SUPREME

Increased utilisation and value creation from whitefish rest raw materials

4. – 5. DECEMBER 2019
Kolkata, India

The recently funded research project, SUPREME will address the challenges of the Norwegian whitefish sector and develop concepts and solutions for increased utilization of rest raw materials (RRM). The sea-going fishing vessels accounts for 86 % of the unutilized whitefish RRM in Norway. Thus, to achieve maximum utilization, the processing solutions need to be flexible, compact and adapted to demanding on-board conditions. This project will focus on solving the technical problems related to on-board handling, preservation and logistics of RRM. This will be done to develop optimized technological solutions for processing of RRM that are suitable for on-board conditions.

The Norwegian fisheries industry produces around 340 000 tons of whitefish rest raw materials (RRM) each year. Marine RRM is a high value raw material rich in proteins, lipids and other important components (calcium, phosphorus, etc.) and can be used to produce ingredients for food and feed. However, in 2018 approximately 166 000 tons of whitefish RRM was discarded and not utilized, resulting in a significant loss in potential value creation from already harvested resources.

Raw material handling on-board

The quality of ingredients (eq. oils and proteins) produced from RRM depend upon sorting, storage and handling practices of the RRM. Marine RRM are especially vulnerable when it comes to spoilage and degradation, and prolonged storage of RRM gives increased concentration of free fatty acids (FFA), increased oxidation and reduction in the molecular weight of proteins leading to the degradation and quality loss. To utilize a higher amount of the RRM generated by the sea-going vessels, the RRM needs to *be preserved by thermal and/or chemical methods* in order to increase their shelf life or *be processed into semi-manufactures or ingredients on board*. However, application of these technological solutions is costly and, if there are no obvious economic incentives to increase the use of RRM, it is difficult to encourage value creation.

"The main impact of SUPREME is increased value creation and profitability of business through improved resource efficiency and maximum utilization of RRM for commercial products"

Logistics Management

In Norway, international guidelines about reuse of RRM from discard and bycatch of fish entered into force in March 2011. Inefficient use of RRM in whitefish supply chains not only contributes to an adverse environmental impact on living resources, but also on the environment due to dumping of RRM. The logistic solutions should secure the volumes needed for industry scale systems in a way that secures the quality of the RRM and the profitability. In addition, the environmental impacts from transport should not outplay the benefits from improved resource utilization.

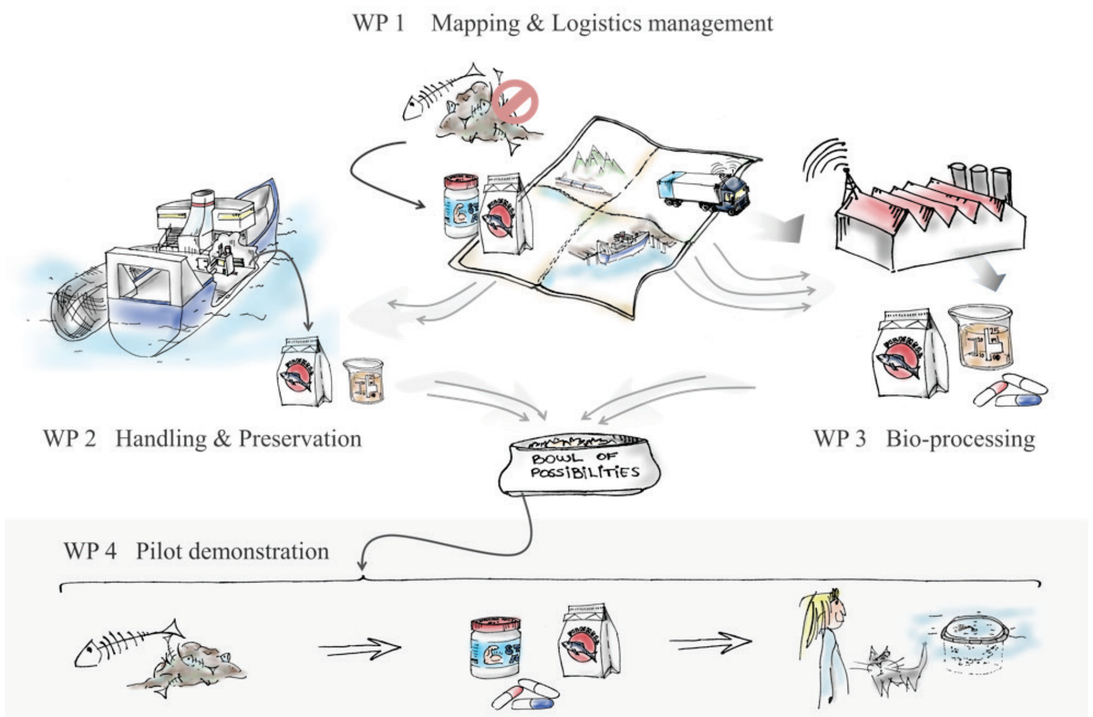

Figure 2. The SUPREME project is devided into several different work packages (WPs), focusing on mapping and logistics (WP1), handling and preservation (WP2), Bio-processing (WP3) and pilot demonstration (WP4).

Processing

During on board production of (frozen) HG fish or fillets, the resulting RRM accounts for respectively 30% and more than 60% of the round weight of the fish. To increase the resource efficiency, whitefish RRM should be processed into valuable ingredients as oil, protein, gelatin and minerals for human consumption, pet-food and livestock- or fish feed. Acid-hydrolysis (silage), traditional fish oil- and meal production, and enzymatic hydrolysis are among the technological solutions for utilization of RRM. Today, all the mentioned technologies are being tested and evaluated for implementation on the fishing vessels. However, they are all facing several challenges and limitations and need further research and development. To establish successful market penetration and meet the customers' requirements, the technological solutions need to be adapted and optimized in accordance to raw material composition and process conditions and be suitable for on board processing conditions.

FOR MORE INFORMATION about the project and ongoing activities check out the following:

Website https://www.sintef.no/projectweb/supreme/
Facebook https://www.facebook.com/SUPREMEProsjekt/
Instagram supreme_project #supremeprosjekt

SUPREME – Sustainable production of ingredients from whitefish rest raw materials (2019 – 2022) (NRC project number 294539)

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