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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 and 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.