INTELL-ECHO

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Economic Information Observatory

a regional cooperation project between

Atlantic Canada and Saint-Pierre and Miquelon, France

Seafood Products



Atlantic Canada (p. 1-4)

Saint-Pierre and Miquelon / France (p. 5-8)



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Thematic Information Bulletin Vol. 3, no. 4, April 2016 ISSN 2292-518X Atlantic Canada,

4 provinces:
Prince Edward Island (PEI),
New Brunswick (NB),
Nova Scotia (NS),
Newfoundland and Labrador (NL)





In this issue:

Exports and international trade

Success Stories

Expert Voice

Seafood Products in Atlantic Canada

In Atlantic Canada, **seafood products** are an essential sector of the local economy and, frequently, the main driver in many rural coastal regions. With **rising production** and a **positive trade balance** that continues to increase in recent years, this industry also receives strong support in the form of booming applied science activities and intensive research and development in areas ranging from improved fishing practices to sustainability and innovation through creation of new industrial seafood products and by-products (see also previous Intell-Écho issues vol. 1, no. 5, 2014, and vol. 2, no. 2, 2015). Based on **promising economic indicators** and **success stories** in this sector, a close link clearly exists between the sea and economic prosperity in Atlantic Canada.

Nationally, the estimated gross value of the commercial fishery exceeds \$2.8 billion, while revenue from fish and seafood preparation and packaging activities surpasses the \$4.3 billion mark. Meanwhile, the volume of commercial marine fishery landings is more than 849,000 tonnes.

In Atlantic Canada, landings in the commercial fishery in 2014 totalled 686,628 tonnes and were valued at a total of \$2.38 billion, up from 673,923 tonnes in 2012.

The commercial fishing fleet in Atlantic Canada reached 15,622 vessels in 2014 (up from fewer than 15,000 in 2012).



of the total economic value of landings in Canada's marine commercial fisheries is generated in Atlantic Canada.



Trade balance in seafood products in 2015

- ➤ Seafood product exports: \$5,958,905,000
- ► Seafood product imports: \$3,520,114,000

International trade – Canada exports its seafood products to more than 130 countries, with total exports accounting for more than 85% of national production volume. Fish and seafood exports totalled just over \$5.9 billion in 2015, up from \$4.9 billion in 2014. In the seafood products sector, lobster remains the most important export product by value, with estimated sales of \$1.5 billion in 2014.

Seafood products & commercial fishery in Atlantic Canada

	•									
		Co	Commercial value of fishery in Atlantic Canada (in \$000s)			Tota	Total weight of commercial fishery catch (in metric tonnes)			
		PEI	NB	NS	NL	PEI	NB	NS	NL	
X	Groundfish	384	1,157	76,741	89,983	69	127	42,779	33,963	
7										
	Pelagics	6,137	16,337	45,449	17,111	7,262	33,055	48,822	58,098	
	Molluscs / crustaceans	130,066	280,208	924,465	579,572	18,760	42,865	164,643	161,156	
	Other	639	596	49	14,139	2,219	11,923	298	2,744	

*data for 2014, published in 2016



Seafood Products: Exports and International Trade

► PEI lobster exports

\$199.3 million (9,357 tonnes)

► NB lobster exports

\$631.2 million (25,517 tonnes)

▶ NS lobster exports

\$579.6 million (34,531 tonnes)

► NB salmon exports

\$148.6 million (16,090 tonnes)

► NL flounder exports

\$58.6 million (10,829 tonnes)

Provincial rankings for seafood product exports

PEI: 6th (\$261.8 million) NS: 1st (\$1.3 billion)

NB: 2nd (\$1.1 billion) NL: 4th (\$874.3 million)

► PEI mussels exports

\$40.0 million (12,677 tonnes)

▶ PEI oyster exports

\$5.9 million (826 tonnes)

► NS scallop exports

\$164.0 million (6,416 tonnes)

► NB crab exports

\$128.3 million (10,325 tonnes)

▶ NS crab exports

\$114.1 million (9,131 tonnes)

► NL crab exports

\$335.1 million (27,252 tonnes)

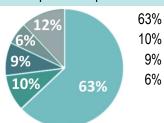
*data for 2014, published in 2015

Primary exports in the seafood product sector in Atlantic Canada



Main destinations of Canadian seafood product exports

USA China EU Japan



In 2014, seafood product exports from Canada to the EU totalled \$459 million, a 2% increase over 2012. Exports to France alone reached \$81.1 million in 2013, up 17% over the previous year. France is currently the ninth-largest importer of Canadian seafood products, accounting for 1.2% of production value and 1.8% of total production volume. Inversely, Canada is France's 24th largest supplier of seafood products. The main exports include scallops, lobster, hake and frozen fish meat.

