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THE CAVIAR MARKET

PRODUCTION, TRADE,
AND CONSUMPTION
IN AND OUTSIDE THE EU

AN UPDATE OF THE 2018-REPORT



EUMOFA

European Market Observatory for
Fisheries and Aquaculture Products

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SUMMARY

This report is an update of the first EUMOFA report on the caviar market from 2018¹. In the previous edition, the latest updated data on production referred to 2016 while this report contains data for 2018. In addition, it should be remarked that since 2018 EUMOFA has expanded the scope of its international trade database, which now covers trade flows of fishery and aquaculture products between almost 100 countries. Consequently, this report provides more analyses of other regions compared to the previous report.

Caviar is roe from sturgeons. Historically, sturgeons were harvested in the Caspian Sea and their roe sold as caviar, mainly by Russia and Iran. Overfishing of sturgeons has led to the near-extinction of several of the species. Globally, the largest capture was recorded in 1977 at 31.800 tonnes². The first FAO-recorded harvest from aquaculture was in 1984 at 150 tonnes. Since then, the rearing of sturgeons gradually increased until the beginning of the 2000s, when it started increasing rapidly year by year. In 2018, the global aquaculture production of sturgeons was about 115.168 tonnes. Subsequently, nearly all caviars on the market today are harvested from farmed sturgeon.

According to the Federation of European Aquaculture Producers (FEAP), EU Member States produced 164 tonnes of caviar in 2018, an increase of 12% from 145,8 tonnes in 2017. The largest producers were Italy, France, Poland, and Germany, accounting for 84% of the total production in 2018. The global production of caviar in 2018 has been estimated as 380 tonnes³.

According to EUROSTAT-COMEXT data, the intra-EU trade of caviar increased from 37,4 tonnes in 2014 to 61,6 tonnes in 2018, before decreasing over the following two years, ending at 48,4 tonnes in 2020. In addition, extra-EU imports doubled from 25 tonnes in 2014 to 54,5 tonnes in 2019 but decreased by 16% to 45,7 tonnes in 2020. The main supplier of caviar to the EU market is China by a large margin, responsible for between 65% and 84% of extra-EU imports over the past five years.

The EU is also an important supplier of caviar globally. According to EUROSTAT-COMEXT data, 43,7 tonnes of caviar were exported outside the EU in 2014. By 2019, the extra-EU export volume had increased by 55% to 67,5 tonnes. With the COVID-19 pandemic in 2020, the export volume decreased by 27% to 49,2 tonnes.

Compared to intra-EU trade, exporting Member States achieve higher prices when exporting outside the EU, although price fluctuate significantly. The yearly weighted average extra-EU export prices over the past seven years have been between 422 EUR/kg and 538 EUR/kg, on average 17% higher than the intra-EU export prices and 54% higher than the extra-EU import prices. Although the long-term trend is negative, prices have shown signs of recovery since 2018.

According to EUMOFA estimates, the total EU apparent consumption of caviar 2018 was between 121 tonnes and 126 tonnes depending on the source⁴. of extra-EU trade⁵ Compared to similar calculations for 2016, EU production of caviar have increased by 30% while apparent consumption in the EU have increased by 20%⁶. France is the largest consumer market for caviar in the EU, followed by Germany and Spain. Other main caviar consuming countries are the USA, Japan, Russia, and China as well as Canada, Switzerland, the United Kingdom, the United Arab Emirates, Singapore, and Australia.

¹ https://www.eumofa.eu/documents/20178/84590/The+caviar+market_EU.pdf

² Source: FAO

³ First World Caviar Forum, 7th May 2019

⁴ Data collected from FEAP, CITES, and EUROSTAT. See chapter 3.2 Consumption in the EU

⁵ Note that the UK is excluded from analysis of the EU, see section 0.1.1

⁶ In the 2018-edition of this report, the reported production in 2016 was 126 tonnes and the calculated apparent consumption in the EU, excluding the UK, was between 101 and 106 tonnes.

DEFINITIONS

CITES	The Convention on International Trade in Endangered Species of Wild Fauna and Flora
CN	Combined Nomenclature ⁷
EU	The European Union as of 1 st January 2021, i.e. excluding the United Kingdom
EUMOFA	European Market Observatory for Fisheries and Aquaculture Products
FAO	Food and Agriculture Organization of the United Nations
FEAP	Federation of European Aquaculture Producers
HS	Harmonised System ⁸
MS	EU Member States as of 1 st January 2021, i.e. excluding the United Kingdom

⁷ Council Regulation (EEC) No 2658/87 of 23 July 1987 on the tariff and statistical nomenclature and on the Common Customs Tariff

⁸ World Customs Organization <http://www.wcoomd.org/en/topics/nomenclature/overview/what-is-the-harmonized-system.aspx>

0. METHODOLOGY

0.1. Methodology

The study is based on publicly available literature, research, news articles, and data sources. Through contact details received from FEAP, the major caviar stakeholders in the EU have been contacted and asked to contribute to the study. Two interviews were conducted, contributing both general and specific insight regarding production, trade, and market outlets.

0.1.1 Brexit

This report analyses data for the years 2014-2020. The UK formally left the EU on 31st January 2020 and entered a transition period that lasted until 31st December 2020. Starting from February 2020, trade data reported by the UK are not available in EUROSTAT. For the sake of consistency, the UK is excluded from the EU aggregate and treated as an extra-EU country throughout the whole period in all analyses in this report.

0.2. Data

The main data sources for this study concerning production of sturgeons and caviar are FAO and FEAP, while data from EUMOFA (based on EUROSTAT and IHS Markit – Global Trade Atlas) and CITES are used when analysing the trade of caviar.

Since the first edition of this report in 2018, EUMOFA has expanded the coverage of its international trade database which now includes volumes and values of imports and exports of fishery and aquaculture products from almost 100 reporting countries.

Although both EUROSTAT-COMEXT and IHS data are comprehensive, it must be underlined that imports and exports of goods are reported in line with the Harmonised System⁹ (HS) and the Combined Nomenclature¹⁰ (CN), which do not include detailed information on caviar products. On the other hand, CITES trade data provide more details in terms of species, origin, trade purpose, etc. However, the CITES data only include trade volumes and not values.

From 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 are consequently harder to interpret. There are large deviations both between and within the different data sources used in this study. 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 methodologies introduced in the following sub-chapters.

0.2.1 CITES Trade Database

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 183¹¹ parties who 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

⁹ World Customs Organization <http://www.wcoomd.org/en/topics/nomenclature/overview/what-is-the-harmonized-system.aspx>

¹⁰ Council Regulation (EEC) No 2658/87 of 23 July 1987 on the tariff and statistical nomenclature and on the Common Customs Tariff

¹¹ [List of Contracting Parties | CITES](#)

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permits and certifications are issued for international trade in specimens listed in the appendices of the agreement¹².

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 by October 31st the following year and are entered into the CITES Trade Database upon submission. The data can be extracted from an online database, or through a bulk download of the entire database.

Compared to the caviar study in 2018, the methodology for this edition of the study has changed. Instead of downloading comparable tables from the online database, the entire CITES trade database was downloaded¹³. Taxa were matched against the FAO common names of species (with hybrid names manually created based on the FAO common names).

From the database, which includes data on all species, both fauna and flora, covered by the convention, only observations where the variables “family” or “order” equalled “Acipenseridae” were kept. This resulted in a dataset with 234.646 observations.

Further filtration and transformation of the dataset consisted of the following:

1. Trade terms other than “caviar” or “eggs” were excluded¹⁴. This amounted to 103.127 observations being deleted.
2. All units of measurements were converted to kilograms. Observations which could not be converted (cm², litres, millilitres, and blanks) were excluded. This amounted to 1.371 observations being deleted.
3. Trade purpose other than “commercial” were excluded¹⁵, amounting to deletion of 3.196 observations.
4. The time-period was set to 2010-2018, excluding 44.915 observations. Although data from 2019 were available, these data were incomplete and therefore excluded.
5. Through working with the data, 66 observations were classified as outliers and removed. Observations were first identified as possible outliers due to abnormal high volume. These observations were only classified as outliers and removed after an overall assessment comparing importer- and exporter-reported volumes, and other trade between the two trade partners as well as comparisons with other sources concerning both production and trade. The complete list of removed outliers is attached in Appendix 1.

The final dataset used for the analyses in this study consists of 81.971 observations.

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*”¹⁶. 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*”.

¹² Read more about the CITES regulation in the convention texts available at <https://cites.org/eng/disc/text.php>

¹³ UNEP-WCMC (Comps.) 2020. Full CITES Trade Database Download. Version 2020.1. CITES Secretariat, Geneva, Switzerland. Compiled by UNEP-WCMC, Cambridge, UK. Available at: trade.cites.org.

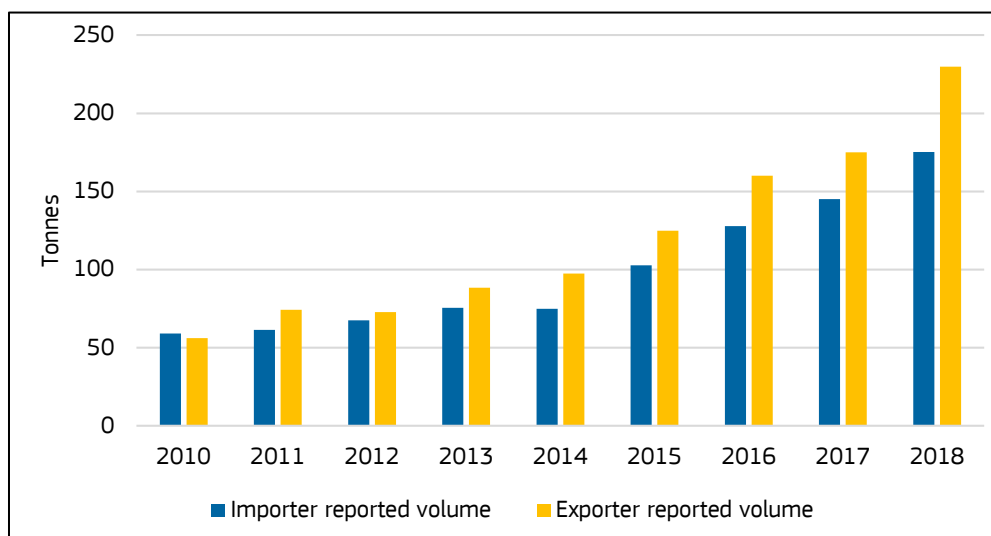
¹⁴ Bodies, bone pieces, bones, carapaces, carvings, cosmetics, derivatives, eggs (live), extract, fingerlings, fins, genitalia, jewellery, leather products, live, meat, medicine, oil powder, skeletons, skin pieces, skins, soup, specimens, swim bladders, trophies, unspecified.

¹⁵ Personal, unknown, scientific, circus or travelling exhibition, breeding in captivity or artificial propagation, educational, medical (including biomedical research), zoo, law enforcement/judicial/forensic.

¹⁶ https://trade.cites.org/cites_trade_guidelines/en-CITES_Trade_Database_Guide.pdf

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Figure 1: Yearly CITES trade volumes of caviar by reporter type (tonnes)



Source: CITES Trade Database

Except for 2010, exporter-reported volumes were higher than the volumes reported by importers. This could imply that the issue of permits being only partially used or not used at all occurs more often for exporters than for importers, so exporter-reported volumes may be greater than those actually traded.

0.2.2 EUMOFA – EU trade data from EUROSTAT-Comext

EUROSTAT (Comext) data available through EUMOFA monitors monthly trade flows within the EU and between EU Member States and third countries. Based on literature and studies, contacts with stakeholders and own analyses, the CN code 16043100 refers to caviar from sturgeons.

The data include several transactions with very low prices, and the EU export exceeds the production. Between 2014 and 2020, the yearly total export volume (both intra and extra EU) varied between 260 and 670 tonnes. This indicates that products other than sturgeon caviar are also included in this CN code.

European stakeholders (producers and distributors) have indicated that caviar is traded with a “floor price” ranging between 300 EUR/kg to 500 EUR/kg, depending on the species from which the caviar was produced, the country of origin, and the volumes sold.

While stakeholders indicated a floor price of 300 EUR/kg for their caviar products, some old products from storage could be sold at far lower prices. Furthermore, the average price of EU imports from China has dropped from more than 400 EUR/kg in 2014 to just above 200 EUR/kg for the past three to four years.

In the 2018 report, a floor price of 100 EUR/kg was used, meaning observations with prices below this threshold were excluded. However, stakeholders have indicated that this threshold might be too low, so for this year’s edition of the report, further tests have been made concerning the floor price. The tests were made with three different minimum floor prices and comparing the trade volumes with other sources:

- Floor price of 100 EUR/kg
- Floor price of 150 EUR/kg
- Floor price of 200 EUR/kg

With a floor price of 200 EUR/kg, the trade volumes were assessed as too low, meaning actual sturgeon caviar products were excluded from the analysis. However, the effects on the trade volumes are small

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when comparing a floor price of either 150 EUR/kg or 100 EUR/kg. After a general assessment considering data analysis and stakeholders' input, the floor price of 100 EUR/kg is used, keeping with the methodology of the previous report. Consequently, transactions with a unit price lower than 100 EUR/kg were disregarded. The floor price used could of course be subject for further discussion.

0.2.3 EUMOFA – data from IHS Markit on trade flows between third countries

EUMOFA collects monthly trade data reported by third countries from IHS Markit. These data have been used when assessing production and consumption in other regions (chapter 1.3 and 3.3).

In line with the methodology used for EUROSTAT data, HS code 160431 has been used in the analysis. However, other products in addition to sturgeon caviar is traded using this HS code. Between 2014 and 2020, the yearly total export volume from 27 non-EU countries was between 300 and 1.300 tonnes. To exclude caviar products most likely from species other than sturgeon, and to ensure a consistent methodology throughout the report, trade flows with an average price below 100 EUR/kg have been disregarded.

Data on trade flows between third countries are publicly available at MCS¹⁷ level on the EUMOFA website.

¹⁷ Main Commercial Species are EUMOFA aggregates of CN and HS codes as part of the harmonisation rules. Read more about EUMOFA data management methodologies (<https://www.eumofa.eu/supply-balance-and-other-methodologies>) and harmonisation correlation tables (<https://www.eumofa.eu/harmonisation>).

1. PRODUCTION

1.1 Sturgeons 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 Danube sturgeon (*Acipenser gueldenstaedtii*)¹⁸, and **Sevruga** from the starry sturgeon (*Acipenser stellatus*). All species originate in Eurasia, primarily in the Caspian Sea, the Black Sea and connected rivers.

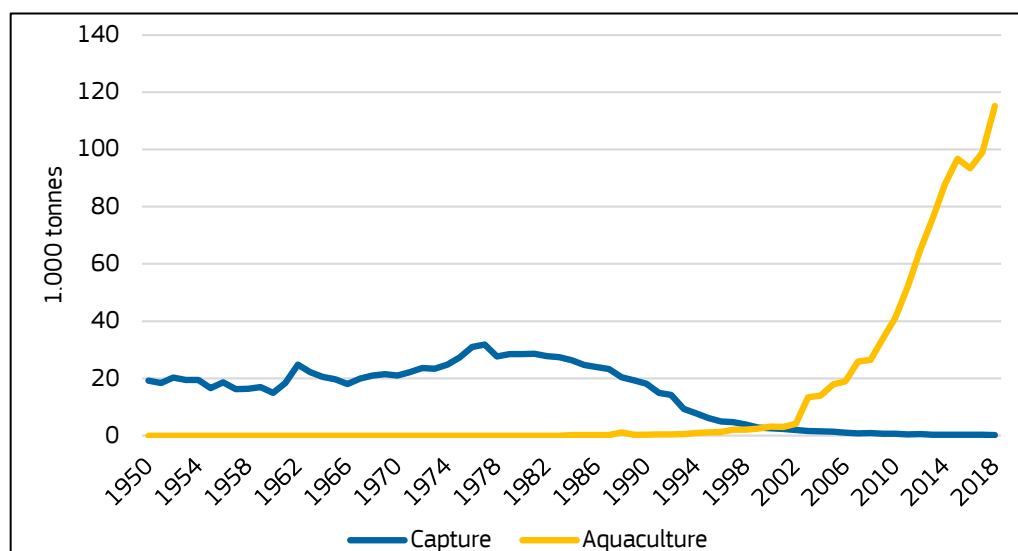
Caviars differ in qualities and the grade, and thereby the price, is determined by factors such as pearl size, texture, colour, lucidity, uniformity, separation, fragrance, firmness, taste, and maturity.

