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PROFIUS is a collaborative effort by six partners from industry and research from five different countries Denmark, Norway, Iceland, and Malta.

## PRESS RELEASE for PROFIUS project

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### Tracking Tuna Side-streams – Steps Towards a More Circular Tuna Farming Industry in Malta

The PROFIUS project and its Malta-based partner AquaBioTech Group (ABT) are making significant advancements towards valorising previously discarded tuna side-stream material and addressing logistic and technical challenges to transform these materials into valuable products.

The farming of Atlantic bluefin tuna (*Thunnus thynnus*) is a significant contributor to the local economy in Malta. The Maltese tuna farming industry generated approximately 190 million euros in 2021, sustains nearly 1,000 local full time employment opportunities, and provides a high-end fresh or frozen product for markets in Japan and other regions across Asia. Although tuna aquaculture is a net positive for the community, there is room for the industry to embrace sustainability and circular economy approaches more fully, ultimately benefitting farmers and the environment.

In Malta, adult and juvenile wild bluefin tuna are caught offshore in the summer and transferred to floating sea cages where they are intensively fed and grown to market size. Harvesting occurs from October to January in a process that generates by-product biomass. Whole fish are typically filleted on board purpose-built vessels where prime cuts are stored in freezers, and the product is then directly shipped to the appropriate market. Off-cuts including the head, tail, fins, viscera, and bone material have historically been discarded during the harvesting process.



AquaBioTech Group, a private aquaculture, fisheries, biotechnology, and environmental consultancy company, is making headway into research that is necessary for tuna side-stream product development. Researchers of the company hosted interviews with local stakeholders to identify which operational factors could limit the capacity for implementing circular practices into daily harvesting activities. The interviews highlighted that a lack of space onboard harvesting vessels for the storage of side-streams is a major challenge. A similar side-stream storage challenge was also raised for a local tuna processing facility. Due to freezer space limitations, raw side-stream biomass at the facility must be processed into fish meal and fish oil within 24 hours. If these challenges are addressed, the tuna farming industry in Malta will be able to generate more opportunities for revenue, reduce waste, and reduce environmental impacts.

To address these challenges, temperature and chemical profiles of tuna side-stream materials were monitored to determine their preservation status prior to processing. To accomplish this, ABT researchers collected tuna side-stream materials in Malta, placed temperature probes inside the materials at the moment of harvest, and logged the temperature of the samples as they travelled to the shore and were frozen at -20 degrees Celsius. From harvest boat to on-land freezer, this journey lasted between 3 to 6 hours. The resulting temperature profiles from the duration of the journey were used to evaluate potential histamine formation and spoilage through a predictive model developed by PROFIOUS partner Technical University of Denmark (DTU).

AquaBioTech Group also assessed the nutritional properties and preservation quality of the tuna side-stream materials to determine their suitability for the extraction of commercially relevant biochemicals. Collagen, enzymes, fish meal, and fish oil are all potential by-products of the tuna farming industry and can contribute to human health and the production of feed for other aquaculture species. General tuna side-stream preservation status was evaluated by the degree of oxidation, and compositional analysis was performed to investigate the nutritional properties of the side-streams. The results are promising, and tuna side-stream material has been verified as a potentially highly valuable product.

As part of the PROFIOUS project, ABT researchers are interested in the circular approach of extracting fish meal and fish oil from local tuna side streams to incorporate into sustainable and functional aquafeeds. As a natural next step of the project, ABT will conduct tuna-incorporated feed trials with shrimp and European sea bass at their on-site recirculating wet

lab facilities. These feed trials will allow researchers to determine the suitability of tuna fish oil and tuna fish meal derived from side-streams as an alternative protein source for aquaculture production. Moreover, ABT scientists will also investigate the capacity to improve the preservation status of the side-stream materials using natural extracts. By doing so, the pre-processing time can potentially be extended under non-refrigerated conditions. Furthermore, ABT is also in the process of collaborating with scientists from the Norwegian University of Science and Technology to develop sustainable methodologies to extract valuable compounds from the side-stream biomass.

PROFIUS is a three-year ERA-NET project unlocking the potential of aquatic bioresources. It is a cooperation between Denmark, Malta, Norway, Iceland, and Greenland to address challenges in the supply chain related to lumpfish and tuna side-streams by developing preservation solutions for maintaining quality and improving utilization of the entire biomass. The consortium involves different institutes such as Technical University of Denmark, the Norwegian University of Science and Technology, and the University of Akureyri working along with industries including Royal Greenland, AquaBioTech Group (Malta) and BioPol (Iceland).