Success Stories

Fishery products: now including high value-added high-tech products

PEI

▶ North Atlantic Organics Ltd., founded in 2007, is a company specializing in the harvest and distribution of sea plants. In 2015, the business received financial support from the Atlantic Canada Opportunities Agency and PEl's Department of Workforce and Advanced Learning in the form of a \$165,000 investment to assist the company in marketing its forage production of organic mineral food supplements made from benthic marine algae to the USA and other countries.

► NL shrimp exports

\$256.9 million (47,022 tonnes)

► Solarvest BioEnergy Inc. specializes in the development of innovative organic technologies with a focus on the use of marine algae for a broad range of applications, including in the medical and energy sectors. The company holds multiple patents relating to production of clean energy from algae and nutraceuticals from marine algae.



Association coopérative des pêcheurs de l'Île

Networks

Association des crevettiers acadiens du Golfe Atlantic Food & Beverage Processors Association Association des pêcheurs professionnels membres d'équipage Association des pêcheurs professionnels crabiers acadiens Atlantic Canada Aquaculture Industry Research Network Atlantic Food & Beverage Processors Association Centre for Marine Biodiversity Fisheries Council of Canada Canadian Council of Professional Fisher Harvesters Fédération régionale acadienne des pêcheurs Fishermen and Scientists Research Society Atlantic Lobster Sustainability Foundation Grand Manan Fishermen's Association National Seafood Sector Council Nova Scotia Fish Packers Association PEI BioAlliance Seafood Producers Association of Nova Scotia Maritime Fishermen's Union

Research & development

- AVC Lobster Science Centre
 Centre for Aquatic Health Sciences
 Atlantic Veterinary College
 Aquatic Animal Pathogen and Biocontainment Laboratory
 Fisheries and Oceans Canada
 Marine Training Centre
- BioNB
 Gulf Fisheries Centre, Fisheries and Oceans Canada
 Huntsman Marine Science Centre
 Coastal Zones Research Institute
 New Brunswick Fish Health Laboratory
 RPC Science and Engineering
 Biological Station, Fisheries and Oceans Canada
- Canada Excellence Research Chair
 in Ocean Science and Technology
 Department of Marine Biology Dalhousie University
 Bedford Institute of Oceanography
 Coastal Ecology Laboratory
 Aquatic Animal Health Laboratory
 Nova Scotia Agricultural College
 Oceans and Coasts Education Awareness Network Society
 Ocean Research Enterprise
 Ocean Tracking Network
 Marine Research Station (NRCC)
- Canadian Centre of Fisheries Innovation
 Ocean Technology Enterprise Centre
 Centre for Aquaculture and Seafood Development
 Centre for Fisheries Ecosystems
 Centre for Sustainable Aquatic Resources
 Centre for Aquaculture Health and Development
 Fisheries and Marine Institute, Memorial University
 Ocean Sciences Centre
 Northwest Atlantic Fisheries Centre (NWAFC)

Success Stories (cont.)

NB

- ▶ In February 2016, the NB **Department of Agriculture, Aquaculture and Fisheries** announced plans to allocate \$37 million in the 2016-2017 budget year toward supporting businesses and operators in the agriculture, aquaculture and fishery sectors.
- ▶ Leading-edge companies in the ocean sector may qualify for further support through the NB Innovation Foundation, which supports innovation development activities throughout the province. For example, **Mycodev**, a startup founded in Fredericton in 2013, was offered \$500,000 in funding in 2015 to help drive its efforts in marketing a new fungal fermentation technology and production of chitosan, a compound traditionally extracted from the exoskeletons of crustaceans and having medical and pharmaceutical applications, notably for its coagulant properties.

