

A REVIEW OF THE EFFICIENCY OF USING FISH BY-PRODUCTS

**I.F. Toma^{*}, I.S. Bololoi, G.M. Gheciu Pirlea, A.E. Moise,
S.T. Vlad, C.G. Nicolae**

*University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Marasti Blvd, District 1, Bucharest, Romania*

**e-mail: toma.ionela1998@gmail.com*

Abstract

Efficient valorisation of fish by-products represents a strategic priority for improving resource utilization, profitability, and sustainability in the fish processing industry. This synthesis paper brings together scientific literature through reports, case studies, and research articles, analysing the efficiency of fish through different valorisation pathways. The results highlight a value hierarchy: high-value biomolecules (collagen, peptides, gelatine) provide the greatest profits, while fishmeal and fish oil ensure stable large-scale demand. Applications in bioenergy and fertilizers contribute indirectly by reducing waste management costs and supporting renewable energy systems. Case studies show that aquaculture industry revenues can be increased, but challenges persist, such as high technological costs, fragmented regulations, and limited consumer acceptance. The study emphasizes that integrated valorisation systems, aligned with the principles of the circular economy and the FAO's "Blue Transformation" initiative, offer the most promising approach for maximizing both economic and environmental outcomes. It also provides recommendations for scaling up fish by-product processing technologies and raising consumer awareness regarding the utilization of fish by-products.

Key words: *Blue Transformation, circular economy, sustainability, valorization*