

Title Destruction of *Salmonella* Enteritidis inoculated onto raw almonds by high hydrostatic pressure
Author L.D. Goodridge, John Willford and N. Kalchayanand
Citation Food Research International, Volume 39, Issue 4 , May 2006, Pages 408-412
Keywords Raw almonds; *Salmonella* Enteritidis; Contamination; Outbreaks; High hydrostatic pressure; Decontamination; Low water activity; Baroprotective; Water pressurization

Abstract

The effects of continuous (50,000, 60,000 and 70,000 psi with holding times of 5 and 10 min) and discontinuous (oscillatory) (six cycles at 60,000 psi with a holding time of 20 s) high hydrostatic pressure (HHP) treatments on the viability of two *Salmonella* Enteritidis strains (FDA and PT30) inoculated onto raw almonds were evaluated at 25, 50, and 55 °C. Complete inactivation of the *S. Enteritidis* was achieved in 0.1% peptone water after continuous pressurization at 60,000 psi and 25 °C for 5 min. Continuous pressurization of raw almonds inoculated with *S. Enteritidis* at 60,000 psi and 50 °C for 5 min resulted in less than a log reduction (\log_{10} 0.83) of vegetative cells. The decimal reduction time using the continuous pressurization parameters was determined to be 9.78 min. A discontinuous process consisting of six cycles of pressurization at 60,000 psi and 50 °C for 20 s provided greater than a one log reduction (\log_{10} 1.27 for FDA and \log_{10} 1.16 for PT30) of the *S. Enteritidis* concentration. The low water activity (a_w) of the almonds was found to impart baroprotective attributes on the *S. Enteritidis* cells. When the almonds were directly suspended in water and then pressurized, a \log_{10} reduction of 3.37 was achieved. HHP of certain dry foods appears to be feasible if the food is directly suspended in the pressurizing medium (water).