

Issue No: 31

OCT '19



ESSEN RIVESTA

ENTWINE WORLD AND NUTRITION

SEA FOODS



*Anniversary
Edition*

INDEX

ABOUT THE EDITION	
NATIONAL NEWS	..... 04
INTERNATIONAL NEWS	..... 04
TAX ON FISH MEAL MAY IMPACT SEAFOOD SECTOR	..... 05
YOU ONLY LIVE ONCE.... LICK THE BOWL	..... 06
ALTERNATIVE SEAFOOD PRESERVATION TECHNOLOGIES	..... 08
SOCIAL ISSUES	..... 09
WHO IS THE BEST SURVIVOR??	..... 10
NEW PRODUCT	..... 11
BOOK ALERT	..... 11
SEA TO FORK	..... 12
INDUSTRIAL UPDATES	..... 14
BANG THE MYTH	..... 15
SECRETS THAT YOU DON'T KNOW	..... 16
DATA CARD	..... 17

AGRICULTURAL ENGINEERING COLLEGE AND RESEARCH INSTITUTE

TNAU, Coimbatore, Tamilnadu-641003

Cordially post your feedback to eesenrivesta@gmail.com

Don't forget to view our other publications at: www.foodxploretnau.com

PH.No : 9445110036, 9789743772



SEA FOODS CAN MAKE YOU LIVE 10 YEARS MORE...

FISH!!! When we hear this word, our mouth secretes saliva and makes us feel hungry. Most of us love sea foods and records state that sea foods are being a staple food since ancient times. We take immense pleasure in revealing the secrets about sea foods.

Seafood is any form of sea life regarded as food by humans, prominently including fish and shellfish. There are many types of seafood which includes cockle, cuttlefish, loco, mussel, octopus, oyster, periwinkle, lobsters, scallop and many more. Fish is a staple food especially in coastal areas.

China is the world's top seafood consumer, followed by Japan and United States. In US, the most widely served seafood is shrimp, followed by salmon and tuna. Seafood provides essential nutrients to the body which includes vitamins A, B and D as well as omega 3 fatty acids. It is also a rich source of calcium and phosphorus.

We were so much interested and the eagerness to know more about seafoods almost killed us, as it showered us with so many unknown secrets. We chose this topic to share what we have gained. It is a vast area which could swell our brain with so much information. We have touched only the surface of seafood. Hope this magazine will give you interest towards this topic and help you gain more information.

Editor: Adhikeshavan B

Co- Editor: Shangamithra SM



NATIONAL NEWS

Monica V

The Marine Products Export Development Authority (MPEDA) has opened its second signature stall at the Cochin International Airport under its 'Seafood India' project launched ten months ago. The new stall at the airport premises will sell ready-to-cook and ready-to-eat value-added products from 10 exporters. The MPEDA had started the 'Seafood India' signature stall in December last year when Union Commerce and Industry Minister Suresh Prabhu had inaugurated the 1700-square-foot facility at Panampilly Nagar in the city. Today, that endeavor found its second chapter with the opening of the stall at the airport. MPEDA Chairman K.S Srinivas said that the signature stall is opened in the airport as a part of brand promotion campaign for Indian seafood, considering the airport's importance in the traffic of international tourists as well as non-resident Keralites. Moreover, MPEDA signature stall helps the domestic consumers also get familiarized to export quality value added seafood products. The stall at the Panampilly Nagar 'Seafood India' facility, currently displays around 100 value-added products of various companies across India. The items for sale, span a range of ready-to-eat, ready-to-fry and ready-to-cook items. MPEDA is to set up similar signature stalls in other international airports as well, Srinivas added. 'Seafood India' stall exhibits products developed by prominent fisheries research institutions such as CMFRI, CIFT and NIFPHATT besides selling and displaying value-added marine products of exporters. It also provides literature on the activities of MPEDA and its societies such as NETFISH, RGCA and NaCSA, enabled with information to browse the details about each product. The stall provides information ranging from its production, processing, cooking and nutritional content.

Reference: <https://thehindubusinessline.com>

INTERNATIONAL NEWS

INTERNATIONAL SEA FOOD SHOW

Ventharish Raj GK

India international seafood show to be held in Kochi in February. This event will have technical sessions by national and international experts. The Marine Products Export Development Authority (MPEDA), in association with Seafood Exporters Association of India (SEAI) is organizing the 22nd edition of Indian International Seafood Show (IISS) in Kochi from 7-9 February 2020. IISS 2020 will have

over 250 stalls spread over 7,000 sq m, showcasing a wide range of products. This biennial show, re-visiting Kochi after a span of 12 years, will provide a platform for an interaction between Indian exporters and overseas importers of Indian marine products and an opportunity for display and sale for manufacturers and suppliers of processing machinery, packaging systems, processing ingredient dealers and cold chain systems. IISS 2020 will highlight the technological advances and sustainable practices followed in sea food processing sector in India. During 2018-19, India exported over 14,37,000 tonnes of marine product worth over \$ 6.70 billion as per provisional figures. It is expected to reach an export turnover of \$ 15 billion in next five years.

