MPEDA

Newsletter

VOL. XI NO. 6 SEPTEMBER 2023

MPEDA-RGCA Advances Aquaculture Diversification in Nagpur

Seafood HACCP Training for Technologists in Nellore by MPEDA

South Korean Delegation's India Visit

High-Pressure Processing: Elevating Seafood Safety & Value

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On the Platter

Mr. Dodda Venkata Swamy
Chairman

Dear Friends,

During August 2023, MPEDA, in association with the State Bank of India, successfully coordinated a delegation visit of Korean importers and investors to India. Nine delegates representing Korean companies had business interactions with Indian seafood exporters in Chennai, Tuticorin, Kakinada and Mumbai. The delegation visited the processing units at Tuticorin and Kakinada, seaweed farming locations in Rameshwaram and shrimp farms in Kakinada.

After the Chintan Shivir workshop organised in Goa, MPEDA regularly organises the meetings of the sub-committees formed with specific action plans. A meeting of the Sub Committee on value addition in the seafood sector was scheduled on 16th August 2023. An action plan based on the first-round meetings of the Sub Committee has been initiated, and the States were also sensitised about their responsibilities. More Sub Committee meetings are planned in September 2023. I, along with Dr M. Karthikeyan, Director MPEDA, got an opportunity to organise the participation of the Indian seafood sector in the Japan International Seafood and Technology Expo held from 23rd to 25th August 2023 in Tokyo. Twelve exporters from India participated as co-exhibitors along with MPEDA in the exposition. Mr. Sibi George IFS, His Excellency the Ambassador of India to Japan, inaugurated the Indian pavilion. We had several meetings with the importers within an outside exhibition venue. I was fortunate to have witnessed the auction process of various varieties of fresh and frozen sashimi-grade tuna in the world-famous Toyosu fish market during the wee hours of the day. The market is adequately equipped and well maintained to ensure smooth raw material handling and ease the auction process.

During my discussions with the Japanese importers, I noticed that many are keen to increase their business with India, considering the market's potential. However, they were very apprehensive about the quality of the seafood exported from India, especially on antibiotic residues in aquaculture shrimps. Their worries are not unfounded, considering the spate of rejections due to antibiotic residues we had this year in the Japanese market. Many are keen to entrust job work to Indian companies for value addition. However, improving the importer's confidence to grab such opportunities is imperative. As the diplomatic relations between the two countries flourish, it is high time that India capitalizes on the opportunities in seafood value addition for the Japanese trading companies.

MPEDA has geared up for participating in upcoming seafood events such as World Seafood Moscow, Busan International Seafood and Fishery Expo, and China Fisheries and Seafood Expo. Many exporters are coming forward to use the platform provided by MPEDA to participate in these exhibitions and enhance their business. We will also participate in the World Food India B2B events organised by the Ministry of Food Processing and Industry (MoFPI) scheduled from 3rd to 5th November 2023 in New Delhi, along with Indian seafood exporters. There, MPEDA will be hosting an exclusive Reverse Buyer Seller Meet explicitly designed to promote seafood trade from India.

MPEDA has also organised meetings of the Authority and its Sub Committees during the month discussed various administrative and trade-related issues.

Thank you.

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South Korean delegation visited India

As a part of export promotion, The Marine Products Export Development Authority (MPEDA) and State Bank of India (SBI) jointly organized a Korean delegation to India from 7th to 12th August 2023. The major objectives of the delegation to India was to explore opportunities for Technology Transfer in Value addition, explore Indian seafood market, Seaweed production and processing and explore opportunities for Joint ventures with buy back arrangements.

As part of this, 9 representatives of 5 seafood trading companies from Korea visited Chennai, Tuticorin, Andhra Pradesh and Mumbai. The companies represented in the delegation were JK Oceans Co. Ltd., A Z Food, JH Trading, Nongshim and Nongshim Taekyoung.

Chennai

The Korean delegation reached Chennai on 6th August 2023. They were welcomed and briefed about their entire program in India and trade by Mr. Anil Kumar P., Joint Director (Marketing), MPEDA.

Korean delegates with MPEDA Officers at Chennai

Buyer Seller Meet

A Buyer Seller Meet was arranged at the Trident Hotel, Chennai on 7th August 2023. Prior registration of the exporters were done, and the meeting with buyers were scheduled based on a first come first serve basis.

Nine exporters from Chennai attended the BSM. Services of two interpreters were taken during the Buyer Seller Meet.

View of the Buyer Seller Meet

The delegation members met Mr. D.V. Swamy IAS, Chairman, and Dr. M. Karthikeyan, Director, MPEDA later in the evening and held discussions. Senior officers from Government of Tamil Nadu and State Bank of India, regional President of SEAI, And Deputy Director (in-charge), EIA Chennai also met the delegates.

Chairman, MPEDA with Korean delegation

MARKETING NEWS

Tuticorin

On 8th August 2023, nine Korean delegates with two interpreters reached Tuticorin accompanied by Mr. S. Asok Kumar, Deputy Director (P&MP), MPEDA.

Arrival of Korean delegation at Tuticorin

The Korean delegation visited the processing unit of M/s. Asvini Fisheries Pvt. Ltd. at Pazhayakayal. Dr. S. Shassi, Deputy Director, MPEDA SRD, Tuticorin and the official of M/s Asvini Fisheries Pvt. Ltd. briefed them about the processing infrastructure facilities and processing methods.

View of the plant visit

Buyer Seller Meet

Another Buyer Seller Meet was organized at Rose Hall in Sathya Park & Resorts Pvt. Ltd., Tuticorin with the major exporters of Tuticorin region. A total of 13 exporters participated in the BSM. The officials

View of the Buyer Seller Meet

from State Bank of India (Mr. H. Ananad, DGM (B&O) Maduari, Mr. Ram Anand, AGM (SME) Madurai & Mr. V. Vidyasagar, AGM Tuticorin), EIA official (Dr. Swapna K. M., Assistant Director, Tuticorin), State Fisheries official (Dr. Mohanraj, Asst. Director (Fishing Harbour), Tuticorin and Mr. Siddiq (Vice President, SEAI) were also present during the Buyer Seller Meet.

Officials & SHG people explaining seaweed culture

MARKETING NEWS

On 9th of August 2023, the Korean delegates visited the seaweed cultivation site at Munaikadu, Ramanathapuram district. Officials of MPEDA, SBI, State Fisheries and NETFISH jointly received the delegates.

Fifty seaweed cultivation stakeholders met the delegation. Members of the WAREN Self Help Group explained the method of seaweed planting and culture to the Korean delegates.

Mr. Sahul Hameed Jailani, ADF, Ramnad explained about the culture of the seaweed (*Kappaphycus alvarezii)* and the livelihood dependence of about 1500 cultivators from about 13 villages. Mr. Sivakumar, ADF Mandapam explained about 1000 rafts are under cultivation and daily harvest is being done.

View of Seaweed Raft Culture – Munaikadu, Ramnad

Officials from State Bank of India, Trichy & Ramnad also participated in this regard and ensured that loan facilities would be made to the local seaweed cultivator to support seaweed culture.

Kakinada, Andhra Pradesh

On 10th August 2023 the Korean delegates arrived at Kakinada, Andhra Pradesh and visited M/s, Devi Aquatech located in Seethanagaram Village, Jaggampeta, Kakinada.

The purpose of their visit was to assess the quality of Indian seafood processing and to gain familiarity with various shrimp products.

Officials of MPEDA-SRD, Bhimavaram receiving the Korean Delegates

Delegates visiting seafood processing plant of Devi Aquatech

Buyer Seller Meet

After visiting the processing plant, the delegates attended a one to one Buyer Seller Meet (BSM) at hotel GRT, Kakinada. There were a total of 18 Indian exporters at the BSM.

Mr. P. Anil Kumar, Joint Director (Marketing), MPEDA briefed the buyers, about the importance of Andhra Pradesh in Indian seafood Industry and the major products available from Andhra Pradesh.

The BSM was controlled by Dr. T. G. Manoj Kumar, DeputyDirector, SRD Bhimavaram, Dr. A. Ansar Ali, Deputy Director, RD, Chennai and Dr. A. Anandkumar, Junior Technical Officer, SRD, Bhimavaram.

View of the BSM

After the BSM, the Korean delegates visited M/s Ananda Aqua Farms at Gadimoga, Thallarevu to witness the farming activities. The delegates saw the nursery unit and the polythene lined as well as the earthern grow-out ponds in the farm. Mr. P. Anilkumar, Joint Director (Marketing), Dr. T. G. Manojkumar, Deputy Director, SRD, Bhimavaram, MPEDA and Mr. Loknath, farm Manager, Ananda Aquafarm explained the various Standard Operation Procedures in the shrimp farming to the delegates.

View of the shrimp farm visit

The SBI DGM Mrs. S. Haritha Poornima addressed the gathering appreciated the importance of bringing the Korean delegation to India and she urged Indian exporters to make use of buyers in order to increase the trade between two countries.

Blanching and tasting session was arranged for the delegates at the farm site. The delegates were very much impressed with the taste and texture and opined that the quality is excellent.

Quality check of cultured L. vannamei shrimps by Korean delegate

Mumbai

On 11th August 2023 the Korean delegation visited Mumbai. Officials of MPEDA RD Mumbai received the Korean delegation.

Arrival of Korean delegation at Mumbai

Buyer Seller Meet

On the first day of the delegation, a Buyer Seller Meet was conducted at Emerald and Jade hall at Hotel Taj Palace, Mumbai, in which 14 exporters participated.

Before starting the BSM, Dr. T. R. Gibinkumar, Deputy Director, RD Mumbai explained about the importance

of the BSM, details about the Korean buyers, and products interested etc. to all the 14 exporters.

He has also briefed the Korean buyers regarding the importance of Maharashtra and the products available in the region.

After BSM, a network dinner was hosted by SBI for the Korean delegates, exporters and officials from various fisheries institutions in Mumbai at Hotel Taj Palace. Dr. M. Karthikeyan, Director MPEDA, Mr. Dinesh Kumar Khara, Chairman SBI and other senior officers from SBI also attended the dinner event.

Delegates with exporters & MPEDA officials

View of the BSM

Dr. M. Karthikeyan, Director MPEDA with delegation and SEAI officials.

