



IFFO

THE MARINE INGREDIENTS ORGANISATION

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CONTENTS

IFFO NEWS

- 3 Editorial
 - IFFO's Annual Conference to analyse the role of marine ingredients
- 4 International Aquafeed Magazine—July column
- 5 Aquavision – Stavanger, Norway 6th – 7th June 2018
- 6 IFFO Response: Fishmeal in poultry diets
 - 2018 Global Aquaculture Summit (China)
- 7 IFFO Technical workshops in Peru and Chile
 - Seaweb Sustainable Seafood Summit, Barcelona
 - New IFFO applicant members
- 8 IFFO RS enjoys steady growth and continues outreach in South East Asia
- 21 Calendar

INDUSTRY NEWS

- 9 US could add \$655m to landings value with better by-product utilization
- 10 Researchers analyse sustainability, scalability of alternative aquaculture feed ingredients
 - Challenges replacing fishmeal in certain farmed fish diets
- 11 SFP releases Target 75 Reduction Fisheries Sector Report
- 12 Omega-3 experts and BASF agree category will benefit from new focus in innovation and marketing
- 13 EU Commission proposes a new fund to invest in the maritime economy and support fishing communities
- 14 Breakthrough in omega-3 understanding could revolutionize feed industry
- 16 Alternatives & Innovation
- 17 News in Brief



Spring and autumn are conference seasons, times when summer and winter holidays don't clash with the well-established and often much anticipated chances to get together with people in a similar line of work. Often events are close to each other in the calendar, competing for diary space and expense account budget but they provide opportunities to learn, share information and maintain those personal interactions that we humans enjoy.

Seeing a wide range of people in a short period of time, perhaps over consecutive events, also highlights trends in attitudes and a catch-phrase I am hearing a lot at the moment is "pre-competitive collaboration" – let's call it PCC. In these times of anti-trust regulations (is anyone else following the USA Bumblebee tuna company legal action?), you could be forgiven for running a mile if asked to sit down with competitors but, fortunately, there is enough wisdom around to realise some problems (a) cannot be solved by individual companies and (b) in no way constitute price fixing. Of course it helps if a group consists of buyers and sellers, and not just sellers alone, but these PCC mechanisms offer a way for industry to solve problems at a speed that would be impossible to do otherwise.

A great example of this is a group of ten of the largest seafood companies in the world, collectively known as SeaBos – Seafood Business for Ocean Stewardship. Lead by their CEO's to ensure fast

decision making, this group of companies is trying to join up science with industry and wild fisheries with aquaculture, to tackle the problems of sustainability. There is no competitive advantage being chased, just a need to solve problems that affect everyone in the seafood industry.

A recent call for more PCC was from Avrim Lazar of the Global Salmon Initiative (GSI), speaking at this year's Seaweb Sustainable Seafood Summit in Barcelona (19 – 21 June). Avrim described how GSI brought together salmon industry interests from Chile, the Faroes and Norway to collaborate on solutions to sea lice, which led to Chilean producers adopting solutions from the Faroe Islands.

There will be free-riders and by-standers who will get the benefits of these leaders solving industry problems but perhaps that is what leadership is about, taking the initiative even when others would prefer to do nothing. It certainly speaks very clearly about where these leading companies see their future.

In the marine ingredients industry, what challenges would our largest ten companies talk about if they were around a table? They are probably all IFFO members and we have our Annual Conference in Rome coming up (15th – 17th October) so the opportunity is there.

PCC – more of it please.

Andrew Mallison

Director General

IFFO's Annual Conference to analyse the role of marine ingredients



This year's IFFO Annual Conference will be held in the glorious city of Rome and the packed agenda will analyse the role of marine ingredients across the aquaculture and animal feed supply chains. This will be the 58th IFFO Annual Conference, in what has become the go to event for the marine ingredients industry. The conference gives companies a unique opportunity to create new business, share best practice and

gain access to the latest intelligence for the industry. It also provides a platform for the industry to communicate sustainable and responsible sourcing practices carried out across the supply chain.

IFFO's President Eduardo Goycoolea will lead and moderate a world class panel of industry leaders to discuss the perception and future development of the marine ingredients industry.

Panellists will include:

- Árni M. Mathiesen, Assistant Director-General, FAO Fisheries and Aquaculture Department
- Ole Eirik Lerøy, Chairman of the Board, Marine Harvest ASA, Norway
- Dr George Chamberlain, President, Global Aquaculture Alliance, U.S.A.
- Chris Ninnes, CEO, Aquaculture Stewardship Council, U.K.
- Jim Cannon, CEO, Sustainable Fisheries Partnership, U.S.A.
- Pål Korneliussen, Publisher, IntraFish Media, Norway

Goycoolea noted that “this panel will give us an opportunity to

ask the tough questions that our industry needs to confront to ensure continued prosperity and stability. We will discuss and challenge the many myths linked to the fishmeal and fish oil industry, including the common misconception that levels of production have been in decline, which has not been the case for over a decade.”

The event will run from 15th to 17th October and registration is now open via a [dedicated website](#). Registration is open to all and IFFO members receive 50% off, an early bird discount is also available until 17th August. The sponsors for this event include Intertek, Haarslev, Dupps, SGS, Blueline Foods, Coland and Teampower.

International Aquafeed Magazine—July column IFFO’s Neil Auchterlonie



It is always interesting when new publications of scientific research report and challenge the received wisdom that has often become unshakable over time according to the fallible characteristics of human nature. This week we were treated to one such scientific paper, which will undoubtedly destined to become a highly cited paper. Publishing in the journal “The Ecological Society of

America”, a team of authors led by Prof Ray Hilborn at the University of Washington, describes an investigation into the environmental costs of producing animal protein. In a review paper, the team looked at what they call Animal Source Foods, or ASF, over 148 other published studies in an attempt to understand how 4 different metrics for environmental impact varied for a number of different production systems. The metrics chosen were energy use, greenhouse-gas emissions, nutrient release, and acidifying compounds.

The authors themselves acknowledge some of the limitations of the data that they have drawn together for the analysis, as is good practice. The superior performance of aquaculture in relation to the efficient use of feed in terrestrial animal protein production has long been understood, but articles such as these are important because they bring into play a broader

comparison of the environmental impacts across different systems. Those environmental impacts, as assessed through a Life Cycle Assessment (LCA) approach are of interest to feed producers and policy-makers alike as they aim to take into account environmental impacts of formulations and production. Nowhere more than aquaculture have the myths become entrenched about environmental impact, and here we have a collation of data across many studies and an objective evaluation on which to base an analysis.

