

INDIAN PASTEURIZED CRABMEAT INDUSTRY – AN OVERVIEW

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- Markets for blue crabs were developed as early as the **1800s** in **United States**.
- Fresh and frozen **whole crabs, sections or legs, and frozen, pasteurized or canned crab meat** is also imported into the US from many different countries around the world.
- **The United States is the major export destination for pasteurized crabmeat; hence the US market drives global Blue Swimming Crab demand.**
- Pasteurized crabmeat is the process in which the meat is put into a metal or plastic sealed air tight container, **heated and cooled by a specialized process**. It will have a shelf life of **12 to 18 months** under refrigeration if kept at 33-40 degrees Fahrenheit.
- For most of the past decade, between 150 and 200 million pounds of crabs, **15 to 30 million pounds** of frozen or pasteurized crab meat, and **50 to 70 million pounds** of canned crab meat were imported annually to USA.
- US imported **28,645 metric tons** of the three species of swimming crab in 2018, an **8.8%** increase over the **26,334t** imported in 2017



HISTORY OF PASTEURIZED CRAB MEAT INDUSTRY

- In 1916, A. E. Phillips founded the Phillips Seafood Company and opened a crab processing facility in Hooper's Island, Maryland.
- Over the course of the following four decades, the Phillips family opened restaurants in Baltimore, Washington, DC, and another two in Ocean City, US.
- In the 1980s, Steve Phillips assumed the reins of the company, but by the time he was ready to make his mark on the family business, the **Chesapeake Bay** didn't have enough blue crabs to satisfy the scope of Mr. Phillips' ambitions.
- He was looking for less expensive sources of product similar to the famous blue crabs found in the Chesapeake Bay and Gulf of Mexico.
- In the 1980s, Steve Phillips he headed to Southeast Asia, and in 1990s to India where he had heard that crabbers were harvesting the **Portunus pelagicus** (blue swimmer crab), a distant cousin of the **Chesapeake Bay blue crab**, with a similar "flavor profile".



- With the help of a chemical—**Sodium acid pyrophosphate**, or **SAPP**—the Phillips Company found they were able to preserve the **Southeast Asia crabmeat** for a period of 18 months, a process the Phillips Company refers to as “**pasteurization**”—a treatment that both whitens the crabmeat and “tempers” its natural flavor.



Shirley Phillips' Original Maryland Crabcake Recipe (1956)

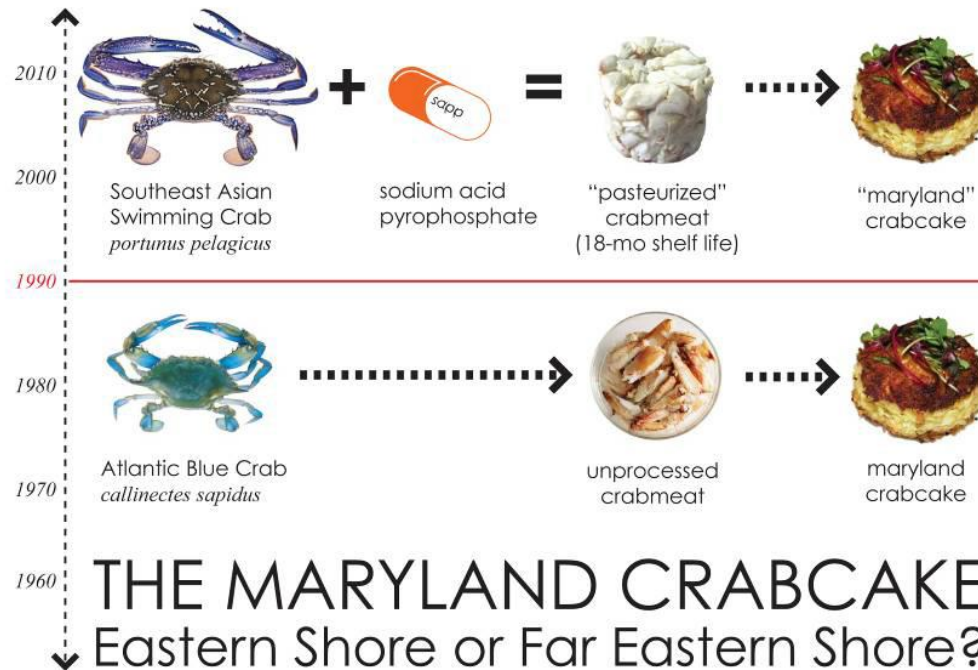
- 1 lb. Phillips Crab Meat
- 1 egg
- 2 tsp. Worcestershire sauce
- 1/4 tsp. dry mustard
- 2 Tbsp. mayonnaise
- 1 tsp. lemon juice
- 1 Tbsp. mustard
- 1 Tbsp. melted butter
- 1 tsp. parsley flakes
- 1 tsp. Phillips Seafood Seasoning
- 1/2 cup breadcrumbs

