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

García-Moreno, P.J.; Hansen, E.B.; Andersen, M.L.; Marcatili, P.; Jacobsen, C.

Publication date: 2018

Document Version
Peer reviewed version

Citation (APA):

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.
Physical and oxidative stability of 5% fish oil-in-water emulsions stabilized by potato peptides predicted by bioinformatics

P.J. García-Moreno, E.B. Hansen, M.L. Andersen, P. Marcatili, C. Jacobsen

a Technical University of Denmark, Lyngby, Denmark
b University of Copenhagen, Copenhagen, Denmark

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.