



MPEDA

Newsletter

VOL. VIII / NO. 5 / AUGUST 2020

**Are Sustainability
Certification Schemes
Reliable?**

**Impact of Stress In
Fish Disease**

**Cover Story: India's
Marine Fish Landings**

**Institute of the
Month: NIFPHATT**

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MPEDA

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25 Years of perfecting the science of aquaculture to help you dream bigger.

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K. S. Srinivas IAS
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On the Platter



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Dear friends,

MPEDA has received information that the General Administration and Customs China (GACC) has started sampling imported food stuff for the presence of Covid-19 nucleic material. In view of the tightened sampling protocols and checking by Chinese Authorities, Quality Control Section of MPEDA has brought out a booklet titled 'Covid-19 guidelines for the seafood sector' encompassing the sanitation, hygiene and social distancing protocols to be followed in the entire value chain of seafood industry including aqua farms, fishing vessels, fishing harbors, auction hall, pre-processing units, processing units and cold storages. The guidelines have been prepared after taking into consideration the protocols prescribed by overseas authorities such as WHO, European Commission, USFDA etc. and FSSAI. A digital form of the booklet is available on the website of MPEDA. We have already circulated it to the seafood exporters and State Fisheries Departments for information dissemination among the stakeholder value chain.

Subsequently, MPEDA along with Export Inspection Council (EIC) and Embassy of India, Beijing had a virtual interaction on 10th August 2020, wherein GACC has expressed concern over the risk of Covid-19 nucleic material in the seafood consignment imported to China. They have re-iterated the fact that as the imports are increasing year by year, they have introduced necessary measures to maintain customer confidence and need to arrest the spreading of the viral material through food or food packaging. GACC urged that all the processing units of India shall take adequate precautionary measures to prevent the spread of Covid-19 contamination through the consignments exported to China. GACC was informed that the seafood processing units in India are taking adequate precautions to avoid contamination while handling food and packaging. They were informed about Covid protocol guidelines brought out by MPEDA and that both the Competent Authorities, MPEDA and EIC are periodically inspecting the units to monitor the compliance to the food safety measures in place.

MPEDA has inaugurated its new Quality Control Laboratory at Porbandar on 15th August 2020 virtually. It was a long standing demand by the seafood exporters in the Saurashtra region of Gujarat to have a state-of-the-art Quality testing Laboratory by MPEDA for their export testing needs, and were sending samples to Mumbai to get the tests done. The lab will test antibiotic residues, heavy metals and toxins like histamine in seafood samples. I would like to thank the support extended by the Department of Commerce and the seafood exporters in Gujarat in establishing the laboratory. We have also renovated and re-launched MPEDA Lab at Bhubaneswar on 15th August 2020, which will serve to test the samples from Odisha and West Bengal.

MPEDA is actively utilizing the social media platform such as facebook, twitter and instagram to promote its activities and Indian seafood among the stakeholders and buyers. I request the readers to closely follow MPEDA's social media handles and offer your support and valuable suggestions for improvement.

Thank You.

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FOCUS AREA

INSTITUTE OF THE MONTH : NIFPHATT



Creating products from low value fish can be a boon for seafood industry

Dr. Jai Singh Meena
Director In Charge, NIFPHATT





When the fish resources are dwindling in deep sea and fishermen are shifting to aquaculture and inland fisheries more, it is also absolutely essential to generate market for the catch. This is where a technical institute like National Institute of Fisheries Post Harvest Technology and Training (NIFPHATT) is making a huge difference.

“Our mandate is to spread awareness about the nutrition value of fish. Unlike what it is in Kerala, many other Indian States do not have much awareness about the use and edibility of low value fish like sardine. Creating products from low value fish could really benefit the seafood industry,” said Jai Singh Meena, Director In Charge of NIFPHATT.

The history of NIFPHATT goes a long way. In 1952, Governments of India and Norway signed an agreement

to start a joint project at Neendakara, Kollam. The goal of the Indo-Norwegian Project, as it was called then, was to develop the fishermen area and community.

“Till then, fishermen were using their traditional vessels without motors. The Indo-Norwegian Project introduced concept of deep sea fishing and fish preservation in India. Fishing grounds in deep sea region were identified during this phase.” That was just the beginning. The seafood industry was opened up, bringing with it a plethora of opportunities.

A fishing centre in Ernakulam was started four years later. In 1964, a slipway was constructed at Ernakulam to repair fishing boats. “Right from 1956 onwards, we have started working towards preserving fish using ice. In fact, it was the Indo-Norwegian Project that introduced scientific fish processing and canning to our land,” Dr. Meena said.

Till then canned fish was unheard of. The mandate was to take fish beyond the coastal area, which was the regions where fish was consumed. To do so, the project was extended beyond Ernakulam. Units were started at Kannur in northern Kerala, Karwar in Karnataka and Mandapam in Tamil Nadu. Once the base for launch was set, the Norwegian team severed links with the project and the Union Government took over the project in 1972. The project was renamed as Integrated Fisheries Project.

“The next paradigm shift came in 2005, when the Union Government asked us to revise our mandate and focus on post-harvest technology. The project was renamed as National Institute of Fisheries Post Harvest Technology and Training and we started to focus on post-harvest technology, upgradation and dissemination of technology among the beneficiaries – who are fishermen, fish farmers and fish students from various universities,” he said.

NIFPHATT is also mandated to provide consultancy to

industry stakeholders in establishing fish processing plants and ice plants besides giving skill development programmes for farmers and students. The latter are given short term on the job training and students from Jammu and Kashmir to Tamil Nadu come over for the same.

“However, the main mandate for NIFPHATT continues to be utilisation of low value fishes and develop them into value-added products. Low value fish has the same nutritional value, but somehow people do not prefer them. We are supposed to popularise them. Another area of focus for us is fresh water fish, which again is not popular among regular fish eating people because of increased bones. That is why we have designed many products out of these fish species.”

Even though NIFPHATT has a wide range of products, they are available through their own exclusive counters. Right now, the number of counters are limited. “We are planning to open more counters. In the initial phase, counters will be opened at Bangalore in Karnataka,





Hyderabad, Vishakhapatnam and Vijayawada in Andhra Pradesh and Coimbatore in Tamil Nadu. Our goal is to open at least one counter in every metro in the country,” Dr. Meena said. Discussions are also underway to join hands with cooperative agencies in government sector as well as private agencies to spread the reach of these innovative products.

NIFPHATT is moving with the times, it seems. Just as its original mandate was, the institute is venturing out to be pioneers in fish preservation and marketing once again. “We have advanced our work in the fish chilling, which is very important in marketing of fish products today. Unlike frozen fish, chilled fish remains closer to its taste as in fresh and hence is much in demand for sushi-like preparations. This increases the value of the fish in international markets.”

NIFPHATT currently has two units, which are leased out to private players. Setting up of new chilled fish units are capital intensive, so not many entrepreneurs will be ready to make heavy investments. They can use the facilities available in our units, train their team and then go out on their own. We have two units – one



in Kochi and one in Vishakhapatnam. The Kochi plant was commissioned in 2010, first leased out for three years and then for five years to another player. Now, it is under repair and once it is done, we will lease it out again.”

Once again, NIFPHATT will be setting its sails for newer grounds in innovation. That mandate remains constant for the Institute.

Training the Next Generation

NIFPHATT provide short term on the job training course in post-harvest technology for students in India. The one-month course is primarily meant for providing hands-on training to the students from universities and colleges specialised in fish or food processing and related areas.



While there are other centres to provide theoretical knowledge, this particular course focusses on providing insight in to the practical aspects of fisheries post-harvest technology. NIFPHATT with its expertise and rich experience in the field has formulated the curriculum to mould the trainees fit for the challenges in fisheries industry.

Besides extensive theoretical, practical and video sessions, the curriculum has field visit to approved exporting units, landing centres, other fisheries institutes woven into its structure. The course covers basics of food science, an overview of India's seafood sector, biochemical composition of fish, seafood spoilage, preservation techniques, seafood microbiology, value-added fishery products, by-products from seafood, packaging technology, quality assurance and HACCP concepts and recent trends in seafood sector.

NIFPHATT also offers very short one-week-long course in canning technology for seafood targeting not just University students and faculties from colleges and universities, but also technical personnel employed in fish processing units and entrepreneurs.





Processing stages of Tuna Canning



The course curriculum is so designed to provide practical and theoretical training on all aspects of commercial level canning of seafood. The course consists of theory sessions on canning and practical sessions on the production of canned seafood and its quality estimation procedures. The sessions cover introduction to thermal processing, canning of tuna, mackerel, sardine, oysters etc., cut open test and quality assurance.

Another week-long course on product development

from fresh water fish is offered for young entrepreneurs, students and self-help groups. The course aims at familiarizing the participants on the development of products from fresh water cultured varieties, which has been recently acquired a big momentum in India. Course objectives are to introduce the species to the consumers and popularise it. During this course, hands-on experience in the processing of various products from fresh water fish like production of battered and breaded products, steaks and fillets, canned and pickled products are provided to the trainees.

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The five-day training on Hazard Analysis Critical Control Points (HACCP) is offered to groups of ten to fifteen participants comprising of University students, faculties from colleges and universities, and technical personnel employed in fish processing units.

The course familiarises the trainees with the principles of HACCP system and provides training in implementation and monitoring of HACCP system and the auditing of the system through different case studies. The course covers subjects like introduction to HACCP, pre-requisite programmes, principles and steps, CGMP, SSOP, hazard analysis and control measures and regulatory requirements and work.

Another course offered by the Institute, which is meant to be skill development for fisher, personnel working in fish processing plants and entrepreneurs is the three-day one on fish filleting and freezing. The course is aimed at instilling the trainees with skills in fish filleting, which ensures quality and maximum yield. The intention is to generate skilled workers with practical understanding of modern fish processing techniques.

Showcasing the Fish

NIFPHATT, right from its earlier days as a collaborative project with Norway, has been mandated with the task





of finding new ways to explore the potential of country's seafood wealth and popularise it.

True to what is expected of it, NIFPHATT introduced the concept of canned seafood to India. Since then, the canning industry has gone a long way. The facilities available at NIFPHATT units in Kochi still trust on machinery established during the Indo-Norwegian Project, but upgraded to match the requirements of modern times.