In a mixing bowl, combine all ingredients except for crab meat. Gently fold in the crab meat, being careful not to break the lumps. Shape into cakes. Pan fry or bake at 375 degrees F for 12-15 minutes or until evenly brown on each side and reach an internal temperature of 165 degrees F. *(serve hot or cold)*



"There is nothing better than fresh Maryland crabmeat. It's the premier crabmeat in the world—it's a great product. The problem is, there's just not enough of it anymore."

- Steve Phillips, 2005



MARYLAND CRAB CAKE



Crab cakes are most often associated with Maryland and the Chesapeake Bay area. They are considered a popular traditional specialty. The phrase "crab cake" appears to be a 20th century appellation.

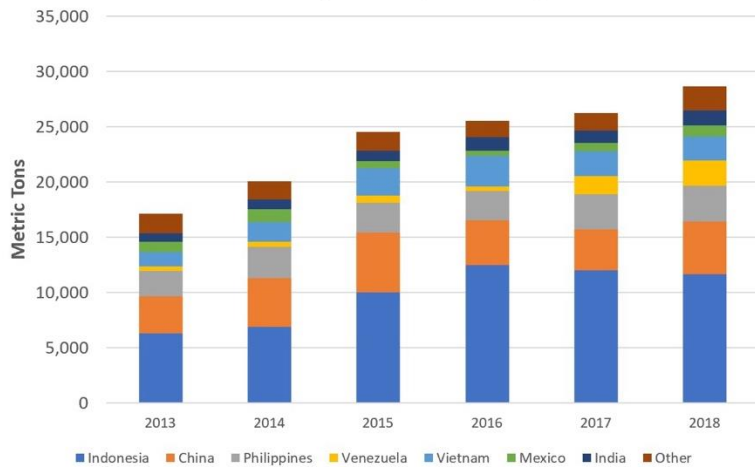
Blue Crabs Are the Best

Blue crabs are most abundant in the estuary of Chesapeake Bay. Since blue crabs thrive in estuarial regions, they became a main staple in the Maryland region for food.