NS

- ▶ Mara Renewables Corporation is a research and development firm specializing in the marine algae fermentation process for applications in the chemicals and renewable energy sectors. Mara Renewables develops technologies to turn algae oil into biofuel and is currently seeking to optimize its processes to make large-scale production feasible.
- ▶ Established in 1981, **Acadian Seaplants Ltd**. has become an independent global leader in the production of value-added components and products made from algae for the food, pharmaceutics, agrochemistry, agriculture and cosmetics industries among others.

NL

- ▶ The Fisheries Technology and New Opportunities program created by the NL Department of Fisheries and Aquaculture seeks to support the seafood product sector and assist local enterprises seeking to become more competitive in their seafood product harvesting, processing and marketing activities. This program supports initiatives including research and development projects targeting, for example, the adoption of sound practices by the private sector to ensure the sustainability of fishery resources.
- ▶ To date, the program has provided a total of more than \$14 million in funding to more than 300 projects. In 2015, 18 different projects received a total of \$1 million in support. Companies offered funding during the 2015-2016 fiscal year included Torngat Fish Producers and Beothic Fish Processors Ltd., each of which received \$100,000 toward the acquisition of high-precision automated processing equipment, as well as Hailey Bear Enterprises and Quinlan Brothers Ltd., which were offered equivalent funding toward the purchase of harvesting and freezing equipment.

Information sources utilized for this issue —non-exhaustive list: Innovation, Science and Economic Development Canada; Statistics Canada; Fisheries and Oceans Canada; GNB, GNS, GPEI, GNL portals; information banks; specialized sites



Expert Voice

Exploitation and marketing of marine by-products and their applications

Coastal Zones Research Institute (CZRI) Shippagan, NB

Founded in 2002 and relaunched in 2005 as a non-profit research centre, the **Coastal Zones Research Institute** (CZRI) in Shippagan, New Brunswick, was established to create a **centre of excellence** in applied scientific research. The institute has developed a **research program in the fishery and marine by-products sector** (see also *Intell-Echo*, 1, 5, May 2014).

Deserving special mention is the work carried out at the CZRI in the area of **exploitation and marketing of marine by-products and their applications** in a range of sectors, such as **fish nutrition** in aquaculture and **human health**, including *nutraceuticals* offering potential benefits in terms of preventing obesity, diabetes and other chronic illnesses.

The CZRI has conducted research into the development of new marine by-products from processing plants in the Acadian Peninsula in northeastern New Brunswick. Numerous **by-products from processing of shrimp, herring, snow crab and sea cucumber** have been identified in partnership both with local plants and with scientists, who collaborated on a multi-centre study implemented between 2009 and 2015.⁽¹⁾

Researchers at the Université de Moncton (Moncton and Shippagan campuses), along with their colleagues at National Research Council Canada (Charlottetown, Prince Edward Island, and Halifax, Nova Scotia) contributed to the success of this five-year research plan implemented at research centres active in Atlantic Canada.

The outlook for this research area is highly promising. Many byproducts may have applications in natural health products for use in **diabetes prevention**. According to the World Health Organization (WHO) *Global report* on diabetes, (2) made public on April 6, 2016, and a study published in the scientific review *The Lancet*, (3) approximately 422 million adults worldwide have diabetes, or four times as many as in 1980, a statistic underlining the enormous scope of this chronic illness whose evolution is linked to factors including the growing scourge of obesity.

In the preface to the *Global report on diabetes*, the authors explain that diabetes is no longer a disease prevalent mainly in wealthy countries but is instead becoming rampant everywhere, growing particularly quickly in middle-income countries.

It is consequently essential to identify ways to combat this debilitating illness, and marine by-products not currently used in fish and seafood processing plants offer great potential insofar as **preclinical studies** to date have pointed toward positive outcomes.

The CZRI's long-term vision is to play a central role in bringing these by-products to market as active ingredients by identifying industrial receptors and partners in the *nutraceuticals* and human health sectors with a focus on treating obesity and diabetes. The CZRI is also striving to achieve use of all residue, which easily accounts for 50% of primary processing. At the end of the day, there will always be marine biomass available to exploit in this manner.