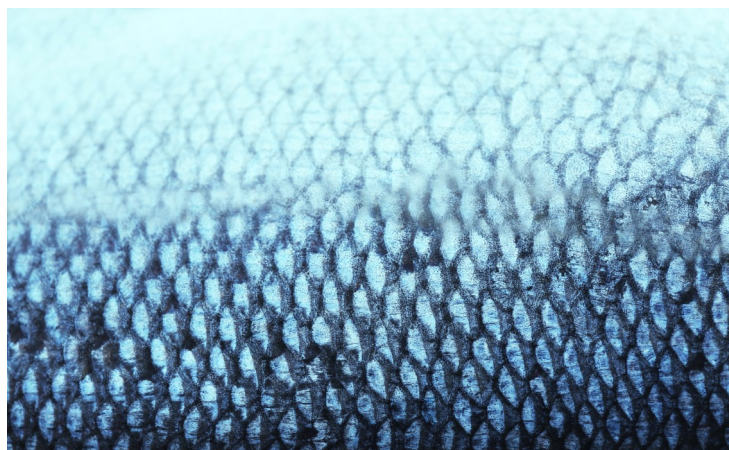
Hilborn and his team compared data for the four parameters across various aquaculture systems including carp, catfish, molluscs, salmon, shrimp and tilapia. As well as aquaculture, data for beef, chicken and pork were also included. Finally, a range of products from capture fisheries completed the data, arising from invertebrates (e.g. lobster), large pelagic, shrimp, small pelagic, and whitefish, giving a broad comparison across several different ASF types.

The analysis showed a wide degree of variation between the impacts for the different ASFs as may be expected. Within those impacts aquaculture showed both some expected results such as mollusc aquaculture presenting low environmental impacts, as well as perhaps some surprises (at least to some audiences) with, for example, salmon aquaculture scoring well across the range of metrics. Interestingly the comparatively good salmon figures were influenced positively by open netpen production systems which do not require energy for pumping water, aeration, and filtration. That is an important point during a time when there is so much interest in recirculation systems in the industry, largely driven by concerns in some quarters of environmental impacts, but those RAS are relatively

high energy users.

Very much of interest to the fishmeal and fish oil industry was the positioning of the small pelagic fish in the analysis, which also score extremely well. The reasoning proposed in the paper for this is that the fish are “caught in dense schools and require relatively little fuel consumption”. As this includes some of the raw material for the fishmeal and fish oil that goes into aquafeeds this is an excellent starting point, and although it is not the whole story in relation to aquaculture LCAs, it is again important to look at the figures objectively and categorise where the impacts occur across production systems.

The LCA approach provides a fine technique for an objective assessment, but there are some areas where the application is not straightforward (e.g. accounting for byproduct use in fishmeal and fish oil production sometimes includes foregoing impacts which may skew the impacts assessments, but the use of the material as a resource is entirely logical). That said, more studies such as these reporting over time are going to be useful



for the fishmeal, aquafeed and aquaculture industries in presenting the true story of our important food-producing industries, although there are some caveats which I look forward to discussing in a later article.

Aquavision – Stavanger, Norway 6th – 7th June 2018

The Aquavision conference is organised by Nutreco and is held every two years, concentrating on the future of aquaculture and featuring high profile international speakers and entrepreneurs. The conference was attended by IFFO Director General, Andrew Mallison (an invited speaker in 2016).

This year, the key note speaker was Mr Ban Ki Moon, formerly Secretary General of the United Nations – Mr Ban oversaw the launch of the United Nations Sustainable Development Goals and his presentation focussed heavily on the threat of climate change and the need for the business sector to forget competitive and geographical boundaries when seeking solutions and mitigations for global warming.

Other notable presentations were from Mr Knut Nesse, CEO of Nutreco, highlighting the need for business to overcome threats from disease, site capacity restrictions and market acceptance if the growth of aquaculture is to be maintained at a level to provide global food security. Collaboration is essential to meeting these challenges and Mr Nesse and HRH Crown Princess Victoria of Sweden also reviewed the work of SeaBos, an organisation representing some of the largest companies in the seafood sector and dedicated to global transformation and sustainability. For more details on SeaBos go to <http://keystonedialogues.earth/>

A driver for the growth of aquaculture is acceptance by younger consumers. A presentation by Nina Grieg, Business



Development Manager of Grieg Seafood ASA and Mads Martinsen, Marketing Director of Skretting Norway AS described a project where young adults had been asked about their views on aquaculture and its products, showing how little was known and how resources in schools and colleges to educate young people on this important industry were very limited.

Overall a thought provoking, highly professional and horizon scanning event.

IFFO Response: Fishmeal in poultry diets



IFFO's Neil Auchterlonie wrote the following response to an article posted on www.WATTAgNet.com titled 'Fishmeal in poultry diets: to use, or not to use?'

We read your recent article in Feed Strategy with some interest. Many of the points you reflected were accurate and pleasing to note, such as the importance of fishmeal in relation to managing health problems in poultry production. It was a little disappointing,

however, to read the comments within your "Cons" section towards the end of the article. In that small section you referred to issues with rancidity, putrefaction, disease (especially Salmonella) and the social/environmental image of using the product.

Some of those points are unfortunately repeated regularly in

the media, but in reality they do not reflect a true and accurate situation in the industry. Rancidity is managed through the use of antioxidants in fishmeal manufacture, putrefaction is addressed within regulations and production standards where there is a focus on raw material quality, and the same is true of Salmonella and other pathogens. Finally, the social and environmental image of the product is well short of what happens in practice. The stocks of fish which are used to produce 66% of global fishmeal (33% comes from byproducts such as trimmings and offal from processed seafood) are largely well managed, principally due to the highly productive nature of the fisheries and the nature of the small pelagic fish species life histories which makes stock assessment and management more straightforward than many of the food fisheries.

I thought it may interest you to know that the global fishmeal industry has been very active in taking up certification, and at this time something close to 50% of the global annual production is certified to the IFFO Responsible Supply (IFFO RS) standard. That standard looks at raw material supply for fishmeal production and assesses fish stocks in relation to specific clauses in the FAO's Code of Conduct for Responsible Fisheries. More information on IFFO RS may be found at www.iffors.com.

2018 Global Aquaculture Summit (China)



IFFO's China Market Analyst Meng Wang recently attended the 2018 Global Aquaculture Summit, held in Fuzhou on 31st May. The composite summit was organized by the China Aquatic Products Processing and Marketing Alliance, National

Fisheries Technology Extension Center, China Society of Fisheries, China-ASEAN Center for Joint Research and Promotion of Marine Aquaculture Technology, Yellow Sea Fisheries Research Institute of Chinese Academy of Fishery Sciences, Modern Shrimp & Crab Industry Technology Research System. The focus of the summit was to show the trends and latest developments in aquaculture industry of Southeast Asia and China. Around 500 delegates attended the summit.

Our Chinese members, Guangdong Evergreen Feed Industry co., Ltd. and Guangdong Haid Group Co., Ltd. were sponsored and supported the Summit. Meanwhile, Mr. Chen Dan, the present Chairman of Guangdong Evergreen Feed Industry Co., Ltd., provided an overview of opportunities and challenges faced by China aquaculture companies during their going Global.

