IFSH Seminar Series

Thursday, November 5, 2015
11:00 AM – 12:00 PM
Bldg. 90, Room 100, Moffett Campus

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"Survival and Thermal Inactivation of Shiga Toxin-Producing *Escherichia coli* and Potential Surrogates in Wheat Flour"

Biosketch

Dr. Hossein Daryaei is a Research Scientist and Principal Investigator at the Institute for Food Safety and Health (IFSH). He received his B.S. and M.S. degrees in Agricultural and Food Engineering from The University of Tehran and Azad University in Iran, and his Ph.D. in Food Science from Royal Melbourne Institute of Technology (RMIT) in Australia. Prior to joining IFSH in 2012, Hossein worked as a Post-doctoral Research Associate at The Ohio State University and investigated novel processing technologies for producing high-quality shelf-stable or extended-shelf-life foods and beverages. Hossein's research interests include microbiological safety validation of thermal and non-thermal food processes, evaluation of the survival and heat resistance of pathogens in low-moisture food, shelf-life extension of fermented dairy products, and packaging for advanced food preserving technologies. He is currently a member of the IFSH Proficiency Testing Team.

Abstract

Escherichia coli are Gram-negative, rod-shaped bacteria. Most of the *E. coli* strains are harmless, but some produce a cytotoxin called Shiga toxin that can inhibit protein synthesis in target cells and cause severe diseases in humans, including bloody diarrhea, blood-clotting problems, kidney failure, and death. Although O175:H7 is currently the predominant serotype of Shiga toxin-producing *E. coli* (STEC) worldwide, non-O157:H7 serotypes are also emerging as a cause of foodborne illnesses. In the United States, a group often referred to as the "big 6" (O111, O26, O121, O103, O145, and O45) accounts for the majority of the non-O157:H7 serotypes isolated from clinical infections, comprising about 80% of the non-O157 STEC isolates. To date, very limited data are available on the survival, heat resistance, and thermal inactivation kinetics of STEC in low-moisture foods and environments. Furthermore, there is a need to identify non-pathogenic bacteria to be used as surrogates to STEC strains to validate the efficacy of the heat treatment of low-moisture foods. In this seminar, the findings from a recent study on thermal inactivation of STEC and potential surrogates in wheat flour with typical moisture content of between 8 and 13% will be presented. The study also examines the effects of inoculum preparation methods on the survival and heat resistance of STEC in the product.