TITLE: MICROENCAPSULATION OF *Lactobacillus brevis* CCMA 1284 WITH PROBIOTIC POTENTIAL USING THE EMULSIFICATION TECHNIQUE AND IONIC GELATION

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ABSTRACT:

The major challenge for using probiotics is to maintain cell viability during the adverse conditions to which they are exposed. The microencapsulation technique is a promising alternative to protect probiotics from the acidic environment of the stomach, control the release of cells in the intestinal tract and maintain cell survival during food processing and storage. The objective of this study was to evaluate the survival percentage of *Lactobacillus brevis* CCMA 1284 with probiotic potential encapsulated by the emulsification and ionic gelation technique in sodium alginate and whey. The strain with probiotic potential was obtained from the Agricultural Microbiology Culture Collection, at the Department of Biology, Federal University of Lavras, Lavras, MG. The isolate was cultivated in MRS broth at 37 ° C for 21h, was subcultured twice. The bacteria was harvested by centrifugation at 7100g, 4 ºC for 10min, washed with sterile water and resuspended in 0.1% peptone water. The encapsulation matrix was prepared with sodium alginate / whey (20g/l), homogenized and autoclaved. 20 ml of the cell suspension (10^9) were added in 80 ml of the matrix. In the emulsification technique, the mixture was distributed in 300 ml of soybean oil with 10 mL/l of Tween 80 and homogenized on a magnetic stirrer (150rpm / 30min), 300 ml of the calcium chloride solution (0.1 mol) was added and stirred for 20min. The solution was left to rest for 30min and the microspheres were collected by centrifugation at 2500g/5min and washed with 0.1% peptone water. In the ionic gelation technique, the solution was atomized in the spray drying in 300 mL of the calcium chloride solution (0.1 mol) with feed flow rate of 6 mL/min and pressure of the air compressor at 0.7 MPa. The microspheres were collected by centrifugation as described above. The viable cell count was performed by direct plating, 1 gram of the microcapsule was resuspended in 9 ml of phosphate buffer (0.1 M, pH 7.0) and homogenized on a magnetic stirrer. The samples were diluted, plated on MRS agar and incubated at 37 °C / 48h. The percentage of cell survival by the emulsification technique was 84.2% and in the ionic gelation was 96%. The results showed that the microencapsulation of *L. brevis* CCMA 1284 using sodium alginate and whey as encapsulating agents presented satisfactory results using the implemented techniques, can probably be an alternative medium to obtain microcapsules, and be added in foods making it probiotic.

Key words: viability, microencapsulation techniques, probiotic

Development Agency: Conselho Nacional de Desenvolvimento Científico e Tecnológico do Brasil (CNPq), Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG) and Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES)