

L'Institut Agro Rennes-Angers

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Année universitaire : 2023-2024 Spécialité : Agronomie Spécialisation (et option éventuelle) : Halieutique option Production et Valorisation Halieutique	Mémoire de fin d'études ☒ d'ingénieur de l'Institut Agro Rennes-Angers (Institut national d'enseignement supérieur pour l'agriculture, l'alimentation et l'environnement) ☐ de master de l'Institut Agro Rennes-Angers (Institut national d'enseignement supérieur pour l'agriculture, l'alimentation et l'environnement) ☐ de l'Institut Agro Montpellier (étudiant arrivé en M2) ☐ d'un autre établissement (étudiant arrivé en M2)
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Description and study of the Alaska Pollock fillet-based products market in Europe, excluding surimi, in the current challenging geopolitical context involving Russia. What are the prospects, in Europe, for new markets of IQF portions of Alaska Pollock with direct import from Alaska?

Par : Caroline AILLAUD

Soutenu à Rennes le 11 septembre 2024

Devant le jury composé de :

Président : Catherine GUERIN-DUBIARD

Maître de stage : Caroline Hanako FELUS DEBEUF

Enseignant référent : Stéphane GOUIN (Enseignant Chercheur, Institut Agro Rennes-Angers)

Autres membres du jury (Nom, Qualité)

Frans William ZEEMAN (Managing director at Seafood Connection B.V.)

Nicolas FOURNIER (Consultant)

Les analyses et les conclusions de ce travail d'étudiant n'engagent que la responsabilité de son auteur et non celle de l'Institut Agro Rennes-Angers

Acknowledgements

I am very grateful for the guidance and help of all who contributed to the preparation of this thesis. Special thanks are due to:

Caroline DEBEUF who has provided professional counsel, helpful comments, and so much of her time to help me in this research. I thank her also for making it possible for me to see the office of Seafood Connection B.V. in Urk in the Netherlands, for me to assist in the Barcelona Seafood expo Global 2024 and for the opportunity of accompanying her on a business trip to London.

Catherine Guérin who has contributed to my graduate training and provided helpful suggestions for the writing of this thesis.

Laurent Métivier from LM Seafood, for welcoming to the office at L'Aigle in Normandie where I spent a week discovering the working environment and activities of the company.

The employees and customers of Seafood Connection B.V., whose cooperation really helped me get valuable information throughout this project.

Table of content

INTRODUCTION.....	1
1. BIBLIOGRAPHIC CHAPTER: OVERVIEW AND CONTEXT OF THE ALASKA POLLOCK MARKET	2
1.1. Raw-material products of Alaska Pollock	2
1.1.1. Types of raw-material products	2
1.1.2. China a major actor in the process of raw material and re-export.....	2
1.1.3. Yields for Alaska Pollock Fillet.....	3
1.2. Global Trade Flows.....	3
1.2.1. The Alaska Pollock market today	3
1.2.1.2. Market size in value.....	4
1.2.1.3. Processing countries	5
1.2.1.4. The workforce challenge in Alaska	5
1.3. State of Chinese processing plants.....	6
1.4. Impacts of Geopolitics on the Market	6
1.5. General consumer trends.....	7
1.5.1. Place of APO in seafood consumption in Europe.....	7
1.5.2. APO offers a healthy and cheap option amid Seafood	7
1.5.3. Rising sustainability concerns among consumers.....	7
2. APPROACH AND TOOLS USED: OVERVIEW OF APO-BASED PRODUCTS IN SUPERMARKETS IN FRANCE TO DATE, CONSUMER HABITS AND INDUSTRIAL USE BY EUROPEAN INDUSTRIALS.	8
2.1. Census and description of the Alaska Pollock Fillet-based products in supermarkets in France	8
2.2. Surveys about consumption habits by consumers in France and industrial use by industrials in Europe	8
2.2.1. Method for the survey analysis	8
CONCLUSION	9
REFERENCES.....	11

