ABSTRACT BOOK

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PW366 Multiple molecular components of Listeria monocytogenes affected by high pressure processing treatments: Fourier transform-infrared spectroscopy insights

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Background: High pressure processing (HPP) is an attractive alternative technology to conventional thermal treatments for inactivation of foodborne pathogenic bacteria. Despite its interest, the effect of HPP on bacterial cellular components is not well established, undermining the development of strategies for circumventing the emergence of HPP-tolerant bacteria.

Objectives: To evaluate the impact of different HPP treatments on molecular components of *Listeria monocytogenes.*

Methods: Fourier-transform infrared with attenuated total reflectance (FTIR-ATR) spectra of two clinically-relevant *L. monocytogenes* strains (RO15-serotype 4b/herring+spices/Romania/2013; ScottA-1/2a/milk/France/1992) were acquired from stationary phase growth suspension cells, exposed to HPP treatments (300MPa-2/8/15'; 400MPa-2/8/15'; 600MPa-15') or not, using Nicolet iS50 FT-IR spectrometer (6 replicates/resolution of 4cm^{-1}/32 scan co-additions), and modeled with hierarchical cluster analysis (HCA) and partial least squares discriminant analysis (PLSDA).

Results: Strain specific spectra were observed before and after HPP treatments by HCA. *L. monocytogenes* cells submitted to HPP were clearly discriminated from non-treated cells by PLSDA, with variances occurring in all spectra. Three clusters were evidenced for each strain by HCA, corresponding to cells exposed to 300MPa-2', 400MPa-2' or 600MPa-15'. Additionally, all but two (RO15: 300MPa-8/15', ScottA: 400MPa-8/15') HPP treatments were discriminated by PLSDA, with multiple cell components being affected. Nevertheless, the main spectral variances were observed in proteins/amides I and II (1700-1500cm^{-1}) and in phospholipids/DNA/RNA (1500-1200cm^{-1}) regions, which seems to be the main targets of HPP. Elucidations of these cellular components are crucial for enhancing HPP efficacy (e.g. development of specific HPP additives) and for studying bacterial HPP tolerance responses.