

The data has been analysed for all taxons on the family *Acipenseridae* where the purpose of the trade transaction was "commercial". By only focusing on commercial trade, another 444 observations are disregarded amounting to between 2.488 and 3.543 kg in terms of importer and exporter reported quantity respectively. The final dataset used for the analyses in this study consists of 8.827 observations.

³ Harmonised Standards at 6 digits.

⁴ CITES trade statistics derived from the CITES Trade Database, UNEP World Conservation Monitoring Centre, Cambridge, UK.

⁵ Governments of states or regional economic integration organizations:

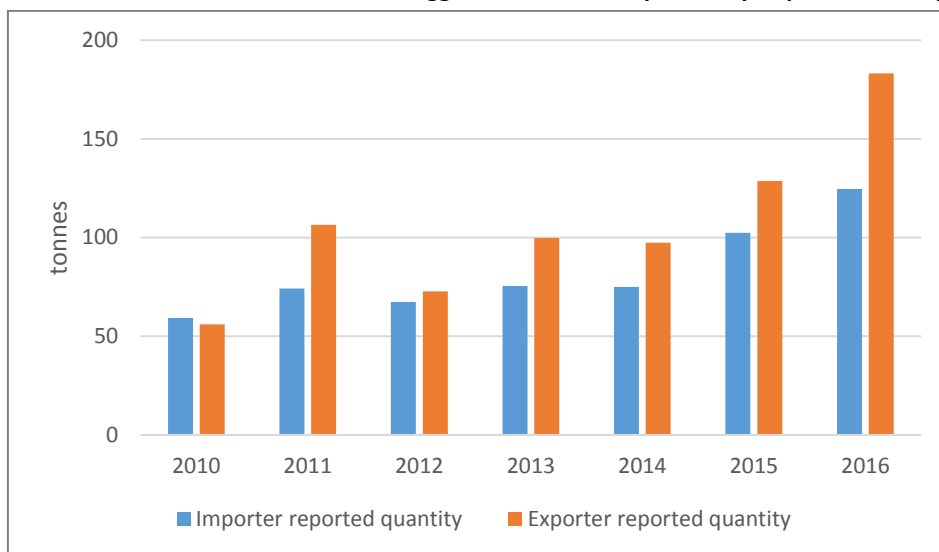
<https://www.cites.org/eng/disc/parties/chronolo.php>

⁶ <https://trade.cites.org/>

When comparing CITES trade data in terms of total volume reported by importers and what is reported by exporters, there are occasional large discrepancies. One explanation can be that the volumes reported to CITES are the quantity for which the permits or certificates were issued and not the actual trade. According to CITES, “it is not uncommon for the quantity of specimens traded to be considerably less than the amount specified on the permits, or for permits not to be used at all.”⁷ Furthermore, due to delays and other reporting problems, the database is constantly updated and “the most recent year for which comprehensive trade statistics are available is normally two years before the current year.”

Except for 2010, exporter reported volumes are higher than the volumes reported by the importers. This can imply that the issue of permits being only partially used or not used at all occurs more often for exporters than for importers.

Chart 1: Total trade volume of caviar and eggs 2010-2016 as reported by importer and exporter



Source: CITES

One could argue that it would be correct to use the importer reported volume and this could be the case concerning the total volume. On the other hand, when analyzing more disaggregated data discrepancies between the two reported volumes get relatively large which e.g. makes it difficult to analyse species at country level.

⁷ A guide for using the CITES Trade Database: https://trade.cites.org/cites_trade_guidelines/en-CITES_Trade_Database_Guide.pdf

2 Production

2.1 Sturgeon and caviar

Caviar is roe from sturgeons. Historically, sturgeons were harvested in the Caspian Sea and their roe sold as caviar, mainly by Russia and Iran. The most well-known and high priced caviars are **Beluga** from the Beluga sturgeon (*Huso huso*), **Osetra** from the Russian sturgeon (*Acipenser gueldenstaedtii*), and **Sevruga** from the Starry sturgeon (*Acipenser stellatus*). All species originate in Eurasia, primarily in the Caspian Sea, Black Sea and the connected rivers.

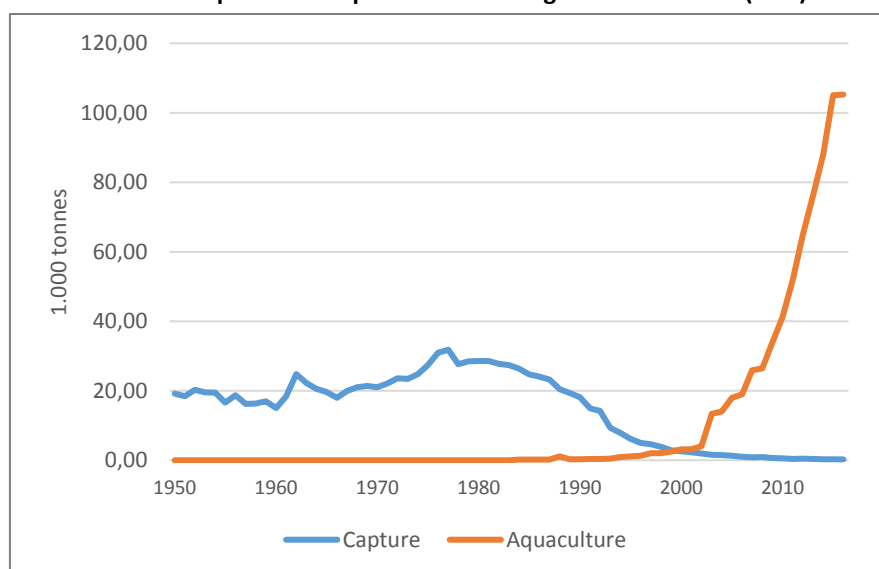
Caviars differ in size and price and are normally graded as classic, royal or imperial describing the appearance of each pearl in terms of size and colour.

While these three species are the most well-known, most of the caviar on the market today is from several other sturgeon species. From the more common varieties as the White Sturgeon (*Acipenser transmontanus*), or the Shortnose sturgeon (*Acipenser brevirostrum*) to the higher prized Siberian sturgeon (*Acipenser baerii*) and the Beluga-like Kaluga sturgeon (*Huso dauricus*).

Overfishing of sturgeon has almost led to the extinction of several of the species. Globally, the largest capture was recorded in 1977 with 31.800 tonnes. Since 1998, international trade of all sturgeon species and related products has been regulated under CITES, and in 2006 Romania, as the first of several countries, introduced a ban on sturgeon fishing in the Black Sea. In 2016 a total global capture of 250 tonnes was recorded.

The first FAO-recorded harvest from aquaculture was in 1984 with 150 tonnes. Since then, it gradually increased to the beginning of the 2000's when it started increasing rapidly year by year. In both 2015 and 2016 the world aquaculture production of sturgeon was about 105.000 tonnes. Subsequently, nearly all caviars on the market today are harvested from farmed sturgeon.

Chart 2: Capture and aquaculture of sturgeons. 1950-2016 (FAO)



Source: FAO

2.1.1 Production cycle

Exploiting sturgeon for caviar production is costly, because it takes many years for female sturgeons to reproduce. Included in the cost is also the selection process of selecting females for caviar production. The gender can be decided after 3 years of farming. During this period both male and female sturgeons are reared and after selection, males are harvested. In the past, the females were slaughtered, and their eggs removed. However, in recent years, fish farmers have developed techniques to remove the caviar without killing the fish, which reduces production costs by improving the yield per mother fish. Below there is a short description of the common sturgeon species used in caviar production and time for reaching maturity.⁸

Siberian: in the wild it takes 19-20 years for the species to reach maturity in Siberia and 11-12 years in southern Siberian rivers (Lena River). In captivity, the time for reaching maturity is 6-8 years. The species can spawn again after 2-3 years.

Kaluga: in the wild maturity reaches after 14-23 years of age. The time is halved in captivity. Spawning once every four to five years. China has developed hybrid species of Kaluga and the production has increased rapidly over the past 10-15 years as it is more cost effective than the original Kaluga species.

Beluga: maturity time in the wild is reached after 19-22 years of age and next spawning at least five years later. In captivity, the species reaches maturity after 20 years – making the species the costliest.

Russian: maturity time 12-16 years, with spawning every four to five years. In captivity, maturity is reached after 9-11 years.

White: in the wild the species reaches maturity at 11-34 years of age. Young females spawning every 4 years, old every 9-11. In captivity maturity is reached during its 10th year. Higher caviar quality after 11-15 years.⁹

2.2 EU production of caviar

According to FEAP, the EU produced 126 tonnes of caviar in 2016, an increase of 17 % from 108 tonnes in 2015.¹⁰ The largest producers were Italy, France, Germany and Poland, accounting for 80% of the total production in 2016.

Table 1: Caviar production by MS (tonnes)

Country	2015	2016
Italy	35	38
France	23	30
Germany	17	15
Poland	10	15
Bulgaria	6	7
Spain	4	6
Finland	4	4
Belgium/Luxembourg	3	3
Hungary	2	3
Latvia	2	3
Netherlands	2	2
Total EU	108	126

Source: FEAP

⁸ FAO FishFinder.

⁹ <https://www.cavaliercaviarclub.com/>

¹⁰ FEAP (2017) European Aquaculture Production Report 2008-2016.

FEAP recently started publishing information on caviar production. Therefore, production data are only available for 2015 and 2016. On the other hand, historical data on production of sturgeons are available. Italy is by far the largest producer of sturgeons in the EU and has been for the last 10 years. While Italian production has decreased in 2015 and 2016, other countries have increased their production, especially France and Poland with an increase in 2016 of 87% and 190% respectively.