Glossary

Community Development Quota	Program established to provide to eligible western Alaska communities the opportunity to participate and invest in the Bering Sea and Aleutian Islands fisheries; to support Economic development in western Alaska; to provide economic and social benefits for residents of western Alaska; and to achieve sustainable and diversified local economies in western Alaska.
Cost and Freight	The seller is responsible for costs of freight during transportation of the Goods to the destination port. Risks of loss or damage as well as further transportation become the buyer's responsibility once onboard the ship.
Cost Insurance and Freight	The same as Cost and Freight with the addition that the seller must also obtain minimum insurance cover against the buyer's risk of loss or damage to the goods during shipment.
Delivered at place	The seller needs to manage all risks involved in bringing the goods at an agreed location. The buyer is at risk when the goods have been placed at his disposal at an agreed destination ready for unloading. Insurance is to be covered by the seller to the place of destination (further transports covered by the buyer).
Delivered Duty Paid	Seller bears all costs and risks, including import duties, to deliver goods to the buyer's location.
Fillet Blocks	Frozen product that is uniformly skin-on or skinless, with bone or boneless fish which is quick frozen in a plate freezer intended for further processing. The most common form of fillet blocks dealt in the EU is Skinless Pin Bone Out fillet blocks.
Individually Quick Frozen	Individual Quick Frozen, or IQF, is a freezing technology used in the food processing industry. This technology is often used to freeze small portions of food. Fillet, shrimp and molluscs are typical frozen products of this type.
Incoterm	the Incoterms rules are a set of 11 globally recognized standard trade terms created by the International Chamber of Commerce (ICC) to facilitate domestic and international B2B sales of goods.
Shatter pack	Frozen fillets separated by a sheet that can be easily separated by dropping or shattering the carton that holds them.
Surimi	Frozen paste made from fish to create moulded products, such as imitation crab meat.

Total Allowable Catch	The total amount of a target species that can be harvested in a given time period.
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List of abbreviations

ATQ	Autonomous Tariff Quota
AFA	American Fisheries Act
APO	Alaska Pollock
B&P	Bits and Pieces
BSAI	Bering Sea/Aleutian Islands
CDQ	Community Development Quota
CFR	Cost and Freight
CIF	Cost Insurance and Freight
DAP	Delivered at place
DDP	Delivered Duty Paid
DF	Double frozen
DS	Deep skin
FAO	United Nations Fisheries and Aquaculture
GAPP	Genuine Alaska Pollock Producers
GOA	Gulf of Alaska
H&G	Headed and Gutted
IQF	Individually Quick Frozen
MNC	Maruha Nichiro Corporation
MSC	Marine Stewardship Council Organization
mt	Metric ton
PBI	Pin Bone In
PBO	Pin Bone Out
SF	Single frozen
TAC	Total Allowable Catch
WR	Whole Round
WSI	Westward Seafood Incorporation

INTRODUCTION

Today, European seafood imports mostly consist of tuna, salmon, cod, shrimps, and Alaska Pollock. Together they represent 43% of the EU's total apparent consumption of fishery and aquaculture products according to the European Commission, Directorate General for Maritime Affairs and Fisheries and EUMOFA (2022). The species of interest in this work is Alaska Pollock (*Theragra chalcogramma*), an abundant fish species in the North Pacific, from the Bering Sea in Alaska to Northern Japan, and it holds significant importance as it is the 2nd most fished wild species in volume after Peruvian anchovy (5 million metric tons (mt) per year on average between 2016 and 2020 excluding El Niño events according to the FAO) worldwide. More precisely, it is around 3 million metric tons of Alaska Pollock (APO) which is caught each year (FAO, 2022). The production is shared between Russia, the U.S. and, to a much lesser extent, Japan, and Korea. Products of APO are consumed mainly in Asia, Europe (EU+UK) and North America. Fillet in Europe and Surimi in Asia are the most consumed products. In Europe the fillet imports reach about 250 000 mt per year (Eurostat. 2024) making it the main importer of APO fillet worldwide (40% share of the global market). Moreover, Russia is the main producer of Headed and Gutted (H&G) APO (670 000 mt in 2023) of which 82% is exported to China to be reprocessed, re-frozen (double frozen) and exported to other countries. In fact, 94% of the raw material of APO used in China has a Russian origin (Buglak, 2023). Concerning European imports of double frozen (DF) APO from China, they accounted for more than half of all European imports of APO with roughly 170 000 mt in 2023 (Eurostat. 2024; European Commission and EUFOMA, 2022). Direct imports from the U.S. or Russia also represent a great share of European imports. They are mainly made of single frozen (SF) PBO blocks of APO (100% fillets) and reached 113 825 mt (39% U.S. origin, 61% Russian origin) in 2023 (an overall of 46% of European imports of APO fillet products) (Eurostat. 2024).

