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M53 - Depicting the suitability of FTIR to improve the differentiation of persistent and sporadic *Listeria monocytogenes*

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Abstract Content

Listeria monocytogenes is a ubiquitous Gram-positive pathogen that is particularly harmful to immunocompromised individuals. In food processing environments (FPEs), certain strains of *L. monocytogenes* are routinely isolated, while others are only encountered sporadically. One possible explanation for this recurrent isolation correlates with the presence of heterogeneous subpopulations, some of which can withstand adverse conditions encompassing high salinity, low temperature, and low pH, along with other FPEs-related stressors. We set out to evaluate the suitability of Fourier Transformed Infrared Attenuated Total Reflectance (FTIR-ATR) spectroscopy to discriminate between the fittest persistent specimens from the remaining sporadic subpopulations. 72 *L. monocytogenes* isolates, encompassing both persistent and sporadic *L. monocytogenes*, were grown in microtiter plates in the presence of different food-associated stressors (pH, T ºC, % NaCl), with growth curves obtained by measuring the optical density (OD600). After reaching the late exponential phase, the cell pellets were collected and analysed by FTIR-ATR spectroscopy. Additionally, infrared (IR) spectra of isolates grown in agar plates at 37ºC were collected. Partial Least-Squares Discriminant Analysis classification models based on collected IR spectra were developed to determine the viability of FTIR spectroscopy to discriminate persistence in different conditions. The gathered data showed no significant differences in growth rates and lag phases of persistent and sporadic *L. monocytogenes* in a planktonic state when grown at 37ºC or under the food-associated stressors tested. FTIR analysis has shown promising results in differentiating persistent and sporadic isolates belonging to the same serogroup, achieving correct assignment rates of over 70%.