

EVALUATION OF VIABILITY *Lactobacillus acidophilus* MICROENCAPSULATED BY COMPLEX COACERVATION AND SUBMITTED BY FREEZE DRYING

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Probiotic cultures have been used in food for its beneficial health effects. However, the viability of the amount of probiotics in food is in a matter, because it is often low. Thus, various techniques have been used to protect these bacteria, such as microencapsulation. A form of microencapsulation is complex coacervation consisting of the combination of hydrocolloids solutions of oppositely charged causing interaction and precipitation of complexes polymers. Moreover, a form of conservation of these microcapsules is freeze drying which consists in drying a previously frozen product in which most of the solvent is removed by sublimation. The objective of this work was to produce *L. acidophilus* microcapsules by complex coacervation and evaluate them against the freeze drying. For encapsulation, was added to 1 g of the probiotic 100 ml of 2.5% gelatin, keeping under stirring and heating (48-50°C/10 min). Then, added 100 mL of 2.5% gum arabic and 400 ml of distilled sterile water, adjusting the pH to 4.0, for the formation of microcapsules. Heating is switched off, leaving cool naturally to 30 ° C and was forced lowering the temperature with ice (12-10°C), leaving sediment. Part of the microcapsules was frozen (-18°C/24h) on the day of production. The microcapsules were placed in the freeze dryer, frozen and removed 24 hours after the start of the process (vacuum: 0.200 to 0.300 µHg; condenser temperature -37°C). Counts were made by homogenizing the microcapsules in a refrigerated incubator *shaker* type (180 min, 37°C, 150 rpm). After, decimal serial dilutions were performed. From each dilution 1 ml was inoculated on MRS agar, is incubated at 37°C in anaerobic medium for 72 h. Before the freeze drying process, the microparticles showed counts 8.58 log CFU.ml⁻¹. After freeze drying, there was a reduction to 6.4 log CFU.ml⁻¹. These results demonstrate that the viability of the microcapsules recorded decrease after freeze drying. Additionally, probiotic microorganisms are sensitive to freeze drying, due to deterioration of the physiological state of the cells. However, the viability still remained in accordance to the legislation (10⁶ - 10⁷ CFU/ml). Therefore, drying of the microcapsules *L. acidophilus* by freeze drying is a suitable method, but the process can be optimized by adding additives in the coating material.

Keywords: microencapsulation, *Lactobacillus acidophilus*, freeze drying

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