In this regard, the CZRI and IFREMER in France have published a patent relating to a **method for extracting a purine from fish scales**.⁽⁴⁾ This advanced, environmentally friendly process is used to recover a pigment called guanine, which fish incorporate into camouflage mechanisms to escape predators in the animal world. Numerous industrial applications may be possible, and in this regard the **CZRI** is also seeking industrial partners working in cosmetics, nanotechnologies and photonics.

Dr. Jacques Gagnon, Scientific Director Fishery and Marine Products, CZRI Contact the CZRI at: info@irzc.umcs.ca

Footnotes:

- 1. ACOA. Government of Canada Invests \$3 million in Coastal Zones Research Institute in Shippagan. January 20, 2009. http://www.acoa-apeca.gc.ca/eng/Agency/MediaRoom/NewsReleases/Pages/2500.aspx
- 2. World Health Organization. Global report on diabetes. Geneva, April 6, 2016. http://www.who.int/diabetes/global-report/en/
- 3. Ezzati, M. Worldwide trends in diabetes since 1980: a pooled analysis of 751 population-based studies with 4.4 million participants. *The Lancet*, 387, April 9, 2016, 1513-1530. www.thelancet.com
- 4. Bergé, J.-P.; Donnay-Moreno, C.; Bruzac, S.; Albert, D.; Subramanian, B.; Djaoued, Y.; Gagnon, J.; Ramin, R. Patent WO/2015/092283: Method for Extracting Purine. WIPO PATENTSCOPE, June 25, 2015.



Observatoire d'information économique

Intell-Echo

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In this issue:

Consumption, seafood

- Overview

A succes story

French « savoir-faire »

Focus - Marine biotechnologie



Do you know?

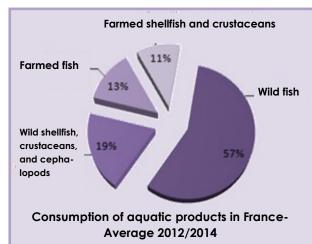
Consumption, seafood—The French market

In France more and more seafood is being consumed, although meat consumption still remains higher. The percentage of the consumption of seafood, out of the total consumption of meat and seafood, has risen from 21% in 1980 to around 30% today. In recent years, consumption has tended to stagnate or even decline slightly, due to rising fish prices. On average, people in France eat fish once or twice a week, but feel that the shelf life of fish is lower and its price is higher than meat. Cod is the fresh fish that is eaten most often. It accounts for 24% of the consumption of fish (statistic from May 2015), compared to 18% for salmon.

There is a tendency today in France to favour the sale of seasonal fish, for a more ethical and responsible consumption, especially since the price is more affordable. The sale of fish said to be "at risk" is decreasing in France, since many major distributors have stopped marketing it.

On average, the French consume 34.6 kg of aquatic products per capita per year, compared to an average of 21.8 kg per capita per year in Europe and 18.9 kg per capita per year in the world (data 2015). In France, the consumption of fish, particularly fresh fish, is related to household income. The higher the household income, the higher the consumption of fresh fish. A little less than a quarter of the aquatic products that we eat come from fish farms.

France imported 1.1 billion tons of aquatic products in 2014, at a cost of 5 billion euros; domestic production covers only 25% of the need. In 2013, Canada ranked 24th as a supplier of fish and seafood to France, with sales of \$81.1 million CA. Norway with salmon, is the number one supplier. But the most imported product in France is frozen shrimp, with cod in 10th place.



Consumption trends

More than 82% of fish sales are retail and less than 15% are in the food services sector. Sales of fish in restaurants have decreased by almost half within the last 6 years.

In France the consumer prefers to buy food that is easy to prepare and inexpensive; sales of fresh fish have therefore declined in favor of packaged fish and seafood, especially refrigerated products.

Sources: Global Trade Atlas, 2014; Euromonitor, 2013; France AgriMer

Further information: CACIMA 41-05-30 alexandre.baridon@cacima.fr



A Success story

Maison Audouze - Saint-Pierre et Miquelon



preneur. 17 years workdelicatessen,

food.