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MPEDA organizes Virtual Buyer Seller Meet

Netherlands

MPEDA organized a Virtual Buyer Seller Meet (VBSM) on 7th September 2023 with M/s. Asia Express Food, Netherlands. The company was represented by Mr. Albert Brouwer (Commercial Purchase Manager).

The company focused mostly on fish because there is a lot of interest and demand for Indian seafood in the Netherlands. The buyer was interested in products like Needlefish, Mullet, Mackerel, Otti, Sardine, Cuttlefish, King fish, Barramundi etc. The VBSM was attended by 9 Indian exporters.

The exporters presented their products, sizes they can offer and the countries to which they have previously exported.

The meeting was moderated by Mr. S. Asok Kumar, Deputy Director (Publicity and Market Promotion), MPEDA.

MPEDA participates in the Japan International Seafood & Technology Expo (JISTE) 2023, Tokyo, Japan

Japan seafood market

Japan is the world's third-largest economy, with a population of 125 million. The country has high disposable income levels, and the per capita fish consumption is 23.2 Kg. It is the third largest seafood importer, and a net importer of seafood.

Major import items are frozen shrimp, tuna fillets, prepared and preserved shrimp, frozen salmon, cuttlefish and squid etc. Japan imports seafood worth USD 14,857 million, of which products worth USD 11,673 million are covered under Chapter 3 and those worth USD 3,184 million are of Chapter 16. China is the major seafood supplier to Japan, followed by Chile and the USA in value. India is the 8th largest supplier of seafood to Japan.

India's marine product trade with Japan

Japan has been a traditional market for Indian seafood exports. The seafood export from India to Japan in 2022 was worth USD 479 million, contributing to 3.22% of Japan's seafood imports. Japan is the 4th largest market for Indian seafood, involving 212 exporters and 159 importers in Japan last year.

Export to Japan has shown a significant increase over the past three years, and have grown 9.08 % in value and 17.2 % in quantity last year. The unit value realization of Indian seafood products is USD 4.44/kg. The main export items from India are frozen shrimp and frozen surimi, contributing around 92% of India's total exports to Japan. Other items exported are frozen fish, squid, cuttlefish and fish meal products. Chapter 3 products contribute 98 % of the exports, while those under Chapter 16 contributes the rest.

Among shrimps, vannamei is the major variety exported, ollowed by Indian Black tiger, Indian White shrimp, Mandapam flower shrimp, poovalan and karikadi etc. The export of Indian Black tiger shrimp has shown significant growth of 78 % by value and 88% by quantity in 2022-23. It offers great potential for enhancing the exports further.

Mr. Sibi George, His Excellency the Ambassador of India to Japan, inaugurates the India pavilion at JISTE 2023

Japan International Seafood & Technology Expo (JISTE)

The Japan International Seafood & Technology Expo was held at Tokyo Big Sight International Exhibition Centre, and is one of the largest expos in Asia, bringing together professionals and experts from all over the world under one umbrella. The Expo was organized by Exhibition Technologies Inc.

It is a unique exhibition specializing in seafood, with a wide range of businesses exhibiting not only domestic and foreign seafood products but also various products and technologies related to seafood. The manufacturing companies of packaging materials, aquaculture technology and fishing equipment showcase their best innovative products and display the latest sophisticated equipment in the show.

The 25th Japan International Seafood & Technology Expo 2023 was held from 23rd to 25th August 2023

Seafood companies from nearly 16 countries exhibited in the JISTE. At the global seafood marketplace, more than 23,394 seafood professionals attended the expo to discover new suppliers and products, while connecting with current contacts and increasing orders.

India at JISTE

MPEDA took a space of 168 sq. m. along with 12 exporting companies as co-exhibitors in the Japan International Seafood & Technology Expo to set up the Indian Pavilion.

Company Name
M/s. S. A. Exports, Kolkata
M/s. Monsoon Bounty Foods, Chennai
M/s. Blueline Foods India Private Limited, Mangalore
M/s. Authentic Ocean Treasure, Mangalore
M/s. Gadre Marine Exports Pvt Ltd, Ratnagiri
M/s. Seacatch International, Mumbai
M/s. Kondiya Fresh Foods, Tuticorin
M/s. Green Asia Impex Pvt Ltd, Bhimavaram
M/s. Arya Seafood Pvt Ltd, Bhimavaram
M/s. Jeelani Marine Products, Ratnagiri
M/s. Ulka Seafoods Pvt Ltd, Mumbai
M/s. Geo Aquatic Products Pvt Ltd, Kochi

MPEDA was represented in the event by Mr. D.V. Swamy, Chairman, and Dr. M. Karthikeyan, Director.

Mr. D. V. Swamy IAS, Chairman, Dr. M. Karthikeyan, Director and Mr. Jun Nakayama, Executive Assistant, TPO Japan in MPEDA stand at JISTE 2023

The MPEDA stall displayed various seafood products in different forms. A wide range of products of cultured and sea-caught shrimp- raw frozen products including individual quick frozen, breaded products, shrimp powder, cooked products of different counts were displayed in the stall. Various product forms of squid, octopus, cuttlefish, and lobster were added attractions in the Indian stall.

Mr. Sibi George, H. E. Ambassador, Embassy of India, Tokyo visits MPEDA stall

The visitors were given access to information on the Indian seafood through brochures, seafood exporters directory, co-exhibitor guide, QR code scanned information on commercial fishes of India and seafood products in the stall.

For improved interaction with the visitors and to address their queries, translators proficient in Japanese were engaged.

The Chairman participated in the inauguration of the Japan International Seafood & Technology Expo 2023 along with senior dignitaries of Japan and other countries participating in the fair. The Indian Pavilion was inaugurated by Mr. Sibi George, His Excellency Ambassador of India to Japan on the day one of the expo in presence of Mr. D.V. Swamy IAS, Chairman, Dr. M. Karthikeyan, Director, MPEDA, and co-exhibiting exporters. The Ambassador went around the co-exhibitor stalls in the Indian pavilion and interacted with the exporters.

Trade enquiries: Around 46 trade enquiries were received in MPEDA booth during the participation in JISTE 2023, which are compiled and published in the trade enquiry section of this newsletter. The co-exhibitors too received good trade enquiries.

MPEDA officials interacted with major seafood buyers during the fair. The quality issues faced by the importers due to the detection of antibiotics, malachite green and the muddy moldy odour in shrimps were pointed out by some of the major importers. MPEDA officials highlighted the actions being taken by MPEDA

MPEDA officials along with Mr. Kimura, "Tuna King" of Japan, Head of Kiyomura Corporation at Tokyo, Japan

with the support of other agencies and stakeholders to overcome the issues. The importers were assured that the quality of Indian seafood will be ensured as per the requirements of Japanese buyers and standards prescribed by Japan.

MPEDA officials interacting with buyers

The officials had an interaction with Mr. Kimura, head of Kiyomura Corporation at Tokyo, Japan, one of the largest importers of Tuna in Japan, to explore the opportunities to promote export of tuna products from India to Japan. Mr. Kimura is known as the "Tuna King" of Japan, and his company runs the Sushi Zanmai chain of restaurants.

The deputed officials also visited the Toyosu Tuna Auction market and saw the facilities created in the market for the auction of both fresh and frozen tuna. The live and chilled fish market were also visited. Interacted with Mr. Katagiri, Chuo Gyorui (Nippon Suisan group), authorized Tuna auctioneer about the prospects of enhancing tuna exports from India to Japan and the measures to be adopted to address the quality issues for better unit value of tuna being caught by Indian fishers.

The officials also visited the seafood corners of the major supermarkets in Tokyo and saw the various seafood products sourced from different countries displayed in different forms like Sashimi tray packs of tuna, ready-to-eat items of value-added products like lunch boxes, bread buttered shrimp and fish fillets etc. It is observed that the customers prefer to have ready-to-cook or ready-to-eat products in customer packs.

Participation in JISTE has offered an excellent networking platform to connect with existing buyers and new buyers over the three days. Through the participation of MPEDA in the fair, a wide range of products exported from India could be displayed and buyers could be connected with the exporters on the products of interest. The presence of MPEDA as the Seafood export promotion authority in the Indian pavilion, along with exporters in the world's most popular seafood show, has created a brand image for Indian seafood products.

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Training programmes by MPEDA - NETFISH

Tamil Nadu

MPEDA- NETFISH, Tamil Nadu conducted eight fishing vessels based training programmes at Pazhayaru, Nagapattinam and Cuddalore fishing harbours, during August 2023. Fishing vessel owners, crew members, supervisors, workers, net menders attended the training programmes. The main topics covered during the training were fish quality management, reduction of post harvest loss, pre-cooling practices, conservation of marine resources, use of square mesh, sanitation and hygiene in the fishing vessels. Dr. M. P. Arulmoorthy, State coordinator, NETFISH - Tamil Nadu conducted the training programmes.

View of the training programmes

Odisha

As part of the initiative for improving the quality standards of processing units on sanitation, handling methodology and time and temperature control, MPEDA–NETFISH, Odisha conducted one day training programme for the employees of M/s, Orchid Marine Exports Pvt. Ltd., Baliapala, Balasore on 14th August 2023. The programme was titled 'Hygienic handling practices, sanitation, personal hygiene and fish quality management'. Dr. Gopal Anand, Assistant Director, MPEDA, Bhubaneswar along with Mr. Subhrakanta Mohapatra, State coordinator, NETFISH conducted the training programmes.

A total of 28 trainees attended the training programme, to whom certificates were issued at the end.

MPEDA- NETFISH officials with the trainees

Distribution of certificates to the successful trainees

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MPEDA - RGCA moves forward on aquaculture diversification in Nagpur division

Ms. Jayalakshmi Bidari IAS, Divisional Commissioner, Nagpur, Dr. Vipin Itankar IAS, District Collector, Nagpur, Mr. Yogesh Kumbhejkar IAS, District Collector, Bhandara and Dr. Kandan S., Director, MPEDA-RGCA during meeting at Nagpur

A team of MPEDA- RGCA officials led by Dr. S. Kandan, Director RGCA & Joint Director (Training) visited Nagpur and met Ms. Jayalakshmi Bidari IAS, Divisional Commissioner, Nagpur on 22nd August 2023 for the development of diversified aquaculture in the region.

Dr. T. R. Gibinkumar, Deputy Director, MPEDA, Mumbai, Mr. Razak Ali, Deputy Director, MPEDA, Valsad and Mr. Atul Sathe, Field Supervisor, MPEDA, Mumbai accompanied. District Collectors from Bhandara & Nagpur, Maharashtra State officials from the Department of Fisheries and Department of Irrigation were also present during the meeting.