Reference: <https://m.economictimes.com>

Praveen

August 25, 2019

This month's 'fish of the month'- **Plaice** is again one of those Cornish treasures to be savoured. While the taste of plaice could be confused with these other 'prime' fishes there can be no mistaking in Plaice's appearance, which is one of the most visually striking flatfish caught in Cornish waters. However, they are more prevalent in the summer. Once onboard, the fishes are carefully removed from the nets, and immediately placed in 'slush ice' to maintain quality.

Chairman of The Marine Export Development Authority (MPEDA) A. Jayathilak, in association with the Seafood Exporters Association of India (SEAI) stated that:

"In the face of continued uncertainties in the global seafood trade, India has been able to cling on to its position as a leading supplier of frozen shrimp and frozen fish in international markets. With a string of initiatives and policy support, we intend to achieve an export target of \$10 billion by 2022".

India's seafood exports to the European Union is set to drop sharply this year after its biggest competitor Vietnam signed a Free Trade Agreement (FTA) with the European Bloc in July that helps it to

export products to the EU without any customs duty, says the Maharashtra region head of the seafood exporters body. India's seafood exports are valued around ₹ 50,000 Crores annually. After almost 15 years of export growth to the EU specifically from the western region –the EU plays a prominent role as 'the seafood trading hub'. All of a sudden what we find is that the EU “had a change of heart because India's exports to Europe had shot through the roof”.

Reference:

<http://www.seafoodnews.com>

August 03, 2019

A 12,000 km coastline surrounded by cold, clear waters. Home to a rich and diverse range of seafood with over 60 species landed from Scottish waters. Scottish farmed salmon has been awarded Protected Geographical Indication (PGI) status by the European Commission, setting it alongside champagne and Parma Ham.

TAX ON FISH MEAL MAY IMPACT SEAFOOD SECTOR

C.J. Vikashini

September 26, 2019

GST exemption granted for fish meal till this month end has brought relief to the fisheries sector. Shrimp is the major item in the seafood export from India worth over ₹ 47,000 crore annually Fish meal from trash fish and fish wastes goes into the making of shrimp and feed used in aquaculture farms. After a month –long strike by the fish meal industry which saw fish prices crash, the center granted an exemption of GST for fish meal from July 2017 to the end of September 2019. “The shrimp feed prices could increase by 4% in the short term and fish meal comes under GST from next month as it is the main raw material for the feed. This will hit the feed factories as the industry is working in an intensely competitive high-volume, low-margin segment,” said PS Narendra, executive director of Grow well Processors. Over 70 fish meal factories spread over the coastal states of Karnataka, Gujarat, Kerala, Tamil Nadu, Maharashtra, and Goa had protested against the decision of the government to collect 5% GST with retrospective effect. “We are thankful to the PM and the government for acceding to our demand. But it would have been better if a complete exemption was given as taxing fish meal will affect the income of fisherman and the aqua feed price,” said Dagwood Sait , secretary of All India Fishmeal and oil Manufactures and Merchants Association The tax due to low catches from 2017 comprises a huge sum which would have led to the closure of the units if they were forced to pay, he said. “At present due to low catches, most of the fish meal factories are underutilized. GST will add to the cost,” said Ravi Pelluru, CEO of BMR Industries.

Reference: <https://m.economictimes.com>

The North Atlantic a rich variety of seafood thrives from Scallops, Razor clams, Brown Crabs to Oysters, Mussels, Lobster and Langoustine. Scotland is one of the most highly regulated and well-managed fisheries in Europe, pioneering many sustainability initiatives. Scottish seafood is recognized as some of the best in the world.

Healthiest seafood:

Clams contain Flem's nutrition [calories]. Cod or Genus Gauds contains a good source of niacin, vitamin B12 and potassium. Crabs are rich in protein, and a multitude of minerals. Catfish has a high quality of protein. Pangasius is a freshwater fish that is a good source of omega 3.. Alaska Pollock is the largest fish in the world, it also contains an excellent amount of amino acids, proteins and minerals. Salmon contains vitamin D, B6, B3, B12. Tun is rich in riboflavin. Shrimp is a good source of antioxidants.

Reference:

<http://www.seafoodfromscotland.org>

YOU ONLY LIVE ONCE.... LICK THE BOWL

SriVasuPrada S, Gokilavani A, Madhubala K

Seafood is a form of aquatic life regarded as food by humans, which includes fishes and shellfishes. Shellfish include various species of molluscs (such as bivalve molluscs-clams, oysters, and mussels and cephalopods-octopus and squid), crustaceans (such as shrimp, crabs, and lobster), and echinoderms (sea urchins). Historically, marine mammals such as cetaceans (whales and dolphins) and seals have been eaten as food, though it happens to a lesser extent in modern times. In North America, although not generally in the United Kingdom, the term "seafood" is extended to fresh water organisms eaten by humans, so all edible aquatic life may be referred to as "seafood". The harvesting of wild seafood is usually known as fishing or hunting, while the cultivation and farming of seafood is known as aquaculture or fish farming. Seafood is an important source of animal protein in many diets around the world, especially in coastal areas.

