

Fish waste as a human health enhancer - sustainable processes for prebiotics production

Francisca Mano¹, Isabel Sá-Nogueira², Susana Barreiros¹, Pedro Simões¹, Steve Bowra³
and Alexandre Paiva^{1*}

¹ LAQV-REQUIMTE – Departamento de Química, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, 2829-516, Caparica, Portugal

² UCIBio-REQUIMTE, Departamento de Ciências da Vida, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, 2829-516 Caparica, Portugal

³ Phytatec (UK) Ltd Plas Gogerddan, Aberystwyth SY23 3EB UK

*alexandre.paiva@fct.unl.pt

According to FAO data, in 2012, 58 million tonnes of fish were produced in fisheries and aquacultures, where 80% is used for direct human consumption and the remaining 20% is destined to non-food uses (fishmeal and oil production). In human consumption fish is processed in different levels before reaching the final consumer (Olsen et al., 2014), resulting in the production of high amounts of fish by-products that are usually applied as feed, fertilizers or even discarded.

Fish and fishery by-products are rich in proteins and other micronutrients, from which it is possible to obtain bioactive components, polymers, amino acids, polyunsaturated fatty acids and other products (Uddin et al., 2010), with vast applications in food, nutritional and pharmaceutical industries. However, there is still a lack of efficient and green processes for the valorisation of these by-products (Olsen et al., 2014).

Subcritical water (SCW) has been attracting interest due to its capacity of extracting, hydrolysate and modifying proteins and amino acids (Tahir, 2015). Extraction parameters optimization was performed and the proteins extracted analysed through SDS-PAGE. SCW extraction showed to be a very efficient extraction process, between 120 and 180 °C, extracting proteins with different molecular weights (> 300 kDa), without degradation. The bioactivity of the extracted proteins was evaluated, especially as potential prebiotics.