Ms. Jayalakshmi Bidari IAS, Divisional Commissioner, Nagpur, welcomed the officials and mentioned the potential of the districts under Nagpur division in fisheries and aquaculture. Dr. S. Kandan gave a brief presentation on MPEDA along with the possibilities of developing aquaculture of GIFT, scampi and sea bass in the inland areas. He highlighted the importance of nursery rearing and suitability of cage farming in reservoirs.

Ms. Jayalakshmi instructed the officials of Department of Fisheries and Irrigation to arrange the data on inland aquatic realms. She sought support from MPEDA and RGCA to arrange training for AFDOs, Matsya Sakhis, Fishermen Co-operative Societies Representative through District Rural Development Agency (DRDA) and National Rural Livelihood Mission (NRLM) on GIFT, scampi and seabass fish farming.

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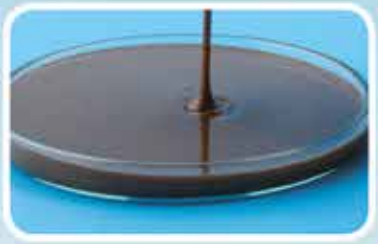

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Marine landing report July 2023

Dr. Afsal V.V. & Dr. Joice V. Thomas
MPEDA-NETFISH

MPEDA-NETFISH collects landing data from approximately 100 key fishing harbours and landing centres across India, with a primary focus on bolstering traceability and the catch certification system, NETFISH tracks the marine landings through its Harbour Data Collectors. Information concerning incoming fishing vessels and the estimated species-specific quantities of their catch landings were documented and uploaded into the MPEDA website. This report presents an overview of the trends observed in marine landings during July 2023.

I. Observations on catch landings

Due to the fishing ban prevailing along the West coast in July 2023, data on marine catch landings was obtained only from 61 landing sites across the 6 coastal states. The catch landings from these locations totaled 24,443.15 tons. The catch encompassed various categories with pelagic finfishes accounting for 11,276.60 tons (46 %) of, demersal fishes comprising 6,620.67 tons (27%), crustaceans contributing 4,277.75 tons (18 %) and mollusc making up 2,268.14 tons (9 %) (Fig. 1).

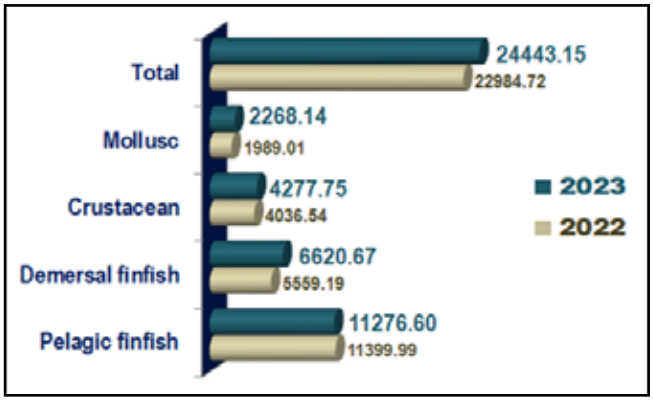

Fig. 1: Catch composition of marine landings (in tons) (July 2022 & July 2023)

Throughout the month, a comprehensive tally of 227 species, including both marine finfishes and shellfishes, was documented. Among these, the five significant contributors were *Johnius spp., Rastrelliger kanagurta, Metapenaeus dobsoni, Sepia pharaonis* and *Sardinella longiceps* (Table 1).

Table 1: Top five species landed during July 2023

1	Croaker	*Johnius spp.*	2,235.95
2	Indian mackerel	*Rastrelliger kanagurta*	1,476.72
3	*Poovalan* shrimp	*Metapenaeus dobsoni*	982.59
4	Pharaoh cuttlefish	*Sepia pharaonis*	966.82
5	Indian oil sardine	*Sardinella longiceps*	915.16

Upon analysing the group-wise landing data, the coastal shrimps, Croakers, Anchovies, Mackerels and Tunas were observed as the major items landed during the month (Fig. 2). These five items collectively accounted for approximately 42% of the total catch. Other major landed items were Cuttlefish, Sardines and Pomfrets.

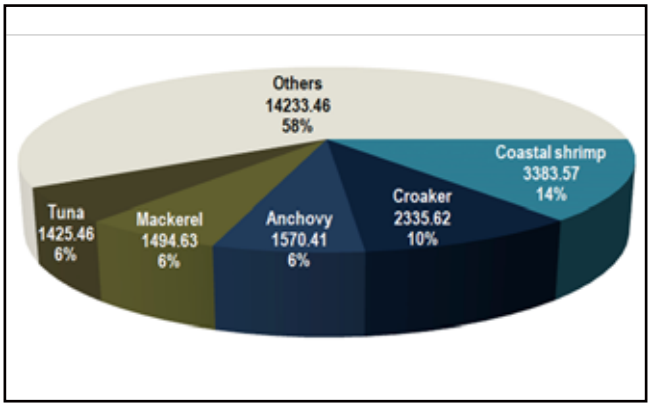

Fig. 2: Major five fishery items landed in July 2023

Among Pelagic finfishes, the major items landed were Anchovies, Mackerels, Tunas and Sardines. Among Demersal finfish resources, Croakers and Pomfrets were the major items landed. In case of Crustaceans, coastal shrimps constituted over 79% of the total catch, and the dominant species was *Metapenaeus dobsoni, Poovalan* shrimp with 982.59 tons of landing. Cuttlefish and Squid were the main Molluscan resources landed during the month.

State-wise landings: West Bengal recorded the highest landing, amounting to 9,105.46 tons, which accounted for 37% of the total catch. Tamil Nadu followed with a share of 7,187.76 tons (29 %) (Fig. 3). Collectively, the East coast states contributed 87% of the total catch. Meagre landing was reported from Kerala & Karnataka and no landing was reported from Goa, Maharashtra & Gujarat, owing to fishing ban.

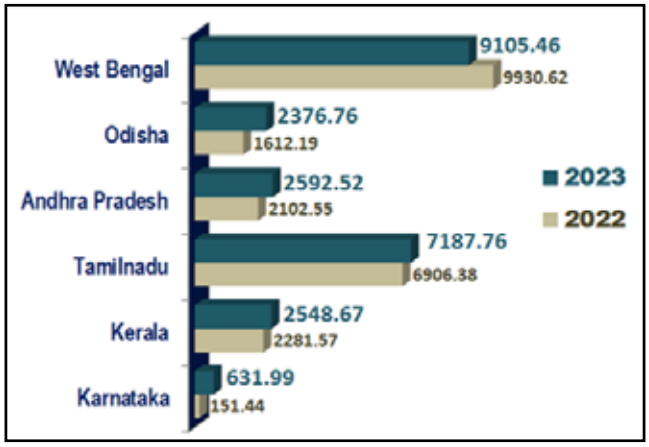

Fig. 3: State-wise marine landings (in tons) (July 2022 & July 2023)

Harbour-wise landings: Chennai harbour in Tamil Nadu recorded the maximum fish landings during the month. The major ten harbours in terms of total catch quantity landed are given in table 2.

Table 2. Top ten harbours based on catch landings

Sl.No:	Harbour	Quantity (tons)
1	Chennai	2552.74
2	Deshapran	2314.13
3	Kakdwip	1958.55
4	Sankarpur	1925.09
5	Nagapattinam	1592.71
6	Visakhapatnam	1017.28
7	Soula	886.00
8	Paradeep	832.75
9	Dhamara	814.82
10	Raidighi	793.09

2. Observations on boat arrivals

In July 2023, the number of fishing vessel arrivals recorded from the 61 designated fish landing sites totaled to 17,992. Tamil Nadu recorded the highest number of boat arrivals (39 %), followed by West Bengal (21 %) (Fig. 4). While considering specific harbours, Kakdwip & Deshapran in West Bengal were the frontrunners with 990 and 819 boat arrivals respectively.

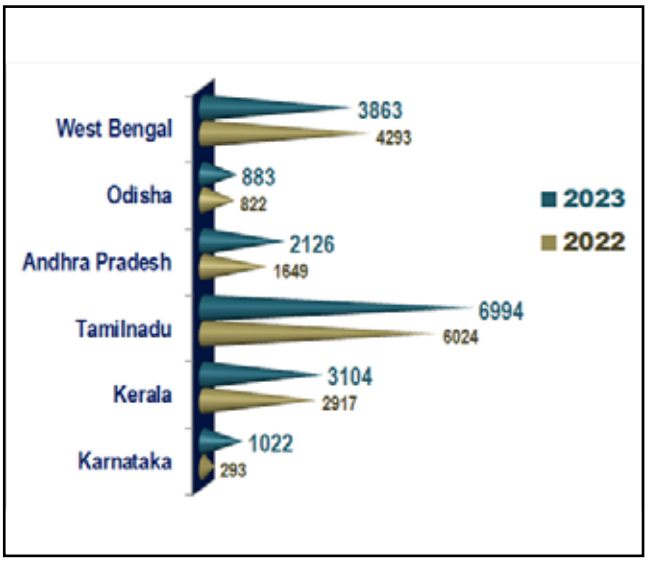

Fig. 4: State-wise boat arrivals (nos.) (July 2022 & July 2023)

Summary:

During July 2023, the marine landings and boat arrivals recorded from the 61 major fish landing sites amounted to 24,443.15 tons and 17,992 nos. respectively. Compared to the previous month, a slight increase was observed in catch as well as in boat arrivals. The catch increased by about 9,218 tons and the boat arrivals by 3,800 nos. than June 2023.

Pelagic finfish resources remained as the primary contributor to the overall catch. Croaker (*Johnius spp.)*, a demersal finfish, emerged as the most landed species during the month. West Bengal was on top in total catch landed, while Tamil Nadu remained as the lead state in terms of highest number boat arrivals.

Among the various landing sites, Chennai harbour attained the top position in catch, while Kakdwip harbour held the first place with the highest number of boat arrivals.

