

Limited enzymatically hydrolyzed Pea Protein - Inulin interaction and gel forming properties

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Plant proteins are gaining significant attention as a potential alternative to animal proteins in many food and beverage products. In general, these proteins lack the physical and chemical properties of animal proteins. The overall objective of this investigation was to evaluate hydrolysis as an approach to changing the structural and functional properties of pea proteins.

Inulin is a neutral oligosaccharide and soluble fiber and has bifidogenic properties to promote gut health. By combining hydrolyzed pea protein and inulin, a functional food/ingredient can be investigated. A specific objective of this research was to explore the degree of hydrolysis and pea protein to inulin ratio needed for the optimum structural and functional properties.

Limited enzymatically hydrolyzed pea protein solutions (7.5%) were prepared using the enzyme Alcalase at three hydrolysis times (0/control, 3 and 6 mins). The pea protein hydrolysate to inulin (PPH:IN) ratios studied were, 0 (no inulin), 4:1 and 2:1. The gels were prepared within the Discovery HR-2 rheometer by heating at 85°C for 10 mins (to induce gelation), and cooling at 25°C for 10 mins. Following cooling, the gel properties were measured using amplitude, frequency and flow sweeps to characterize the viscoelastic properties of the samples.

The highest storage modulus value was observed for gels with a PPH:IN ratio of 4:1 and 3 mins of hydrolysis, and the lowest value was observed for control samples with PPH:IN ratio of 2:1. It was apparent that hydrolysis time controlled the ability of the gel to incorporate inulin and had a greater effect on gel strength, as compared to PPH:IN ratio. The gels (except control samples) were physical gels, with similar frequency dependence values, despite having significantly different storage modulus values. The steady shear flow sweeps demonstrated that viscosity decreased with an increase of shear rate for all samples, suggesting a shear thinning behavior.