Even after the mandate given to the Institute was revised to shift focus from harvesting to post-harvesting, NIFPHATT's penchant for innovation did not subside. The best example for this drive is the unique product that it has developed – the Fishture.

NIFPHATT has introduced this as a snack, targeting mainly children who are put off by the bones of fish.

The conventional mixture is enriched with fish, thus boosting the snack with essential amino acids for tissue growth and essential Omega-3 fatty acids for brain development of children.

The Ministry also entrusted the Institute with the task of developing a new product from *Pangasius* fish, known in local parlance as koori vaala. *Pangasius* is a genus of medium-large to very large shark catfishes native to fresh water in South and Southeast Asia. Following the directions from the government, NIFPHATT developed a product using *Pangasius* fish and moringa leaves. Similarly, it has developed other products like fish cutlets, fish samosa and fish wafers.

These products fulfil the main mandate of NIFPHATT – which is optimum utilisation of low-value fishes and designing value-added products out of them to popularise and promote their consumption. This applies

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not just to sea fish, but also to fresh water fish. This move is of importance especially with the advancement made in aquaculture in the country.

With NIFPHATT opening more counters across the country, its products will find more takers. In the initial phase, NIFPHATT is opening five counters and later on, working towards ensuring at least one stall in all metro cities.

Development of novel value-added unconventional products from marine and inland fish varieties is a key component of the Vision 2020 developed by the Institute. This vision also includes using seasonally abundant fish and promotional activities for the development of fish products, which are locally acceptable and appealing,

incorporating locally acceptable process and use of locally appealing ingredients and condiments.

Through many State and national level campaigns, the Institute is projecting the message that the “fish is the healthiest food” and emphasizing its vital role in the cardiac health and anti-aging properties. It is giving accent to the message that the fish holds immense potential as a remedy for the protein-deficient population and intends to disseminate this message among fisheries administrators and planners of different States.

The various fish-related products designed by NIFPHATT augments these efforts to promote the consumption of fish.



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Name of Course	Duration	Beneficiary
On the Job Training	One Month	Under/Post Graduate Students
Canning Technology	One Week	University students, faculties from colleges and universities, technical personnel employed in fish processing units and entrepreneurs.
Product Development from Fresh Water Fish	One Week	Young entrepreneurs, Students, Self-Help Groups
Training on HACCP Concepts	Five Days	University students, faculties from colleges and universities, technical personnel employed in fish processing units
Value-added Product Development	3-5 Days	Fisher, Self Help Groups, Kudumbasree units etc.
Fish Filleting and Freezing	3 Days	Fisher, personnel working in fish processing plants and entrepreneurs
Seafood Processing	15 Days	Students from Vocational Higher Secondary Schools



MARKET ACCESS ISSUES FOR INDIAN SEAFOOD

Introduction

Food safety regulations or standards can impact trade in two ways. They can promote public health. At the same time, they can act as protectionist measures. The Agreement on Application of Sanitary and Phytosanitary Measures (SPS) and the Agreement on Technical Barriers to Trade (TBT) try to strike a balance between these competing uses of standards in international trade. The Agreement on the Application of SPS sets out the basic rules for food safety and animal and plant health standards. It allows countries to set their own standards. But it also says regulations must be based on science. They should be applied only to the extent necessary to protect human, animal or plant life or health and they should not arbitrarily or unjustifiably discriminate between countries where identical or similar conditions prevail.

All countries maintain measures to ensure that food is safe for consumers, and to prevent the spread of pests or diseases among animals and plants. Sanitary (human and animal health) and phytosanitary (plant health) measures apply to domestically produced food or local animal and plant diseases, as well as to products coming from other countries. The Technical Barriers to Trade (TBT) Agreement aims to ensure that technical regulations, standards, and conformity assessment procedures are non-discriminatory and do not create unnecessary obstacles to trade. At the same time, it recognises WTO members' right to implement measures to achieve legitimate policy objectives, such as the protection of human health and safety, or protection of the environment.

1. USA

i) Section 609 of US public law 101-162 provides that shrimp or products from shrimp may not be imported to US unless the US Department of State certifies that the exporting nation harvests shrimp without adversely affecting the sea turtles.

Certification occurs in one of the two ways

(1) the Govt. provides evidence of a regulatory programme governing the incidental taking of sea turtles that is comparable to the programme of the US and average rate of incidental taking is comparable to that of US, or

(2) the particular fishing environment of a nation or its fishery/fisheries does not pose a threat of incidental taking of sea turtles in the course of shrimp harvesting.

The first category of certification usually involves implementing a Turtle Excluder Device (TED) programme comparable in effectiveness to that of the US.

The second category typically applies where shrimp is collected in a way, most often manually, that does not endanger sea turtles or where shrimp harvesting occurs only in cold or deep waters, where the risk of taking sea turtles is negligible. When certifying all of a nation's shrimp fisheries is not feasible, the US department makes determination with respect to individual fisheries.

Based on the request from Govt. of India for certification pursuant to section 609, US Department of Environment and US National Marine Fishery Service (NMFS) conducted two certification visits in India. During the visit, US department informed that the characteristics of the CIFT TED render it unsuitable for use on shrimp trawls due to reduced size of the grid in relation to the trawl size, small diameter of the material used for constructing the grid, reducing the overall strength of the TED, spacing between the bars exceeding the maximum allowed by US standards, escape opening cuts under the minimum allowed by US standards and escape opening cover (Flap) measurements under the minimum allowed by the US standards.

Further it is informed that the US Department of State is not able to certify India or make determinations with respect to individual fisheries such that any wild caught shrimp harvested in India would be eligible to enter the United States at this time. Aquaculture or farm raised shrimp harvested in India remains eligible to enter the US as long as no wild caught shrimp harvested in India is attempted to be imported into or does enter, the US.

ii) US DOC has initiated anti-dumping duty (ADD) on shrimp imports from India since 2004. They had contended that India was selling shrimp to USA at a price lower than that to any other country. The initial anti dumping duty imposed was 10.17%.

Every year there is an Administrative Review on the duty to be collected and so far 13 administrative reviews

have been conducted. USDOC has announced the results of 13th Administrative review and fixed the antidumping duty of frozen shrimp from India as 1.87% after review.

2. China

i) GACC informed to immediately stop the exports from 10 enterprises of India due to the presence of WSSV and IHHNV.

ii) China is only permitting to import items which are listed in the General Administration of Customs of the People's Republic of China (GACC) website and many of the Indian species are not included in their website.

3. European Union

1. Establishment is also delisted for sea caught materials even when de-listing an establishment based on non-compliance for anti-biotic residues in aquaculture.

2. De-listed establishment should be granted approval upon fulfillment of non-compliance identified by the Competent Authority.

3. The higher rate of sampling of 50% is a trade barrier for export of aquaculture shrimps.

4. Addition of new fishery establishments:

It is noted that the European Union has not added new establishments from India to their approved list since 26/06/2018. Processors qualified for approval and recommended by the Competent Authority are not in a position to commence export to EU due to non inclusion in the EU approved list. It is understood that the units recommended by Competent Authority are yet to be figured in the list. Inordinate delays in approval by EU authorities need to be avoided so as to enable smooth trade for fishery products to the EU.

4. Japan

Farmed shrimp exports to Japan are subjected to 100% inspection by Japanese health authorities for Nitrofurantoin metabolite, AOZ (antibiotic residue). The matter has already been taken up with the Embassy of India, Tokyo through MOC&I, and the matter is under official procedure. With the relentless efforts undertaken by MPEDA through its TPO Tokyo, with the help of EOI, Tokyo and Department of Commerce, the Japanese Ministry of Health, Labour & Welfare has reduced the import inspection for antibiotic residue in

farmed Indian Black Tiger shrimps from 100% to 30% since April 2020.

5. Thailand

Department of Fishery, Thailand issued a notification on Temporary suspension of Indian shrimps imports to Thailand in view of the reported occurrence of Infectious Myonecrosis Virus (IMNV) disease in shrimps in India. Thailand notification also states that the World Organization for Animal Health (OIE) also revealed that certain categories of shrimp namely (*Penaeus esculentus*, *Penaeus monodon*, *Penaeus stylirostris*), are vulnerable to Infectious myonecrosis (IMN). The notification says that the temporary suspension is to prevent infectious myonecrosis spreading into Thailand, which could cause damage to the country's shrimp industry. This Notification came into effect on 22nd September, 2017 onward.

MPEDA has taken up this issue with Embassy of India, Thailand and requested to lift the temporary suspension for the benefit of the trade. In response the Department of Fishery, Thailand requested to provide the following details.

1. Information on methods used by the Government of India to declare disease-free zones and disease zones for IMN in India including geographic locations of those disease-free zones and disease zones for IMN in India.

2. A complete list of Indian competent authority for export certification names and signing authority names for health certificate for permit including detailed descriptions that is signature and divisions of all signing authorities.

3. A complete list of Government/private laboratories for testing drugs and diseases including the address and scopes certifications of all laboratories' approved by competent authority of India.

Name and contact details (i.e., address, telephone number and email address) of the competent authority of India for further discussion. In addition to this, department of fisheries requested to complete a detailed questionnaire on potential of the competent authority of India in preventing and controlling trans boundary spread of shrimp diseases.

This questionnaire is requesting to provide detailed information on (1) Competent Authority and Stakeholders in shrimp industries. (2) Legislation, certification schemes and disease surveillance and

control for the whole shrimp production chain. (3) Shrimp Production. (4) Shrimp Disease distribution. (5) Laboratories. (6) Processing plants. (7) Export certification. (8) Quarantine measures. (9) Potential of ports.

The inputs from MPEDA has been furnished to DOC. DoC vide letter dated 15.10.2018 forwarded the comments of Govt. of India to Embassy of India, Thailand for forwarding the same to Dept. of Fisheries, Thailand and requested to review the temporary ban imposed by them on Indian shrimp import to Thailand.