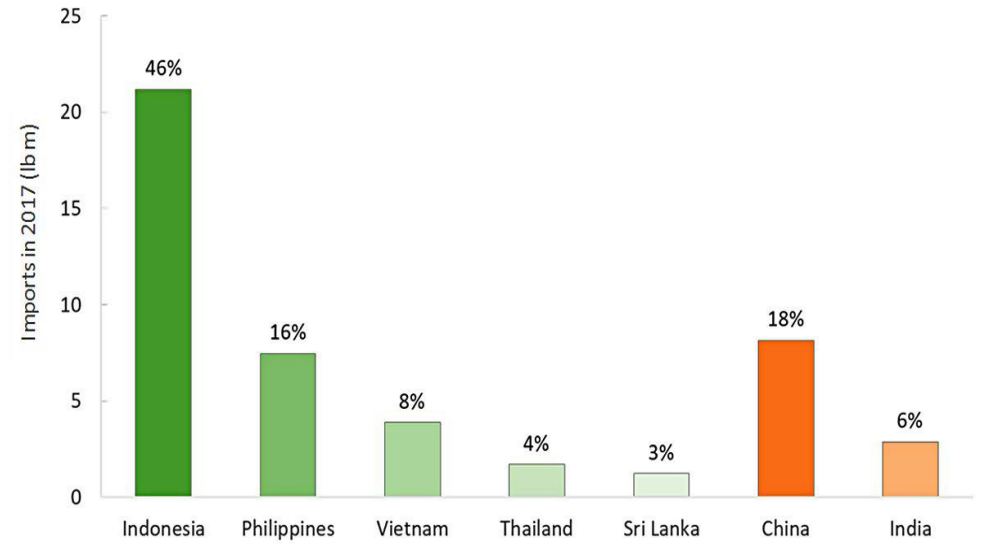
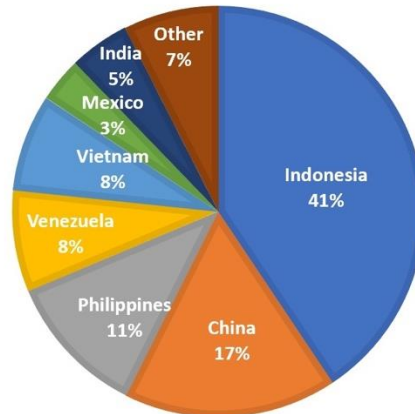


- It Maryland in the Chesapeake Bay, where harvests of blue crabs **declined in the 1990s and 2000s** because of **fishing and environmental causes**, scientists say.
- This time it's in Asian countries that began exporting crab meat some 20 years ago. This industry now supplies the majority of the crab meat consumed in the United States.
- During the past two decades, American companies, have increasingly imported meat from Asia. They wanted to satisfy a growing demand for crab cakes in America and provide a product available year-round.

US imports of blue, blue swimming and red swimming crab by volume, 2013-2018



US IMPORTS OF BLUE, BLUE SWIMMING AND RED SWIMMING CRAB, 2018
TOTAL = 28,645 METRIC TONS



CALLINECTES SAPIDUS

- Also known as “**Blue Crab**” or regionally as the **Chesapeake blue crab** is a member of the Portunidae (Swimming Crab family). This species is most abundant in Gulf coasts of the USA (Texas, Florida, Louisiana, New York, New Jersey).
- It is the most widely harvested and consumed crab in the USA. Blue crabs which have shed their shells, known as soft shell crabs, have more commercial value than hard shell ones; these are a highly favored delicacy in the restaurant trade in the USA.
- Male and female blue crabs have sexually dimorphic claw coloration; adult males have white and blue claws, and adult females have orange or red claws



Male blue crab.
Note his blue tipped claws.



Female blue crab
Note her “painted” red claws



PORTUNUS PELAGICUS

- This species is also known as “Swimming Blue Crab” and a member of the **Portunidae** family. The species can be found around the world but predominantly in Southeast Asia (Indonesia, Thailand, Vietnam and the Philippines) and India.
- This species most closely resembles the *C.sapidus* species.
- The blue swimmer crab is found in the intertidal estuaries of the Indian and the Middle Eastern coast of the Mediterranean Sea.
- **Portunus pelagicus** inhabits sandy and muddy bottoms in shallow waters at depths between 10 to 50m, including areas near reefs, mangroves, seagrass and algal beds.
- Maximum carapace width is **20 cm** for males with a common size of **14 cm**.
- The males have bright blue accent colors on their claws, while the females have a duller green/brown coloring.



