THE IMPACT OF SOME FACTORS ON THE VIABILITY OF *LACTOBACILLUS PLANTARUM* AND *LACTOBACILLUS FERMENTUM* STRAINS DURING THE PROCESS OF LYOPHILIZATION

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Summary. The present study was designed to assess the impact of different protective media, the method of concentration and the age of the lactate-fermenting bacteria *Lactobacillus plantarum* and *Lactobacillus fermentum* on their viability during the lyophilization.

The cultures of *L. plantarum* and *L. fermentum* of 18 and 48 hour age were studied. For the concentration of these cultures the following methods were used: centrifugation and removal of the cultivative medium from the spontaneously precipitated microorganisms. The precipitates were suspended 1:3 with the protective media (No. 1, 2, 3, 4 and 5), containing skimmed milk, various carbohydrates and other ingredients. The number of viable microorganisms was studied on rigid nutritive medium - MRS agar (Liofilchem-Italy). The lyophilyzer GT-2 (*Leybold-Heraeus, Germany)* was used for the lyophilization.

It was defined that the viability of *L. fermentum* strain depends on their age. The number of viable microorganisms *L. fermentum* in 18 hour age culture was from 6% ($p>0.1$) to 32% ($p<0.01$) higher than in 48 hour age culture after the lyophilization in all media tested, although the age of *L.plantarum* strain had no impact on their viability. The methods of concentration used for the cultures of *L. fermentum* and *L. plantarum* strains had no effect on their viability. However, the viability of studied microorganism strains during lyophilization depends on the composition of protective media used. The number of viable microorganisms in the media No. 5, which contained milk, saccharose, lactose, ascorbic acid and peptone, was from 18% ($p<0.05$) to 35% ($p<0.01$) higher than in other studied media.

The analysis of the results leads to the conclusion, that in order to save as many as possible viable microorganisms during the process of lyophilization it is necessary to pay attention to the age of microorganisms and the composition of protective media.

Keywords: lyophilization, *Lactobacillus plantarum, Lactobacillus fermentum*, age, viability, centrifugation, protective media.