Most of the seafood harvest is consumed by humans, but a significant proportion is used as fish food to farm other fish or rear farm animals. Some seafood (kelp) are used as food for other plants (a fertilizer). In these ways, seafoods are used to produce further food for human consumption. Also, products such as fish oil and spirulina tablets are extracted from seafoods. Some seafood is fed to aquarium fish, or used to feed domestic pets such as cats. A small proportion is used in medicine, or is used industrially for non-food purposes (e.g. leather).

History

The harvesting, processing, and consuming of seafoods are ancient practices with archaeological evidence dating back well into the Paleolithic. Findings in a sea cave at Pinnacle Point in South Africa indicates Homo sapiens (modern humans) harvested marine life as early as 165,000 years ago, while the Neanderthals, an extinct human species contemporary with early Homo sapiens, appear to have been eating seafood at sites along the Mediterranean coast beginning around the same time. Isotopic analysis of the skeletal remains of Tianyuan man, a 40,000-year-old anatomically modern human from eastern Asia, has shown that he has regularly consumed freshwater fish. Archaeology features such as shell middens, discarded fish bones and cave paintings show that sea foods were important for survival and consumed in significant quantities. There are early examples of permanent settlements (though not necessarily permanently occupied) such as those at Lepenski Vir, they are almost always associated with fishing as a major source of food.

The ancient river Nile was full of fish; fresh and dried fish were a staple food for much of the population. The Egyptians had implements and methods for fishing and these are illustrated in tomb scenes, drawings, and papyrus documents. Some representations hint that fishing was being pursued as a pastime. Fishing scenes are rarely represented in ancient Greek culture, a reflection of the low social status of fishing. However, Oppian of Corycus, a Greek author wrote a major treatise on sea fishing, the *Haliēutica* or *Haliēutika*, composed between 177 and 180. This is the earliest such work to have survived to the modern day. The consumption of fish varied in accordance with the wealth and location of the household. In the Greek islands and on the coast, fresh fish and seafood (squid, octopus, and shellfish) were common. They were eaten locally but more often transported inland. Sardines and anchovies were regular fare for the citizens of Athens. They were sometimes sold fresh, but more frequently salted. A stele of the late 3rd century BCE from the small Boeotian city of Akraiphia, on Lake Copais, provides us with a list of fish prices. The cheapest was skaren (probably parrotfish) whereas Atlantic bluefin tuna was three times as expensive. Common salt water fish were yellowfin tuna, red mullet, ray, swordfish or sturgeon, a delicacy which was eaten salted. Lake Copais itself was famous in all Greece for its eels, celebrated by the hero of the Acharnians. Other fresh water fish were pike-fish, carp and the less appreciated catfish.

Pictorial evidence of Roman fishing comes from mosaics. At a certain time, the goatfish was considered the epitome of luxury, above all because its scales exhibit a bright red color when it dies out of

water. For this reason, these fish were occasionally allowed to die slowly at the table. There even was a recipe where this would take place in garo, in the sauce. At the beginning of the Imperial era, however, this custom suddenly came to an end, which is why mollusk in the feast of Trimalchio (see the Satyricon) could be shown as a characteristic of the parvenu, who bores his guests with an unfashionable display of dying fish.

In medieval times, seafood was less prestigious than other animal meats, and often seen as merely an alternative to meat on fast days. Still, seafood is the mainstay of many coastal populations. Kippers made from herring caught in the North Sea could be found in markets as far away as Constantinople. While large quantities of fish were eaten fresh, a large proportion was salted, dried, and to a lesser extent, smoked. Stock fish, cod that was split down the middle, fixed to a pole and dried, was very common, though preparation could be time-consuming, and meant beating the dried fish with a mallet before soaking it in water. A wide range of mollusks including oysters, mussels and scallops were eaten by coastal and river-dwelling populations, and freshwater crayfish were seen as a desirable alternative to meat during fish days. Compared to meat, fish was much more expensive for inland populations, especially in Central Europe, and therefore not an option for most.

Seafood industry:

An extensive fish curing industry was carried on for more than one hundred years before there was a permanent settlement. At 1580, more than three hundred ships from Europe were salting cod in this area. Newfoundland was colonized because of seafood industry, which remains a factor in the province's economic life. The trade in salt fish stimulated other industries, and capital was gradually accumulated so that the colonists could go into the shipping business. Before the end of the sixteenth century, more efficient, faster vessels were developed to meet the needs of expanding fishery. Attempts were made to establish fishing boundaries, but they were poorly defined, and fishing rights over a wide area were the cause of frequent bickering, sometimes flaring up into undeclared warfare.

Seafood processing:

Live food fish are often transported in tanks at high expense for an international market that prefers its seafood killed immediately before it is cooked. This process originally was started by Lindeye. Delivery of live fish without water is also being explored. While some seafood restaurants keep live fish in aquaria for display purposes or for cultural beliefs. The majority of live fish are kept for dining customers.