PORTUNUS PELAGICUS



© Bella Galil

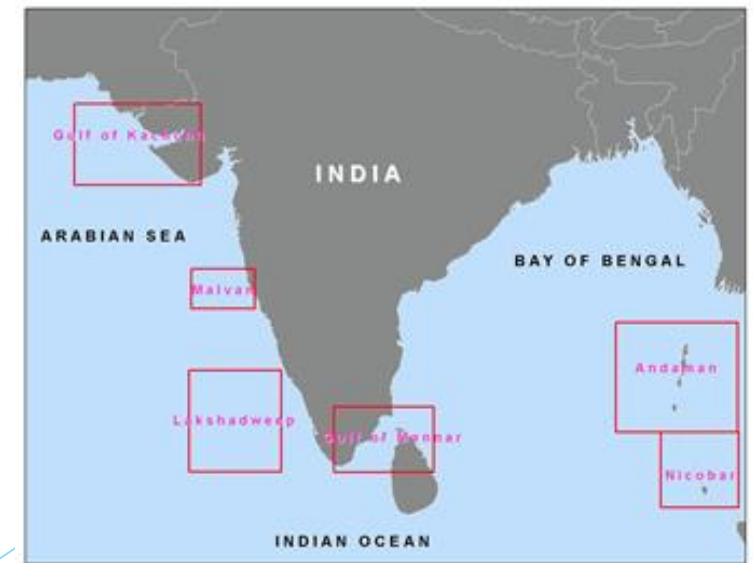


PORTUNUS PELAGICUS in INDIA

- India is the major contributors of marine crustaceans in the world market.
- Among the marine crustaceans found along the Indian coasts, **crabs ranks third** after shrimp and lobsters by virtue of importance as an esteemed seafood delicacy.
- Crab fishery is one of the important fisheries in India having an average annual production of **56,000 metric tonnes** (CMFRI, 2017).
- The crab species are not only consumed locally but also exported extensively to the US and European markets as pasteurized crabmeat products.
- About 70-80% of blue swimming crabs are exported as **pasteurized crabmeat** and the remaining, 20% as **cut crabs**.
- On an average, **1268 metric tonnes** of pasteurized crab meat worth **US \$ 22.11 million** are exported from India.



- In India the best potentials of **Portunus pelagicus** resources are seen in the coasts of **Tamil Nadu, Kerala and Karnataka, Andhra Pradesh** and to certain extend in **Orissa and Gujarat**.
- Tamil Nadu ranks first in **P. pelagicus** landings for the past several years and a good fishery exists along the **Palk Bay and Gulf of Mannar**.
- Blue Swimming Crabs are mainly caught as by-catch by **bottom trawls** (targeted for shrimps and fishes), operated in depths up to 50 metres.
- Among the indigenous gears used for crab fishing, the bottomset gillnets contribute significantly and their operation is restricted to shallow grounds up to 15 meters depth.
- There are **EIGHT** major crab processing plants in India, exclusively taking up processing of pasteurized blue swimming crabs for export to US.



PROCESSING

Crabmeat is processed in different ways: **fresh, pasteurized, and shelf stable.**

Traditionally, **live crabs are cooked**, and then the **meat is hand-picked and packed in containers** for market under refrigeration and sold as **fresh crabmeat.**

The crabmeat may also undergo further heat treatment and be sold as a **pasteurized product with an extended shelf life (6-18 months).**

Blue crab is pasteurized by placing containers of blue crab into a **hot water bath tank for a minimum time and temperature, and then cooling them in ice water.**

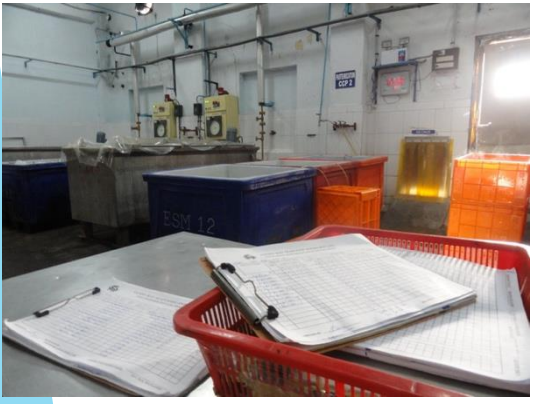
This pasteurization process may put such products at risk for recontamination after pasteurization from **defective containers or contaminated cooling water.** Therefore, certain controls (e.g., ensuring container seal integrity) are critical to ensuring food safety.