This study focuses on the global trading of Alaska Pollock fillets and is part of a potential project concerning the multinational Japanese group Maruha Nichiro Corp.'s (MNC) production plants in Alaska. In Alaska, MNC fully owns several processing companies which provides 27% of the shares on the U.S. Alaska Pollock quota making MNC a leader in the surimi industry as well as fillet, mince, and roe (eggs, popular in Japan). Moreover, MNC holds 70% of shares in the company Seafood Connection B.V. based in the Netherlands which distributes this production in Europe. Seafood Connection is a supplier of frozen seafood products that trades about 70 000 mt a year through retail, foodservice, wholesale, and the industry in more than 30 countries (Seafood Connection, 2022).

Because processing in Alaska never went further than filleting and the production of surimi base blocks due to its remote location and the high cost of the workforce, most products with added value transit through third countries like China. The aim of this work is to set an overview of the APO market, gathering information and arguments in the eventuality of investment in single frozen IQF portions production plants directly in Alaska. Thus, avoiding transit through China. This is even more interesting considering the actual geopolitical context. European processors are increasingly pushed to look for alternatives to let go of Russian Pollock, including double frozen PBO blocks and IQF portions from China using Russian raw material. What market potential is there for single frozen IQF portions from the U.S. in Europe?

This study was carried out by conducting bibliographical research and by contacting different experts in the industry. The report goes by the following outline: We first draw up an overview of the Alaska Pollock industry in its global background. Then, the methodology used

for the industrial and consumer studies (for the latter, the French market will be chosen for practical matters) will be explained in detail. The last part presents the results in three steps, firstly an overview of the APO based products in supermarkets in France followed by the outcome of the industrial survey and by the outcome of the consumer survey. Finally, this last part ends on a discussion about the feasibility of production units specialized in IQF portions in Alaska.

1. BIBLIOGRAPHIC CHAPTER: OVERVIEW AND CONTEXT OF THE ALASKA POLLOCK MARKET

1.1. Raw-material products of Alaska Pollock

1.1.1. Types of raw-material products

APO is typically found under a variety of raw materials destined for use in final products such as breaded portions, IQF portions, surimi, and so on. The quality of the raw material products can vary, the highest quality being frozen-at-sea fillet, produced by catcher/processors. Single-frozen processed by Alaskan shoreside plants comes close after. Finally, double-frozen fillet processed in China come as the lowest and most prevalent quality (Johnston *et al.*, 1994).

Produced at an industrial scale, APO raw material products enter the market under 7 different types which are detailed in ANNEX I:

- Whole round (WR)
- Headed and gutted (H&G)
- Fillet for which production is divided into different types of fillets: Pin bone out (PBO) (see specification sheet in ANNEX II), Pin bone in (PBI), Deep skin (DS), Bits and pieces (B&P)
- Surimi blocks (largest product category)
- Mince blocks (fillet trim and frames)
- Roe blocks (eggs of APO)
- Milt (seminal fluid of APO)

1.1.2. China a major actor in the process of raw material and re-export

The supply chain of the APO is quite complex within the groundfish business. Indeed, after the fish is headed and gutted it is either directly processed into raw products (Annex I) to be sent to secondary processing factories in Europe or in the U.S. (single frozen) but mostly H&G is sent to China (double frozen). China plays a major role in the process of raw material and re-export. It receives most of the H&G to make IQF portions, blocks of PBO loin less and blocks of B&P. IQF portions are made with the loins which correspond to the thicker part of the fillet. Additionally, some products are further processed into breaded fish fingers or natural portions (slices) for example (FAO, 2022; Abelman *et al.* 2023). Packaging can be done in China (Fig.1.) or in Europe (Fig.2.), but the products must adhere to the European Union's food

safety and labelling standards in either case, for them to enter the European market. In fact, the product's origin is given by the last processing country, hence packaging in Europe has the benefit of giving a European origin to the product even if it was imported from China (Fig.2.) (European Commission, 2024).