Fresh fish is a highly perishable food product, so it must be eaten promptly or discarded; it can be kept for only a short time. In many countries, fresh fish are filleted and displayed for sale on a bed of crushed ice or refrigerated. Long term preservation of fish is accomplished in a variety of ways. the oldest and still most widely used techniques are drying and salting. Desiccation (complete drying) is commonly used to preserve fish such as cod. Partial drying and salting is popular for the preservation of fish like herring and mackerel. Fish such as salmon, tuna, and herring are cooked and canned. Most fish are filleted prior to canning, but some small fish (e.g. sardines) are only decapitated and gutted prior to canning. Modern knowledge of the reproductive cycles of aquatic species has led to the development of hatcheries and improved techniques of fish farming and aquaculture. Better understanding of the hazards of eating raw and undercooked fish and shellfish has led to improved preservation methods and processing.

Reference:

<https://m.indiamark.com>

www.imedpub.com



ALTERNATIVE SEAFOOD PRESERVATION TECHNOLOGIES: IONIZING RADIATION

Ramya Shree R

Fish as a seafood requires freshness as the most important and fundamental single criterion for judging the quality of fish and fishery products. Fish is known to be a perishable product that requires effective preserving method to maintain quality and avoid food poisoning. Irradiation and high-pressure treatment has been used to extend the shelf life of foods, especially fish and fish products, due to its microbial inhibition. Irradiation has been proposed as an alternative technique to thermal processing to destroy food borne pathogens and spoilage organisms in order to enhance safety and shelf life of perishable foods.

Food irradiation is a process for the treatment of food products to enhance their shelf life and to improve microbial safety. Generally, ionizing radiations emitted by radioisotopes, Cobalt-60, and Cesium-137 are used for food preservation. Food irradiation, sometimes called “cold pasteurization,” is a process in which irradiation energy travels through space or matter in invisible waves, is applied to kill microorganisms or insects in foods. The quantity of energy absorbed by the food during irradiation is called “absorbed dose.” The international unit for absorbed dose is the Gray (Gy).

Treatment levels can be grouped into three general categories:

- (1) “Low” dose, up to 1 kGy
- (2) “Medium” dose, 1–10 kGy and
- (3) “High” dose, greater than 10 kGy.

Medium dose is used to reduce spoilage and pathogenic microorganisms on various foods, to improve technological properties of food and to extend the shelf-life of sensitive foods.

Optimum irradiation dose for the different fishes have been reported and have been found suitable 1.5–3 kGy, for mackerel 1.5 kGy, for White pomret, Black pomfret 1 kGy, for Sole 2–3 kGy. The shelf life of Bombay duck, under refrigeration was shown to be about 5–7 days. Radiation doses of 1.5-2.5 kGy extended the shelf life to about 15–20 days. Whitefish were gamma irradiated at 0.82 and 1.22 kGy, and stored at 3°C for 17-21 days. The non-irradiated samples exhibited a sensory shelf life of 7-8 days, whereas those of the irradiated ones were extended by 10-13 days.

The positive effects of irradiation in determining the quality of fish:

- Microbial load decreased,
- Lower total volatile basic nitrogen value,

The negative effects of irradiation in determining the quality of fish:

- Based on species, irradiation may cause increase in Tiobarbituric acid (TBA) values as a result of radiolytic products formation. However, in most of the studies it has been claimed that mentioned values have lower compared to non - treated samples.
- Some fatty acids are decreased by irradiation.
- Thiamin loss was more severe at higher doses (≥ 4.5 kGy), whereas riboflavin was not affected.
- pH values decreased gradually.

Reference:

<https://www.fisheriessciences.com>

SOCIAL ISSUES

Shalini S

Sea food is an excellent source of top-quality protein and compares favourably with meat and chicken. Sea food is an excellent source of many important minerals including iodine, zinc, potassium and phosphorus. It is loaded with saturated fat and cholesterol. Consuming sea food also has many issues.

PLASTIC:

25% of fish tested had plastic in their guts, University of Ghent in Belgium recently found that seafood eaters ingest upto 11,000 tiny pieces of plastic every year & dozens of particle become embedded in tissues.

MERCURY:

Fish and shellfish have a natural tendency to concentrate mercury in their bodies, often in the form of methylmercury, a highly toxic organic compound. Species of fish that are high on the food chain, such as shark, swordfish, king mackerel, albacore tuna and tilefish contain higher concentrations of mercury than others. This is because mercury is stored in the muscle and when a predatory fish eats another fish, the entire body burden of mercury is present in the consumed fish. Since fish are less efficient at de purating methylmercury, fish-tissues mercury concentrations increase. Thus, species that are high on the food chain has mass body burdens of mercury that can be ten times higher than the species they consume. This process is called biomagnification. The first occurrence of widespread mercury poisoning in humans occurred this way in Minamata, Japan, now called Minamata disease. Shellfish are among the more common food allergens.

In fact, the FDA reports that seafood imported from China, around 27% of the seafood consumed by Americans are frequently contaminated. Incredibly, one Chinese seafood exporter was caught feeding fish a partial diet of feces from hundreds of pigs and geese in an attempt to cut costs. Sea foods consumed in required amount is good.

Reference: <https://www.risesseafood.org> <https://fish-i-africa.org>

WHO AM I?