Low-Acid Food products and the microorganism of concern will always be the most heat resistant **spore-forming clostridium botulinum** and generally destroyed by a sterilization process at 121.0°C. But doing so will damage the **quality attributes and sensory properties** of the heat-sensitive food products.









Crabmeat Grades

The five basic commercial crabmeat grades on the market



Claw Meat



Claw Fingers



Jumbo Lump



Special



Backfin

GRADES OF CRAB MEAT

There are four parts of the blue crab and blue swimming crab that yield distinctly different grades of meat. From the back of the crab forward are the Colossal/Jumbo Lump, the Super Lump, the Lump, the Backfin Lump, the Special and the Claw meat

COLOSSAL & JUMBO LUMP CRAB MEAT:

Colossal (>7gm)/Jumbo Lump (3gm-6.9gm). Derived from the two large muscles connected to the swimming legs, jumbo lump/Colossal is the largest and most expensive grade of crabmeat. It boasts a bright white color and delicate flavor.

SUPER LUMP:

Super Lump is a blend of firm, thick and long pieces of white muscle crabmeat from the backfin, large pieces of body meat and broken jumbo lump.

LUMP:

Lump is a blend of broken jumbo lump and special crab meat from the body. Considered to be the sweetest crab meat the pieces are smaller than the jumbo lump crab meat



Colossal/ Jumbo Lump



Colossal lump crab (also known as mega jumbo or super jumbo) is the large chunks of meat that connect to the swimmer fins. There are only two of these muscles per crab, which is why it is so expensive (often \$40 to \$50 or more per pound).

Flower Lump/Lump





BACKFIN

Backfin grade is made up of smaller, broken chunks of lump crabmeat mixed in with flakes of white body meat. It is less expensive than lump crabmeat.

SPECIAL

Special is often considered the most versatile grade of crabmeat for the widest range of recipes. It is finely shredded smaller pieces of white meat from the body of the crab.

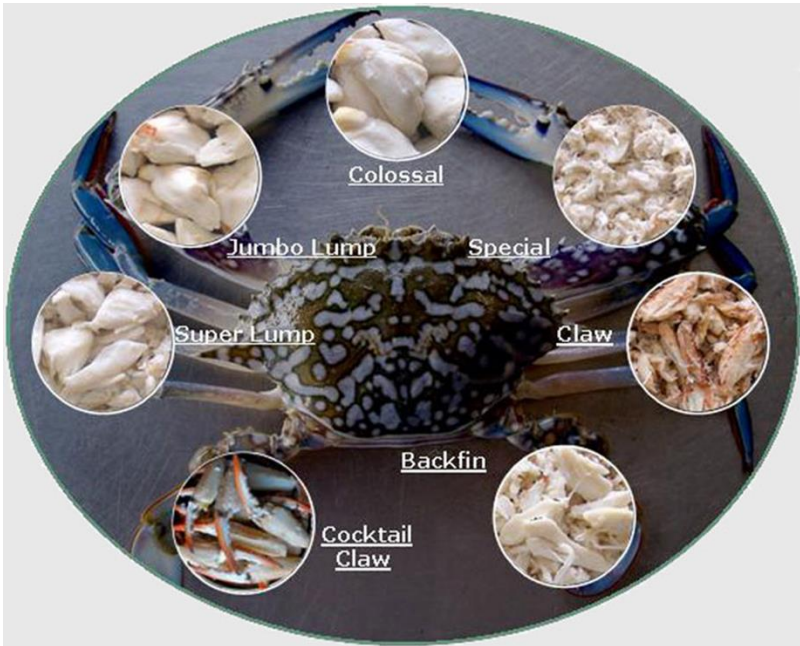
CLAW CRAB MEAT

Claw meat comes from the swimming fins and claws of the crab. Because these are very active muscles—much like dark meat in poultry—the meat is pink or brown, high in fat, and has a much stronger crab flavor. Its texture is similar to backfin.



