MPEDA Newsletter

AUGUST 2012

THE MARINE PRODUCTS EXPORT DEVELOPMENT AUTHORITY

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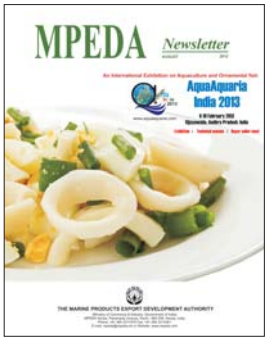

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On the platter.....!!

Dear friends,

The month after my message in the July 2012 issue of MPEDA Newsletter we have seen a lot of turbulence in our trade relations with Japan. The decision by Japanese Health Authorities to inspect the shrimp consignments from India for Ehtoxyquin residue at the default standard of 0.01 ppm has come as a bolt from the blue for our exporters and farmers, who were already suffering due to the lower level of purchase by the US as well as European markets.

Our delegation to Japan has made an all out effort for resolving the issue. We met all the concerned authorities including the Directors, Director General and Hon'ble Minister of Health, Labour & Welfare, Japan Mrs. Yoko Komiyama. We were successful in getting the authorities to refer the issue to the concerned Food Safety Commission, which is expected to come out with its result soon. Her Excellency, the Minister of Health, Labour and Welfare, Japan has assured us that they would resolve the issue "quickly and with integrity". The importers in Japan were also taken aback by this move of their Government and are definitely very upset about the present crisis.

I can assure you that Government of India as well as MPEDA will relentlessly follow up with the Japanese authorities for a speedy solution of the issue.

I would also like to inform you that in all our endeavours in this matter, the Embassy of India, Japan has provided us with wholehearted support. Mrs. Deepa Gopalan Wadhwa, the Ambassador of India herself was our pillar of strength and support. Special thanks are due to her from MPEDA and the industry as also to Mr. Sanjay Panda, the Deputy Chief of Mission, Mr. Tapan kumar Datta, First Secretary (Commercial) and the entire staff of the Embassy including the translators.

I hope the next issue brings with it some good tidings.

Sd/-
(LEENA NAIR IAS)
Chairman

September 2012

MARKETING NEWS

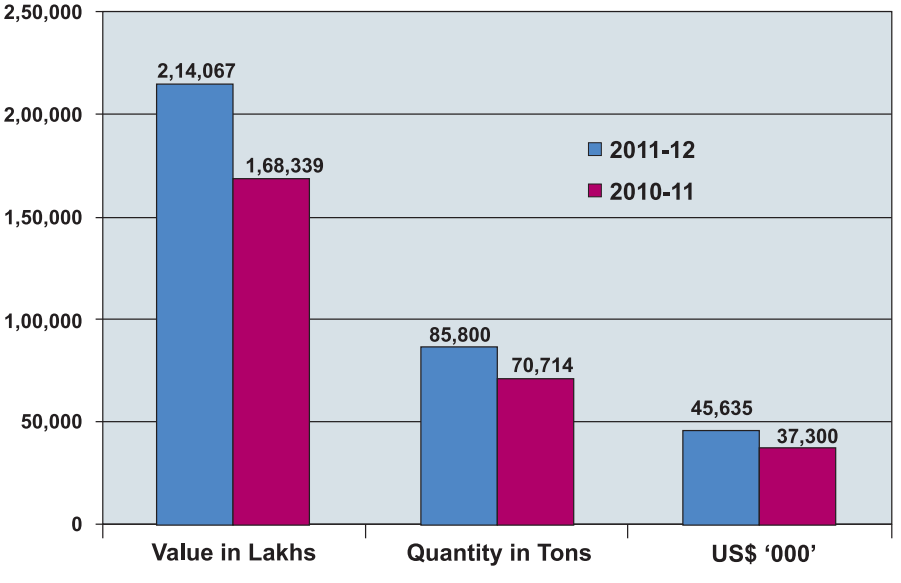
Showcasing of Indian seafood in the 14th Japan International Seafood and Technology Expo at Tokyo

Exchange between Japan and India is said to have begun in the 6th century when Buddhism was introduced to Japan. Indian culture, filtered through Buddhism had a great impact on Japanese culture, and this is the source of the Japanese people's sense of closeness to India. The countries celebrate their 60 years of mutual trade, which is worth US$ 13 Billion now and is poised to cross US$ 25 Billion by 2015. The Japan-India Comprehensive Economic Partnership Agreement (CEPA) effective from August 2011, will eliminate about 94% of the tariffs between Japan and India within 10 years.

View of the MPEDA stall

During 2011 – 2012, marine products exports from India to Japan was 85,800 MT worth US $ 456.35 million. Exports to Japan registered a positive growth of 21.33% in quantity, 27.16% in rupee value and 22.35% in US $ realization.

Frozen shrimp continues to be the top most item of export to Japanese market accounting for 73.28% of the total US $ earnings. Frozen shrimp exports to Japan increased by 15.82% in quantity, 27.02% in rupee value and 23.55% in US$ realization. Fish exports to Japan has retained its second position and registered 22.57% growth in quantity and 36.93% in US$ earnings. Other items of export are frozen cephalopods, dried, live chilled and various other items like kneaded products.



Indian Seafood Exports to Japan during 2011-12 compared to 2010-11

The Japan International Seafood and Technology Expo hosted by Japan Fisheries Association (JFA) is the largest annual seafood event that showcases seafood business opportunities in Japan to all stakeholders. The 14th edition of this Expo held during 18 – 20 July 2012 at Big Sight, Tokyo, was beneficial to India to promote and popularize a wide array of Indian seafood products among Japanese buyers. Considering the importance of this event, with the approval of Govt. of India, MPEDA deputed Mr. K Vijayakumar and Mr. S Asok Kumar, Deputy Directors for

organizing MPEDA's participation. Assistance on quality related issues were addressed by Mr. J Ramesh, Quality Control Consultant of MPEDA. Local assistance was provided by Mr. Jun Nakayama of MPEDA TPO, Tokyo Taking into account the prominence of Japan in the list of India's seafood buying countries, all necessary steps were taken well in advance for sending the publications and samples for display. Accordingly all the publicity literature and seafood samples were received well in time.

This time MPEDA has hired 20 sq. m. stall area and was set attractive with special backdrop theme with collage of photographs of various value added products. MPEDA stall received a lot of appreciation from co-exhibitors and other visitors to the stall for the layout and unique design. An exclusive area was also arranged for discussion with buyers and VIPs to the stall.

A horizontal freezer displayed wide range of frozen value add seafood products such as Vannamei shrimps in different styles viz. raw head-on, raw PD tail-on, raw PD tail-off, blanched headless, cooked PD tail-on, cooked PUD, cooked PD and Black tiger shrimps in different packing styles viz. raw PD tail-on, raw PD tail-off, PD, PUD and whole cooked lobsters.

A view of frozen seafood samples displayed in MPEDA stall

A view of retort pouch products /pickle samples displayed in MPEDA stall

Cephalopod products like cuttlefish whole cleaned, cuttlefish fillet, squid whole cleaned, squid rings, squid tentacles, yellow clam meat, other high end value added products like skewer, *surimi* products, *surimi* imitation products (super snow crab, crab flakes, crab sticks, lobsters, shrimp tails and crab claws), tuna loins, tuna steaks, sword fish steaks, red snapper fillet, grouper fillet, ribbon fish cut portions and pasteurized crab meat were also displayed. Many importers have evinced keen interest to visit India and MPEDA for further discussions in sourcing more seafood from India.

Other items displayed were various dry samples such as prawn curry of different cuisines (Amritasari, Kashmiri, Mughalai, Malabar, Goan, Kerala), prawn pulao, prawn biriyani, various tuna products in retort pouches, prawn and tuna pickles, freeze dried shrimp and clams. The publicity materials were also arranged for distribution. Apart from Japan, exhibitors from Vietnam, Thailand, China, Malaysia, Korea, USA etc. also had put up stalls.

Japan International Seafood and Technology Expo attracted vide array of visitors that included seafood producers, seafood buyers, seafood users in hospitality sectors, those in fishing business and others like business consultants, traders, students, media etc.

A numbers of new technologies relating to preserving the freshness of fish, rationalizing the processing stages and enhancing hygienic control were showcased in the expo which included machinery and equipment for chilling and freezing facilities, and measuring, packaging and slicing. The following technologies and products were

Mr. S Asok Kumar, Deputy Director attends visitors

displayed by various exhibitors in the expo.

- Fresh / processed / aqua cultured and sea caught seafood products
- Seasonings and food additives
- Seafood processing machinery and related equipment
- Packaging, distribution equipment and service
- Kitchenware and cooking appliances
- Sushi business
- HACCP services and food sanitation equipment and technology
- Biomass technology for fishery / waste recycling technology
- Fishery Bio-technology, fishery industry, fishery market modernizing technology
- Technology for abstracting medical elements from seafood, technology for commercializing these elements, technology for computerizing these elements, functional products related to seafood.
- Fishery, nursery and aquaculture technologies
- Environment-friendly and conservation technologies

More than 500 companies / organizations related to seafood processing and related technologies participated in the expo. The number of visitors, mainly industrial users and foodservice operators, totalled 26,101 during the 3-day period.

The visitors to the MPEDA stall were well received and answered their queries and clarifications . Publicity material, Exporters directory CD etc. were distributed to the visitors in a printed bag, which attracted most of the visitors. Two interpretators were also arranged to assist in attending the visitors. The three days' event gave an exciting exposure to the entire seafood and processing industry in accessing the Japanese seafood market, showcasing of latest innovations in seafood and seafood processing, finding out solutions to business problems and to identify ideas to grow the business. M/s. Hiravathi Group, Veraval and M/s. Tri-Star Group, Cochin also participated in the show and showcased their products and services. The trade enquiries received were published in the July 2012 issue of MPEDA newsletter. ●

Visitors in MPEDA stall hold discussions with Mr. K Vijayakumar and Mr. S Asok Kumar, Deputy Directors

MPEDA participates in the AAHAR International Food Fair – 2012, Chennai

MPEDA through its Regional Office, Chennai has participated in the AAHAR International Food Fair-2012, held at Chennai Trade Centre, from 23rd to 25th August 2012. The Fair was organized by the India Trade Promotion Organization in association with Ministry of Food Processing Industry. Mrs. M P Nirmala, IAS, Secretary, Department of Co-operation, Food & consumer Protection, Govt. of Tamil Nadu inaugurated the Fair. Around 120 exhibitors participated in the Fair. Apart from MPEDA, Government organizations like APEDA, Coffee Board and Spices Board also participated.

Mrs. M P Nirmala, IAS, Secretary, Department of Co-operation, Food & consumer Protection, Govt. of Tamil Nadu visits MPEDA stall

MPEDA stall was well arranged with Insta banners, posters etc. A beautiful aquarium, seafood samples and publications were also displayed in the stall and a good number of publications were sold out. A lot of people including Mrs. M P Nirmala IAS visited MPEDA stall. ●

A view of MPEDA stall

Mrs. A R Savithri, Jr. Technical Officer, MPEDA Chennai interacts with the visitors

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FOCUS AREA

MPEDA organizes Tuna workshops in association with FAO / INFOFISH

Tuna is the most highly traded fish species in the international market. Japan is the largest importer of tuna in *Sashimi* form (which is of highest quality, normally consumed raw). Oceanic tunas are among the resources that offer immense scope for the development in the Indian EEZ. India with an EEZ of about 2.02 million sq. km. having estimated potential resources of 2, 78,000 MT of tuna of which 2, 13,000 MT is belonging to the category of oceanic tuna. The commercially important species of oceanic tuna from India are yellow fin tuna which is 41%, skipjack tuna 31% and big eye tuna 4% in their order.

Considering the economic potential of the tuna resources, the India Ocean coastal nations have expressed their desire to get directly involved in tuna fishing and market promotion of the catches in conformity with internationally-accepted norms of ensuring resource sustainability and elimination of IUU fishery.

The project by FAO/ INFOFISH/MPEDA envisages that the small/medium scale tuna long line operators handle and land better quality of raw material for producing value added products ensuring better price and better economic improvement. MPEDA is the nodal agency in India for the implementation of this project and the proposed activities under the project are as under.

1. Shore based training in fish handling and quality.
2. Training and design of product/ market development plans
3. Design and training in catch certification.

It was only in the last few years, focus has been shifted to the Oceanic fishery in India. National efforts towards expansion of small-medium scale tuna long-line operations have shown a sharp increase in recent times in countries in India due to the efforts taken by MPEDA. MPEDA is making its efforts for capacity building amongst the tuna fishermen by providing onboard training from consultants abroad and conducted 59 trainings.

MPEDA has introduced the monofilament long line technology for catching oceanic tuna resources and tries to popularize the monofilament long line technology by promoting the conversion of the existing fishing vessels to tuna long liners by providing financial assistance. Under this scheme as on 31st March 2012, MPEDA has assisted the conversion of 681 vessels and released an amount of Rs.33.80 Crores as assistance.

Exports of tuna from India were at a peak of US $ 62 million in 2006-09. In 2010-11, India exported US $ 40.5 million worth tuna. However, most of the exports were of frozen products, mainly to Middle East, Africa, Latin America and other markets. Tuna exports to Japan, USA and EU were very less. The major problems faced by the Indian tuna long line operators are identification of exact fishing grounds, lack of scientific and latest fishing technology, lack of expertise among the Indian crew in onboard handling of the catch and preservation and lack of up to date market information.