6. Canada

The Canadian regulation stipulates requirement of a Zoo Sanitary Certificate towards testing of shrimp consignments for OIE listed pathogens. It is a similar measure like the Australian restriction. Though the EIA issues Health certificate after sampling and testing for Virus stipulated by Canada, Canadian Food Inspection Agency (CFIA) does not recognize/accepts the Health Certificate issued by EIA. CFIA's contention is that the agency that is recognized as Competent authority on Aquatic Animal Health inspection is Department of Animal Husbandry Dairying & Fisheries (DAHD&F), Ministry of Agriculture, and the Zoo Sanitary Certificate shall be issued by DAHD&F.

7. Kuwait

The temporary ban by Kuwait is also on the similar lines of Saudi Arabia. Kuwait also has imposed a temporary ban on Indian farmed shrimps, though more information is lacking.

8. South Africa

Issue with South Africa was related to the presence of pathogenic bacteria, *Vibrio* spp in seafood consignments.

In 2016 November, South Africa has rejected more than 90 Indian aqua cultured shrimp consignments due to the presence of *Vibrio* spp. (a human pathogenic bacterium). In view of this mass rejection by South Africa, a joint delegation comprises MoCI, MPEDA & EIC had a Joint Management meeting with the National Regulator for Compulsory Specifications (NRCS) South Africa on 1st & 2nd of June 2017. Consequently, EIA has started to test South African consignments code-wise as per the ISO method (ISO21872-1:2017 and issued health certificates based on this test results for shipment. Apart from above testing, the exporter is also

testing samples batch wise in their in-house laboratory during the production. However during 2018 (October & November) three consignments rejected due to the presence of *Vibrio* spp.

As South Africa is very potential market for Indian seafood and still buyers from South Africa are offering very attractive prices for Indian shrimp. However most of regular exporters are reluctant to export seafood due to the fear of rejection. So the trend of export is not changed after the rejection occurred in 2016.

As a promotion body, MPEDA attended the first session of India-South Africa Joint working group meeting on "Trade investment" on 23rd January, 2019 and 4th meeting of India-South Africa Joint Working Group on "Agriculture and Allied Activities" held on 24th January 2019 under the Ministry of Agriculture and Farmers' welfare at Delhi. In both meetings, MPEDA has expressed the concern on the recent rejections and the decline occurred in the export of shrimp and other seafood to South Africa. MPEDA also requested to the South African officials to provide the present status of decisions taken by NRCS during the Joint Management Meeting held in 2017. As requested, MPEDA has provided copy of Minutes of Meeting and conveyed the details to Chief Director: Agro-Processing and Marketing, Department of Agriculture, Forestry & Fisheries, South Africa for reviewing the issue with the present scenario.

9. Saudi Arabia

i) Saudi Food and Drug Authority (SFDA) has announced a temporary ban on the import of fresh, chilled and frozen shrimps from India due to emergence of WSSV in *L. vannamei*.

ii) Saudi Arabia has issued temporary suspension on importation of cultured fish originating from India due to unclear health situation of the cultured fish originating from India based on SFDA report.

10. Australia

As per the Bio security (Suspended Goods- uncooked prawns) Determination 2017, the import of uncooked prawns, marinated prawns, and Australian prawns processed overseas in a non-Australian government audited supply chain, from all countries except New Caledonia is suspended for a period of six months due to unacceptable biosecurity risk.

The risk that is identified in relation to uncooked prawns

is White Spot Syndrome Virus (WSSV) as far as India is concerned. Australia feels that the offal from peeling of raw frozen shrimps could introduce WSSV and/or similar viruses into their aquatic systems and could risk diseases to local crustacean fauna. Besides, imported shrimps are also used as bait in sport fishing.

Though the original import suspension had lapsed on 6 July 2017, enhanced import conditions are in place from 7th July to allow for safe trade in prawns and prawn products. From 7th July 2017, previous classes of prawn products, namely uncooked prawns, marinated prawns, and Australian prawns processed overseas in a non- Australian government audited supply chain, is being consolidated into one product class. Prawns within this class must be uncooked, frozen and have had the head and shell removed (the last shell segment and tail fans permitted). A model health certificate has also been issued by Australia.

These prawns will all be subject to the following import conditions:

a. Exporting countries will be required to certify that the prawns have been found to be free of white spot syndrome virus (WSSV) and yellow head virus (YHV) based on sampling and testing methods recognized by the World Organisation for Animal Health (OIE).

b. Pre-export sampling and testing is to be conducted post -processing. The prawns will also be subject to 100 per cent secure seals intact inspection on arrival in Australia and testing for WSSV and YHV at an Australian screening laboratory. Only those prawns which pass testing for both WSSV and YHV at an approved screening laboratory will be released from biosecurity control.

c. Australian prawns processed overseas through an Australian Government approved supply chain (as exists for Thailand) will not be subject to pre-export testing. However, this product will continue to be tested on -arrival for WSSV and YHV. Breaded, battered and crumbed prawns will not be subject to pre-export or on-arrival testing for the presence of WSSV and YHV.

d. Breaded, battered and crumbed prawns will not be subject to pre-export or on arrival testing. However, this product will continue to be subject to 100 percent secure seals intact inspection on-arrival to ensure minimum coating requirements are met. Par-cooking step (for example, pre-frying, or baking) is to be applied after the prawn has been coated with batter and bread crumbs.

Indian exporters has to follow the above procedures for export of uncooked shrimps (in frozen raw peeled or peeled tail on forms) with strict procedures of monitoring and sampling procedures for WSSV and YHV which is not presently done with other major markets like EU, Japan & USA.

Conclusion

MPEDA used to study the SPS & TBT Notifications in details and give necessary comments and inputs to the Ministry to take up the matter with countries concerned at appropriate levels.

MPEDA has also constituted a internal CODEX committee to look into the WTO notifications and to do necessary consultations and analysis for matters seem to be considered as SPS and TBTs. Circulars are issued to the industry to create awareness and issue necessary advisory notes to overcome the negative impacts.



Lackluster export figures points to sluggish demand amid COVID-19

Provisional estimates collected from the field offices indicate that the export of marine products during July 2020 has shown a decline of 25.78% in quantity, 21.14% in rupee value and 28.35% in US\$ earnings, compared to July 2019.

The cumulative export during April to July in FY 2020-21 has also shown a decline of 32.35% in quantity, 22.84% in rupee value and 30.06% in US\$ earnings compared to the same period last year.

The details are given in the table 1 below.

MARKETING NEWS

Table -1: Marine Products Export Performance: April to July 2020

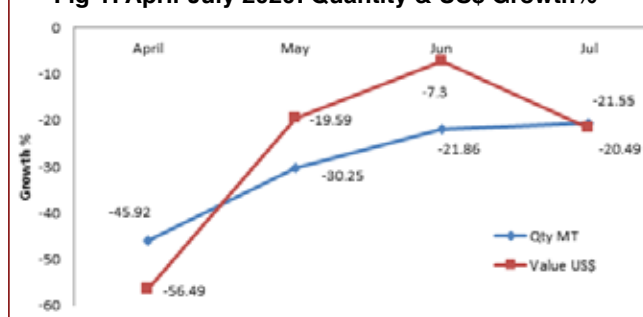
Month	Unit	2019	2020*	Growth %
April	(MT)	114413	61873	-45.92
	Value (₹ Crore)	3344.55	1607.27	-51.94
	Value (US \$ million)	490.14	213.25	-56.49
May	(MT)	108507	75686	-30.25
	Value (₹ Crore)	3633.61	3162.97	-12.95
	Value (US \$ million)	525.54	422.56	-19.59
June	(MT)	98059	76620	-21.86
	Value (₹ Crore)	3589.95	3553.43	-1.02
	Value (US \$ million)	521.74	483.65	-7.30
July	(MT)	100782	80133	-20.49
	Value (₹ Crore)	4123.59	3561.52	-13.63
	Value (US \$ million)	605.34	474.91	-21.55

CUMULATIVE EXPORT

		APRIL- JULY 2019-20	APRIL- JULY 2020-21 (PROVISIONAL)	GROWTH (%)
Qty. in MT	Q:	421761	294312	-30.22
Value in ₹ Crore	V:	14,691.70	11885.19	-19.10
US\$ (Million)	\$:	2,142.75	1594.37	-25.59

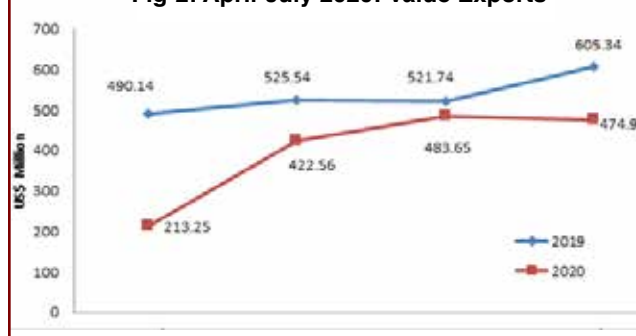
From Table-1, it is observed that, month-wise percentage decline in terms of quantity is reducing. This is evident from the percentage reduction in exports in terms of quantity during June which was 45.92% and the same has reduced to 20.49% in the month of July 2020. This indicates clearly that the industry has slowly started recovering. Similarly, exports in terms of US\$ is also improving, as the month-wise percentage decline in terms of US\$ is having an improving trend till June and in July it has declined from -7.3% to -20%.

Fig-1: April-July 2020: Quantity & US\$ Growth%



If we look at the exports in terms of US\$ value, the export is showing an increasing trend. Overall indication is that export of marine products has improved gradually from April 2020 to July 2020.

Fig-2: April-July 2020: Value Exports



Inference:

The field reports indicate that, the shrimp exports to China, our second largest market after US is sluggish due to the prevailing uncertainty.

The outbreak of COVID-19 and its impact has resulted in a drop in demand as well as price in our major markets. In addition to that the trawl ban till the end of July has resulted, a reduction in sea catch especially in the West coast. All the above factors has affected the exports during the month.



From the Coast to the Kitchen: Delivered Fresh

How technology helped this Kerala entrepreneur take his fresh fish business to new heights

Starting his career as an accountant in a seafood exporting company in Kerala, Mathew Joseph found his true calling when his boss transferred him to the purchase department. A few years later, Mr. Joseph started his own business of fresh fish exports. As his business started to flourish, the Great Recession struck the global economies and his business also suffered.

Joseph then shifted gear and started to sell fresh fish in Indian market. However, competing with local sellers was tough. It was then he chanced upon the idea of selling fish online.

