

TITLE: Evaluation of the viability of encapsulated *Lactobacillus paraplantarum* FT259 in a model of fresh Minas cheese.

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ABSTRACT

Microencapsulation of lactic acid bacteria (LAB) is an approach used to increase the viability of protective and probiotic cultures in food products, as well as in the gastrointestinal tract. *Lactobacillus paraplantarum* FT 259, isolated from Brazilian semi-hard Minas cheese, is a LAB strain that presents bioprotective and probiotic potential. In this study, *L. paraplantarum* FT259 was encapsulated in casein-pectin microcapsules obtained by complex coacervation and its viability was evaluated after dispersion of the microcapsules in a model of fresh Minas cheese (FMC). For these experiments, an overnight bacterial culture of *L. paraplantarum* FT259 was grown in MRS broth, centrifuged under refrigeration and resuspended in peptone water 0.1% (p/w). Then, 5% of bacterial cells were incorporated into an aqueous dispersion of casein-pectin (1:1 m/m, 6% total solids content) and the pH was adjusted to 4.0 with citric acid 1M. The FMC was prepared in the laboratory and microcapsules were incorporated into it during the production process. A control was prepared with non-encapsulated LAB cells. The FMC were stored for up to 21 days at 8°C. Bacterial populations of free and microencapsulated *L. paraplantarum* FT259 were counted at regular time intervals in MRS agar. The experiments were done as independent duplicates. The microbial counts at time zero were 5.7 log CFU mL⁻¹ and 6 log CFU mL⁻¹, respectively, for the free and encapsulated *L. paraplantarum* FT259. After 21 days of storage, the free bacteria reached a population of 7.0 log CFU mL⁻¹ while the entrapped bacteria achieved 9.1 log CFU mL⁻¹, which indicates the efficiency of the microencapsulation process. These results suggest the casein/pectin microcapsules may be an option to protect *L. paraplantarum* FT259 for potential food applications.

Key words: microencapsulation; lactic acid bacteria, bioprotection, probiotics, Minas cheese.

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