In order to train small and medium scale vessel owners, the crew of the tuna long liners on board handling of Tuna and to create awareness among processors in the processing and marketing for ensuring more income to the stake holders, MPEDA organized National workshop on "Improving post-harvest practices and sustainable market development for ling-line fisheries for tuna and other large pelagic fish species in the Indian Ocean Region" in association with FAO and INFOFISH.

The activities of this workshop were of a pilot scale in nature to demonstrate quality/safety management of their landings and products ensuring better remuneration to the fishermen engaged in tuna fishing. The series of workshop commenced at Tuticorin on 13th August 2012 and covered Nagapattinam and Vizag region and culminated during 23 – 25 August 2012 at Kochi.

Tuticorin

The two day workshop at Tuticorin was from 13th to 14th August 2012, which included the demonstration of on board handling of Tuna fish and a plant visit to M/s. Jude Foods India (P) Ltd, North Thamaraikulam, Kanyakumari District. The workshop at Tuticorin was inaugurated by Mr. N Ramesh, Director (Marketing), MPEDA. Dr. Karunasagar Iddya, Senior Fisheries Officer FAO, Rome, Mr. R Amal Xavier, Joint Director, Department of Fisheries, Government of Tamil Nadu,

Mr. N Ramesh, Director (M) addresses the participants

Tuticorin and Mr. D Durai Raj, President, SEAI, Tamil Nadu Region attended the ceremony.

The sessions of the workshop were handled by Mr. N Ramesh, Dr. Karunasagar Iddya, Mrs. Jeyashakila, Associate Professor, Fisheries College & Research Institute, Tuticorin and Ms. Shirlene Anthonysamy, INFOFISH.

Mr. K Rajendramany, Asst. Director, MPEDA speaks during the inaugural ceremony

Mr. Francisco Blaha, the Fisheries Consultant from New Zealand gave a lecture on regulatory framework for Tuna marketing, catch documentation, Traceability system and quality issues. He explained about the different methods of slicing tuna fish with the objective of upgrading the quality of seafood.

During the 2nd day of the workshop, the participant team visited the Tuticorin fishing harbor, where Mr. Francisco Blaha gave practical demonstration of on board handling of tuna to more than 150 Fishermen. At the demonstration, the traditional Japanese method of paralyzing and bleeding a freshly captured fish, which should be stored with slurry of ice to maximize its quality for consumption as raw meat, was explained. With a 22-kilogram tuna fish, Mr. Blaha demonstrated as to how to slice the fish, which has a considerable export market value in countries abroad. As soon as fishes were caught, these methods of processing should be carried out onboard the vessel itself, he added.

Mr. N Ramesh, advised all the fishing vessel owners to have scientific

A view of the audience

Mr. Francisco Blaha, Fisheries Consultant demonstrates tuna slicing at Tuticorin

toilet in their fishing vessels to maintain cleanliness, which is the key to quality assurance in fishing vessels. Besides, the quality of ice for the upkeep of freshness had to be maintained, at all costs.

In the processing unit of M/s. Jude Foods India (P) Ltd, Mr. Blaha demonstrated the proper handling methods of Tuna in the processing plant to maintain its quality at plant level which included the observation on raw material choice.

Mr. K Rajendramany, Assistant Director, MPEDA, SRO Tuticorin, Mr. R Balasubramanian, State Coordinator, NETFISH, MPEDA, SRO Tuticorin, Mr. C Ravindran, Retired Joint Director of Fisheries and officials from Fisheries Department and Quality Control sector also attended the 2 day workshop.

Nagapattinam

The second Workshop and demonstration was held at Nagapattinam on 16th August 2012. About 115 fishermen participated in the workshop. The workshop was formally inaugurated by Dr. Iddya Karunasagar, Senior Fishery Officer, FAO, Rome. In his inaugural address, Dr.Karunasagar stressed on the need for proper handling of tuna during tuna fishing. Further, he advised the fishermen to focus on *Sashimi* grade tuna which fetches more price than ordinary tuna, in the export market.

Earlier, Shri K J Antony, Deputy Director, MPEDA HO, Kochi welcomed the gathering. In his welcome address, Mr. Antony has informed that MPEDA had assisted 681 fishing vessels under the scheme of conversion of fishing vessels to tuna long liner, of which, 639 fishing vessels are solely from Tamil Nadu. He also explained about the purpose of the workshop.

Dr. Iddya Karunasagar inaugurates the workshop at Nagapattinam

A view of the audience at Nagapattinam

Mr. Francisco Blaha demonstrating tuna processing at Nagapattinam

While offering felicitation address, Ms.Shirlene Anthonysamy, INFOFISH opined that this workshop will definitely help the fishermen to improve the handling methods of tuna right from the fishing to shore. Mr. Subburaj, Jt.Director of Fisheries, Nagapattinam also spoke on the occasion. The lectures on various topics were handled by Mr. Francisco Blaha and Dr. Iddya Karunasagar.

Mr. A Jeyabal, Deputy Director, MPEDA, Chennai proposed vote of thanks.

There was a demonstration of onboard handling and processing of tuna by Mr. Francisco Blaha. The entire programme was translated into Tamil by Mr. Senthil Kumar, Asst. Professor, College of Fisheries, Thanjavur.

Visakhapatnam

The 2-day workshop at Visakhapatnam was held on 18th and 21st August, 2012. Dr. M I Surya Prakash, Senior Executive Director of NFDB inaugurated the Programme, which was presided over by Mr. N Ramesh, Director (Marketing), MPEDA. Dr. M M Prasad, Principal Scientist and Scientist in Charge, CIFT, Vizag, Dr. Karunasagar Iddya, Consultant, FAO, Rome and Mr. Padmanabham, Regional President, SEAI, AP Region were speakers on the occasion.

Power point presentations on various subjects were handled by Dr. Karunasagar Iddya, Ms. Shirlene Anthonysamy, INFOFISH, Dr. M K Venu, NIFPHATT, Kochi, Mr. N Ramesh, MPEDA and Mr. Franciseo Blaha, FAO expert. The faculty also had interaction with participants and their doubts were also cleared.

On the last day, Mr. Fransisco Blaha demonstrated on board handling of tuna and processing in the processing Hall of National Institute of Fisheries Post-Harvest

Shri N Ramesh, Director (M) speaks during the workshop at Vizag

Mr. Francisco Blaha, FAO Expert deliberates

Mr. N Ramesh

Dr. T K Srinivasa Gopal

Dr. S Girija

Dr. Iddya Karunasagar

Technology and Training (NIPHATT), Visakhapatnam. 126 persons participated in the programme. The workshop in general deliberated on quality requirements of sashimi grade tuna, how to avoid poor fish handling and storage, need to upgrade know-how, quality/safety assurance and assessment, traceability and chain of custody and improved utilization of by-catch and waste for food and feed purpose.

Kochi

The workshop at Kochi was inaugurated by Ms. Leena Nair IAS, Chairman, MPEDA on 23rd August 2012. Chairman in her presidential address recollected various efforts of MPEDA in promotion of tuna fishing and handling. Dr. Peter Ervin Kenmore, Country Representative, FAO, India who was the Guest of Honour on the occasion appreciated the efforts of MPEDA in promotion of tuna fishing and processing. He has also narrated the activities of this project and also enlightened the requirement of onboard handling of tuna in maintenance of quality for sashimi grade. During the occasion, Dr. T K Srinivasa Gopal, Director, CIFT and Dr. S Girija, Director, NIFPHATT delivered felicitation addresses. Mr. N Ramesh, Director (M), MPEDA gave the welcome address while Dr. Iddya Karunasagar, FAO, Rome proposed the vote of thanks. Mr. P Mohanasundaram, Director, MPEDA was also present on the occasion. Various other dignitaries from fisheries research institutes, MPEDA officials, representatives of seafood exporters and technologists from seafood processing units were present on the occasion.

Presidential address by Ms. Leena Nair IAS, Chairman, MPEDA

Ms. Leena Nair, Chiarman, MPEDA inaugurates the workshop at Kochi

The workshop saw eminent speakers from FAO, INFOFISH, CIFT and NIFPHATT throw more light on various aspects of tuna fishing, handling and processing. About 75 processing and quality control technologists representing more than 50 seafood processing plants and about

Address by Mr. Peter Ervin Kenmore, Country Representative, FAO, India

A view of the audience

60 fishermen attended the workshop. The workshop was aimed to give specific and focused encouragement on tuna handling and processing of various value added products from tuna and their export marketing in various destinations.

The organization of all the workshops were coordinated by Mr. K J Antony, Deputy Director, MPEDA Kochi. It is envisaged that the workshops will give specific and focused encouragement on tuna handling and processing of various value added products from tuna and their export marketing in various destinations.

●

Barriers to achieve low-impact fuel-efficient fishing

The issue

Most fishing techniques in use today have their origin in an era when fisheries resources were abundant, energy costs were much lower than current levels, and less attention was paid to the negative impacts of fishing on aquatic and atmospheric ecosystems. Current high energy prices and greater awareness of ecosystem impacts are now realities and present major challenges to the viability of fisheries, particularly in developing countries where access to and promotion of energy-efficient technologies have been limited. However, as illustrated in this article, which is largely based on a paper by Suuronen *et al.*, each type of fishing gear and practice has advantages and disadvantages, and the suitability of each gear type depends considerably on the operational conditions and on the species to be targeted.

The impacts of fishing gear on ecosystems vary widely. Overall, these impacts largely depend on: the physical characteristics of the gear; the mechanics of its operation; where, when and how the gear is used; and the extent of its use. Moreover, gear types that rank high for one kind of impact may rank low for another. Physical damage to the environment may also result from the inappropriate use of an otherwise acceptable gear. Only a small number of fishing methods are recognized as inherently destructive no matter how they are used, prime examples being explosives and toxins. It should also be kept in mind that in spite of the fact that many fisheries are highly selective, fishers are often not capable of catching only the desired target species. When poorly selective fishing occurs, it leads to the incidental catch of fish and invertebrates, part of which may consist of juveniles of ecologically important and/or economically valuable species. In addition, fishing can also result in the incidental mortality of non-target species of seabirds, sea turtles and marine mammals, as well as causing damage to vulnerable ecosystems, such as coldwater corals, which can take many decades to recover.

With regard to greenhouse gas (GHG) emissions, insufficient attention has been paid to the fisheries sector as a whole and to fishing operations in particular. Consequently, it is difficult to rank fishing gear and practices in terms of GHG emissions. However, using the consumption of fuel as a proxy for total GHG emissions can provide a good estimate. It is also a fact that, notwithstanding the provisions of existing international conventions, the quality of available fuel is not constant worldwide with regard to sulphur content.

It is noteworthy that life cycle assessments show that significant energy consumption and GHG emissions occur after the catch is taken on board and more so after landing, owing to fish processing, cooling, packaging and transport. Thus, minimizing the impacts and energy consumption throughout the whole product chain would be important to reducing the overall environmental costs of fishing.

Possible solutions

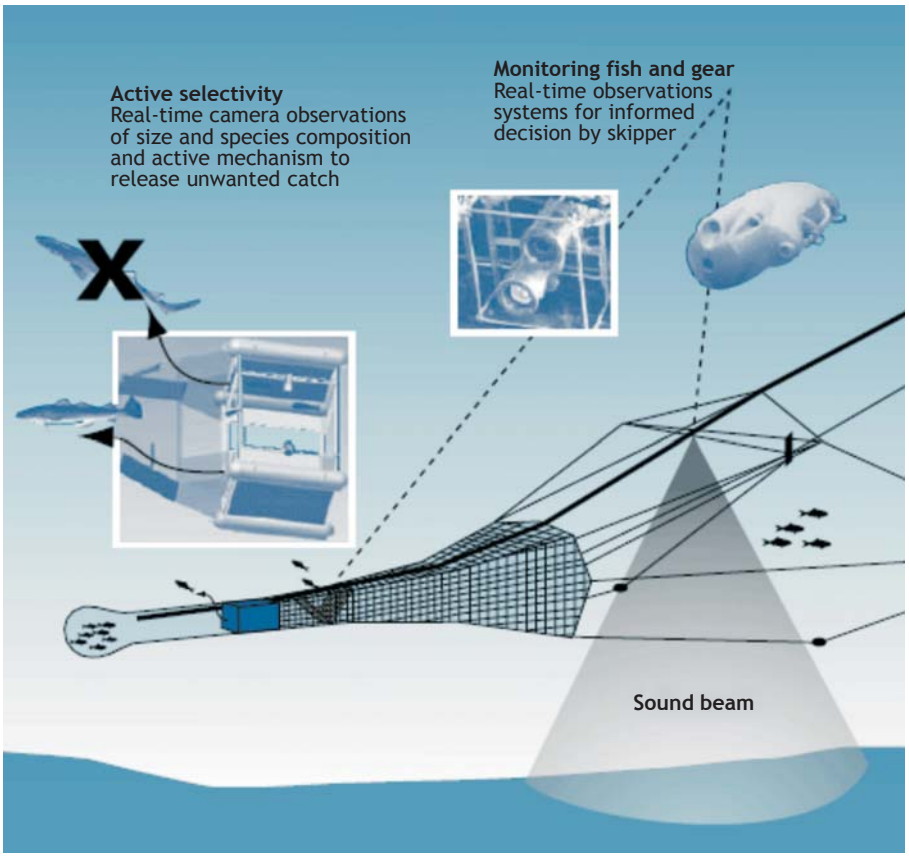
The fishing sector should strive to further lower its fuel consumption and decrease ecosystem impacts. Despite a growing number of initiatives and experimentation with energy-reducing technologies, there is currently no viable alternative to fossil fuels for mechanically powered fishing vessels. However, it is well demonstrated that, through technological improvements, gear modifications and behavioural change, the fishing sector can substantially decrease the damage to aquatic ecosystems, reduce GHG emissions (which is a legal obligation for governments under existing international conventions) and lower operational costs for fuel without excessive negative impacts on fishing efficiency.

