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Physical and oxidative stability of 5% fish oil-in-water emulsions stabilized by potato peptides predicted by bioinformatics

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Potato industry produces a large volume of waste solutions rich in proteins derived from the production of starch and related products. Peptides embedded within the structure of potato proteins may exhibit enhanced emulsifying property. Thus, added-value products such as plant-based emulsifiers could be obtained from these discarded protein fractions. Bioinformatics tools allow the prediction and identification of embedded functional peptides, which can be released by hydrolysis, reducing time and costs for extensive screening processes to obtain such products.

In this work, synthetic potato peptides predicted by bioinformatics to have emulsifying properties were evaluated for their ability to provide physical and oxidative stability to 5% fish oil-in-water emulsions. Potato peptides with potential different conformation at the interface (e.g. α -helix or β -sheet) and charge were investigated. First, the interfacial tension at the oil/water interface was assayed by drop tensiometry. Secondly, the physical stability of the emulsions was studied by measuring zeta potential and monitoring droplet size distribution during storage. Finally, the oxidative stability of the emulsions was evaluated by electron paramagnetic resonance (EPR) of trapped radicals generated from lipid oxidation during storage.