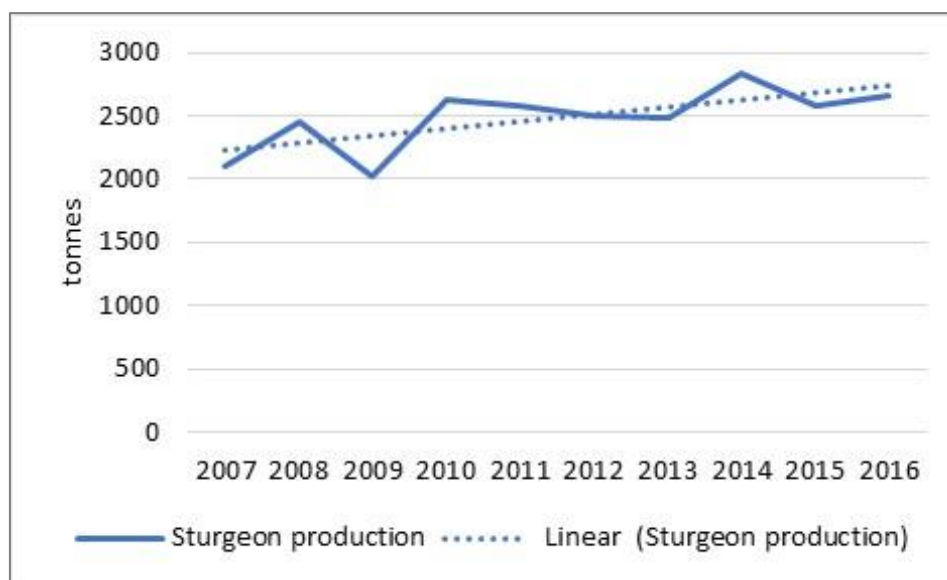
Table 2: Sturgeon production by MS (tonnes)

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Italy	1.200	1.350	1.350	1.900	1.900	1.700	1.900	2.000	1.480	1.000
Poland	250	270	148	200	240	241	95	140	193	560
France	250	250	250	380	280	250	280	298	241	450
Germany	228	214	106	120	120	240	150	300	225	225
Bulgaria									120	140
Spain	183	370	166	35	40	66	66	100	120	110
Finland									50	60
Netherlands									50	50
Belgium									20	20
Total	2.111	2.454	2.020	2.635	2.580	2.497	2.491	2.838	2.579	2.655

Source: FEAP

Although the production has fluctuated from year to year, there is an increasing trend with an annual average growth rate of 2,6%.

Chart 3: Total EU sturgeon production (tonnes)



Source: FEAP

FEAP does not publish information about sturgeon species, but using trade data from CITES, assumptions can be made. Based on this approach, Italy is mainly producing white sturgeon as well as Russian and Siberian sturgeon, while Poland is only producing the latter two species. France primarily produces Siberian sturgeon while Germany has a more diverse production covering Russian sturgeon, white sturgeon and some Siberian sturgeon as well as hybrid species.

Bulgaria primarily produces Russian sturgeon, while Spain primarily produces Adriatic Sturgeon. Finland produces only Siberian sturgeon and the Netherlands primarily Russian sturgeon.

Table 3: Main production of sturgeon species in each MS

Common name	Scientific name	Italy	Poland	France	Germany	Bulgaria	Spain	Finland	Netherlands
White sturgeon	Acipenser Trasmontanus	x			x				
Russian sturgeon	Acipenser Gueldenstaedtii	x	x		x	x			x
Siberian sturgeon	Acipenser Baerii	x	x	x	x			x	
Hybrid sturgeons	Acipenser Hybrid				x				
Adriatic sturgeon	Acipenser Naccarii						x		

Source: CITES

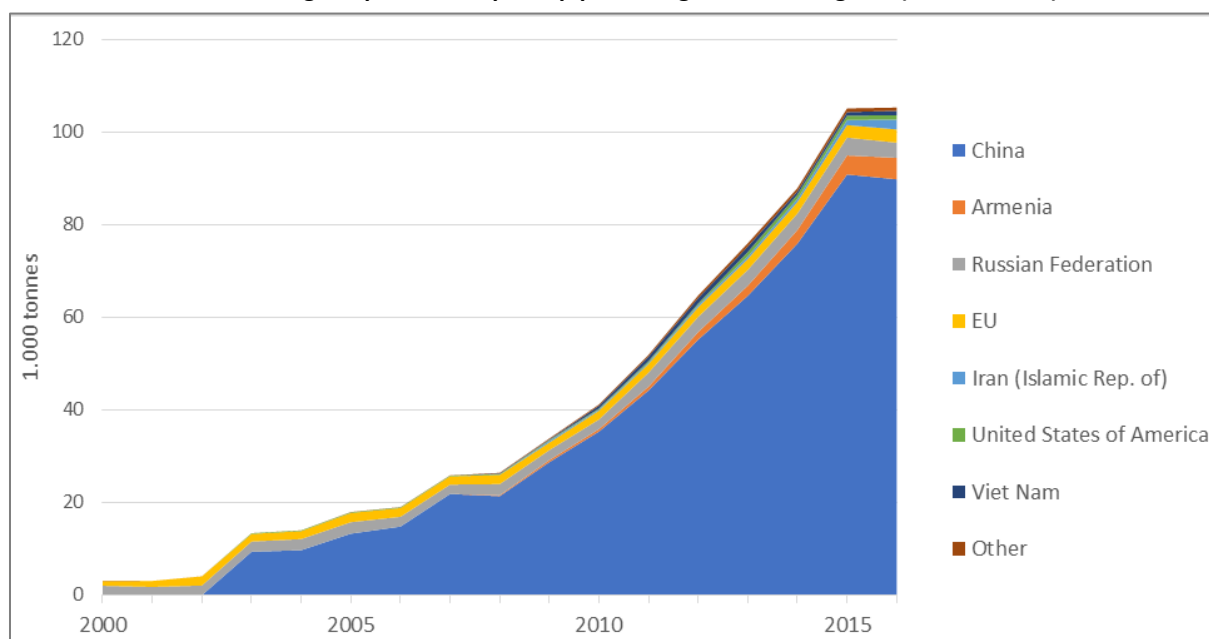
In addition, FAO reports sturgeon aquaculture in other MS. Lithuania, Hungary, Estonia, Austria and Denmark altogether totalled 297 and 229 tonnes in 2015 and 2016, respectively.

2.3 Production in other regions

During the last 15 years, there has been a steep growth in aquaculture production of sturgeons. According to FAO, the world production was 4.100 tonnes in 2002, half of which took place in Russia and the remaining part in the EU. In 2003, the world production more than tripled when China reported a production of over 9.000 tonnes. Since then, the Chinese production has increased by tenfold to almost 90.000 tonnes in 2015 and 2016. In 2016, China accounted for 85,3% of the global production, followed by Armenia at 4,4% (4.600 tonnes), Russia at 3,1% (3.300 tonnes), the EU at 2,7% (2.900 tonnes) and Iran at 2% (2.100 tonnes).

Data from CITES supports the FAO data as massive Chinese imports of live sturgeon eggs started in 2001. From that time China obviously built production and own stocks of Siberian sturgeon. Chinese stock building matches CITES data which shows a significant decline in Chinese imports of live eggs as from 2013.

Chart 4: Sturgeon production per top producing countries/regions (1.000 tonnes)



Source: FAO

World production of caviar was estimated at 290 tonnes in 2014¹¹ and 340 tonnes in 2016¹². Over the last decade, China has become the main caviar producer in the world. Estimated Chinese caviar production range between 75¹³ and 144¹⁴ tonnes.

The graph above shows the strong growth in Chinese production of sturgeon and gives a good indication on what can be expected on caviar output in some years (current Chinese caviar production, sturgeon maturity time and growth in sturgeon farming), as sturgeon farming is mainly intended for caviar production.

¹¹ <http://www.wscs.info/sturgeons/caviar-p-m.aspx>

¹² Harris L., and Shiraishi H. (2018) Understanding the global caviar market. Result of a rapid assessment of trade in sturgeon caviar. TRAFFIC and WWF joint report.

¹³ Ibid.

¹⁴ Sicuro B. (2018) The future of caviar production on the light of social changes: a new dawn for caviar?

3 Trade of caviar

In the sections below focus is put on caviar trade. Data used in showing/estimating caviar trade flows is from EUROSTAT and CITES.

Description of the sources, methodologies and assumptions made are described in section 1.2 Methodology.

3.1 Intra-EU trade – EUROSTAT/EUMOFA

Intra-EU trade of caviar, which consists of caviar of EU origin and re-export of imported caviar, is estimated at 58.100 kg in 2017. This represents an increase of 19.000 kg or 48% from 2014. The increase reflects both increase in EU production and in imports to the EU.

