IFSH Seminar Series

Wednesday, October 12, 2016
1:00 – 2:00 PM
Innovation Exchange (Bldg 91, Room 108)

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Lecturer
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"Effect of Various Preparation Parameters on the Formation and Stability of Multilayer Emulsions"

Biosketch

Dr. Young-Hee Cho received her B.S. and M.S. degrees in Food and Nutrition at Chonnam National University in Korea and worked for three years at Korea Food Research Institute. She received a Ph. D. in Food Science at the University of Massachusetts. Following graduate work, she has worked for four years at Purdue University as a continuing lecturer. Dr. Cho's research interests include the interaction between food proteins and polysaccharides in solution and colloidal systems, and the development of structured delivery systems using biopolymers and their applications in real food matrices.

Abstract

The objectives of this study were to carry out research to better understand the formation, stability and properties of multilayer emulsions containing nano-laminated biopolymer coatings. The effect of various preparation parameters on the formation and stability of multilayer emulsions was investigated: droplet concentration; mean droplet diameter; droplet charge; biopolymer concentration. At certain droplet and pectin concentrations stable multilayer emulsions could be formed consisting of protein-coated lipid droplets surrounded by a pectin layer. The possibility of assembling protein-rich coatings around lipid droplets was examined using the electrostatic deposition method, with the aim of producing emulsions with novel functionality. The composite particles formed had relatively small diameters ($d < 500$ nm) and were stable to gravitational separation. They also remained stable after they were heated above the thermal denaturation temperature of the globular protein and had better stability to aggregation at high salt concentrations (50 – 200 mM NaCl) than conventional emulsions stabilized by only protein. Knowledge gained from this research will provide guidelines for rationally designing emulsion-based delivery systems that are resistant to environmental stresses or with controlled release properties. These delivery systems could be used to encapsulate, protect and release functional components in various industrial products, such as foods, pharmaceuticals, cosmetics, and personal care products.