

## ABSTRACT

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### **THE INCORPORATION OF PROBIOTICS IN FOOD WITH THE ADDITION OF PREBIOTIC TO DELIVER SUFFICIENT VIABILITY: A REVIEW**

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Functional foods such as probiotics are increasing in demand. Probiotic food such as yogurt, probiotic drinks, dried fermented milk, chocolate, and jelly dessert are made by incorporating probiotic either in the form of free cell/culture, lyophilized, spray-dried powder, or microcapsules. In probiotic food, maintaining and delivering sufficient viable probiotic of  $6 \log$  CFU/gram or CFU/mL is important and challenging. As a result, preservation methods such as spray-drying, freeze-drying, and microencapsulation are used. Alternative methods were studied to deliver sufficient viable probiotics by incorporating free probiotic cells into food products such as gummy candy and carrageenan jelly drink. The use of spray-drying, freeze-drying, microencapsulation in processing step, followed by storage and digestion requires the addition of protectants and growth promoter such as prebiotics to maintain probiotic viability, hence delivering sufficient viability into the colon. Prebiotics maintain probiotic viability due to being polyhydroxy compound that forms hydrogen bond with cell macromolecules, replacing the role of water and therefore, maintaining cell structure integrity and function during manufacture process. Polyhydroxy compounds can also form glass state where limited rotational and vibrational movement are allowed, therefore adding storage stability. Previous studies commonly use prebiotics such as fructo-oligosaccharides (FOS), inulin, gum acacia, and others as growth promoters and protectants. Previous studies have also explored alternative prebiotic sources that are more available such as psyllium husk, soybean powder, taro flour, modified taro flour, cereal extracts, potato starch, *Plantago psyllium*, and modified banana flour that probiotics can utilize to promote growth and are potential protectants.

Keywords : probiotic, prebiotic, viability, freeze-drying, spray-drying, microencapsulation

Reference : 67 (1989 and 2021)