1.1.3. Yields for Alaska Pollock Fillet

Filleting yields vary according to a wide range from the size of the fish to the filleting technique. Indeed, automated filleting results in lower yields than manual filleting (Crapo *et al.*, 2004). On average 28% of the fish weight is conserved for fillets (between 24% and 36% is allowed) (Table 1). For instance, if a fish weights 600g WR, it is equivalent to 168g of fillets (84g per fillet).

1.2. Global Trade Flows

1.2.1. The Alaska Pollock market today

1.2.1.1. Market size in volume

Today, European whitefish supplies are tight, and the demand for Alaska Pollock is increasing. European industrials import about 100 000 mt of single frozen APO per year (Fig. 3.), with 113 825 in 2023 divided into U.S.-origin (39%) and Russian-origin (61%) which accounted for almost half (46%) of total European imports of APO that year (Eurostat. 2024).

In Europe, Germany and France lead the market for frozen fillet imports. While the U.S.'s exports of SF APO to Europe have decreased since 2020, going from 94 654 mt in 2020 to 44 292 in 2023, Russia's exports of SF APO to Europe have kept increasing since 2005 and reached 69 533 mt in 2023 (Fig. 3.). These exports were mostly targeted towards Germany (49%) and the UK (10%) (Buglak 2023). However, DF remains dominant in European imports of APO with 170 639 mt imported last year (Fig. 3.). Chinese imports were particularly important in 2023, indeed, European importers made stocks in December 2023 to meet the 13.7% duty autonomous tariff quota implemented on January 1st, 2024, in the EU (Seaman, 2024d).

China is an important hub for Seafood processing. It receives about 94% of its APO raw material (H&G) from Russia reaching roughly 550 000-600 000 mt per year (Imports-exports China, 2023). Russia is indeed the main producer of H&G/WR APO. In 2023 it produced 670 000 mt of H&G and 130 000 mt of WR (Buglak, 2023; Seaport, 2024).

