

Inactivation and Stress Response of *Salmonella enterica* Serotype Typhimurium lt21 upon Cold Gas-Phase Plasma Treatment

Authors : Zoran Herceg, Tomislava Vukušić, Anet Režek Jambrak, Višnja Stulić

Abstract : Today one of the greatest challenges are directed to the safety of food supply. If food pathogens are ingested they can cause human illnesses. Because of that new technologies that are effective in microbial reduction are developing to be used in food industries. One of such technology is cold gas phase plasma. *Salmonella enterica* was studied as one of the pathogens that can be found in food. The aim of this work was to examine the inactivation rate and stress response of plasma treated cells of *Salmonella enterica* inoculated in apple juice. After the treatment cellular leakage, phenotypic changes in plasma treated cells-biofilm formation and degree of recovery were conducted. Sample volume was inoculated with 5 mL of pure culture of *Salmonella enterica* and 15 mL of apple juice. Statgraphics Centurion software (StatPoint Technologies, Inc., VA, USA) was used for experimental design and statistical analyses. Treatment time (1, 3, 5 min) and gas flow (40, 60, 80 L/min) were changed. Complete inactivation and 0 % of recovery after the 48 h was observed at these experimental treatments: 3 min; 40 L/min, 3 min; 80 L/min, 5 min; 40 L/min. Biofilm reduction was observed at all treated samples. Also, there was an increase in cellular leakage with a longer plasma treatment. Although there were a significant reduction and 0 % of recovery after the plasma treatments further investigation of the method is needed to clarify whether there are sensorial, physical and chemical changes in juices after the plasma treatment. Acknowledgments: The authors would like to acknowledge the support by Croatian Science Foundation and research project 'Application of electrical discharge plasma for the preservation of liquid foods'.

Keywords : salmonella enterica serotype typhimurium lt21, gas-phase plasma treatment, inactivation, stress response

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