

Title High hydrostatic pressure processing reduces *Salmonella enterica* serovars in diced and whole tomatoes

Author Jessica E. Maitland, Renee R. Boyer, Joseph D. Eifert and Robert C. Williams

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Abstract

Fresh and fresh-cut tomatoes have been associated with numerous outbreaks of salmonellosis in recent years. One effective post harvest treatment to reduce *Salmonella enterica* in tomatoes may be high pressure processing (HPP). The objectives of the study were to determine the potential for HPP to reduce *S. enterica* serovars Newport, Javiana, Braenderup and Anatum in tryptic soy broth (TSB) and to determine the effect of HPP to reduce the most pressure resistant of the four serovars from fresh diced and whole tomatoes. To evaluate pressure resistance, TSB containing 8 log CFU/ml of one of the four serovars was packaged in sterile stomacher bags and subjected to one of three different pressures (350, 450 or 550 MPa) for 120 s. The most pressure resistant *S. enterica* serovar evaluated was Braenderup. Subjecting the broth culture to 350, 450 and 550 MPa resulted in a 4.53, 5.74 and 7.09 log reduction in *S. Braenderup*, respectively. Diced tomatoes (150 g) and whole red round tomatoes (approximately 150 g) were inoculated with 0.1 ml of 9.1 log CFU/ml *S. Braenderup*, and subjected to the same pressure treatments (350, 450 or 550 MPa). Significant reductions of *S. Braenderup* concentrations in diced tomatoes ($P < 0.05$) were seen after processing at 350 (0.46 CFU/g), 450 (1.44 log CFU/g), and 550 MPa (3.67 log CFU/g). In whole tomatoes, significant reductions ($P < 0.05$) were also seen at 350 (1.41 log CFU/g), 450 (2.25 log CFU/g) and 550 MPa (3.35 log CFU/g). HPP may be an effective post harvest strategy to reduce low levels of *S. enterica* contamination in whole and diced tomatoes.