IFFO Technical workshops in Peru and Chile

IFFO Technical hosted two workshops recently, one in Lima (Peru), and one in Concepcion (Chile). IFFO was represented by Alejandra Aguilar, Jorge Mora and Neil Auchterlonie, and these workshops were conceived as an opportunity to engage directly with the technical representatives of the IFFO member companies in Peru and Chile. Discussions were held in both English and Spanish, and with approximately 20-25 attendees in each workshop, the events were successful in achieving dialogue with technical specialists. A wide ranging summary of IFFO's technical work was presented, and the presentation may be viewed [here](#) by IFFO members who are looking for more information.



Seaweb Sustainable Seafood Summit, Barcelona



The Seaweb Summits have been held annually since 2002, growing from a small group of NGO's meeting with industry to discuss environmental concerns to an international conference attracting several hundred delegates. The debate has moved on from a more adversarial relationship to one where most NGO's recognise industry is making progress and where industry consults and partners with environmental groups on their sustainability agendas.

The conference covers both farmed and wild seafood so the program is broad and combines plenary sessions with breakouts to give choices of interest to delegates. The 2018 event was attended by IFFO Director General Andrew Mallison, participating in sessions on social standards,

traceability, attracting investment and fisheries management. Of particular interest to IFFO members were sessions on Byproducts and Sustainable Feeds. In the latter, Mr Mallison spoke from the floor to welcome the panel presenters positive view of marine ingredients and support the message that negative criticism of feed ingredients by competitors was harmful to the overall image of aquaculture.

Ray Hilborn presents at SeaWeb in Barcelona

Prof Ray Hilborn of the University of Washington in the US has been undertaking some project work for IFFO on forage fish stocks since 2015. Ray's work looks specifically at the interactions between forage fish stocks and the predator populations that predate on these fish species as a food source. The work challenges some of the assumptions in the Lenfest report about the need to limit exploitation of the fishery based on a need to leave enough fish in the water that marine mammals and seabird populations are not impacted by fishing pressure. Ray recently presented at the Seaweb conference in Barcelona, and members who may be interested in seeing a copy of his slides may access them [here](#).

New IFFO applicant members

(awaiting Board approval in October)

Country	Company	Category
USA	PolarBear Enterprise Inc	Premium

IFFO RS enjoys steady growth and continues outreach in South East Asia



As the years go by since the launching of the IFFO RS programme in 2010, the number of certified plants and countries covered have continued to increase. Since

the beginning of 2018, IFFO RS has welcomed 11 new IFFO RS certified plants and 1 new IFFO RS CoC certified plant bringing the number of countries covered by the IFFO RS programme to 24 and the total number of certified sites to 201.

This year we have continued to focus on South East Asia, as shown in our growth in certified sites in this region, and an example of this is a trip taken by our Francisco Aldon, General Manager and Nicola Clark Monitoring, Evaluation and Learning Coordinator. IFFO RS joined its first Seafood Task Force Meeting between 21st and 25th May 2018. Francisco and Nicola attended the meeting to gain a better understanding of the Task Force and how IFFO RS can effectively contribute, aligned with the IFFO RS strategy in SE Asia, specifically the IFFO RS Improver Programme. After an on-boarding session, the 8 sub-groups within the Task Force gave an overview of their progress

and successes as well as any current challenges and future expectations. The second part of the week focused on action, with each sub-group working to inform on any additional actions, update their work-plan for the next 6-12 months and exchange ideas between working groups where their goals overlap. On the final day, Nicola attended a field trip to visit a Feed Mill and a Fishmeal Plant to see the process and traceability systems they have in place.



Company	Country	Standard Type
Sarval Bio - Industrias Noroesete S.A.U	Spain	IFFO RS
Thai Union Manufacturing Co Ltd	Thailand	IFFO RS
Nouvelle Ougala	Morocco	IFFO RS
Sia Venta FM	Latvia	IFFO RS
Coomarpes Ltda	Argentina	IFFO RS
Pesquera Capricornio S.A	Peru	IFFO RS
Laayoune Proteine	Morocco	IFFO RS
Negocios Industriales Real NIRSA S.A	Ecuador	IFFO RS
IQI B.V	Netherlands	IFFO RS CoC
Kovie Vina Co Ltd	Vietnam	IFFO RS
Golden Prize Canning Co Ltd	Thailand	IFFO RS
Productos Pesqueros S.A PRODUPES	Ecuador	IFFO RS

US could add \$655m to landings value with better by-product utilization

The US landing utilization yield of 65% could be increased to Icelandic whitefish levels for (80%), the increase in volume of seafood utilization would be 655,000 metric tons, or the equivalent of \$169 million based on fishmeal prices. This was one of the findings of a new report published by Arctica Finance and Iceland Ocean Cluster on fish-related subjects, as part of the series titled "100% fish".

The primary aim of these articles is to draw more attention to the Icelandic fishing industry. "Iceland Ocean Cluster and Arctica Finance believe their partnership will create multiple exciting opportunities that will help drive further growth of the Icelandic fishing industry."

In the US, fishery by-products are mainly used for bait, fertilizer, animal feed and fishmeal. However, increased number of US companies are using by-products in more innovative ways such as Tidal Vision, which produces wallets from salmon skin and chitosan; RayFish Footware, which creates shoes from stingrays; and Neptune's Harvest, which makes fertilizers from fish by-products and seaweed.

Several companies also create gelatin from fish bones and other fish by-products, such as Norland Products, which creates gelatin and fish glue from coldwater fish skin. These companies, however, still operate on a relatively small-scale basis.

"For the purpose of gauging how much value is discarded in the US, and with some liberties, an attempt can be made to quantify the wasted value. Since fishmeal is a fairly low-value product, it can serve as a minimum salvage value benchmark for by-products."

Landed catch in the US amounted to 4.4m metric tons in

2016, according to the report. Based on a 65% utilization rate approximated by the Food and Agriculture Organisation of the United Nations, the volume of discards can be estimated at about 1.5m metric tons.

FAO calculates that 212 kilograms of fishmeal are produced from 1,000kg of raw fish, implying a yield of 21.2%. Based on that yield, 1.5m metric tons of discards would result in 320,000t of fishmeal.

In 2016, 253,000t of fishmeal was produced for a value of \$307.7m, which calculates to \$1,213/t of fishmeal. "Given that all by-products are used for fishmeal production and the price per metric ton of discard is \$257.3, the total dollar equivalent being discarded is \$393m."

Studies have indicated that in Iceland, approximately 77-80% of cod and other whitefish species are utilized. Overlaying the US seafood market with an 80% utilization rate in volume and value yields 874,000t in discards, 655,000t less than is currently being discarded, the report claimed.

"In terms of value, if these 655,000t of discards were only used for fishmeal, then the added value would amount to \$169m." However, "if the yield in the US (65%) could be increased to the Icelandic whitefish-yield

(80%), then the increase in [the] volume of seafood utilization would be 655,000t, or the equivalent of \$169m based on fishmeal prices". "Supposing that the US could receive 50% of the value of Icelandic cod by-products for 655,000t, the increase in value in the seafood market would amount to \$655m, or 12%."