Claw, Finger, Swimming Leg





CRAB PASTEURIZATION

Crab pasteurization was initially a means of **extending the shelf life of this perishable product**. ***Clostridium botulinum*** is the organism of primary concern in the low-acid canned food industry because it represents a serious potential health hazard. An adequate thermal process is therefore imperative to ensure a safe product.

PASTEURIZATION OF CRAB MEAT REDUCES:

The spores of *Clostridium botulinum* type E and nonproteolytic B and F, making the product safe for an extended refrigerated shelf life. These strains are unique in that they will produce toxin at temperatures as low as **38 °F**.

A 6-log reduction in pathogens is possible with treatment in the **185 °F (51.8 minutes) to 212 °F (1.0 minute)** range.

The numbers of other target pathogens (e.g., *Listeria monocytogenes*, *Vibrio vulnificus*, and *Vibrio parahaemolyticus*, *Escherichia coli*, *Salmonella* spp., *Shigella* spp., *Staphylococcus aureus*).



CRITICAL CONTROL POINTS

The critical control points for pasteurization of crab may include:

1. Sealing / Seaming / Pouch handling
 2. Pasteurization (heating step)
 3. Pasteurization (cooling step)
 4. Refrigerated Storage
- Length of the pasteurization cycle.
 - Temperature of the water bath.
 - Water bath circulation.
 - Measurable residual of chlorine (or other approved water treatment chemical) present in the cooling water to combat microbial growth.
 - Product initial temperature.
 - Container size (e.g., can dimensions, pouch thickness).
 - Container seal integrity.
 - Accuracy of monitoring and timing instruments, including thermometers, recording thermometer charts, high temperature alarms, and digital data loggers.



QUALITY FACTORS- SENSORY ASPECTS

Organoleptic tests are very widely used to assess quality in the crab industry.

ODOR:

The odor of the crab meat is the first indication of the degree of freshness at the time of processing—how long it took to get the crab from the water to the plant.

The odor should be that of a **freshly cooked crab—sweet and light seafood, never fishy, sour, sickly sweet, ammonia.**

COLOR:

The color of canned crab meat is another clue to its quality. The meat should appear clean, white and smell fresh with no off odors, colors.

An ivory color is the natural and most desirable color. If the crab meat is **bright white**, it is a good indicator that **additives** of this sort have been used. An occasional **blue tinge** in the meat is natural in blue and blue swimming crabs, most often caused by **trace quantities of minerals** in the crabs' diet.



TEXTURE:

Top-quality crab meat will have a firm texture with distinguishable muscle fiber—never **mushy, soft or dry attributes**.