While these three species are the most well-known, most of the caviar on the market today is from several other sturgeon species. More common varieties are from the white sturgeon (*Acipenser transmontanus*), or the shortnose sturgeon (*Acipenser brevirostrum*) with more highly prized caviar originating from Siberian sturgeon (*Acipenser baerii*) and the beluga-like kaluga sturgeon (*Huso dauricus*).

Overfishing of sturgeon has almost led to the extinction of several of these species. Globally, the largest capture was recorded in 1977 at 31.800 tonnes. Since 1998, international trade of all sturgeon species and related products has been regulated under CITES¹⁹. In 2006, Romania, as the first of several countries, introduced a ban on sturgeon fishing in the Caspian and Black Sea. In 2018, a total global capture of 222 tonnes was recorded.

The first FAO-recorded harvest from aquaculture was in 1984 at 150 tonnes. Since then, production gradually increased to the beginning of the 2000s, at which point it started increasing rapidly year by year. In 2018, the world aquaculture production of sturgeon was about 115.168 tonnes²⁰. Subsequently, nearly all caviars on the market today are harvested from farmed sturgeon.

Figure 2: Capture and aquaculture of sturgeons (1.000 tonnes)



Source: FAO

¹⁸ Also known as the Russian sturgeon

¹⁹ See chapter 0.2.1 for more information about CITES regulation.

²⁰ Note that FAO has updated their database adjusting quantities. Production numbers listed in the previous report are higher than the current reported numbers.

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1.1.1 Production cycle

Several different technologies are used for rearing sturgeon. Estimates from 2016 show that roughly 36% of sturgeons are reared in flow-through systems, followed by recirculating aquaculture systems²¹ (21%), and cages (18%)²². Ponds are also used, but only make up a small percentage (7%)²³. The remaining sturgeon rearing is undertaken using a combination of techniques.

Exploiting sturgeons 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 sex can be determined after an average of three years of farming, depending on the species, through using ultrasound. During this period, both male and female sturgeons are reared, and after sex determination, males are harvested.

To harvest the caviar, female fish are monitored through ultrasound to determine if they are ready to spawn, and if the eggs are ready for harvesting. Females that are near harvest are purged in separate tanks with fresh, colder water, and taken off feed for four to six weeks²⁴. This mimics the natural breeding habits of the fish and prevents undesired taste in the eggs. After purging, the fish are slaughtered, and their egg sac is removed. Once removed, the egg sac is rolled by hand over a sieve/metal grate to separate the eggs from the surrounding membrane. A control process then takes place to remove discoloured eggs and other impurities as well as to determine the size of the eggs. The eggs are salted by hand and either immediately placed in cans that are weighed down to press out excess air, allowing the caviar to absorb salt, or directly placed in small cans placed under vacuum. Caviar that is only lightly salted is entitled *malossol* and has a short shelf life, but higher value. Additives such as Borax and LIV-1 can be added in small amounts to the caviar to extend the shelf life, in addition to pasteurising the caviar^{25,26}.

Several techniques for harvesting caviar without killing the fish have been tested. Two main methods have emerged as no-kill alternatives: milking and c-section²⁷. The milking method involves massaging the eggs out of the sturgeon, without cutting into the fish. A hormone is administered to the fish, inducing labour and releasing the eggs from the membrane of the fish allowing for the collection of the eggs. However, the labour inducing hormones changes the texture and taste of the pearls and industry stakeholders claim the quality is inferior to caviar produced through traditional methods^{28,29}. The c-section method requires a small incision in the fish to access and remove the egg. However, following a c-section the fish are susceptible to infections and may in some cases not be able to produce eggs later. The increased costs of labour and time required to utilize the non-kill caviar methods, alongside the risk of poorer quality caviar and reduced fish welfare, currently makes traditional methods the preferred alternative for industry stakeholders.

Below there is a short description of the common sturgeon species used in caviar production and time for reaching maturity.³⁰

²¹ Read more about RAS in the EUMOFA report [Recirculating Aquaculture Systems](#), published in December 2020

²² Bronzi, P, Chebanov, M, Michaels, JT, Wei, Q, Rosenthal, H, Gessner, J. Sturgeon meat and caviar production: Global update 2017. *J Appl Ichthyol.* 2019; 35: 257– 266. <https://doi.org/10.1111/jai.13870>

²³ *Ibidem*

²⁴ <https://roadsandkingdoms.com/2018/farmed-russian-sturgeon-caviar-in-the-united-states/>

²⁵ <https://caviar-aquatir.de/faq/>

²⁶ <https://www.careliancaviar.com/our-caviar/interesting-facts-about-caviar>

²⁷ <https://www.nhpr.org/post/no-kill-caviar-aims-keep-treat-and-save-sturgeon#stream/0>

²⁸ *Ibidem*

²⁹ <https://caviarstar.com/blogcaviar-harvesting-how-to-make-caviar-where-does-caviar-come-from/>

³⁰ FAO FishFinder

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

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

Beluga: maturity is reached after 19-22 years in the wild, with spawning occurring a minimum of five years later. In captivity, the species reaches maturity after 16 - 18 years, making it the most expensive sturgeon species to rear.

Danube: maturity is reached at 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 spawn every four years, and older females every 9-11 years. In captivity, maturity is reached during its tenth year. Caviar is of a higher quality after 11-15 years.³¹

Starry: maturity in captivity is reached after 8 - 10 years. In the wild females mature with an average age of 9.7 years and rarely spawn more than three times in their lives³².

Sterlet: matures faster than other sturgeon varieties. In the wild, males reach sexual maturity at an age of 3-6 years old, one to two years earlier than the females³³ while in captivity maturity is reached after 4 - 5 years.

³¹ <https://www.cavaliercaviarclub.com/>

³² <http://www.fao.org/fishery/species/2071/en>

³³ <http://www.fao.org/fishery/species/2070/en>

1.2 EU production of caviar

According to FEAP, EU Member States produced 164 tonnes of caviar in 2018, an increase of 12% from 145,8 tonnes in the year before, and a 55% increase from 106 tonnes in 2015 when FEAP first started disseminating production volumes. The largest producers were Italy, France, Poland and Germany, accounting for 84% of total production in 2018.

Table 1: Caviar production by MS as reported by FEAP members (tonnes)³⁴

Producing MS	2015	2016	2017	2018	Growth (2015-2018)
Italy	35	38	43	54	54%
France	23	30	37	45	96%
Poland	10	15	20,4	24	140%
Germany	17	15	16,1	15	-12%
Spain	4	6	5	7	65%
Bulgaria	6	7	8	6	0%
Belgium	3	3	3,8	5	67%
Finland	4	4	3,5	5	25%
Latvia	0	0	3	3	N/A
Netherlands*	2	2	1		-100%
Hungary	2	3	2		-100%
Greece			2		N/A
Austria*			1		N/A
Total	106	123	145,8	164	55%

*Currently does not have any caviar producers as FEAP members

Source: FEAP

FEAP does not publish information about which sturgeon species are reared by their respective members, but assumptions can be made by analysing CITES trade data. It is important to note that the CITES trade data includes exports of caviar products which have been imported, repackaged and then re-exported. The caviar exported by a country may therefore not necessarily reflect the production of the different sturgeon species in the MS.

Of the caviar exporting MS, Spain mainly exports caviar from the Adriatic sturgeon (53%) and Siberian Sturgeon (34%). Bulgaria mainly exports caviar from the Danube sturgeon (95%), while Belgium primarily exports caviar from a Siberian/Danube sturgeon hybrid (61%) followed by Danube sturgeon (23%). Finland only exports caviar from the Siberian sturgeon, while Latvia mainly exports caviar from the Siberian sturgeon (81%) and Sterlet sturgeon (17%).

³⁴ FEAP only collects information from its members. Therefore, if a sturgeon producer is not a member of FEAP their production is not taken into consideration. The numbers present in the table may therefore not fully represent the caviar production in MS.

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Table 2: Export of caviar by sturgeon species in each caviar producing MS*, 2018

	Italy	France	Poland	Germany	Spain	Bulgaria	Belgium	Finland	Latvia
Siberian sturgeon <i>Acipenser baerii</i>	X	X	X	X	X		X	X	X
Danube sturgeon <i>Acipenser gueldenstaedtii</i>	X	X	X	X	X	X	X	X	X
Kaluga/Amur sturgeon hybrid <i>Huso dauricus x acipenser schrenckii</i>		X			X		X		X
White sturgeon <i>Acipenser transmontanus</i>	X	X		X			X		
Beluga <i>Huso huso</i>	X	X		X	X	X	X		
Acipenseridae hybrid <i>Acipenseridae hybrid</i>		X		X					
Starry sturgeon <i>Acipenser stellatus</i>	X	X		X		X			
Siberian/Danube sturgeon hybrid <i>Acipenser baerii x gueldenstaedtii</i>	X	X					X		
Adriatic sturgeon <i>Acipenser naccarii</i>	X	X			X				
Beluga/Siberian sturgeon hybrid <i>Huso huso x acipenser baerii</i>	X								
Acipenser hybrid <i>Acipenser hybrid</i>				X					
Sterlet sturgeon <i>Acipenser ruthenus</i>	X	X		X			X		X
Siberian/Adriatic sturgeon hybrid <i>Acipenser baerii x naccarii</i>	X	X			X				
Kaluga <i>Huso dauricus</i>									
Amur sturgeon <i>Acipenser schrenckii</i>					X				X
Danube/Siberian sturgeon hybrid <i>Acipenser gueldenstaedtii x baerii</i>									

* as reported by FEAP members

Source: Own elaboration of CITES export data

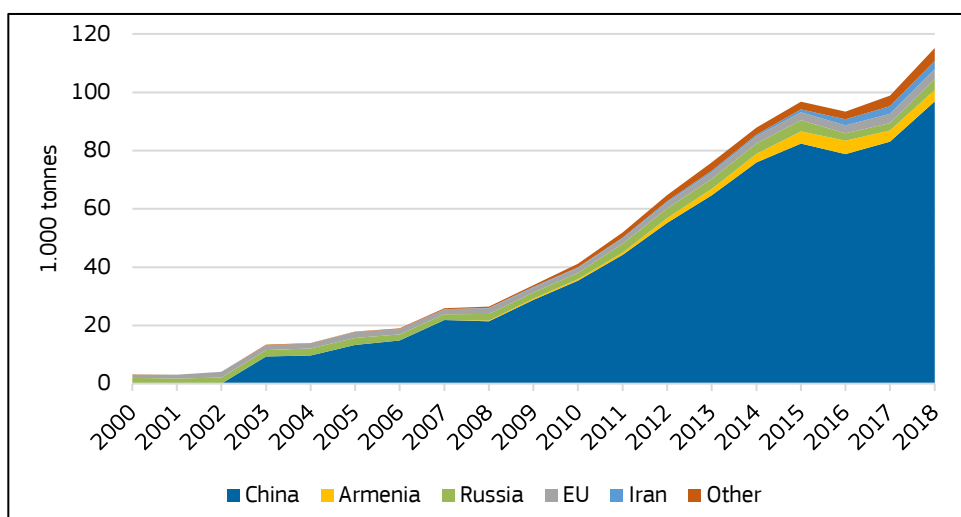
1.3 Production in other regions

The global production of caviar in 2018 has been estimated to be 380 tonnes³⁵.

Over the past 20 years, there has been a steep growth in aquaculture production of sturgeons, mainly driven by China. 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, Chinese production has increased by tenfold to almost 97.000 tonnes in 2018.

In 2018, China accounted for 84% of global sturgeon production, followed by Armenia at 3% (3.900 tonnes), and Russia at 3% (3.800 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 from 2013 onwards.

Figure 3: Sturgeon production by top producing countries (1.000 tonnes)



Source: FAO

Table 3: Sturgeon production (tonnes)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
China	35.324	44.211	55.184	64.652	75.920	82.436	78.764	83.058	96.914
Armenia	550	830	1.636	2.170	2.931	4.115	4.649	3.798	3.910
Russia	2.078	3.020	3.270	3.430	3.560	3.845	2.517	2.584	3.791
EU	1.793	1.821	2.092	2.317	2.473	2.731	2.699	3.152	3.366
Iran	251	312	456	564	650	1.071	2.146	2.618	2.839
Vietnam	600	1.000	1.200	1.200	693	785	939	1.331	1.400
USA	200	300	300	947	947	947	947	947	1.166
Other	265	342	535	671	681	779	741	1.332	1.763
Total	41.061	51.836	64.673	75.951	87.855	96.709	93.402	98.819	115.149

Source: FAO

³⁵ First World Caviar Forum, 7th May 2019.

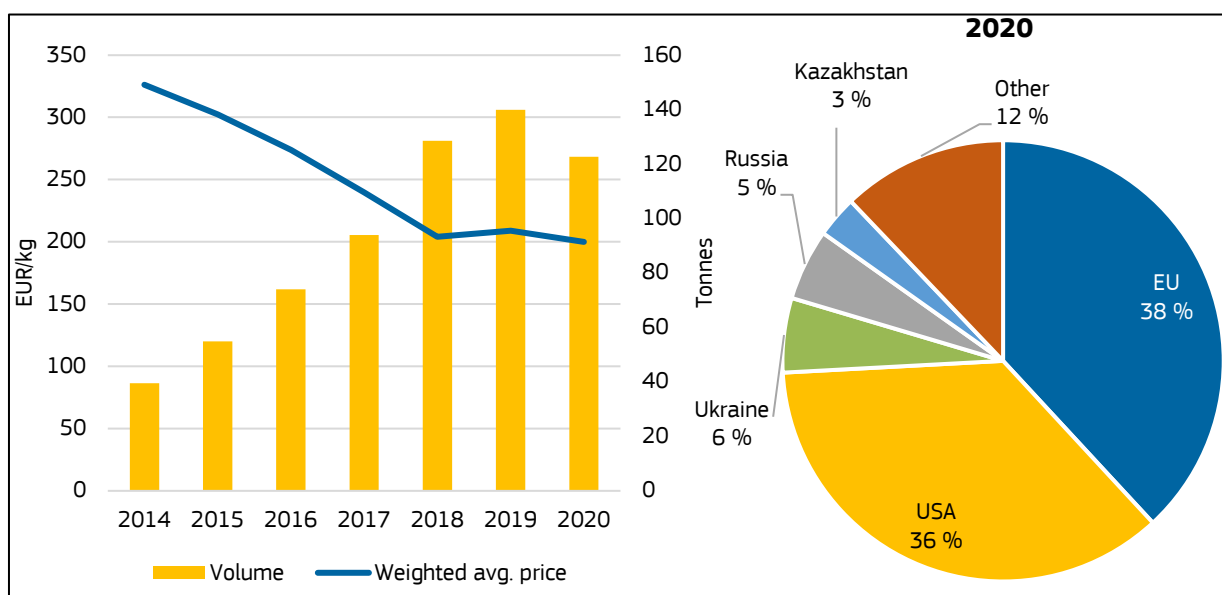
The caviar market: production, trade, and consumption in and outside the EU

1.3.1 China

According to the China Fishery Statistical Yearbook 2020, the production of sturgeon reached 102.042 tonnes in 2019³⁶. Much of the sturgeon meat is produced exclusively for consumption³⁷, but China still supplies an estimated one third of global caviar volumes³⁸. There are no reports of the total caviar production in China. However, the Chinese company Kaluga Queen reportedly produced 86 tonnes of caviar in 2018³⁹. Roughly half of Kaluga’s production is sold to Europe, 20% to the USA, and 10% to Russia⁴⁰. At present, Kaluga Queen produce about 200.000 sturgeon fry each year, claiming a survival rate of each batch as high as 99%⁴¹.

In 2020, China exported 123 tonnes of caviar, down from 140 tonnes in 2019. The largest export market for Chinese caviar in 2020 was the EU (38%), closely followed by the USA (36%). As the volumes of Chinese caviar export has increased year by year, the price level decreased by almost 40% between 2014 and 2018 but seems to have stabilised at around 200 EUR/kg since.