SOLUTIONS BY FISHING OPERATION

Demersal trawling

Trawls are flexible gear and can be used on many types of areas and grounds, in shallow and deep waters, and by small and large vessels for a wide range of target species. These characteristics have made trawling the preferred method for many fishers, and it may be the only short-term economic solution for capturing, for example, certain shrimp species. However, bottom trawling has been identified as one of the most difficult to manage in terms of bycatch and habitat impacts.

There are many techniques and operational adaptations available to reduce the drag and weight of the bottom trawl gear and, thereby, to reduce significantly fuel consumption and sea-bed impacts without marked decrease in the catch of the target species. Fuel savings of 25–45 percent and gear-drag reductions of 20–35 percent have been reported.



A new semi-pelagic low-impact and selective trawl gear (CRIPS-trawl) that is under development in Norway

However, in general, further work is needed to improve the construction of different components of trawl gear in order to minimize friction on the bottom and to reduce overall gear drag. In this regard, there is further potential to develop technologies in which the force of trawl doors and ground gear on the sea bed is automatically measured and adjusted by instrumentation. In the case of beam trawls, progress has been made in recent years by developing alternative gear designs. In essence, the objectives are to reduce the amount of tickler chains, avoid excess weight in the beams, and use other stimuli (e.g. electric pulses) as an alternative to chains to scare the target fish off the bottom and into the net. The use of acoustics, light or any other additional stimuli to enhance encounters by target species within the catching zone of trawl nets is worth exploring.

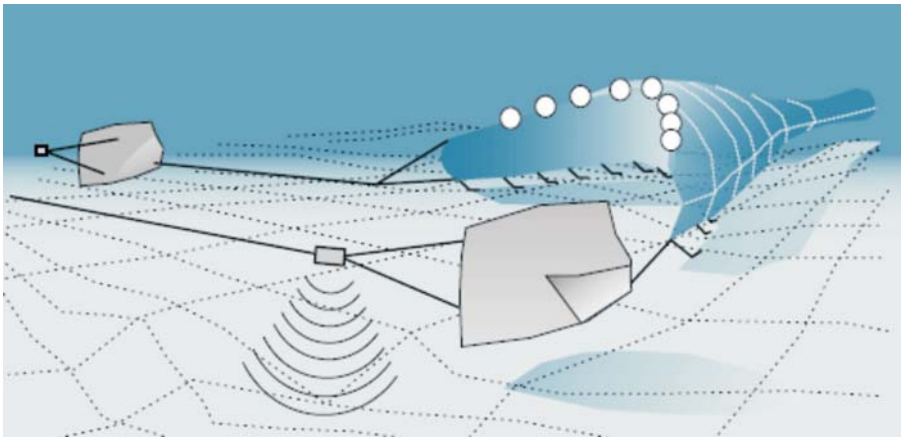
The use of improved location and targeting of fish with the help of electronic seabed mapping tools and integrated global navigation satellite systems has resulted in avoidance of sensitive bottom habitats and helped to minimize fishing effort and fuel consumption. Multibeam acoustic technology, widely used in sea-bed exploration, has been successfully applied, for example, to mapping scallop beds off the east coast of Canada, thereby substantially reducing the time required to locate the grounds and the actual fishing time.

Bottom seining

Bottom seining (Danish, Scottish and pair seining) is generally considered to be a more environmentally friendly and fuel-efficient fishing method than bottom otter trawling. The gear is lighter in construction and the area swept is smaller than in bottom trawling. Moreover, because there are no trawl doors or heavy ground gear, there is less force on the sea bed. The light gear and low hauling speed mean that fuel usage can be significantly lower than for a comparable trawling operation. Bottom seine nets are generally also regarded as having low impact on benthic invertebrates. However, the high bycatch of both undersized individuals of the target species and individuals of non-target species can be a problem in some seine fisheries.

Trap-net

Trap-nets are passive fishing gear that are usually set on traditional sites



Smart trawling: reduced seabed damage of bottom trawling

in the path of migrating fish in relatively shallow coastal waters. Leader-netting herds and guides fish into a holding chamber or pound where they are entrapped. The pontoon trap is a more recent innovation and offers various advantages compared with traditional trap-nets such as being easy to transport, handle and haul, adjustable in terms of size, target species and capture depth, as well as being predator-safe. Future developments may include large-scale, ocean-based fish traps together with the technology to attract fish. Modern trap-net fisheries can be energy efficient, flexible, selective and habitat-friendly, providing catches of high quality as the catch is usually alive when brought aboard the vessel. Live capture provides the operator with a greater number of options to add value to the catch. However, designs and practices need to be developed to prevent the entangling of non-fish species in netting and mooring ropes of the trap.

Pots

A pot is a small transportable cage or basket with one or more entrances designed to allow the entry of fish, crustaceans or cephalopods, and prevent or retard their escape. Pots are usually set on the bottom, with or without bait. While pot fishing vessels in general have low fuel use, some pot fisheries have high fuel use owing to the need to tend fleets of many pots and lifting them more than once a day, necessitating travelling at high speed over long distances.

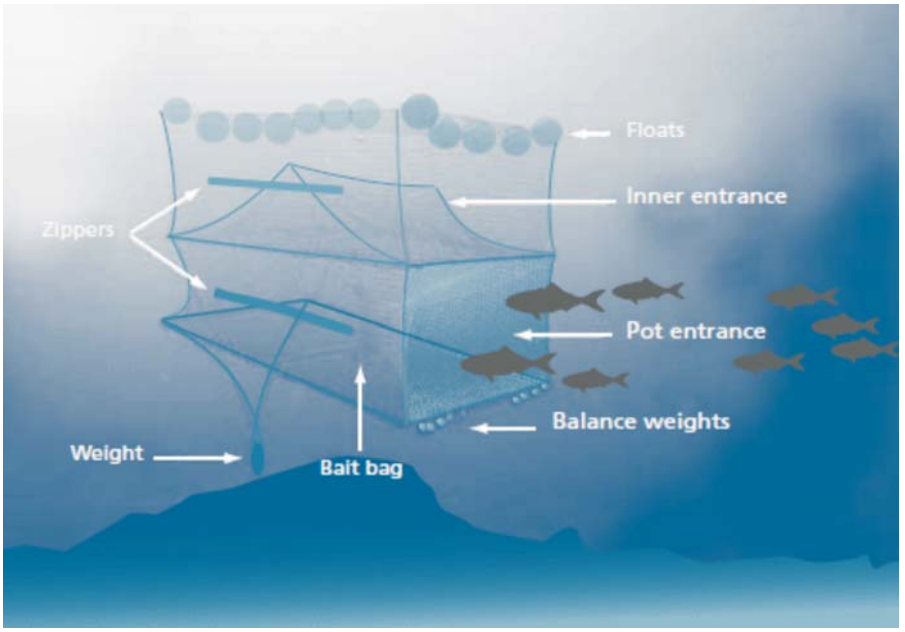
Pots are extensively used in the capture of crustaceans such as lobster and crab. Although the use of pots for capturing finfish has a long tradition in many parts of the world, it has progressively declined. Nevertheless, pots are still an efficient and economically viable fishing method for finfish. They are also successfully used in fisheries targeting coral-reef species inhabiting areas where the use of active gear is banned or not practical.

Recent tests with collapsible pots have shown promising results for Atlantic cod in Canada and for pink cusk-eel (*Genypterus blacodes*) in Argentina. A floating pot developed in Scandinavia provides another example of an innovative pot design that has shown significant potential. Floating the pot off the bottom allows the pot to turn with the current so the entrance always faces down current, resulting in a higher catch rate of cod. It also avoids non-target catch of crabs and may also reduce the seabed impacts compared with a pot sitting on the bottom. The same type of floating pot has successfully been tested in the Baltic Sea as an alternative to the gillnet fishery for cod, where there are serious problems with depredation by seals.

Compared with many other types of fishing gear, pots, like trap-nets, possess several appealing characteristics such as low energy use, minimal habitat impact, high quality and live delivery. On the negative side, lost or abandoned pots may continue catching target and non-target species (ghost fishing) and contribute to marine debris with associated effects. Design features such as biodegradable materials may reduce ghost fishing, while delayed surface marker buoys and location aids may promote the recovery of lost gear. Understanding fish behaviour in relation to pots is essential in order to increase efficiency for those species that are currently not captured by pots in commercially viable quantities.

Hook and line

Hook and line refers to gear to which fish, squid or other species are attracted by natural or artificial bait or lures placed on a hook, on which they are caught. Wide variations in hook and line configuration and their mode of operation have made them an effective gear type for a wide variety of species. It is a versatile fishing method, employed by a wide range of vessels from artisanal boats to large mechanized longliners. Hook and line fishing is generally considered an environmentally friendly but labour-intensive fishing method that catches



A floating pot

fish of high quality. Fuel consumption in these fisheries is comparatively low although it can increase significantly depending on the distances vessels have to travel to and from the fishing ground (e.g. coastal hook and line fisheries versus high seas tuna longlining). Longline fishing may cause the incidental mortality of seabirds, sea turtles and sharks, many of which are either protected or endangered. The lines can be set with a streamer in order to deter seabirds from seizing the baited hooks – this system is reported to have led not only to a reduced mortality level of sea birds but also to higher catch rates of the target species. There are several other mitigation measures capable of reducing the likelihood of incidental bycatch of seabirds and sea turtles, such as the new "circle hook" and "weak hook". While bottom-set longlines may snag and damage benthic epifauna and irregular objects on the bottom, longline fisheries do offer the potential to conduct fishing without severe habitat damage and to do so in a relatively energy-conscious manner.

Gillnetting

Bottom-set gillnets, entangling nets and trammelnets are widely used, and improved materials and techniques have allowed the expansion of such gear to rougher grounds (including wrecks and reefs) and deeper waters. Gillnetting is a very versatile and flexible fishing method but can also be labour-intensive. Except with trammelnets, the size selectivity for finfish is generally good, but species selectivity can be poor. In addition, fish are often injured and die during capture; accordingly, catch quality is typically not as good as with pots, traps and longlines, although gillnets may also give catch of good quality when the time the net is left in the water to fish is short.

Gillnet fishing operations in general can damage benthic epifauna during retrieval of the gear, at which time the nets and leadlines are more likely to snag bottom structures. Although the capture of seabirds, sea turtles and marine mammals by gillnets has received increased attention in recent years, more development work is required to develop mitigation measures further.

The impacts of ghost fishing by abandoned, lost or otherwise discarded gillnets are of concern as such nets may continue to fish for long periods depending on their construction, the depth, and prevailing environmental conditions. This problem can be addressed by increasing efforts to avoid losing gillnets and by facilitating the quick recovery of lost nets. Abandoned gillnets have been identified as a particular problem in deeper waters and where long lengths of gear are deployed.

Barriers to change

There are many barriers to the transition to low-impact and less fuel-intensive practices and gear. In summary, the most important seem to be:

- lack of familiarity with cost-effective and practical alternatives;
- limited availability of suitable technologies, especially in developing countries;
- incompatibility of vessels with alternative gear;
- risk of losing marketable catch;
- additional work at sea;
- concerns with safety at sea related to using unfamiliar gear or strategies;
- high investment costs;
- lack of capital or restricted access to capital;
- ineffective technology infrastructure support;
- inflexible fisheries management systems that include too rigid regulatory regimes.

With regard to inflexible management systems, regulatory regimes that are too rigid can create a new set of problems to be solved and deny fishers the flexibility required to innovate and adopt new technologies. In this regard, stakeholders should be an integral part of the management process, particularly as and when amendments to legislation are under consideration. Changes from high-energy high-impact fishing methods or practices to ones with lower energy consumption and lower ecosystem impacts offer opportunities for conserving fuel, preserving ecosystems and improving food security. However, the transition from one gear type to another is seldom easy or practical. First, the size and design of existing fishing vessels and their machinery and equipment often limit the possibilities of changing the fishing method. Second, fishing gear, fishing vessels, operations and practices have evolved around specific fishing grounds and the behaviour of target fish species over a considerable period. Accordingly, the evolved fishing gear and practices are "tailor-made" to catch specific target species or species groups in a manner that is often perceived to be optimized to the best technical and economic scenarios that will be encountered during fishing. Moreover, where fishing practices are rooted in tradition there is a strong resistance to change.

Nevertheless, fuel consumption and ecosystem impacts can often be reduced through simple modifications in operational techniques and gear design without drastic changes in the gear and operational practices. This approach has shown promising results

in many cases and is often preferred by the fishing industry over transitioning to a completely new gear type and fishing practice, which is an alternative that has many more uncertainties and higher economic risks.

RECENT ACTIONS

Environment

International conventions include timetables for compliance regarding emissions of nitrogen oxides from diesel engines of over 130 kW and new fishing vessels are required to comply. Morevoer, as a consequence of research and development (R&D) on energy-saving technologies carried out by designers of machinery and fishing vessels and gear, there are signs that the fishing industry has begun to improve its fuel efficiency. Nevertheless, fuel continues to be the major cost of operation in capture fisheries and further refinements to fuel quality, such as lowering the content of sulphur oxides and particulate matter, could well lead to even higher fuel and lubricating-oil costs. This may have an even greater impact on the fishing industry in developing countries where mechanization continues to increase, although it will also strengthen the drive for fuel efficiency.

