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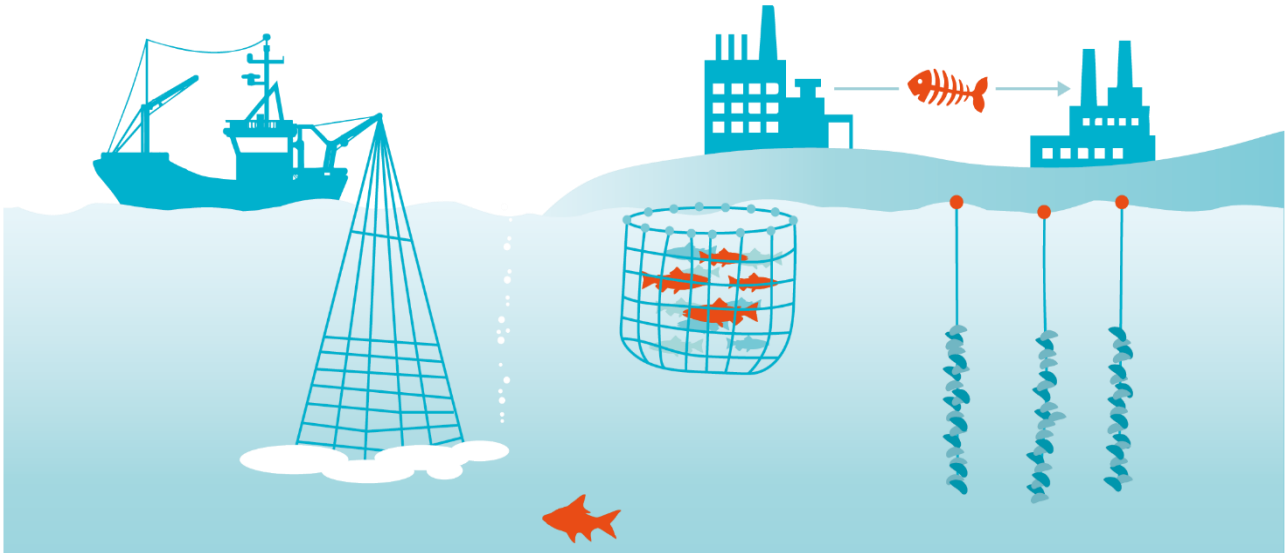
Optimal utilization of seafood side-streams through the design of new holistic process lines

D3.2 pH-shift technology for solid and liquid side-streams



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Deliverable 3.2 on “pH-shift technology for solid and liquid side-streams” is considered confidential, and as stated in the consortium agreement and in IPR management plan only executive summary, that contains non sensitive data, will be released within the project time span to protect any exploitable results.

1 Executive Summary

The aim of task 3.2 was to look back into the steps of the value chain before the pH-shift processing and investigate impact of sorting of side stream (co-products), their combination, harvest season and stabilization on protein isolation yield and quality of protein recovered from cod and herring side streams. It was found that cod viscera can be efficiently valorised to a protein enriched product using the pH-shift process, but the recovered proteins have no gel-forming capacity. Cod head resulted in a higher quality protein in terms of gel-forming capacity and colour compared with its frame, but combination of head and frame can substantially improve the quality of protein recovered from frame without jeopardising protein yield. Therefore, it is recommended to use a combination cod head and frame for protein isolation using the pH-shift processing.

Using different fractions of herring produced within Task 2.1, showed an opposite trend of the cod case where herring head resulted in the lowest protein isolation yield and protein quality. Herring frame on the other hand resulted in the highest protein yield and produced proteins with highest quality. It is strongly recommended to sort herring solid side streams before pH-shift processing and avoid processing of viscera which induces enzymatic degradation in samples harvested in fall. Herring frame is the most promising fraction for value addition with pH-shift processing. Besides the type of co-product, the season of catching affected the pH-shift processing of herring co-products. The co-products caught during spring were more difficult to process with the pH-shift method but resulted in proteins with better gel-forming capacity compared with co-products from fall.

Altogether, this task shows the importance of sorting and adaption of processing condition for the protein extraction from cod and herring co-products from different seasons. The ideal type or combination of side stream for value addition using the pH-shift method varies by the processed species and must be carefully taken into account.