

SURVIVAL OF ENCAPSULATED
LACTOBACILLUS ACIDOPHILUS LA-5
(EXTRUSION TECHNIQUE) IN BILE

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2008

ABSTRACT

Probiotic bacteria were investigated to demonstrate benefits to human health. However, their survivability during transit through gastrointestinal tract (GIT) was reported to be low. In this research, response surface methodology (RSM) was used to optimize concentrations of encapsulating materials for the maximum survival of encapsulated *Lactobacillus acidophilus* LA-5[®] in simulated bile salt condition. Sodium alginate acted as supporting material for the capsule whereas inulin and glycerol functioned as prebiotic and cryoprotectant respectively. The concentrations of encapsulating materials: sodium alginate (1-5%), inulin (0-3%) and glycerol (1-3%). The beads were formed using extrusion technique. In this research, the size of beads generated was reported in the range of 2.12 to 3.13mm. At 2% bile salt condition, 2.09 log reductions were reported as the free cells decreased from 9.69 log cfu/mL to 7.60 log cfu/mL. On the other hand, a range of 9.16 log and 8.89 log cfu/mL encapsulated bacteria were decreased to 8.96 log and 7.85 log cfu/mL respectively after exposure to 2% bile salt condition. This research results indicated that the survival of encapsulated *Lactobacillus acidophilus* LA-5[®] increased after 4 hours exposure to the simulated bile salt condition (2%) compared with non-encapsulated *Lactobacillus acidophilus* LA-5[®]. The optimum combination of encapsulating materials for the encapsulated *Lactobacillus acidophilus* LA-5[®] was found to be 1.81% alginate, 0.99% inulin and 1.7% glycerol and the survival of this combination was 8.78 log cfu/mL. The experimental value was close to predicted values indicated the corresponding model was able to fit this experiment.

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