

ANTILISTERIAL EFFECT OF BACTERIOCIN ISOLATED FROM *ENTEROCOCCUS FAECALIS* DURING THE FERMENTATION OF SOFT WHITE CHEESE

Slavica Veskovic Moracanin^{1*}, Dragutin Djukic², Branka Borovic¹, Nurgin Memisi³

¹Institute of Meat Hygiene and Technology, Belgrade, Kacanskog 13, 11000 Belgrade, Serbia

²Faculty of Agronomy Cacak, University of Kragujevac, Cara Dusana 34, 32000 Cacak, Serbia

³IMLEK AD, Tolminska 10, 24000 Subotica, Serbia

*e-mail: slavica@inmesbgd.com

Abstract

Until recently, genus *Enterococcus* is considered as indicator of fecal contamination. Nowadays, strains of this genus are considered as common microbiota, particularly in autochthonous kinds of cheese, in which they contribute to the development of specific sensory properties. Also, numerous *Enterococcus* strains, isolated from different fermented and non-fermented foodstuffs, produce many types of bacteriocins that induced many investigations due to perceiving its use in foodstuff protection. In this paper, it is investigated the antilisterial effect of bacteriocins produced by *Enterococcus faecalis*, isolated from autochthonous Serbian white cheese (Zlatar cheese), in the aim of *Listeria monocytogenes* growth control during soft white cheese manufacturing.

Isolation of semi purified bacteriocin from *E. faecalis* (enterocin) was done by the method of saturated precipitation with ammonium-sulphate, adjusted to the individual laboratory conditions. The activity of the isolated, semi purified enterocin was determined by the critical dilution method against the selected test microorganism - *L. monocytogenes* ATCC 19111. Its strength was approximately 1280 AU/mL. After milk coagulation on traditional way by commercial rennet with strength of 1 : 5,000 (1.5 - 2 mL/L), the total amount was divided into three equal parts: the first part was control group (K), the second part was inoculated with *L. monocytogenes* (ca. 104 cells/mL) (O-1), in the third part was added *L. monocytogenes* and bacteriocin isolated from *E. faecalis* (1280 AU/mL) (O-2). Manufacturing of these cheese was repeated three times. Samples for laboratory examinations were taken on days: 0, 2, 4, 7, 14 and 21. Determination of the presence of *Listeria* spp. was carried out following the procedure of the ISO 11290 - 1, 2 ([26] and [27]). The software package "Statistica for Windows" (StatSoft, Inc., USA) was used for statistical analysis. Differences between average values are presented on the level of 95% ($P \leq 0.05$).

L. monocytogenes was not detected in any sample of the control group. In the experimental group of cheeses with added bacteriocins (group O-2), at the end of maturation, there was the statistically significant level of reduction of *L. monocytogenes* number ($P \geq 0.05$). From the initial number of 104 CFU/g, at the end of the maturation, the number of this pathogen was reduced under 100 CFU/g.

These results show that enterocin was successful in preventing *L. monocytogenes* growth, despite the possible inactivation by various interactions within the food system. A very important fact is that the strain tested in the present work is isolated from a traditional Zlatar cheese, represents the natural bioprotector isolated from a similar matrix.

Key words: *Enterococcus faecalis*, Bacteriocin, Antilisterial effect, Cheese.