Figure 4: Chinese export of caviar. Volume and weighted average price* (left-hand side). Main export markets in 2020 (right-hand side)



*Nominal values

Source: EUMOFA/IHS Markit

³⁶ China Fishery Statistical Yearbook 2020 pg. 33

³⁷ World Caviar Forum 2019

³⁸ <https://www.businessinsider.com/china-caviar-prices-kaluga-queen-2020-2?r=US&IR=T>

³⁹ <https://gulfnews.com/photos/news/caviar-queen-chinese-roe-reigns-around-the-world-1.1576149388350>

⁴⁰ *Ibidem*

⁴¹ <https://www.kalugaqueen.com/gywm>

The caviar market: production, trade, and consumption in and outside the EU

1.3.2 Armenia

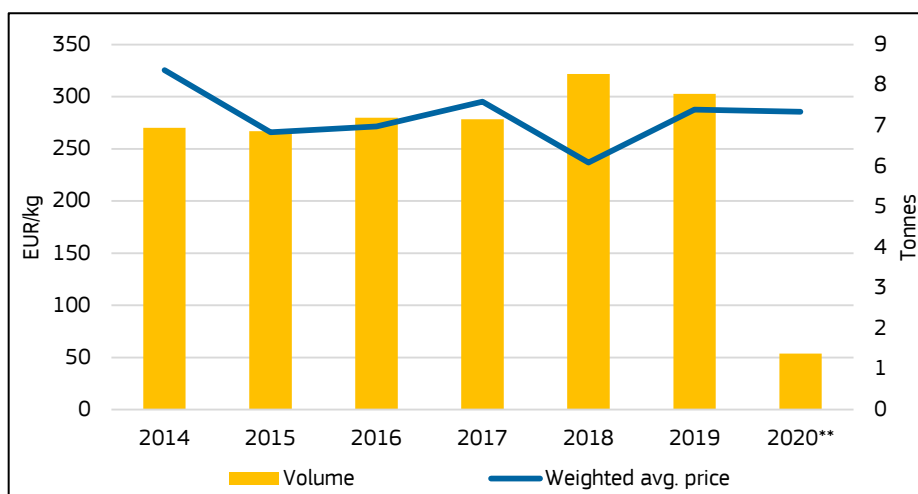
Although sturgeon production is high in Armenia, these volumes are most likely due to production of meat for consumption, and not primarily from caviar production. Industry stakeholders have estimated that Armenia produces between 10 tonnes and 20 tonnes of caviar. Armenian reported trade data is not available but, considering imports from Armenia by the other reporting countries, the yearly Armenian export volume between 2014 and 2019 is around 1 tonne with an increasing average price (205 EUR/kg in 2014 and 337 EUR/kg in 2019). In the CITES trade data, yearly Armenian export of caviar varies between 0 and 3 tonnes.

1.3.3 Russia

It is estimated that Russia produced between 40 and 50 tonnes of sturgeon caviar in 2019 and 2020^{42,43}. In 2019, there were 80 farms in Russia producing sturgeon and caviar. There are some disagreements about whether the Russian caviar production numbers contain falsely labelled caviar obtained through imports from China and Uruguay, before being reexported as Russian products⁴⁴. A solution proposed to combat the issue with counterfeited caviar is electronic labelling of caviar in cooperation with the Union of Sturgeon Breeders⁴⁵. Observations of the Russian caviar black market show a fall in the domestic market from 420 tonnes to 170 tonnes of illegal caviar over the past six years⁴⁶.

In 2020, Russia exported around one tonne of caviar, which is low compared to previous years where exports had been relatively stable between seven tonnes and eight tonnes. The trade statistics do not specify which countries Russia exports caviar to. Prices of Russian caviar exports have been relatively stable for the last seven years, fluctuating between 237 EUR/kg (2018) and 326 EUR/kg (2014). The Russian Federal Agency for Fishery has set a goal of increasing its export of sturgeon caviar to 38 tonnes by 2025⁴⁷.

Figure 5: Russian export of caviar. Volume and weighted average price*



*Nominal values

**January-November

Source: EUMOFA/IHS Markit

⁴² <https://www.seafoodsource.com/news/supply-trade/russian-caviar-production-up-23-percent-but-skeptics-claim-mislabeling>

⁴³ <https://rskrf.ru/tips/rassledovaniya/roskachestvo-issledovalo-osetrovuyu-ikru-vyavleny-zapreshchennaya-bura-kontrafakt-i-drujie-narusheniya-/>

⁴⁴ <https://www.seafoodsource.com/news/supply-trade/russian-caviar-production-up-23-percent-but-skeptics-claim-mislabeling>

⁴⁵ <https://rosng.ru/post/rossiya-v-pyat-raz-velichit-eksport-chernoy-ikry-za-rubezh-za-pyat-let>

⁴⁶ <http://varpe.org/analytics/rossiyskiy-i-mirovoy-rynok-chernoy-ikry/>

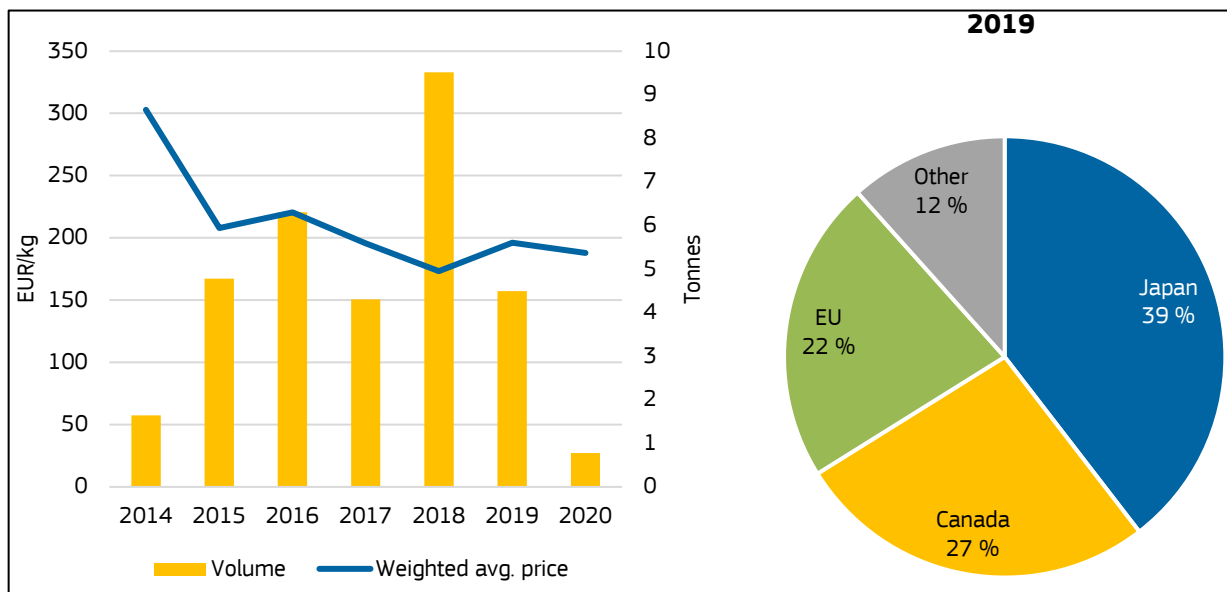
⁴⁷ <https://rosng.ru/post/rossiya-v-pyat-raz-velichit-eksport-chernoy-ikry-za-rubezh-za-pyat-let>

The caviar market: production, trade, and consumption in and outside the EU

1.3.4 USA

It is estimated that the USA produced 18 tonnes of caviar in 2018⁴⁸, and the FAO reports 1.166 tonnes of sturgeon production for the same year. In 2020, the USA exported around one tonne of caviar, down from four tonnes in 2019 and 10 tonnes in 2018. Looking at 2019, which may be a more representative year for exports, the USA exports were primarily destined to Japan (39%), Canada (27%), and the EU (22%). The price level of American caviar exports has experienced a downward trend, dropping from 303 EUR/kg in 2014 to 188 EUR/kg in 2020⁴⁹.

Figure 6: US exports of caviar. Volume and weighted average price* (left-hand side). Main export markets in 2019 (right-hand side)



*Nominal values

Source: EUMOFA/IHS Markit

⁴⁸ World Caviar Forum 2019

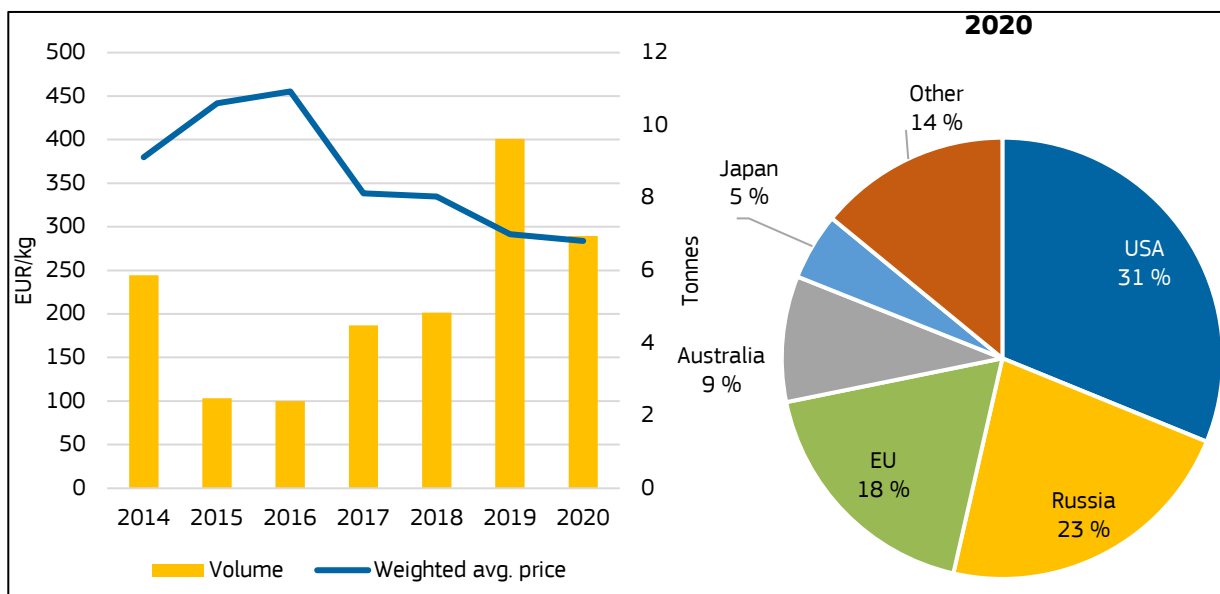
⁴⁹ Feedback from stakeholders indicate that prices in recent years are too low and not representative for the US exports of sturgeon caviar. Analyses of the US export data indicate large amounts of products other than sturgeon caviar being traded under HS code 160431 which increases the uncertainty in the methodology of using a floor price of 100 EUR/kg in this study. With no floor price the yearly US export volume over the period varies between 80 and 545 tonnes. For US exports, a floor price of 150 EUR/kg or even 200 EUR/kg is more likely to capture the real export of sturgeon caviar. Compared to the analyses with a floor price of 100 EUR/kg, a floor price of 150 EUR/kg reduces the total export volume over the 7-year period by 36%, and the yearly weighted average price declines from 308 EUR/kg in 2014 to 222 EUR/kg in 2020. A floor price of 200 EUR/kg reduces the total 7-year export volume by 58%, and the yearly weighted average price declines from 314 EUR/kg in 2014 to 248 EUR/kg in 2020.

The caviar market: production, trade, and consumption in and outside the EU

1.3.5 Uruguay

Uruguay is the leading caviar producer in South America. It is estimated that Uruguay produced 19 tonnes of caviar in 2019⁵⁰ and 94 tonnes of sturgeon⁵¹. In 2020, Uruguay exported seven tonnes of caviar. The largest shares of Uruguay’s caviar export went to the USA (31%), followed by Russia (23%) and the EU (18%). Until 2016, Uruguay experienced a growth in its export prices, reaching a peak of 455 EUR/kg. Since then, prices have trended downward reaching 284 EUR/kg in 2020.

Figure 7: Uruguayan export of caviar. Volume and weighted average price* (left-hand side). Main export markets in 2020 (right-hand side)



*Nominal values

Source: EUMOFA/IHS Markit

⁵⁰ <https://www.bloomberq.com/news/articles/2016-05-13/uruguay-is-betting-size-doesn-t-matter-in-global-caviar-market>

⁵¹ FAO, 2018

2. INTERNATIONAL TRADE OF CAVIAR

As clarified in chapter 0.1.1, for the sake of consistency in the time series, the United Kingdom is excluded from the EU aggregate.

The intra-EU trade analysed in chapter 2.1 is based on EUROSTAT (Comext) trade data.

The extra-EU trade is analysed based on two different sources. Chapter 2.2 analyses EU imports and exports with third countries based on EUROSTAT (Comext), while these trade flows are also analysed based on CITES data in chapter 2.3. The two data sources are complementary: Comext data includes values which makes it possible to analyse price developments, while CITES data only contains volumes but are more detailed *inter alia* in terms of species. A more thorough description of the sources, methodologies and assumptions are available in chapter 0.0.2.

The data concerning 2020 is not complete in terms of data submission for December from all reporting countries. However, of the main caviar producing and trading countries, only trade data from Russia is missing. The analyses on trade are therefore assessed as representative for the development in 2020.

Still, the analyses concerning 2020 should be interpreted with care as they do not necessarily represent a lasting change in export volumes or shares. With travel restrictions, closed HoReCa segments and social distancing measures due to the COVID-19 pandemic, more caviar products were sold domestically (ref. chapter 3.1). It is too soon to conclude whether this is a short-term shift in trade patterns or whether it represents a long-term trend.

2.1 Intra-EU trade

Reported intra-EU export of caviar, which consists of both caviar of EU origin and re-export of imported caviar, increased by 65% between 2014 and 2018 from 37,4 tonnes to 61,6 tonnes. The total export volume decreased by 11% in both 2019 and 2020 to 54,5 and 48,4 tonnes, respectively. There is a clear seasonality with increased volumes around holidays, especially towards the end of the year during the Christmas season and around Easter.

Table 4: Monthly intra-EU export volume (tonnes) and weighted average price* (EUR/kg)

Month	2014		2015		2016		2017		2018		2019		2020	
	Volume	Price	Volume	Price	Volume	Price	Volume	Price	Volume	Price	Volume	Price	Volume	Price
1	1,9	407	2,3	388	1,9	427	3,0	365	3,3	352	3,3	378	2,3	424
2	1,6	419	2,0	373	1,5	404	2,0	377	2,5	373	3,3	395	5,0	292
3	4,1	299	2,1	390	3,5	348	3,4	409	7,8	333	4,0	391	1,6	400
4	1,8	409	2,2	358	2,1	369	2,2	376	4,0	345	4,6	358	1,2	398
5	1,8	462	2,1	373	2,3	400	3,1	376	3,1	372	3,4	415	1,4	451
6	1,8	489	1,9	422	2,4	430	2,6	416	2,4	432	2,4	446	2,9	375
7	2,0	377	2,5	394	2,0	431	1,7	466	2,7	410	2,2	468	2,0	398
8	1,8	439	2,1	403	2,9	346	1,8	443	3,0	388	3,2	365	3,2	379
9	3,1	389	2,4	401	2,3	379	4,7	361	3,4	351	4,8	367	6,8	516
10	5,6	403	5,0	369	4,8	389	5,5	362	6,9	335	6,8	354	7,4	324
11	5,7	412	5,2	404	5,3	427	12,4	355	11,7	343	8,3	364	10,7	385
12	6,3	506	6,8	493	7,6	452	9,8	420	10,7	433	8,2	450	4,0	319
Total	37,4	418	36,6	408	38,8	406	52,3	385	61,6	369	54,5	391	48,4	383

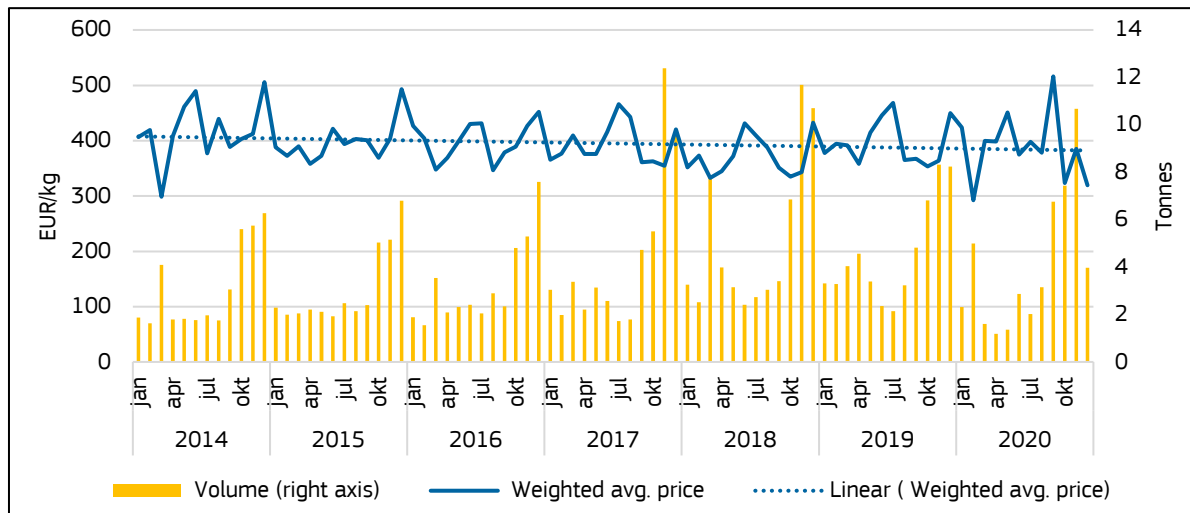
*Nominal values

Source: EUMOFA/EUROSTAT

The caviar market: production, trade, and consumption in and outside the EU

From January 2014 to December 2020, the monthly average export price fell from 407 EUR/kg to 319 EUR/kg (-21%). However, with all the price fluctuations, these two price points are not necessarily representative. The long-term downward trend in the export price corresponds to a compound monthly growth rate of -0,08%.

