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The Antagonistic Activity of Lactobacillus Sakei on Pathogenic Bacteria during Meat Fermentation

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The aim of the study was to determine the antagonistic activity of starter culture *Lactobacillus sakei* against *Salmonella typhimurium* and *Escherichia coli* during meat fermentation. *S. typhimurium* and *E. coli* cultures were grown on PCA slants at 37 ºC for 24 h. *L. sakei* was grown on MRS slants at 30 ºC for 48 h anaerobically. Minced pork (fat content 30 %) salted by 2 % of NaCl was inoculated with suspensions of bacteria (10^8 CFU/ml) and the following samples were prepared: with *L. sakei*; *L. sakei* + *S. typhimurium*; *L. sakei* + *E. coli*; *E. coli*; *S. typhimurium.* Samples were thoroughly mixed, tucked into proteins hells and fermented at 22°C, 48 h, then at 20°C, 48 h. The number of lactobacilli, *S. typhimurium* and *E. coli*, as well as the pH, was determined at the begining of the fermentation process and during the process after 24 h, 48 h, 72 h and 96 h.

L. sakei had an antagonistic effect against the growth of *E. coli* and *S. typhimurium*. During the fermentation process, in samples with *L. sakei* the number of *E. coli* and *S. typhimurium* decreased by 100 and 35 times, respectively. *L. sakei* showed the stronger antagonistic activity against *E. coli* than against *S. typhimurium*. During the fermentation, pH of meat decreased from 5.7 to 4.9-5.0. The antagonistic activity of lactobacilli could occur in meat due to the decrease of pH and production of antimicrobial substances inhibiting the growth of *S. typhimurium* and *E. coli*.

Keywords: Lactobacillus sakei, pathogens, meat fermentation.

Biography:

- Irena Mačionienė is working from 2005 to until now in Kaunas University of Technology, Food institute, laboratory of microbiology science, senior researcher associate. Main research area: food microorganisms – investigation of activities, developing and improving of their determining methods.
- 2002-2005 Kaunas University of Technology, Food institute, laboratory of microbiology, research assistant. Main research area: food microorganisms – investigation of activities, developing and improving of their determining methods.
- 2002-2009 Kauno Kolegija, University of Applied Sciences, Department of catering, associated professor. Lectures, practical work with students.
- 1997-2001 Lithuanian Food Institute/ Kaunas University of Technology, PhD student. Microbiological research of food products, recording, collation, checking of all scientific data, planning of experiments, preparation of scientific publications.
- 1985-1997 Food institute of Kaunas University of Technology (former Lithuanian Branch of All Union Research Institute for Butter and Cheese), laboratory of microbiology, engineer. Microbiological research of milk and milk products.
- 1984-1985 „Vilnius dairy factory“, master. Organization of cream and sour cream production, quality control.