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P73 SE-HPLC and RP-HPLC as powerful tools for analyzing the gastrointestinal delivery of collagen hydrolysates obtained from codfish skins using chitosan-TPP hydrogels

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Approximately 70% of the fishery industry's production is waste, including heads, skins, bones, and scales. The valorization of these by-products may result in new raw materials for applications in various industries. Collagen is a ubiquitous protein with many applications, mainly derived from mammals. However, considering some health and religious restrictions, using marine collagen in codfish skin is a new alternative.[1,2] In this work, collagen was extracted with acetic acid and a mixture of urea and propanoic acid (1:2).[1] Additionally, bioactive collagen peptides were obtained recurring to enzymatic hydrolysis with alcalase.[3] Peptide size was evaluated using size exclusion (SE-HPLC), with the prevalent molecular weight ranging between 1-3 kDa and 3-5 kDa. The hydrolysates were encapsulated in chitosan-tripolyphosphate hydrogels,[4] accounting for 38.3% and 39.2% encapsulation efficiencies for peptides extracted with acetic acid and with the eutectic solvent, respectively. Finally, gastrointestinal simulation allowed the evaluation of the release of peptides from the hydrogels and the effect of digestion on the hydrolysates. Thus, it was possible to observe that the peptides were primarily delivered in the intestine, releasing approximately 87% of acetic acid-based peptides and 58% of urea with propanoic acid-based peptides. It is noteworthy that encapsulation can rely on peptides' polarity. Therefore, RP-HPLC was a powerful tool that showed hydrolysates' heterogenicity. Although enzyme action in the human tract did not significantly alter collagen peptides in size, it did in their bioactive properties, so encapsulation is still the most suitable alternative to apply them as possible nutraceuticals to replace conventional drugs.

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