

European Fishmeal and Fish Oil Producers' conference, 1-3 June, Skagen, Denmark

Comprehensive insight into sustainable industrial fisheries

The European association for Fishmeal and Fish Oil Producers (EFFOP) held their general assembly and biennial conference in Skagen, Denmark on 1-3 June. The conference entitled "Responsible production-the European way" was addressed by speakers from academia, industry, and NGOs covering topics ranging from the science behind stock assessments, sustainability, collaboration between science and industry, and traceability.

In his opening remarks, Frank Treaty, President of EFFOP and the CEO of Pelagia Killybegs, identified the importance of unity among fishmeal and fish oil producers in combating the challenges of rising inflation, disrupted supply chains, changed energy availability, and climate change. He reminded attendees that the European fishmeal and fish oil industry produced responsible, transparent, and traceable products that are healthful, nutritious, and affordable, and that with ingenuity and innovation the industry had all the ingredients to mitigate the challenges it faced.

Can the supply of fishmeal and oil follow projected growth in aquaculture?

Europe is a significant producer of fishmeal and fish oil accounting for 10-15% of the global fishmeal production and over a fifth of the fish oil supply. Production is based on landings of small, oily, short-lived species such as blue whiting, capelin, sandeel, Norway pout and sprat as well as by-products (trimmings) from the consumption fish processing sector. Members of the EFFOP come both from EU member countries and

non-EU countries. and produce on average some 574,000 tonnes of fishmeal and 170,000 tonnes of fish oil a year valued at EUR1.2 billion/year. Fishmeal and fish oil are used primarily (65-70%) as ingredients in the production of feeds for fish and crustaceans. They are also used in feeds for pigs, poultry, and pets. Fishmeal and oil provide the essential amino acids, minerals, phospholipids, and fatty acids that fish need to thrive and grow. According to the FAO, aquaculture production is projected to reach 109m tonnes in 2030 from 83m tonnes in 2018. Production of carnivorous high-value species such as shrimp, salmon, and trout, which are fed on extruded feeds containing fishmeal and oil, is also expected to increase. This leads to the question of whether the fish resources that go into the manufacture of fishmeal and oil will continue to deliver as demand on them increases.

Prof. Anna Rindorf, Head of Section, Danish National Institute of Aquatic Resources, Section for Ecosystem based Marine Management provided her estimation of the industrial fishery a decade from now. Emphasising the naturally high variation in biomass and the high

demand not only from fisheries but also from fish, seabirds, and mammal, she said the primary factors that will impact fish stocks and fish management over the next ten years include climate, density dependence, quest for food stability, financial stability, MPAs and Brexit, and shifting policy objectives. Based on historical data of fish stocks she emphasized that often when one fishery experiences low stocks, other fisheries also experience low stocks. Therefore, as stock yields reduce, fishers cannot shift fish stock in order to maintain yields. In the future, climate warming is predicted to change the distribution of fish stocks with few stocks expected to increase while most are expected to decrease. Overall, the decline in productivity in the North Sea will most likely decrease yields by 45-70% however there is a possibility that southern species will migrate north in numbers significant enough to constitute a fishable resource. Prof. Rindorf concluded her presentation by saying that despite concerns about industrial fishing's impact on the environment, there is not enough public awareness of the benefits of fishmeal and fish oil as low-emission products that are high in nutritional value.



Frank Treaty, Chairman of European Fishmeal, CEO, Pelagia Killybegs



Prof. Anna Rindorf, Danish National Institute of Aquatic Resources



Sara Hornborg, Department of Agriculture and Food, RISE

Fishmeal and oil are relatively low GHG emission products

Sara Hornborg, a researcher at RISE, the Swedish state research institute, spoke about the life cycle assessment which is a tool to systematically measure a broad set of environmental impacts. Despite initiatives to standardise assessments of product groups, she cautioned that studies were unique, and the absolute values usually could not be compared without harmonisation. Focusing on fish feed, she gave the example of a life cycle assessment for 1 kg of Danish fishmeal and oil. The driver of greenhouse gas emissions (GHG) is the raw fish material which requires fuel to be caught, then the second primary driver is the processing of the fishmeal or fish oil. However, the challenge with this lifecycle assessment is that it depends on the species and fishery that the fish originates from. Additionally, the energy source used in production will cause the greenhouse gas emission to fluctuate drastically as coal has a much larger impact compared to renewable energy. She said that to minimize the emissions of the fishmeal and fish oil industry, suppliers should continue to switch to renewable or low emission energy sources. And

she pointed out that fishmeal and fish oil have significantly less emissions than soy.