Source: [Undercurrent News](#)



Researchers analyse sustainability, scalability of alternative aquaculture feed ingredients



In an industry with such a clear understanding of its challenges, undermining competitors to gain market share is self-defeating. So it's incumbent on the fish feed sector to find ways to develop alternative technologies together. Lukas Manomaitis, aquaculture program technical contractor with the US Soybean Export Council (USSEC), said at a feed panel during the SeaWeb Seafood Summit held in Barcelona last week that one of the biggest mistakes in the industry would be to promote an alternative ingredient as “the solution.”

The USSEC financed and recently released a study on the sustainability and scalability of protein alternatives, led by researchers Dane H. Klinger, Aquaculture Innovation Fellow at Conservation International, and Nathan Pelletier, Endowed Chair in Bio-economy Sustainability Management, Egg Industry Chair in Sustainability at the University of British Columbia.

The study looks into nutritional values of fishmeal, soybean meal, soy protein concentrate, feather meal, poultry meal, krill meal and soldier fly larvae meal for substitution purposes, scalability and market viability, and environmental impact. “The study focuses just on protein trade-offs and highlights the different properties of each of them and how the solution for feed composition will come from balancing these different ingredients,” Klinger told IntraFish. “It is an exciting opportunity to start having this conversation and to see that there is continuous dialogue in this field.”

Researchers looked into a range of fishmeal protein from different origins used at large scale in the composition of intensive aquaculture feed such as Peruvian anchovy and British Columbia herring byproduct meal. While both resources are fish-based, the large-scale anchovy fishery is an energy efficient operation, while the small-scale BC herring fishery is less energy -efficient, according to the report.

According to the study, protein contents are highest for poultry products, followed by soy protein concentrate and fishmeal. But the paper notes that despite the protein content of each component, additional research is needed to identify “semi-essential nutrients in fishmeal that may need to be replaced or supplemented when utilizing only non-fishmeal proteins.”

The study finds that overall, US soybean meal and Peruvian anchovy meal perform quite well across most impact categories relative to the other feed inputs. US soybean meal has the lowest estimated carbon footprint, followed closely by Peruvian anchovy.

Source: [Intrafish](#)

Challenges replacing fishmeal in certain farmed fish diets

The use of soybean meal to replace fishmeal in the diets of farmed Totoaba may be limited, say researchers.

As part of the process toward commercialization of *Totoaba macdonaldi*, researchers with several academic institutions in Mexico and Chile examined how much soybean meal (SBM) could be used in the diets to replace fishmeal (FM) without provoking negative responses in fish health. The group published its work in the journal *Aquaculture*.

“As SBM is a lower-cost protein alternative to FM, in the present work we evaluate the effect of graded levels of SBM on growth performance, digestive capacity, molecular expression,

distal intestine and liver integrity in juveniles of Totoaba macdonaldi, that may result in enteritis with detrimental outcomes in fish of commercial size,” they said.

The research team found that severe enteritis symptoms in the distal intestine and liver were produced when soybean meal (SBM) was included in amounts higher than 22% of the diet. There also was some evidence of impaired immunological response when much higher levels – 44% and 64% – were used.

“Results indicate a detrimental status of the digestive physiology of totoaba fed SBM-based diets at inclusion levels

above 22%,” said the researchers. *“Thus, suggesting that SBM should be cautiously used in totoaba feed formulations.”*

Results

Overall, the feeding trial found that there were some limitations to the use of soybean meal in the diets of *T. macdonadil*, the researchers said. The feed ingredient appears to alter the structure and physiology of the distal intestine and digestive enzyme activity when included at intermediate or higher levels.

“Our findings demonstrated a state of intestinal atrophy in totoaba caused by the exposure of high dietary SBM inclusion levels during the time,” they said. *“Therefore, the present work directly suggests that SBM should be cautiously used in totoaba feeds.”*

Growth at the end of the feeding trial was altered by diet, they said. Fish on the control diet outperformed those on the trial diets. The increasing level of SBM affected TGC, FCR, CF, PER and HSI, they said. Fish getting the diet with 64% SBM had reduced growth, higher FCR and worse condition factor scores compared to the control.

Similarly, fish on the control diet demonstrated no signs of morphological damage at week four or eight, the researchers said. Fish getting SBM demonstrated mucosal inflammation and intestinal damage, which increased linearly depending on the level of the alternative protein in the feed.

As the amount of SBM increased, the amount of mucosal fold (MF) atrophy also grew, they said. Dietary SBM also was found to support the development of lipid vacuoles in pancreatic tissue. The activity of several proteases and amylase in the intestine declined as levels of SBM were increased in the diet, they said. *“Although, l-aminopeptidase did not result in significant differences in total activity among treatments, a considerable decrease in intestinal activity was observed in the 44% and 64% SBM inclusion levels,”* they added.

In terms of gene expression, at four weeks there was an increase in the expression of interleukin for fish getting the diet with 22% SBM, however, results for the control and other trial diets were the same, they said. All diets had similar results at week eight.

Source: [Feed Navigator](#)

SFP releases Target 75 Reduction Fisheries Sector Report

About 41% of global reduction fisheries can be classified as sustainable or improving, and the key to the sector’s further improvement worldwide lies largely in Southeast Asia, according to the newest sector report released by Sustainable Fisheries Partnership (SFP).

The report is the latest sector report focused on SFP’s Target 75 Initiative, a global movement launched last year that sets the goal of seeing producers of 75% of the world’s seafood operating sustainably or improving toward sustainable production by the close of 2020.

Much of the currently sustainable or improving fisheries lie in the Atlantic/Pacific reduction fishery sub-sector, meaning work to improve the global sector should focus more on other regions.

“While Target 75 (for the sector overall) can only be achieved by expanding improvement efforts in Asian reduction fisheries, the path to close the gap to T75 is not yet clear. Higher-volume multispecies trawl and small pelagic fisheries must be investigated to identify the most likely candidates to contribute to improvement in this sector,” the report’s authors wrote.

“Reduction fisheries in South America and the North Atlantic

have made steady progress but there is a real challenge in achieving

improvements within Asian fishmeal fisheries and that’s where efforts need to be concentrated,” said Blake Lee-Harwood, Strategy Director at SFP. “Improving the

sustainability of mixed species trawl fisheries is not going to be easy but it’s a journey that has to be taken.”

To promote and effect greater positive change in the global sector, SFP highly recommends the use of supply chain roundtables (SRs) such as the European Sustainable Fishmeal, Latin American Reduction Fishery, and Southeast Asian Reduction Fishery SRs, which work to organize multiple FIPs in a sector, thereby streamlining the work required to improve sustainable seafood production.