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Monthly outlook forecast report

Ritesh Victor – Co- founder & Country Head – Myforexeye Fintech Pvt. Ltd.
Email-id: sales@myforexeye.com

USD INR

The rupee has declined this month as USD INR began the month at 82.00 and reached its monthly high of 82.75 during the start of the month. The Rupee started to gain and made a two-month high of 81.67 before completing the month at 82.26, favored by the inflows of $3.7 Bn in the month. The dollar index weakened to a 15-month low this month falling by more than 3% from 103.03 to 99.81, with the release of bearish CPI and PPI data, supported by dovish comments of Fed members. After breaking through the 82-level barrier, it stabilized in a constrained range of 81.60 and 82.70.

This month, the Fed increased interest rates by 25 bps to 5.5%, making it the highest in 16 years. In their statement, the Fed signaled that the upcoming major economic data would direct their interest rate policy and left the door open to another rate increase. The USD-INR pair saw a decline post-rate hike. The India FX reserves (USD) were one year high at 609.02 Billion. Key events for upcoming months are ADP Nonfarm employment change (Jul), Non-farm payrolls (Jul), Unemployment rate (Jul), CPI (YoY) (Jul), and PPI (MoM) (Jul).

In the previous month, the Rupee declined by 15 paisa, mainly due to the intervention of our central bank (RBI). The RBI added forex reserves whenever the Rupee gained, preventing it from gaining much despite continuous inflows in the Equities market.

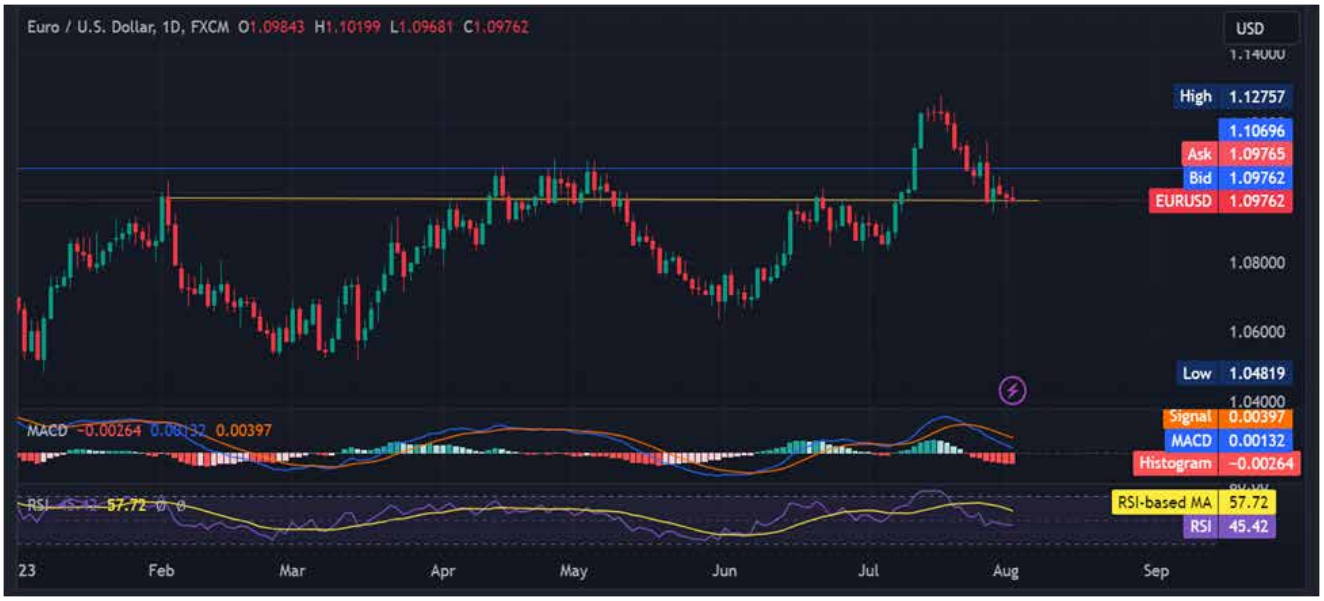
Our view is bearish now as we are near to the long-term resistance level of 82.70-80. We expect the pair to decline from these levels. Additionally, the 144-day moving average is near 82.20, and there is an unfilled gap on the downside. On the daily time frame, the momentum indicator MACD is giving mixed signals, while the Relative Strength Index (RSI) is trading in an overbought zone.

We hope Importers hedged their payments which were advised to them if not now they can wait for 82.20 to hedge their short-term payables. On the other hand, this is a good time for exporters to increase their hedge ratio at 82.60 or higher.

EUR USD

The EURUSD pair's performance was driven by a mix of limited European data, US economic indicators, inflation worries, and central bank policies, which influenced the stability and fluctuations of the Euro against the US Dollar. Initially, the US Nonfarm Payrolls report initially helped the EUR-USD to 1.0930, but it later fell below 1.0900. The EUR-USD was able to have some positive days, where it rose to 1.1275, before the Fed and ECB monetary policy meetings.

The euro was boosted by the weakness in the US dollar due to weakened due to easing inflation according to US CPI data. The EUR-USD declined around the end of the month due to a strong US Dollar supported by impressive US economic data. Both the Federal



Reserve (Fed) and the European Central Bank (ECB) raised interest rates by 25 basis points. The Fed's move was expected, but data suggests further tightening might still be possible. The ECB's decision was more driven by economic outlook than inflation concerns. Some key events to follow in the upcoming month include German Unemployment Change (Jul), German Manufacturing PMI (Jul), German CPI (MoM) (Jul), and CPI (YoY) (Jul).

EUR-USD opened at 1.0910. During the first half of the month, the EUR-USD showed strength, gaining over 360 pips also making a 15 month high of 1.1275. The pair quickly surpassed 1.1100 before retracing towards 1.0833 as the low for the month but managed to close above 1.0990. Currently, the pair is close to the support which was previously acting as a resistance.

A break below 1.0960-70 could expose levels below 1.0900 where bears may target in the middle term. The pair has traded nearly 50 days moving average at the time of closing. Anyhow if the pair comes up then we can see a resistance at 1.1075.

On the daily time frame momentum indicators show overbought signals, with the RSI and stochastic also in an overbought zone, while the MACD giving bearish signals. Traders should closely monitor these levels to determine potential breakouts or further declines in the pair. Overall, the EUR-USD displayed quick gains in the starting of the month but lacked sustained momentum, remaining within a familiar range.

GBP USD

It was a roller-coaster ride for Sterling this month, as it gained in the starting but fell rapidly toward the end of the month. The pair gained because of the BoE's hawkish pricing of its terminal rate of over 6.0%. The average hourly earnings also came at 6.9%, the highest level since March 2022. Further, the CPI and Core CPI of the U.S. came lower at 3.0% and 4.8%. And the dollar index fell to a 15-month low to 99.57 levels, after lower PPI data. All of the factors mentioned favored the pound and it reached 1.3142, which is a 15-month high level. But, the pair quickly reversed its gains and started falling after the inflation in the U.K. CPI fell to 7.9%, and the Core CPI fell to 6.9%. The lower inflation derailed the expectation of another 50-bps hike by the BoE in August. The pound fell to the 1.2781 level, after the bullish GDP release of the U.S. economy, which showed signs of resiliency as it grew by 2.4%. However, towards the end, the pair recovered a little helped by the lower PCE Price Index, which came lower at 4.1%. The pair ended the month by closing at 1.2828.

This was the second consecutive month where we saw a positive rally from Sterling gained more than 100 pips. Pair remained on the front foot in the first half of month but in the second half bears remained heavy and pushed the pair from 1.3146 to 1.2850. In the past two weeks, it seems bulls has lost the momentum and bears have taken the charge and their first target would be 1.2720-25 where 50 days moving average is located afterwards 1.2650 may come into play which played a

crucial role of support in the past, and breaking below them could lead to a decline towards 1.2400 while on the upside bulls would target 1.29 figure afterwards 1.30 which had been acting as a crucial resistance, but the pair has managed to break above it. On the daily time frame momentum indicator MACD giving mixed signals and RSI also trading in a neutral zone.

USD JPY

USD-JPY started the month on a positive note by opening at 144.26 level. But after that, the yen , started gaining rapidly. The bearish release of the U.S. NFP supported and the pair fell by more than 1% in a single trading session to 142.06 level.

Further, the lower CPI and Core CPI of the U.S. economy and dovish comments from Fed officials led to the downfall in USD-JPY. But the major impact was the lower PPI data of the U.S. after which the U.S. 2-year and 10-year Treasury Bond Yield fell to 4.60% and 3.75%. The lower yields led to the strengthening of the Yen to 137.23 levels. But the pair recovered its losses after the dollar index gained after the lower CPI release of the U.K. economy and the fall in Initial Jobless claims to a 2-month low level.

The lower CPI of Japan at 3.3% supported the ultra-loose monetary policy stance of the BoJ, which benefitted the pair as it gained to 141.35 levels. But the pair dropped after the slightly hawkish stance of BoJ as it provided greater flexibility to its YCC policy. The pair ended the month at 142.27, after recovering slightly due to the gain in the dollar index.

The USD- JPY opened at 144.26 and showed a resistance around 145 regions in the starting 3-4 trading sessions. Yen has quickly gained in 4 trading sessions around 5% to touch a low of 137.23 in the first half of the month. The rally of dollar against the yen has been like a see-saw in the second half of the month taking the pair back to close at 141.14.

Yen after gaining has almost depreciated by 3% against the dollar while BoJ shows the same stance for changing its ultra-loose monetary policy. USD-JPY can find its first resistance at 143 and if able to break we will see the same strong resistance at 145 where BOJ comes in to give some support to the yen.

The 50-Day EMA shows a support close to the 140.50 level. The pair can find support in the near term towards 138.75 if in any case BOJ comes with some positive signs for their currency. The relative Strength Index showing neutral signal currently at the 48 value and the momentum indicator MACD comes close showing a selling signal.

The mysterious Peacock Cichlids

V. K. Dey

V. K. Dey has over three decades of experience in diverse sectors of seafood industry in Asia- Pacific region. He was the Deputy Director of MPEDA and then associated with INFOFISH, Malaysia. As part of INFOFISH, he was involved in several studies related to seafood industry in the Asia-Pacific region and beyond, including setting up of Aqua-technology Park for ornamental fish. MPEDA has published Living Jewels, a collection of his articles on ornamental fish.

RAINBOW IN A BOWL

Peacock cichlids are the new introduction to the hobby market and enjoy a growing popularity. Like most of the rock-inhabiting cichlids from Lake Malawi, peacock cichlids of the species *Aulonocara* form local variants as different populations have practically no contact with each other. Due to this, they are known as mysterious fish. Ease in spawning and their peacefulness with other fishes make them much sought. They are known for their tendency to cross-hybridise.

