

July 2024

IFFO's monthly newsletter



Editorial

The 2024 edition of the Food and Agriculture Organisation's [State of the World's Fisheries and Aquaculture report](#) provides a sobering analysis about the growth of aquaculture and confirms its role as the fastest growing sector for animal protein production. The amount utilised for fishmeal and fish oil production peaked in 1994 at over 30 million tonnes before declining in the subsequent two years to reach 16.7 million tonnes in 2022. While this seems counter-intuitive, as the fastest growing part of aquaculture is fed aquaculture, these data reveal a few interesting trends (...)

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Register for IFFO's Annual Conference

Check out the detailed agenda of the IFFO Conference, due to take place in **Lisbon, Portugal, from 21st to 23rd October**, and make sure you've booked your seat.

[Register](#)

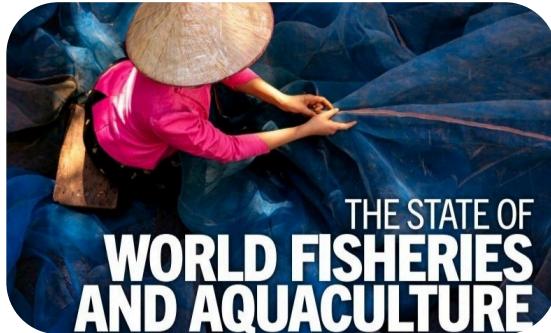
Register for IFFO's China workshop

The in person IFFO China Workshop "Exploring the value points and global market dynamics of marine ingredients" will be held in **Xiamen, China on 3 September 2024**.

[Register](#)

Sustainability metrics for the marine ingredient sector: a new peer reviewed research paper

In this paper, the basis of existing metrics and their shortcomings are discussed and an alternative strategy is proposed based on a life cycle assessment (LCA) approach so the sustainability of the use of all feed ingredient resources is assessed on an equivalent basis.

[Read more](#)

Key takeaways from the FAO SOFIA report, from a marine ingredients perspective

Aquaculture is making a strategic use of marine ingredients, leveraging the high-nutrient density and palatability stimulating characteristics of those ingredients to produce more aquatic animals than capture fisheries do, for the first time since 2022.

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Watch the recorded webinar IFFO held on mineral oils

On 19th June, IFFO and GOED shared their insights about the emerging EU regulations pertaining to mineral oils.

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Membership information

New IFFO Member:

[CORPORACIÓN PESQUERA INCA S.A.C.](#) (Producer), following the merge of Companies Corporacion Pesquera Inca S.A.C and CFG Investment S.A.C

No longer IFFO Members:

[Hiller GmbH](#) (Non-producer)

[Pharmamark Nutrition Pty Ltd](#) (Non-producer)

Industry news

- [Intrafish](#): Key Peru anchovy fishery concludes with nearly full quota caught
- [FeedStrategy](#): Aquafeed sector optimistic despite drop in production
- [Intrafish](#): Norwegian salmon farmer urges industry to 'share the risk' in developing feed
- [Feed Strategy](#): Europe's feed body sets out recommendations for future strategy
- [FishSite](#): Why true traceability can help to restore the reputation of seafood
- [Nature](#): Climate change impacts on small pelagic fish distribution in Northwest Africa: trends, shifts, and risk for food security
- [Feed&Additive](#): Nofima: Consumers distrust use of insects and microalgae in salmon feed
- [FishSite](#): Insect-based salmon feed receives Label Rouge endorsement
- [Seafoodsource](#): China seeking fresh fisheries cooperation deal with Mauritania
- [FishSite](#): FAO pressured to remove "sustainable" label from farmed salmon and sea bream

Innovation & Research

FISHMEALS and their competition

- The replacement of fishmeal (FM) with poultry by-product meal (PBM) in practical diets for European sea bass, *Dicentrarchus labrax* was examined in a [study](#) using five diets formulated with PBM replacing FM at levels of 0% (control), 25%, 50%, 75%, and 100%. At the end of the trial, growth performance of fish fed diets containing up to 75% PBM were comparable to those of the control group, whereas the diet with 100% PBM resulted in a significantly poorer performance. Whole body composition also showed significant differences across the dietary treatments. Therefore, this study demonstrates that PBM can replace up to 50% of FM in the diets of European sea bass without adverse effects on growth performance, body composition, or liver and intestine morphology.
- A [study](#) examined the impact of altering levels of jack mackerel meal (JMM) in the diets of red sea bream (*Pagrus major*), replacing various animal protein sources. The animal protein sources included tuna byproduct meal (TBM), chicken byproduct meal (CBM), and meat meal (MM) and two FM substitution levels (25% and 50%). The control (Con) diet contained 60% FM. In the Con diet, 25% and 50% of FM were replaced with TBM, CBM, and MM, respectively, and then 24% jack mackerel meal (JMM) was included at the expense of FM, named as the TBM25, TBM50, CBM25, CBM50, MM25, and MM50 diets, respectively. At the end of the experiment, the TBM-substituted diets produced greater