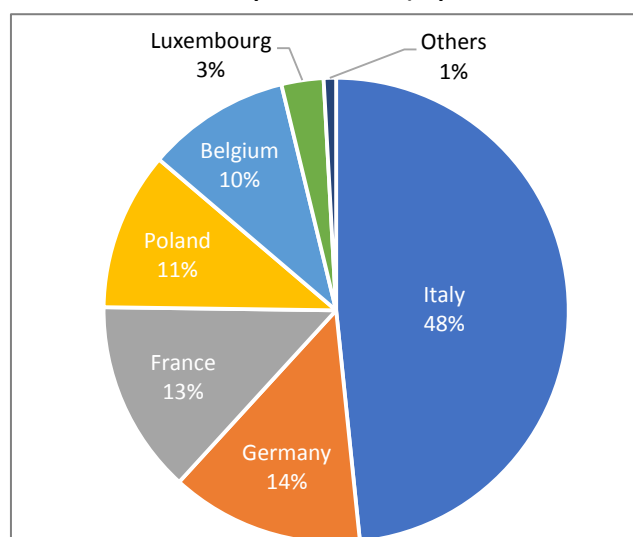
Table 4: Intra-EU exports of caviar from all MS

Month	2014		2015		2016		2017		2018	
	Kg	EUR/kg	Kg	EUR/kg	Kg	EUR/kg	Kg	EUR/kg	Kg	EUR/kg
01	2.000	357	2.000	341	1.500	433	3.700	347	4.100	305
02	1.500	431	1.600	342	1.900	320	1.500	321	4.100	319
03	4.200	353	2.200	366	3.400	367	4.800	334	1.000	353
04	1.700	411	2.600	334	2.000	330	2.200	322		
05	1.800	370	1.900	395	2.100	394	3.200	331		
06	1.700	385	2.000	393	2.700	427	3.000	364		
07	1.900	381	2.900	362	3.500	379	2.300	355		
08	1.400	403	1.900	388	3.300	328	1.700	382		
09	3.000	460	2.900	339	2.200	338	4.300	355		
10	6.100	456	5.100	406	5.900	416	7.600	389		
11	5.900	396	5.700	387	7.200	349	13.300	398		
12	7.900	544	7.500	464	8.300	436	10.500	436		
Grand Total	39.100	428	38.300	386	44.000	383	58.100	370	9.200	314

Source: Eurostat/EUMOFA

The top intra-EU exporting MS is Italy with almost half of the export volume. On the next places follow in descending order Germany, France and Poland. Exports from all the 3 MS exceeded 6.000 kg in 2017.

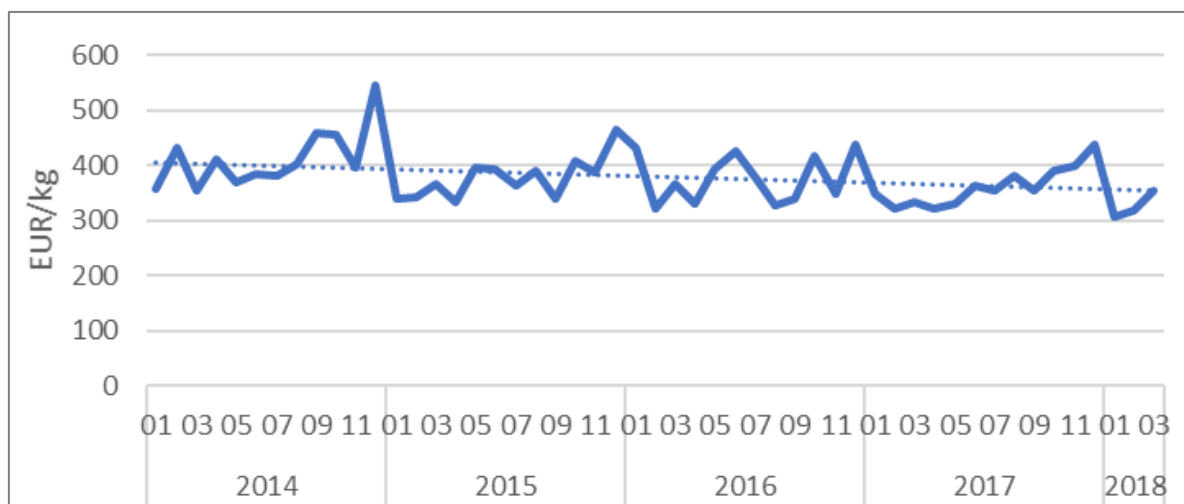
Chart 5: Intra-EU caviar exports in 2017 (export volume > 1.000kg)



Source: Eurostat/EUMOFA

From 2014 to 2017 average export price fell from 428 EUR/kg to 370 EUR/kg (-14%). The structural changes in prices through the year point in direction of increase in demand in the festive seasons. The same trend is observed in export volumes (see table above). The price and volume trend observed through the year coincide well with market inputs from industry stakeholders.

Chart 6: Intra-EU export price of caviar, 2014-2018



Source: Eurostat/EUMOFA

3.2 Extra-EU trade – EUROSTAT/EUMOFA

3.2.1 Import

EU imports of caviar from non-EU countries are estimated at 30.600 kg in 2017. This represents a steep increase from 2015 and 2016 of 82% and 32%, respectively. The increase in import volume from 2014 was 25%. In each of the last 4 years, EU import volumes have peaked in December.

Table 5: Monthly extra-EU import of caviar 2014-2018

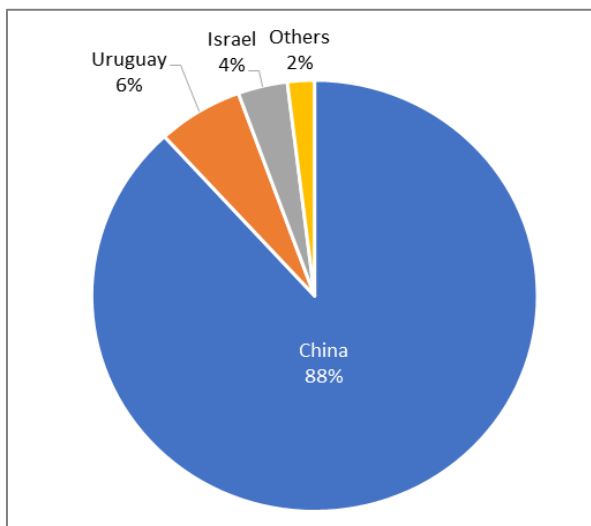
Month	2014		2015		2016		2017		2018	
	Kg	EUR/kg	Kg	EUR/kg	Kg	EUR/kg	Kg	EUR/kg	Kg	EUR/kg
01	2.100	513	400	396	1.900	299	1.900	534	2.300	224
02	1.300	767	300	283	900	300	3.600	300	1.500	211
03	1.000	356	400	405	900	384	1.300	276	1.500	222
04	600	335	200	933	800	360	800	232		
05	1.300	369	300	435	900	329	700	284		
06	700	371	700	248	900	285	2.200	219		
07	900	408	700	345	1.700	449	1.400	218		
08	800	306	900	264	800	298	700	227		
09	1.300	409	1.400	337	1.300	337	3.600	249		
10	3.000	348	2.500	345	3.600	326	3.700	423		
11	3.200	370	3.500	291	3.400	279	4.200	321		
12	8.200	459	5.500	368	6.000	352	6.500	262		
Total	24.400	412	16.800	353	23.100	333	30.600	309	5.300	219

Source: Eurostat/EUMOFA

The main supplier of caviar to the EU market in 2017 was by far China (27.000 kg), followed by Uruguay (1.900 kg) and Israel (1.100 kg).

The main importing MS in 2017 was France (13.200 kg). Then Germany (6.400 kg) and Belgium (4.900 kg) followed. These volumes might be affected by the fact that these MS are the point of entry for caviar entering the EU market.

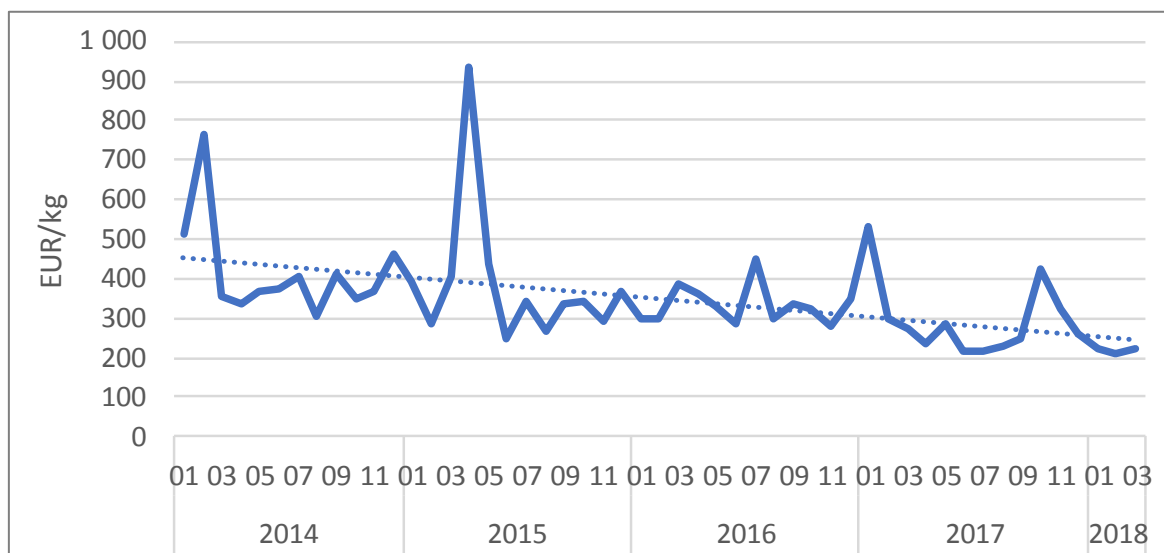
Chart 7: EU caviar imports from main suppliers in 2017 (export volume > 1 000kg)



Source: Eurostat/EUMOFA

From 2014 to 2017 average import price fell from 412 EUR/kg to 309 EUR/kg (-25%). This is a steeper fall in prices than for EU exports to third countries.