Bycatch and discards

The seriousness of the impacts related to bycatch and discards has been recognized by the international community and in particular through the endorsement of the International Guidelines on Bycatch Management and Reduction of Discards at the Twenty-ninth Session of the FAO Committee on Fisheries in 2011. There is a range of tools to manage bycatch and reduce discards, including technological measures to improve the selectivity of fishing gear. The declines in the bycatches and discards in many fisheries have mainly been the result of introducing effective gear modifications and bycatch reduction devices. However, there remains concern about the impacts of unaccounted fishing mortalities such as ghost fishing by abandoned, lost or otherwise discarded fishing gear and the fact that such gear may also cause environmental damage.

Furthermore, at the sixty-second session of the Marine Environment Protection Committee of the International Maritime Organization (IMO) in July 2011, Annex V of the International Convention for the Prevention of Pollution from Ships 1973/78 (MARPOL) was amended to provide a regulation for the loss of fishing gear that may be a substantial threat to the environment or the safety of navigation to be reported to the flag State, and, where the loss occurs in waters under the jurisdiction of another coastal State, to that State. This regulation is supported within guidelines for the application of Annex V currently under revision.

Outlook

With continued exposure to rising fuel prices and little or no significant price increases at the point of first sale for catches, capture fisheries will probably continue to suffer declining profitability. Moreover, if resource abundance remains static, some bottom trawl and dredge fisheries may become uneconomic (although passive gear and seine net fisheries may be less affected). As demersal trawl fishing accounts for a significant part of the total catch destined for direct human use, there could be an adverse affect on global fish supply and food security, at least in the short term.

With medium-term forecasts indicating a high likelihood of further and steady increases in fuel prices, as indicated by the International Energy Agency, the future of the fishing industry is challenging. An increase in sulphur-oxide-emission control areas (the most recent being adopted by the IMO in 2011) would add to the cost of fuel for vessels operating in such zones.

The fishing sector will no doubt strive to lower its fuel consumption, reduce its carbon footprint, and decrease ecosystem impacts. Although the continuation or expansion of fuel subsidies would reduce immediate costs, this is less acceptable. To help the fisheries sector achieve significant and permanent reductions, governments will most probably strengthen their fisheries sector energy policy and create an enabling environment in which fishing industries can rapidly and comprehensively adopt low-impact fuel-efficient (LIFE) fishing technologies and practices. The development and adoption of such fishing techniques offer scope for maintaining the long-term profitability and sustainability of capture fisheries worldwide.

With fossil fuels remaining the dominant energy source, pursuing energy efficiency in capture fisheries may generate benefits by reducing operating costs, controlling GHG emissions and minimizing environmental impacts within the aquatic environment. However, the success of this transition will depend heavily on the response of governments to the implementation of international conventions together with a positive reaction from the engine manufacturing sector, fuel-oil and lubricating-oil producers and the fishing industry (including the manufacturers of fishing gear). This could lead to the development and application of suitable and acceptable

measures to conventional fisheries and create an appropriate catalyst for change in the behaviour of fishers. Of equal importance are initiatives such as pursuing the modification of existing gear types and the development of lowresistance towed fishing gear with minimal impact within the aquatic environment. In some cases, it may be necessary to switch to completely new gear types or practices in order to enable LIFE fishing.

However, to be effective, this would require global R&D priorities to be established and work undertaken in support of the development and uptake of LIFE fishing. These include:

- promoting and funding studies of cost-effective gear designs and fishing operations, including the establishment of technology incubators and other public–private sector initiatives to commercialize economically viable, practical and safe alternatives to conventional fishing methods;
- analysis and review of best practice operations across fisheries;
- improvement of technical ability among fishers;
- establishment of appropriate incentives;
- industry compliance with international conventions;
- execution of robust but flexible fishery policies that support the transition to alternative technologies.

Finally, close cooperation between the fishing industry, scientists, fisheries managers and other stakeholders will be fundamental to the development, introduction and acceptance of LIFE fishing technologies.

Source :the fishsite

Book Review

OFI Book on International Transport of Live Ornamental Fish

Ornamental Fish International (OFI) has published an updated and expanded edition of the book "International Transport of Live Fish in the Ornamental Aquatic Industry". The editors of the book are Alex Ploeg, Robert R Hensen and Svein A Fossa. The book contains nine chapters namely Description of the Supply Chain, Preparation for Transport, Fish Packaging Techniques, The volume of the Ornamental Fish Trade, Import and Export Legislation, Reception protocol of Ornamental Fish, Facts on Mortality with Shipments of Ornamental Fish, Invasive Alien Species, Bio security and the OFI Health Certificates tool.

Chapter on the supply chain describes the different chains in the ornamental fish industry viz. wild harvest, captive breeding, export business, transporters, importers, transhippers and retailers. Chapter on Preparation for Transport, Fish Packaging Techniques includes packaging systems, Principles of fish transport, Fish packaging techniques, Conditioning for transport, Management of water quality and Acclimatisation and Recover of Fish after shipment. While chapter on the Volume of the Ornamental Fish Trade details about Statistics and development in exports, chapter on Import and Export Legislation mentions about different type of legislations like Customs legislation, Animal Welfare legislation, Species protection legislation and Animal Health Legislation. Chapter on Reception Protocol of Ornamental Fish deliberates Receipt of the Fish, Quarantine Procedures and Prophylactic Treatments for different fishes. Chapter on Facts on Mortality with Shipments of Ornamental Fish covers the causes for mortality, and a comparison of fish mortality against gross profit margins. Chapters on Invasive Alien Species and Bio security are very informative. The last chapter describes the tool developed by OFI for the online generation of health certificates by giving relevant information inputs. Text matter of the book is well supported by tables, figures and photographs. This book will be useful to ornamental fish industry, researchers, academicians and to scientific community alike.

Exposure visit to Kolkata for ornamental fish entrepreneurs from Assam

The Sub Regional Office of MPEDA at Guwahati organised a 2-day interstate exposure visit to Kolkata participating seven ornamental fish entrepreneurs from Assam and three from West Bengal during August 2012. The team was guided by Dr. T R Gibinkumar, Deputy Director, SRO, Guwahati. The programme was coordinated by the Kolkata center of Central Institute of Fisheries Education (CIFE) at Salt Lake City in West Bengal. The programme included one day theory cum practical training at CIFE and a field visit to one of the MPEDA assisted ornamental fish breeding unit.

L-R : Dr. T.R. Gibin Kumar, Dy. Director, Mrs. Asha C Parameswaran, Jt. Director, MPEDA, Dr. B.K. Mahapatra, OIC, CIFE and Mrs. Suba Laxmi Das Banerjee, Programme Manager (OFD)

The training programme was inaugurated by Mrs. Asha Parameswaran, Joint Director, MPEDA, RO Kolkata at CIFE. Dr. T R Gibinkumar, Dr. B K Mahapatra, OIC, CIFE, Dr. Subhendu Datta, Senior Scientist, CIFE, Mr. P K Patra, Programme Coordinator and Mrs. Subalaxmi Das Banerjee, Programme Manager (OFD), West Bengal were present during the occasion.

Various theory and practical classes on ornamental fish were handled by the scientists of CIFE, that included Introduction to breeding and culture of ornamental fishes, Water quality management, Artificial feed preparation, Live feed culture and disease management. Programme Manager (OFD), West Bengal had briefed the MPEDA schemes and the points to be noted during various stages of construction of breeding units for availing subsidy from MPEDA.

Training in progress at CIFE, Kolkatta

On the second day, a field trip was arranged to M/s Prayag Ornamental Fish Breeding Unit at Rajendranagar, Naihati, a unit that is assisted by MPEDA. The participants were able to observe and comprehend the structure, layout and various components required in an ornamental fish breeding unit. The participants also got an opportunity to see different ornamental fish species available in the unit and the basic activities involved in an ornamental fish breeding unit such as water exchange, tank cleaning, waste removal, live feed culture, feeding, breeding activities etc.

The participants were very enthusiastic and expressed their sincere gratitude towards MPEDA for organising such a useful, informative and motivating tour programme and all are hopeful towards establishing their own ornamental fish breeding units in Assam.

QUALITY FRONT

Indian delegation visits Japan on Ethoxyquin issue

Consequent to the sudden decision taken by the Japanese Food and Safety Authority to impose the compulsory testing for Ethoxyquin in the shrimp consignments received from India on the basis of a default standard of 0.01 ppm, the Commerce Secretary Shri. S R Rao immediately sent a delegation led by Ms. Leena Nair IAS, Chairman MPEDA, Dr. S K Saxena, Director EIC and Dr. M K Ram Mohan, Deputy Director, MPEDA to Tokyo to try and resolve the situation.

The delegation had meetings with the Director General, Department of Food Safety, Pharmaceutical and Food Safety Bureau, Mr. Koji Miura in the Ministry of Health Labour and Welfare and other senior officials of the department including the two Directors of the MHLW concerned with the issue –Mr. Hideshi Michino in charge of Import Food Safety, Inspection and Safety division and Mr. Hiroshi Moriguchi Director Standards and Evaluation division.

Chairman, MPEDA and Director EIC in discussion with Her Exellency Ambasador of India to Japan

The discussion began by recalling the excellent cooperation between the two countries for the last 60 years and the necessity for resolving any issues in the matter of the recent decision of the Department of Food Inspection of the Quarantine Division, Ministry of Health, Labour and Welfare (MHLW), to start examining the shrimp consignments from India for Ethoxyquin adopting the default standard of 0.01 ppm. The Chairman MPEDA pointed out that the decision was sudden and without any notice to India and that the default standard fixed by the MHLW was not based on any scientific studies on safety evaluation, nationally or internationally. It was also pointed out that there are no International norms / MRLs fixed for Ethoxyquin in shrimps by the USFDA, USEPA, Regulations of the EU and the Codex as there was insufficient scientific evidence to show that Ethoxyquin was unsafe as there was no threat to human health. The studies done by these countries had not thrown up any risk warranting the fixing of an MRL for fish and Shrimp. It was also mentioned that even Japan permits an MRL of 1.0 ppm for fish.

The delegation meets Japanese seafood importers

Fishmeal forms an important component of feed for shrimps. In order to protect the feed from rancidity a large range of anti-oxidants are authorised. Ethoxyquin is one of the most popular and effective anti-oxidant being used the world over as it is most effective in stabilizing fish meal. Infact maritime rules and the rules of some other countries mandate its use to

Delegation along with H.E. Mrs. Deepa Gopalan Wadhwa, Ambassador and other Embassy Officials meet Mrs. Yoko Komiyama, Hon'ble Minister of Health, Labour and welfare, Japan

prevent combustion (in transport) and rancidity (causing harm to the animals / pets etc.). Therefore Ethoxyquin finds its way into shrimps through the aqua feeds given to them.

The Indian delegation impressed upon the Authorities the gravity of the situation arising out of this sudden decision of the Japanese inspecting agency. As an immediate measure it was requested to fix MRLs for Ethoxyquin in shrimps only after conducting proper safety studies and should not be imposed at a default level of 0.01 ppm. It was also requested that till the studies are conducted and concluded, the MRL applicable to fish (1.0 ppm) as per Japanese guidelines may be permitted for all shrimps which have been received and are going to be received shortly. This would under no circumstances adversely affect the consumer safety in any way in Japan.

In view of the gravity of situation, the delegation along with the Ambassador of India, Her Excellency Mrs. Deepa Gopalan Wadhwa also met Ms. Yoko Komiyama, the Japanese Minister for Health, Labour & Welfare. The Ambassador effectively conveyed to the Hon'ble Minister the issue and requested for an urgent intervention in the matter. She also requested the Hon'ble Minister to issue instructions for keeping the orders for checking of Ethoxyquin at the default standard in abeyance temporarily. The Chairman, MPEDA after explaining the situation in detail also requested the Hon'ble Minister to look at the issue compassionately as the life of more than 50,000 aqua farmer families was involved apart from that of the exporters. A great deal of distress could be avoided if orders were issued to temporarily adopt the MRL applicable for fish (1.0 ppm) in Japan. While the Hon'ble Minister acknowledged the seriousness of the situation she informed that the entire issue had already been referred by her to the Food Safety Commission which is the nodal agency for giving advice on the matter. She also assured that decisions will be taken soon but since the decisions had to be taken with integrity, it will necessitate following the procedure.

The delegation had a detailed discussion lasting over two hours with the Directors of different Divisions in the Department of Health, Labour and Welfare. The general sense of what the Minister had conveyed was reiterated by the Heads of the Departments. During the course of the discussion, the officials were not able to give complete and full replies to many of the queries especially with regard to protocols of testing, validation and other technical parameters raised by the Indian side.

The meeting with the technical committee was followed with a meeting with the Food Safety Commission led by Mr. Hideki Hongo Deputy

Director General. The Food Safety Commission confirmed that the issue had been referred to them by the Hon'ble Minister on the preceding day. The Delegation made a fervent appeal to Food Safety Commission officials to resolve the issue quickly.

The delegation also met the Japanese Importers and reassured them that a solution would soon be found to the whole issue and requested for their co-operation in the matter. The matter is being followed up by both the Embassy of India in Japan, MPEDA and Ministry of Commerce.

AQUACULTURE SCENE

Digestibility of fishery by-products tested on shrimp

A study demonstrated that byproducts prepared from salmon livers, salmon milt, black cod viscera and arrowtooth heads and viscera from Alaskan fisheries processing plants were easily digested by shrimp. These byproducts also contained a high level of protein or/ and lipid and therefore are considered good candidates as ingredients or additives for shrimp feed. The by-products from pollock bones and crab carapaces and viscera, however, had poor digestibility, according to researchers from the Oceanic Institute and USDA ARS. Taken from the Global Aquaculture Advocate, a Global Aquaculture Alliance publication.