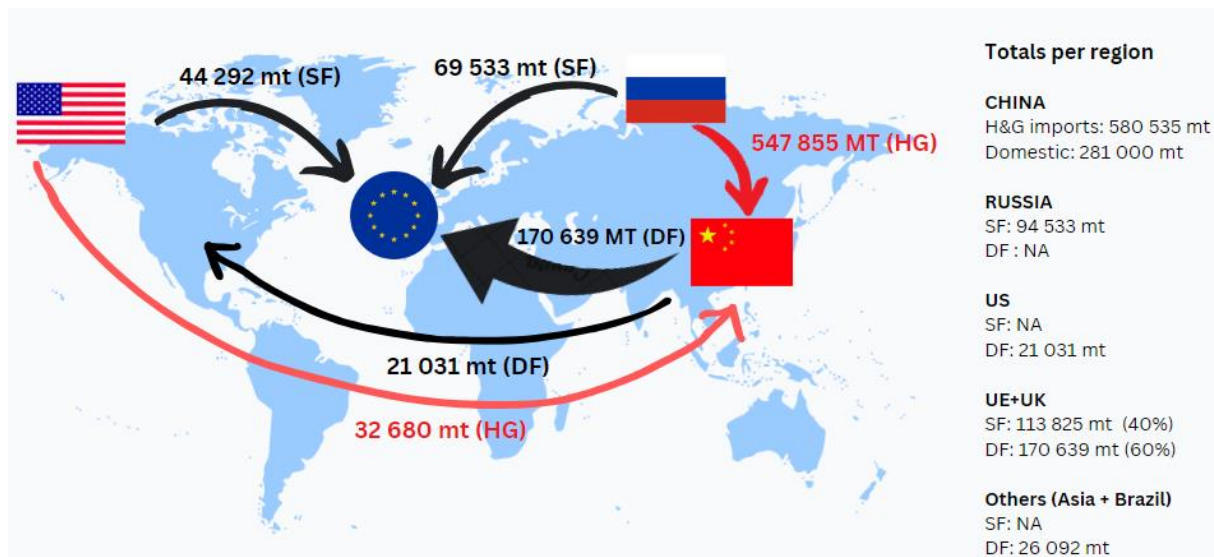


Figure 1. Global Alaska Pollock H&G, single/ double frozen fillets trade flow in 2023 in volume (mt). Figure created using Canva.

Focusing on Europe, Germany is the first European importer (Eurostat. 2024). However, all products are not destined for the domestic market and simply transit through the country before being re-exported to their final destination in another European country. Germany is the main producer of fish fingers and battered fillets called "Schlemmer filets". Indeed, the largest fish finger factories in the world are in Germany (Centenera, 2014). However, regarding the imports for the domestic market, Germany is fourth behind the Netherlands, the UK and Italy (Fig. 5.).

More specifically, the size of the IQF market, on average over the last 5 years in France, corresponds to 50% imported from China, 27% from Russia and 23% from the U.S. per year. A total of 33 264 mt per year (European Commission, 2023).

1.2.1.2. Market size in value

The global Pollock market size reached \$2.1 billion in 2023 and is expected to reach \$3.4 billion by 2033, corresponding to a 4.9% growth rate (Ocean treasure "APO market update", 2023).

The competitiveness of Alaska Pollock on the global market remains undefeated throughout the years (Fig. 6.) making it difficult to find alternatives that match its value, abundance and taste. However, it can be expected that freshwater whitefish, while representing a relatively small part of the total market, will be used to substitute traditional whitefish marine species in the future (Abelman et al. 2023).

Globally, APO is expected to reach 3.796 million tons of raw material produced in 2024, up 2.8% from the previous year. APO is predicted to overtake Cod, Saithe, and Haddock in market share this year. High cod prices may pressure buyers to focus on APO (prices for industrial frozen portions of cod reached €15 per kilo in March 2024). As cod supplies decline, cod prices will keep rising further, making Pollock more affordable and competitive (Ocean treasure "APO market update", 2023).

1.2.1.3. Processing countries

Processing in Alaska is a challenge. APO is one of the least valued species in the world and it is being caught/processed in one of the costliest places on the planet. The use of automated systems comes naturally due to the high cost of the workforce. Therefore, processing costs in Alaska differ from the costs of processing in China by the high and costly use of automated equipment. However, this method results in lower yields compared to those of hand manufacturing (Crapo et al., 2004).

Processing in China is known for its efficiency and high production volume. To meet demand on both domestic and international markets, factories have equipment for filleting, freezing, packaging, but rely highly on human-hand workforce. Indeed, handling by workers results in better yields and quality of the final product. More importantly, processing in China has become the natural choice for industrials worldwide as the workforce cost is particularly low (Lindkvist et al. 2007).

Processing in Europe consists mainly in cutting SF blocks and adding batter. For DF, some H&G APO is also filleted in Europe in countries like Poland, but it is still more expensive than processing in China. It is not profitable to add value in Europe, however for the products which bear a European factory number (ex: FR 62.160.122 CE), this number corresponds to the factory where the last processing step, such as packaging, was undertaken after products were first processed in China (Abelman et al., 2023).

Finally, concerning processing in Russia, there are a few shore plants in the country, but most of the catches are still processed onboard factory vessels. Processing further than H&G or surimi is thus limited, and the labour availability is very much challenged due to the ongoing war (Abelman et al., 2023).