Chart 8: Extra-EU import price of caviar, 2014-2018



Source: Eurostat/EUMOFA

3.2.2 Export

Along with the increase in production of caviar in the EU, exports to countries outside the EU are increasing. In 2014, exports from the EU are estimated at 29.000 kg and through 2017 volumes have increased by 25%.

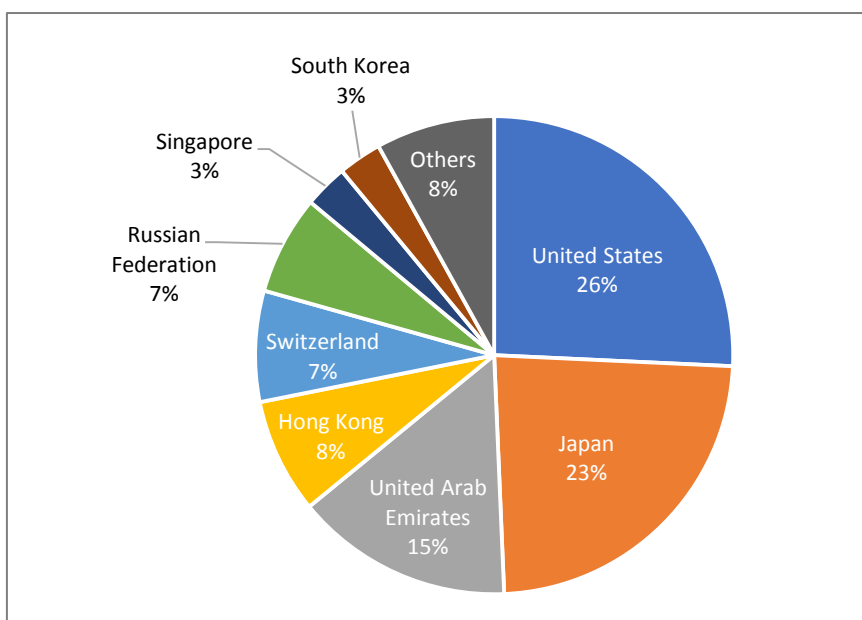
Table 6: Monthly extra-EU exports of caviar 2014-2018

Month	2014		2015		2016		2017		2018	
	Kg	EUR/kg	Kg	EUR/kg	Kg	EUR/kg	Kg	EUR/kg	Kg	EUR/kg
01	1.200	460	1.300	386	1.700	365	1.700	403	2.000	351
02	1.700	349	1.700	336	1.800	422	2.600	385	2.100	372
03	2.200	397	2.400	328	1.600	408	2.800	461	5.100	370
04	2.500	430	2.700	380	2.100	425	2.700	350		
05	1.600	416	1.900	590	1.800	419	1.800	362		
06	1.600	622	1.300	410	1.700	385	4.600	388		
07	1.800	407	2.400	394	2.600	367	1.500	357		
08	900	347	1.600	394	1.400	433	2.800	331		
09	3.700	395	2.700	360	2.600	402	2.900	356		
10	2.400	398	2.800	418	4.000	421	3.300	413		
11	7.700	457	4.700	479	6.200	378	6.000	403		
12	2.600	570	5.400	543	4.700	514	4.600	467		
Total	29.900	443	30.900	431	32.200	416	37.300	396	9.200	366

Source: Eurostat/EUMOFA

The two main EU export markets for caviar in 2017 were the USA (9.600 kg) and Japan (8.800 kg). The same two markets were also the biggest ones in 2016. Ranking next are United Arab Emirates (5.500 kg), Hong Kong (2.900 kg) and Switzerland (2.800 kg).

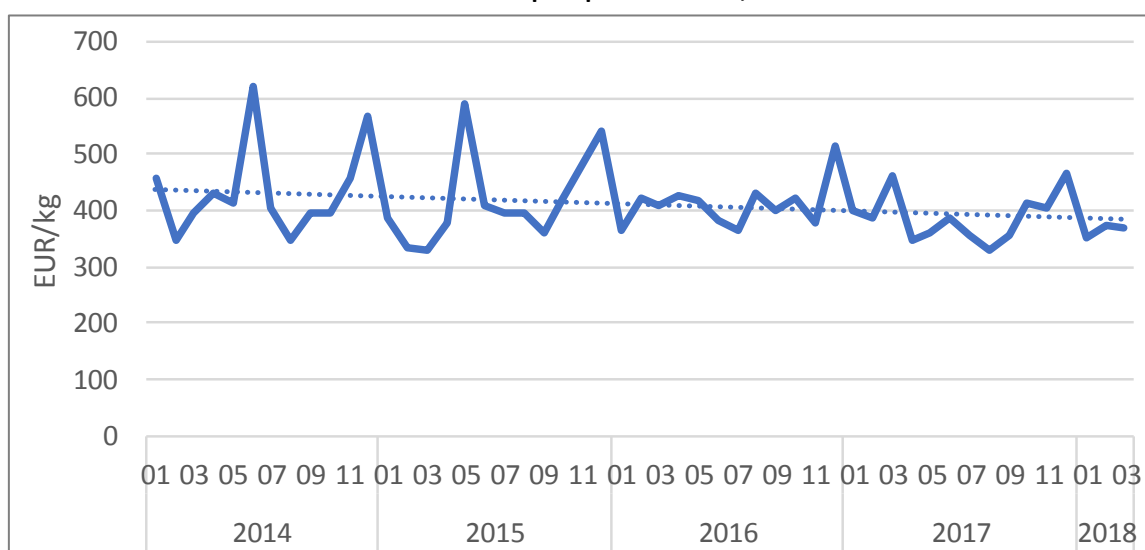
Chart 9: EU caviar exports to main markets in 2017 (export volume > 1.000 kg)



Source: Eurostat/EUMOFA

From 2014 to 2017 average export price decreased from 443 EUR/kg to 396 EUR/kg (-10%).

Chart 10: Extra-EU export price of caviar, 2014-2018



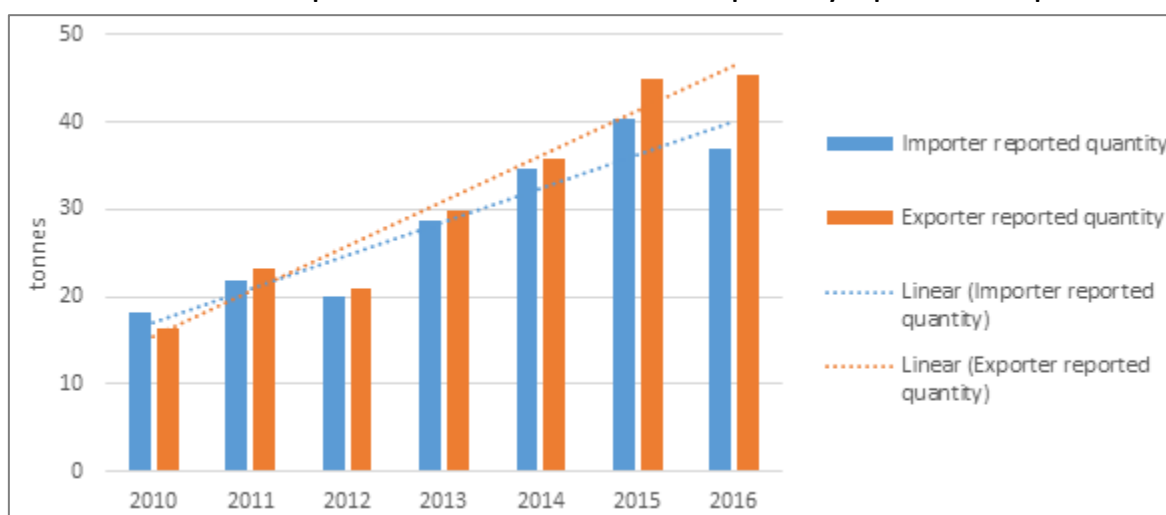
Source: Eurostat/EUMOFA

3.3 Extra-EU trade - CITES

3.3.1 Import

According to CITES, the EU imported between 40 and 45 tonnes of caviar in 2015. As data for 2016 may still be incomplete, the import volume of between 37 and 45 tonnes should be interpreted with caution. Over the period 2010 to 2016 the imports of caviar show an increasing trend with an annual average growth rate of between 13% and 18% for importer reported and exporter reported quantity respectively.

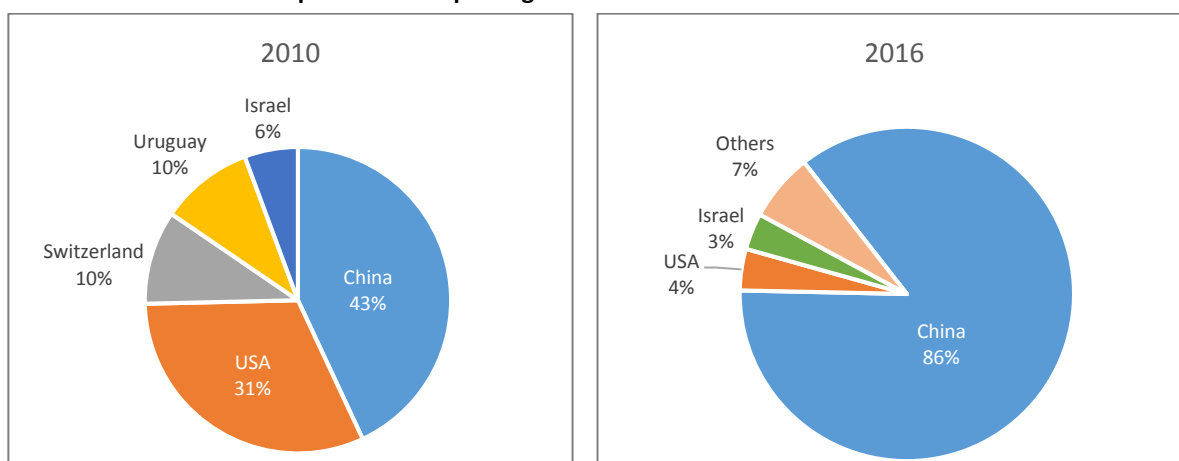
Chart 11: Extra-EU import volume of caviar 2010-2016 as reported by importers and exporters



Source: CITES Trade Database

A large part of the increased imports is due to China's production growth and to its improved dominance in the market. According to the importer reported quantity, China accounted for 42% of the EU import in 2010, while in 2016 the share had increased to 85%.