Brilliantly colored peacock cichlids, most of which are small, ranging from 8 – 12 cm, are ideal for a well decorated aquarium. In the wild they feed on micro-invertebrates found hidden in the sand, while in the aquarium they prefer live baby shrimp, micro worms and daphnia. Appropriate water chemistry includes hard water with a pH ranging from 7.8 – 8.4 and temperature is consistent at 24°C. They are mouth brooders and it take almost 18 days for the egg to develop into a free-swimming fry. Though there are more than 20 species described, only a handful of varieties are popular in the hobby which are: *Aulonocara baenschi, A. hansbaenschi, A. jacobfreibergi, A. koningsi* and *A. stuartgranti.*

With brilliant yellow color, *Aulonocara baenschi,* known as yellow peacock or Baensch's peacock, is one of the most popular species among peacock cichlids. It is an elongated high backed cichlid with large lips and eyes. The pelvic and pectoral fins are elongated. Four color morphs are available to the hobbyist. The most common one is the blue-yellow morph. A popular, new color morph is all yellow except for the lower half of the head and the pale 6-8 blue stripes. The morph from the Marleri Islands has a blue head. The final variation, the Usisya morph has a yellow body and a blue head. The vertical stripes that are found on the other morphs are very pale on the Usisya form. The maximum size of male is 15 cm while females are 9 cm. Ideal water conditions are pH ranging from 7.5-8.8, dH 10 -25 and temperature 25-29°C.

A. hansbaenschi, is known as peacock cichlid or red shoulder Malawi or African peacock. Females are pale, while males are colorful-usually dark indigo blue. In males, the dorsal fin is elongated and pointed. The upper ridge of this fin is white while the rest is body colored. The body is indigo blue with 7-9 faint horizontal black stripes. Alternating with the blue scales, there are red to pink scales that are not as numerous as the blue ones. The belly and the area immediately behind the gill cover are more reddish to pink with scales. The other fins are the same color as the body. The female has less elaborate fins and is brownish-gray in color. The eye appears larger and the fins are brown or transparent. Ideal conditions are water with pH ranging from 7.5-8.8, dH 10 -25, temperature 25-29°C. They can be combined with other medium sized cichlids in aquariums.

A. jacobfreibergi, is known as Lake Malawi butterfly cichlid. Their body shape is similar to that of other peacock cichlids. Several different color variations are known, although only one is common in the hobby. A dark, indigo blue color extends along the lower jaw and to the rear part of the body. The forehead and the upper back is reddish-brown in color. Nine to ten faint, but dark, horizontal stripes are positioned on the body. The first starts just behind the gill cover, and the last ends at the base of the tail. The dorsal and caudal fins are iridescent blue and the pectoral fin is transparent. The anal fin is red and black with an electric blue trim. The first ray of the pelvic fins also has an electric blue color. It is a peaceful fish that can be combined in a community tank containing other robust fish. Keep one male with several females.

A. stuartgranti, known as Chilumba peacock or blue peacock Cichlid, originated from the northwestern coast of Lake Malawi, Chilumba. Also found along the entire area in the northwestern coast stretching about 150 km. Along the length of its range, the colour of breeding males changes from blue to bright yellow and then to black. The male fish from the northern most area has blue body with a large orange patch on the lower half. The orange colour disappears in the fish from the southernarea and is only present as a faint hue in males from Chitande Island, near Chilumba. Their colour becomes more vivid during breeding time. Ideal water conditions are pH ranging from 7.8 – 8.5 and dH 10 – 15 with temperature between 24-26°C.

A. walteri, commonly known as "Blue Face peacock" is typical of other Malawian peacock. Brightly colored males with a lot of blue and drab barred females. The males are brilliantly colored and become deeper blue and the color extends further down the body during spawning season. Males also exhibit yellow or tan coloration on their upper flanks. They are closely related to *A. jacobfreibergi* and are easy to breed.

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MPEDA & RGCA explores suitable fields to diversify aquaculture production in Maharashtra

MPEDA - RGCA team visited seed production centres and reservoirs in Maharashtra with an aim to assist the state in diversifying aquaculture production through GIFT, seabass and scampi.

Seed production center, College of Fishery Science, Telanakhedi, Nagpur

The team visited the seed production center operated by College of Fishery Science (COFS) at Telankhedi in Nagpur on 22nd August 2023, which produces seeds of IMC and *Clarias batrachus* (Indian Magur). The visit was arranged to find whether the centre was suitable for organizing training for farmers or can be used as nursery facilities.

Pench reservoir, Nagpur

The team along with Mr. Anup Gajbiye & Mr. Ramdayal Patil, who are farmers doing cage culture in Pench Reservoir, Mr. Pulkesh Kadam (ACF, Nagpur), Mr. Dhope (FDO, Nagpur) visited the Pench Reservoir in Nagpur on the same day and observed pontoon-based pangasius and tilapia cages introduced under PMMSY. Seeds are sourced from West Bengal.

Gosekhurd reservoir, Bhandara

The team visited Gosikhurd reservoir in Bhandara district on 23rd August 2023 and met Mr. Piyush S. Masram, Assistant Engineer Gr-1, Dhairyasheel R. Patil, Junior Engineer and other officials of Irrigation Department.

Shiwni Bandh fish seed production centre, Bhandara

On the same day, the team visited Shiwni Bandh fish seed production centre, which is located in 2.5 ha area and has a production capacity of 1 crore IMC seeds.

Itiyadoh seed production center & reservoir, Gondia

MPEDA RGCA Team along with Mr. Mahesh Hajare, AFDO, Bhandara visited Itiyadoh seed production center, Gondia later the day.

Visit of MPEDA-RGCA team to fish seed production centre of College of Fishery Science at Telanakhedi, Nagpur

Visit of MPEDA-RGCA team to cage culture site at Pench Reservoir, Nagpur along with officials of Department of Fisheries

Visit of MPEDA-RGCA team to Gosekhurd reservoir, Bhandara

Visit to Shiwni bandh, fish seed production centre, Bhandara

Meeting at Itiyadoh Fish Seed Production Center, Gondia

Jayakwadi fish seed production centre, Paithan, Aurangabad

The team visited the Jayakwadi Fish Seed Production Centre at Paithan in Aurangabad district on 24th & 25th August 2023. It was deemed suitable for the nursery and hatchery facilities.

Team visiting Jayakwadi seed production centre, Paithan, district Aurangabad

Farmers meet by MPEDA-RGCA

MPEDA & RGCA officials attended farmers' meetings along with the officials of Department of Fisheries at Pawani Fishermen Cooperative Society at Pawani in Bhandara district on 23rd August 2023. The team had interaction with the members of various societies who are doing fish and scampi farming in reservoirs and small village ponds.

On 23rd August 2023 another farmers' meet was conducted along with the Department of Fisheries at Shiwni Bandh fish seed production centre in Bhandara district, and interacted with the farmers and Matsya Sakhis.

Matsya Sakhi

Matsya Sakhis are the Community Resource Persons (CRP) for fisheries engaged under National Rural Livelihood Mission (NRLM). Matsya Sakhis are responsible for disseminating uniform technical knowledge for the pond upkeep to the farmer.

They follow up with the farmers on their practices and provide handholding support in monitoring of processes on the farmer's end. Matsya Sakhis guide the farmers on how to prepare their pond, make good quality seeds and feed available to farmers. They are also responsible for teaching farmers how to test water and ensure that the quality of water is maintained.

Members of SHGs, preferably women with minimum education of 10th class who are also the best practitioners in the core livelihood activity are selected. They are certified as Matsya Sakhi through theory and practical tests. They are further trained and monitored by Mentor-CRPs.

Farmers meet at Pawani Fishermen Cooperative Society, Bhandara

Interactive meet at Shivani bandh, fish seed production centre, Bhandara with Matsya Sakhis, Fishermen Cooperative Society Members and fish farmers

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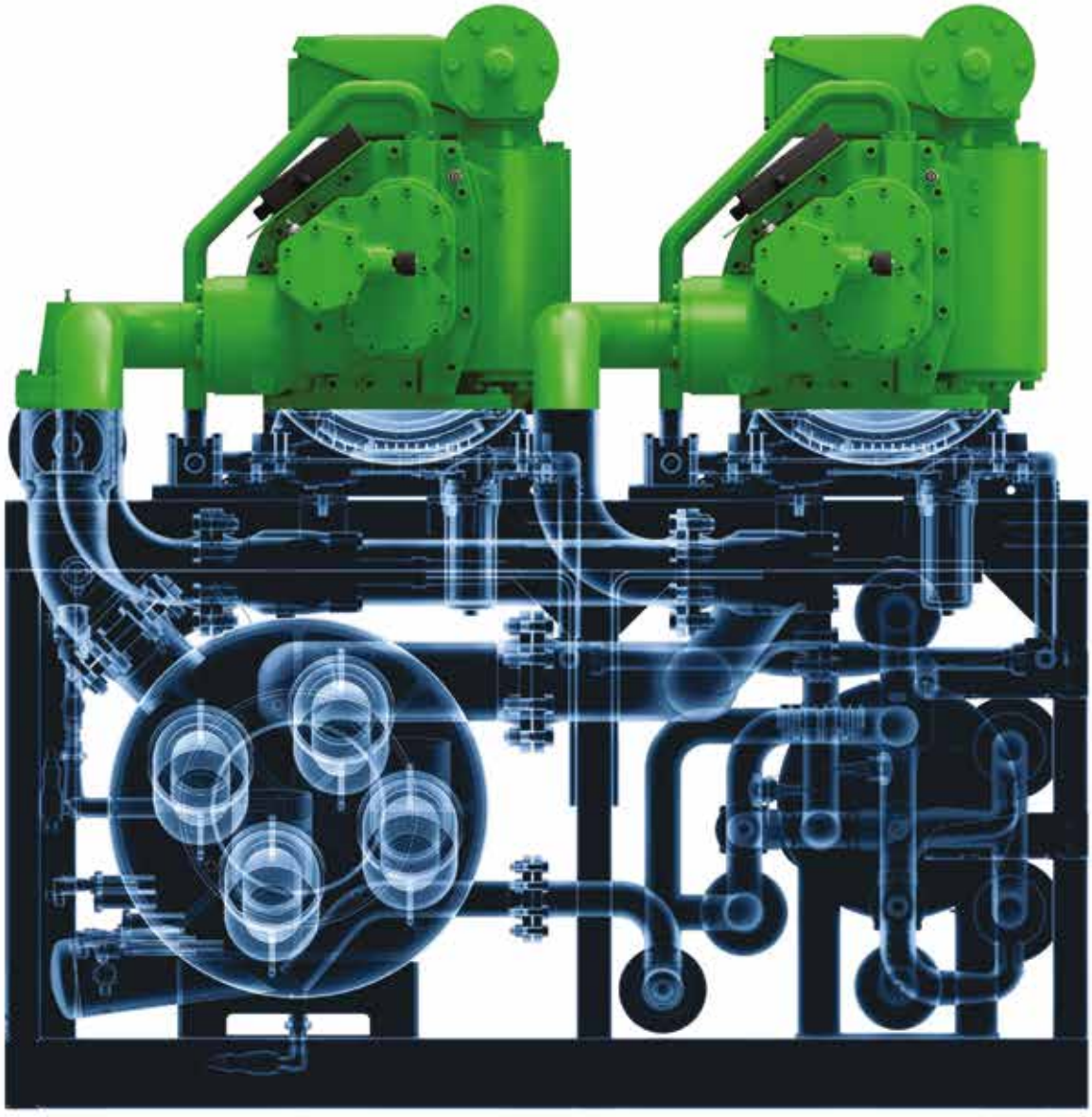