Source: [SPE](#)



Omega-3 experts and BASF agree category will benefit from new focus in innovation and marketing

For well over a decade, potency has dominated clinical trial design, product launches and marketing claims, but still there remains a global omega-3 deficiency. In the USA, for example, approximately 60% of consumers are aware that including omega-3 supplements in their diet could benefit them, yet usage is estimated at only 20%.

Furthermore, while the global omega-3 supplements category has grown at low single digits from 2012-2017, it lags behind other VDS categories such as probiotics, vitamin D and protein supplements, all enjoying significantly higher growth rates in the same period. A conclusion is these categories have more successfully convinced consumers with innovation and marketing strategies to include these supplements in their daily dietary regime. Undoubtedly, there are some winning strategies the omega-3 category could learn from.

Leading industry experts agree with BASF that to stimulate faster growth in the omega-3 category, fundamental changes are required. Firstly, to ensure marketing claims are science-based, supported by correctly constructed studies. Secondly, to bring to market superior products with credible and appealing consumer benefits. Thirdly, to communicate these benefits effectively both to consumers and recommenders, converting awareness into regular purchases.

Leading omega-3 academic Professor Philip Calder is one who believes omega-3 clinical research design should be reconsidered: "Given the many applications fatty acids have, we need to make sure that evidence is more robust." He continues to talk about bioavailability as a marketing strategy: "I prefer to talk about enrichment of blood, cells and tissue

with EPA and DHA. Certainly, this is an opportunity for industry because it might enable people to get delivery of omega-3s with greater enrichment from a particular dose; or it might provide a means to deliver omega-3 fatty acids to people who have problems with digestion or absorption or with some other aspect of gastrointestinal function."

On the commercial side, Adam Ismail, former Executive Director of GOED, sees benefit-led claims communication as a long term industry opportunity. "If we want to make products consumers put in their mouths every day, they have to trust these products and the companies they buy them from. Claims are one way to do that, so we need to be better marketers of these types of claims in order to retain consumer trust."

BASF, with over 100 years' experience in omega-3 science and innovation, has concluded that prevalent potency benefits and claims are not enough to deliver what consumers want and need. Latest BASF scientific learning suggests EPA and DHA fatty acids must be absorbed into our body much more efficiently than most in-market supplements currently achieve, otherwise they will be wasted.

This perspective is supported by BASF consumer research which points to omega-3 absorption as a market-ready opportunity. Quantitative testing has indicated the high potential of absorption-based concepts to influence purchase intent among existing category consumers, and encouragingly, also lapsed and new consumers.

Chris Howell, Category Lead Omega-3 Nutrition says: "Our



mission is to help people live longer and stronger and we know omega-3s are scientifically proven to make a genuine difference. It's frustrating with many current omega-3 supplements that consumers likely won't get the claimed benefits, which they could if their supplements were properly absorbed. Our research across multiple markets revealed consumers easily understand the concept of absorption, and find the idea of getting more omega-3 to where it's needed particularly motivating. It's not so surprising, considering many other categories claim added benefits based on superior product functionality, thanks to additional technology that makes the original product better. This combination of new scientific and consumer insights encouraged BASF to focus innovation activities on omega-3 absorption, and led directly to the development of Accelon™."

Data from two single dose crossover studies show BASF's new

Accelon™ delivers a minimum of four times better absorption of omega-3 on an empty stomach in comparison to the same omega-3 oils without Accelon™ technology. The result is higher delivery of EPA and DHA to cells throughout the body. Even if taken with food, Accelon™ absorption is still 30% greater than with other omega-3s.

Øyvind Ihle, Head of Omega-3 Nutrition adds: "For brand owners, Accelon™ technology and absorption benefits are an omega-3 supplements' game changer. A validated opportunity to invest in today and leverage through innovation and marketing for the foreseeable future. We strongly believe this is how omega-3 brands will drive consumer usage and return the category to the levels of growth currently enjoyed by other supplements."

Source: [NutraIngredients](#)

EU Commission proposes a new fund to invest in the maritime economy and support fishing communities

For the next long-term EU budget 2021-2027, the Commission is proposing €6.14 billion under a simpler, more flexible fund for European fisheries and the maritime economy.

The new European Maritime and Fisheries Fund will continue to support the European fisheries sector towards more sustainable fishing practices, with a particular focus on supporting small-scale fishermen. It will also help unleash the growth potential of a sustainable blue economy towards a more prosperous future for coastal communities. For the first time, it will contribute to strengthening international ocean governance for safer, cleaner, more secure, and sustainably managed seas and oceans. Finally, the Commission is reinforcing the environmental impact of the Fund with a focus on protecting marine ecosystems and an expected contribution of 30% of its budget to climate change mitigation and adaptation, in line with the commitments agreed under the Paris Agreement.

Commissioner for Environment, Maritime Affairs and Fisheries, Karmenu Vella, said: "Healthy, well-managed oceans are a pre-condition for long-term investments and job creation in fisheries and the broader blue economy. As a global ocean actor and the world's fifth largest producer of seafood, the European Union has a strong responsibility to protect, conserve and sustainably use the oceans and their resources. The Fund will allow Member States and the Commission to live up to that



responsibility and invest into sustainable fisheries, food security, a thriving maritime economy, and healthy and productive seas and oceans."

Fisheries are vital to the livelihood and cultural heritage of many coastal communities in the EU. Together with aquaculture, they also contribute to food security and nutrition. A particular focus of the Fund will be to support small-scale coastal fishermen, with vessels below 12 metres, which represent half of European employment in the fishing sector. Since the reform of the Common Fisheries Policy in 2014, progress has been made in bringing fish stocks back to healthy



levels, in increasing the profitability of the EU's fishing industry, and in conserving marine ecosystems. The new Fund will continue to support these socio-economic and environmental objectives.

As regards the maritime economy, the Commission proposes to strengthen its support compared to the 2014-2020 period. This is a high-potential economic sector whose worldwide output is estimated at €1.3 trillion today and could more than double by 2030. The maritime fund will enable investment in new maritime markets, technologies and services such as ocean energy and marine biotechnology. Coastal communities will receive more and broader support to set up local partnerships and technology transfers in all blue economy sectors, including aquaculture and coastal tourism.

In the context of the United Nations' 2030 Agenda for Sustainable Development, the Union has also committed at international level to make seas and oceans safer, more secure,

cleaner and more sustainably managed. The new European Maritime and Fisheries Fund will support these commitments for better international ocean governance. It will, among others, also provide the necessary funding to improve maritime surveillance, security and coastguard cooperation.

To ensure that the fund is both efficient and effective, it comprises several new features, such as:

- Simplification and a wider choice for Member States, who will now be able to target support to their strategic priorities, instead of having to choose from a 'menu' of eligible actions.
- Better alignment with other European Union funds. Rules applying to all structural and investment funds are set out in a Common Provisions Regulation.
- A better targeting of support to the achievement of the Common Fisheries Policy.

