

Effect of Freeze Drying and Cryoprotectants on Viability of Entrapped Bifidobacteria

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Abstract

The effects of cryoprotective agents on the viability of *B. longum* entrapped in alginate were studied. In the entrapped cell, the viability after freeze drying was less than untrapped cell, however, it was showed that the viability was increased when using skim milk as a base protectant. The 20% skim milk was superior comparing to other concentrations for preserving the viability of entrapped cells after freeze drying. Different concentrations of cryoprotective agents including sugars, polyols, and nitrogen compounds were tested either alone or in combination with skim milk. There was less or no effect when 1% additives were used. However, the concentration increased 5 to 10% of additives showed good effects. Each 10% lactose, erythritol, and MSG was effective as cryoprotectant when those were tested alone (>30% survival). The survival rate of entrapped bifidobacteria was increased to around 70% when using appropriate cryoprotectants mixing skim milk and other protectants such as erythritol.

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