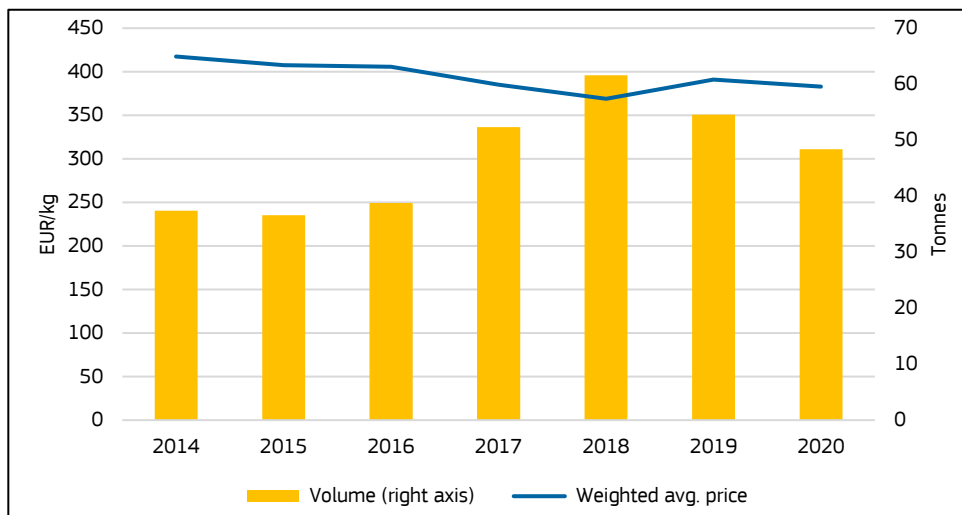
Figure 8: Monthly intra-EU export volume (tonnes) and weighted average price* (EUR/kg)



*Nominal values
Source: EUMOFA/EUROSTAT

Although the long-term linear trend is negative, the intra-EU export price actually shows an increasing trend from 2018 towards 2020. The yearly weighted average prices declined by 12% from 418 EUR/kg in 2014 to 369 EUR/kg in 2018, before increasing by 4% to 383 EUR/kg in 2020.

Figure 9: Yearly intra-EU export volume (tonnes) and weighted average price* (EUR/kg)

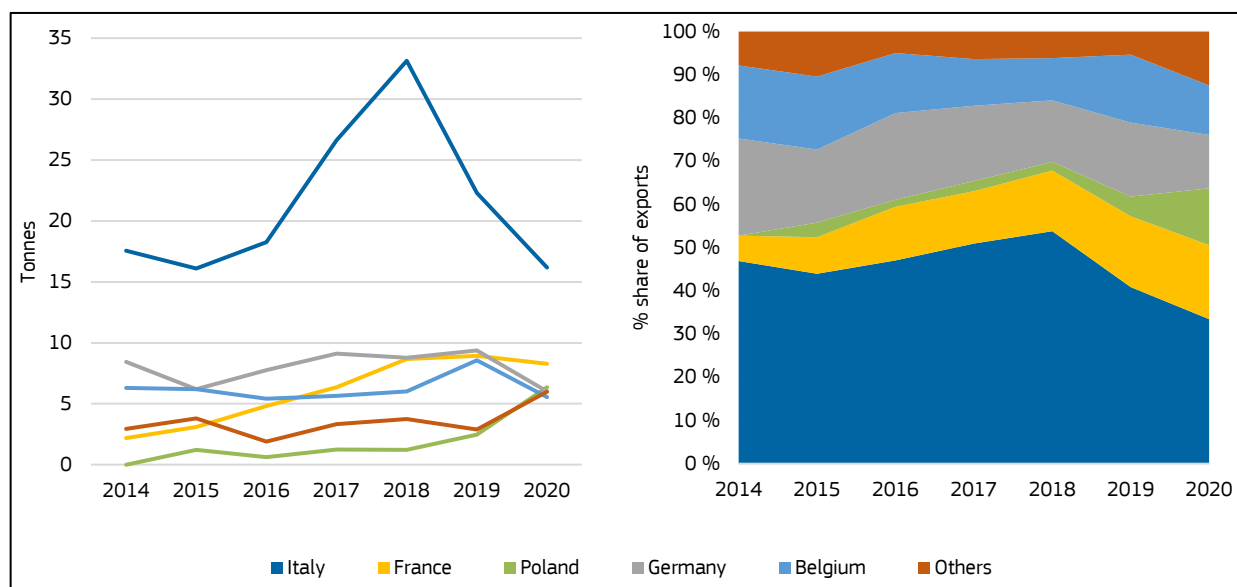


*Nominal values
Source: EUMOFA/EUROSTAT

The caviar market: production, trade, and consumption in and outside the EU

Italy is the main intra-EU exporting MS, but has lost market shares over the past two years. Between 2014 and 2018, Italy accounted for between 44% and 54% of the total intra-EU export. Increased trade from other MS, combined with a sharp decrease in Italy's export volumes, has seen Italy's share of total intra-EU exports decrease to 41% in 2019 and further to 33% in 2020.

Figure 10: Intra-EU export by main MS (tonnes on the left-hand side and export shares on the right-hand side)



Source: EUMOFA/EUROSTAT

2.2 Extra-EU trade – EUROSTAT/EUMOFA

2.2.1 Import

According to EUMOFA elaborations of EUROSTAT-COMEXT data, EU imports of caviar from third countries more than doubled in volume from 25 tonnes in 2014 to 54,5 tonnes in 2019. Extra-EU import volume decreased by 16% to 45,7 tonnes in 2020. Compared with intra-EU trade, the seasonality of extra-EU imports - peaking in December - is far clearer. The highest monthly import volume of 12,2 tonnes was recorded in December 2019.

Table 5: Monthly extra-EU import volume (tonnes) and weighted average price* (EUR/kg)

Month	2014		2015		2016		2017		2018		2019		2020	
	Volume	Price	Volume	Price	Volume	Price	Volume	Price	Volume	Price	Volume	Price	Volume	Price
1	2,1	413	0,4	454	1,9	303	1,9	421	2,2	249	4,5	297	4,6	239
2	1,5	531	0,4	376	1,0	290	3,4	234	1,5	224	5,4	256	2,5	248
3	1,1	423	0,4	416	0,6	454	1,4	303	1,8	271	2,9	240	2,7	243
4	0,9	385	0,5	429	0,9	420	0,6	334	1,6	249	2,3	264	0,2	229
5	1,3	376	0,6	401	0,9	339	0,8	335	1,5	251	1,6	236	0,4	221
6	0,7	438	0,6	395	0,9	408	2,2	261	2,5	299	3,1	255	2,1	219
7	1,3	351	0,5	477	2,3	341	1,1	291	1,6	262	2,4	286	2,8	235
8	0,9	355	0,8	371	0,8	317	0,8	355	2,1	243	3,4	253	2,1	245
9	1,4	392	1,4	349	1,3	353	3,1	256	1,9	309	3,4	302	3,3	238
10	2,7	422	2,5	369	3,2	357	3,8	326	5,2	269	5,5	248	6,0	225
11	2,8	459	3,4	302	4,1	366	4,5	274	6,7	259	7,6	262	8,8	267
12	8,3	448	5,6	356	6,0	314	6,5	291	7,1	266	12,2	254	10,0	241
Total	25,0	430	17,2	360	23,9	344	30,1	293	35,8	264	54,5	262	45,7	243

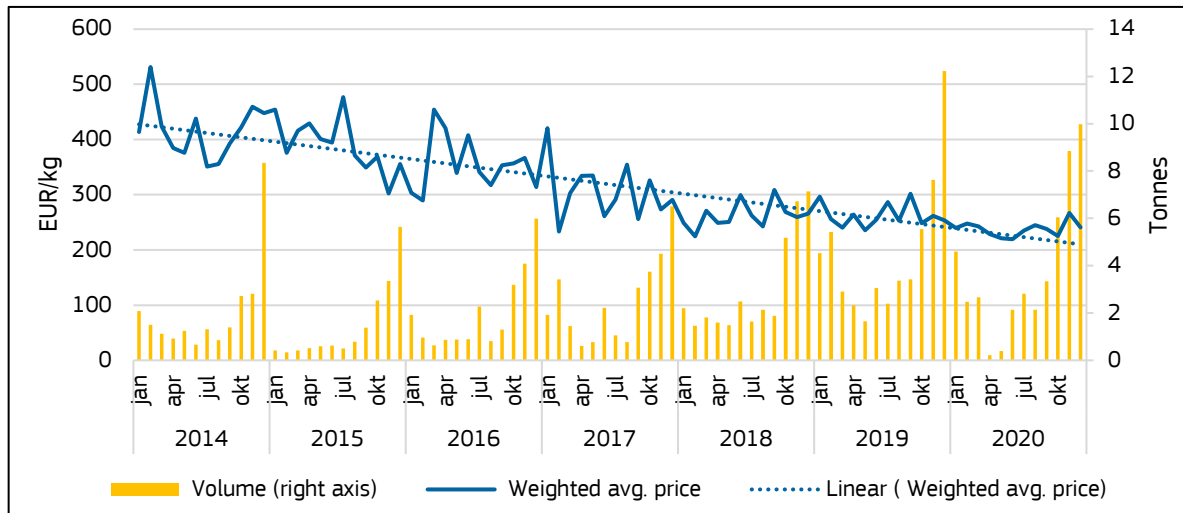
*Nominal values

Source: EUMOFA/EUROSTAT

The caviar market: production, trade, and consumption in and outside the EU

Comparing January 2014 with December 2020, the average price decreased by 43% from 413 EUR/kg to 241 EUR/kg. The long-term downward linear trend corresponds to a compound monthly growth rate of -0,84%, meaning that the average price has decreased by close to one percent each month over the past seven years.

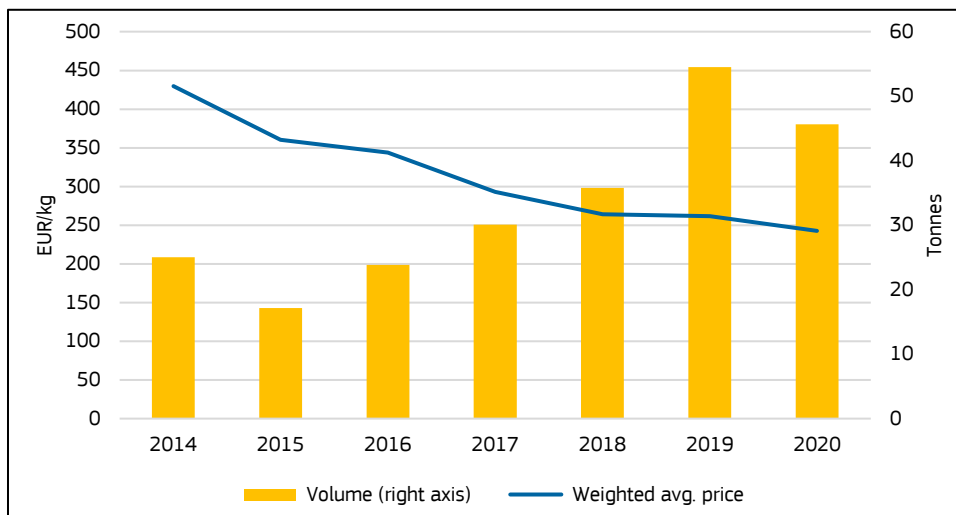
Figure 11: Monthly extra-EU import volume (tonnes) and weighted average price* (EUR/kg)



*Nominal values
Source: EUMOFA/EUROSTAT

The price decrease was strongest between 2014 and 2018, when the yearly weighted average price fell from 430 EUR/kg to 264 EUR/kg - a compound annual growth rate of -11%. From 2018 to 2020 the compound annual growth rate was -4%, leading to the lowest price over the past seven years of 243 EUR/kg.

Figure 12: Yearly extra-EU import volume (tonnes) and weighted average price* (EUR/kg)

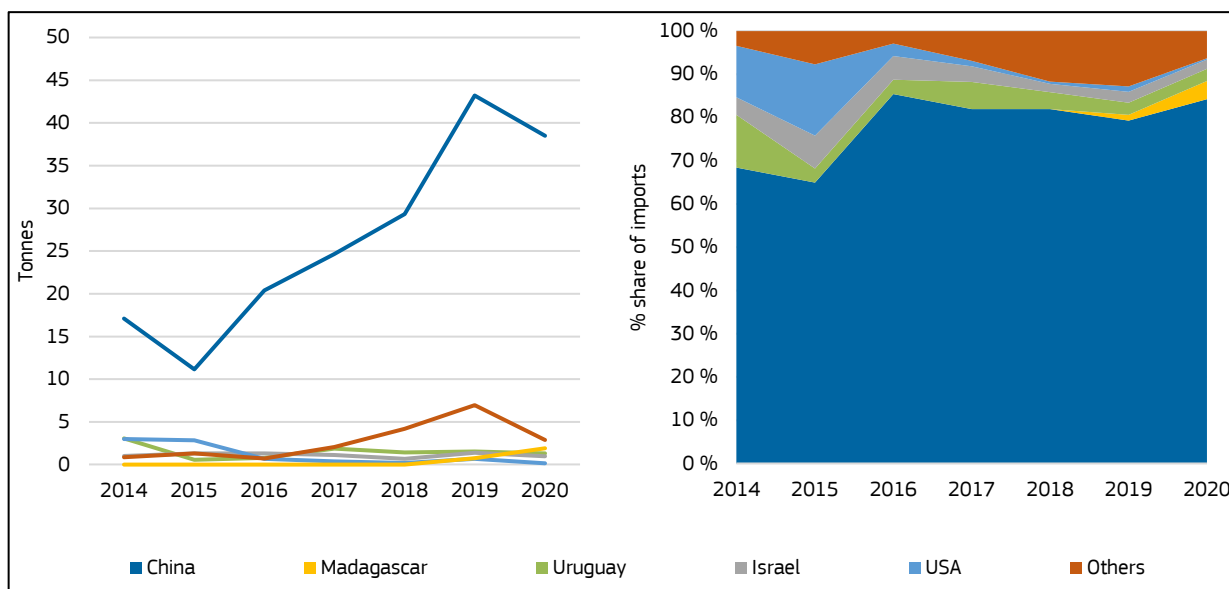


*Nominal values
Source: EUMOFA/EUROSTAT

The caviar market: production, trade, and consumption in and outside the EU

The main supplier of caviar to the EU market by far is China, with an increasing share of imports between 65% and 84% over the past five years. The highest volume was recorded in 2019, when the EU imported 43,2 tonnes of caviar from China. Other suppliers of caviar to the EU are Uruguay, Israel, and the USA. In 2017, a producer in Madagascar harvested caviar for the first time, and in 2019, France started importing it. In 2020, the French import of caviar from Madagascar amounted to 1,9 tonnes, making Madagascar the second largest extra-EU supplier to the EU.