Shanmugadevi M

Hello! I am the common name for several species of ray-finned fish in the family Salmonidae. I am one of the healthy fish and I am classified as oily fish. I have 69 % water, 20% protein content,6% fat, high vitamin D, vitamin B content, rich in omega 3 fatty acids and dietary minerals like copper and potassium . I also have astaxanthin which is the antioxidant that may benefit heart, brain and skin. My flesh is generally in orange to red colour. I have many health benefits like reducing the risk of heart disease, weight control, protect brain health and I can help to fight against inflammation. I am very delicious and versatile. Guess who am I?

Answer to the Previous
Edition

CHEWING GUM

WHO IS THE BEST SURVIVOR??

Halilur Rahman

Tired of reading seafoods?? 😞. Well, let's take a break! Have some interesting things about the world's toughest survivor... 😞. If my guess is right, you got Bear Grylls in mind 😊. You are somewhat right, even he is also not the best survivor...!!! Actually, humans can't last for seconds in the following extreme environmental conditions. Then who can...? Let's see.

These extreme survivors are called **Tardigrades** also known as **water bears** or **space bears** or **moss piglet** rarely found to be greater than 1.5mm in size and are visible only under a microscope. But don't let the size fool you as they are the most resilient animals on earth. In 1777, the Italian biologist Lazzaro Spallanzani named them **Tardigrada**, which means "slow steppers". They live almost everywhere from damp moss, flowering plants, sand, fresh water, mountain tops, mud volcanoes to the deep sea. They also



exist in **outer space** (they don't need space suits 😊). Tardigrades have a well-developed head region and a short body composed of four fused segments, with each segment bearing a pair of short, stout, unjointed limbs generally terminated by several sharp claws. The animals have no known specialized organs of circulation or respiration; the tardigrade's body cavity is filled with fluid that transports blood and oxygen. The alimentary canal traverses the body from end to end. Most plant-eating tardigrades feed by piercing individual plant cells with their **stylets** (spear like structures near the mouth) and then sucking out the cell contents. A few tardigrades are predatory carnivore. Tardigrades may reproduce sexually or through asexual reproduction (by means of parthenogenesis or through self-fertilization [**hermaphroditism**]). Eggs are discharged either into the posterior end of the alimentary canal or directly to the exterior through an opening in front of the anus.

The most remarkable feature of the tardigrades is their **ability to withstand extremely low temperatures and desiccation**. Under unfavorable conditions, they go into a state of suspended animation called the "**tun**" state—in which the body dries out and appears as a lifeless ball. In this state their metabolism may decline to as little as 0.01 percent of its normal rate. Tardigrades can survive as tuns for years, or even decades, to wait out dry conditions. In addition, specimens kept for eight days in a vacuum, transferred for three days into helium gas at room temperature, and then exposed for several hours to a temperature of $-272\text{ }^{\circ}\text{C}$ ($-458\text{ }^{\circ}\text{F}$) came to life again when they were brought to normal room temperature. Sixty percent of specimens kept for 21 months in liquid air at a temperature of $-190\text{ }^{\circ}\text{C}$ ($-310\text{ }^{\circ}\text{F}$) also revived. Tardigrades are easily distributed by wind and water while in the tun.

Well, that's all.. Just imagine yourself in those conditions. Do you think you can survive??



References: <https://www.britannica.com/animal/tardigrade> <https://en.m.wikipedia.org/wiki/Tardigrade>
<https://earthworld.com/top-10-toughest-animals-world/>

NEW PRODUCTS:

Savitha S Shangamithra SM

Company Name: Acme Smoked Fish Corp.

Each Protein Bowl is single serve and features 2.5 oz. of smoke roasted salmon, pre-cooked white rice, and a featured sauce – either Lemon Dill or Harissa, a Moroccan-inspired chilli spice. The smoke roasted salmon provides a rich flavor; the fish is hot smoked, creating a firm, flaky texture, and is delicious alongside rice and any accouterments added by the diner.

Company Name: Australis Aquaculture

The sweet and savory pre-glazed frozen barramundi portions are designed for health-conscious consumers who crave the great flavor and nutritional value of sustainable seafood, without the fuss. Garlic Teriyaki Barramundi comes as “ready-to-roast” portions in a 12 oz bag. Each piece is packed with omega-3s and contain 18g of protein per 4 oz serving.

Company Name: East Coast Seafood

Our Lobster Macaroni & Cheese is produced without preservatives or artificial flavors, using only premium sustainably caught North American lobster meat. Offering a versatile entry or a decadent side at restaurant level, our succulent Lobster is paired with delicate semolina pasta and a creamy blend of Cheddar, Parmesan, and Mozzarella cheese to create a seafood star on any menu!

Company Name: Fish people

Fish people Wild Alaskan Salmon Jerky has bold flavor and sustainably sourced superfood benefits, like 24g truly wild protein and 900mg omega-3s per bag without all the sugar. It is available in 4 flavors and contains no artificial flavors, preservatives or antibiotics.