With the help of a tech company, he set up seatohome.com, an online fresh fish retailing venture. He sourced fish directly from local fishermen without losing freshness. Joseph's focus on quality also earned him regular customers. He could trace back every fish to the exact fisher/boat that caught it as the batches were tagged while procuring.

But as demand rose, the site crashed and he had to stop the operations. It was at this time, he received a call from Shan Kadavil, who was the CEO of Zynga. Shan was a regular customer of seatohome. When he came to know about the situation, he decided to step in and join hands with Joseph to revive his venture.

The company was then renamed 'Fresh to Home', which is now a full-fledged e-commerce platform for seafood, meat, vegetables and milk with a presence across the supply chain. The company now delivers across major cities in India and the UAE.

Joseph's success story underpins the need to embrace change and adopt new technologies to emerge victorious and stay relevant in this constantly evolving and competitive market.





Beating the Pandemic Blues: A Virtual Exhibition on Food Processing Technology



Today, the industry as whole is going through a challenging period and business development has been disrupted by unforeseen factors such as the COVID-19.

In this environment, businesses are compelled to consider different ways and means to reach out to their customers and meet their needs. It is important for firms to mitigate the impact on their revenues even as their existing businesses strategies are proving to be ineffective due to unprecedented social and economical transformation the world is witnessing.

With an aim to provide a virtual platform for food technology providers and food industry stakeholders to meet, discuss and come out with solutions for overcoming the pandemic-induced crisis, the Confederation of Indian Industry (CII) organised a Virtual Exhibition & Conference on Food & Agri Processing Technologies, the “i-FPT Expo 2020” and

“CII Mega Agri Show” from 22 July to 21 October 2020.

MPEDA actively participated in the expo by putting up a virtual stall.

i-FPT Expo was an initiative of Foodpro and Food & BevTech Expo. This initiative with its cross-over concepts focused on the broad spectrum of opportunities, technologies and solutions available for Food Processing, Packaging, Dairy, Beverages, Retailing, Refrigeration & Cold Chain, Processed Foods, Agricultural Products Foods, Perishables etc. In the three-month-long exhibition, more than 500 products were on display. Over 100 exhibitors took part in the expo which had virtual sessions / webinars and B2B Meetings.

ABOUT CII

CII is a non-government, not-for-profit, industry-led and industry-managed organization, with about 9100

MARKETING NEWS



members from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 300,000 enterprises from 288 national and regional sectoral industry bodies.

CII works to create and sustain an environment conducive to the development of India, partnering industry, Government and civil society, through advisory and consultative processes.









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Engagement - 3 K



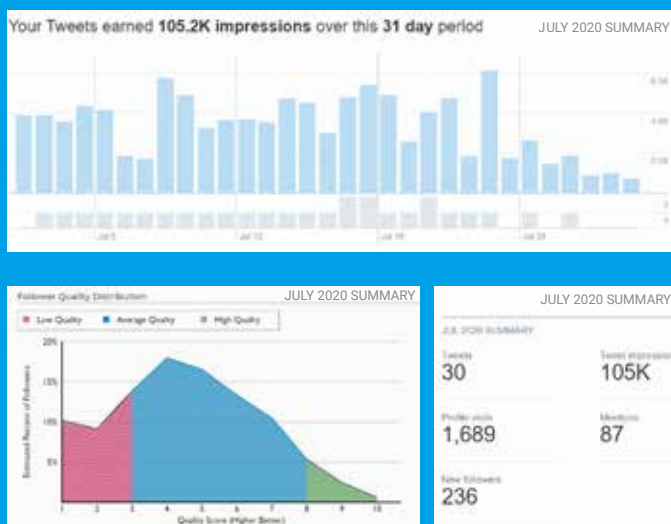
twitter

Engagement - 1.7%

Link Clicks - 198

Retweet - 152

Likes - 442



Instagram

Followers - 1.9 K

Reach - 2.6 K

Interactions - 2.9 K

Impression - 45K

Profile Vists - 538

Web Tap - 10



YOUTUBE

Total Views - 1.1K

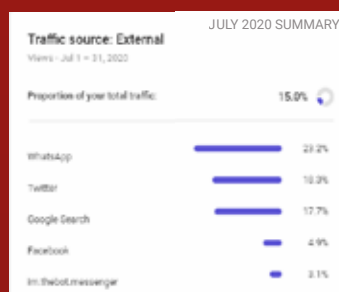
Impression - 15.7 K

Unique Views - 617

Total Watch Time - 36.4 hr

CTR - 4.7 %

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Unusual weather raises concern as India's marine fish landings pick up

In India, fisheries are an important source of food, nutrition, and employment. The sector provides livelihoods to about 16 million fishers and fish farmers in the country. With increase in population and growing demand for fish protein, the need for sustainable development of aquatic resources is felt much more than ever before. Fisheries has also been one of the major contributors of foreign exchange earnings for India.

India closely monitors its marine fish landings every year for the assessment of exploited marine fishery

resources. Fish landings refer to the catch that arrives at ports.

The estimation of annual marine fish landings is done by the Fishery Resources Assessment Division of ICAR-CMFRI through a national level sample survey. Using the data collected covering all the 1,265 marine fish landing centres along the Indian coast through the sampling design, estimates of species wise, fishing zone wise and gear wise landings were made for all the maritime states.



COVER STORY

The estimated marine fish landings from all the maritime states and two union territories in the main land of India for the year 2019 is 3.56 million tonnes showing an increase of 2.1% in comparison to landings in 2018 (3.49 million tonnes).

As per the latest estimation, the marine fish landings in India in 2019 was 3.56 million tonnes, showing a marginal 2.1% increase of about 73,770 tonnes compared to 3.49 million in 2018. Also it marks a recovery from 2018, when marine fish landings showed a decline of about 3.47 lakh tonnes (9%) compared to 3.83 million tonnes in 2017.

State-wise landings

Tamil Nadu grabbed the first position from Gujarat with 7.75 lakh tonnes of marine fish landings in 2019 compared to 7.02 lakh tonnes in 2018 (10.4% increase)

Weathering the Storms

The fact that marine fish landings improved in 2019 despite several extreme weather events is something that unpins hope.

In 2019, the Indian coast witnessed almost 8 cyclonic storms of which 6 turned out to be severe cyclones - Fani in April, Vayu in June, Hika in September, Kyarr in October, Maha in Oct-Nov and Bulbul in Oct-Nov which adversely affected fishing calendar days especially in the west coast.

accounting for 21.8% of the total landings in India.

The landings from Gujarat in 2019 is 7.49 lakh tonnes (21.0% of national total) showing reduction of 4.0% compared to 7.80 lakh tonnes in 2018.



COVER STORY

Kerala retained the third position with landings of 5.44 lakh tonnes (6.43 lakh tonnes in 2018). However, there was reduction in landings of about 0.99 lakh tonnes (15.4%) and the contribution from Kerala towards total landings in India dropped to 15.3% from 18.4% in 2018.

Among the maritime states and the two Union Territories, the highest rate of increase in marine fish landings was recorded by Daman & Diu with a 64% growth compared to 2018, followed by West Bengal (56%), Andhra Pradesh (34%), Odisha (15%), Karnataka (11%) and Tamil Nadu (10%). The sharpest decline in landings were recorded from Goa, where it reduced by 44% compared to 2018. The second biggest fall was from Maharashtra at 32% followed by Puducherry (19%), Kerala (15%) and Gujarat (4%).

Species-wise landings

It is worth noting that at the national level, Redtoothed

trigger fish (*Odonus niger*) became the major resource in the harvests with its landings increasing to 2.74 lakh tonnes from 72,140 tonnes in 2018. The second highest landings is 2.19 lakh tonnes of ribbon fishes followed by penaeid prawns 1.95 lakh tonnes, non-penaeid prawns 1.80 lakh tonnes, lesser sardines 1.71 lakh tonnes, Indian mackerel 1.62 lakh tonnes, threadfin breams 1.53 lakh tonnes and oil sardine 1.45 lakh tonnes.

The highest setback is for the Indian mackerel (*Rastrelliger kanagurta*) with huge reduction in its landings to the tune of 1.18 lakh tonnes at national level. Indian oil sardine (*Sardinella longiceps*) which used to be the highest contributor to India's marine fish basket, continued reduction in landings with 6% decrease compared to 2018.

In 2019, out of the total 3.56 million tonnes landings, 1.69 million tonnes (48%) is pelagic resources, 1.20 million tonnes (34%) is demersal resources, 0.44 million tonnes (12%) is crustaceans and 0.23 million tonnes (6%) is molluscs.



COVER STORY

Sector-wise landings

The mechanized sector contributed 2.98 million tonnes (83%) towards the total landings in 2019 which is 0.13 million tonnes more than that in 2018. The contribution by motorized and nonmotorized sectors are 0.56 million tonnes (16%) and 0.03 million tonnes (1%) respectively.

Region-wise contribution

In 2019, three regions that almost equally contributed to total landings were Southwest region with 1.08 million tonnes (30.3%), Southeast region with 1.7 million tonnes (30.0%) and Northwest region with 1.06 million tonnes (29.8%). The Northeast region contributed 0.35 million tonnes (9.9%).

Valuation of fish landings

The estimate of the value of marine fish landings during

Peak Time

Maximum landings took place during the period October-December with 1.21 million tonnes (34.0%), followed by 0.97 million tonnes (27.4%) during January - March, 0.76 million tonnes during July - September (21.3%) and 0.61 million tonnes during April - Jun (17.3%).

2019 at landing centre level was ₹60,881 crores, marking a 15.7% increase over 2018. The unit price per kg of fish at landing centre was ₹170.5, which was 12.2% higher than 2018.

Courtesy: ICAR-Central Marine Fisheries Research Institute (Marine Fish Landings in India 2019)





Carrying Life Within



V.K. Dey

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

Among the ornamental fish enthusiasts, livebearers hold a significant space. As the name suggests, livebearers are ornamental fish that retain the eggs inside the body and give birth to live, free-swimming young.

Why they are popular? Because, the advantages of livebearing to the aquarists are that the newborn juvenile fish are larger than newly-hatched fry, have chance of less mortality and are easier to care for.