In Denmark, members of the Danish Pelagic Producer Organization (DPPO) catch and supply most of the raw material to the fishmeal and oil industry. Claus Reedtz Sparrevohn, the chief science advisor for DPPO, suggested that scientific advice for fisheries and ecosystem management could be improved significantly with the input of data from fishers who have acoustic and fisheries data which can be used by the scientists. Given that the fishing fleet covers 290,000 nautical miles in the course of a year the data should be used in scientific advice to a larger extent than today. He also noted that fishermen have knowledge on catch sampling, length and weight measurements, catch rates, gear development, and catch composition, all of which can usefully supplement the data collected by scientists. The second point he made was that collaboration between fishers and scientists should be governed by transparency, communication, mutual respect, and recognition of the fact that although the two groups have different interests, they are both fisheries stakeholders.

Industry needs to become better at telling its story

Ken H. Anderson, professor of theoretical marine ecology at the Technical University of Denmark spoke on some of the threats facing the fishing industry and the severity of each threat. Agreeing that scientists tend to deliver bad news for fishermen he emphasized that their data and research is important for the long-term prosperity of the industry. He mentioned that microplastics, despite all the media

coverage, may not be as dangerous as made out to be because copepods, microscopic aquatic crustaceans which form the feed of fish larvae, do not ingest microplastic particles, meaning one less route for microplastics to enter the food chain. The impact of ocean warming, he said, is likely to have a mixed impact on the food chain resulting in generally lower productivity with some species responding to climate change impacts such as stormier weather with higher productivity. As water temperatures increase, species are likely to migrate to areas with cooler water affecting the yields of fisheries. Another threat comes from negative public opinion and to counter it the sector has to communicate the economic, social, and environmental sustainability of the fishing industry and to become better at shaping the public's perception of the sector.

The sustainability of fishing can only be guaranteed with full traceability, said Anne Mette Bæk. The director of European Fishmeal and Fish Oil Producers, Ms Bæk is also director in Marine Ingredients Denmark, and she showed how the Danish organisation had implemented measures that enable responsible and transparent handling of landings by the industrial fleet. The system involves three main groups: a third-party surveyor who can provide unbiased measurements, government and regulatory authorities that verify the reported measurements, and the seller. The third-party surveyors control the scales and ensure that no manipulation of the measurements has occurred in order to guarantee the quantity of product for quota management as well as for the seller. Anne Mette Bæk also discussed EFFOP's industry standard for draining, weighing, and sampling unsorted pelagic landings. This new industry standard will promote traceability and



Claus Reedtz Sparrevohn, Chief Scientific Advisor, Danish Pelagic Producers Organization



Prof. Ken Haste Andersen, Danish National Institute of Aquatic Resources



Anne Mette Bæk, Managing Director, EFFOP



Alexandre Cornet, Ocean Policy Officer, WWF

transparency, increase trust with stakeholders, prove legality of practices, verify sustainability, and ensure correct handling for quotas. These standards are supplementary to any existing national legislations or international agreements; however, they are very beneficial for ongoing efforts to make fisheries more sustainable, transparent, and traceable.

Climate change impacts make implementation of traceability critical

The role of traceability in ensuring stocks are sustainably exploited is magnified when considering the impact of climate change. Alexandre Cornet, Ocean Policy Officer, WWF, said that climate change was likely to lead to a decrease in global biomass of marine animals, a subsequent decrease in production of marine animals, shifts in compositions of marine species, and changes in the spatial distribution of marine species. These impacts could decrease maximum catch potential by an estimated 25%, decrease the safety of fish products for human consumption, affect the livelihoods of fishermen, and further disrupt the fishing industry. He said

that traceability was important in providing the necessary data for regulators in order to ensure a level playing field for all fishermen, evaluating the carbon footprint of different products, combating illegal, unreported, or unregulated fishing (IUU), ensuring sanitary practices at different levels of the supply chain, and finally safeguarding the livelihoods of fishermen. However, he added, there were significant challenges in ensuring traceability including the diversity of import controls within different EU states, failure by member states to implement obligations, limited cooperation within the EU market, differences in terminology, and a lack of effective control.