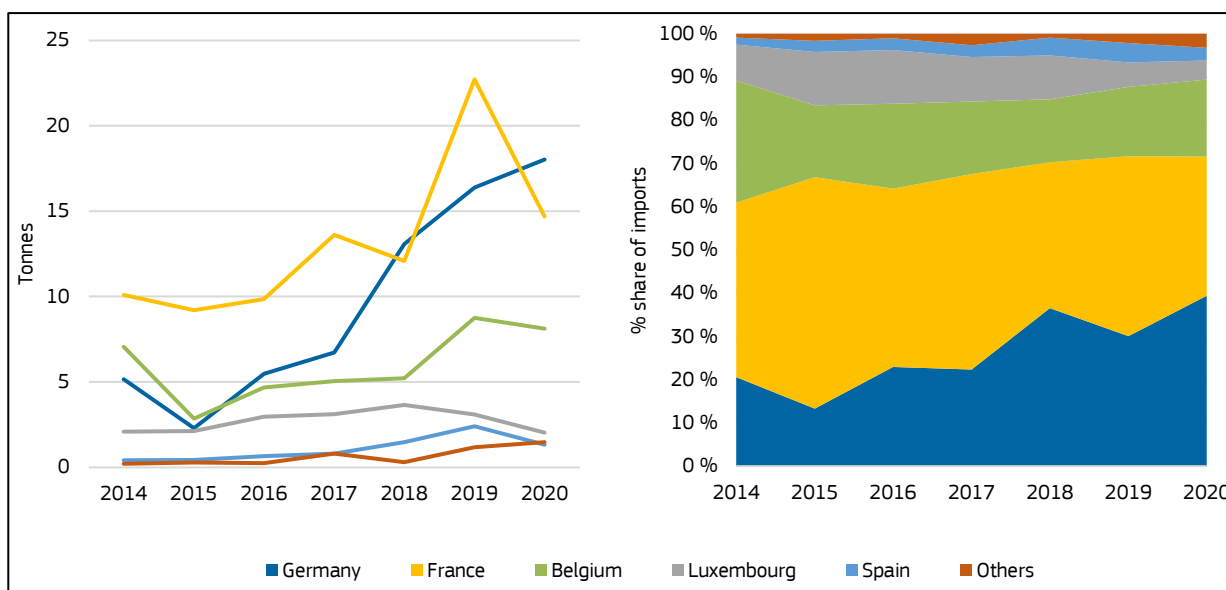
Figure 13: Extra-EU import by main suppliers (tonnes on the left-hand side and import shares on the right-hand side)



Source: EUMOFA/EUROSTAT

The main importing MS are Germany and France, with a combined share of between 61% and 72% of the imported volume over the past seven years. Their combined import volume has more than doubled, from 15,2 tonnes in 2014 to 32,7 tonnes in 2020. Belgium is the third largest importing MS with 8,1 tonnes in 2020, further followed by Luxembourg (2 tonnes) and Spain (1,3 tonnes).

Figure 14: Extra-EU import by main importing MS (tonnes on the left-hand side and percent of market shares on the right-hand side)



Source: EUMOFA/EUROSTAT

The caviar market: production, trade, and consumption in and outside the EU

2.2.2 Export

The EU is an important supplier of caviar. In 2014, 43,7 tonnes of caviar were exported to outside the EU. By 2019, the extra-EU export volume had increased by 55% to 67,5 tonnes. With the COVID-19 pandemic in 2020, export volume decreased by 27% to 49,2 tonnes. Similar to intra-EU trade, extra-EU export volumes follow a seasonal trend with higher volumes around Easter and a major peak before Christmas.

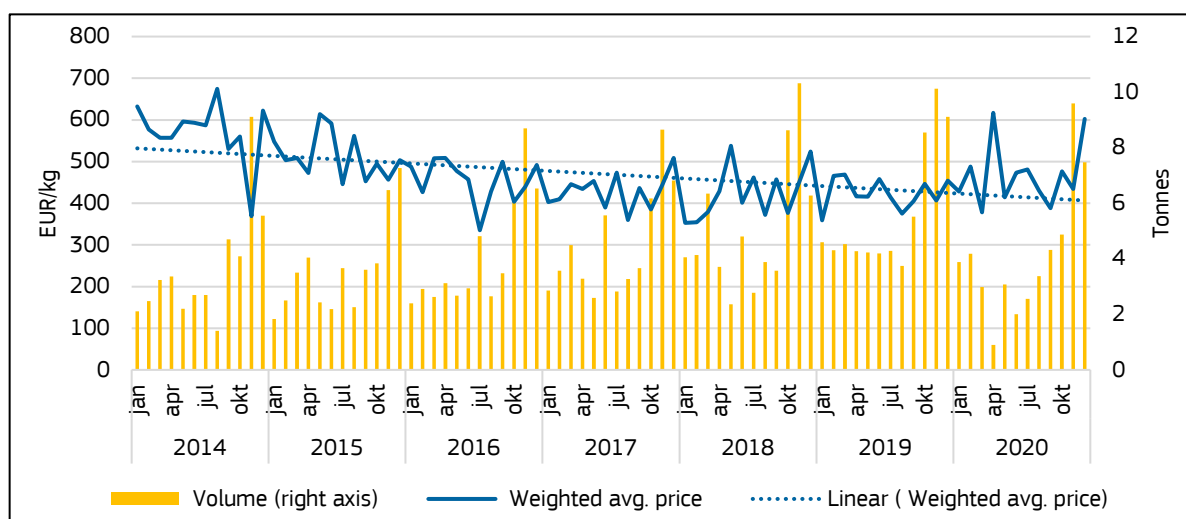
Table 6: Monthly extra-EU export volume (tonnes) and weighted average price* (EUR/kg)

Month	2014		2015		2016		2017		2018		2019		2020	
	Volume	Price	Volume	Price	Volume	Price	Volume	Price	Volume	Price	Volume	Price	Volume	Price
1	2,1	633	1,8	548	2,4	488	2,9	403	4,1	353	4,6	359	3,9	428
2	2,5	577	2,5	503	2,9	427	3,6	410	4,1	354	4,3	466	4,2	488
3	3,2	557	3,5	509	2,6	508	4,5	446	6,3	379	4,5	469	3,0	379
4	3,4	557	4,0	472	3,1	509	3,3	434	3,7	429	4,3	417	0,9	617
5	2,2	597	2,4	614	2,7	477	2,6	453	2,4	538	4,2	416	3,1	414
6	2,7	593	2,2	591	2,9	457	5,6	390	4,8	401	4,2	458	2,0	473
7	2,7	587	3,7	446	4,8	335	2,8	474	2,8	462	4,3	414	2,6	481
8	1,4	675	2,3	562	2,7	428	3,3	360	3,9	372	3,7	375	3,4	430
9	4,7	530	3,6	453	3,5	499	3,7	436	3,6	457	5,5	405	4,3	388
10	4,1	560	3,8	495	6,1	403	6,2	385	8,6	376	8,5	446	4,9	477
11	9,1	369	6,5	456	8,7	440	8,7	445	10,3	452	10,1	407	9,6	434
12	5,6	622	7,3	503	6,5	492	6,8	509	6,3	524	9,1	454	7,5	603
Total	43,7	538	43,6	500	48,9	448	53,8	432	60,9	422	67,5	426	49,2	466

*Nominal values

Source: EUMOFA/EUROSTAT

Compared to intra-EU trade, exporting MS achieve higher prices when exporting to third countries, although with large fluctuations. During the seven-year period from 2014 to 2020, the highest monthly average price was 675 EUR/kg, noted in August 2014. Just three months later, one of the lowest prices of the period was recorded, while the overall lowest price was recorded in July 2016 at 335 EUR/kg. The long-term price trend is negative, corresponding to a compound monthly growth rate of -0,32%.

Figure 15: Monthly extra-EU export volume (tonnes) and weighted average price* (EUR/kg)

*Nominal values

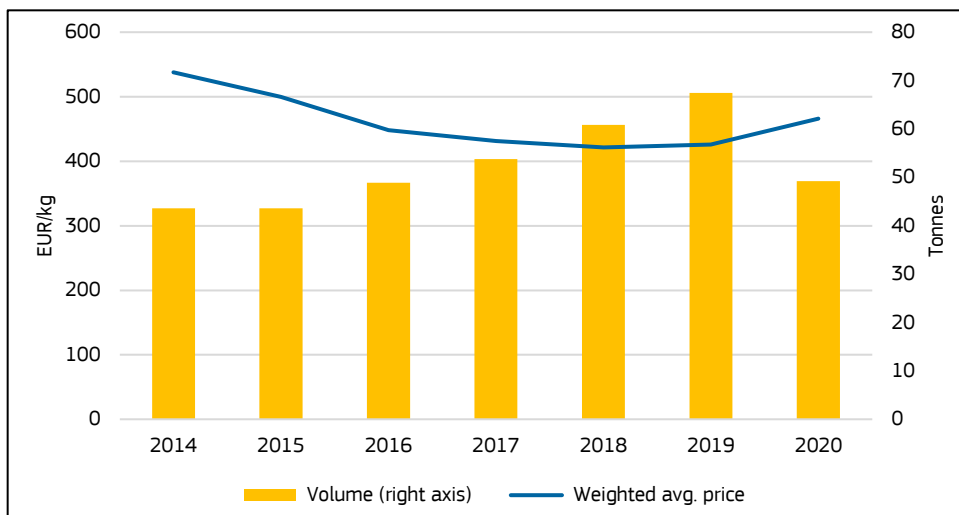
Source: EUMOFA/EUROSTAT

The yearly weighted average extra-EU export prices over the past seven years have been between 422 EUR/kg and 538 EUR/kg, on average 17% higher than the intra-EU export prices and 54% higher than the extra-EU import prices. Although the long-term trend is negative, the prices have shown signs of recovery since 2018. From the highest level of 538 EUR/kg in 2014, the price decreased by 22% to 422

The caviar market: production, trade, and consumption in and outside the EU

EUR/kg in 2022. The price then increased by 1% in 2019, followed by a 10% increase in 2020. Whether the last year’s increase to 466 EUR/kg is an actual recovery of the caviar price or merely a result of the lower volumes during the COVID-19 pandemic remains to be seen.

Figure 16: Yearly extra-EU export volume (tonnes) and weighted average price* (EUR/kg)

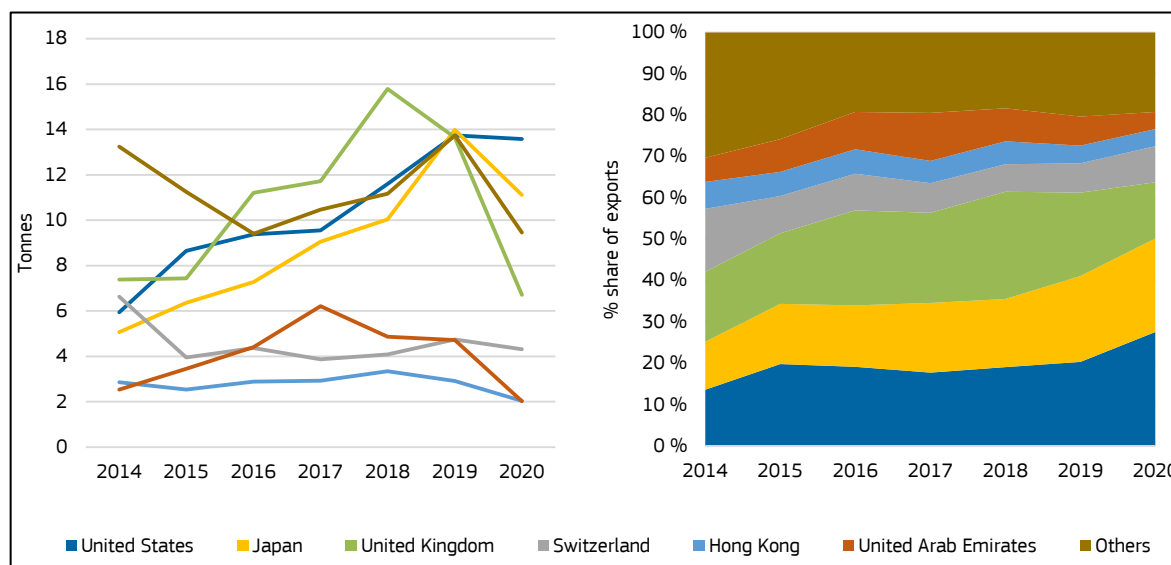


*Nominal values
Source: EUMOFA/EUROSTAT

In 2020, the EU exported caviar to 69 third countries, and to 99 third countries over the seven-year period from 2014 to 2020. Still, extra-EU export is concentrated on a few destinations. In 2020, the top ten export markets accounted for 88% of export volume, while the top five markets accounted for 71%. In fact, the top three markets (USA, Japan and the UK) accounted for 64% of the volume in 2020. Among these three markets in 2020, the average export price was highest for Japan (477 EUR/kg) followed by the USA (371 EUR/kg) and the UK (326 EUR/kg).

Although the total extra-EU export volume in 2020 decreased by 18,3 tonnes compared to 2019, the export volume to the USA remained high and only decreased by 0,2 tonnes. The overall decrease was primarily driven by Japan, the UK, the United Arab Emirates and other Asian countries.

Figure 17: Extra-EU export by main market (tonnes on the left-hand side and export shares on the right-hand side)



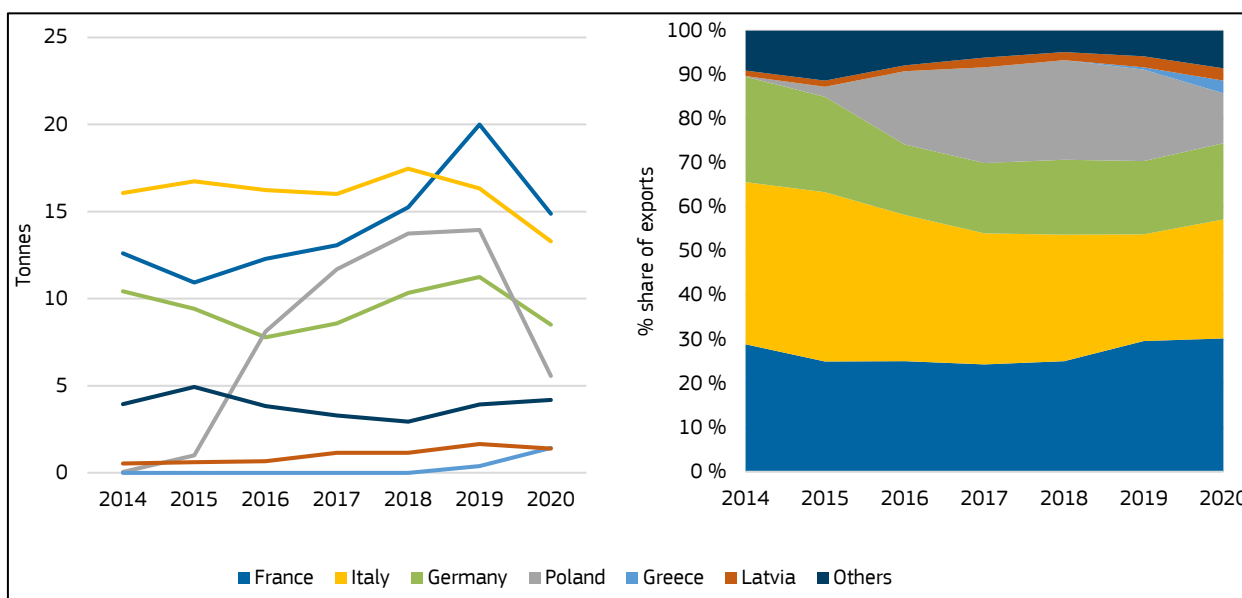
Source: EUMOFA/EUROSTAT

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The main exporting MS are the same as the main EU producers, namely France, Italy, Germany, and Poland. France has increased export volumes and became the largest exporting MS in 2019. Italy's and Germany's export volumes have been relatively stable over the past seven-year period, while Poland has increased export volumes from almost nothing in 2014 to around 14 tonnes in both 2018 and 2019. Of these top four exporters, France achieved the highest average export price in 2020 (634 EUR/kg) followed by Germany (467 EUR/kg), Italy (399 EUR/kg), and Poland (242 EUR/kg).

