

Valorization Cascade Approach of Fish By-Products towards a Zero-Waste Future: A Review

Authors : Joana Carvalho, Margarida Soares, André Ribeiro, Lucas Nascimento, Nádia Valério, Zlatina Genisheva

Abstract : Following the exponential growth of human population, a remarkable increase in the amount of fish waste has been produced worldwide. The fish processing industry generates a considerable amount of by-products which represents a considerable environmental problem. Accordingly, the reuse and valorisation of these by-products is a key process for marine resource preservation. The significant volume of fish waste produced worldwide, along with its environmental impact, underscores the urgent need for the adoption of sustainable practices. The transformative potential of utilizing fish processing waste to create industrial value is gaining recognition. The substantial amounts of waste generated by the fish processing industry present both environmental challenges and economic inefficiencies. Different added-value products can be recovered by the valorisation industries, whereas fishing companies can save costs associated with the management of those wastes, with associated advantages, not only in terms of economic income but also considering the environmental impacts. Fish processing by-products have numerous applications; the target portfolio of products will be fish oil, fish protein hydrolysates, bacteriocins, pigments, vitamins, collagen, and calcium-rich powder, targeting food products, additives, supplements, and nutraceuticals. This literature review focuses on the main valorisation ways of fish wastes and different compounds with a high commercial value obtained by fish by-products and their possible applications in different fields. Highlighting its potential in sustainable resource management strategies can play an important role in reshaping the fish processing industry, driving it towards circular economy and consequently more sustainable future.

Keywords : fish process industry, fish wastes, by-products, circular economy, sustainability

Conference Title : ICWMRE 2025 : International Conference on Waste Management, Recycling and Environment

Conference Location : Oslo, Norway

Conference Dates : June 24-25, 2025