The experiment was conducted in an indoor flow-through water system with a series of 550-L polyethylene tanks.

With the rapid global expansion and increased production of aquaculture, increases in aquatic feed production are challenged by the availability of traditional ingredients such as fishmeal and fish oil, and environmental sustainability. Therefore, alternative ingredients are being explored to replace traditional ingredients to meet the demands of the fast-growing feed industry. For example, utilization of by-products from different industries in aquatic feeds is becoming attractive.

Beyond the nutritional composition of an ingredient and its effect on palatability, digestibility is often a concern in aquatic feeds. In a study funded through a grant from the U.S. Department of Agriculture Agricultural Research Service and a cooperative agreement with the University of Alaska – Fairbanks, the authors determined the digestibility of six fisheries by-products in shrimp feed.

Table 1. Proximate composition of fishery by-products used in the digestibility trial

Ingredient	Moisture (g/kg)	Ash (g/Kg)	Protein (g/Kg)	Lipid (g/Kg)	Energy (g/Kg)
Menhaden fishmeal	82.9	201.0	603.3	105.2	17.9
Pollock bones	127.8	416.4	380.9	40.8	10.0
Tanner crab carapaces an viscera	49.4	282.4	358.6	87.0	12.9
Pink salmon livers	102.7	41.4	686.3	102.0	20.9
Pink salmon milt	95.3	83.9	814.6	48.9	18.8
Arrowtooth heads and viscera	112.8	105.0	329.7	370.7	24.4
Black cod viscera	293.3	73.2	421.7	208.9	19.7

Table 2. Apparent digestibility coefficient of shrimp diets

Diet	Dry Matter (%)	Protein (%)	Lipid (%)	Energy (%)
Trial 1				
Reference	60.0 ± 1.1^{c}	85.7 ± 0.4^{bc}	91.8 ± 0.3^{c}	76.6 ± 0.6^{bc}
Pollock bones	33.2 ± 1.3^{a}	78.3 ± 0.6^{a}	88.0 ± 0.8^{b}	67.9 ± 0.9^{a}
Crab carapaces and viscera	49.3 ± 1.4^{b}	77.7 ± 1.0^{a}	87.5 ± 0.9^{b}	68.1 ± 1.1^{a}
Pink salmon livers	61.6 ± 1.3^{c}	84.8 ± 0.4^{b}	78.3 ± 0.9^{a}	74.0 ± 0.8^{b}
Pink salmon milt	60.1 ± 0.3^{c}	87.9 ± 0.2^{c}	88.6 ± 0.5^{b}	77.7 ± 0.2^{c}
Trial 2				
Reference	58.7 ± 0.8^{b}	81.5 ± 0.8^{a}	88.4 ± 0.7^{ab}	75.6 ± 0.8^{a}
Arrowtooth heads and viscera	54.8 ± 0.6^{a}	79.3 ± 0.6^{a}	89.7 ± 1.3^{b}	76.5 ± 0.6^{a}
Black cod viscera	$57.9 \pm 1.1a^{b}$	84.2 ± 0.5^{b}	86.0 ± 0.6^{a}	74.9 ± 0.9^{a}

Different letters within the same column indicate significant difference ($P<0.05$).

Digestibility Study

Alaska has the largest number of fisheries in any United States state. Its annual fisheries production totals 1.84 mmt, and processing generates significant amounts of by-products. Previous research by the authors demonstrated that some fisheries by-products contained significant amounts of nutrients and exhibited a stimulating effect on shrimp fed plant protein-based diets.

For this digestibility study, six Alaskan fisheries by-products from processing plants in Kodiak, Alaska, were supplied by the University of Alaska's Fishery Industrial Technology Center (Table 1). A reference diet containing 40.0% protein and 9.0% lipid was formulated with 34.2% menhaden fishmeal, 32.7% whole wheat, 12.5% soybean meal, 6.0% vital wheat gluten, 5.0% brewer's yeast, 2.5% squid meal, 2.0% soy lecithin, 1.6% menhaden oil, 1.0% chromic oxide and 4.5% other ingredients, including vitamins and minerals. Chromic oxide was used as a marker to estimate digestibility.

The test diets were formulated by replacing the reference diet with 30% byproduct. The diets were milled to a pellet size of 2.4 x 4 mm.

The digestibility trial was conducted in an indoor system with flow-through water and a photoperiod with 12 hours light and 12 hours dark. Four replications were used for each dietary treatment. In trial 1, 6-g shrimp were stocked at 100/tank, and in trial 2, 14-g shrimp with 75 shrimp/tank were stocked. Shrimp were fed 10% of body weight for two hours before fecal samples were collected. Water quality was monitored during the trials, with temperature at 26.5 ± 0.2° C, salinity at 31.0 ± 0.3 ppt, dissolved oxygen at 6.0 ± 0.3 mg/L, pH at 7.8 ± 0.1 and total ammonia nitrogen below 0.08 mg/L.

Nutrient Composition

Proximate composition analysis of the tested by-products showed that the salmon livers and milt meal had higher protein levels than menhaden fishmeal (Table 1). The rest of the by-products had lower protein levels than the fishmeal, but still contained significant levels of crude protein ranging from 35 to 42%.

The crude protein level for the black cod viscera could be increased from 42 to 50% if moisture could be removed from the product. Some by-products, such as the arrowtooth heads and viscera, and the cod viscera, were found to be rich lipid sources. The by-products from crab carapaces and viscera, and pollock bones had very high ash content. All the by-products except pollock bones and crab carapaces/ viscera contained higher gross energy than the fishmeal.

Apparent Digestibility

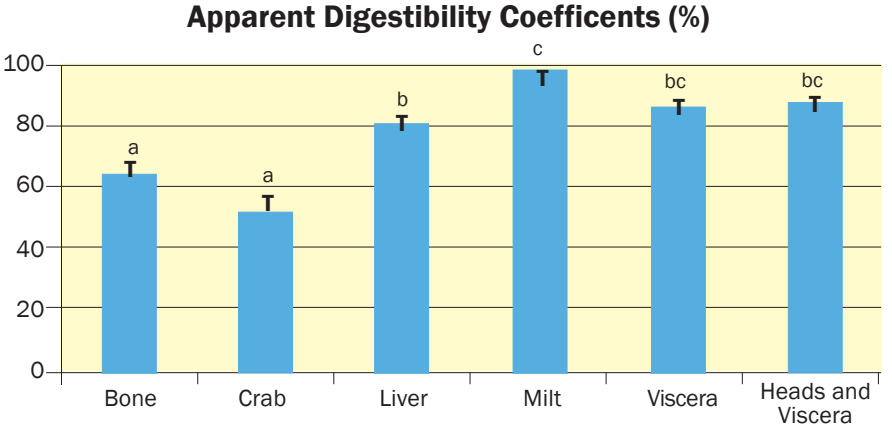
The apparent digestibility coefficients (ADCs) of the test diets showed that the diets containing salmon livers or milt had the same digestibility as the reference diet, except that the lipid ADC was lower than for the reference diet (Table 2). The ADCs of test diets containing pollock bones or the crab carapaces and viscera were significantly lower than the ADC for the reference diet. The ADCs of nutrients for the diets with arrowtooth heads and viscera or black cod viscera were similar to the ADC of the reference diet.

Among all by-products, the ADC for crude protein was the highest for the salmon milt, followed by those for the black cod viscera and the arrowtooth heads and viscera, which had values similar to that for the salmon liver ($P > 0.05$) (Figure 1). The pollock bone and crab carapace and viscera treatments exhibited significantly lower ADC values for crude protein than the other by-products did.

The ADC values for crude lipid were significantly lower for the pollock bones and salmon livers than the other by-products (Figure 2). Although not presented, the ADC values for gross energy were lower for the pollock bone and crab carapace/ viscera treatments than those for the remaining by-products used in the test.

Perspectives

The study demonstrated that byproducts from salmon livers and milt, black cod viscera, and arrowtooth heads and viscera were easily digested by Pacific white shrimp. These

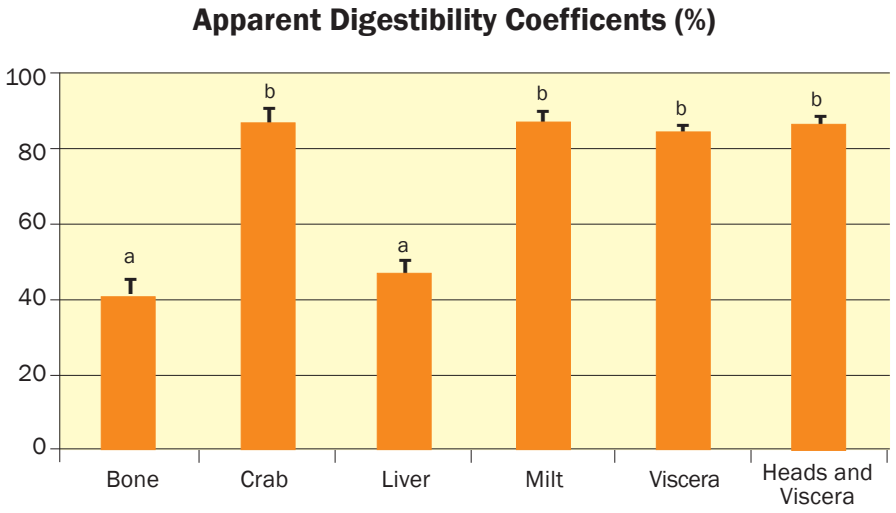


Mean apparent digestibility coefficents of crude protein for the test ingredients. Different letters indicate significant differences ($P < 0.05$).

by-products are also rich in protein and/or lipids.

Previous studies have shown that supplementation of these by-products in shrimp feed stimulated feeding in shrimp fed a plant protein-based diet. Therefore, based on evaluation of the proximate compositions of the by-products and their effects on palatability and digestibility in shrimp, the by-products can be considered good candidates as ingredients or additives for shrimp feed. Investigation of their effects on the growth performance of shrimp will be needed to further support this conclusion.

The low digestibility of pollock bones and crab carapaces and viscera could be due to the high level of ash in these byproducts. The authors' previous studies also showed that these by-products had no stimulating effect on shrimp feeding. Therefore, under current conditions, the by-products are not good candidates for ingredients in shrimp feed. *Source : thefishsite*



Mean apparent digestibility coefficents of crude lipids for the test ingredients. Different letters indicate significant differences (P < 0.05).

Training programmes organised by field offices of MPEDA

Detection of chemical / antibiotic residues in export consignments of shrimp, fish and allied products is a serious trade issue. Besides, the importing countries and the buyers insist a reliable certification system for the food product so that the products shall not contain harmful substances as per the standards imposed by the importing countries. The issue of traceability of farmed shrimp is taken seriously. It has become therefore, imperative on the part of promotional / governmental organizations to inform the farmers who are mostly small and marginal, that they have to maintain highest quality standards for the shrimp they produce and also to collect Pre Harvest Testing (PHT) certificate, without which they would not be able to sell their product to exporters/processors.

1) Sub Regional Center, Karwar

The Sub-Regional Centre of MPEDA, Karwar has organised a five-day training programme on Eco-friendly and Sustainable Aquaculture for SC/ST beneficiaries during August 2012 at the Marine Fisheries Research and Information Centre Training Hall, Bela, Ankola, Uttar Kannada District. Twenty candidates attended the training programme. The main objective of the training programme was to encourage and educate the members of the SC/ST communities in promoting the development of shrimp aquaculture and other cultivable species.

The training was inaugurated by Dr. Mansingh Naik, Associate Professor and Head of the

A view of participants and trainers

Department, Marine Fisheries Research and Information Centre, Bela, Ankola. Mr. Manjappa N, Assistant Professor and Farm Superintendent and Dr. Chandrakant Lingadhal, Assistant Professor of Marine Fisheries Research and Information Centre, Bela, Ankola were also present in the inaugural function. Mr. R A Gupta, Deputy Director (Aqua) welcomed the dignitaries and highlighted the role of MPEDA in the development of aquaculture in India.

Classes were conducted by efficient personalities on various topics such as site selection, pond construction, biosecurity measures, water preparation, hatchery techniques, seed selection, packing, transportation, acclimatization and stocking, water quality management, feed management, disease management, harvest and post harvest management, economics and marketing of shrimp aquaculture, Sea bass cage culture, Mussel culture, Organic Farming, Crab Culture, MPEDA schemes and Better Management practices.

A field trip was arranged for the trainees to the farms in Harwada, Ankola. The training programme was concluded with valedictory function in which certificates were distributed to those who have successfully completed the training programme.

2) Sub Regional Center, Kannur

The Sub-regional Centre (Kannur) organized a campaign on the 'Abuse of banned antibiotics in Aquaculture' during August 2012 at Payyannur Block Agricultural Improvement Cooperative Society Ltd Hall, Payyannur, Kannur District. Mrs. Elsamma Ithack, Assistant Director, MPEDA SRC, Kannur explained briefly on the withdrawal period of antibiotics in cultured shrimp and the issues and consequences related to the presence of banned antibiotics in cultured produce while Inaugurating the campaign.

Mrs. Elsamma Ithack , Assistant Director, MPEDA speaks to participants

During the discussion session, Mr. T Purushothaman, President, Kerala Aquafarmer's Federation pointed out the multiple issues faced by shrimp farmers in Kannur especially higher cost of production and low price for the produce. The campaign was concluded with the vote of thanks by Mr. C Suresan, Secretary, Kannur District Aqua farmers Federation, Kannur. 10 farmers from Cherukunnu, Kannapuram, Payyannur, Kunhimangalam and Kandangali area participated in the campaign.