Overall, the export of caviar from MS to third countries decreased in 2020. According to EUMOFA/EUROSTAT, MS exported 67 tonnes of caviar in 2019 and 49 tonnes in 2020. It is currently too early to determine if the reduction is due to incomplete data, the COVID-19 pandemic or other market changes. France and Poland both reduced their exports to the United Kingdom (from 4 tonnes in 2019 to 1 tonne in 2020 and from 6 tonnes in 2019 to 2 tonnes in 2020 respectively). Poland also reduced its exports to the United Arab Emirates (from 3 tonnes in 2019 to 1 tonne in 2020) and Belarus (from 2 tonnes in 2019 to none in 2020). Greece slightly increased its exports in 2020 due to increased exports to the United States.

Figure 18: Extra-EU export by main exporting MS (tonnes on the left-hand side and export shares on the right-hand side)



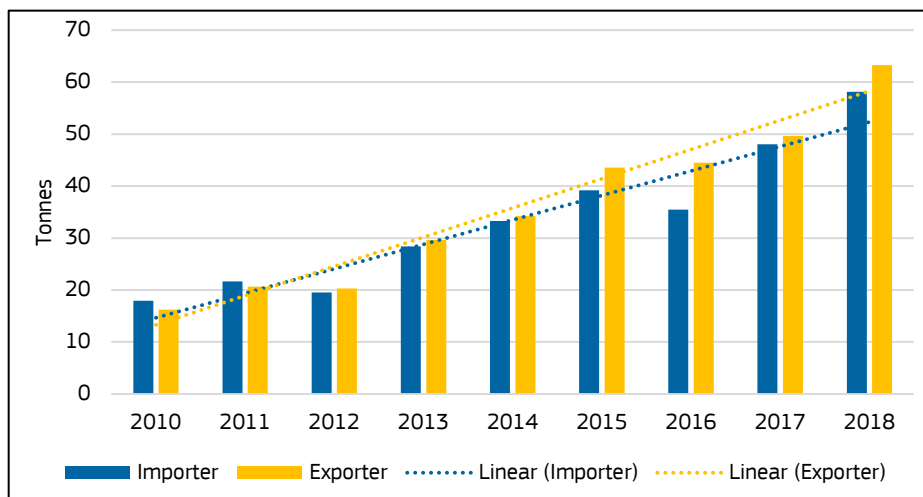
Source: EUMOFA/EUROSTAT

2.3 Extra-EU trade -CITES

2.3.1 Import

According to CITES, the EU imported between 58 tonnes and 63 tonnes of caviar in 2018. Over the period of 2010 to 2018, imports of caviar showed an increasing trend with a compound annual growth rate of 16% and 19% for importer-reported and exporter-reported quantity, respectively.

Figure 19: Extra-EU import volume of caviar 2010-2018 as reported by importers and exporters (tonnes)

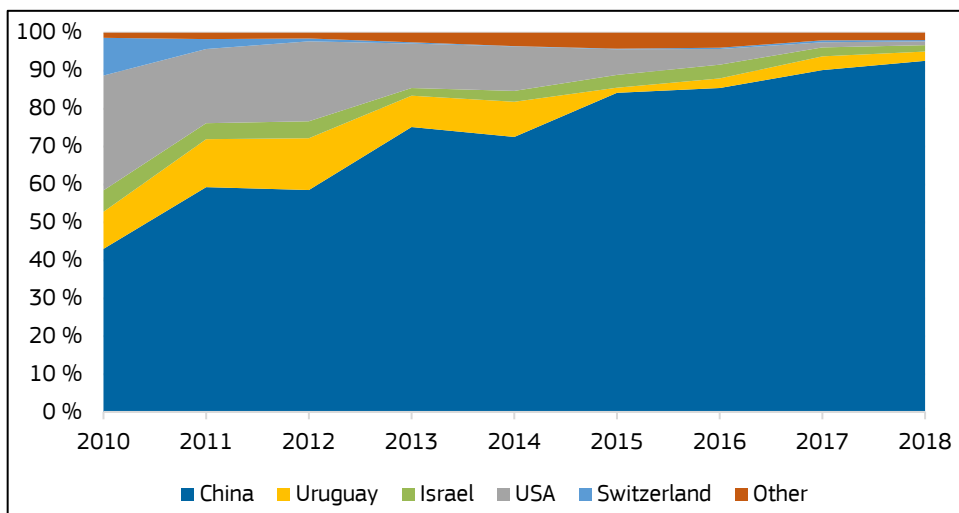


Source: CITES Trade Database

The increase in imports is largely due to China’s growth in production which has increased supply and pressured prices. According to the importer-reported quantity, the EU imported 8 tonnes of caviar from China in 2010, and 54 tonnes in 2018.

Over the same period, market shares of other countries fell. The most notable decline was for US market shares, which decreased from 30% in 2010 to only 1% in 2018, with import declining from five tonnes in 2010 to under one tonne in 2018. The EU still imports caviar from Switzerland, Uruguay, and Israel, but the aggregated percentage is only 3% of the total import volume. In addition, the EU began importing from Iran in 2012 and Moldova in 2015, although these nations represent only 1% of total import volume each.

Figure 20: Extra-EU import by main suppliers (percent of market share)

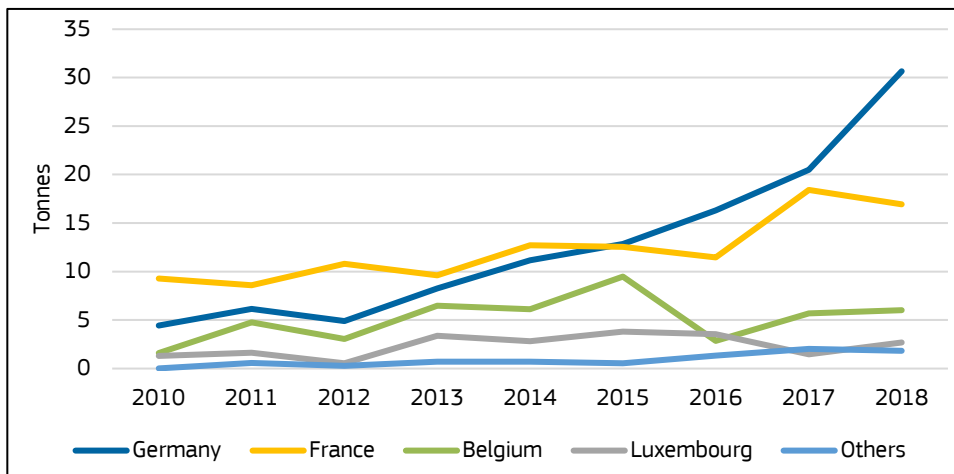


Source: CITES Trade Database

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In 2010, caviar was mainly imported by the EU MS France (52%), Germany (25%), Belgium (9%), Luxembourg (7%), and Spain (7%). Although these MS were still the main importers in 2018, the shares have changed, increasing for Germany (53%) and Belgium (10%), while decreasing for France (29%), Luxembourg (5%), and Spain (3%).

Figure 21: Main importing MS in terms of volume (tonnes)

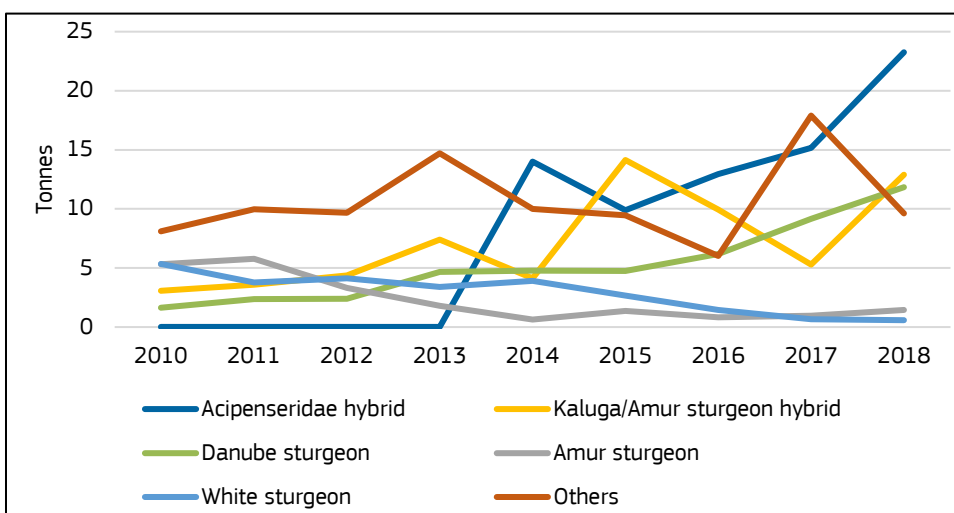


Source: CITES Trade Database

The change in caviar from various species imported to the EU from 2010 to 2018 is highly affected by the growth in exports from China. According to CITES, in 2010, 30% of EU caviar imports were from the Amur sturgeon, of which 83% originated in China and 17% in Switzerland. Caviar from the white sturgeon originating from the USA also made up 29% of total EU imports in 2010.

In 2018, 40% of EU imports of caviar were the Acipenseridae hybrid, all from China. The kaluga/Amur sturgeon hybrid represented 2% of EU imports, again all from China. Imports of caviar from the white sturgeon decreased by 89% between 2010 and 2018, accounting only for 1% of imports in 2018.

Figure 22: Main imported species to the EU in terms of volume (tonnes)



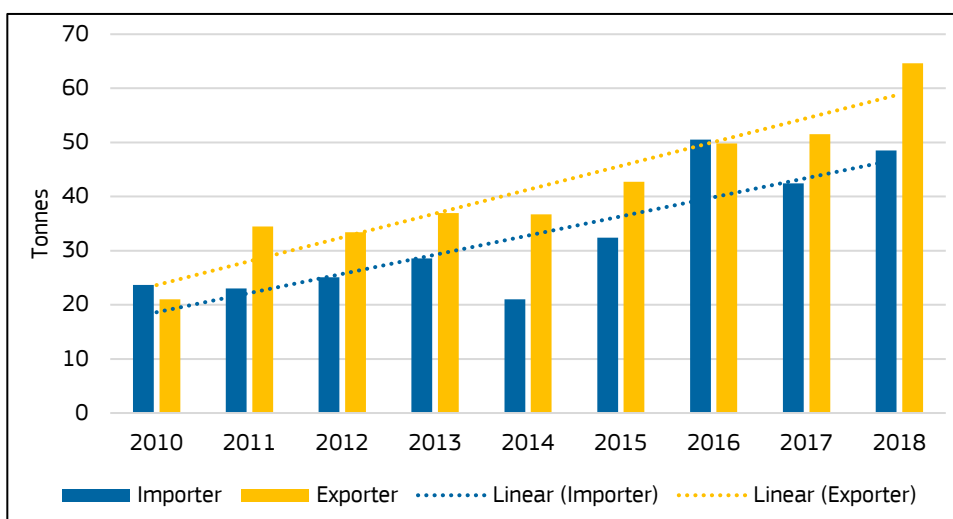
Source: CITES Trade Database

The caviar market: production, trade, and consumption in and outside the EU

2.3.2 Export

According to CITES, the EU exported between 48 and 65 tonnes of caviar in 2018. A large part of the discrepancies in Figure 23 is caused by missing importer-reported quantities (only 32 third countries reported imports from the EU). Whilst subject to inaccurate data, they still show an increasing trend over the period with a compound annual growth rate of between 9% and 15% for importer- and exporter-reported volume respectively.

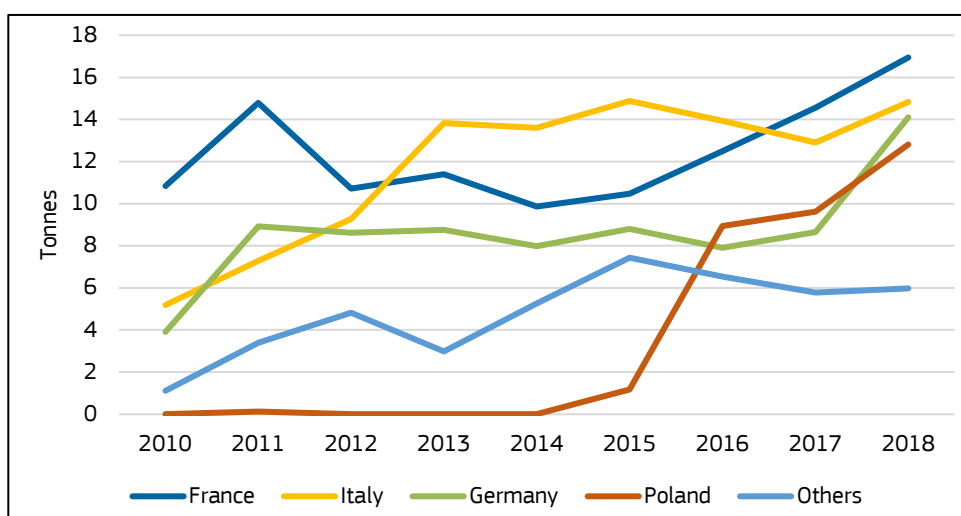
Figure 23 Extra EU export of caviar 2010-2018 as reported by importer and exporter (tonnes)



Source: CITES Trade Database

According to CITES, EU MS reported 65 tonnes of caviar exports in 2018. The four main exporting MS were France, Italy, Germany, and Poland accounting for 91% of the total export volume. In 2018, the export shares of these four countries were relatively similar. While France exported 52% of the caviar from the EU in 2010, their share was reduced to 26% by 2018 as Italy, Germany, and Poland increased their export volumes over the examined period. Poland recorded the most rapid growth, with export volumes standing at virtually nothing until 2015, to exporting nearly 13 tonnes in 2018.

Figure 24 Main exporting MS in terms of volume (tonnes)

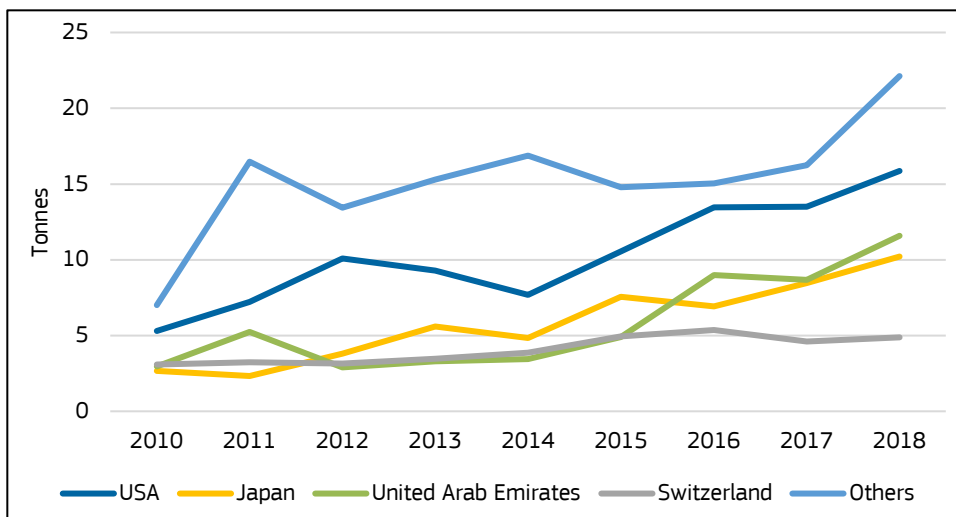


Source: CITES Trade Database

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The largest export market is the USA – the destination of 25% of EU exports both in 2010 and in 2018 - although the US import volume grew from 5 tonnes in 2010 to 16 tonnes in 2018. Other large export markets in 2018 are the United Arab Emirates (18%), Japan (16%), Switzerland (8%), and Ukraine (5%).