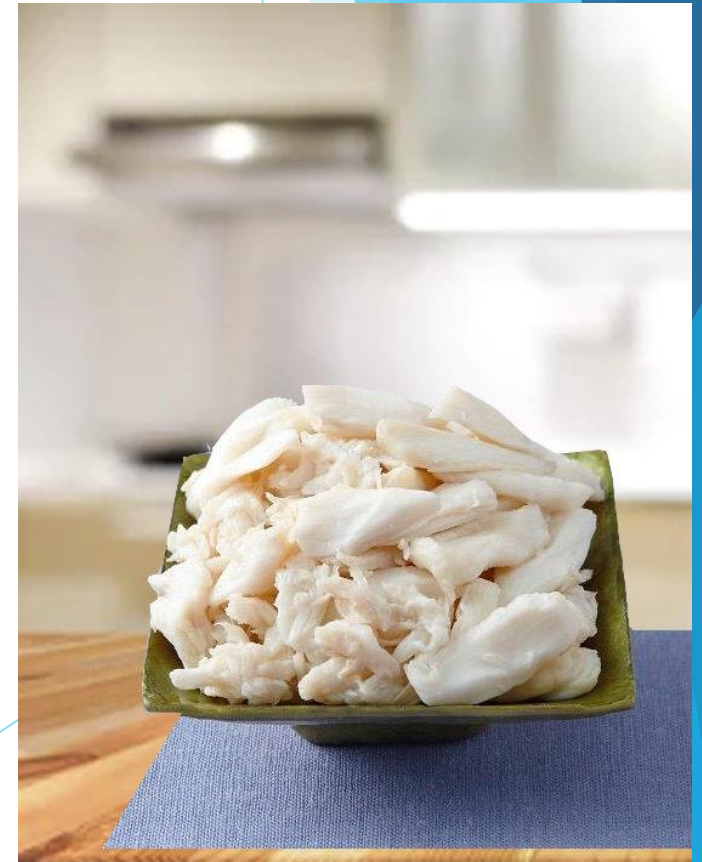
The texture of the crab meat can vary according to a number of factors, including the freshness of the crabs when brought to the plant, and the method of processing.

FLAVOUR.

The crab should taste **fresh and clean, sweet, slightly salty** (“of the sea”), with no unpleasant aftertaste. Some additives impart a chemical flavor or aftertaste to the crab meat.

Cheaper cans can contribute a tinny (metallic) flavor.

Crab is lighter flavor in than other crustaceans; Each bite of crab meat should be a delight.



SHELL CONTENT.

Pieces of shell in the crabmeat add an unpleasant dimension. The presence of shell and cartilage is a function of the skill and dedication of the individuals who pick the crab—an incredibly intensive and tedious task.

It can only be done successfully by hand. While an occasional shell will be found in any crab meat, the amount of shell, shell fragments and cartilage should be negligible.

No other foreign objects should ever be present.

SODIUM ACID PYROPHOSPHATE (SAPP)

It is an additive used to prevent the formation of struvite crystals and discoloration of the crab meat. SAPP is not an allergen and is added in accordance with industry standards and expectations.



QC INSPECTION



ADVANTAGES OF PASTEURIZED CRAB MEAT

- They have longer shelf life than fresh crab meat for months.
- They are ready to be eaten even without further cook meaning you can cut preparing and cleaning stage.
- They are sold in cheaper price than fresh crab meat so it is economical alternative of expensive crab meat.
- They are available year around and easy to be found anywhere and anytime.
- They are versatile and can be cooked or mixed with various ingredients to make a nice healthy dishes or recipes.
- Controlled inventory.
- Quality-control standards driven by food technicians at all plants.
- Guided by HACCP regulation.



THREATS & CHALLENGES

The rapid growth of harvests to provide those exports is blamed for signs of possible **overfishing** that have appeared in South-East Asia, especially in India. The number and size of crabs caught have dipped.

The average size of crabs caught has declined, suggesting that fewer crabs were surviving to adulthood and reproductive age.

Fishermen in one part of Asia were catching 5 crabs per kilogram in 2000; four years later, their catch averaged 10 crabs per kilogram, according to the Sustainable Fisheries Partnership, a nonprofit group.

India, one of the largest exporters of blue swimming crab meat to the U.S., have lacked the scientific expertise to do detailed studies of the stock there.

American crab importers are funding a group, **the National Fisheries Institute Crab Council**, formed in 2009 to better understand the current status and future direction of the Asian crab population.

The group is also financing research to get more information on the size of the blue crab population.



NFI CRAB SUSTAINABILITY COUNCIL™



NATIONAL
FISHERIES
INSTITUTE



The National Fisheries Institute Crab Council is a group focused on crab sustainability.