Chart 12: Top countries exporting to the EU in terms of volume. 2010 and 2016

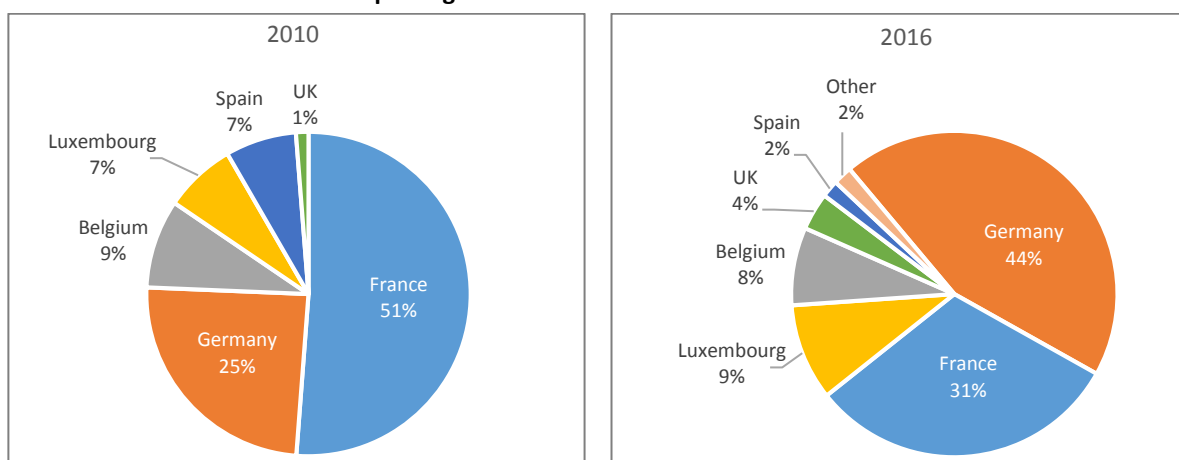


Source: CITES Trade Database

Over the same period, the other countries reduced their market shares, and especially USA who decreased from 31% in 2010 to only 4% in 2016. EU still imports caviar from Uruguay and Switzerland, but in addition started importing from the United Arab Emirates and Iran in 2012.

In 2010, all EU import of caviar was imported by the six Member States France, Germany, Belgium, Luxembourg, Spain and the UK. These were still the main importing Member States in 2016, but their share of the total import has changed, and other Member States are now also importing caviar, amounting to 3% of the total volume.

Chart 13: Main importing Member States in terms of volume. 2010 and 2016

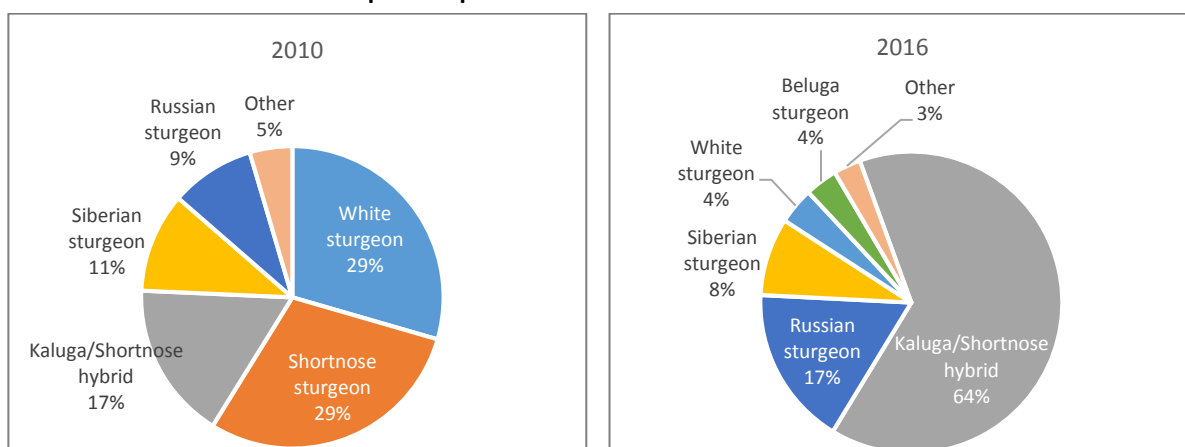


Source: CITES Trade Database

In terms of species, the development from 2010 to 2016 is highly affected by increased imports from China. According to the importer reported quantity, of all EU imports of caviar 29% were from white sturgeon and 29% from shortnose sturgeon in 2010, mainly from USA and China.

In 2010, 17% of the EU import of caviar consisted of Kaluga caviar, mainly from China. By 2016 the share of Kaluga caviar increased to 64%, corresponding to an increase in absolute terms of almost 700%. Russian sturgeon and Siberian sturgeon, which accounted for almost 25% of the EU import of caviar in 2016, were also mainly imported from China.

Chart 14: Main imported species to the EU in terms of volume. 2010 and 2016



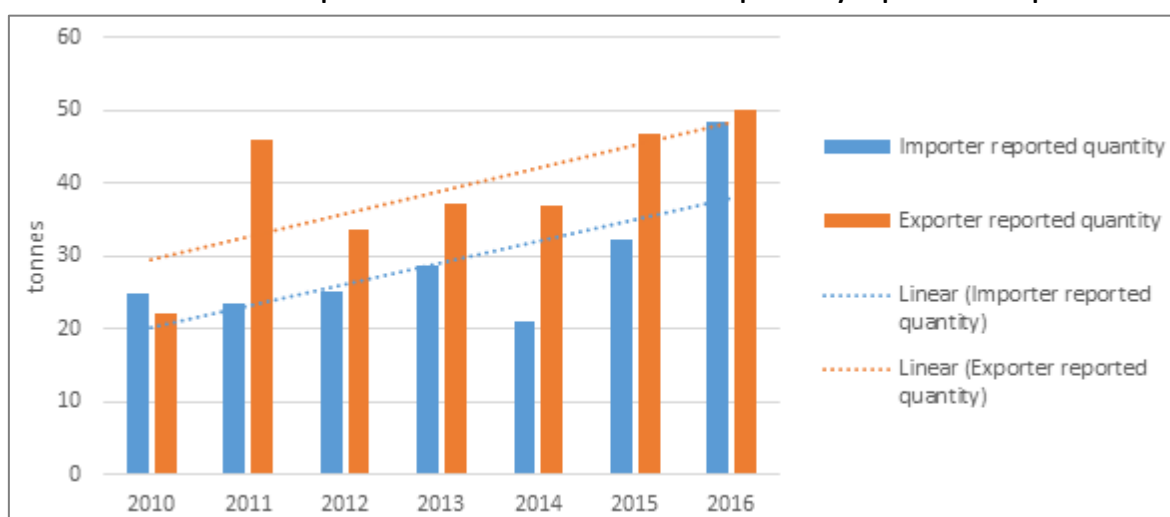
Source: CITES Trade Database

3.3.2 Export

According to CITES, the EU exported between 32 and 47 tonnes of caviar in 2015. As data for 2016 may still be incomplete, the export volume of between 48 and 50 tonnes should be interpreted with caution. Between 2010 and 2016 the EU reported export of caviar to 111 different non-EU countries and a large part of the discrepancies in chart 15 is caused by missing importer reported quantities. Consequently, the exporter reported quantities are more credible, except from the abnormal high volume in 2011, which is caused mainly by export volumes from France being twice as high as usual.

Subject to inaccurate data, they still show an increasing trend over the period with an annual average growth rate of between 12% and 15% for importer and exporter reported quantity respectively.

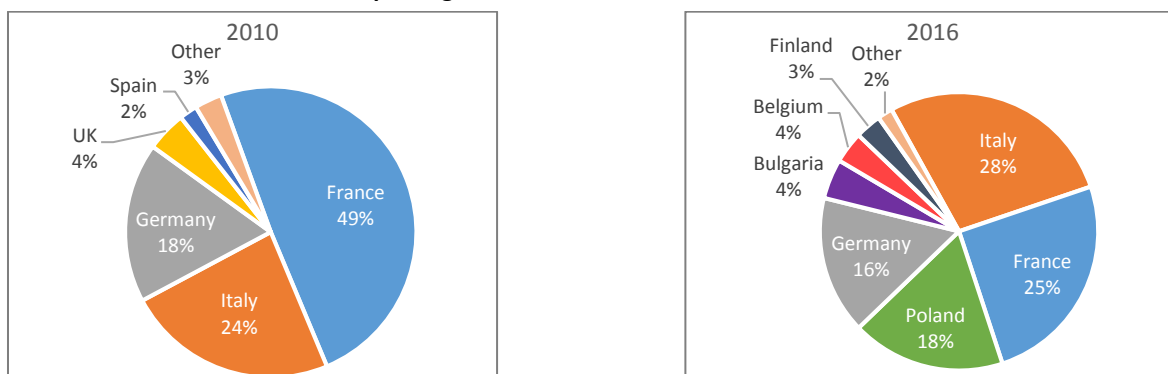
Chart 15: Extra EU export volume of caviar 2010-2016 as reported by importer and exporter



Source: CITES Trade Database

Roughly 50% of the export growth is driven by Italy, Germany and France, who from 2010 to 2016 increased their exports of caviar in absolute terms by 170%, 100% and 15% respectively. The other 50% of the growth is driven mainly by Poland, Bulgaria, Belgium and Finland. According to CITES, Poland and Finland had no exports in 2010, but respectively 9 and 1,5 tonnes in 2016.