All members of the family Poeciliidae include guppies, mollies, platies and swordtails are livebearers. The Unusual livebearers include seahorses and pipefish, where the males care for the young, and certain cichlids that are mouthbrooders, with the parent incubating the eggs in the buccal cavity.

Live bearers are again the most commonly exported fish to the EU from Singapore while Israel supplies gold fish and Koi carps for European garden ponds.

Among live bearers, the swordtail (*Xiphophorus maculatus*) and the platy (*X helleri*) are more attractive after guppy. With elongated lower tail fin rays to form a sword-like projection in the male, swordtails are a favourite and colourful addition to the ornamental fish industry. Though swordtails originated from the freshwater basins of Mexico and Honduras, there has been considerable hybridisation among the species and varieties domesticated by hobbyists.

Wild swordtails were introduced into the USA a century ago and into Asia about 50 years ago. While the wild swordtail has a greenish-silver sheen with a hyaline tail with greenish tinge, the aquarium varieties are bright red and wag-tailed. Three fin shapes which exist in the sword tail are lyre tail, high fin and veil tail with numerous colour patterns from blood-red sword tail

with solid red body to gold with xanthic body colour. Like the swordtail, the platy also lives in similar environmental and water conditions but prefers stretches of water in their natural habitat. There are more than 15 colour patterns of platy that are available in the market today. The wild-type platy has a definite black crescent-moon pattern in the caudal peduncle. The swordtail and platy hybridise easily and hence have numerous colour and fin patterns.

The molly (*Poecilia sphenops*) is a native of north Mexico, Central America to the northern parts of South America. It can tolerate extreme conditions of temperature and salinity. The sailfin molly (*P latipinna*) is a native of fresh and brackish water environs of Mexico, which later established in Central America. As the male fish has an enlarged dorsal fin, they are called sailfin molly. They are also found in numerous colour patterns, golden sailfin with bright orange spots to variegated with brownish orange background with silver spots.

Currently about 25 strains of molly are being cultured and traded in the market with the well-known black molly. Most of the mollies cultured today are the hybrids between two species and have exotic names like gold dust, starburst, copper topaz, opal etc. The molly is very hardy and can withstand any adverse conditions. However, they are not as popular as the guppy, platy or swordtail.

Calm and collected, livebearers are often called the most peaceful among ornamental fish community. They are mostly valued for their sturdiness and quick adaptability to different habitats. No wonder, livebearers are often the first fish many aquarium enthusiasts prefer to start their hobby with. They can truly light up your world with their colours.



Expanding the Scope of Aquaculture Sustainability Certification Schemes

A recent study published in the journal Global Environmental Change has highlighted the need to expand the scope of the existing sustainability certification schemes

Nations across the globe give special emphasis on developing aquaculture due to its ability to produce nutritious seafood. However, the sector is often criticised for unsustainable production practices. For this reason, sustainability certification has become an increasingly important feature in aquaculture production. A recent study published in the journal Global Environmental Change has reviewed the metrics and methodology of eight global sustainability certification schemes for aquaculture: ASC, GLOBAL GAP, Global Aquaculture Alliance (GAA), BRC Global Standards, International Featured Standards (IFS), Scottish Salmon Producers' Organisation (SSPO), Royal Society for the Prevention of Cruelty to Animals (RSPCA), and Friend of the Sea (FOS).

and do not address sustainability as a whole, nor do they complement each other. Sustainability is a comprehensive concept, but if the cultural and economic issues are to be addressed in aquaculture, the scope of certification schemes must be expanded, the study says. In addition, there are other limitations to sustainability certification, such as a narrow focus confined to production sites, exclusion of smallholders, and democratic deficit lacking representation from those who are affected by certification. The proliferation of such certification schemes and eco-labels confuse consumers who find it difficult to navigate and ultimately reduce the credibility of the aquaculture industry.

Wheel of Sustainability

The study found these certification schemes predominantly focus on the environmental domain

The researchers suggest adopting the "wheel of sustainability" model when creating certification



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AQUACULTURE SCENE

schemes. This concept defines four elements of sustainability: economics, environment, governance and culture.

By adopting this model, the schemes could provide practical and concrete ways for aquaculture firms to achieve sustainability benchmarks. The economic domain concerns the impact a commercial factor has on the surrounding community, through economic contribution and responsible use and management of resources.

The environmental domain focuses on the interconnections between human activity and the surrounding ecosystem. Environmental conditions range from the untouched to the modified, and this domain emphasizes humans' responsibility to limit their impact on nature, while still acknowledging their place in it. The governance domain emphasize basic issues of social power through the regulation and provision of public goods and services. This includes how the industry is regulated on a public level, but encompasses also norms and practices initiated on a company-level.

The cultural domain addresses issues relating to the role of the organisation in society, acknowledging that business actors like other actors in the community

bear a responsibility for the wider social fabric of their communities.

Applying the Concept

The analysis found that the certification schemes do not complement each other in addressing the many different aspects of sustainability. Eight of the most widely used certification schemes predominantly emphasizes issues relevant for environmental concerns and governance.

"The concept as defined by these schemes does not capture the intricate reality of aquaculture production, but rather promotes a skewed definition that largely ignores the economic and cultural aspects that are central to a panoptic perspective on sustainability," the study report says. The Wheel of Sustainability can be a reference model for improving these certification schemes. Furthermore, the model can contribute to the general understanding of how to improve the industry, as well as influence initiatives in other industries.

Excerpts from study 'The operationalisation of sustainability: Sustainable aquaculture production as defined by certification schemes' published on www.sciencedirect.com





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Impact of stress in fish disease

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ABSTRACT:

Over the last three decades, the commercial aquaculture has experienced spectacular growth. In spite of the unprecedented development of the intensified culture practices many economical problems have arise that are threatening the sustainability of culture systems. The root cause for all is stress. The word, "stress" is very common but reflects vast effective results. It is an invisible factor, influencing the survivability, growth, reproduction, production etc. In aquaculture, the stress plays major role on production, productivity, sustainability of the culture and economic loss and degradation of economic standards. A summation of causes for the acute and chronic stressors will enlighten the aqua farmers, scientists and fishery officials in designing environmentally friendly controlling measures, in obtaining higher yields.

Key words: fish, stressors, impact, controlling measures.

INTRODUCTION:

The aquaculture has been the fastest growing food production system since four decades. Besides fetching sizable foreign exchange revenue, it also provides the nutritional security, globally. The aquatic animals, fish and prawn promote human health. Consumers have become more and more critical about fish, shrimp quality, fish welfare and the negative effects of the aquaculture production sector on the environment. In the last decade, the expansion and intensification of culture practices have given rise to the stress factor. The welfare aspects such as the impact of chronic stress on aquatic animals (fish and shrimp) have gained interest.

Stress is defined as physical or chemical factors that cause bodily reactions that may contribute to disease and death. Many potential fish disease pathogens are continually present in the water, soil, air or fish

(Rottmann et al, 1992). In nature, fish are often resistant to these pathogens, and they are able to seek the best living conditions available. Food fish reared under commercial aquaculture conditions are confined to the production unit and are weekend by stress conditions including:

- 1) The intensified / increased fish stocking densities and deteriorated water quality (low dissolved oxygen, undesirable temperature, pH, increased levels of carbondioxide, ammonia, nitrite, hydrogen sulphide, organic matter in water).
- 2) Injury during handling (i.e. capture, sorting, shipping).
- 3) Inadequate nutrition
- 4) poor biosecurity measures and
- 5) Poor sanitation
- 6) Environment.

These conditions result in decreased resistance by the fish, resulting in the spread of disease and parasite infestation. Stress and injury initially trigger an alarm reaction, which results in a series of changes within the fish. A blood sugar increase occurs in response to hormone secretion from the adrenal gland as liver glycogen is metabolized. This produces a burst of energy which prepare the animal for an emergency situation. In addition, inflammatory response, a defence used by fish against invading disease organisms, is suppressed by hormones released from the adrenal gland. Water balance in the fish (osmoregulation) is disrupted due to changes in the metabolism of minerals. Under these circumstances, freshwater salt water fish lose water to the environment (dehydrate) fish absorb excessive amounts of water from the environment (over dehydrate). This disruption increases energy requirements for osmoregulation. Respiration increases, blood pressure increases and reserve red blood cells are released into the blood stream.

Fish will adapt to stress for a period of time, they may look and act normal. However, energy reserves are eventually depleted and hormone imbalance occurs, suppressing their immune system and increasing their susceptibility to infectious diseases.

AQUACULTURE SCENE

MATERIALS AND METHODS:

The data is documented from July 2019 to May 2020 from the observations of experimental ponds of Fisheries Research Station (SVVU, Undi, West Godavari).

RESULTS AND DISCUSSION:

The below mentioned are some of the barriers in protecting against the disease causing pathogens.

Defence against infection:

Mucus: The mucus is the first physical barrier that inhibits entry of disease organisms from the environment into the fish. It is also a chemical barrier, containing enzymes and antibodies which can kill invading disease organisms. Mucus also lubricates the fish, aiding their movement through water, and is important for osmoregulation. An injury due to handling (capture, transport, sampling etc.) and certain chemicals in the water (poor water quality, disease treatments) remove or damage the mucous layer, reducing its effectiveness as a barrier against infection at a time when it is needed most. This damage decreases the chemical protection of the slime layer and also results in excessive uptake of water by freshwater fish and dehydration by salt water fish. Decreased lubrication causes the fish to expend more energy to swim at a time when its energy reserves are already depleted.

Scales and skin:

Scales and skin function as a physiological barrier which protects the fish. These are injured most commonly by handling, rough surfaces of tanks and by fighting caused by overcrowding or reproductive behaviour. Parasite infestation can also result in damage to skin, gills, fins and loss of scales. Damage to scales and skin of the fish can increase the susceptibility to infection. It also causes excessive uptake of water by freshwater fish or loss of water from marine species (osmotic stress). Fish which are heavily parasitized may die from bacterial infections which gained initial entrance to the fish's body through damaged areas in the skin.

Inflammation:

Inflammation is a natural immune response by the cells to a foreign protein, such as bacteria, virus, parasite, fungus or toxin. Inflammation is characterized by swelling, redness and loss of function. It is a protective response, an attempt by the body to wall off and destroy the invader.

