Production of High Quality Oil from Herring Rest Raw Material

Ana Karina Carvajal[1,2], Revilija Mozuraityte[1], Inger Beate Standal[1], Iren Stoknes[3] and Ivar Storrø[1]

[1] SINTEF Fisheries and Aquaculture, N-7465 Trondheim, Norway
[2] Norwegian University of Science and Technology (NTNU), Dep.Biotechnology, NO-7491, Trondheim, Norway
[3] EPAX Norway AS, 6028 Aalesund, Norway

Annually, the herring industry in Norway generates more than 300 000 tons of rest raw material. Most of it is used for production of animal and fish feed. However, this rest raw material has a high potential as a valuable source for production of fish oil and fish protein hydrolysates for human consumption. Such production would increase the profitability for the fishing and processing industry.

To obtain high quality oil that is suitable for human consumption the quality of the raw material is important. Enzymatic activity can lead to degradation of proteins and lipids in the rest raw material. In order to avoid quality loss by enzymatic and oxidation processes it is important to process rest raw materials shortly after slaughtering of the fish.

The objective of this work has been to produce high quality oil from fresh herring rest raw material. A mobile pilot plant (SINTEF Mobile SeaLab) designed to produce fish oil and protein hydrolysate was used for production of herring oil. The mobile plant was allocated close to the factory of Grøntvedt Pelagic (Uthaug, Norway), enabling the use of fresh rest raw material straight from the filleting line. Two different processes for oil production were tested: i) thermal treatment, and ii) enzymatic hydrolysis with commercial proteases, in order to evaluate how extraction methods affected the quality of the oil. In addition, different types of antioxidants (BHT, propyl gallate and citric acid) were added to the rest raw material prior to oil extraction. It was of interest to investigate the antioxidants ability to retain oxidation in the raw material during processing and their influence on the quality of the oil.
Addition of antioxidants to the raw material prior to oil extraction showed to influence both the oxidative quality and stability of the produced oils.