Reference: <https://www.seafoodexpo.co>

BOOK ALERT:

Amirtha Nandhini S

BOOK NAME: SEAFOOD SAFETY AND QUALITY

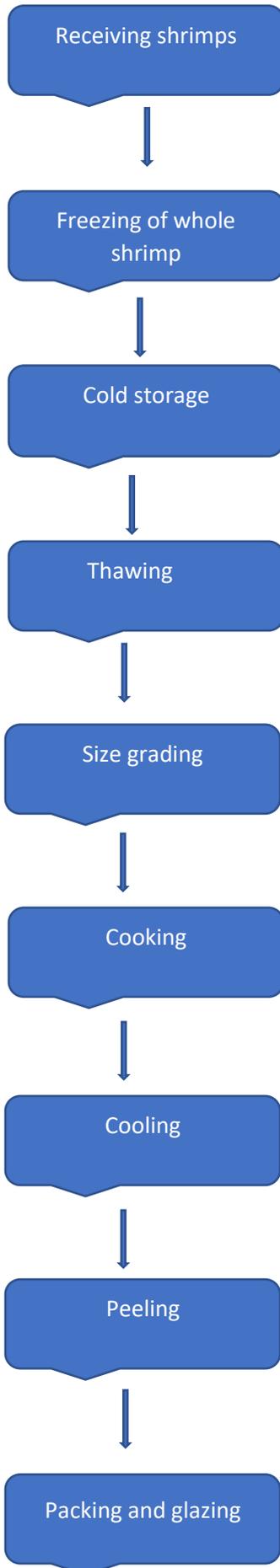
AUTHOR'S NAME: Md. Latiful Bari and Koji Yamazaki

PUBLICATION DATE: SEPTEMBER 17,2018

SUMMARY: Seafood safety and quality continues to be a major public health issue and its importance has escalated to unprecedented levels in recent years. In this book, major seafood borne diseases and key safety issues are reviewed. In addition, emerging microbial agents, fish toxins and other contaminants including heavy metal, allergy, water safety and related topics are discussed. It also addresses the challenges faced by both developed and developing countries to ensure seafood safety in new seafood products and processing technologies, seafood trade, safety of food derived from biotechnology, microbiological risks, emergence of new and antibiotic resistant pathogens, particularly from emerging pathogens, directing research to areas of high risk and establishment of target risk levels and target pathogens. The book serves as a comprehensive resource on the seafood borne diseases and a wide variety of responsible etiologic agenda, including bacteria, viruses, parasites, seafood toxins, and environmental toxins. It has been written in a simple manner and aims at promoting the efforts of the scientific community to deliver safe seafood for a better health and environment.

SEA TO FORK- PROCESSING OF SHRIMPS

Sowrnarubini MS



Journey from the board itself

The processing of shrimps, first started in the board itself. The shrimps are caught near the area of the tide line either by using trawls towed by horse or tractor or by wading at low water using a push net. The trawl has to be towed long enough to get a reasonable catch. Once the shrimps are on board it should be handled carefully and quickly. The catch is first sorted or culled. They are washed and drained to remove their dirt and dust.

Whole raw shrimp should be processed at factories close to the ports of landing. Unless freezing facilities are available on board, all processing including cooking, is better done at shore. Inshore species of shrimp as well as deep water shrimp can be cooked and further processed on shore under more hygienic conditions with little loss of quality if they are iced at sea immediately after capture.

Freezing:

These shrimps can be frozen by dipping them in a cold brine or using air blast freezers or deep bed freezers. Deep water shrimps can be frozen in 10-15 minutes by immersing them in brine at -20°C . The added water in the shrimps can help the protection against physical damage to the shrimp, provides better contact during freezing, and reduces dehydration of the shrimp during subsequent storage.

Cold storage:

Frozen shrimp can be stored at -30°C for at least 6 months. At -20°C the whole shrimp can be fresh for 3-4 months and only one month for -10°C . The frozen shrimps develop cold storage odors and flavors during storage, the higher the storage temperature the more quickly they develop.

Thawing:

Thawing times for typical commercial block measuring $1050 \times 530 \times 50$ mm thick and containing about 18kg shrimp and 6kg of water; 20hrs in still water at 18°C , 2 hours in saturated moving air at 18°C , $1\frac{1}{2}$ hours immersed in water at 18°C and 1 hour in a water spray at 18°C . The water spray method is the fastest method in thawing in which the blocks are soft enough to break up by hand before the shrimp are fully thawed.

Size grading:

Whole shrimp are first graded for size, since large ones are more valuable than smaller ones and mechanical peelers require a supply of shrimp within a fixed range. Smaller shrimps that are uneconomic to peel are either discarded or chopped and used as raw material for various products

Cooking:

The shrimps are cooked to make the product ready to eat or to make loosen the meat in the shell prior to peeling. A lidded wire mesh basket can be used for immersing the shrimps and they are agitated gently in order to get uniform cooking. Scums are removed from the surface of the water as often as possible, and the water in boiler is changed frequently.

Cooling:

The shrimps can either be cooled in water or air after cooking. The yield of meat from the water-cooled shrimp is 4 % higher than air cooled shrimp. They can either be cooled in chilled water for 3 min or using the two-stage cooler.