Any stress causes hormonal changes which decreases the effectiveness of the inflammatory response. Temperature stress, particularly cold temperatures, can completely halt the activity of immune system, eliminating this defence against invading disease organisms. Excessively high temperatures are also extremely detrimental to the fish's ability to withstand infections. High water temperatures may favour rapid population growth of some pathogens. High temperatures also reduce the ability of the water to hold oxygen and increase the metabolic rate and resulting oxygen demand of the fish.

Antibodies:

Unlike inflammation and other nonspecific forms of protection, antibodies are compounds formed by the body to fight specific foreign proteins or organisms. The first exposure results in the formation of antibodies by the fish which will help protect it from future infection by the same organism. Exposure to sublethal concentrations of pathogens is important for fish to develop a competent immune system (Newman S.G. 1999). Aquatic animals raised in a sterile environment will have little protection from disease. Younger ones may not have as effective an immune response as older animals and therefore, may be more susceptible to pathogens in the environment.

Stress impairs the production and release of antibodies. Temperature stress, particularly rapid changes in temperature, severely limits the fish's ability to release antibodies, giving the invader, time to reproduce and overwhelm the fish. Prolonged stress reduces the effectiveness of the immune system, increasing the opportunities for disease causing organisms.

Disease prevention:

Lot of literature is available on the diagnosis and treatment of specific fish diseases; however, prevention through good management practices is the best control measures to minimize disease problems and fish kills. Good management involves maintaining good water quality, preventing injury and stress during handling providing good nutrition, and using sanitation procedures. The following are management practices that help prevent stress and the resulting fish kills.

Water quality:

1. The stocking density should not exceed the carrying capacity of fish in culture ponds.
2. Regular monitoring of water quality parameters in culture ponds.

AQUACULTURE SCENE

3. Dissolved oxygen levels should be maintained above 5 mg/l. Low level of dissolved oxygen leads to stress which result in mortality of fish.

4. The accumulation of organic wastes, nitrogenous wastes (ammonia and nitrite), carbon dioxide and Hydrogen Sulphide should be prevented.

5. The physico chemicals parameters like pH, alkalinity and temperature should be maintained at appropriate levels.

6. The existence of plankton and turbidity levels should be monitored regularly.

Handling and transporting:

1. Harvesting methods should be efficiently carried so that the physical injury and stress will be minimized.

2. The scale loss and injury occurrence can be reduced by the usage of knitted mesh nets rather than knotted nets.

3. Quick and gentleness in handling fish are of utmost important.

4. Minimize the number of times, the fish are lifted from the water, and work as quickly as possible when transferring fish.

5. At harvesting, the handle and transport fish at times when fish are least susceptible to stress and infection.

6. The transport vehicle should be big enough, to allow complete freedom of movement of fish and also should not have any sharp corners or edges which might injure the fish.

7. Maintain optimum water conditions while hauling, capturing, handling and transport.

8. High levels of dissolved oxygen is very crucial for rapid recovery of fish from the struggle of capture and handling.

9. Salt of 0.3 to 1.0 % may be used in the transport water to minimize osmotic stress and bacterial infection of freshwater fish.

10. Ice may be added to the water during hauling to prevent an increase in water temperature which reduces the ability of the water to hold oxygen and increases the metabolic rate and resulting oxygen demand of fish.

Nutrition:

1. High quality of feed with all the nutritional requirements for the culturing sps. should be applied.

2. Over feeding and under feeding should be avoided and feeding rate should be proper.

3. Store feed in a cool dry place to prevent deterioration. If available, a freezer is ideal for storing fish feed.

Sanitation:

1. Before stocking of seed, it should be diagnosed for bacterial, viral and parasitic disease. They should be quarantined and observed for mortality.

2. The supplying water should be highly filtered (through 100-150 micron filters) before it enters the culture ponds.

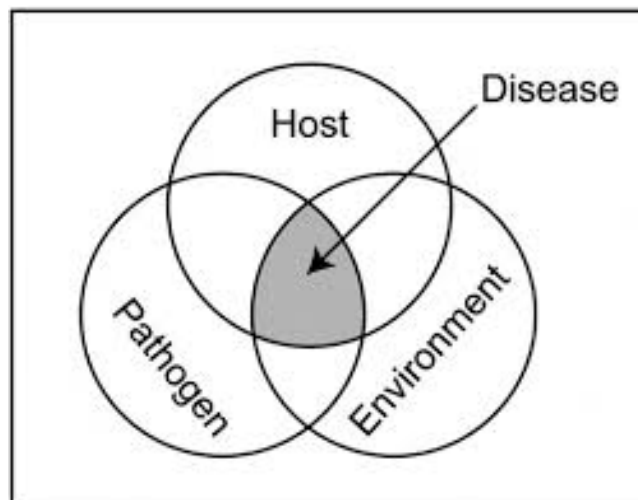
3. On observation, the dead fish should be immediately removed from the culture ponds.

4. To minimise the transmission of parasites and disease from one pond to another, the nets and other equipments should be disinfected.

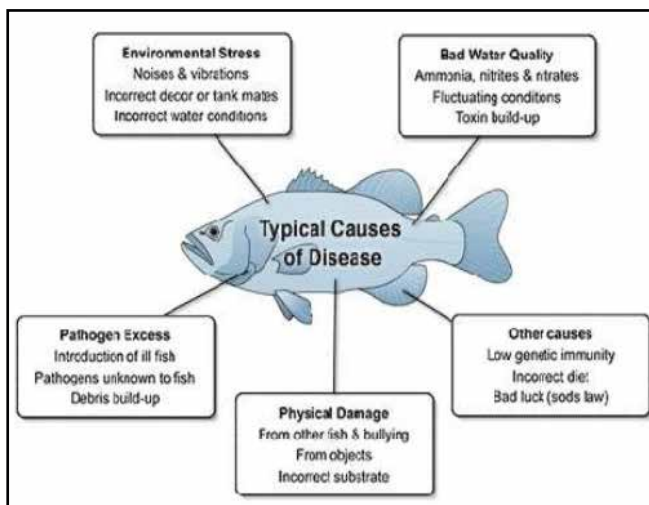
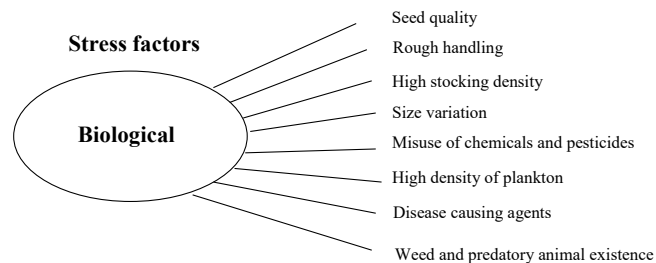
5. Good sanitation practices should be followed at the culturing area and also by the workers at the farm.

Environment:

The environmental stressors to some extent can be expected and many may be suppressing. The low dissolved levels and high levels of algal toxins and toxic pollutants play a crucial role in causing stress.



AQUACULTURE SCENE



CONCLUSION:

Stress plays a very important role in susceptibility to disease and the outcome of the disease process. Either external or internal, it disturbs the normal physiological balance, natural phenomenon and it is impossible for life to exist without it. In its benevolent form it shapes evolutionary progress and strengthen a species ability to survive. In its malevolent form it weakens animals to the point where their normal physiological processes no longer can protect the host against the onslaught of pathogenic organisms (Plumb J.A. 1999).

Stress comprises the fish's natural defences against invading pathogens. When disease outbreaks occur, the underlying stress factors, as well as the disease organisms, should be identified. Correcting stress factors should precede or accompany chemical disease treatments. A disease treatment is only an artificial way of slowing down an infection so that the fish's immune system has time to respond. Any stress which adversely affects the fish will result in an ongoing disease problem. Prevention of disease outbreaks is more cost effective than treating dying fish.

Hence the key to management of stress in the farmed fish is avoidance through the use of enlightened animal husbandry techniques, optimization of animal genetic tolerance, appropriate nutritional and feeding strategies

and the selective use of biologically active compounds to promote heightened immunity during times of stress.



Diseases in carps

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Plant Based Seafood: An alternative opportunity for food sector

Dr. Shine Kumar C.S, Sakthivel. A and Velu Anand K.

Soya milk is a plant-based milk which is the most developed imitated food. Similar to this other plant-based dairy, plant-based meat and egg are also available in food market. Plant based seafood is a relatively new category.

Highly intensive aquaculture production systems

are contributing to global warming and causing environmental concerns. Plant-based fish are a safe, mercury-free alternative that still provides necessary protein. They also lessen the guilt that is associated with overfishing that comes with eating seafood. "Plant-based seafood provides a host of environmental benefits, including alleviating pressures on rapidly

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depleting fisheries, providing relief to fragile ocean ecosystems, reducing the impact of fishing nets on the ocean plastic problem. A number of restaurants in the US have already started serving plant based shrimp and seafood as part of their menu.

The recent coronavirus outbreak has created additional pressures, including shortages of items in grocery stores. All of these factors have created a combination that is pushing consumers toward a dinner plate filled with plant-based fish instead of regular ones. Another advantage that consumers and companies need to consider is the ability to make plant-based fish shelf-stable.

Scenario in US Meat Industry

The traditional US Meat and Seafood Industry has been increasingly concerned about the impact of the

plant based alternatives. This is especially on account of many of the safety, hygiene and health compliances required for them which are relatively less stringent on plant based manufacturers. Further, plant based meat production has not faced issues with labour as regular meat processors have in the recent past.

This has led the US Meat Processing industry to lobby for a newly introduced federal legislation, the Real MEAT Act (“Marketing Edible Artificials Truthfully”). This Act requires meaty products that don’t come from slaughtered animals to be prominently labelled as “**imitation**.” This bill was introduced in the US Congress, in October, 2019.

What is plant based Shrimp?

Plant-based shrimp is an imitation shrimp produced



from seaweed and other natural ingredients. . Flavor of this product comes from all natural plant extracts that offer briny, lightly savory and subtly sweet notes that taste like shrimp. Imitation Shrimp does not contain animal products or ingredients derived from genetically modified sources. There will be zero cholesterol, fewer calories, and less shellfish allergens compared to oceanic shrimp.

