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DISINFECTANTS EFFICIENCY AGAINST *Listeria monocytogenes* BIOFILMS ON STAINLESS STEEL

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Listeria monocytogenes is a foodborne pathogen that can cause severe invasive human illness (listeriosis) in susceptible individuals. This microorganism is of special concern to the food industry, among several other characteristics, due to its ability to form biofilm and to persist in the processing environment. When in biofilms, cells are more resistant to disinfectants and this led to an inefficient disinfection of surfaces and equipments. Disinfectants are classified by their chemical nature and each class has unique characteristics, hazards, toxicities and efficacy against various microorganisms. Quaternary ammonium compounds are cationic detergents that are attracted to the negatively charged surfaces of microorganisms, where they irreversibly bind phospholipids in the cell membrane and denature proteins impairing permeability. Oxidizing agents, as peroxide based compounds, act by denaturing the proteins and lipids of microorganisms. Alcohol compounds damage microorganisms by denaturing proteins, causing membrane damage and cell lysis. The aim of this study was to evaluate the efficiency of three disinfectants applied over a biofim produced by *Listeria monocytogenes* isolated from a food processing area. Biofilms were produced on stainless steel coupons incubated in meat broth inoculated with *L. monocytogenes* during 24 h to let the surface to be covered by a biofilm layer (4.2 x 10^8 UFC/cm^2). The coupons were washed with sterilized tap water and the disinfectants efficacy were analysed in accordance with EN 1276 European Standard for evaluation of bactericidal efficacy of disinfecting liquids, analysis were done in triplicate. Tested substances were: ethanol:isopropanol:benzilic alcohol (46:27:1) [D1], hidrogen peroxide [D2] and benzalkonium chloride (0.5 e 2%) [D3] and the neutralizants were: polysorbate 80 (30 g/L), lecitin (3 g/L), saponin (30 g/L) [N1] and thiosulfate (10 g/L), polysorbate (50 g/L) and lecitin (3 g/L) [N2]. The coupons were dipped in disinfectant D1 followed by neutralizing N1 during 1, 15, 30 and 60 minutes in each solution and washed again prior to swab, dilution and plate the samples on TSA-YE. The procedure was repeated to D2-N2 and D3-N1. The results evidence that after 1 minute the average rates reduction were 6.03 log to D1, >8.55 log to D2, 7.29 log to D3 (0.5%) and >8.55 log to D3 (2%). It was not possible to observed microbial growth after 15, 30 and 60 min in contact with tested disinfectants. The contact time recommended by the disinfectants producers were: 30 seconds (D1), 15 minutes (D2) and 5-15 minutes (D3), but in this study it was observed that it is necessary to keep these products in contact with the surfaces at least 1 minute to reach an appropriate microbial reduction.

Key-words: foodborne pathogens, antimicrobial activity, disinfection, biofilms