

Development of Protein-based Emulsion Gels For Food Structuring

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Abstract : Emulsion gels are constituted by a colloidal system (emulsion) stabilized by a polymeric gel matrix. These systems are more homogeneous and stable than conventional emulsions and can behave as either gel-like or soft-solid. Protein-based emulsion gels (PEG) have been used as carrier systems of bioactive compounds and as food structuring to improve the texture and consistency, mainly in producing low-fat content products. This work studied the effect of protein: polysaccharide ratio 0.75:1.25, 1:1, and 1.25:0.75 (levels -1, 0, and +1) and pH values (2-9) on the stability of protein-based emulsion gels using soy protein isolate and sodium alginate. Protein emulsion capacity was enhanced with increased pH (6,7,8 and 9) compared to acid pH values. The smaller particle size for PEG was at pH 9 (~23 μ m); however, with increasing protein ratio (level +1), higher particle size was observed (~23 μ m). The same trend was observed for rheological measurements; the consistency index (K) increased at pH 9 for level -1 (1.17) in comparison to level +1 (0.45). The studied PEG showed good thermal stability at neutral and pH 9 (~98 %) for all biopolymer ratios. Optimal conditions in pH and biopolymer ratios were determined for PEG using soy protein and sodium alginate ingredients with potential use in elaborating stable systems for broad application in the food sector.

Keywords : emulsion gels, food structuring, biopolymers, food systems

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