ate terrines, mousselines, blood rope. sausages, soups, or frozen dishes, made using local seafood and "I do not count my hours and I local vegetables, as well as char-often work on weekends, but I still cuterie. I am innovative and eve-manage to balance my family ry day I create products with life and my professional life. It fresh wholesome flavours. I pro- would be very rewarding for me mote and showcase the prod- to get my line of products "Mon ucts of local agriculture and the Chef" into France (mainland local fishery in the foods I pre- France) because I am putting a pare, in order to support the lot of work into it. But also to economy of Saint Pierre and Milmake Saint Pierre and Miguelon, quelon, but mainly because they its heritage and its gastronomy, are very good products. Here, better known to other French we have the opportunity to be people. " able to work directly with the are fresh and of high quality. This every success

ean-Patrick high quality allows us to create a Audouze is flavourful end product with a tex-35 ture that is outstanding, which year old entre-reflects all the richness of our is-After lands."

ing in the family With a new bigger location, equipped with state of the art he decided to machines, Jean-Patrick plans to launch his own brand "Mon Chef" grow his business by offering for his traditionally processed more than 16 frozen dishes and products and prepared dishes, approximately fifteen terrines. many of them based on sea- Ambitious, eager to innovate, and always smiling, the young chef works hard to expand his "In my production facility, I cre-business into Canada and Eu-

producers or the fishermen, so To Jean-Patrick, father of five we are able to get products that children, we wish good luck and

A Promising Future

Currently mainly available on the local market, the "Mon Chef" line of products is starting to export internationally, via online retail sales.

Building on this success, Jean-Patrick Audouze intends to expand his distribution market and plans to launch his products on the European market, through partnerships with local retailers. He wants to meet an everincreasing demand and is com-

mitted to making the local products of Saint-Pierre and Miquelon better known everywhere. Exporting to Canada is also planned, in a second phase.

"French and Canadian consumers do not have the same expectations and my market approach has to be adapted to best satisfy the different clienteles. In the short term, I prefer to focus on France."





Internet site: www.monchef.net



The products

Many products from the fishery are processed by Maison Audouze, whether in the form of pre-cooked dishes or terrines and mousselines. They include the traditional Saint-Pierre and Miguelon cod, but also snow crab, lobster and scallops. Redfish, whelk, shrimp and capelin complete the product line and offer a wide choice of tastes. The range of products offered continues to expand with the creation of new recipes, especially those using seasonal products:

"There is a willingness to create specific products, whether for holiday periods or for the summer, always working with local ingredients and local products, whenever possible."

The products use a preservation technique, called sterilization, which allows a long shelf life without altering the contents.



French "Savoir-faire"

<u>i</u>...?

French expertise

France has the second largest maritime area in the world, with more than 11 million square kilometers under its jurisdiction. Like other European countries, France carries out a regulated and ethical fishery and respects fishing seasons and species protection. Numerous processes to ensure quality, designated through "labels" are applied in the territory.

These include the designation "label rouge" or the Pavillon-France brand, focusing on the quality of products derived from the French fishery. Unfortunately however, there is a lack of consistency among the labels; such consistency is required in order to make them more easily understood by the consumer.

In the processing of seafood, France is innovative and is developing methods to provide consumers with increased flavour and more authentic textures. There is a wide range of products, which perpetuate ancestral and traditional "savoir faire": **smoking** (wood and direct smoke), **salting** (in brine and in dry salt), **filleting**, **drying** (traditionally and using temperature controlled dryers).

France also focuses on using marine co-products which represent approximately 50% of the weight of a fish (bones, head, skin...). These are used as ingredients for cosmetics and for research.

Like the French company COPALIS, located in Boulogne-sur-Mer, a world expert in its field, which uses the co-products of the fishery to produce dietary supplements, functional food or cosmetic and animal feed.

Expertise - Saint-Pierre et Miquelon

• Les pêcheries Paturel - Marque La Boucanière



The company Pêcheries Paturel in Saint-Pierre and Miquelon salts their fish, in particular cod, by hand, but they also smoke with maple wood and fillet their fish in the traditional way. They also offer smoked salmon, trout, cod, redfish ... in keeping with the French tradition.

Cuir océan



Cuir océan is a French leather goods company, which produces individually handcrafted products, using leather made from the skins of wild fish caught in North Atlantic, such as local cod. They make small leather items like wallets, handbags, keychains...

SURIMI - France, the European leader

SURIMI, a small fish stick made from white fleshed fish, with the taste of crab, comes to us from Japan. Called "kamaboko" the traditional recipe was used to extend the shelf life of fish. Later, a crab taste was added, before exporting it to western countries.