The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

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For more information on the PROFIOUS project, visit the PROFIOUS project website (<https://profius-project.com/>) and LinkedIn page ([linkedin.com/in/profius-project-bb9b15232](https://www.linkedin.com/in/profius-project-bb9b15232)).



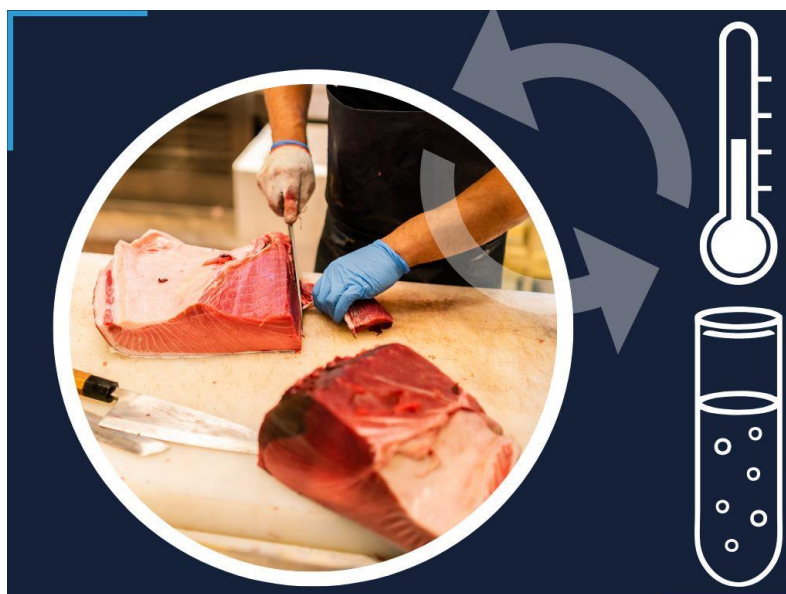
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*Malta-based PROFIUS project partners are currently investigating the potential for valorisation of tuna side-stream biomass.*



*The main objective for PROFIUS in Malta is to determine the suitability of tuna side-streams for use in aquafeeds. One of the next steps for ABT researchers is to conduct feed trials incorporating tuna fish meal and fish oil.*



*Tuna side-stream biomass is generated during the harvesting and filleting process. ABT researchers have conducted temperature and compositional analysis on locally sourced side-stream biomass.*



*Goals and objectives of the PROFIOUS project.*

### **About the project:**

The aim of **PROFIUS** is to address challenges in the supply chain related to lumpfish (roe and carcass) and tuna side-streams by developing preservation solutions for maintaining quality and improving utilization of the entire biomass. Improved preservation methods will be developed to enhance quality and shelf life of lumpfish roe and thereby reduce waste. **PROFIUS** will also study the processes responsible for the chemical and microbial deterioration of tuna side-streams and develop strategies to prevent them. Furthermore, **PROFIUS** will look into new applications of lumpfish and tuna side-streams including logistics and development of gelatin extraction processes

for lumpfish, and development of fish feed based on tuna side-streams. The goals of **PROFIUS** will address supply system challenges for:

- Wild caught lumpfish roe and the carcass remaining after the roe has been removed
- Lumpfish used as a cleaner fish in salmon farming
- Side-streams obtained after filleting of farmed tuna.

#### **About Blue Bio ERA-NET cofund:**

The Blue Bio COFUND is the result of a collaboration between JPI Oceans and the former ERA-NETS COFASP and ERA MBT and consists of 27 partners from 16 countries.

The main objective of the COFUND is to establish a coordinated R&D funding scheme that will strengthen Europe's position in the blue bioeconomy. The first co-funded call launched 17 December 2018. The COFUND partners have committed EUR 23,5 million, which will make up a maximum total budget of EUR 30 million including EUR 6.5 million co-funding from the European Commission.

The goal is to identify new and improve existing ways of bringing bio-based products and services to the market and find new ways of creating value from in the blue bioeconomy. Next to the co-funded call, the COFUND plans to contribute to the national priorities as well as to the strategic research agenda of JPI Oceans, and the ERA-NETS COFASP and MBT.

<https://bluebioeconomy.eu/about-2/>