IFSH Seminar Series
Thursday, December 4, 2014
1:00PM – 2:00 PM
Room 100, Moffett Campus

N. Rukma Reddy, Ph.D.
Research Food Technologist
Division of Food Processing Science and Technology
Food and Drug Administration

Guy E. Skinner, Ph.D.
Research Food Technologist
Division of Food Processing Science and Technology
Food and Drug Administration

"Inactivation Kinetics of *Clostridium botulinum* Spores by High Pressure Processing"

Biosketch

Rukma Reddy received his Ph.D. degree from Utah State University. Guy Skinner received his Ph.D. degree from the University of Georgia. They both joined FDA at the start of National Center for Food Safety and Technology and have been lab partners ever since. Their research expertise is in the area of inhibition and control of *Clostridium botulinum* in low-acid shelf-stable and extended shelf life refrigerated food products.

Abstract

This presentation covers the brief overview of *Clostridium botulinum* types and their associated outbreaks, and inactivation kinetics of most resistant spores of *Clostridium botulinum* exposed to combinations of high pressures and temperatures. These resistant strains were selected by screening 31 strains of type A and proteolytic type B *C. botulinum*. Resistance of spores of selected *C. botulinum* strains (Giorgio-A and 69-A) was compared with the resistance of *Clostridium sporogenes* PA3679 spores. Proteolytic type B strains were less resistant compared to resistance of type A strains to processing at a high pressure and temperature (105ºC and 700 MPa) combinations. *C. botulinum* strains Giorgio-A, 69-A, and *C. sporogenes* PA3679 spores demonstrated decreased resistance as the process temperature increased from 93 to 108ºC. High pressure had little or no effect on resistance of Giorgio-A and 69-A, and *C. sporogenes* PA3679 based on D-values and range of pressures (600-750 MPa) tested. Pressure-assisted D-values of *C. sporogenes* PA3679 at 108ºC and various pressures were higher than the selected *C. botulinum* strains. Thermal D-values were higher for Giorgio-A, 69-A, and *C. sporogenes* PA3679 at any temperature compared to those processed at the same temperature combined with pressure. This implies that pressure does assist in the inactivation of *C. botulinum* spores, but not within the range of pressure tested here. Based on the thermal and pressure-assisted D-values, *C. sporogenes* PA3679 reported to be more resistant than *C. botulinum* strains, Giorgio-A and 69-A. Details on the inactivation kinetics of *C. botulinum* strains in comparison with *C. sporogenes* PA3679 will be presented.