Next Steps

A swift agreement on the overall long-term EU budget and its sectoral proposals is essential to ensure that EU funds start delivering results on the ground as soon as possible. Delays similar to the ones experienced at the beginning of the current 2014-2020 budgetary period would mean that the needs of fishermen, coastal communities and the protection of the marine environment they depend on will not be addressed with the required urgency.

An agreement on the next long-term budget in 2019 would provide for a seamless transition between the current long-term budget (2014-2020) and the new one, and would ensure predictability and continuity of funding to the benefit of all.

Source: [European Commission](#)

Breakthrough in omega-3 understanding could revolutionize feed industry

A new study, led by the University of Stirling in Scotland, has led to a major discovery about the way in which omega-3 long-chain polyunsaturated fatty acids are produced in the ocean. According to lead scientist Oscar Monroig from the university's Institute of Aquaculture, the breakthrough challenges the generally held principle that marine microbes, such as microalgae and bacteria, are responsible for virtually all primary production of omega-3 fatty acids, which are essential for human health, and have been proven to be particularly useful in combating and preventing cardiovascular and inflammatory diseases.

Instead, an international team of scientists from the United Kingdom, Portugal, Spain, Japan, and Australia found that omega-3s can be created by many marine invertebrates. "Our study provides a paradigm shift in understanding, as it demonstrates that a large variety of invertebrate animals, including corals, rotifers, molluscs, polychaetes and crustaceans, possess enzymes called 'desaturases' of a type that enable them to produce omega-3, an ability thought previously to exist almost exclusively in marine microbes," Monroig said.

Invertebrates form an important part of the biomass of many

marine ecosystems, including coral reefs, hydrothermal vents, and abyssal plains, which are underwater plains on the deep ocean floor that cover more than 50% of the earth's surface. As a result, the research team believes that these animals' contribution to the oceans' omega-3 production is likely to be significant.

David Ferrier, of the Scottish Oceans Institute at the University of St. Andrews, who undertook evolutionary analyses for the study, was surprised to find that the production of omega-3 in marine invertebrates appears to have happened through a process called horizontal gene transfer.

"This is a controversial theory, but we were surprised to see how widespread the genes responsible for omega-3 production were, particularly in animals that are so common and abundant in the sea," Ferrier said. "We are confident that horizontal gene transfer takes place between plants and fungi, into insects such as whitefly and springtail bugs, but we had not seen it in the marine environment before. However, our data looks rather convincing that these genes have transferred in at least some species."

Global demand for omega-3 fatty acids is growing, particularly from the health-supplement industry and as an ingredient in fish oil used in salmon farming and other forms of aquaculture. Given that fish oil supplies from wild-caught fish such as Peruvian anchoveta are finite, considerable effort and finance is being put in to finding and developing new sources, from algae, insect meal and advanced soy products, amongst others.

The research team hopes that their results may help to add to the basket of ingredients available to industry, Ferrier said. "In revolutionizing the way we think about omega-3 production,



we expect that our research will open the way for new combinations of enzyme sequences to be explored and give researchers and developers new material to play with," Ferrier said.

IFFO, the Marine Ingredients Organization, has been following the research closely, and is also pleased to learn of the potential for increased sources of omega-3 implied by the results. "Fish oil is the go-to resource for marine omega-3 fatty acids, but as the resource is finite there is unfortunately not enough to meet societal demands at the current time, nor is it likely to increase. The Western diet is acknowledged to be deficient in omega-3s, and IFFO supports the development of responsibly-produced alternatives that can supplement fish oil in achieving human and farmed animal health benefits," IFFO Technical Director Neil Auchterlonie told SeafoodSource.

Source: [Seafood Source](#)



US: KnipBio wins grant to explore health boost from novel protein



KnipBio is planning to examine how its novel protein feed ingredient interacts with other diet

components and is able to improve fish gut health and production, says CEO.

The Massachusetts-based biotech company announced that it had received a Small Business Innovation Research (SBIR) grant from the National Science Foundation (NSF) last week. The grant covers an exploration of multiple components in KnipBio meal (KBM) to find which are linked to growth and gut biome composition in salmonid species.

The goal of the research project is to examine some of the attributes that KnipBio has found during earlier feeding trials

using its novel, single-cell protein, said Larry Feinberg, CEO with KnipBio, Inc. *"We need to understand how we play in the sandbox with other ingredients,"* he added. *"We see ourselves as a component in feed, we're just an ingredient, and we need to understand better how we work with soy and other ingredients,"* he told FeedNavigator. *"And if we can have our ingredients provide better functionality ... then they can include more of a cheaper component."*

Early feeding trials showed that adding KBM to diets for some aquaculture species boosted gut health, reduced rates of enteritis and improved morality levels, the company said. The grant supports efforts to find the mechanism involved in allowing KBM to generate those results.

Source: [Feed Navigator](#)

Half-time for Veramaris' algal oil production facility in Nebraska



Veramaris, the DSM and Evonik joint venture algal oil production facility, has celebrated a

major milestone in the construction of its new production site in Blair, Nebraska. In the presence of Nebraska Lieutenant Governor Mike Foley, the management of Veramaris and the two parent companies Royal DSM and Evonik, a topping-out ceremony was held on 4 June 2018 in Blair, Nebraska.

The construction of the US\$ 200 million facility is progressing on-time and according to plan. Commercial quantities of algal oil will be ready for delivery in mid-2019. Pilot-scale quantities are already being supplied to selected feed producers and farmers for market development. The initial annual production capacity of the Nebraska plant will meet roughly 15% of the

total current annual demand for EPA and DHA by the global salmon aquaculture industry.

Veramaris uses locally sourced sugar in its fermentation process. The algae strain, *Schizochytrium*, which is applied, has the advantage of producing the essential omega-3 fatty acids EPA and DHA and the resulting oil has a concentration exceeding 50%. The production site will be entirely waste-free.

The successful product and process development was only possible thanks to the complementary competencies that Evonik and DSM bring to the collaboration: DSM has expertise in the cultivation of marine organisms including algae and long-established biotechnology capabilities in development and operations, whilst Evonik's focus has been on developing industrial biotechnology processes and operating competitively large-scale manufacturing sites for fermentative amino acids.

Source: [Veramaris](#)



BUSINESS

Hans Erik Bylling, CEO and owner of Aller Aqua, recently returned from the competition EY World Entrepreneur Of the Year 2018 (WEYO). The competition took place in Monaco where



sunshine, yachts, champagne and expensive hotels added glamour to the event. Hans Erik Bylling was in Monaco with Aller Aqua's co-owners Henrik T. Halken and Carsten

Jørgensen, as well as his son, Anders C. Bylling. Anders is the CEO of Aller Aqua Qingdao, the company's Chinese factory, as well as 4th generation in the family owned company.