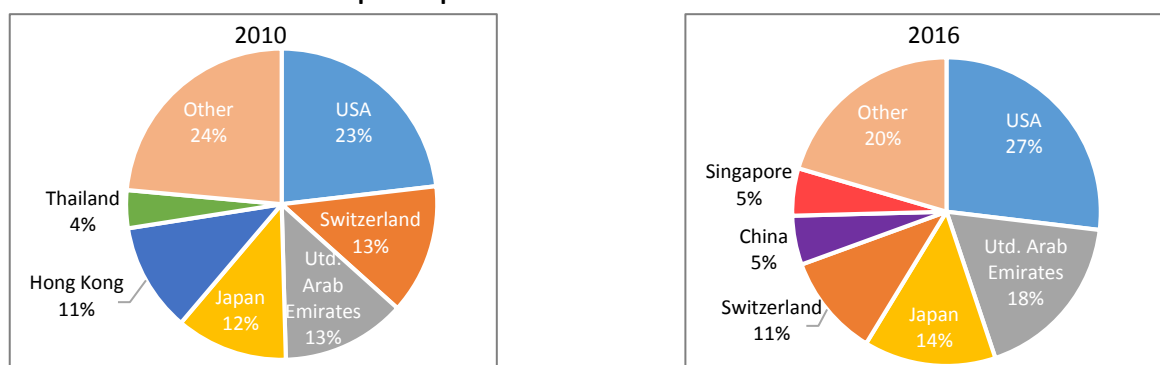
Chart 16: Main exporting Member States in terms of volume. 2010 and 2016



Source: CITES Trade Database

The biggest destination market of EU exports is USA with an increased import from the EU in absolute terms of more than 150% from 2010 to 2016. In 2010, almost 100% of the EU caviar export to USA was from Italy, Germany and France. In 2016, the share of export from these three countries was reduced to less than 75%, while Bulgaria had gained a market share of more than 15% and Finland, Poland and Belgium 10% each.

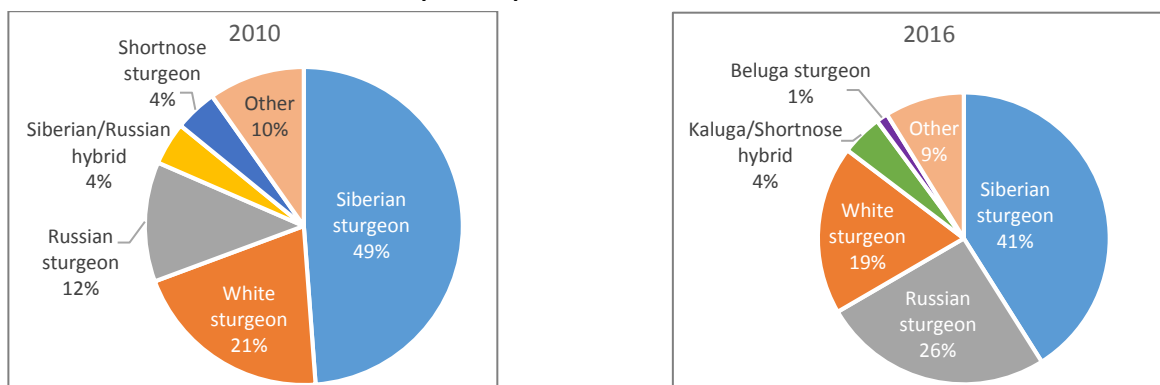
Chart 17: Top EU export markets in terms of volume. 2010 and 2016



Source: CITES Trade Database

In terms of species, caviar from Siberian, Russian and white sturgeon are the largest exported products. Although Siberian and white sturgeon decreased their shares of total export from 2010 to 2016, their export about doubled in absolute terms. Export of Russian sturgeon in absolute terms increased by almost 400% over the same period.

Chart 18: Main exported species in terms of volume. 2010 and 2016



Source: CITES Trade Database

4 Consumption

As described in section 1.2, production of sturgeons, and especially of caviar, is very small. Generally, as the volumes get smaller, data discrepancies in relative terms increase and consequently are harder to interpret. As for caviar, no database exists for consumption. Consequently, assessments have to be made based on the data available. Big deviations in data from different sources make assessments on consumption difficult as the volumes of caviar consumed in the main market are marginal.

In the following, general information on market segments in the EU is given based on input from stakeholders in the caviar industry.

In addition, apparent consumption of caviar is estimated based on available data and assessments.

4.1 General market descriptions

At the Seafood Expo Global 2018 in Brussels, general market and segment inputs from stakeholders/exhibitors in the caviar sector were collected.

General information from stakeholders on availability was that production and accessibility of caviar have been on the rise over the last years. Most of them pointed at China as the main reason for higher caviar volumes. This matches the trend shown in the production section of this report.

The segments mentioned as target for producers/distributors were the high-end segments, including:

- Michelin-starred restaurants;
- Special retail shops (physical and web shops);
- High-end hotels;
- Airliners with exclusive first and business class;
- Exclusive cruise ships.

As surveyed from stakeholders, it was evident that the last years' increase in caviar production raised some concerns. Increase in production have put pressure on prices and distributors were looking for new possible well-paying segments.

Two of the stakeholders expressed their concern that two large-scale retailers (reckoned as hard discount retailers) has started to offer caviar. The caviar is sold from special lockers in the stores at prices lower than from other shops.

4.2 Consumption in the EU

In the table below, apparent consumption of caviar in the EU in 2016 is calculated. Production is based on FEAP data and net intra-EU import is based on EUROSTAT data. For extra-EU net import, two different sources are used (CITES data and EUROSTAT data), which report some differences in trade data.

Table 7: Calculated apparent consumption in the EU 2016 (tonnes)

	FEAP	EUROSTAT	CITES	Apparent consumption (calculated based on CITES data)	EUROSTAT	Apparent consumption (calculated based on EUROSTAT data)
	Production	Intra-EU balance	Extra-EU balance ¹⁾		Extra-EU balance	
Caviar producing countries:						
Italy	38	-18,7	-13,8	5,5	-12,3	7,0
France	30	8,1	-1,0	37,1	1,1	39,2
Germany	15	-2,7	8,4	20,7	-0,8	11,5
Poland	15	-4,2	0,0	10,8	-4,1	6,7
Bulgaria	7	0,0	-2,3	4,7	0,0	7,0
Spain	6	0,1	0,4	6,5	0,4	6,5
Belgium	3	-3,6	1,0	0,4	4,4	3,8
Finland	4	0,8	-1,5	3,3	-1,3	3,5
Hungary	3	0,0	0,0	3,0	0,0	3,0
Latvia	3	0,4	0,0	3,4	-0,4	3,0
Netherlands	2	0,0	0,4	2,4	-0,1	1,9
Non-producing countries:						
Austria		2,2	0,0	2,2	0,0	2,2
Denmark		2,3	0,0	2,3	0,0	2,3
Estonia		0,4	0,0	0,4	0,0	0,4
Greece		0,1	0,0	0,1	0,0	0,1
Luxembourg		-0,6	3,1	2,5	2,8	2,2
Romania		0,0	0,0	0,0	0,0	0,0
Sweden		0,4	0,0	0,4	0,0	0,4
United Kingdom		2,2	1,4	3,6	1,2	3,4
EU TOTAL	126,0	-12,8	-4,0	109,2	-9,1	104,1

1) As reported by the EU countries to CITES

Total EU consumption of caviar in 2016 is calculated between 101 tonnes and 106 tonnes.

Regardless of sources used, France is the largest consumer market for caviar in the EU, followed by Germany. While consumption calculation for France is relatively consistent by using the two sources, consumption calculation for Germany deviates widely. Poland, Italy, Spain and Bulgaria follow. Their ranking depends on sources used in the calculation.

Among the Member States with no production, the United Kingdom has the highest caviar consumption. Other main consuming Member States in this category are Luxembourg, Denmark and Austria.

In addition to Germany, significant deviations are also observed for Poland, Belgium and Bulgaria in using the two different data sources.

4.3 Consumption in other regions

Several studies and reports identify USA, Japan, Russia and China as main caviar consuming countries and Australia as a small but growing market outside the EU. This is also confirmed by the CITES trade database which, in addition, also identifies United Arab Emirates (UAE), Switzerland and Singapore as main importers of caviar.