French industries very quickly identified strong potential and began to mass produce surimi. Today, France ranks second in the world in its consumption, after Japan, and 90% of the products consumed in France are produced in France. On average, a French person eats 1kg of surimi a year. There are 4 manufacturers in France: Fleury Michon; Bongrai (Coraya brand); La compagnie des pêcheurs de Saint Malo and Intermarché.

Made from wild fish caught in the open sea, in particular, blue whiting and pollock from Alaska, using sustainably sourced fish, it is composed of fish meat, water, starch, egg whites, oil, paprika and flavourings.

In France, a percentage of the commercial fishery is intended exclusively to provide raw material for the manufacturing of Surimi.



Marine biotechnologie

Areas and expertise

Today, marine biotechnology is recognized as an area of strategic importance internationally. It has become a key to sustainable development and is a resource that is used for food, health and cosmetics. France ranks third among European countries in this field

What is marine biotechnologie?

"Biotechnology is the application of techniques and knowledge of biology to produce goods and services. It is called marine biotechnology or blue biotechnology when the resources used are of marine origin."

"Marine biotechnology includes the research and use of marine bio-resources such as micro-organisms (micro-algae, bacteria, marine fungi and viruses), invertebrates, co-products of fishing (by-catch, unused parts ...) microalgae, as well as the use of biotechnological and industrialization tools, including in aquaculture.

Marine bio-resources are used in five major sectors:

- Energy (biofuels)
- Human and animal health
- Cosmetics
- Environment and industry
- Food

France has many competitiveness clusters in marine biology, in all fields of application. Sixty-two masters and four doctoral schools in marine biotechnology are available in the territory. On average, 3% of patents filed in France relate to marine biotechnology.

The **BioMarine Business Convention** will take place in Oslo, Norway from October 19 to 21, 2016. Then, in October 2017, it will be Rimouski, Quebec's turn to host this conference, which takes place every year. Recent research is showcased in a context of global development. These encounters are the link between innovation and the business world.

Sources: Aquimer, Ifremer, Franceagrimer, bluecluster.fr

<u>(i) (!) (?)</u>

The major competitiveness Cluster in France

le Grand Ouest

The Grand Ouest consists of the regions of Bretagne and Pays de la Loire. Many university courses are offered there and internationally recognized, high quality marine biology and engineering research laboratories are scattered throughout the territory. With dynamic technology transfer, as well as a vibrant and diversified industrial base, le Grand Ouest has the potential to become a major center of excellence on the international scene.

With over 2700 km of coastline, Brittany is France's leading region in marine biotechnology.

4 competitivity clusters are located there

- Pôle Mer Bretagne Atlantique with strategic actions dedicated to marine biological resources - the headquarters is in Brest.
- Valorial and its interest in marine bio-resources as health ingredients and foods of the future the head office is in Rennes.
- Atlanpole Biotherapies for health applications of marine biotechnology - headquartered in Nantes.
- **Images et Réseaux** its interest in bioinformatics the head office is in Lannion.

Other major centres in France

Pôle Mer Méditerranée

It aims to sustainably develop the maritime and coastal economy in the Mediterranean basin – the headquarters is in La Seyne-sur-Mer.

Aquimer

Specializing in aquatic products, Aquimer seeks to use all the products that are caught in the oceans in order to conserve resources and to strengthen the protection of the ecological balance – its headquarters is in Boulogne-sur-Mer.

Other competitiveness clusters are using marine biotechnology.

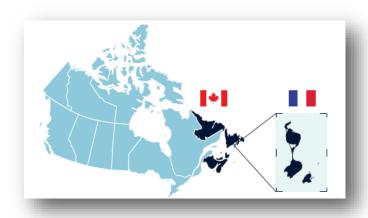
Information: http://competitivite.gouv.fr/identifier-un-pole/annuaire-des-poles-20.html

For further information on marine biotechnology, please consult:

http://www.futura-sciences.com/magazines/high-tech/infos/dossiers/d/technologie-biotechnologies-defi-futur-2158



INTELL-ECHO



Are you seeking business opportunities in this sector? CACIMA and FCCC-AN can facilitate your business prospection process and help with establishing new partnerships (targeted information and network contacts)

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