

Application of encapsulation to improve probiotic cell viability in fruit juices

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Abstract: Probiotics are live microorganisms which upon ingestion in adequate numbers provide health benefits beyond general nutrition. Application of probiotic in juice has gained popularity in recent year due to its health-promoting effects. However, the survival of probiotics during storage conditions is important. Encapsulation is a process to entrap bacterial cell within a carrier material aimed to protect the bacterial cell from the damages caused by the external environment.

The objective of this study was to investigate the effect of encapsulation coated with alginate and chitosan on cell survival of 4 probiotic strains (*Lactobacillus paracasei* MSMC 128, *Lactobacillus casei* MSMC 130, *Lactobacillus salivarius* MSMC 308 and *Lactobacillus plantarum* MSMC 515) newly isolated from Thai foods and physicochemical properties of orange juice and guava juice during storage at 4°C for 5 weeks. Results showed that encapsulation obviously improved all strains cell viability during storage at 4°C for 5 weeks compared to control. Encapsulation increased survival rate of all probiotic strains approximately 100% in both tested juices compared to control. It was found that %survivals of all probiotic strains in control and encapsulated samples were 29.52-35.53 and 57.93-69.02, respectively in orange juice while %survivals of all probiotic strains of 23.27-32.69 and 57.59-67.22 were found in control and encapsulated samples, respectively in guava juice. In addition, there were no significant differences between control and encapsulated mean values of pH, °Brix, total acid, color values (L*, a*, b*) and total phenolic compound of orange juice and guava juice during storage at 4°C for 5 weeks.

Since encapsulation exhibited cell viability enhancement, it may be an alternative procedure for juice industry to improve probiotic cell viability resulting in health benefits without any effect of physicochemical properties of orange juice and guava juice during cold storage.

Keywords: probiotic, encapsulation, fruit juice