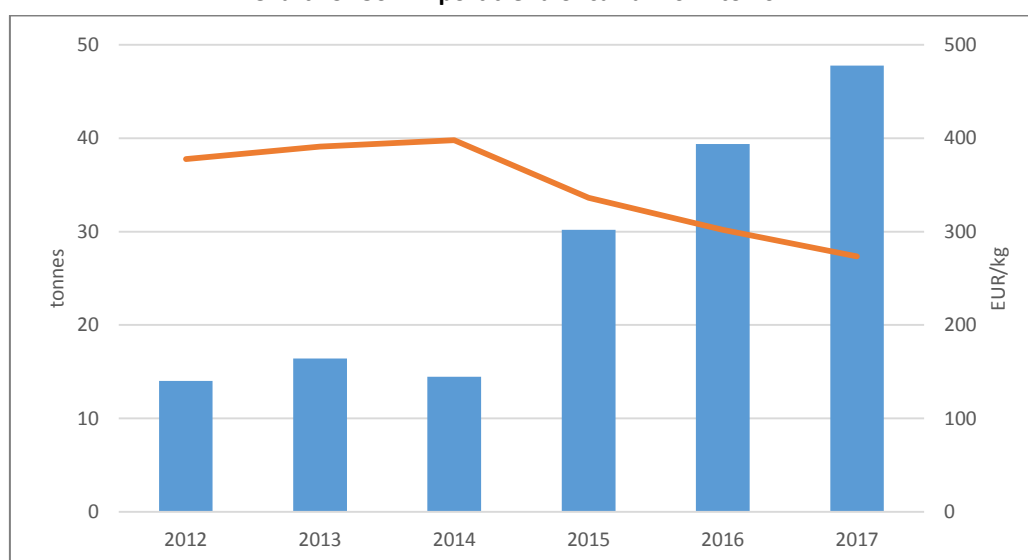
Consumers of caviar in the main non-EU markets tend to have high income. Like for the EU market, caviar consumption peak around the holiday periods such as Christmas, New Years and Valentine's Day. Caviar is also purchased related to celebrations such as weddings.

Literature suggests that in most of the markets, wild sourced caviar is still requested by customers and quality is reckoned as superior compared to farmed caviar. There also exist preferences of origins with Russian and Iranian caviar most sought and Osetra as the most popular product.

4.3.1 USA

Literature suggests that the US may become one of the main producers of caviar in a few years overtaking France and Italy. According to CITES, the US imports of caviar in 2016 was between 40-44 tonnes. This is similar to EUMOFA foreign trade data, which report the US importing 39 tonnes (after excluding abnormal values). In 2017, the US imports of caviar increased to 47,8 tonnes.

Chart 19: USA import trend of caviar 2012 to 2017

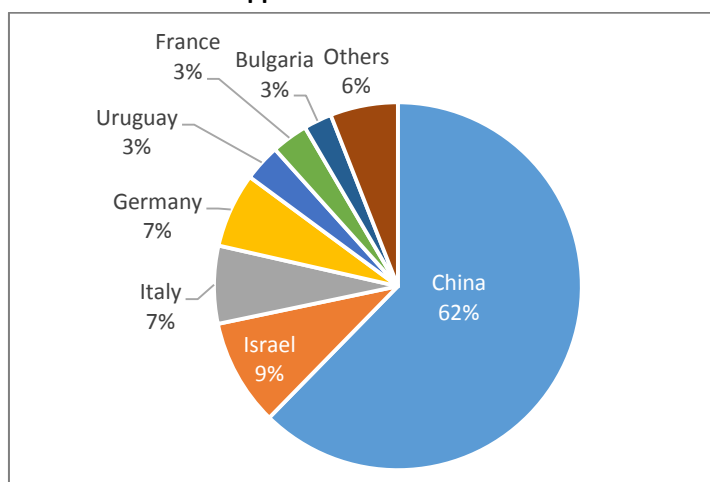


Source: GTA/EUMOFA

In the US market, import prices have over the last years trended in the opposite direction of import volumes. In 2017 the lowest average yearly import price for caviar was from China (209 EUR/kg). The highest price was recorded in France (466 EUR/kg).

China was by far the main supplier of caviar to the US market in 2017, followed by Israel, Italy and Germany. From 2015 to 2017, US import of caviar from China more than doubled from 14 tonnes to around 30 tonnes. The growth in caviar import from China is even more impressive considering that in 2013 it was 1,2 tonnes.

Chart 20: Main suppliers of caviar to the US market 2017



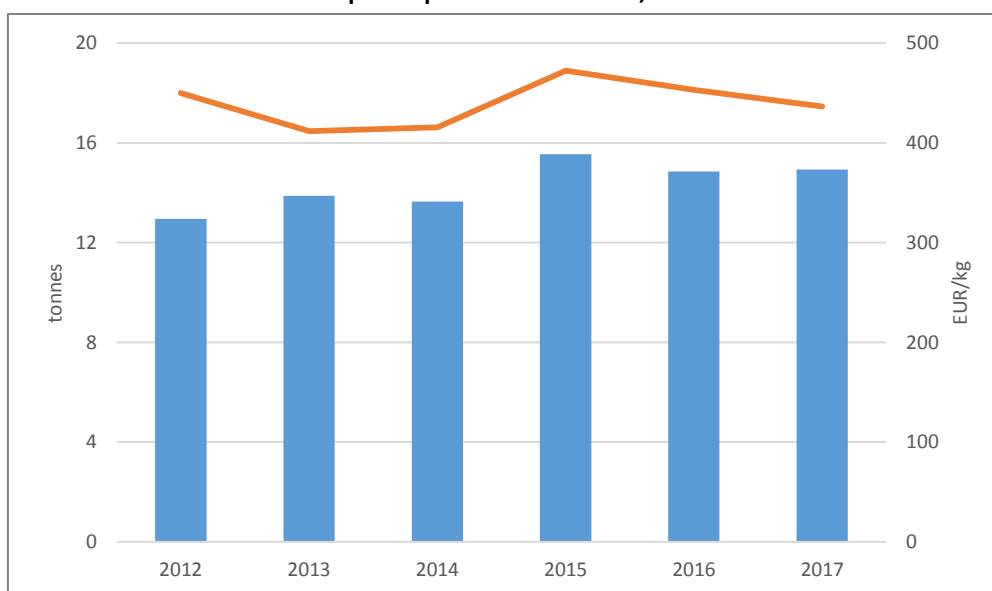
Source: GTA/EUMOFA

4.3.2 Japan

According to CITES, Japan is among the top 5 importers of caviar in the world. Data from the same source shows that Japanese import of caviar amounted to between 9,5 and 11 tonnes in 2016. EUMOFA foreign trade data show import volume of caviar to Japan of 15 tonnes. The average import price from the biggest supplier, the US, indicates that some of the caviar of US origin could be caviar substitute (paddlefish) which is not included in the CITES data.

Japanese imports of caviar have been relatively stable from 2012 to 2017, ranging from 13 to 15 tonnes.

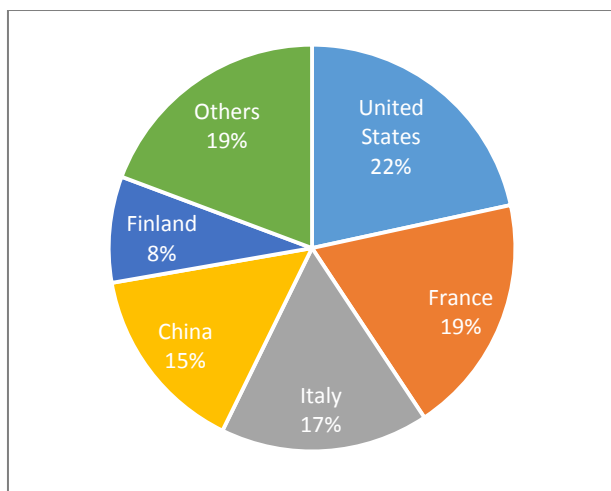
Chart 21: Japan import trend of caviar, 2012 to 2017



Source: GTA/EUMOFA

Over the last years, Japanese import prices for caviar have shown a slight downward trend. Average price for caviar of US origin achieved the lowest price (see comment above). Among the top five suppliers to Japan in 2017, average price from France was the highest (543 EUR/kg) while the highest price level recorded in 2017 was for caviar from Iran (2.237 EUR/kg) at very small volumes.

Chart 22: Main suppliers of caviar to the Japanese market, 2017



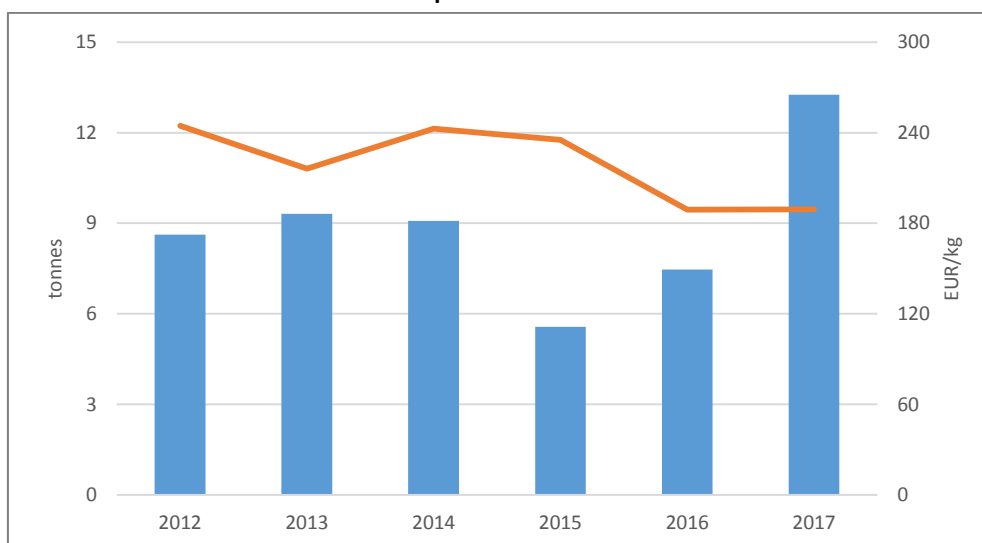
Source: GTA/EUMOFA

4.3.3 Russia

Historically, Russia was the world's main supplier and a big consumer of caviar from traditional fisheries. Caviar is a national symbol in Russia and used to be traditional food. Several years ago, the production of caviar in Russia was at its highest levels, with more than 2.000 tonnes of caviar and 90% of international trade was caviar of Russian origin. After a complete ban on commercial fishing of sturgeon in 2007, Russia became a net importer of caviar. Russian production in 2016 was estimated to 45 tonnes.

