Emulsifying properties of potato peptides

García-Moreno, Pedro J.; Atak, Merve; Marcatili, Paolo; Jacobsen, Charlotte; Hansen, Egon B.

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.
Emulsifying properties of potato peptides

Pedro J. GARCÍA-MORENO¹, Merve ATAK¹, Paolo Marcatili², Charlotte JACOBSEN¹, Egon B. HANSEN¹

¹ National Food Institute, Technical University of Denmark, 2800 Kgs. Lyngby, Denmark
² Department of Bio and Health Informatics, Technical University of Denmark, 2800 Kgs. Lyngby, Denmark

The enrichment of food with bioactive ingredients is gaining an increasing interest by the food industry. Many of these bioactive compounds are hydrophobic (e.g. omega-3, vitamin A, D, and E and carotenoids), thus they need to be incorporated as oil-in-water emulsions in aqueous-food matrices.

Emulsifiers are required to physically stabilize oil-in-water emulsions. Proteins are commonly used as emulsifiers due to their amphiphilic properties which permit them to unfold at the interface, stabilizing oil droplets via steric and/or electrostatic repulsion. In the last years, there is an increasing trend to replace animal proteins (e.g. casein and whey protein) by plant proteins in vegetarian or vegan products, as well as to enhance food sustainability. Several plant proteins (e.g. pea proteins) have been reported to show emulsifying properties. Additionally, enzymatic hydrolysis of plant proteins may release embedded peptides with improved functional (e.g. emulsifying) or bioactive (e.g. antioxidant) properties.

Particularly interesting is the production of added-value ingredients from by-products streams. In this regard, the potato industry produces a considerably volume of waste solutions rich in proteins. These wasted proteins may have the potential to be used as cheap raw material for the production of plant-based emulsifiers.

In the light of the above, this study aimed at investigating the emulsifying properties of potato peptides. First, peptides embedded in potato protein with potential emulsifying activity were identified by using bioinformatics tools. Peptides which could adopt different conformation (e.g. α-helix or β-sheet) and which could have different charge at the oil-water interface were selected. Secondly, the emulsifying properties of the selected peptides were tested in 5% rapeseed oil-in-water emulsions. Emulsions were stabilized with synthetic peptides and their physically stability (e.g. droplet size distribution) was monitored during one week of storage. These results provide new insights into the production of emulsifying peptides from potato protein.