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MPEDA trains technologists in Nellore region on Seafood HACCP

MPEDA through its Regional Division, Vijayawada organized a 4-days training programme from 8th to 11th August 2023 on seafood HACCP for the technologists working in the pre-processing and processing units in Nellore region. This is the 133rd HACCP training programme of MPEDA. The training was conducted with the objective of effective implementation of HACCP & HACCP based food safety programmes in the seafood industry. 25 participants attended the training.

The training began with an inaugural session. Mr. A. Jeyabal, Joint Director, MPEDA, RD Vijayawada welcomed all dignitaries and participants to the training programme. The training was inaugurated by Dr. A. Balasubramanian, Associate Dean, College of Fisheries, Muthukur, Nellore, who stressed on the importance of producing safe and quality food and also emphasized upon the need for imparting HACCP training programme in the seafood processing plants in the current scenario when the seafood trade is facing challenges in the international markets. In his keynote address, Mr. Anil Kumar, Assistant Director, Export Inspection Agency, Nellore gave an insight on HACCP. Dr. K. Dhanpal, Professor and Head of the Department, Fish Processing Technology, College of Fisheries, Muthukur, Mr. Sravan Kumar, Director, Munnangi Sea Foods Pvt. Ltd., Mr. Vinod V., Deputy Director (QC), MPEDA also spoke on the occasion. The inaugural function concluded with a vote of thanks by Mr. Sibasish Mohanty, Assistant Director, MPEDA, RD, Vijayawada.

Mr. Vinod V., Deputy Director (QC), and Mrs. Anju, Assistant Director (EP) from MPEDA Head office and Mr. Prasad Naik, Assistant Director, MPEDA Sub Regional Division, Visakhapatnam were the faculty members. On the last day of training, Mr. A. Jeyabal, Joint Director made a presentation on National Standards, EU requirements and Common NCs observed during the inspections by Assessment Panel of Experts and ways to avoid such errors.

Inauguration of the training by the chief guest Dr. A. Balasubramanian, Associate Dean, College of Fishery Science, Andhra Pradesh Fisheries University, Muthukur, SPSR Nellore in the presence of other guests and trainers

Mr. A. Jeyabal, Joint Director, MPEDA, RD, Vijayawada giving the welcome address

View of training session

Work session by the groups

Participants with their digital certificates

Participants with MPEDA officials

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High Pressure Processing- A novel approach to seafood safety and value enhancement

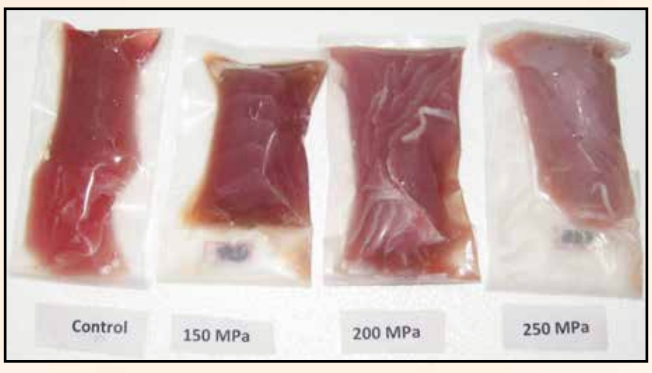
Dr. Ginson Joseph[1] & Dr. Bindu J[2]
Corresponding Author: ginsonjoseph@cusat.ac.in
[1]School of Industrial Fisheries, Cochin University of Science and Technology, Kochi-682016
[2]ICAR-Central Institute of Fisheries Technology, Kochi-400061

Introduction

High Pressure Processing (HPP) is a revolutionary technology in food preservation. In response to the increasing demand for natural, additive-free foods with extended shelf life and maintained nutritional quality, HPP has gained prominence. This method, also known as high hydrostatic pressure processing or pascalization, aligns perfectly with the trend of "clean label" foods. Seafood, with its delicate flavors and nutritional value, presents unique preservation challenges. Traditional methods often compromise its freshness and quality. In contrast, HPP offers an appealing solution that addresses these challenges, meeting the preferences of both consumers and producers. By enhancing safety, preserving quality, and fostering innovation in seafood, HPP is driving positive, sustainable change in the industry.

High Pressure Processing applies elevated pressures (typically 100 to 1000 megapascals) to seafood, yielding significant benefits. Beyond safety, HPP notably enhances seafood quality and value. It neutralizes harmful microorganisms and deactivates spoilage enzymes without excessive heat, preserving flavors and textures. Unlike heat treatments, HPP minimizes protein denaturation and nutrient degradation. This maintains the fresh-like qualities of taste and nutrition. HPP-treated seafood, with vibrant colors, firm textures, and vital nutrients, appeals to health-conscious consumers seeking minimally processed options. This technology encourages culinary innovation, aligning with evolving consumer preferences. By incorporating HPP, the seafood industry supports sustainable and health-oriented dietary trends. Its proficiency in extending shelf life, reducing waste, and preserving nutrition could revolutionize the trade. Crucially, HPP substantially reduces pathogenic bacteria, enhancing the safety of raw or minimally cooked seafood. The USDA-FSIS recognizes high-pressure processing as a food safety method for eliminating Listeria monocytogenes in processed meat products and effectively inactivating other harmful microorganisms like *E. coli*, Salmonella, Vibrio, as well as various spoilage-causing yeasts, molds, and bacteria (Hayman *et. al.*, 2004). HPP's success depends on food composition, microorganism type, pressure levels, and treatment time. Understanding these factors, along with packaging and regulations, is crucial for effective implementation.

High Pressure Processing offers many opportunities to create novel food products distinguished by their high nutritional value and exceptional sensory attributes. Furthermore, HPP introduces a unique avenue for crafting and controlling new food textures, particularly in protein-based or starch-based items. Noteworthy studies have highlighted the efficacy of HPP for muscle products, particularly in meat and seafood domains, revealing its usefulness. Additionally, its capability to delicately extract raw meat from the rigid shells of molluscs and crustaceans without initiating the cooking process underscores its significance in seafood processing. Notably, countries including the USA, Canada, New Zealand, Australia, South Korea, and Greece have embraced commercial pressure treatment for shellfish like oysters and crustaceans.



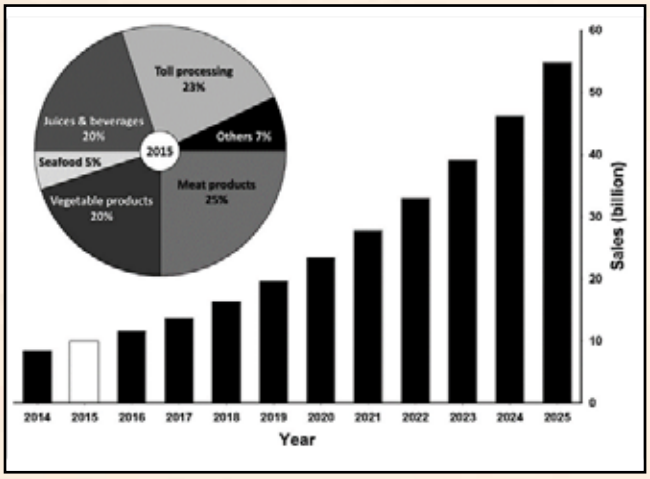
Pressurized tuna meat (Photo Courtesy: ICAR-CIFT, Kochi)

Pressure processed Prawns
(Photo Courtesy: ICAR-CIFT, Kochi)

The global High-Pressure Processing foods market is poised for substantial growth. The market's growth is driven by urbanization, shifting lifestyles, surging demand for ready-to-eat fare, increasing disposable income, and the proliferation of online food ordering platforms. By the end of 2015, over 300 units of HPP equipment were operational worldwide.

Despite the substantial cost and significant barriers to investment, the specialized original equipment manufacturer service sector has seen steady growth, with the global HPP market's annual output value nearing $10 billion (Huang, *et. al.*, 2017). Over 80% of the HPP equipment was installed after 2000, signifying a rapid and accelerating adoption of HPP technology. Recognized by the U.S. Food and Drug Administration, HPP has gained official approval as a non-thermal pasteurization method, capable of substituting traditional techniques in the food industry (Huang, *et. al.,* 2017). The COVID-19 pandemic has influenced the market, estimating the High-Pressure Processing Food market size at USD 3,228.6 million in 2022, projected to reach USD 5,267.4 million by 2028 with an 8.5% CAGR during the re-evaluation period.

According to Visiongain (2015) the global HPP food market reached approximately $9.8 billion in 2015 and is projected to reach a market value of $54.77 billion by 2025. Annually, around 500,000 tons of HPP products are distributed worldwide, with ready-to-eat meat products, particularly burger patties, constituting the most significant application within the HPP product category. Key markets for pressurized food products include North America (U.S., Canada and Mexico), Europe (Spain, Italy, Portugal, France, UK and Germany), Australia and Asia (Japan, China, India and S. Korea). North America is a significant and expanding region regarding HPP food consumption. The burgeoning trend of busy lifestyles and the prevalence of apartment living in countries such as the U.S. and various other developed nations have contributed to the growing popularity of HPP foods, valued for convenience. Meanwhile, the Asia Pacific region is also rising, gradually embracing and integrating HPP functional foods into its dietary landscape. Notably, categories like baby food and infant formula have emerged as rapidly growing sectors within the HPP market, particularly in countries like India and China.