weight gain and feed consumption than the CBM- and MM-substituted diets. Fish fed the TBM50 diet achieved the greatest weight gain and feed consumption. Protein retention, biological indices, plasma and serum parameters, and the whole body chemical composition and amino acid (AA) profiles of red sea bream were not significantly influenced by dietary treatments. In conclusion, TBM and MM and CBM could replace 50% and 25% FM in the feeds with 24% JMM inclusion, respectively, without compromising the growth, feed utilization, plasma and serum parameters.

- **Fish protein hydrolysates (FPH)** were fed to juvenile common carp (*Cyprinus carpio*) to investigate their effects on growth performance and feed utilization and potential influence on intestinal antioxidant status, expressions of protein synthesis gene and microflora. Common carp were fed with 0%, 0.5%, 1%, 1.5%, and 2% FPH (named as FPH-0, FPH-0.5, FPH-1, FPH-1.5, and FPH-2) respectively, substituting 0%, 13.3%, 28.3%, 41.6%, and 55.0% of fish meal. **Results** showed that final body weight, weight gain rate and protein efficiency ratio in the FPH-0.5 treatment were higher than those in other treatments. Improvements in the activities of superoxide dismutase, peroxidase, catalase and glutathione and decline in malondialdehyde contents of the intestine were found in the FPH-0.5 treatment. Up-regulation in the expression levels of various intestinal protein synthesis regulatory genes was observed in fish fed the FPH-0.5 treatment. Overall, 0.5% FPH supplementation exhibited a sparing effect on fish meal in common carp feed on the premise of promoting the growth and strengthening the intestinal health.

FISHOILS and their competition

- A [study](#) reported the development of a model with **detailed and flexible accounting for lipids — Simulated Salmon Lipid Metabolism (SimSaLipiM)** — to predict the nutritional and environmental outcomes of feed formulations. Using the SimSaLipiM model with feed ingredient databases enabled detailed analysis of an in vivo feed trial in silico. The model predicted optimal feed efficiency in agreement with observations, as well as a detailed energy budget and fish biomass lipid composition for each feed. The model was also used to formulate novel feeds and feed supplements minimizing the CO₂ footprint.
- The aim of a [study](#) was to **explore immune responses under various levels of polyunsaturated fatty acid**. Atlantic salmon kidney cells (ASK cell line) were incubated for one week in different levels of the unsaturated n-3 eicosapentaneoic acid (EPA) resulting in cellular levels ranging from 2–20% of total fatty acids. The cells were then stimulated with a viral mimic before responses by immune genes were analysed. The results showed that the level of EPA in the cellular membranes exerted clear dose dependent effects of the immune gene expression. The results suggest that innate immune responses are heavily influenced by the fatty acid profile of salmonid cells and constitute another example of the strong linkage between omega-3 fatty acids and inflammatory responses.
- An [investigation](#) into the **effects of EPA and DHA on cell proliferation, nutrient sensing signalling, and branched-chain amino acids (BCAA) transporting** was examined in turbot muscle cells. The findings showed that EPA and DHA could stimulate cell proliferation, promote protein synthesis and inhibit protein degradation through a range of signalling pathways. EPA and DHA also influenced a range of muscle cell regulatory factors. A significant increase in the concentrations of intracellular BCAs was observed following treatment with EPA or DHA, accompanied by an upregulation of the associated amino acid transporters. This study provides some valuable insights into the mechanisms underlying the mechanistic effects of omega-3 fatty acids in fish.

Calendar

- [14-15 August 2024, TARS Aquaculture, Bangkok, Thailand](#)
- [19-22 August 2024: NorFishing Conference, Trondheim, Norway](#)
- [3 September 2024: 7th IFFO China Workshop, Xiamen, China](#)
- 19-20 September 2024: Fish Waste for Profit, Reykjavik, Iceland
- [21-23 October 2024: IFFO Annual Conference, Lisbon, Portugal](#)



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