

TITLE: BEHAVIOR OF *LISTERIA MONOCYTOGENES* STRAINS IN BRINE SIMULATING COMMERCIAL CONDITIONS

AUTHORS: BARANCELLI, G.V¹; CRUZADO-BRAVO, M.L.M¹; PADOVANI, N.F.A.; OLIVEIRA, C.A.F²; HOFER, E³; CONTRERAS-CASTILLO C.J¹.

INSTITUTIONS:

¹DEPARTAMENT OF AGROINDUSTRY, FOOD AND NUTRITION, LUIZ DE QUEIROZ COLLEGE OF AGRICULTURE, UNIVERSITY OF SÃO PAULO (AV. PÁDUA DIAS, 11, CEP 13418-260, PIRACICABA, SP, BRAZIL)

²FACULTY OF ANIMAL SCIENCE AND FOOD ENGINEERING, UNIVERSITY OF SÃO PAULO (CAMPUS FERNANDO COSTA, AV. DUQUE DE CAXIAS NORTE, 225 - ZONA RURAL, PIRASSUNUNGA - SP, 13635-900, BRAZIL)

³LABORATÓRIO DE ZONOSSES BACTERIANAS, INSTITUTO OSWALDO CRUZ (AV. BRASIL, 4365 - MANGUINHOS, RIO DE JANEIRO - RJ, 21040-360, BRAZIL)

Listeria monocytogenes is an important human pathogen that can occur in food processing environments. Due to its ubiquitous nature and ability to survive in adverse conditions, such as low temperatures, the control of this bacterium in dairy processing plants is a challenge. Brine is used in the production of most cheeses and can harbor *L. monocytogenes*. There are few researches evaluating the survival of different *L. monocytogenes* strains in brine simulating commercial conditions. The aim of this research was to evaluate the behavior of 4 different *L. monocytogenes* strains, previously characterized by Pulsed-field Gel Electrophoresis. Sterilized samples of brine (pH 5.6) containing 17%, 20% and 23% of NaCl added with milk whey (5.0%) were inoculated (4.5 log UFC/mL) with 3 strains (B, C and D) isolated from cheese processing plants and the reference ATCC 7644 *Listeria monocytogenes* (with three replicates). Brine was incubated at 10°C and the populations of *L. monocytogenes* were determined by surface viable count (10µL) on Tryptic Soy Agar (TSA) with 0.6% of Yeast Extract (YE). When no growth was observed, an enrichment step was performed in Tryptic Soy Broth + YE followed by streaks on TSA-YE. The analysis of variance of repeated measurements was performed by Duncan averages comparison test, for comparison between strains and salt concentration (level of significance of 0.05 using XLSTAT 2016 Software Microsoft®, USA). A slow downward trend was observed in relation to the initial inoculum. It was possible to perform bacterial counts until 240, 270, 300 and 360 days for A, C, D and B strains, respectively. There was significant difference between the strains, but the different concentrations of salt did not affect the counts of the bacteria over time. After several months of brine exposure, the presence of the bacterium was detected only after the enrichment step (8 months for strain A, 12 for B and 11 months for C and D strains). For B, C, D and A strains, the survival, after enrichment stage, was 452, 392, 362 and 242 days, respectively. Strains originated from cheese processing plants were more resistant to NaCl than ATCC 7644. For the strains evaluated, the high concentrations of NaCl used, simulating commercial brines, were not able to offer safety against this microbiological hazard. The long exposure time of the bacteria to high concentrations of salt did not avoid the survival of the pathogen.

Keywords: survival, osmotic stress, NaCl, *Listeria monocytogenes*, brine

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