

Summary

The purpose of this study was to determine the applicability and usefulness of prognostic microbiology tools as part of food safety management systems. The research assumes the possibility of contamination of raw materials by *Listeria monocytogenes* cells during butter production by periodic method.

The literature presents the human health risks associated with the presence of this pathogen in food and the contamination of food products with this microorganism in Poland and in the world. In addition, the assumptions and models of predictive microbiology were discussed, along with the application possibilities and possibilities of their use in compatibility with applicable laws and industry requirements.

Research has been conducted since the collection of raw milk. Intentional contamination was performed in raw materials, semi-finished products used in the production of butter, as well as extra butter and flavored butter, assuming different variants of the possibility of product contamination. In one variant it was assumed that sweet cream was intentionally contaminated with *L. monocytogenes* strains before the production of butter. In the second variant it was assumed that the butter has been contaminated during packing process. The adaptability of the pathogen was also determined by specifying the presence and number of pathogen cells in buttermilk and post-production residues (In the case of butter production - in the rinses obtained at the butter rinsing process). Divided into test samples material was stored at 3, 6, 9, 12 and 21 °C.

Based on the obtained results, it was observed more than twice higher growth rate of *Listeria monocytogenes* cells in butter produced from contaminated sweet cream than in butter contaminated at the packaging stage. Such a regularity was not observed for flavored butter. The inhibitory properties of used supplements on *L. monocytogenes* was observed. Predictive microbiology tools used in applications and predictive platforms could be used during prediction of microbiological hazards and may be a valuable element of a food safety management system. Creating databases and applications that take into account results from food analysis, the accuracy of generated prediction could be enhanced.