A failsafe way of identifying species could reduce fraud

Sorting fish by species is contingent upon correct identification which is not always easy. Whether done deliberately or unintentionally mis-identifying the fish can negate efforts to ensure transparency and traceability. Einar Eg Nielsen, a professor at the National Institute of Aquatic Resources presented a new potential solution to the challenges of identifying the species distribution in mixed catches. Using a DNA barcoding database, samples from the fillet or a fin can be tested to identify the species. In addition, in the case of mixed catches, Prof. Nielsen was able to use samples of the blood water (the water in which the fish had been stored) to carry out the DNA testing. The trials carried out by Prof. Nielsen and his team suggested that the method shows a high level of precision and factors such as species and fish size can be accounted for in relation to

the proportion of DNA present in the sample. While the first results have been positive more trials are needed to validate the method and to study its reliability in relation to maturity, sea area, and time of year of the catch.

While DNA analysis can abate fraud, threats to fisheries also come from predators like seals which are known to eat fish from stationary fishing gear and damage the gear. In addition, two species between them consume about 4m tonnes of fish a year and so compete directly with fishers. Furthermore, a bycatch of seals frequently results in increased market restrictions. Jonas Viðarsson, the director of the value creation division at Matis, an Icelandic research institute, leads the Nordic Seals Project which has studied the impact of seals on fisheries and will suggest ways of mitigating them. Seal numbers have exploded in the Nordic region since a moratorium was imposed on hunting them some two decades ago. The project seeks to identify ways of controlling seal populations, including by sustainable harvesting, and will also analyse potential products and markets, whilst considering barriers such as animal welfare, policy and political correctness, food safety and toxins.

Deriving value added products from fish waste

In the technical session of the conference Stefan Kirchner from GEA spoke about collagen, a protein that provides structural support and is found in skin, tendons, and bones of animals and fish. Collagen is composed primarily of the amino acids, glycine, proline, and hydroxyproline of which the presence of the latter can be used as an



Jónas R. Viðarsson, Director, Division of Value Creation, Matis

indicator of collagen in a raw material. Collagen is used as gelatine in food applications where it increases viscosity, and as collagen peptides which are used by the nutraceutical industry as a dietary supplement. The process of collagen extraction has three main steps, pre-treatment, formation of gelatine, and the formation of collagen peptides. The pre-treatment process depends on the type of raw material used: for fish skin, the pre-treatment is by washing with cold water, and for bones and scales the pre-treatment is by demineralisation using acid. The collagen-rich material that results from the pre-treatment is subject to treatment with heat or acid to give gelatine, which in turn is treated with enzymes to give the collagen peptides. These are then cleaned, fractionated, concentrated and dried to give the final product that is put on the market.

Fishmeal and oil producers have ways to reduce their emissions

Michael Lundgaard Thomsen, director, Aalborg Portland, Denmark's only cement company and the country's biggest individual emitter of greenhouse gases discussed the efforts his



Michael Lundgaard Thomsen,
Director, Aalborg Portland

company was making to reduce emissions. Many of those present at the conference fall into what Mr Thomsen called process industries which tend to be heavy emitters of GHGs, so what he had to say was followed closely by the audience. Mr Thomsen is also chairman of

the energy intensive industries, a group that includes fishmeal and oil producers and on behalf of which he negotiates with the government on ways to keep a competitive process industry in Denmark. These industries are typically involved in cement, building materials, energy, transport, and food, where domestic and international competition is stiff as most of the outputs are commodities. They often use high temperature processes and are very energy intensive. He noted that a number of ways to reduce emissions are being discussed but that many of them are expensive to implement (such as electrification) or run, are not proven (such as green hydrogen or carbon capture and storage) or

have other drawbacks. In process industries emissions come not only from the use of energy but also from some of the processes themselves. Recommendations from the energy intensive industries group to make production more sustainable include increasing energy efficiency using alternative fuels. Another way to increase sustainability is by reusing energy. At Aalborg Portland the excess heat is recovered and supplied to households. Developing new products that are more sustainable is another recommendation. The use of waste streams from biomass (like wood) as fuel as well as increasing use of gas and biogas and exploring the potential of carbon capture are also strategies



Stefan Kirchner, GEA Westfalia

that the company is following to reduce its emissions.

The presentations and panel discussions at the European Fishmeal and Fish Oil Producers' conference provided a wealth of information and much food for thought for everyone attending. EFFOP's next biennial conference will take place on 5-7 June 2024 in Estonia.



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