Since 2009, the Crab Council has practiced industry led stewardship, influencing crab management through funding fisheries improvement projects and market leadership.

Throughout five countries in Asia, NFI sponsor sustainability projects to preserve crab as a popular, plentiful seafood item as well as an important economic resource for dependent livelihoods.

To fund the work, the council's member companies have agreed to pay 1.5 cents for every pound of crab meat imported into the United States. The World Bank has also supported the council's efforts, awarding it grants of \$50,000 a year for three years.

NFI Crab Council Members collectively represent around 85% of the total Blue Swimming Crab imported into the U.S.



NFI PROJECTS FOR BLUE SWIMMING CRABS

The NFI Crab Council sponsors comprehensive sustainability projects throughout Southeast Asia.

Working with in-country businesses, NGOs and government organizations the Crab Council identifies fishery needs and assists in creating and implementing **Fishery Improvement Projects (FIPs)** to further bolster crab stocks.

Implementing management frameworks, **fishery stock assessment, crab hatcheries, gear exchange programs, sustainability outreach, education and setting sourcing standards** are just a few of the ongoing Crab Council funded efforts.

FIP MEMBERS:

- Crab Meat Processors Association, India (CMPA)
- Indonesia Blue Swimming Crab Processors Association (APRI)
- Philippine Association of Crab Processors (PACPI)
- Thai Crab Product Group (TCPG)
- The Crab Council of the Vietnam Association of Seafood Exporters and Producers (VASEP)
- The Seafood Exporters' Association of Sri Lanka (SEASL)



FISHERY IMPROVEMENT PROGRAM (FIP) by CMPA

The Fishery Improvement Program (FIP) for Blue swimming crab has been initiated by **Crab Meat Processors Association, India** through the financial support of **National Fisheries Institute (NFI) of Crab Council (NFI -CC), USA**.

Various activities of CMPA which were implemented at the field level with regard to its conservation *viz.*, **over exploitation, minimum size limit(10cm min), berried female catch and habitat conservation.**

The awareness meeting on the sustainable exploitation of blue swimming crab resources, release of ovigerous females, protection of breeding and nursery grounds, habitat conservation .

Display of bill boards and preparation of outreach material for awareness program - The bill board with the message of blue crab conservation is made in local language (Tamil) and English.

Stakeholders Meeting Periodical meeting with stakeholders has been organized with the participation of Research Institutions, State Fisheries Department, NGOs, Fishermen, representatives of different Associations from fishermen community.



WOMEN IN CRAB MEAT INDUSTRY



NEWPORT INTERNATIONAL



Founded in **1964**, Newport International maintains its status as one of the leading powerhouses in the seafood industry, distinguished by its **outstanding quality of product**, unwavering **sustainability** standards, and unbeatable taste across all of its brands.

The majority of our product production and processing facilities are stationed in Southeast Asia and China, but our global reach extends worldwide.

Newport International is also one of the largest wholesale importers of crab meat in the US.

The products include **pasteurized crab meat in both refrigerated and frozen form** in the popular species of Portunus Pelagicus (Blue Swimming Crab), Portunus Haanii (Red Swimming Crab) as well as many other species that are available.

Newport International strives to be as cognizant of the world's sea life as possible, **donating a portion of every dollar purchased to the NFI council's FIP efforts every year.**



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The company is committed to providing quality and sustainability across all its' product lines. It employs quality assurance inspectors (direct employees) that are stationed abroad, to monitor its operations.

It requires independent audits to all its plants, and it is one of the founding members of the **NFI Crab Sustainability Council™**.

The President of the Newport International Mr. Anjan Tharakan is the **Chairman** for the NFI's Red Crab Council.

NPI is the first company to import Frozen pasteurized crab meat from China.

NPI stands No.1 in importing frozen pasteurized Crab meat. Nea



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THANK YOU