Figure 25 Top EU export markets in terms of volume (tonnes)

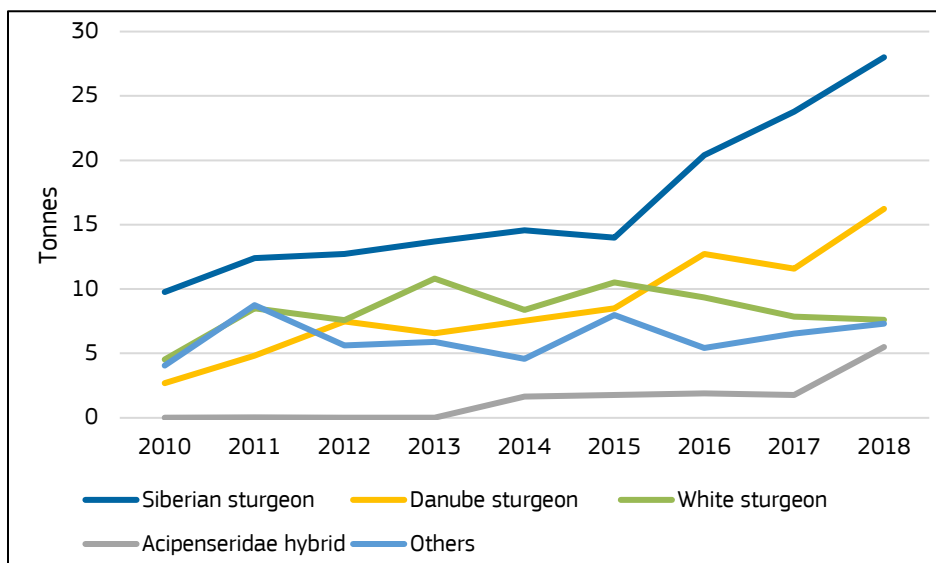


Source: CITES Trade Database

The USA market is supplied by several nations, with Germany (35%) and Italy (27%) supplying the largest shares. Poland accounts for 91% of EU exports to the United Arab Emirates. Half of the exports to Japan are supplied by France and 20% by Italy. Switzerland receives most of its caviar imports from France (37 %) and Germany (37%).

In 2018, the EU primarily exported caviar of Siberian sturgeon (28 tonnes), Danube sturgeon (16 tonnes), and white sturgeon (8 tonnes). The share of exports of caviar of Siberian and white sturgeon decreased from 2010 to 2016 (from 46% to 43% and from 21% to 12% respectively). The share of caviar exports of Danube sturgeon on the other hand grew from 13% in 2010 to 25% in 2018.

Figure 26: Main exported species in terms of volume (tonnes)



Source: CITES Trade Database

3. CONSUMPTION

As described in section 0.0.2, production of sturgeons, and especially of caviar, is small in a global perspective. Generally, as the volumes get smaller, the data deviations in relative terms increase and consequently are harder to interpret. Big deviations in data from different sources make assessments on consumption difficult as the volumes of caviar consumed in the main markets are relatively marginal.

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

3.1 General market descriptions

Keeping with the conclusions of the previous report, which was based largely on general information from stakeholders, the segments mentioned as target for producers/distributors were the high-end segments, including:

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

The COVID-19 pandemic has had a strong impact on the caviar market. As the HoReCa segment was largely shut down alongside a dramatic reduction in airline and cruise ship travel, many of the traditional market outlets for caviar disappeared. However, following interviews with stakeholders, it seems the caviar industry was somewhat shielded from the most severe impacts of the pandemic.

Already before the COVID-19 pandemic a trend of increased caviar sales through the retail sector had been observed. This pre-existing market outlet was useful for reaching consumers and could channel some of the excess caviar previously destined for the HoReCa and luxury travel sectors.

As the HoReCa segment closed, many of the traditional caviar customers adapted. Previously, restaurants would buy caviar in tins of 120 grams or 250 grams and split the caviar into multiple meal servings. As restaurants began to offer take-away options, they shifted their purchases away from larger caviar tins and, in place, increased their purchase of smaller 30 grams tins which could be sent out with take-away meals.

It was also observed that more caviar producers made their caviar available for purchase on their websites. French producers developed click and collect services and tried to increase sales and targeted new customer groups by offering smaller packaging and prices, for example with 10 grams tins⁵². Additionally, French producers published a press release to promote their products and raise awareness about their difficult situation both due to the pandemic and increasing competition from foreign producers. By doing this, the French producers encouraged consumers to purchase caviar produced domestically⁵³.

⁵² <https://france3-regions.francetvinfo.fr/nouvelle-aquitaine/charente-maritime/charente-maritime-blues-producteurs-caviar-face-crise-covid-19-fermeture-restaurants-1902426.html>

⁵³ <https://objectifaquitaine.latribune.fr/agroalimentaire/2020-12-17/produits-festifs-les-producteurs-de-caviar-mobilisent-face-a-la-concurrence-chinoise-2-3-866630.html>

3.2 Consumption in the EU

In the table below, apparent consumption of caviar in the EU in 2018 is estimated. Production is based on FEAP data and the intra-EU trade balance is based on EUROSTAT data. For the extra-EU trade balance, two different sources are used (CITES data and EUROSTAT data) to show deviations in the output based on the two available sources.

Table 7: Apparent consumption in the EU 2018 (kg)

	FEAP	EUROSTAT	CITES	Apparent consumption (calculated based on CITES data)	EUROSTAT	Apparent consumption (calculated based on EUROSTAT data)
	Production	Intra-EU trade balance	Extra-EU trade balance ¹		Extra-EU trade balance	
Caviar producing countries						
Italy	54	-34,7	-14,6	4,7	-14,7	4,5
France	45	13,0	0,0	57,9	-1,9	56,1
Poland	24	-9,2	-12,8	1,9	-5,7	9,1
Germany	15	-5,9	16,6	25,7	3,9	13,0
Spain	7	0,9	1,4	9,3	1,3	9,3
Bulgaria	6	0,3	-1,0	5,3		6,3
Belgium	5	-5,0	4,4	4,5	4,9	4,9
Finland	5	1,0	-1,0	5,0	-1,0	5,0
Latvia	3	0,1	-1,3	1,8	-1,1	2,0
Non-producing countries						
Denmark	0	4,4	-0,1	4,2	-0,1	4,3
Austria	0	2,9	0,0	2,9	0,0	2,9
Luxembourg	0	-0,3	2,7	2,4	2,5	2,2
Other	0	1,5	-0,7	0,7	-0,3	1,2
EU TOTAL	164	-31,1	-6,6	126,3	-12,2	120,7

1) As reported by the EU MS to CITES.

Source: FEAP/EUROSTAT/CITES, calculations by EUMOFA.

Total EU consumption of caviar in 2018 was calculated at between 121 tonnes and 126 tonnes, depending on the source of extra-EU trade data. Compared to similar calculations for 2016, EU production of caviar increased by 30%, while apparent consumption in the EU have increased by 20%⁵⁴.

Independent of the extra-EU trade sources used, France is the largest consumer market for caviar in the EU, followed by Germany. While consumption calculation for France is relatively consistent between the two sources, consumption calculation for Germany deviates widely. Among the caviar producing MS, Spain is the third largest consumer market followed by Bulgaria, Finland, Belgium, and Italy.

The two calculations produce similar results for the remaining MS, with the exception of Poland. Compared to the calculations for 2016, and considering that Poland has not reported any caviar imports to CITES in 2018, the correct level of apparent consumption is probably closer to 9 tonnes than 2 tonnes, meaning that Poland is also among the top caviar consuming MS in the EU.

Among the MS with no production, Denmark has the highest apparent consumption of caviar, followed by Austria and Luxembourg.

⁵⁴ In the 2018 edition of this report, the reported production in 2016 was 126 tonnes and the calculated apparent consumption in the EU, excluding the UK, was between 101 and 106 tonnes.

3.3 Consumption in other regions

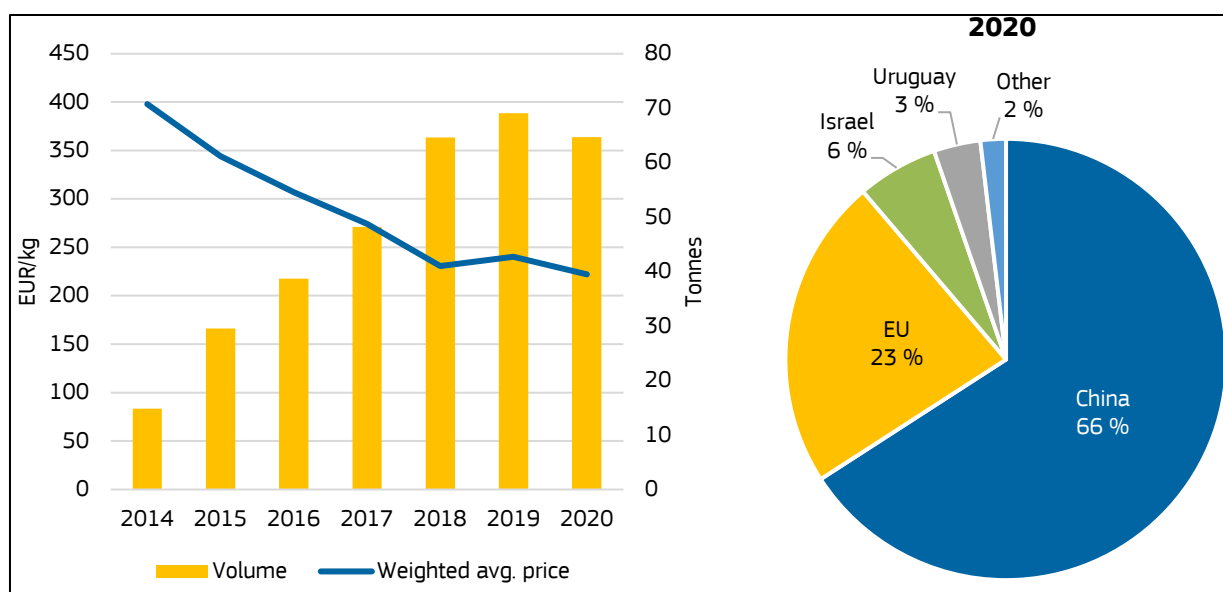
According to data on production and trade, the USA, Japan, Russia, and China are identified as the main caviar consuming countries. Furthermore, Canada, Switzerland, the United Arab Emirates, Singapore, and Australia also emerge as important consumer markets outside the EU.

With the exception of Russia and China who are major caviar producers, all these countries are amongst the world's top 30 high income countries in terms of GDP per capita⁵⁵. As for the EU market, caviar consumption seems to peak around the festive periods in December such as Christmas and New Year. For example, 70% of the turnover for French caviar producers is generated in December⁵⁶. According to industry sources, caviar is also purchased related to other celebrations such as weddings.

3.3.1 USA

The USA have increased their import of caviar every year since 2014, with the exception of 2020 when the import volume was 65 tonnes, down from 69 tonnes in 2019. The yearly average price of US caviar imports experienced a negative trend from 398 EUR/kg in 2014 to the lowest level of 222 EUR/kg in 2020. Over half of the caviar imports in 2020 were from China (66%), followed by the EU (23%).

Figure 27: USA import of caviar. Volume and weighted average price* (left-hand side). Main suppliers in 2020 (right-hand side)



*Nominal values

Source: EUMOFA/IHS Markit

⁵⁵ GDP per capita (PPP) 2019, World Bank

https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.KD?most_recent_value_desc=true

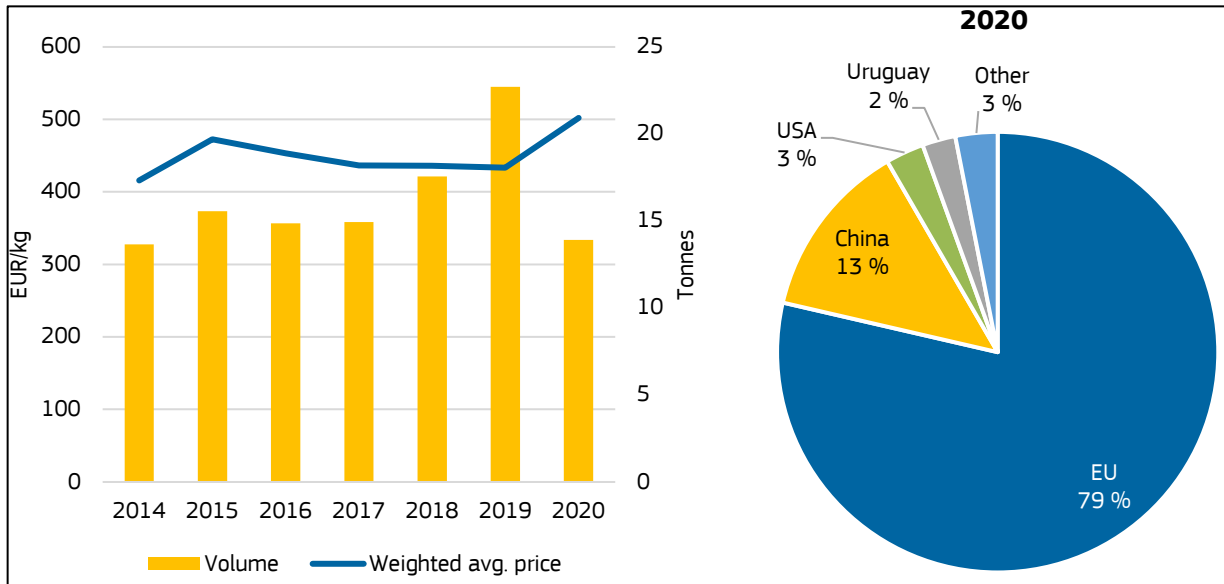
⁵⁶ <https://france3-regions.francetvinfo.fr/nouvelle-aquitaine/charente-maritime/charente-maritime-blues-producteurs-caviar-face-crise-covid-19-fermeture-restaurants-1902426.html>

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3.3.2 Japan

Japanese import of caviar has been relatively stable since 2014, except for higher volumes in 2018 (18 tonnes) and 2019 (23 tonnes). The yearly average import price is relatively high and fluctuated between 416 and 502 EUR/kg over the 7-year period. In 2020, Japan imported 14 tonnes of caviar, mainly from the EU (79%) but also from China (13%).

Figure 28: Japanese import of caviar. Volume and weighted average price* (left-hand side). Main suppliers in 2020 (right-hand side)



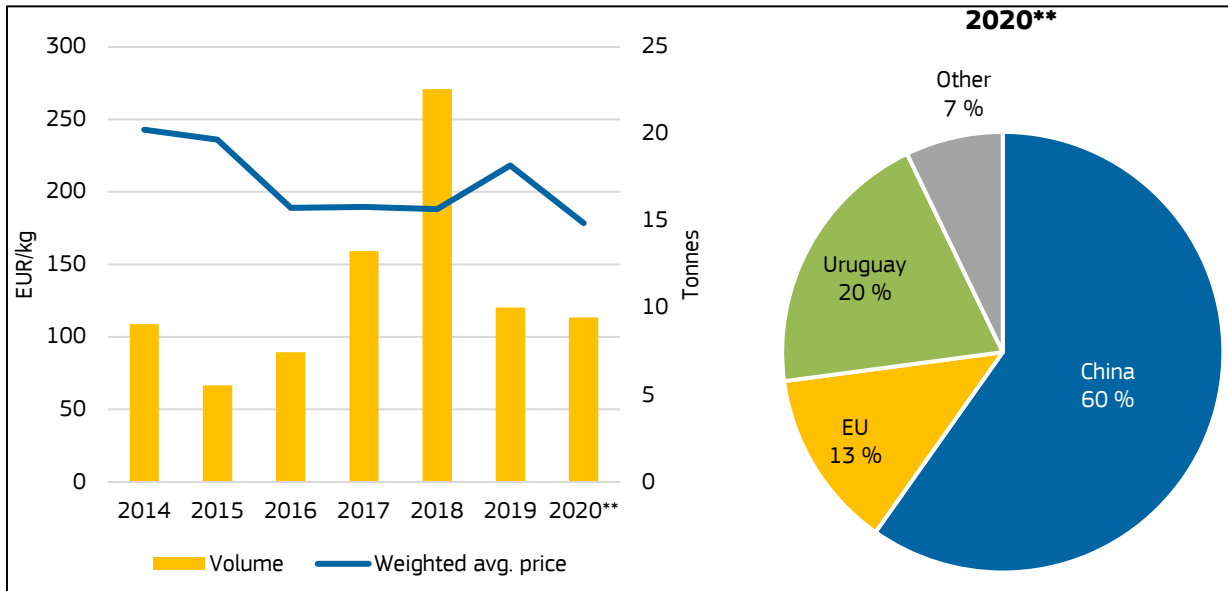
*Nominal values
Source: EUMOFA/IHS Markit

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3.3.3 Russia

Russian import volume of caviar fluctuated over the seven-year period, from the lowest import volume of 6 tonnes in 2015 to the highest volume of 23 tonnes in 2018. Prices also fluctuated but showed a general downward trend from 243 EUR/kg in 2014 to 178 EUR/kg in 2020⁵⁷. The majority of Russian imports in 2020 was from China (60%) followed by Uruguay (20%) and the EU (13%).