3) Regional Center, Panvel

(A) MPEDA Regional Center, Panvel has conducted an Awareness Campaign on "Scampi Culture & aquaculture diversification" at Bhormal village in Surgana Taluk, Nasik District during July 2012. 30 fish farmers/beneficiaries in and around Bhormal village participated in the programme. Mr. Chintamani L Kamdi, Sarpanch, Khokri and Mr. Narendra D Gavit, a progressive farmer of Bhormal, Surgana Taluk attended the campaign and addressed the farmers.

Mr. Purusotham Sai, Assistant Director, MPEDA welcomed the participants and assured full support/ cooperation for development of the scampi/fin fish farming in this area. He also spoke on the diversification of fin fish culture and detailed the present financial assistance schemes.

At the end of the programme a discussion was held in which the doubts raised by the participants were cleared. Dr. A Anand Kumar, Junior Technical Officer (AQ), MPEDA proposed vote of thanks.

(B) One more campaign against antibiotics and on best management practices was organised at the farm site of village Jalsar of Thane district during the same month, to make the farmers more aware on BMP and against use of antibiotics and chemicals in shrimp farms.

The campaign was attended by 12 shrimp farmers. Mr. J Purusotham Sai, Assistant Director and Dr. A Anand Kumar, JTO, MPEDA attended the campaign and addressed the farmers on water/soil/seed quality through regular monitoring/testing of different parameters, procedures on pond bottom management, feed management, use of probiotics, optimum stocking for higher returns, adverse effect of antibiotics/chemicals in human health and on the export of shrimp from the country.

The farmers were also made aware of the best management practices of shrimp farming, traceability, Pre harvest testing, registration with the Coastal Aquaculture Authority, Chennai and need for compliance to the quality standards by the importing countries stipulated from time to time.

L-R: Mr. Chintamani L Kamdi, Sarpanch, Khokri, Surgana Taluk, Mr. J Purusotham Sai, Asst. Director, MPEDA and Mr. N D Gavit, progressive farmer of Bhormal village

A view of participants

Mr. Harischandra Nana Gavad, a progressive farmer of the locality who spoke on the occasion appreciated the steps taken by MPEDA for the campaign and requested MPEDA to conduct 3-day training programme in the area for the benefit of the shrimp farmers. He has also narrated the problems of shrimp farmers in the region i.e., availability of only sub standard seed by the agents, poor infrastructure facilities in the shrimp farming areas etc. and asserted that the farmers of this area are not using any antibiotics for shrimp culture and most of the farmers are using probiotics if required.

Leaflets on Antibiotics and guidelines on Abuse of Antibiotics in Aquaculture, Standards of Inputs & manual on BMP etc., in Marathi were distributed among farmers. Farmers expressed their happiness for attending such a programme and thanked MPEDA for organizing the campaign in their region.

(C) A Training Programme on "Best Management Practices in shrimp Farming" was conducted during August 2012 for 20 shrimp farmers at village Jalsar, Taluka: Palghar, Dist: Thane for the benefit of farmers from nearby farming area viz; Jalsar, Chikalpada, Ranjanpada, Virthan, Safala & Vitalwadi.

Shrimp farms are being constructed scientifically but the method of farming practice is not up to mark & farmers are not adopting any BMP / Code of Practices for better production in Jalsar/Safala locality except few entrepreneurs. Since 2 years white spot disease is predominant in the area due to bad farming practices/seed quality/lack of good management practices. Keeping in view it was decided to organize a 3-day Training Programme in the locality.

During registration leaflets / manual on local vernacular were distributed among farmers. The Inaugural programme was attended by Mr. J Purusotham Sai, Assistant Director, Mr. K Sivarajan, Assistant Director, MPEDA, RC Panvel, Mrs. Nita Bhoir, Sarpanch, Jalasar, Smt Vrushali Gawad, Member, Jalsar Gram Panchayat and Dr A Anand Kumar, JTO(AQ), MPEDA.

The lectures were handled by Mr.

L-R: Mr. J Purusotham Sai, Asst. Director, MPEDA, Mrs. Nita Bhoir, Sarpach, Jalsar, Smt Vrushali Gawad, Member Jalsar Gram Panhayat and Mr. K Sivarajan, Asst. Director

View of trainees in training programme

Mr. A S Patil, Director, M/s Pancham Aquaculture (P) Ltd distributing certificates to the trainees

Maruti D Yaligar, Deputy Director, Mr. J Purusottam Sai, Assistant Director and Mr. K Sivarajan, Asistant Director (AE), MPEDA. Mrs.Nita Bhoir, Sarpanch, Jalsar appreciated MPEDA for conducting training programme. Mrs. Vrushali Gawad, Member, Jalsar Gram Panchayat also spoke on the occasion.

Other faculty were Mr. Hiren Gohil, JTO (ELISA Lab), Palghar, Dr A Anand Kumar, JTO (AQ), MPEDA and Mr. Nanda Kumar Patil, AFDO, Palghar. Mr. Harish Chandra Gawad, a progressive farmer of Jalsar appreciated the role of MPEDA in promotion of shrimp farming in the State, and thanked MPEDA for organizing the training programme in Jalsar area while assuring to form an aqua society in near future. The training certificates to the participants were distributed on the last day.

4) Sub Regional Center, Kolkatta

To make the shrimp farmers of West Bengal aware on the banned antibiotics/chemicals MPEDA organized a series of campaigns on "Abuse of Antibiotic in Aquaculture" in the State during August 2012.

The fifth campaign of the annual series was organized at village Dholkhali, South 24 Parganas, which was attended by 44 farmers. Mr. Sachidananda Adhikari, Head Master of Dholkhali FP School, Mr. Dhirit Ekka, Assistant Director (AE) and Mr. Sibasish Mohanty, JTO, MPEDA participated in the campaign and addressed the farmers.

The sixth campaign was organized at village: Sandeshkhali, South 24 Parganas. 32 farmers attended the campaign. Mr. Palash Kumar Singha, President, Future Group of Sunderban, Mr. Dhirit Ekka, Assistant Director and Mr. Sibasish Mohanty, JTO, MPEDA participated in the campaign and addressed the farmers.

The seventh campaign was organized at village: Raydighi, South 24 Parganas. Mr. Sibasish Mohanty, JTO (Aqua) and Mr. Pradip Kumar Das, Field Assistant of MPEDA guided the farmers on various topics.

The topics covered included the importance of engineering aspect at the time of preparation of pond for better management, adoption of better farm management practices, ill effects of the abuse of antibiotics and banned chemicals, use of probiotics, ongoing MPEDA schemes, recent trends in aquaculture, developments in shrimp markets, formation of "Aqua Society" in each farming cluster, CAA registration, use of PCR tested hatchery produced seeds, Pre Harvest testing of shrimps etc.

Leaflets on Antibiotics and guidelines on use of "Antibiotics in the Aquaculture" in Bangla vernacular were distributed among farmers. Farmers expressed their happiness for attending such a programme and thanked MPEDA for organizing the campaign in their region and expressed the desire to attend similar programmes. ●

Farmers are listening about "Abuse of Antibiotics in Aquaculture" at Dholkhali, South 24 Parganas

A view of the Awareness Campaign at Sandeshkhali, South 24 Parganas

Temperature affects shrimp survival, feed conversion

Temperature changes can alter the growth, survival and feed conversion of cultured Pacific white shrimp, Litopenaeus vannamei. To examine the effects of temperature on these performance factors, Dr Chalor Limsuwan, Kasetsart University, and Dr Carlos A. Ching, performed studies with shrimp in the laboratory as well as at an intensive culture farm. Taken from the Global Aquaculture Advocate, a Global Aquaculture Alliance publication.

Lab trials at Kasetsart University found shrimp consumed more feed at the higher temperature but did not grow faster than shrimp held at a lower temperature.

Laboratory Tests

Laboratory trials at Kasetsart University in Thailand compared how two experimental temperatures affected Pacific white shrimp. Animals averaging 12 g each were stocked into aquariums with a salinity of 25 ppt at 10 animals/aquarium. During the first part of the trial, feed was given at 3% of shrimp body weight in three doses of 1%/day at 29° C, while at 33° C, feed was given ad libitum for two hours.

Three replicates were made for each temperature and feed dose. Then, in the second part of the lab experiment, feed consumption was compared for three experimental groups:

Group 1 – Temperature 29 ± 1° C and feeding at 3% body weight

Group 2 – Temperature 33 ± 1° C and feeding at 3% body weight

Group 3 – Temperature 33 ± 1° C and feeding at 36.5% more than 3% body weight.

Laboratory results indicated that average feed consumption was 36.5% higher at 33 than at 29° C (Table 1), although growth was similar at both temperatures (Table 2). However, at 33°, survival was lower due to deterioration of the water quality. Levels of ammonia-nitrogen and nitrite-nitrogen were higher (Table 3), thus giving this group the highest FCR due to low survival. Also, when feed was restricted to 3% of body weight at 33°, growth was lower, indicating the shrimp needed more feed to attain normal growth at this temperature.

A commercial feed table was the main reference for the daily feed doses. Feeding adjustments were made based on evaluation of leftover feed in feeding trays and/or intestine color checks using a technique described by Dr. Carlos Ching. In Ching's method, overfeeding is identified when more than 10% of the guts sampled show the brownish color of artificial feed demand during the July-September cycle.

Table 1. Feed consumption of L. vannamei at different temperatures under laboratory conditions.

	Feeding Time	Feed Intake (g) (33±1°C)			Feed Intake (g) (29±1°C)		
		Replicate 1	Replicate 2	Replicate 3	Replicate 1	Replicate 2	Replicate 3
Day 1	8 a.m	1.70	1.70	1.60	1.20	1.20	1.20
	1 p.m	1.60	1.60	1.70	1.20	1.20	1.20
	6 p.m	1.70	1.70	1.70	1.20	1.20	1.20
Day 2	8 a.m	1.53	1.53	1.60	1.20	1.20	1.20
	1 p.m	1.65	1.65	1.55	1.20	1.20	1.20
	6 p.m	1.63	1.63	1.65	1.20	1.20	1.20
Average		1.63	1.63	1.63	1.20	1.20	1.20

Field Trials

Field trials took place at an intensive culture farm in Naozhou dao, Guandong Province, China. Six ponds with an average area of 0.25 ha were stocked at an average of 144 shrimp/m² to evaluate temperature and feed one hour before feeding. Underfeeding is suspected when intestines show more than 40% blackish color from natural food one hour after feeding.

Temperature and feed consumption data were taken over 40 days. Days 21 to 40 had higher

Table 2. Performance of L . vannamei at two experimental temperatures under laboratory conditions. Values in the same column followed by different letters are significantly different (P<0.05)

Experimental Group	Average Body Weight (g)	Survival (%)	Weight Gain (g./day)	Feed-Conversion Ratio
Group 1 (29°C)	20.00 ± 1.25[a]	96.00 ± 4.00[a]	0.20 ± 0.02[ab]	1.82 ± 0.04[a]
Group 2 (33°C)	18.20 ± 1.98[b]	91.67 ± 0.57[b]	0.17 ± 0.21[a]	1.84 ± 0.30[a]
Group 3 (33°C)	20.80 ± 2.15[a]	65.33 ± 11.55[b]	0.22 ± 0.14[b]	2.71 ± 0.10[b]

Table 3. Concentrations of Ammonia-Nitrogen and Nitrite-Nitrogen during temperature trials under laboratory conditions. Values in the same column followed by different letters are significantly different (P < 0.05).

Rearing Period (days)	Temperature Treatment	Ammonia - Nitrogen (mg/L)	Nitrite-Nitrogen (mg/L)
7	Group 1 (29°C)	0.61 ± 0.90[a]	4.67 ± 0.59[a]
	Group 2 (33°C)	1.34 ± 0.29[b]	4.07 ± 1.48[a]
	Group 3 (33°C)+)	0.86 ± 0.29[a]	4.45 ± 1.57[a]
14	Group 1 (29°C)	0.67 ± 0.21[a]	7.49 ± 0.88[a]
	Group 2 (33°C)	1.02 ± 0.33[a]	3.47 ± 3.82[ab]
	Group 3 (33°C)+)	0.91 ± 0.42[a]	1.79 ± 1.63[b]
21	Group 1 (29°C)	0.67 ± 0.72[a]	5.73 ± 8.04[a]
	Group 2 (33°C)	1.08 ± 0.72[a]	66.67 ± 23.09[b]
	Group 3 (33°C)+)	1.50 ± 0[a]	80.00 ± 0.87[b]
28	Group 1 (29°C)	0.25 ± 0[a]	3.30 ± 4.12[a]
	Group 2 (33°C)	1.08 ± 0.72[a]	58.20 ± 37.41[b]
	Group 3 (33°C)+)	1.58 ± 1.37[a]	79.97 ± 1.31[b]
35	Group 1 (29°C)	1.17 ± 1.58[a]	1.17 ± 0.75[a]
	Group 2 (33°C)	1.52 ± 0.03[a]	79.67 ± 0.86[b]
	Group 3 (33°C)+)	2.00 ± 0.87[a]	80.83 ± 0.58[b]
42	Group 1 (29°C)	0.67 ± 0.72[a]	0.93 ± 0.57[ab]
	Group 2 (33°C)	2.83 ± 0.29[b]	1.46 ± 0.23[a]
	Group 3 (33°C)+)	2.25 ± 0.90[b]	0.63 ± 0.57[b]
49	Group 1 (29°C)	2.08 ± 1.58[a]	0.28 ± 0.02[a]
	Group 2 (33°C)	4.83 ± 0.28[a]	78.73 ± 2.36[b]
	Group 3 (33°C)+)	3.16 ± 1.75[a]	0.57 ± 0.25[a]

temperatures, and days 41 to 60 had lower temperatures. Shrimp weights were sampled every few days to determine the average daily gains.

