

There is a high demand for plant-based foods and beverages. U.S. retail sales for plant-based foods have significantly outpaced overall grocery sales. Evidently, the food industry is racing to develop plant-based food replacements. Soy and wheat proteins have been the basis of many plant-based foods; However, pea protein has recently gained popularity. The major challenge in using pea protein is its low solubility which limits its function in foods. Previous work has reported poor emulsifying ability of pea protein due to its large particle size. In this study, we aimed to improve solubility and emulsification properties of pea protein isolate (PPI) by combined ultrasound treatment and complexation of protein with citrus pectin.

The PPI-pectin solution was prepared by mixing 3% (w/w) PPI and 0.1 or 0.3% (w/w) pectin at pH 7 and sonicated for 20 min at 60% amplitude. Solution properties were characterized by measuring particle size and surface charge. Untreated or ultrasound-treated PPI or PPI-pectin solutions were then used to form emulsions at pH 5, 6, and 7, and the emulsion properties were determined. Results showed that ultrasound treated PPI-pectin complex had improved solubility and formed better emulsions as shown by decreased droplet size, increased negative charge and increases stability against creaming.