

Public Abstract

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Title:Application of Whey Protein-Polysaccharide Complexes in Aerated Dairy Gels

The effect of heating whey protein isolate (WPI) and polysaccharides together to form a complex was studied. Polysaccharides from two different groups (pectins and carrageenans) were chosen due to their different degrees of electrostatic charge. WPI-polysaccharide complexes were prepared by heating the mixed solutions (8% protein, 0 to 1% polysaccharide) at pH 7 and then mixing with heated skim milk powder (8% protein). Aerated gels were formed by whipping the liquid solution with a handheld frother and then setting the foam as a gel by lowering the pH. The aerated gels were evaluated for overrun, stability, and textural properties such as firmness and mouthfeel.

Overrun of aerated gels significantly decreased as polysaccharide concentration increased due to increased viscosity which limited air incorporation. Aerated gel stability increased with polysaccharide concentration. Additionally, complexes made with highly charged polysaccharides were better at improving stability. Yield stress and  $G'$  are important indicators of firmness and mouthfeel. For both the pectin and carrageenan systems, regression models show that yield stress and  $G'$  decreased with increasing overrun and increased with increasing gel strength.

Stable dairy-based aerated gels can be created with heated WPI-polysaccharide complexes. High charge density polysaccharides, at concentrations that provide adequate viscosity, are needed to achieve stability while also maintaining solution overrun capabilities. Knowledge gained from this study can be used by food manufacturers to formulate dairy-based aerated gel foods set by acid or calcium such as whipped yogurts and mousses.