Effect of plant based seafood on Indian seafood Industry

USA is the major seafood importer in the world and India's top seafood exporting destination. During 2019-20, India has exported 3,05,178 MT of seafood with a value of USD 2562.54 million. Frozen shrimp

is the principal item of export to U.S. from India and during 2019-20 India has exported 2,85,904 MT with a value of USD 2448.13 million.

95% of India's seafood export to U.S. is contributed by frozen shrimps. It may be noted that Section 609 US Public Law for protection of sea turtle by-catch has restricted the export of wild caught shrimp from India since 2019 onwards. Anti-dumping duty (ADD) on frozen shrimp is also affecting the shrimp export from India since 2004 onwards.

Marine Mammal Protection Act (MMPA) will be implemented from 1st Jan 2022 and this will restrict the import of seafood from India to United States. These trade restrictions/barriers and increasing demand for



imitation seafood may affect the export of seafood from India to U.S in near future.

Seafood exporters can diversify their products by producing plant based seafood which seems to have growing demand amongst vegetarian and non-vegetarian customers. This will help in increasing the value addition by creating a sustainable and healthy food system and effective utilization of agricultural resources.

It will also reduce the fishing pressure and pave way for improving sustainable fishing practices in the fishery sector. Plant based shrimp often obtain its protein base from seaweed and other natural source.

Hence, this will be an opportunity to boost seaweed cultivation and promote seaweed based industry for producing plant-based imitation seafood in India and export to U.S.

Requirement of value addition is a need of the hour and imitation seafood products also may be promoted which is gaining market in U.S.

Government assistance is required in areas like investment, entrepreneurship and R & D to promote production & export of plant based imitation products in seafood sector. Suitable export policies, incentives & financial assistance schemes are required for growth of this sector in India.



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MPEDA opens new lab at Porbandar, renovates Bhubaneswar lab facility

MPEDA has strengthened its QC Lab at Nayapally in Bhubaneswar with state-of-the-art technology and launched a new one at Porbandar

The Marine Products Export Development Authority (MPEDA) opened its refurbished Quality Control Laboratory at Nayapally in Bhubaneswar, ensuring high-precision tests using state-of-the-art equipment that can also detect banned antibiotics.

MPEDA also opened a Quality Control Laboratory in Porbandar, facilitating tests for seafood processors and exporters to confirm product safety as per international regulatory requirements.

The Bhubaneswar facility, which has shifted to Raptani Bhavan was inaugurated by MPEDA Chairman Mr K

S Srinivas on August 15, will provide facilitate testing of antibiotic residue in farmed shrimps as per the regulatory requirements prescribed by the importing countries and the Export Inspection Council (EIC) of India as well. The lab will also issue PHT (pre-harvest test) certificates to aquaculture famers as per the regulatory requirements for export of farmed shrimps to the European Union.

The lab will pursue accreditation by the National Accreditation Board for Testing and Calibration Laboratories (NABL) as per ISO/IEC 17025:2017 and



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approval by the Export Inspection Council (EIC) soon after inauguration.

The lab is strategically located to ensure processing and export of residue-free shrimps produced in not just Odisha but neighbouring West Bengal as well.

The Nayapalli laboratory has sophisticated devices such as liquid chromatography tandem mass spectrometers, high-performance liquid chromatographs and automated ELISA reader. The test parameters include nitrofurans metabolites, chloramphenicol, nitroimidazole, sulphonamides, quinolones, fluoroquinolones and tetracyclines with 4-epimers.

The inaugural ceremony over video-conferencing was held in the presence of Fisheries and Animal Resource Development Department Commissioner-cum-Secretary Mr R Raghu Prasad IFS, MPEDA Director

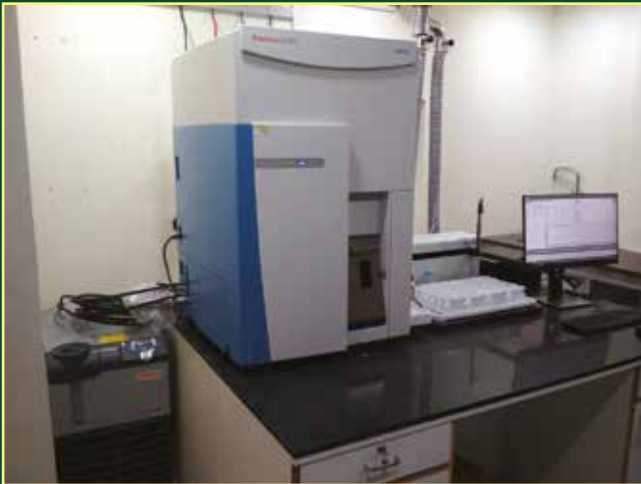
Dr M Karthikeyan, MPEDA Director (Marketing) Mr T Dolasankar IOFS, MPEDA Member Mr Aditya Dash, Seafood Exporters Association of India Managing Committee Member Tara Ranjan Patnaik, and its Odisha Regional President Dr Kamlesh Mishra.

Mr Srinivas noted that Odisha has shown an average annual growth of 13 per cent in the export of marine products over the past decade: from 21,311 metric tonnes (worth Rs 800 crore) in 2011-12 to 66,654 MT (Rs 3,243 crore in 2019-20).

Odisha is India's third-largest state producing cultured shrimp, with a 6.2 per cent share in the country's total shrimp production. When it comes to cultured shrimps of the exotic vannamei variety, the state has registered an average of 52% yearly growth in production: from 100 MT in 2012-13 to 44,007 MT in 2019-20.



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Odisha's seafood finds major markets in China (37 per cent) and USA (36 per cent). The other countries that buy the products are Japan and Southeast nations besides European.

Porbandar Facility

The state-of-the-art laboratory at Porbandar is equipped with advanced testing instruments such as ICP MS and LC MSMS to analyse antibiotic residues, heavy-metals such as Cadmium, Lead, Mercury and Arsenic in seafood samples and Histamine in fishes like tuna and mackerel.

The set-up, with all support systems for accurate results, has begun efforts to secure accreditation by National Accreditation Board for Testing and Calibration Laboratories (NABL) and the Export Inspection Council. Present at the inaugural ceremony over video-conferencing, besides Mr Srinivas, were MPEDA Director Dr M Karthikeyan, Director (Marketing) Mr T Dolasankar IOFS, Seafood Exporters Association of India President Mr Jagdish Fofandi, its Gujarat region chief Mr Piyushbhai Fofandi and MPEDA Authority Member Mr Karshanbhai R Salet.

Gujarat has relatively low instances of antibiotic residue in seafood exports, yet a number of cephalopod consignments are rejected overseas due to the presence of heavy metals, mainly cadmium. This prompted MPEDA, under the Union Ministry of Commerce & Industry, to set up QC lab in Porbandar to test seafood samples, Mr Srinivas said.

The state comes second only to Tamil Nadu in marine fish landings, contributing 7.49 lakh tonnes in 2019, as per CMFRI data. Gujarat is also making strides in shrimp farming, producing 73,842 tonnes of the product (from 9,709 hectares) and 1,890 MT of scampi.

During 2019-20, Gujarat exported 27,9750 MT of seafood worth Rs 5019.49 crore (\$716.25 million). The major export items are frozen fin fish, frozen cephalopods, dried items and frozen shrimp in terms of quantity. Value-wise, fish is the principal item.

Gujarat's major markets for seafood exports are China, European Union, South-East Asia, Japan and USA. The state is also a major exporter of surimi to markets, primarily Japan.





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Treat fisheries as essential service like agriculture: Study

In wake of the pandemic and its impact on fisheries, researchers from Madras Institute of Developmental Studies have pointed that resilience can be built in the sector, if it is treated as important as agriculture. The State government, imposed a total ban on fisheries when India went into lockdown from March 24. Fisheries, unlike agriculture, was not considered an essential service.

Until mid-April, fishermen did not venture into the sea. The study by Ajit Menon and Maarten Bavinck looked into the cumulative impact of the pandemic and has proposed remedial and rehabilitation measures. After repeated complaints from fishers and fish workers, the Government of India relaxed restrictions and issued model Standard Operating Procedures (SOP) on April 10, to include marine fisheries and aquaculture, movement of fish and movement of workers along the fishery value chain and subsequently inland fisheries from April 15.

Despite these measures, the fisheries economy suffered as the trawl fishing ban was put into place from April 15- June 14. "The government's relief package did not compensate for the average earnings of fishers and fish workers. Moreover, the usual support given by the Tamil Nadu Fishermen Welfare Board excluded the most vulnerable groups, such as women fish vendors," the study pointed.

In order to build long term resilience, the Fisheries Department should set a minimum floor price for all species for the small-scale fisheries, based on market data, similar to the minimum support price for major crops, the study suggested adding that they can also provide collective support such as micro-credit, cold storage and building safe market infrastructure.

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New freshwater fish identified in the Ganga

Researchers from Kerala and West Bengal have identified a new species of freshwater fish from the Ganga in West Bengal.

The fish, which is edible, has been christened *Systemus gracilus* for its thin and compressed body. 'Gracilus' means slim in Latin. This fish can be cultured in inland waterbodies.

The fish was discovered, scientifically named, and described by Mathews Plamoottil, Head of Zoology Department, Government College, Chavara, Kollam, and Debargya Maji, an young researcher with the Central Inland Fisheries Research Institute, Kolkata. The latest issue of *Journal of Experimental Zoology* has published an article on the discovery.

The fish, which has a light reddish-white body and fins,

was discovered from Naihati, West Bengal. *Systemus* is a genus in the family Cyprinidae. *Systemus gracilus* can be distinguished from other species of the genus by its high and strongly compressed body, tiny barbels, and anal fin with six branched rays. The collected specimens were of 11 to 12 cm in length.

Specimens have been deposited with the Zoological Survey of India museums at Pune and Port Blair. The fish has also received zoo bank register number from the International Commission of Zoological Nomenclature, Dr. Plamoottil said.

The research was funded by the Core Research Grant of SERB, Department of Science and Technology, Government of India.