1.2.1.4. The workforce challenge in Alaska

Getting workers to remote places like Alaska is a real challenge (Fig. 8.). A state study indicates the seafood processing workforce in Alaska is shrinking. There were 3,000 fewer workers by July 2023 than in 2015, resulting in low prices, plant closures, and sell-offs, significantly impacting the industry (Dobroth, 2024b; Alaska Department of Labor and Workforce Development, 2024). Indeed, it is hard to get a workforce because Alaska is such a remote place and because it is seasonal work (in December there is 1/6 of July's employment level), so the wage is inconsistent throughout the year. In fact, labour in the Alaskan plants heavily depends on foreign labour. Most of the workers in the Alaskan plants are not Americans. Moreover, when hiring foreigners in Alaska, a special visa is needed that requires special competence which increases costs and adds difficulty in hiring in these plants (Dobroth, 2024b).

Concerning living conditions in Alaska, 11% of the region's residents live below poverty level (United States Census Bureau, 2022). Thus, the importance of the CDQ entities. However, according to the Alaska Department of Labor and Workforce Development (2024), the Federal minimum wage is \$11.73/hour (\$1876,8/month for 40 hours/week) and it keeps increasing (Fig. 9.).

1.3. State of Chinese processing plants

Amid the seafood processed in China, APO holds a significant place as the demand in international markets is high. The main processing plants in China for APO are in Qingdao in Shandong region and Dalian in Liaoning region (Fig. 10.). These factories are equipped with machinery including filleting, freezing, IQF technology and packaging lines and, more importantly, with a highly skilled labour force. This constitutes the main difference with Alaska based factories. Although yields are globally under-reported, Chinese yields are much higher compared to processing with fully automated systems found in the U.S. Additionally, given China's cheap investment in processing costs, Chinese factories can make fillets at considerably cheaper prices and it accounts for their competitiveness (FAO, 2007).

However, some scandals about forced labour in some Chinese factories have emerged. Specifically, North Korean labour in Donggang, Liaoning province and Uyghurs labour have been reported. There is poor transparency on what exactly is going on in these processing plants. In October 2023 the NGO « the Outlaw Ocean Project » pointed out that at least a thousand Uyghurs have been sent to work in seafood-processing factories in Shandong since 2018. In February 2024 they also highlighted the fact that China uses thousands of workers from North Korea, in violation of U.N. sanctions and U.S. law. Some cases of sexual abuse have been reported as well (Urbina I., 2024). Doing business with Chinese plants can have an impact on the image of foreign companies.

1.4. Impacts of Geopolitics on the Market

International trades are set in changing and challenging environments. The ongoing war of Russia in Ukraine has caused the U.S. to ban any product from Russia and the EU to put a 13.7% duty autonomous tariff quota (ATQ) on block frozen products with Russian origin (14,2% for surimi), meaning both single frozen from Russia and double frozen from China using Russian raw material. Before that, Russian fillet and double-frozen fillet from China were coming at 0%. Today, European industrials want to let go of Russian Pollock (Seaman, 2024a).

Moreover, the TAC for Alaska Pollock in Russian waters keeps going up. Russia has increased its TAC in 2024 by 10,6% year on year to 2.28 million mt and an increase of 12% is expected for 2025 (Takeuchi, 2024c). This increase in TAC is most likely related to the current geopolitical situation and the low price of H&G. From 2024 onwards, with the import duties imposed by the EU which previously was the main destination for Russian Pollock fillet blocks, and with the fact that Russia's new vessels do not have EU registration numbers as part of a restriction towards the Russian government, Russia will be forced to change its product mix. This explains the rising production of Russian surimi, targeting Asia where the population and seafood consumption per capita is growing (while in Europe it's flat) (Blagov, 2024a). The surimi production is said to have tripled, to 50 000 mt according to the PCA (Pollock Catchers Association). Despite the shift in product mix and the higher export volumes, the value of Russian Pollock exports dropped 5% to \$1.2 billion (EUR 1.1 billion) in 2023 (Seaman, 2024b). In 2024, prices remain unstable as the geopolitical context doesn't improve.