As from 2016, China has replaced Italy as the main country of origin of caviar imported in Russia. In the same years, average import prices fell below 200 EUR/kg. In 2017, Russian import amounted to 13 tonnes which is the highest yearly import volume so far recorded.

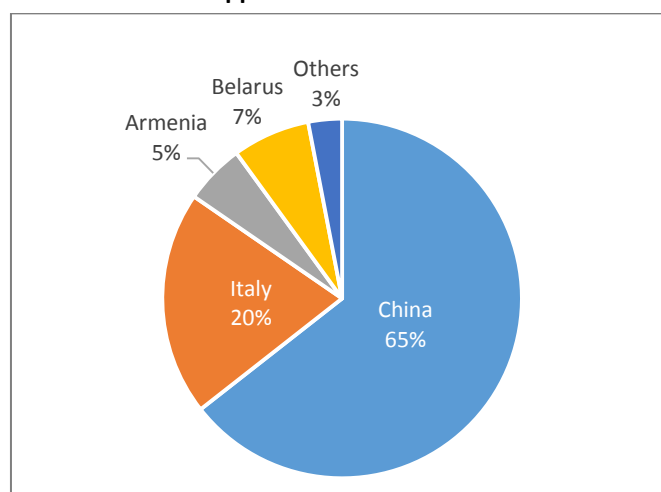
Chart 23: Russian import trend of caviar 2012 to 2017



Source: GTA/EUMOFA

From a 13% import share in 2015, China's import share rose to 65% in 2017. On the other hand, Italy's import share fell from 59% to 20% in the same period.

Chart 24: Main suppliers of caviar to the US market 2017

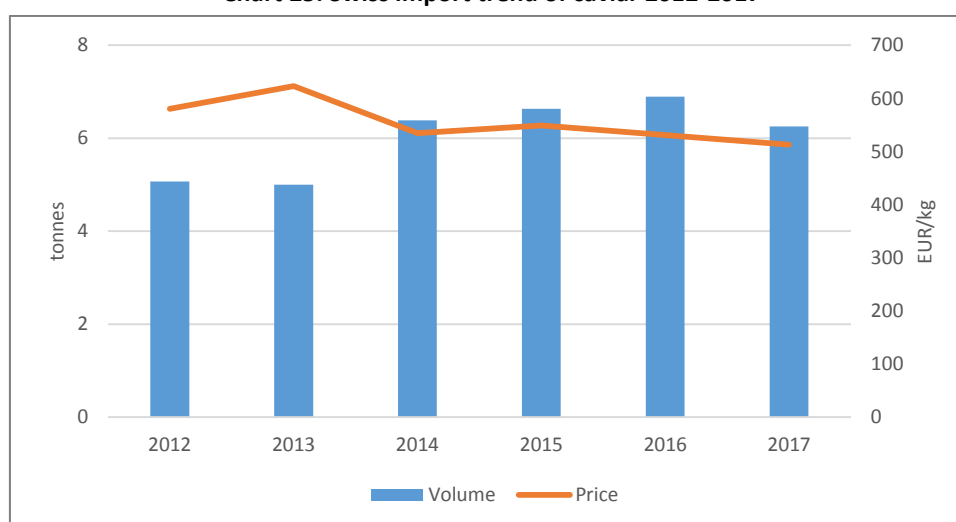


Source: GTA/EUMOFA

4.3.4 Switzerland

According to FEAP, Switzerland produced 1 tonne of caviar in 2016. Additionally, according to CITES, Switzerland imported around 6,7 tonnes of caviar in 2016 and exported only between 250 and 600 kg. This corresponds well with EUMOFA bilateral trade data which shows Swiss imports of 6,9 tonnes in 2016 (after filtering out abnormal values). According to EUMOFA trade data, the caviar import declined to 6,2 tonnes in 2017.

Chart 25: Swiss import trend of caviar 2012-2017

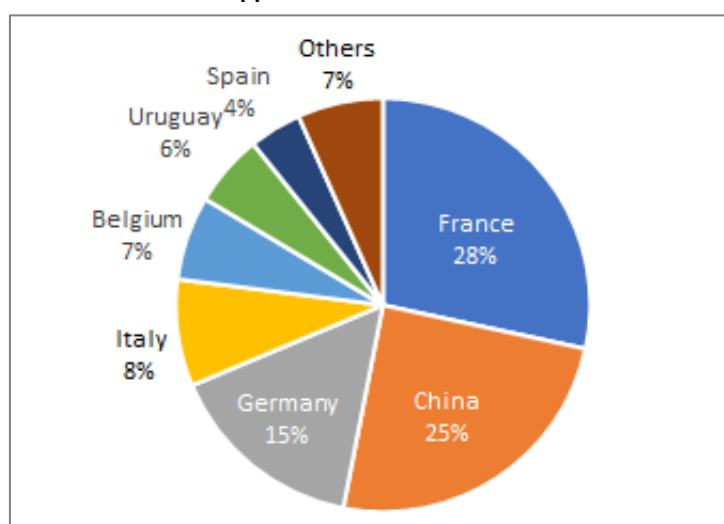


Source: GTA/EUMOFA

Swiss import prices have declined in line with the increased volume, fluctuating around 500 EUR/kg for the last 4 years. According to EUMOFA trade data, the lowest average yearly import price of caviar in 2017 was from the Netherlands (351 EUR/kg) while the highest price was from Iran (1.548 EUR/kg).

Switzerland's main suppliers in 2017 were France and China followed by Germany. Together, the three top countries accounted for 68% of the total Swiss import of caviar.

Chart 26: Main suppliers of caviar to the Swiss market 2017



Source: GTA/EUMOFA

4.3.5 China

Production estimates for China range widely. While the highest estimates were 144 tonnes in 2016, other suggest production around 75 tonnes. However, what seems to be the case and consensus among different sources is that production is on the rise and, based on FAO sturgeon production data, the top is not reached yet. China is a net exporter of caviar and its exports have increased significantly over the last years –from 18 tonnes in 2012, to 82 tonnes in 2016 and 92 tonnes in 2017 (according to GTA/EUMOFA data). According to CITES, Chinese exports in 2016 was between 62 and 83 tonnes.

Given the different estimates on production, and discrepancies of trade data, there is no basis to calculate credible estimates on apparent consumption in China.

4.3.6 Other main consumption markets outside the EU

UAE

According to CITES, UAE imported between 13 and 19 tonnes of caviar in 2016. At the same time UAE is a producing country. The total production volume is unknown, but according to CITES, they exported between 2,5 and 4,5 tonnes in 2016. This leaves an apparent consumption of at least between 8,5 and 16,5 tonnes. The main suppliers of caviar to UAE in 2016 was China, France and Poland.

Singapore

According to CITES, Singapore imported between 3 and 3,5 tonnes of caviar in 2016. This was stable compared to 2015, but Singaporean import of caviar have increased in the previous years and almost tripled since 2010. The main suppliers of caviar to Singapore in 2016 was Italy, France and China.

Australia

Australia is reckoned as a growing market. In 2016 Australia imported around 1,3 tonnes of caviar, but both Australian importers and foreign exporters are counting on a continued growth in the Australian market. The main suppliers of caviar to Australia in 2016 was UAE, Italy and the US.

5 Perspectives and future development

According to data from FAO, production (harvest) of sturgeon has increased dramatically. From a production of 19.000 tonnes in 2006, the production in 2016 was more than 5 times higher. It is assumed that the production of sturgeon consists of early harvest of males (male detection possible after 3-4 years of farming) and harvest of females as a result/consequence of caviar production.

Caviar production in 2016 was estimated to 340 tonnes and it is forecasted that production could reach 550 tonnes by 2020¹⁵.

However, by assuming (on global basis) that the caviar production cycle takes 8 years in average - from hatching to the first harvest of mature sturgeon – the 340 tonnes of caviar produced in 2016 came from a global sturgeon production of 26.000 tonnes (FAO production estimate 2007/2008). In 2016, global production turned 100.000 tonnes, four times higher than in 2007/2008. If using the same caviar/sturgeon ratio as mentioned above for the 2016 sturgeon production, the caviar production could turn 1.000 tonnes when this sturgeon production becomes mature. This figure is also supported by literature, where estimates for future production range from 500 to 2.000 tonnes.¹⁶

There are raising concerns that there will be more production than demand, which means prices and profitability are likely to decrease.

The main difficulties within the caviar trade faced by aquaculture operations are the lack of quality control and the need to shape enough consumer demand for caviar in line with the growth in production.¹⁷

¹⁵ Harris L. and Shiraishi H. (2018) Understanding the global caviar market. Result of a rapid assessment of trade in sturgeon caviar. TRAFFIC and WWF joint report.

¹⁶ Sicuro B. (2018) The future of caviar production on the light of social changes: a new dawn for caviar?

¹⁷ Harris L. and Shiraishi H. (2018) Understanding the global caviar market. Result of a rapid assessment of trade in sturgeon caviar. TRAFFIC and WWF joint report.

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