

***In vitro* gastrointestinal model to study tolerance of encapsulated and non-encapsulated *Latobacillus* sp. and *Lactococcus* strains to pH variation and gastric enzymes**

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Short title: ***In vitro* gastrointestinal model for *Latobacillus* sp. and *Lactococcus***

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**Summary**

Probiotics are bacteria that, when administered in right proportions, could have a good health benefit on the host. When viable cells of probiotics are in the human intestine, the probiotics could have their beneficial effects. In this study, a gastrointestinal model was used to represent the pH variation and gastric enzymes that participated in the digestion process. Eight *Lactobacillus* strains and one *Lactococcus* were studied; these strains were encapsulated using alginate sodium. The aim of this study was to indicate the number of viable probiotic cells that could reach the human intestine, compared with free probiotic bacteria and encapsulated probiotic bacteria. Probiotic organisms were microencapsulated following the method of extrusion using alginate compound. Microencapsulated and free probiotic bacteria were inoculated into 200 ml of MRS. Stimulated gastric juice and bile and pancreatic salt were used to test the tolerance of free *Lactobacillus* and *Lactococcus* species and microencapsulated bacteria to acid pH and enzymes. For the enumeration of microencapsulated probiotic organism, the bacteria were released from capsules after total digestion using sodium citrate solution. Samples were taken to count the number of live bacteria (CFU/g) using the plate count method on MRS plates incubated at 37° for 48 h. Bacterial cell viability was determined on MRS agar duplicate plates at different dilutions. The results indicated that microencapsulated probiotic bacteria improved the viability of probiotic bacteria compared with free cells at 2 h of exposure to acidic conditions and also at 2 h of exposure to bile and pancreatic salt. Encapsulation of probiotic bacteria with alginate can protect probiotic bacteria from acidic conditions and bile salts.