Figure 29: Russian import of caviar. Volume and weighted average price* (left-hand side). Main suppliers in 2020 (right-hand side)



*Nominal values
 **January-November
 Source: EUMOFA/IHS Markit

⁵⁷ Russian trade data for 2020 does not include December data.

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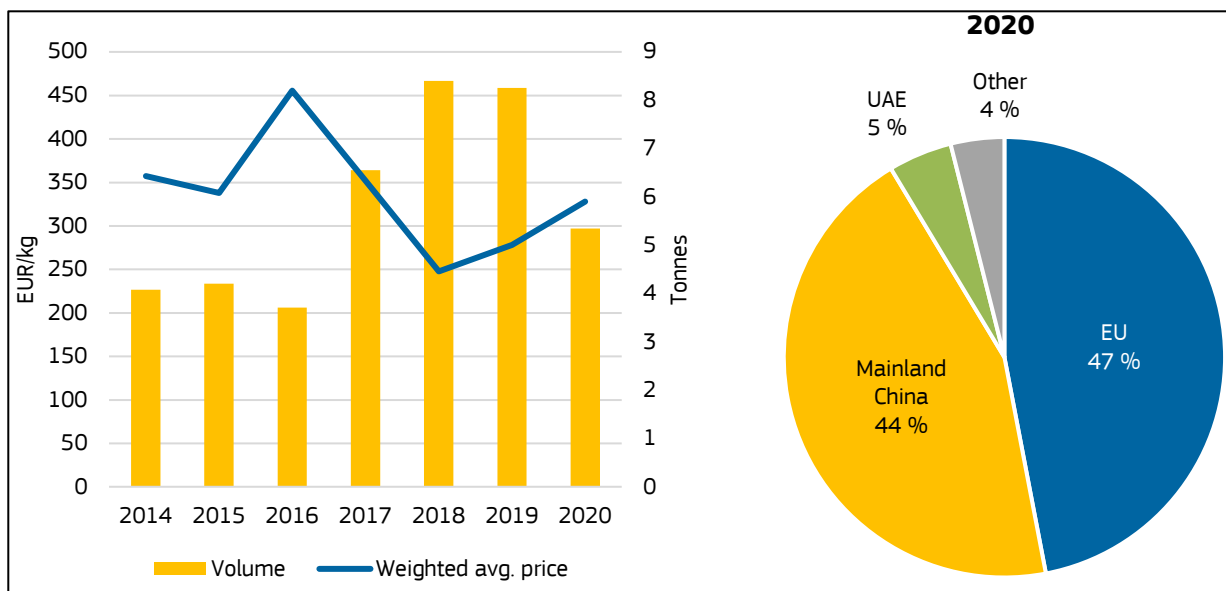
3.3.4 China

Chinese caviar has had to deal with scepticism from foreign clients concerned about previous Chinese food scandals⁵⁸. Because of this, many companies selling Chinese caviar abroad do not advertise China as the country of origin of their caviar⁵⁹. Through partnerships with chefs and reputable trading houses who have promoted the product, China has been able to gain access to the French market, among others. Currently, efforts are being made to increase domestic consumption in mainland China⁶⁰.

According to trade statistics, import of caviar to mainland China is virtually zero. The import to Hong Kong on the other hand has increased over the past seven years, although the volumes are still relatively low in absolute terms (between 4 and 8 tonnes). The yearly average import price shows large fluctuations, with the lowest price of 248 EUR/kg in 2017 and the highest price of 455 EUR/kg in 2016. Since 2018, prices have shown an increasing trend.

The EU is, and has been, the main supplier of caviar to Hong Kong but with increasing competition from mainland China. In 2014, the EU accounted for 76% of Hong Kong’s imports while mainland China accounted for 16%. In 2020, EU and China’s shares were practically similar with 47% and 44% respectively.

Figure 30: Hong Kong import of caviar. Volume and weighted average price* (left-hand side). Main suppliers in 2020 (right-hand side)



*Nominal values
Source: EUMOFA/IHS Markit

⁵⁸ <https://gulfnews.com/photos/news/caviar-queen-chinese-roe-reigns-around-the-world-1.1576149388350?>

⁵⁹ <https://www.inkstonenews.com/food/singaporean-entrepreneurs-trying-put-chinese-caviar-map/article/3018633>

⁶⁰ http://www.shuichan.cc/article_view-63375.html

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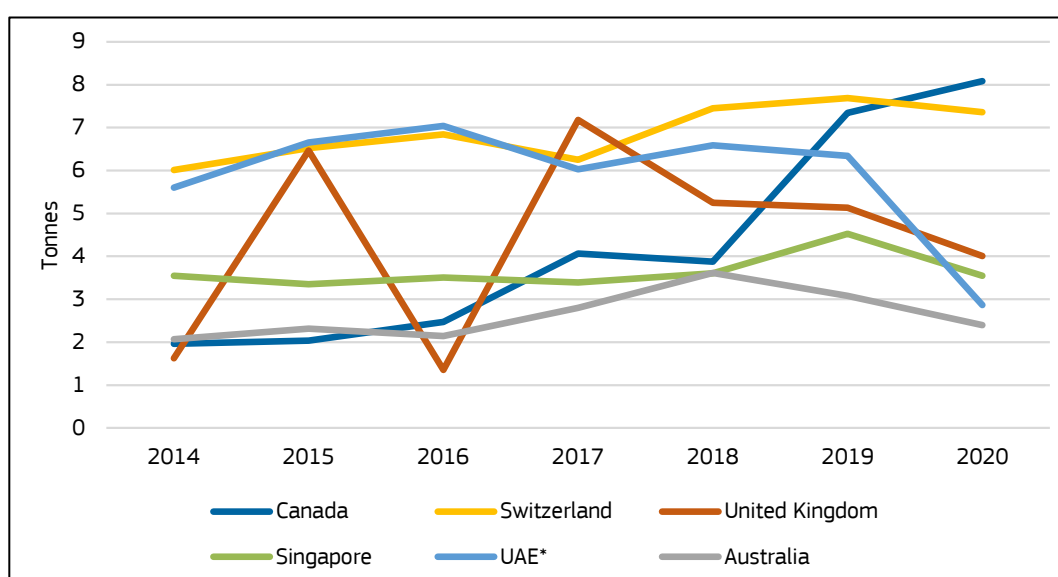
3.3.5 Other main consumption markets outside the EU

Other main consumption markets outside the EU include Canada, Switzerland, the United Kingdom, Singapore, Australia, and the United Arab Emirates⁶¹, although combined, these countries imported less than half the volume the USA imported in 2020.

Canada's imports increased from 2 tonnes in 2014 to 8 tonnes in 2020, while imports to the United Arab Emirates decreased since the peak of 7 tonnes in 2016 to 2 tonnes in 2020. Over the past 7 years, the weighted average import price for Switzerland, Singapore, and Australia is higher (between 400 EUR/kg and 600 EUR/kg) than that of Canada and the United Arab Emirates (between 160 and 300 EUR/kg).

Over the seven-year period, between 88% and 99% of the United Arab Emirates' caviar supply was from China, and the EU has not recorded any exports to the country. However, in 2020, the EU was the largest supplier to all the other four markets, accounting for more than 50% of the total supply, followed by China with 23% of the supply.

Figure 31: Import volumes of other non-EU consumption markets (tonnes)



*United Arab Emirates (mirrored statistics)

Source: EUMOFA/IHS Markit

⁶¹ Trade data reported by the United Arab Emirates are not monitored by EUMOFA. The analysis is based on mirrored statistics, i.e. other reporting countries' export to the United Arab Emirates.

4. PERSPECTIVES AND FUTURE DEVELOPMENT

The rapid growth in Chinese caviar production has increased the competition in the international caviar market over the past decade. In the major importing markets, increased imports from China has led to a sharp decrease in the average prices, for example in the EU where the average import price decreased by almost 40% from 430 EUR/kg in 2014 to 264 EUR/kg in 2018. However, it seems that the price level has since stabilised, although at historically low levels.

EU producers and exporters are also faced with Chinese competition in other markets, although the prices are affected to a lesser degree and remain at a higher level. From a yearly average export price of 538 EUR/kg in 2014, caviar price decreased by 22% to 422 EUR/kg in 2018. The price remained stable in 2019 and increased by 10% in 2020, but it remains to be seen if this was merely an effect of COVID-19 or an underlying trend.

Recently, the Chinese government has published a new regulation to combat water pollution⁶². This directly affects the aquaculture production of Chinese caviar and may cause several farms to close⁶³. However, Kaluga Queen has managed to secure a delay until 2024 before having to meet the new standard⁶⁴. As China increases its focus on sustainability⁶⁵ and increasing domestic consumption, there is hope that price pressure and competition for other producers may soften.

In 2020, the COVID-19 pandemic disrupted the market and forced producers to rethink their activities concerning both distribution and markets. How many of the recent changes will be permanent remains to be seen, but some trends are likely to last. The possibility of purchases directly from the producers assures consumers of the origin and quality of the caviar. As pandemic restrictions ease, demand from traditional outlets for caviar such as high-end restaurants and luxury travel is likely to pick up again.

⁶² <https://www.undercurrentnews.com/2019/01/15/cappma-chinas-environmental-drive-will-continue-in-2019-aquaculture-production-to-fall/>

⁶³ *Ibidem*

⁶⁴ <https://www.entreprendre.fr/le-caviar-est-il-le-nouvel-or-noir-daquitaine/>

⁶⁵ http://www.shuichan.cc/article_view-63375.html

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APPENDIX 1 – DELETED OBSERVATIONS FROM CITES DATA

CITES ID	Species	Year	Export Country	Import Country	Quantity (kg)	Reporter type*
2449230625	Siberian sturgeon	2011	France	Australia	800	E
1828851325	Siberian sturgeon	2011	France	Australia	500	E
8639255410	Danube sturgeon(=Osetr)	2011	France	Australia	300	E
3625307325	White sturgeon	2011	France	Australia	300	E
1478376710	Danube sturgeon(=Osetr)	2011	France	China	880	E
3764850025	White sturgeon	2011	France	China	360	E
5416831625	Beluga	2011	France	Ivory Coast	750	E
6733215610	Danube sturgeon(=Osetr)	2011	France	Ivory Coast	500	E
5184854310	Danube sturgeon(=Osetr)	2011	France	Monaco	700	E
2444618425	Siberian sturgeon	2011	France	Monaco	515	E
8482167910	Danube sturgeon(=Osetr)	2011	France	Monaco	374	E
8054097725	Amur sturgeon	2011	France	Monaco	225	E
2176560010	Kaluga/Amur sturgeon hybrid	2011	France	Monaco	200	E
5963627910	Danube sturgeon(=Osetr)	2011	France	Monaco	180	E
4417017610	Danube sturgeon(=Osetr)	2011	France	Monaco	175	E
6908255010	Danube sturgeon(=Osetr)	2011	France	Monaco	100	E
8002829010	Danube sturgeon(=Osetr)	2011	France	Monaco	90	E
2524921125	Siberian sturgeon	2011	France	Singapore	190	E
3751312810	Danube sturgeon(=Osetr)	2011	France	Singapore	100	E
5528478225	White sturgeon	2011	France	Singapore	100	E
4848086225	Siberian sturgeon	2011	France	Singapore	100	E
8262227425	Siberian/Adriatic sturgeon hybrid	2011	France	Singapore	100	E
4102997710	Danube sturgeon(=Osetr)	2011	France	Singapore	90	E
1662784625	Beluga	2011	France	Singapore	60	E
6871176525	White sturgeon	2011	France	Singapore	50	E
3902737825	Siberian sturgeon	2011	France	Singapore	50	E
2681210625	Siberian/Adriatic sturgeon hybrid	2011	France	Singapore	50	E
8269278325	Siberian sturgeon	2011	France	Singapore	30	E
9336960728	Acipenseridae hybrid	2011	France	Togo	500	E
8840328326	Danube/Siberian sturgeon hybrid	2011	Saudi Arabia	United Kingdom	12.755	I
2640565027	White sturgeon	2012	Italy	Hong Kong	20.625	I
1205298827	White sturgeon	2012	Italy	Hong Kong	20.396	I
2391759810	Danube sturgeon(=Osetr)	2012	Italy	Hong Kong	6.882	I
2094330527	White sturgeon	2012	Italy	Hong Kong	6.627	I
9869494110	Danube sturgeon(=Osetr)	2012	Italy	Hong Kong	3.489	I
2814186929	Siberian sturgeon	2013	Uruguay	Russia	4.365	E
9545842129	Danube sturgeon(=Osetr)	2013	Uruguay	Russia	2.032	E
4087742029	Danube sturgeon(=Osetr)	2013	Uruguay	Turkmenistan	2.832	E
5845387229	Siberian sturgeon	2013	Uruguay	Turkmenistan	2.168	E
6499354733	Kaluga/Amur sturgeon hybrid	2014	UAE**	USA	101.190	E
9650276139	Danube sturgeon(=Osetr)	2015	Italy	Australia	41.804	I
6604060439	Danube sturgeon(=Osetr)	2015	Italy	Australia	16.363	I
5756221439	Starry sturgeon	2015	Italy	Australia	2.133	I
8785513633	Kaluga/Amur sturgeon hybrid	2015	Spain	Andorra	1.400	E
1235386233	Amur sturgeon	2015	Spain	Andorra	1.200	E
4392165833	Beluga	2015	Spain	Andorra	1.200	E
7320587641	Danube sturgeon(=Osetr)	2016	Italy	Australia	27.312	I
7551816439	Danube sturgeon(=Osetr)	2016	Moldova	Indonesia	5.008	E
1871877039	Acipenseridae hybrid	2016	Moldova	Indonesia	5.008	E
7596497339	Sterlet sturgeon	2016	Moldova	Indonesia	4.008	E
9424649239	Danube sturgeon(=Osetr)	2016	Moldova	Romania	3.336	E
6064033939	Sterlet sturgeon	2016	Moldova	Romania	3.336	E
1003839139	Acipenseridae hybrid	2016	Moldova	Romania	2.736	E
3412466739	Danube sturgeon(=Osetr)	2016	Moldova	USA	3.682	E
8807572541	Danube sturgeon(=Osetr)	2016	UAE**	Australia	41.525	I

The caviar market: production, trade, and consumption in and outside the EU

CITES ID	Species	Year	Export Country	Import Country	Quantity (kg)	Reporter type*
7108249741	Danube sturgeon(=Osetr)	2016	Uruguay	Australia	6.200	I
2646600238	Danube sturgeon(=Osetr)	2017	Moldova	Romania	3.600	I
7533382538	Beluga	2017	Moldova	Romania	3.600	I
5552449640	Huso spp.	2017	Moldova	USA	8.400	I
3316801940	Huso spp.	2017	Moldova	USA	6.250	I
7002539040	Danube sturgeon(=Osetr)	2017	Moldova	USA	5.100	I
3705930540	Sterlet sturgeon	2017	Moldova	USA	4.100	I
4198791140	Danube sturgeon(=Osetr)	2017	Moldova	USA	1.400	I
6122132341	Siberian/Danube sturgeon hybrid	2018	Belgium	Morocco	1.765	E
7565438644	Kaluga/Amur sturgeon hybrid	2018	China	UAE**	52.000	I
3675433742	Siberian sturgeon	2018	Russia	USA	36.562	I

Source: CITES Trade Database

*Reporter type: I = Transaction as reported by importer, E = Transaction as reported by exporter

**UAE = United Arab Emirates

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