

Aquatic food production – safety and quality

Hydrolysis of herring rest raw material – technological optimisation in the search for bioactive peptides

30 credits

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The work will be done in cooperation with SINTEF Fisheries and Aquaculture

The aim of the work is to select enzymes and conditions for processing of herring rest raw material in order to get high quality proteins with bioactive properties

Seafood processing discards and by-products account for approximately three-quarters of the total weight of the fish. Valuable components such as fish oil, proteins, collagen and gelatine, enzymes and minerals can be obtained from this rest raw material. Enzymatic hydrolysis is one of the methods for recovery of valuable components from fish by-products.

Hydrolysis with addition of commercial proteases allows a better control over the process compared to autolysis that is choice of the enzyme, reaction conditions and time, permits good control of the hydrolysis and production of number of hydrolysate products with defined and desirable properties. Fish protein hydrolysates (FPH) have good functional properties and can contribute to water holding, texture, gelling, foaming and emulsification properties in different food systems. In addition hydrolysates have high nutritional properties. Several studies have indicated that peptides derived from fish proteins have antioxidative properties in different oxidative systems. Production of fish protein hydrolysates with antioxidant properties would allow production of protein enriched and oxidatively stable seafood. Fish protein hydrolysates have also bioactive properties, such as antihypertensive (blood pressure lowering - ACE in-hibiting effect), antithrombic, immunomodulatory, reducing obesity, growth inhibition on cancer cells, but they are not so extensively studied. In addition it is important to control that FPH do not exhibit bitter taste which can prevent the use of hydrolysates in many applications.

Different peptide sequences has been reported to have ACE inhibiting effect in the literature. The length of the peptides vary from two to 21 amino acids. The sequence of many proteins have now been determined and can be found in the literature. Several databases are available based on these literature data. One of these databases is the database of The National Center for Biotechnology Information (<http://www.ncbi.nlm.nih.gov/protein>). Using these resources it is possible to find the sequence of proteins found in marine raw materials and especially rest raw materials.

The research activities will mainly be performed at SINTEF SeaLab, which is a process laboratory, where facilities for protein technology and marine process techniques are available.