Global HPP foods market forecast 2014-2025 and submarket share in 2015 (Visiongain, 2015)

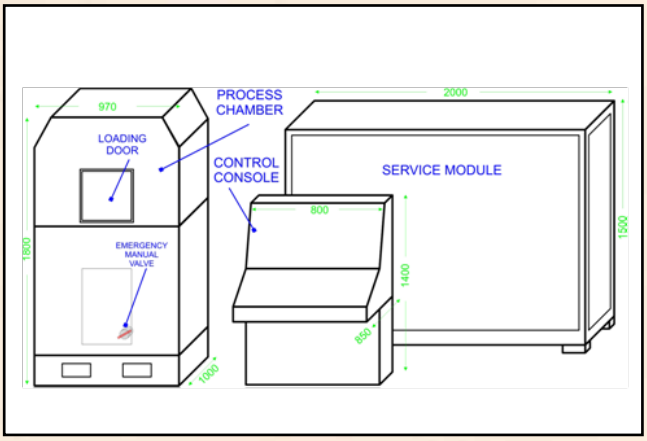
Principles of High Pressure Processing

High Pressure Processing requires a meticulous procedure. Products must be carefully pre-packed in materials like vacuum-sealed bags or flexible plastic bottles. Unsuitable materials include ceramics, glass or metal. The chosen packaging should withstand high pressures without compromising the seal's integrity or barrier properties and prevent the leaching of undesirable chemicals. The product is then vacuum-sealed using appropriate material and placed in a specialized high-pressure chamber filled with hydraulic fluid (distilled water or 30% food-grade propylene glycol) as the pressure-transmitting medium. The hydraulic fluid is pressurized using a pump, uniformly transferring pressure to the packaged food. HPP is less suitable for dry foods due to air pockets, so treated foods should have sufficient moisture content.

High Pressure Processing works by using high pressure to change the volume of food, following a principle called Le-Chatelier's principle. It mainly affects weak bonds in food like hydrogen, ionic, and hydrophobic bonds, leaving strong covalent bonds untouched. This

means that HPP doesn't break important chemical bonds during the process. Because of this, HPP can change the shape and structure of molecules in the food, especially those held together by hydrophobic and ionic interactions.

This allows HPP to kill harmful microorganisms and enzymes without causing significant loss of nutrients or changing the food's essential characteristics. Pascal's law, or the isostatic principle, ensures that pressure is applied evenly to all parts of the food, no matter its size or shape. This means that the food will go back to its original form after HPP is done. This consistency in treatment makes HPP a great choice for making safe and high-quality products.



General layout of the HPP machine

Exploring the diverse applications of High-Pressure Processing in the food industry

ince 1885, the U.S. led HPP research, discovering its bacteria-eliminating potential. Early studies extended milk shelf life, laying HPP's food industry foundation. From 1985, it transitioned from research to practical use, transforming food preservation.

In the early 1990s, Japan pioneered high-pressure processed foods, notably jams, sparking global interest (Suzuki, 2002). By 1992, Japan commercially introduced various high-pressure processed foods, starting a broader trend.Europe and the U.S. widely adopted HPP, leading to a range of commercial products: orange juice (France), acidified avocado puree and oysters (USA), and ham varieties (Spain) (Hugas *et al.,* 2002).

HPP excelled in extending shelf life for low-acid foods. This extended to poultry, red meat, foie-gras, goat milk cheese, eggs, ham, and fish (López-Caballero *et.al.*, 1999). Beyond preservation, HPP sparked innovation, creating new foods. HPP's journey from mid-1980s inception to global integration revolutionized food preservation, offering vast opportunities for both preservation and innovation.

HPP equipment has advanced, leading to widespread use in food processing. Devices come in horizontal and vertical types, with horizontal ones preferred for commercial use due to easy loading.

Globally, there are more than 300 operational sets for mass production, primarily in North America (54%), Europe (25%), and Asia (12%). Leading manufacturers like Avure and Hiperbaric produce lab-scale HPP equipment (0.3 to 10 liters). Avure and Hiperbaric stand out, with devices capable of 525 liters and 60 million tons annually.

Manufacturers from the U.S., Spain, the U.K., Japan, and China now produce HPP equipment. Key players include Avure (Middletown, OH, USA), Hiperbaric (Burgos, Spain), and Multivac (Germany, merged with Uhde High Pressure Technologies in 2011).

Notably, Baotou Kefa High Pressure Technology Co., Ltd. is a significant Chinese manufacturer. Hiperbaric commands over 50% market share among more than 10 HPP equipment suppliers, reflecting the growth and potential of HPP technology in modern food processing.

Pros and cons of High Pressure Processing for seafood preservation

Non-thermal preservation: This method operates at ambient temperatures, preserving heat-sensitive nutrients effectively. It offers the flexibility to adjust pressurization temperatures with additional equipment design, allowing for the creation of diverse food products. This adaptability presents opportunities for producing safe, additive-free, value-added products aligned with consumer preferences.

Sustainable energy approach: HPP excels in energy efficiency, utilizing minimal resources for food preservation compared to traditional thermal methods. This sustainable approach aligns with modern priorities, making HPP an innovative technique for a more energy-conscious future in seafood preservation and value addition.

High pressure processing equipment
(Photo Courtesy: ICAR-CIFT, Kochi)

Low environmental footprint: High Pressure Processing, relying solely on electrical energy, leaves no waste and allows for the recycling of the pressure transfer medium, making it an environmentally conscious choice for seafood processing.

Swift processing duration: High Pressure Processing's rapid pressure application makes it ideal for time-sensitive seafood processing, ensuring efficiency and safety.

Uniform pressure dispersion: It employs isostatic pressure, ensuring uniform treatment for all food particles. This guarantees consistent quality and safety improvements in the entire seafood batch, crucial for reliable preservation and value addition.

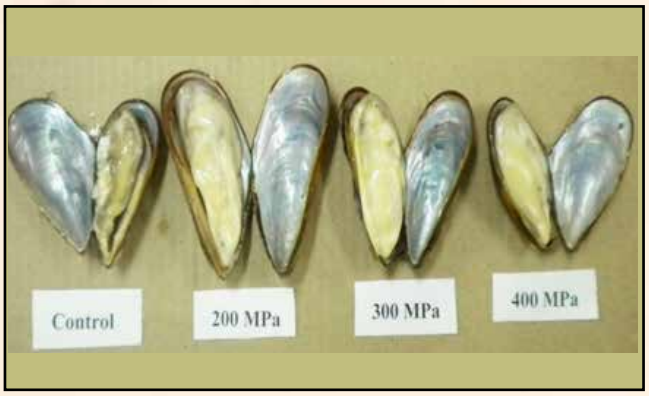
Eliminating spoilage and pathogenic bacteria: HPP combats pressure-sensitive Gram-negative bacteria. It alters cell membranes, reducing bacterial load and deactivating enzymes. Studies confirm its efficacy against pathogenic Vibrio, coliform bacteria, and seafood-related viruses. In oysters, it lowers V. parahaemolyticus and V. vulnificus and also shows promise against various viruses.

Sensory splendor retained: Traditional methods, such as heat processing, can compromise seafood's flavor, texture, and nutrition. High Pressure Processing, however, preserves these attributes, retaining seafood's sensory appeal. HPP's finesse in maintaining the original essence allows it to delight palates with authentic taste, texture, and nutrition.

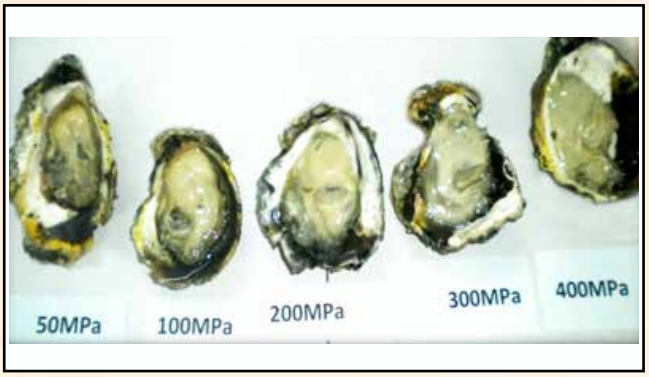
Safeguarding true flavors: HPP spares covalent bonds (Balny & Masson, 1993), safeguarding seafood flavor compounds. This shields authentic flavors, ensuring distinctive profiles persist. HPP's pivotal role in retaining seafood essence delivers a consistently delightful culinary experience.

Broad applicability: HPP excels in adaptability, suitable for diverse seafood products. It seamlessly accommodates variations in geometry and composition. This versatility streamlines seafood processing and underscores HPP's applicability across product types.

Unshells raw meat efficiently: HPP excels in extracting raw shellfish meat with a remarkable 100% yield. It proves an alternative, preserving the natural state of oysters and mussels meat. This technology minimizes waste, a pivotal step in seafood sustainability. HPP delicately separates meat from shells without cooking,



Pressurized Mussel
(Photo Courtesy: ICAR-CIFT, Kochi)



Pressurized Oyster (Photo Courtesy: ICAR-CIFT, Kochi)

promising to reduce waste and maximize yield from these valuable shellfish varieties.

Augmented consumer protection: HPP plays a crucial role in ensuring consumer safety in seafood consumption, particularly for those who prefer minimally cooked or raw dishes.

HPP acts as a vigilant microbial safeguard, neutralizing harmful microorganisms through elevated pressures. This proactive approach reduces microbial risks, guaranteeing consumer well-being without the necessity for extensive cooking or chemical additives.

HPP's role in hurdle technology: HPP seamlessly integrates with various preservation methods, enhancing seafood protection through a collaborative approach.

As a hurdle technology, HPP combines with techniques like controlled atmosphere packaging and natural antimicrobials to create a multi-layered defense against spoilage. This synergy extends shelf life while preserving seafood quality and safety.

Limitations of high-pressure processing: HPP has its limitations. It struggles with baroresistant enzymes and bacterial spores. At higher pressures, it can lead to lipid oxidation, harder texture, and a cooked appearance in seafood.