However, SF cannot meet the pricing point for several products with Russian origin, so the market will likely disappear until the war is over unless alternatives are found to replace Russian Pollock (Seaman, 2024b).

Moreover, because Russia cannot import APO from outside the country, the Russian government has pushed for internal consumption. This was done by implementing an export tax that pushes suppliers to sell their products domestically rather than exporting them. To compare with the state-of-affairs pre-war, in 2021, Russia produced 105 000 mt of PBO blocks, out of which Europe imported 69 400 mt. Only 29 000 mt was sold within Russia, whereas from the A-Season of 2024, 48,000 tons of Russian Pollock fillets were produced, with around half sold on the domestic market (Blagov, 2024b).

Furthermore, with the U.S. election coming up in November 2024 it is difficult to predict the market's evolution. Because the diplomatic relationship between China and the U.S. is complex, involving a combination of economic, political, and military issues, the current situation for international relations is unstable. The outcome of the election is significant because it could potentially disrupt international trade. This is particularly important for industries that operate on a global scale, thus the need for businesses to diversify their manufacturing bases to other countries. Another disruptor is climate change which is going to impact food webs. Seafood is no exception, and that increases costs. Additionally, concentrated markets where a few key players set prices, will be especially vulnerable to "seller's inflation". These challenges are pushing more and more towards automated production systems outside China (Blyth, 2024).

1.5. General consumer trends

Another challenge that faces the APO industry is consumer trends. Understanding general consumer trends is necessary to analyse the patterns and dynamics of the demand of APO fillets products on the market.

1.5.1. Place of APO in seafood consumption in Europe

As mentioned before, Alaska Pollock is a highly consumed species in Europe as it is fourth behind Tuna, Salmon and Cod and its consumption remains stable throughout the years.

1.5.2. APO offers a healthy and cheap option amid Seafood

Most APO fillet-based products found in Europe are added-value products, such as fish burgers, breaded fillet patties, and fish sticks. They are popular in grocery stores, fast food restaurants, and food service companies due to their mild flavour, flaky texture, and nutritional value (Centenera, 2014).

APO is a healthy option for consumers due to its high protein and low-fat content. Like other fish it is high in omega-3 fatty acids, which are important for heart health. As health trends and well-being are becoming more and more a concern, fish has grown in popularity and APO offers a healthy and cheap option in its category (Bailey, 2013).

1.5.3. Rising sustainability concerns among consumers

Furthermore, fishing and more particularly fishing at a global scale is subject to more and more sustainability concerns among European consumers. The APO fishery has the MSC label ensuring a well-managed and sustainable fishery according to certain standards set by the MSC. This label is the most recognized eco-label in the seafood industry today. However, there's a rising demand for more transparency on food products both on environmental and social subjects (Edge et al. 2023).

Nonetheless, Alaska pollock is already a well-established fish species on the European market. It is frequently linked to certain brands, and the MSC certification is a powerful selling feature. Therefore, the market remains stable. The convenience of the products (ready meals, portions, sticks...) are also highly responsible for the APO popularity (GAPP, 2020).

2. APPROACH AND TOOLS USED: OVERVIEW OF APO-BASED PRODUCTS IN SUPERMARKETS IN FRANCE TO DATE, CONSUMER HABITS AND INDUSTRIAL USE BY EUROPEAN INDUSTRIALS.

2.1. Census and description of the Alaska Pollock Fillet-based products in supermarkets in France

The study was conducted in the following supermarkets in France: Carrefour, Casino, Intermarché, Leclerc, ALDI, Netto, Hyper U and Metro. Because Alaska Pollock-based products are mostly frozen products, fish markets don't sell them whereas supermarkets have the right storage equipment to do so.

A database was built (ANNEX III) where products were registered by product name, category of product (battered, ready meal, Natural, Natural IQF, Fresh aisle, Battered Fresh aisle), supermarket name, factory number and factory country (Table 6).