At average temperature ranges from 30.5 to 33.2° C during days 21 to 40, feed consumption was 30% above the amount suggested by the feed table, while at average temperatures from 28.6 to 30.4° C during days 41 to 60, consumption was similar to the table values (Table 4). On the other hand, average daily weight gains were similar during the whole production cycle (Table 5), but feed-conversion ratios were higher (1.64) for days 21 to 40 than the 1.26 average value at the lower temperatures of days 41 to 60.

Water deterioration was observed during the high-temperature period. Layers of dead microalgae appeared on the surface of the pond, and organic matter increased on the bottom. This is due to higher feed doses at higher temperatures, where feed supplied excess nitrogen and phosphorus to the pond and caused increases in algae.

Later, when temperature decreased and feed doses were lower, the dead microalgae disappeared. It was also observed that at higher temperatures, dissolved- oxygen concentrations decreased but were never below 3.0 mg/L.

Table 4. Feed consumption during two periods of the same production cycle in the intensive culture of L. vannamei. Values in the same column followed by different letters are significantly different (P < 0.05).

Pond Number	Days 21 - 40			Days 41 - 60		
	Minimum Temperature Ranges (°C)	Maximum Temperature Ranges (°C)	Feed Amount Above Table Values	Minimum Temperature Ranges (°C)	Maximum Temperature Ranges (°C)	Feed Amount Above Table Values
2	30.6 ± 1.50[a]	330 ± 1.20[a]	30.1% ± 4.9[a]	28.8 ± 1.21[a]	30.7 ± 1.15[a]	1.5% ± 0.6[a]
4	30.8 ± 3.33[b]	33.6 ± 3.60[b]	29.1% ± 9.9[b]	28.4 ± 1.55[a]	30.0 ± 1.33[a]	3.7% ± 1.8[b]
6	30.0 ± 1.85[a]	32.7 ± 1.43[a]	29.5% ± 4.5[a]	28.1 ± 0.90[a]	29.9 ± 1.52[a]	1.6% ± 0.5[a]
8	30.8 ± 1.10[a]	33.5 ± 0.96[a]	31.2% ± 5.3[a]	28.9 ± 1.70[a]	30.7 ± 1.24[a]	1.3% ± 0.4[a]
10	30.4 ± 1.76[a]	33.1 ± 1.12[a]	29.7% ± 5.0[a]	28.3 ± 1.30[a]	30.0 ± 0.98[a]	0.8% ± 0.2[a]
12	30.7 ± 1.90[a]	33.5 ± 1.03[a]	30.2% ± 5.5[a]	29.3 ± 3.01[b]	30.8 ± 2.99[b]	1.4% ± 0.3[a]
Average	30.5	33.2	30.0 %	28.6	30.4	1.70%

Source:thefishsite

Re-circulating aquaculture systems- innovative technologies in Tilapia Farming

A previous article by the Institute of Marine Affairs (IMA) gave an overview of aquaculture in Trinidad and Tobago and the challenges faced by this industry. Now a new technology used at the IMA for more sustainable and profitable aquaculture ventures is featured.

Aquaculture as a vibrant and profitable industry is still in the developmental stage locally. Food fish culture is constrained and its full economic potential still unrealised, partly due to adherence to traditional pond-based systems with its myriad of environmental and security concerns.

Local and international demand for fish and fish products, coupled with declining stocks, as well as the need to diversify the local economy, demand a more innovative approach to aquaculture to achieve profitability as a business venture.

The IMA conducted research in culture technologies for freshwater food fish, like tilapia and cascadura and is now planning for mariculture species as a means of fast-tracking the development of the local aquaculture industry.

Re-Circulating Aquaculture Systems (RAS) is a fast growing field, both in terms of research and for commercial activities. The advantages of a RAS over pond-based systems are that this system can be used where land is limited, water scarce or when ambient environmental conditions are not suitable for the cultured species. However, given its more intense approach high stocking densities and very controlled environmental conditions, risks are higher and there are costs associated with appropriate back-up systems.

The RAS is essentially a closed production system that re-uses more than 85 per cent of its water for continuous production and which can be incorporated into other agriculture production systems, such as aquaponics.

In 2009, the Institute teamed up with the Seafood Industry Development Company (SIDC) to implement a pilot project of the RAS for intensive fresh water tilapia production adapted to local conditions. Imported YY or super male tilapia from Swansea, UK were crossed with Swansea red, silver and IMA-bred red hybrid females to produce the offspring used in the production system. The genetically male tilapia, Oreochromis niloticus, and red hybrid tilapias were used to demonstrate the technical and economic feasibility of commercial production, with a view to encouraging entrepreneurs and investors. A handbook, technical reports and a demonstration facility for industry users were other outputs anticipated from the pilot project.

All treatment processes involved in a RAS, as well as its management, are not unique to aquaculture but are closely related to wastewater treatment systems used for a range of domestic as well as industrial applications. The general design of this system allows for flexibility and ease of management and requires minimum inputs of manual labour except at times of sampling and harvesting.

The basic components of a RAS are the culture tanks, mechanical filters for solids removal, biological filters for breakdown and removal of excretory wastes, aeration and re-circulation of the water. In addition, gas removal of carbon dioxide and ammonia, pumping and disinfection devices such as ultra-violet filters, ozone generators and foam fractionation for bacteria and other solids removal are considered.

The tilapia RAS, located at the IMA's facilities in Chaguaramas, consists of a covered shade-house of approximately 740 m2 with ten 30,000-litre circular production tanks and other tanks which serve as sumps for water treatment and recirculation. In addition, there are two mechanical filters for solids removal as well as eight 3,000-litre moving bed bio-filters for nitrification. A secured control room to house pumps, blowers, feed timer, alarm system and data logger was constructed from a 6.09 m (20-ft) shipping container while another was retro-fitted for feed storage.

In the pilot stage of the project, fish were fed a complete ration of 42-35 per cent imported crude protein over a 180-day production cycle. Market size fish were purged with clean well-water for a minimum of 24 hours before final harvest. Approximately 5,564 kg (12,255 lbs) of harvested fish were distributed by the SIDC to wholesalers, retailers, processors and other end-users in 2010 and 4,967 kg (10,941 lbs) in 2011. Up to May of this year, production was approximately 16,782 kg (36,694 lbs).

Re-circulating aquaculture facilities are fully contained and can

be located in rural or urban areas and in most warehouses. Site selection is not dictated by proximity to a natural source of water but rather by the business opportunity. The RAS can be modified to accommodate the species for target markets and environmental conditions can be monitored and controlled to fit the requirements of the species of interest.

RAS have strong 'green credentials'. Products are promoted as sustainable because, as closed systems, they abstract little water from natural water bodies and produce minimal effluent discharges, thereby reducing the potential impacts from pathogens and fish release into natural water courses. There is also improved bio-security which reduces the risk of disease outbreaks and eliminates losses to predators. Research continues at the IMA into Re-circulating aquaculture systems for the production of commercial marine fish such as cobias, snappers and groupers.

Paul Gabbadon, Senior Research Officer, Fisheries and Aquaculture Research Programme.

Source:Trinidad & Tobago Express

Price List of MPEDA Publications / Periodicals

	PERIODICALS	Annual Subscription (Rs.)
1	PRIME Weekly (Price Indicator for Marine Products)	350.00
2	MPEDA Newsletter	300.00
	PUBLICATIONS	**Price Per copy (Postage extra)**
4	MPEDA Act, Rules & Regulations	25.00
5	Statistics of Marine Products 2009	550.00
6	Seafood Delicacies from India	100.00
7	Indian Fishery Hand Book	250.00
8	Product Catalogue	150.00
9.	Commercial fin fishes and shell fishes of India	125.00
9	Handbook on Ornamental Fish Diseases	50.00
10	Water Quality in the Ornamental Aquatic Industry - Serial 1	125.00
11	International Transport of Live Fish in the Ornamental Aquatic industry Serial - 2	125.00
12.	Live Food Culture for the Ornamental Aquatic Industry - Serial 3	125.00
13	Biosecurity in the Ornamental Aquatic Industry - Serial 4	125.00
14	Ornamental Fish Breeders / Traders Directory	25.00
15	Directory of Exporters of Marine Products	75.00
16	Directory of Exporters of Marine Products (Interactive CD)	50.00

NEWS SPECTRUM

Health benefits of seafood

Seafood is part of staple diet for many Indian communities living in coastal regions. But what makes this delectable seafood nutritious? We lay out the facts about the health benefits of seafood and different kinds of fish that is beneficial.

Proteins: What is the other protein substitute for chicken, beef and pork? Yes, it is fish. Seafood is a good source for proteins. The added bonus to consuming fish is that the creatures of the deep sea, and of course rivers, are low in saturated fats. You don't have to worry about avoiding it as with pork, beef and chicken. It is lean 'meat' all the way to the bone.

Omega 3: Omega 3 fatty acids are a favourite with health enthusiasts - they can boost energy as well as reduce the signs of aging. Do you know the secret to glowing and healthy skin? No it's not lotions, creams and chemical products. But the secret lies in Omega 3 fishes like salmon, sardines and mackerel. Hold up, that's not all, we break down health benefits of Omega 3 and the health benefits of seafood.

Heart disease: Seafood is connected to the heart; well the truth is Omega 3 fatty acids can protect your heart and reduce blood triglyceride levels. It is quite a hearty solution to heart disease. But deep down you do

realise that change in diet is one part of reducing your chances with the silent killer. You still have to exercise and burn it out as you eat healthy.

Pregnancy: Research endorses the importance of Omega 3 fatty acids during pregnancy. Mothers are recommended to consume properly cooked fish in their third trimester. Some studies claim that these healthy fatty acids can improve the intelligence of the baby. Fish also reduces the chance of premature birth. It is best to consult your doctor on the amount of fish you consume and which fish is healthy for mother and baby.

Eyes: Carrots are known to improve eyesight, this is ingrained in our minds since childhood. You can now consume fish to improve your eyes. A little known fact about seafood is that it boosts our vitamins and minerals intake, thus giving us better and sharper eyesight.

Muscles: You need proteins after a workout? Try fish instead of land animals, the taste is unique, cooks in a short period of time and helps in building and recovery of muscles. Now that you have focused on brawns, does fish help in improving grey cells?

Brain: Seafood is considered to be a brain food by many. Some studies suggest that if pregnant women consume seafood in pregnancy, their children have chances of developing higher IQs. However, these studies are inconclusive and speculative at best. One is better off believing that the nutritious benefits of eating healthy seafood lends toward preserving good mental health as well.

Mental health: Seafood has the 'power' and the components to reduce your chances of dementia, Alzheimer's and depression. Yes, depression is linked to low level of Omega 3.

India's best seafood:

- Indian Salmon or raavas
- Sardines or trale
- Mackerel or bangda
- Tuna or chura
- Sting ray or waghole
- Spanish Mackerel or surmai
- Shark or moree
- Squid, calamari or samudra pheni
- Carp fish or rohu
- Prawns or jhinga
- Pomfret

- Times of India

New Director for CFTRI

Prof. Ram Rajasekharan has been appointed as the director of Central Food Technological Research Institute (CFTRI), Mysore, which is part of the Council of Scientific and Industrial Research (CSIR). He has taken charge early this month from the acting director, Dr G Venkateswara Rao.

Prior to this appointment, Prof. Rajasekharan was the director, Central Institute of Medicinal and Aromatic Plants, Lucknow. Earlier he was professor, department of biochemistry, Indian Institute of Science, Bangalore, and visiting professor, School of Science, Monash University, Sunway Campus, Malaysia.

finbnews

Fisherfolk pitch for harbour at Ennore Creek

Fed up with bringing home small catches and at times nothing, the fisherfolk of 12 fishing villages in north Chennai are planning to write to the State government seeking to construct a fishing harbour at the mouth of the Ennore Creek. The proposal is an old one, which the fisherfolk are planning to renew.

Former MLA T Arumugam, who belongs to Nettukuppam had also raised the issue during a recent meeting with the Tiruvallur district administration.

"It was a proposal that had been mooted in 2001. Many fishermen would benefit from it. If the estuary had been converted into a fishing harbour, it would have prevented the sea erosion in Nettukuppam," he said.

The fishermen opine that instead of constantly dredging the mouth to ensure free flow of water for the thermal power stations, they could construct two arms that would help sand accumulation on either side.

They say that since the sea off the coast of Ennore has become very rough, most of them are forced to go to Kasimedu, their nearest fishing harbour, which is 15 km away.

"The presence of the Chennai port and the Kasimedu harbour has only pushed the waves further north, making fishing tough for us. Not many of us have big boats. It takes about 45 minutes to an hour to cross 200 metres of waves near the coast," said M. Kalaivanan of Nettukuppam.

Those who have big boats keep them at Kasimedu. "We are afraid to leave them there but we have no other go. If there is a fishing harbour at Ennore, we would be able to fish throughout the year. We will only have to stop deep sea fishing during the 45-day ban," said Rajendran of Ennorekuppam.

And for those travelling to Kasimedu, apart from problems posed by the distance, there is also the issue of the cost involved.

"We pay Rs. 400 to transport the fish in iceboxes to share autorickshaws. Similarly to carry our nets, boxes, food, water, light and other stuff to Kasimedu , we have to pay through our noses," said L. Madanagopal of Kattukuppam.

Sources in the Fisheries Department said that the department would look into the request of the fisherfolk and determine if the project would be feasible and financially viable.

