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Editorial: The aquatic product processing and by-product utilization

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Editorial on the Research Topic
The aquatic product processing and by-product utilization

Aquatic products are extremely popular with consumers since they have a unique taste and rich content of essential nutrients required by the human body. However, they are highly susceptible to spoilage due to their high water content and fragile tissue. Consequently, various processing methods have been adopted to extend their freshness. The farmed rainbow trout (*Oncorhynchus mykiss*) was treated with high-voltage electrostatic fields which can reduce the growth rate of microorganisms to extend its shelf life (Cheng et al.(a)). With the growth of the global population and changes in consumption patterns, the demand for aquatic products continues to rise, and the types are becoming more diversified. For instance, rainbow trout (*Oncorhynchus mykiss*) filets were salted and smoked to extend their shelf life and enhance their commercial value (Cheng et al.(b)). Furthermore, surimi is a convenient and delicately flavored aquatic processed product that is easy to cook, and it is one of the highest volume aquatic processed products globally. The gel properties of surimi are crucial to the quality and texture of surimi products. Duan et al. presented CO_2 can alter the advanced structure of proteins to induce gelation, providing a theoretical basis for the development of aquatic products.

The aquatic product processing industry, while providing a rich variety of food products, also faces dual challenges of resource utilization efficiency and environmental impact. Traditional aquatic product processing methods often only utilize a portion of the edible components, with the remaining by-products often considered waste. This inefficient resource utilization mode not only leads to resource waste but also burdens the environment. By-products of aquatic product processing, such as fish bones, scales, and heads, which are often overlooked, are rich in proteins, lipids, minerals, and vitamins, and have great potential for development. Kendler, Sasidharan et al. reviewed the utilization of by-products generated from fileting side streams. These by-products can be transformed into high-value products, such as protein hydrolysates, fish oil, gelatin, chitosan, etc., widely used in food, pharmaceuticals, cosmetics, and biomaterials. Lian et al. obtained collagen peptide by enzymolysis of inedible fish to increase its economic value. Shibata et al. extracted fucoxanthin from Ishimozuku (*Sphaerotrichia firma*), which inhibited

fatty liver in obesity model mice and improved the production of short-chain fatty acids. Kotsoni et al. found that the protein content in the enzymatic hydrolysate can be increased after materials were pretreated by high-pressure. We can extract collagen and minerals from aquatic by-products, but the extraction method should be considered, as different extraction methods have different impacts. Green extraction methods should be considered to reduce energy consumption and chemical pollution. Kendler, Kobbenes, et al. found that microwave and ultrasound were green extraction procedures in the extraction of collagen from fish by-products. Yakti et al. reutilized leftover biomass from the marine environment as a feed of black soldier fly larvae, minimizing waste and benefiting various industries and society.

The comprehensive utilization of aquatic product processing and its by-products is an important way to achieve sustainable development of the aquatic industry. Faced with global resource and environmental challenges, we must strengthen technological innovation, optimize the industrial structure, expand international cooperation, promote industrial upgrading with scientific and technological innovation, and lead the future of the industry with green development.

Author contributions

SW: Conceptualization, Funding acquisition, Validation, Writing – original draft, Writing – review & editing. YC: Investigation, Supervision, Validation, Writing – review & editing. LS: Investigation, Supervision, Validation, Writing – review & editing. RD: Investigation, Validation, Writing – review & editing. HH: Investigation, Supervision, Validation, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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