"I know fish feed is not the most sexy product, but when you look at what we can achieve together with our customers and the aquaculture sector as a whole, it suddenly gets very interesting," explains Hans Erik. The visit to Monaco has been positive: "It is quite an experience to participate with so many skilled business people, all with amazing stories. We have learnt a lot, and we got many new contacts. We have returned to the office in Aller feeling inspired. We are also pleased with the positive publicity, for us as a company, but also for the aquaculture sector as a whole. I hope that the increased focus on aquaculture will open the public's eyes to the fact that aquaculture is a sustainable way of producing meat. We use fewer resources than any other meat production." Source:

[Aller Aqua](#)

BioMar targets 80% certified fishmeal, oil use by 2020. The group has managed to hit four out of five key performance indicator goals it had set itself with 2020 as a target. "BioMar has decided



to raise the bar further and have now set new targets for 2020." The announcement comes as the firm published its latest sustainability report, which takes an

in-depth look at the role and importance of traceability and data analytics in the future of sustainable aquaculture.

In 2015 BioMar set ambitious targets for the use of certified

products. These included 100% certification of all soy protein, krill and palm oil and 70% of all fishmeal and fish oil. While soy protein remains on track to achieve its 2020 objective, all other ingredients have met or exceeded expectations, the firm said. BioMar has now raised the bar on its targets for fishmeal and fish oil to 80% certified material by 2020.

By the end of 2018 BioMar aims to have finalized a full source-to-market sustainability rating of its entire raw material portfolio. "This comprehensive assessment tool will enable them to steer their raw material purchasing toward more sustainable solutions, and enable aquaculture farmers and the wider value chain to have a more complete understanding of the sustainability of every raw material found in aquaculture feed." Source: [Undercurrent News](#)

Skretting Ecuador has a long-term commitment to enabling the country's shrimp industry to sustainably increase its production while also reducing its exposure to risk. To empower farmers and

reduce farming costs, Skretting Ecuador has launched Skretting 360+, a concept proven to significantly boost



farm profitability. Skretting 360+ is a complete package of precision-based innovative tools, incorporating precision nutrition, farm management practices and proactive technical support, all delivered via the already successful Skretting AquaSim app.

Skretting 360+ provides a complete overview of the business, with full control of the total cycle. The development process began 20 years ago, when Skretting generated growth models for salmon and other fish species – the original AquaSim. Over the past 5 years, Skretting has been developing the concept for shrimp based on research, experimentation and validation.

Skretting Aquaculture Research Centre (ARC) has a dedicated team of shrimp researchers, centrally located in Norway. Research trials have been carried out at the Skretting ARC Hezhoubei Research Station in China, with validation trials at the Skretting Validation Station in Ecuador. On-farm validation under different conditions and challenges has taken place in Ecuador and Vietnam.

Skretting 360+ allows the farmer to hold the whole farm in their hand. It has the capability to benchmark the performance of each cycle and manage feed and harvest predictions custom-

BUSINESS

ised to every pond. The collection of essential real-time data enables teams to take proactive and preventative action to help customers get the maximum value from their farm in a sustainable and cost effective way. Source: [Skretting](#)

As the first business partner and a founding patron to the action platform, Cermaq has been active in the formation of the UN Global Compact Action Platform for Sustainable Ocean Business.



The action platform is launched on the World Oceans Day, at the United Nations headquarters in New York.

“We are very proud to be the first business partner for this initiative. As salmon farmers we depend on a healthy ocean and hence the Sustainable Development Goals are integrated in Cermaq’s strategy and in the way we do business. Ocean challenges must be solved through multi-stakeholder dialogue, between governments, businesses, research institutions and

civil society. In this action platform for sustainable ocean business we will develop a framework for leadership for the global goals and the ocean”, says Cermaq’s CEO Geir Molvik.

“We cannot meet the SDGs without the commitment and participation from the private sector. Cermaq is already engaged in partnerships for sustainability within the salmon industry (Global Salmon Initiative), the seafood industry (Seafood Business for Ocean Stewardship), and the food sector (FReSH). In the rise of the blue economy, the platform intends to build the foundations for a sustainable use of the ocean across the maritime industries. The multi-stakeholder setup including governments, demonstrates the commitment we all share especially with regards to SDG14 – Life below water”, continues Geir Molvik.

The UN Global Compact Action Platform for Sustainable Ocean Business will focus on growth, innovation and sustainability, exploring how to best protect the health of the ocean. It aims to mobilize the private sector to take tangible action, make investments and form partnerships to leverage the ocean as a resource to achieve the Global Goals. Source: [Cermaq](#)

COUNTRY

US Marine aquaculture development bill generates doubts. A



Senate’s bill intended to promote aquaculture development in federal waters is facing opposition from several groups, who are concerned it could bring marine floating factory farms to the

United States. Those opposing AQUAA Act (Advancing the Quality and Understanding of American Aquaculture), introduced by Senator Roger Wicker (Mississippi), believe that it would allow the federal government to permit industrial ocean fish farming in the US.

Some representatives of the opposition to the AQUAA Act, including a broad coalition of more than 100 organizations, consisting of commercial and recreational fishing groups, indigenous populations and consumer advocacy, food, farming and conservation organizations, are convinced that it will improperly place the new program under the Magnuson-Stevens Fishery Conservation and Management Act — a law

that has historically preserved the ocean ecosystems and protected wild fish stocks.

In response to the introduced bill, Hallie Templeton, Senior Oceans Campaigner for Friends of the Earth, stated that Congress is devastating the oceans, coastal communities and marine-reliant industries. Friends of the Earth joined other stakeholders, industries, and organizations who rely significantly on a healthy ocean ecosystem and sent a letter on June 6 to the Senate complaining that industrial marine finfish farming poses serious risks to the oceans, coastal communities, and public health.

The members of this group claim that farms cram thousands of fish into enormous floating net pens and cages, exposing wild fish stocks to pests and disease and risking massive farmed fish spills that further threaten wild fish. Source: [FIS](#)

The Norwegian government has set out its first detailed maritime strategy which includes the cultivation and harvesting of new fish species. Launching the plan, industry minister Torbjørn Røe Isaksen said: ‘The sea is one of the most important areas Norway will focus on in the future. Our

COUNTRY

coastline is one of the world's longest and we have sea space that is more than six times larger than our land area. The sea has always been important for Norway, and the sea will offer great opportunities for both jobs and growth in the economy in the future.'

He said that today some 214,000 people work in the marine sector which includes fish farming, conventional fishing, oil and marine related industries. It was an industry worth 500 billion kroner (almost £46 billion) a year. 'Every year we provide billions for research and innovation in the marine industries, through programmes in the Research Council and Innovation Norway.'

Several ministries, including fisheries, are working together on the project. Oslo also hopes it will become a driving force for strong international cooperation in this area. With this in mind, Norway's Prime Minister Erna Solberg, launched an international sea panel earlier this year. One of the priorities will be tackling marine pollution which is threatening conventional fishing.