Table 6. Column names for the census of Alaska Pollock based products

Product name	Category	Supermarket name	Factory number	Factory Country
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2.2. Surveys about consumption habits by consumers in France and industrial use by industrials in Europe

2.2.1. Method for the survey analysis

Two surveys were conducted, one was sent to consumers, and one was sent to industrials involved in the APO market. The questionnaire for consumers was written in French whereas the questionnaire for industrials was written in two languages: French and English (ANNEXES IV and V).

The consumer survey was spread through social media such as Facebook, WhatsApp and Instagram with a link to the survey and a QR code was used to get answers on a farmers' market. The survey for industrials was shared through Seafood Connection's network and its customers.

For the consumer survey, a theoretical representative sample size was calculated following a probabilistic approach:

$$\text{Sample size} = \frac{(Z \text{ score})^2 \times \text{standard deviation} \times (1 - \text{standard deviation})}{(\text{margin of error})^2}$$

With a 1,96-confidence level set to 95%, 0.5 standard deviation and a margin of error set to 5%, sample size equals:

$$\text{Sample size} = ((1,96)^2 \times 0,5 \times (0,5)) / 0,05^2 = 384,16$$

Following this calculation, it will be essential to interview a minimum of 385 people to acquire reliable findings. It is important to note that the survey is a multiple-choice questionnaire, therefore the total number of responses can exceed 385.

As for the industrial survey, there is no need for a great number of responders because the individuals likely to reply and provide valuable information were all questioned, corresponding to 22 responders.

The answers to both questionnaires were registered and downloaded in an Excel sheet to be reorganised for better analysis. The comments in the open questions were read and summarised in key ideas to have a global picture of the answers but are not considered in the data frame analysed to build the graphs in this report.

By studying the answers to these questions, it can help better understand consumer behaviour and knowledge towards APO. It can give valuable information on general transparency and marketing manoeuvres provided by the APO industry.

CONCLUSION

The seafood industry is now dealing with several important trends and difficulties. Due to embargoes, short-term price rises are expected and the rising demand for sustainably and ethically sourced products is pushing towards a preference for U.S.-origin Alaska Pollock. However, consumers' awareness on Alaska Pollock seems to be quite low reflecting poor transparency on Alaska Pollock-based products in France. Nevertheless, the demand for U.S. sourced Alaska Pollock is increasing among industrials as there is a clear will to move away from Russian raw material including Russian raw material processed in China. SF IQF portions with direct import from Alaska could enter the European market if the price differential is reasonable compared to Russian and Chinese. Even if Russian SF might come back after the war is over, seafood transiting through China might decrease unless there are no alternatives, so SF IQF portions from Alaska would still have a market in Europe. Indeed, minor markets seem to be interested in a shift towards U.S.-origin, while bigger industrials will maintain current suppliers due to volume and price constraints. In the end, price is the main driver and shortages will drive prices up. However, if Russian products are banned from the UE in the coming months or years the market will have to adapt and start focusing on alternatives to APO as the U.S. cannot cover the volumes necessary. Europe will need to replace restricted Russian raw materials with cheaper and more available white fish species, potentially from aquaculture, which might result in higher pricing and lower consumption.

Alternative species and diversified supply networks will become essential to meet demand and keep up with the market. The overall demand is expected to remain steady, with big European industrials continuing to purchase Russian Pollock. However, the trade barriers and the requirement for “cleaner” products may cause supply and demand to become more regionalized in the future.

Despite market uncertainty, product development, particularly value-added items, remains a significant driver, with a rising desire for environmentally and ethically derived products, as well as a requirement for transparent supply chains. A new charter, with 82 signatures including the main supermarket chains in France, has been established for the implementation of a logo on agricultural processed food products (Ministère de l'Economie, 2024). This logo aims to indicate the origin of the 3 main ingredients of the product. The implementation of this logo is starting this summer 2024. This logo could drastically increase consumers' awareness in France.

To conclude, there is a possibility for a market for SF IQF portions of APO from the U.S. (Alaska) in Europe. However, to address the feasibility of such a market, this project requires further analysis. Indeed, this work sets a context for the study of feasibility and displays initial findings showing that there is potential for a market in Europe, but additional studies are essential to move further with this idea, notably to assess costs of investment.

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