Peeling:

Brown and pink shrimps which are usually peeled by hand ,is now replaced by machines .Machine peeling results in the far less recontamination of cooked shrimp than hand peeling. Where raw meats are required for further processing, thawed frozen whole shrimp are much easier to peel than very fresh unfrozen shrimp. Peeling of unfrozen shrimp becomes easier after 1-2 days chilled storage.

PACKING AND GLAZING:

Individually quick-frozen meats for sale to caterers and retailers are normally weighed into flexible film bags which are sealed and packed in fiber board outer cartons for storage and distribution. The film used should have a high resistance to the passage of water vapor and oxygen, so that dehydration and oxidation are kept to a minimum.

In addition, smoked, canned, and potted shrimps are also available. **SMOKED SHRIMPS** are whole headless shrimps which are boiled in a 10% salt solution for about 3 min, drained for about 2 hrs,

laid on oil mesh trays and smoked in a mechanical kiln for 1-1 1/2 hours @30C. **POTTED SHRIMPS** are the peeled shrimps which are heated in melted butter and then ladles into containers like a waxed cartons; the mixture is left until the butter has set, lids are put on and the cartons are wrapped in greaseproof paper and packed in outer cartons for dispatch.

Not only the use but also the waste shrimp also plays a role in poultry feed. The shrimp waste, heads and shells, can be used to produce shrimp meals containing 40-45% crude protein and 5% moisture after cooking, drying and grinding.



INDUSTRIAL UPDATES



Bharath J

India plays an important role in sea food products processing, with a coastline of over 8,118 kms, 2.02 million sq. km of EEZ, 0.5 million sq. km. Continental shelf estimated to have exploitable resources to the tune of 4.41 million tons of which about 3.40 million tons are presently exploited. With the growing demand for Indian seafood products across the world, India has an installed processing capacity of 23,000 M.T with 506 state-of-the-art processing plants, out of which over 62% of them are EU approved plants. Almost every plant has put in place HACCP and other quality control system with the best in the world to ensure highest quality output.

Individually quick frozen (IQF) products:

TANDELS, an US based firm in fish produce, imports and exports most of its produce as IQF, some of the IQF products are “IQF Black tiger cooked”, “IQF Black tiger raw”, “IQF Vannamei cooked”, “IQF Vannamei raw”. Similarly, “Shree Datt Aquaculture Farms Pvt. Ltd at Gujarat” exports IQF products of Black Tiger Shrimp (*Penaeus monodon*) & Vannamei Shrimp (*Litopenaeus vannamei*).



Fish fillets

Skinless and boneless fillets of white lean fish are brined in dilute brine to improve the color and taste. The brined fillets are battered and breaded, flash fried for one minute, frozen and packed. Popular brands of fish fillets are “Vedant sea foods”, “Kalinga food products”, “Orion foods” etc.

Fish mince and mince-based products

Minced meat is the meat separated from fish in comminuted form free of bones, skin etc. In principle, meat separation process can be applied to any species of fish, but when it is applied to low cost fishes significant value addition will occur. Flesh can be separated from filleting waste also. Minced meat can be used as a base material for the preparation of a number of products of good demand. These mince products are popularly produced by “Jelex sea foods”, “Vedant sea foods”.

Sushi (cooked butterfly shrimp)

Shrimp is washed in chilled water containing 5 ppm chlorine, beheaded, deveined and again washed in chilled water. Bamboo stick is then pierced between the shell and the meat from head portion to tail and then cooked in 1% brine for 2 minutes at 100°C. The cooked shrimp is then cooled in chilled water, bamboo stick removed and then peeled completely, including the tail fans. The ventral side is then gently cut down length wise completely using a sharp scalpel. The cut surface is then gently opened up to form the butterfly shape, packed in thermoformed trays under vacuum” and frozen at -40°C. Few popular brands are “Shree Datt Aquaculture Farms Pvt. Ltd” and “Tandels”.

Reference: <https://www.seafish.org> <https://fishfocus.co.uk>

BANG THE MYTH:

Jaithilak

Myth: The bigger the oyster, the better the oyster

The myth is wrong as some of the best oyster in the world are small or very tiny. For Example, “Olympia oysters” are small which is one of the most delicious oysters in the world. It all depends on personal preference. The important factor here is the freshness, as it determines the taste of the oyster. It was quoted that, “There is no difference in the quality of smaller versus larger oysters. Bigger oysters are just older or faster growing than the smaller one” by Jules Opton himmel of Walrus and Carpenter Oysters.