This is due to protein denaturation, influenced by pressure levels and protein type. Pressure accelerates lipid oxidation by exposing heme groups to fatty acids, particularly at pressures over 400 MPa.

Isolated marine lipids show greater stability under high pressure. These effects vary by seafood type, potentially impacting sensory perception. Moreover, HPP requires lower storage temperatures and significant capital investment.

Packaging materials must have a compressibility of at least 15%, limiting options to plastic. Establishing proper regulations is vital for HPP's future growth in the food industry. Addressing these challenges will enhance HPP's efficacy and expand its application in seafood processing.

Conclusion: HPP revolutionizes seafood preservation, meeting consumer demands, culinary innovation, and food safety needs.

By neutralizing harmful microorganisms and spoilage enzymes, HPP ensures seafood safety for raw or lightly cooked seafood. It also preserves sensory and nutritional value, elevating gastronomy. Despite its merits, HPP has limitations, highlighting the need for tailored approaches.

Researchers and practitioners strive to enhance HPP effectiveness, aiming for a future of seafood preservation that balances innovation, safety, and culinary excellence.
HPP transforms seafood preservation, promising fresh, safe, and enticing ocean delights for global palates.

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Ecuador's VMAF and FDA signs regulatory partnership arrangement

The U.S. Food and Drug Administration (FDA) has concluded the signing of a Regulatory Partnership Arrangement (RPA) with Ecuador's seafood regulatory authority to enhance the safety of shrimp imported to the United States.

A first of its kind, the RPA serves as an arrangement between the FDA and the Vice Ministry of Aquaculture and Fisheries (VMAF) to work more closely to reinforce food safety practices along the entire supply chain. Such arrangements aim to leverage commodity-specific oversight systems — in this case, imported aquacultured shrimp — along with data and information, to strengthen food safety before and at the port of entry.

In remarks during the signing ceremony on August 24, Don Prater, Acting Director of the FDA's Center for Food Safety and Applied Nutrition (CFSAN) described the RPA as the "culmination of a lot of work and relationship-building between both of our agencies."

To prepare for the RPA, the FDA and VMAF signed a confidentiality commitment (CC) in August 2022 that allows for the exchange of confidential information, including inspection records, sample findings, and other nonpublic documents.

In addition, the FDA conducted a rigorous assessment of Ecuador's aquacultured seafood safety system and examined important parts of VMAF's programmes and capabilities.

The FDA found that Ecuador's food safety controls for shrimp are science- based; include the key elements of a basic food safety system; have ongoing processes to ensure the sustainability of preventive controls; provide competent oversight throughout the supply chain; and have a public health focus.

Large scale shrimp farming in Ecuador. (Getty Images)

Through this assessment, the FDA became confident that Ecuador has key components of a food safety oversight system for shrimp and shrimp products intended for export to the United States.As a result, the FDA will be able to leverage data and information from Ecuador for the FDA's regulatory decision making. And, vice versa, Ecuador will leverage data analytics from the FDA to inform their regulatory activities.

Since 94% of the seafood consumed by volume in the United States is imported, one of the agency's tasks has been to ensure that imported seafood is held to the same food safety requirements as food produced domestically. In the past, that's primarily meant intercepting unsafe food at the border and preventing its entrance into the U.S. marketplace.

In 2021, the U.S. Congress highlighted the importance of food safety related to shrimp — the most popular seafood in the United States — by mandating that the FDA consider and develop new options for enhancing the regulation of imported aquacultured shrimp, including an RPA with the three largest shrimp- exporting countries by volume. Ecuador is one of those countries. Such an arrangement would provide an opportunity for the FDA and its regulatory counterpart to proactively learn about each other's regulations and food safety initiatives, identify potential areas for collaboration, prioritize activities, and engage in specific regulatory and programme evaluations.

With the signing of this first RPA with Ecuador, the FDA is delivering on this congressional mandate and has been making progress on implementing the mandate with the two other countries, India and Indonesia."Ecuador may be a small country, but it is an important supplier of food to the United States, especially of seafood," FDA Latin America Office Acting Director Michelle Rodriguez said at the signing ceremony. "To achieve our joint food safety goals, collaboration and information sharing is essential."

The new RPA with Ecuador sets forth how the FDA and VMAF intend to collaborate with one another to:

- Share information on best practices, food safety policies, and regulatory approaches to address the safety of shrimp.
- Ensure prompt notification and response to adverse food safety events such as illnesses, recalls, and outbreaks.
- Promote and conduct training, including FDA Import Operations, Basic HACCP, Train-the-Trainer HACCP, Good Aquaculture Practices, Good Fishing Vessel Practices, and seafood decomposition detection.
- Participate in shrimp inspections, audits, and investigations.

The FDA is already sharing information with VMAF as a result of the 2022 CC, including import refusals, compliance actions, outbreak investigation information, and detailed sampling results. In response, VMAF has provided the FDA with information on Ecuador's regulatory follow-up to these events.

"This free flow of information yielded important food safety benefits for consumers in both of our countries, while demonstrating the trust we place in the Vice Ministry," Rodriguez said.

FDA Associate Commissioner Mark Abdoo signed the RPA on behalf of the FDA while Vice Minister Andrés Ahrens signed the arrangement for VMAF. Both an English and a Spanish language version of the RPA have been posted on the FDA's website.

The RPA signing was scheduled so it would coincide with a daylong commemoration of the sixth anniversary of the creation of the Undersecretariat for Quality and Safety (Subsecretaría de calidad y inocuidad or SCI). The commemoration featured a series of presentations on scientific and technical topics, including presentations by Julie Moss, Director of CFSAN's Office of

International Engagement, and Steve Bloodgood, Director of CFSAN's Office of Seafood Safety.

SCI is the office within VMAF that is responsible for ensuring the health of fishery and aquaculture products, including those intended for export.

For more information:

Enhancing the Safety of Imported Shrimp Through Regulatory Partnerships

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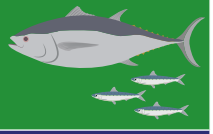
3	Teruhiko Shindo Overseas Operation and National Account Director Tsuruhachi Co., Ltd The Royale Bldg., 2F.8-7, 3-Chome, Irifune, Chuo-ku, Tokyo 104-0042, Japan Email: shindo@tsuru8.co.jp *Tilapia*	4	Tomohiko (Bono) Koyama Senior Manager Fresh Foods Department CGC Japan Co., Ltd. 2-1-14 Okubo, Shinjuku-ku, Tokyo 169-8531 Japan Email: bono@cgcjapan.co.jp Website: www.cgcjapan.co.jp *Seabass* 
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5	Bruce Kojiro Sato Managing Director Siam Northern Viking Co., Ltd. 432/16 Habitia Yard Ramindra Panya indra road, Sam Wa Tawan Tok Khlong, Bangkok, Thailand 10510 Ph.: +668 9129 8823 +849 0384 7565 *Value Added Products (Squid and Shrimps)*	6	Yuichiro Amano Perishable/Delicatessen Products Mgt. Product Development Aeon Topvalu Co., Ltd. Chiba-shi, Chiba, 261-0023 Japan Email: yu_amano@aeonpeople.biz *Squid, Shrimp, Cuttlefish*
7	Hiroshi Azakami Marketing Office Manager N Nichirei Foods Group 4-10-6, Hikoshima, Nishiyamacho Email: azakamih@nichirei.co.jp Website: https://www.chuurei.co.jp *Fish Cakes/FD Shrimp*	8	An-na Nakada Chief Seafood Import Group, Shellfish Mollusc Team Kohyo Co., LTD 5-4-19, Shinsho, Yokkaichi,Mie 510-0064, Japan Email: nakada@kohyoj.co.jp *Shrimp, All other products*
9	Hideaki Eguchi Marine Products & Livestock Department Toyota Tsusho Foods Corporation 2-3-13, Konan, Minato-ku, Tokyo, 108-0075, Japan Email: hideaki_eguchi@toyotsu-shokuryo.com Website: www.toyotsu-shokuryo.com *Shrimp, Squid, Octopus*	10	Hiroshi Kawauchi & Tomoka Yamada National Accounts Sales Team Foods Materials Sales Div. & Global Business Development & Support Div. NIPPN Corporation 8, Kojimachi 4 chome, Chiyoda-Ku, Tokyo 102-0083, Japan Email: h-kawauchi@nippn.co.jp Website: https://www.nippn.co.jp *Bread Crumble , Batter Supplier*
11	Akhiko Hara President Seijo Ishii Co., Ltd 2-9-30 5F Kitasaiwai Nishi-Ku Yokohama City Kanagawa 220-0004 Japan Website: www.seijoishii.co.jp *Shrimp, Squid*	12	Fuminori Sano Director, Tokyo Office K.K. Fukushima Shoten Cynthia Takanawa., 102 22-2, Takanawa 4-Chome, Minato-Ku, 108-0074, Tokyo Japan Email: sano@shijimi.co.jp Website: www.shijimi.co.jp *Clam meat/clam*
13	Akihiro Watanabe Executive Officer Director of TGR Division Kobira Corporation 4-48-9, Shimoarata Kagoshima - city Kagoshima 890-0056 Japan Email: akihiro@kobira.co.jp *Surimi*	14	Hiroshi Matsukawa Merchandiser Overseas procurement Department Seven & I Holdings Co., Ltd. 8-8, Nibancho, Chiyoda-ku, Tokyo, 102-8452 Japan Email: matsukawa-hiroshi@hd.7andi.co.jp Website: https://www.7andi.com/en *Squid, Cuttlefish*
15	Sotaro Ishihara Managing Director JCT Co., Ltd. 1800-16, Kasoricho, Wakab-ku, Chiba-shi, Chiba-ken 264-0017, Japan Email: soutarou@mrh.biglobe.ne.jp *Squid, Cuttlefish*	16	Uchu Saito Senior Manager Dried Food Dept. Higashimaru International Corporation Yumoto Building 2F 2-6, Higashi-Nihonbashi 1-Chome, Chuo-ku Tokyo 103-0004, Japan Email: uchu_saito@hic-jp.com Website: http://www.hic-jp.co.jp *Freeze dried, Frozen products*

TRADE ENQUIRY

17	K. K. Fukushima Shoten Ph.: 03-5798-7151 Email: sano@shijimi.co.jp Website: http://www.shijimi.co.jp *Oyster, Shrimp HOSO*

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