-www.thehindu.com



FISHCOPFED signs MoU to promote fisheries

A national level apex body of fishery cooperatives- Fishcopfed has signed an Memorandum of Understanding (MoU) with the Uttar Pradesh based Shobhit Institute of Engineering & Technology, Meerut. On behalf of Fishcopfed, Managing Director, B. K. Mishra signed the MoU with Shobhit University Prof Moni Madaswamy.

The objective of the MoU is to develop appropriate human resources for rural India and strengthen Research- Farmer- Extension Linkage in Fisheries Cooperative Sector by undertaking collaborative initiatives through academic and research programs and Fishery Informatics Network for Digitalized Value Chain. As soon as MoU was signed between the two organizations, Kumar Shekhar Vijendra, Chancellor of Shobhit University extended the greetings to Fishcopfed through his facebook post.

According to the MoU, "Both the Parties wish to strike jointly to make significant contributions to promote Fisheries Informatics Network for Digitalised Value Chain in Fisheries Marketing, through Training, Research, Consultancy, Documentation, Dissemination, Education and Policy Advocacy. Both the Parties desire to encourage, establish and maintain exchange programs, collaborative training, consultancy, research, documentation, education, policy advocacy and developmental activities in Fisheries Marketing and

other related areas, to empower fishery cooperatives, through digital technologies, in the country".

"Furthermore, both the parties wish to foster understanding between FISHCOPFED and Shobhit Institute of Engineering & Technology (Deemed to be University) to achieve this common goal. The agreement will remain valid for an unlimited period with the understanding that the appropriate authorities of either party may terminate this MoU with a written notice to the other party, three months before termination", it further reads. The agreement may be amended by mutual written consent of both the Institutions.

India has about 22,000 Primary Fisheries Cooperative Societies, 7500 Wholesale Agricultural Produces Markets and about 25000 Rural Markets. The Government initiatives such as eNAM and AGMARKNET Projects have brought in disruptive technologies in the agricultural marketing segment. To develop appropriate human resources for rural India and to strengthen Research-Farmer-Extension Linkage in Fisheries Cooperative Sector, the University desires to undertake collaborative initiatives through academic and research programs and Fishery Informatics Network for Digitalised Value Chain, with the FISHCOPFED, according to MoU.

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India's seafood exports pegged at 12,89,651 MT in FY 2019-20

India shipped 12,89,651 MT of seafood worth Rs 46,662.85 crore (USD 6.68 billion) during 2019-20, largely cushioning the adverse impact of the COVID-19 pandemic, Marine Products Export Development Authority (MPEDA) said here on 17.08.2020.

Frozen shrimp remained the major export item in terms of quantity and value followed by frozen fish while the USA and China turned out to be the major importers of India's seafood.

During the FY 2019-20, the export improved in rupee term by 0.16 per cent, but the quantity and US dollar value declined by 7.39 per cent and 0.74 per cent, respectively, MPEDA said in a statement.

In 2018-19, India had exported 13,92,559 MT of seafood worth Rs 46,589.37 crore (USD 6,728.50 million).

K. S. Srinivas, Chairman, MPEDA, said India managed to export 12,89,651 MT of seafood, despite the sluggish demand in its major export markets caused by the pandemic, which led to cancellation of several orders, reduced and delayed payments, slowdown of cargo movements and difficulty in getting new orders.

The decline in sea catch along the west coast due to reduced fishing days has also been a reason for the shortfall in quantity, he said.

"We missed the 7-billion-dollar target, though not

by a fair distance. However, exports are now likely to witness an uptick as lockdowns have been eased globally and there is an increased sale of value added products in retail chains. MPEDA's vision is to take Indian seafood exports to Rs one lakh crore by 2030," Srinivas said.

Frozen shrimp, which earned Rs 34,152.03 crore (USD 4,889.12 million), retained its position as the most significant item in the basket of seafood exports, accounting for a share of 50.58 per cent in quantity and 73.21 per cent of the total dollar earnings.

Shrimp exports during the period increased by 6.04 per cent in dollar value and 6.20 per cent in quantity.

The overall export of frozen shrimps during 2019-20 was pegged at 6,52,253 MT, which fetched foreign exchange worth USD 4,889.12 million.

USA, the largest market, imported (2, 85,904 MT) of frozen shrimp, followed by China (1, 45,710 MT), European Union (74,035 MT), Japan (38,961 MT), South East Asia (34,439 MT), and the Middle East (32,645 MT).

The export of Vannamei (white leg) shrimp increased from 4,18,128 MT to 5,12,189 MT in 2019-20.

Of the total Vannamei shrimp exports in value terms, USA accounted for 51.07 per cent, followed by China (21.81 per cent), European Union (8.19 per cent), South East Asia (4.73 per cent), Japan (4.51 per cent), and the Middle East (3.66 per cent).

USA also turned out to be the major market for Black Tiger shrimp with a share of 36.88 per cent in terms of value, followed by Japan (31.55 per cent) and European Union (10.40 per cent).

Frozen fish, the second largest export item, fetched Rs 3,610.01 crore (USD 513.60 million), accounting for 17.32 per cent in quantity and 7.69 per cent in dollar earnings.

However, the export of frozen fish declined by 34.11 per cent in quantity and 26.53 per cent in dollar value.

Export of frozen cuttlefish, pegged at 70,906 MT, showed a positive growth of 17.76 per cent in quantity, 1.71 per cent in rupee value and 1.45 per cent in dollar terms, and earned Rs 2,009.79 crore (286.40 USD million).

Export of chilled items, which is considered as a promising sector, also increased by 23.22 per cent, 2.53 per cent and 1.29 per cent in terms of quantity, rupee value and USD earnings, respectively. However, exports of frozen squid and dried items declined during the period.

Though live items also showed a decline of 28.41 per cent in terms of quantity, the unit value realisation increased from 5.49 to 6.37 USD this year, the statement said. As for overseas markets, the USA continued to be the major importer of Indian seafood in value terms with an import worth USD 2,562.54 million, accounting for a share of 38.37 per cent in terms of dollar value.

Exports to the US registered a growth of 8.25 per cent in quantity, 10.38 per cent in rupee value and 9.30 per cent in USD earnings. Frozen shrimp continued to be the principal item exported to that country and the exports of Vannamei shrimp showed a growth of 18.94 per cent in quantity and 19.02 per cent in dollar terms, it said.

China emerged as the largest seafood export destination from India in terms of quantity with an import of 3,29,479 MT worth USD 1,374.63 million, accounting for 25.55 per cent in quantity and 20.58 per cent in dollar terms. Exports to that country grew by 46.10 per cent in quantity and 69.47 per cent in USD value.

Frozen shrimp, the major item of exports to China, had a share of 44.22 per cent in quantity and 62.65 per cent in dollar value while the frozen fish had a share of 40.12 per cent in terms of quantity and 23.54 per cent in terms of value out of the total exports to China.

The European Union continued to be the third largest destination for Indian seafood with frozen shrimp, the major item of exports, registering an increase of 5.21 per cent and 1.63 per cent in quantity and dollar value, respectively.

South East Asia is the fourth largest market. However, overall exports to the countries in this region plummeted by 50.02 per cent in quantity, 53.32 per cent in rupee value and 53.90 per cent in dollar earnings.

Japan continued to be the fifth largest importer with a share of 6.09 per cent in quantity and 6.32 per cent in USD value terms, registering a growth of 0.02 per cent in rupee value. Frozen shrimp continued to be the major item of exports to Japan.

Exports to the Middle East also showed a growth of 5.04 per cent in rupee and 3.82 per cent in dollar terms, but marked a 4.72 per cent negative growth in quantity.

- www.economictimes.indiatimes.com

Research project on status of marine creatures launched

A research project to assess the status of 27 species of marine mammals and five species of sea turtles in Indian waters has been launched by the Central Marine Fisheries Research Institute (CMFRI). With a budget of Rs 5.66 crore, the project is funded by the Marine Products Export Development Authority (MPEDA) for three years, the CMFRI said in a statement here on Thursday. The study aims to address the information gap on the status of stocks of marine mammals as well as bycatch of sea turtles, the statement said. The research assumes significance in the context of emerging seafood trade-related challenges faced by the country.

The National Oceanic and Atmospheric Administration (NOAA), USA, had issued import provisions of Marine Mammal Protection Act (MMPA) stating that seafood exporting countries should not allow intentional killing of marine mammals in commercial fisheries. For exporting fish and fish products, the US had given a five-year exemption period starting January 1, 2017, to nations for developing regulatory programs by assessing marine mammal stocks, estimating bycatch, calculating bycatch limits, and reducing total bycatch.

Likewise, the US Public Law provides that shrimp products should not be imported unless the US certifies that the exporting nation harvests shrimp without adversely affecting sea turtles. Following this, the US banned import of shrimp from India from May 2018. Deputy Director General of Indian Council of Agricultural Research (ICAR) Dr JK Jena inaugurated a webinar during the launch of the project on Wednesday. According to him, the research project would bolster the preparedness of the country in meeting the challenge faced by the seafood export industry, and enhance the indigenous capacity to address the emerging

conservation concerns of marine mammals and sea turtles. Speaking on the occasion, Chairman of MPEDA K. S. Srinivas said the country is looking forward to this project, which is being implemented with the technical support of NOAA, with a hope that it would help solve the issues related to seafood export of the country. Marine acoustic research expert, University of Washington, Dr Kate Stafford, and Director, National Marine Fisheries Service (NOAA Fisheries) of USA, Dr Mridula Srinivasan shared their experiences in the use of advanced acoustic and Artificial Intelligence (AI)-based technologies in the marine mammal stock assessment in US waters.

They lauded the initiative and offered cutting-edge collaborative research support. CMFRI Director Dr A Gopalakrishnan recalled the achievements of scientists of the institute in the field of research on marine mammals and sea turtles. "Marine mammals and sea turtles play a key role in maintaining marine ecosystems. Considering the need for conservation, the Wildlife (Protection) Act 1972 listed the species of marine mammals and sea turtles under Schedule I," he said.

However, interaction on fisheries and other human interventions have negative effects on the population of the megafauna, Gopalakrishnan said. "This is evident from frequent reports on bycatch and stranding of these animals along the coastline of India. While government and non-government organisations have undertaken studies on distribution, biological and ecological characteristics, the information on status of stocks of marine mammals as well as bycatch of sea turtles are not available, he added.

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