Myth: All sea foods has a strong fishy odor



The fish which is fresh out of the ocean, have a scent of the ocean. If a fish has a strong fishy odor it is considered to not be fresh. In order to maintain the fluid balance, the sea fishes have their cells filled with amino acids and amines to counter the saltiness of seawater. Ocean fish tend to rely on Trimethylamine oxide (TMAO) for this purpose. The stink or the bad odor arises in the sea or ocean fishes when they are killed and bacteria and fish enzymes convert TMAO into trimethylamine which develops the characteristic fishy odor. This chemical is especially common in the flesh of cold-water surface-dwelling fish like cod, as they would start smelling bad faster. As contrast to this, freshwater fishes generally do not accumulate TMAO because their environment is less salty than their cells. So, the longer the fish is fresh the longer the time it takes to smell bad or to develop the fishy odor

Myth: Oysters are not delicious, but not that nutritious

Many people worry that oysters are high in calories, cholesterol, and heavy metals. However, oysters are previously thought to contain high amounts of cholesterol. As the technology developed, various new methods of calculating cholesterol levels have actually removed oysters from the list. Dr.Denise Skonberg, Associate Professor at the University of Maine’s School of Food and Agriculture says that ‘Oysters are healthy foods’. He also adds that “They are the powerhouse of micronutrients, including zinc, iron, and vitamin B12.They are definitely not high in calories, a 3 ounce of serving raw Eastern oysters have only 45 calories. Oysters are also an excellent source of the very bioavailable heme iron.



Reference: <https://www.thrillist.com> <https://www.getflavor.com>

SECRETS THAT YOU DON'T KNOW

Priyanka S

We may consume lots and lots of healthy foods such as fruits, vegetables, nuts, pulses. Eating sea food directly is better than taking vitamins, calcium, protein and omega-3 supplements for health benefits.

- Adding more marine life to your meals could help calm inflammation and protects the heart.
- Fish contains high levels of calcium. If you are concerned about the bone-thinning disease-osteoporosis, eat plenty of fish.
- Omega-3 fatty acids in fish help to improve your skin, hair and to improve eyesight.
- It's better boil your fish rather than frying, which damages the healthy oils. And, don't overcook it!
- Crab meat is high in vitamin B12.
- Fish don't have vocal cords-but that doesn't mean they're silent
- Apart from vitamin D, seafood is a good source of vitamin A, vitamin B, and B-complex vitamins. These vitamins are good for your energy production, concentration, metabolism, and even beauty.
- Seafood has high level of mercury. This substance could stop the development of a baby. Pregnant women should be careful with the seafood they consume.
- The oysters we eat are not the same oysters that supply pearls - The treasure kept within the oysters we eat is their flavour.
- Crawfish were the first to be claimed as an official state crustacean.
- Lobster used to be considered lowly poverty food in colonial New England. Cheap and overly abundant, they were mostly consumed by the poor and prisoners.
- A flaky white fish is the traditional (and arguably best) choice for Baja fish tacos
- Uni (the Japanese term for “Sea Urchin”) refers to the edible portion of a sea urchin: the gonads



Reference: <https://www.coastalliving.com/food/seafood-basics/seafood-fun-facts>

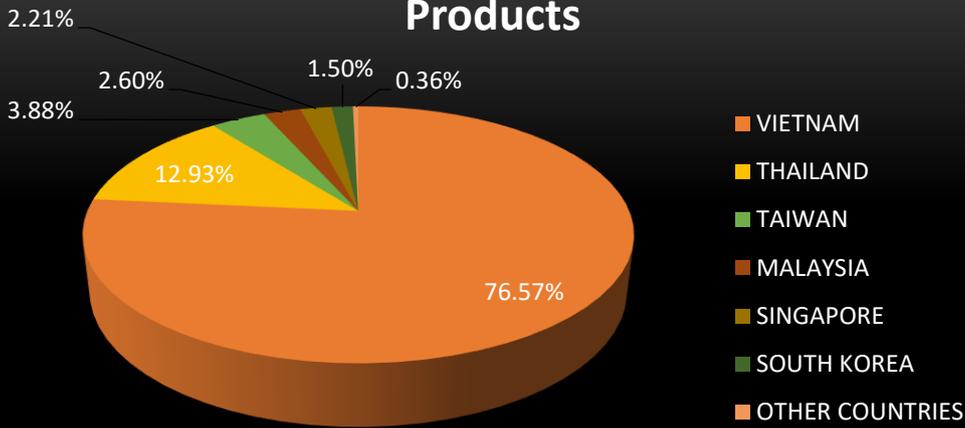
<https://www.originaloysterhouse.com/seafood-facts.php>



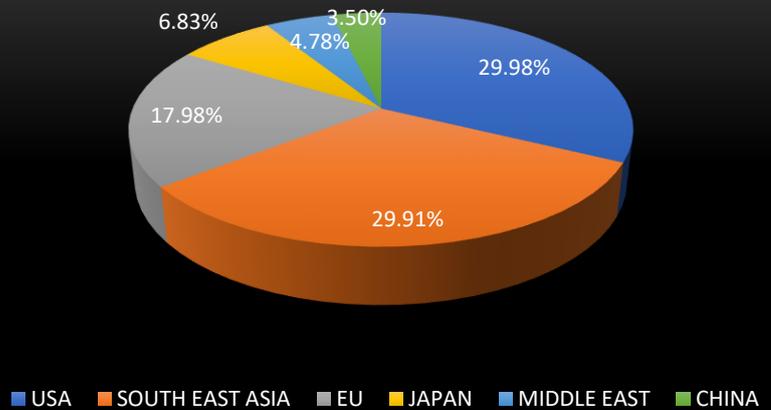
DATA CARD: -

Arun K

Asian Markets For Indian Marine Products



Destinations For Indian Marine Products



Export Of Vannamei Shrimp

