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Abstract

Evaluation of the microbial ecology present in a meat industry through Surface-Sensors (SCH): Influence of resident microbiota on Listeria monocytogenes.

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Abstract:

Despite all the efforts to eliminate the microorganisms present on the surfaces in food industries, certain microbial communities can persist forming the resident microbiota. In fact, multiple studies show the transfer capacity of microorganisms between food, surfaces, hands and utensils, among others, highlighting the relevant role of cross-contamination in foodborne diseases (Dantas et al., 2018; González-Rivas et al., 2018; Jensen et al., 2017; Ripolles-Avila et al., 2018a; Ripolles-Avila et al., 2018b). Generally, Enterobacteriaceae, Pseudomonas spp., Bacillus spp., Acinetobacter spp., Staphylococcus spp. and lactic acid bacteria dominate and reside on the surfaces of food facilities (Møretrø&Langsrud, 2017).These resident microorganisms can either inhibit the proliferation of pathogens or, on the contrary, enhance their establishment in mixed biofilms (Giaouris et al., 2015). Consequently, resident microbiota can have a significant effect on the probability of finding L. monocytogenes on food premises. For example, in the presence of a natural microbiota on wooden shelves, inoculated L. monocytogenes remained stable or even decreased to 2 log(CFU/cm2) after twelve days of incubation at 15°C under all conditions tested. However, L. monocytogenes increased to 4 log (CFU/cm2) when the resident biofilm was thermally inactivated, suggesting that the ecosystem residing in wooden shelves is able to control certain pathogens (Mariani et al., 2011). The specific purpose was to identify the resident microorganisms (aerobic mesophilic bacteria, lactic acid bacteria and yeasts and molds) after the cleaning and disinfection processes by means of implementing SCH sensors. Another objective was to compare the existing species in the different areas that could have a positive or negative effect on the presence of L. monocytogenes. As a long-term aim, this study was conducted to investigate the presence of possible inhibitors or enhancers of this persistent foodborne pathogen in the industry's microbiota to reinforce the control strategies of L. monocytogenes and optimize cleaning and disinfection protocols.

Biography:

Dr. Carolina Ripolles-Avila was graduated in Food Science and Technology by the Autonomous University of Barcelona (Spain-2014). After that, she graduated from her master studies in Food Safety and Public Health with Honors and received the Food Science Young Investigator Award by the Heriot-Watt University (UK-2015).

Recent Publications:

1. Dr. Carolina Ripolles-Avila, et al; Novel Intervention Techniques in the Food Industry; 2020
2. Dr. Carolina Ripolles-Avila, et al; Effect of an enzymatic treatment on the removal of mature Listeria monocytogenes biofilms: A quantitative and qualitative study; 2020
3. Dr. Carolina Ripolles-Avila, et al; Microscopic analysis and microstructural characterization of the organic and inorganic components of dairy fouling during the cleaning process; 2020
4. Dr. Carolina Ripolles-Avila, et al; Bactericidal efficacy of UV activated TiO2 nanoparticles against Gram-positive and Gram-negative bacteria on suspension; 2019
5. Dr. Carolina Ripolles-Avila, et al; Biofilms, microorganismos alterantes y deterioro de productos cárnicos; 2019

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