The minister said the focus will be on: mapping opportunities for breeding new species and to facilitate harvesting of new species; mapping and monitoring the seabed; building environmentally friendly vessels; creating an international sea panel; combatting plastic and marine sewage; and fighting fishing related crime. Source: [Fish Update](#)

From Indonesia to Norway, China looking to invest in aquaculture overseas. The "Tropical Countries Aquaculture Science and



Technology Innovation Cooperation Group" is a little-known entity with a potentially enormous impact on future Asian aquaculture production trends. Operating out of the

China Academy of Fisheries, the entity shares Chinese know-how internationally. Speaking at a major aquaculture conference in Fuzhou recently, the academy's director, Li Jian, explained how investing overseas in agriculture and fisheries has become a new priority under the "One Belt, One Road" (OBOR) program, China's foreign policy blueprint of integrating regional and Middle Eastern countries into its

economy through new infrastructure, of which the 'New Maritime Silk Road' is part.

China sees Southeast Asia and Africa as part of the OBOR seafood initiative, with support in seawater cage aquaculture systems producing species like yellow croaker, grouper, cobia, and silver pomfret; according to Guan Chang Tao, the chief scientist for mariculture at the Fisheries Academy. He sees China's "outstanding resources" and "improved seed selection" as key for collaboration with developing countries in Asia and Africa.

On the same day as the conference in Fuzhou, Chinese media reported how Guinea – with which it has major trade relations – was seeking to expand its freshwater aquaculture and its poultry industries to become more self-sufficient. Likewise, Ecuador, another supplier of China's resource requirement, has cancelled import duties on many inputs for agriculture and fisheries in order to encourage more production at home.

Chinese companies have invested USD 180 billion (EUR 155 million) in overseas agriculture and fisheries across 140 countries up to 2016, according to Gu Wei Bing, the senior agriculture ministry official, speaking at the Fuzhou conference. Indeed, Chinese industrial companies seeking to diversify their earnings have ploughed funds into overseas beef and soybean farms. They've been keen to lock down large assets and supply production back into China. Source: [Seafood Source](#)

The European parliament has rejected the latest fishery measures recommended by the EU commission; a move

applauded by NGO ClientEarth, which said the measures had risked vulnerable marine life and ecosystems in protected areas of the North Sea. "In a first for fisheries management, the parliament recently



rejected measures from the EU commission that did not comply with the law and did little to conserve protected species and seafloor habitats under threat from fishing in seas off Belgium."

In February 2017 Belgium, together with the Netherlands, France, UK, Germany and Denmark, submitted to the commission a joint recommendation with fisheries manage-

COUNTRY

ment measures for these North Sea sites.

The proposed measures allowed for all types of fishing activities to occur in protected "Natura 2000" sites, with the exception of some small management zones where certain fishing gear types were restricted. However, in those management zones damaging fishing activities like seine fishing were allowed, as well as the alternative sea-bed impacting fishing gear, said the NGO.

While the member states followed the process set by the

common fisheries policy, ClientEarth felt the recommendation did not comply with its spirit, as this process is designed for implementing conservation measures in protected areas that can be negatively impacted by fishing. "And the law is very clear in only allowing fishing activities in Natura 2000 sites if it is scientifically certain that they will not adversely affect the integrity of the site."

Despite all of these inadequacies, the EU commission approved the recommendations in March. Source: [Undercurrent News](#)

RESEARCH

Fish oils most effective against cancer: Omega-3 oils derived from fish pack a stronger punch than other sources such as flaxseed when it comes to cancer prevention, according to a first ever study by a leading Canadian research university.



Prof David Ma from the University of Guelph, near Toronto in Ontario, said he has discovered that marine based omega-3s, of which salmon is a rich source, are eight times more effective at inhibiting tumour development and growth.

The professor, who works in the Department of Human Health and Nutritional Sciences at Guelph, explained: 'This study is the first to compare the cancer fighting potency of plant versus marine derived omega-3s on breast tumour development. 'There is evidence that both omega-3s from plants and marine sources are protective against cancer, and we wanted to determine which form is more effective.'

The study, published in the Journal of Nutritional Biochemistry, involved feeding the different types of omega-3s to mice with a highly aggressive form of human breast cancer called HER-2. 'It's known that EPA and DHA can inhibit breast tumour growth, but no one has looked directly at how effective these omega-3s are compared to ALA.'

Professor Ma found overall exposure to marine based omega-3s reduced the size of the tumours by 60 to 70% and the number of tumours by 30%. Conversely, higher doses of the plant based fatty acid were required to deliver the same impact as the marine based omega-3s. Source: [Fish Update](#)

Cardiovascular Mortality And Fish Oil: Omega 3 fatty acids seem to lower cardiac death by 8%, especially docosahexaenoic and eicosapentaenoic acids. Meta-analysis includes 14 randomized clinical trials which included a total of 72,000 subjects. 13-29% death reduction further benefit was seen in adults utilizing higher doses of omega 3, and in those with higher baseline cardiovascular risk, elevated triglycerides, LDL-cholesterol, and non-statin users. Results are to some degree in accordance with recent Science Advisory from the American Heart Association suggesting omega 3 use for secondary prevention of coronary heart disease, heart failure, and sudden cardiac death.

Randomized controlled trials investigating use of long chain omega 3 polyunsaturated fatty acids, primarily docosahexaenoic acid and/or eicosapentaenoic acid have shown mixed results. Objectives were designed to update and further explore available randomized controlled trial data regarding LC-OM3 supplementation and risk for cardiac death to propose testable hypothesis for mixed results obtained. Literature search was conducted using PubMed and Ovid/MEDLINE for randomized controlled trials assessing LC-OM3 pharmaceuticals or supplements with interventions periods of 6 months or more reporting outcomes of cardiac death. Meta-analysis was conducted to compare cumulative data including sensitivity and subset analyses.

14 RCTs were identified for primary analysis consisting of 71,899 subjects. 1613 cardiac deaths were recorded in the LC-OM3 arms with 1746 in control groups, pooled relative risk estimate shows an 8% lower risk in the LC-OM3 group. Subset analyses showed greater effects of 12.9-29.1% lower risks, supporting LC-OM3 supplementation association with reduction in cardiac death. Source: [Worldhealth.net](#)

2018



25 August	AQUA 2018	Montpellier, France
29-31 August	Shanghai International Fisheries and Seafood Exhibition	Shanghai, China
4-6 September	Seafood Expo Asia	Hong Kong, China
20-21 September	14th JCI Autumn Conference	Xi'an City, China
25-27 September	GOAL 2018	Guayaquil, Ecuador
15-17 October	IFFO 58th Annual Conference	Rome, Italy
29-30 October	Omega-3 Summit 2018	Brussels, Belgium
14-16 November	China Fisheries & Seafood Expo	Hong Kong SAR, China
14-16 November	Sustainable Ocean Summit 2018	Hong Kong, China
7-11 March	Aquaculture 2019	New Orleans, U.S.A.
22-23 March	IFFO/JCI Fishmeal and Fish Oil Forum	Wuzhen City, China



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