"We are already in the process of constructing a fish landing centre at Ennore to improve the trade in that area. The work is expected to be completed soon. We will consult experts regarding the request from the fishermen," the official said.

The Hindu

Workshop on 'Networking Opportunities for Entrepreneurs'

Dr. T K SrinivasaGopal, Director, CIFT, Cochin, delivering the introductory remarks

Business incubatees attending the workshop

The Business Incubation Centre (BIC) of Central Institute of Fisheries Technology (CIFT), Cochin conducted one day Workshop on 'Networking Opportunities for Entrepreneurs', on 14th August, 2012. The Workshop was meant for building relationship of the incubates and entrepreneurs with the public sector, funding bodies and policymakers. It was also aimed at increasing awareness and improving the understanding of the role of Government in promoting business in Food Processing & Fisheries Sector.

Eminent speakers, Smt. K M Veena, Joint Director (Development), MPEDA, Cochin, Dr. C K Murthy, Executive Director (Technical), National Fisheries Development Board, Hyderabad, Shri Abdul Jaleel, Food Safety Officer, FSSAI, Ernakulam, Shri Martin P Chacko, Assistant Director (Food), MSME-DI, Thrissur, Shri Shivdas B Menon, Managing Director, Sterling Group of Companies, Shri R Shivakumar, Co-ordinator, Food Processing Division, KINFRA, Cochin and Ms. Ashey Susane, Assistant Manager, State Bank of India, Agri-Commercial Branch, Ernakulam addressed the incubates on promotional schemes available from their respective organizations. Twenty two incubates/prospective entrepreneurs participated in the Workshop.

Dr. T K Srinivasa Gopal, Director, CIFT, Cochin conferred the introductory remarks at the Workshop. Dr. C N Ravishankar, Principal Investigator, BIC & Head, Fish Processing Division, CIFT, Cochin welcomed the gathering while Dr. A A Zynudheen, Senior Scientist and Co-PI of BIC, CIFT delivered the vote of thanks. The entrepreneurs also visited the Pilot Plant where Dr. George Ninan, Senior Scientist and Co-PI of BIC detailed them on the various fish processing lines and facilities available to them for pilot

Fisherfolk to receive real-time ocean data from wave rider buoy

A new wave rider buoy deployed off the Kodiakkarai coast will now provide satellite-enabled, real-time ocean state forecast to fisherfolk.

The wave rider buoy, deployed jointly under the aegis of the M.S. Swaminathan Research Foundation and INCOIS, Hyderabad, will mark a significant shift in the critical ocean state information from forecast to real-time data for stakeholders.

Wave rider buoy is a sea-monitoring system integrated with INSAT. The buoy will gauge sea conditions, from wave patterns, swells and depths to sea temperature, and transmit the data as real-time information via satellite to the earth stations. Here, INCOIS and MSSRF will be the receiving stations of the real-time information from the buoys. The processed date will include ocean weather forecasts on high wave alerts and cyclonic surges.

The ocean state information involves an array of critical inputs on wave pattern and swell, sea temperature, wave speed, wind speed, water currents, including cyclone alerts, in three-hour intervals as real-time data. This is an upgraded departure from the forecast format to real-time reading of the ocean state by the Village Resource Center of the MSSRF for fisherfolk, as primary stakeholders.

Speaking to *The Hindu* , Velvizhi, Coordinator, Village Resource Centre, MSSRF, the buoy has been anchored by a moor on the seabed, and the sea wave data is gauged by an accelerometer mounted on the buoy. The upheavals of the buoy register the wave patterns. The buoy will add value for the entire Palk Strait due to its location, providing better accuracy. Earlier, the radial coverage was 11.5 km per unit.

Now the wave ride buoy is set to cover a radial distance of 1 km per unit, making it location specific, locally relevant owing to definitive information, says Ms. Velvizhi.

This also marks a significant shift from earlier forecasts for a six-hour period to real-time information based on minute by minute information transmission in local language.

The buoy is equipped with two antennae, one as a receptor to transmit signals via INSAT to INCOIS and other to the local receiver station in VRC located at Vedaranyam. The buoy has been deployed 10 km off the Vedaranyam coast and at a depth of 10 metres.

Technical support and financial support for deployment has been provided by INCOIS and deployment facilitated by the National Institute of Oceanography. INCOIS has also provided the strategic and training support to the MSSRF in real time forecast dissemination to fisherfolk.

The Kodiakkarai buoy will be first in Tamil Nadu and sixth in the country after Port Blair, Kollam, Vishakapattinam, Ratnagiri, Puducherry, and Karwar.

The buoy presently deployed at Port Blair provides for lesser accuracy due to the gulf and bay-riddled shoreline of the Palk Strait. Kodiakkarai, with its open coast, will enable the wave rider buoy to transmit accurate information on wave forecasts for the entire Palk Bay region. This is set to provide critical wave forecast and ocean state information for fisherfolk of Nagapattinam, Pudukottai, Thanjavur, Tiruvarur, and Rameswaram, says Ms.Velvizhi.

The MSSRF will disseminate OSF (Ocean State Forecast) information through its Village Resource Centers and Village Knowledge Centers, and will be clubbed with its existing helpline on ocean state forecasts on 9282442312.

Collector T. Munusamy flagged off the buoy that was transported via a trawler from Nagapattinam to Kodiakkarai.

Nancy, Director, Information, Education and Communication division of MSSRF, was among those present on the occasion.

· Is a sea-monitoring system integrated with the INSAT satellite

· Deployed jointly under the aegis of MSSRF and INCOIS, Hyderabad

-The Hindu

Top 20 health benefits of fish oil

Good sources of fish oil are mackerel, sardines, swordfish, oysters, salmon, and tunas. Here are 20 important health benefits of fish oil that everyone should know.

Cardiovascular disease

Fish oil helps in preventing cardiovascular diseases.

Fish oil not only helps in lowering triglycerides, hardening of the arteries and cholesterol, but also prevents certain heart rhythm abnormalities.

Cancer prevention

Fish oil has proved effective against three common forms of cancer - breast, colon and prostate.

Omega-3 helps in maintaining normal healthy cells from mutating into cancerous tumors and restrain unwanted cellular growth.

Normalize cholesterol

One of the main benefits of fish oil is that it helps in regulating cholesterol levels.

The presence of EPA (Eicosa Pentaenoic Acid) and DHA (Docosa Hexaenoic Acid) found in most high quality fish oil supplements helps in regulating cholesterol.

Go slim; with fish oil

Fish consumption can be used to cure hypertension and obesity.

A study in Australia has discovered that a weight-loss diet which includes a regular amount of fish can be quite effective.

Treatment of arthritis

Fish oil helps in treating arthritis. Prolonged use of the oil can be effective in reducing and preventing arthritis pain. The relief, will not be immediate, and may take days, weeks or even months to show results.

Eye health

Omega-3 offers protection against macular degeneration (AMD) of the eye and also reduces the risk of dry eye syndrome.

Mental disorders

Fish oil helps in reducing the risk of Alzheimer's disease, dementia, and schizophrenia.

Skin and hair health

Omega 3 helps lock moisture into skin cells, produces collagen, alleviates skin blemishes, and gives one a youthful look.

The protein content in fish oil helps in hair growth and maintaining strong, healthy hair.

High blood pressure

Omega-3 possesses anti inflammation and anti-coagulant properties, which help in lowering blood pressure.

Blood is pushed more proficiently throughout the body hence there is less pressure exerted on the heart.

Asthma

Fish oil is very effective for respiratory problems like asthma. It helps in reducing asthma attacks and to breathe more easily.

AIDS

Research conducted by the Nutritional Sciences Program in Lexington proved that fish oil helps in the treatment of AIDS, as it helps in reducing triglycerides levels

Nails

Fish oil can also be used in cosmetic enhancement, as high intakes of fish oil can help improve the texture and quality of nails

Health bones

Omega-3s found in fish oil helps in regulating the balance of minerals in bone and surrounding tissue.

Depression

People suffering from depression have lower levels of EPA. Hence, fish oil is beneficial for those suffering with depression.

Happy pregnancy

Fish oil is good for pregnant women as the DHA present in it helps in the development of the baby's eyes and brain.

It helps to avoid premature births, low weight at birth, and miscarriage.

Anti-inflammation

Fish is effective in reducing inflammation in blood and tissues.

Fish oil is effective in treating gastrointestinal disorders, short bowel syndrome and chronic inflammatory diseases.

Brain and nervous system

Fish oil also helps in improving memory, reasoning and focus.

It improves blood flow and may even affect hormones and the immune system, eventually affecting brain function.

Protects against type 2 diabetes

A study has found that fish oil can prevent inflammation in fat cells which can lead to insulin resistance and, ultimately, type 2 diabetes.

Acne

Fish oil is effective for acne as well, because of its EPA properties, which influence the formation of sebum in hair follicle.

Improves your mood

In addition to decreasing depression, fish oil has been shown to improve mood swings.

-www.healthmeup.com

Aquaculture production to grow by one-third by 2021

Global seafood production is projected to reach about 172 million metric tons (MT) in 2021, which would be up 15 percent from the 2009-11 average, according to a new report from the United Nation's Food and Agriculture Organization (FAO).

The increase in global seafood production is expected to come mainly from aquaculture production, which is projected to grow 33 percent to 79 million MT by 2021; wild fisheries production is projected to grow only 3 percent between 2012 and 2021.

However, the rate of aquaculture production is forecasted to slow, from an average annual rate of 5.8 percent in the previous decade to 2.4 percent between 2012 and 2021. The decline is attributed mainly to water constraints, limited availability of optimal production locations and the rising costs of fishmeal and fish oil. But, aquaculture will remain one of the fastest-growing animal food producing sectors.

The State of World Fisheries and Aquaculture 2012 also revealed that global seafood production for human consumption hit a record 128.3 million MT, or an average of 18.4 kilograms per person, in 2010. That's up from 123.6 million MT in 2009, 119.7 million MT in 2008 and 117.3 million MT in 2007. Asia accounted for two-thirds of total seafood consumption, at 85.4 million MT, or 20.7 kilograms per capita. And farmed fish will soon account for half of total seafood consumption. Aquaculture represented 47 percent of global food fish production in 2010, compared with just 9 percent in 1980, reports the FAO. The growth rate of farmed food fish production from 1980 to 2010 far outpaced that of the world population (1.5 percent), resulting in average annual percapita consumption of farmed fish rising by almost seven times, from 1.1 kilograms in 1980 to 8.7 kilograms in 2010, at an average annual rate of 7.1 percent. The total farmgate value of food fish production from aquaculture is estimated at $119.4 billion in 2010.

Looking ahead, global seafood production for human consumption is estimated to total 130.8 million MT in 2011, according to FAO.

Global seafood production for all purposes, including human consumption, totaled 148.5 million MT in 2010, up from 145.3 million MT in 2009, reports the FAO. Wild fisheries accounted for 88.6 million MT, while aquaculture repraesented 59.9 million MT.

Steven Hedlund, Seafood Business Magazine.

India hopes Bangladesh lifts ban on export of Hilsa fish

India is hopeful that Bangladesh will lift the ban on Hilsa fish exports after Ramadan concludes.

The secretary of the Fish Importers' Association, Syed Anwar Maqsood, said this while sharing the concern of fish traders with media.

From time immemorial, Bengalis have been passionate about Hilsa fish, a strongly flavoured, white-fleshed fish known for its mouth-watering aroma while being cooked. However, the dazzling silver creature that was declared the National Fish of Bangladesh upon the country gaining independence in 1971, now has become a rare sight on dining tables in Bangladesh itself due to rising prices.

Further, the domestic shortage experienced in Bangladesh has been attributed to huge and consistent

demand from India. Maqsood described the embargo as unfortunate.

"We were actually continuing with the import of Hilsa as usual; every year we do it. Our association does it. So, this year also, this season also we started it. Initially, the Hilsa catch in Bangladesh was also very poor, but two weeks ago, the catch was huge. Every day we were having around 60 to 70 metric tones of Hilsa fish. All of a sudden, on July 31, the notification came that the Bangladesh Government has banned the export of not only Hilsa, but all kinds of fish. We were shocked by the decision, and so were our exporters in Bangladesh," said Maqsood.

He said that the Ministry of Commerce has requested its counterpart in Dhaka to lift the ban as it has hit the importers, their trade and above all the connoisseurs of Hilsa dishes.

Hilsa, known as 'ilish' in Bengali parlance, is mainly a sea species but prefers to lay its eggs in rivers due to absence of salinity and lesser current.

It is caught in all major Bangladeshi rivers, such as the Padma, Meghna and Jamuna, and their estuaries leading to Bay of Bengal.

According to Department of

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Products of interest: Frozen Shrimp/ Cuttlefish

Fisheries, Bangladesh produced 340,000 tonnes of Hilsa in 2010-11.

India imports Hilsa through legal channels although the illegal trade is much larger, traders say, since it's cheaper and also much less complicated because they bypass customs checks.

In 2011, the Department of Fisheries in Bangladesh, 5,376 tonnes of Hilsa was exported to India alone out of total 8,500 tonnes in the fiscal year. The rest went to the ethnic Bangladeshi markets in Europe and America.

But the actual exports are likely to be much higher due to active smuggling along the river borders between India and Bangladesh, which are impossible to completely control. (ANI)

Newstrack India

Passes for fisheries harbour

Cochin Port Trust will issue fresh passes for entry into the Cochin Fisheries Harbour as part of improving the security at the harbour and in view of the requests made by trade union leadership.

Application forms for the new passes are available from August 21 and the completed forms can be submitted till September 15. All applications carry a fee of Rs. 100. Entry into the Fisheries Harbour will be controlled by new passes from October 1

The Hindu