

***Lactobacillus* Enriched Intermediate-Moisture Fruit Products**

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ABSTRACT

*This study fortified partially-dried apple and cantaloupe with *Lactobacillus* spp. by employing vacuum impregnation and vacuum drying techniques using impregnation media of sucrose solution and whole milk and two species of *Lactobacillus*, *Lactobacillus acidophilus* and *Lactobacillus casei*. The lightness, firmness and moisture content of the lactobacilli-impregnated fruits were depended on the type of fruit and impregnation solution. The species of *Lactobacillus* did not produce any significant effect on the fruit microbial property. The final apple and cantaloupe products contained lactobacilli numbers exceeding 10^9 cfu/g sample. Scanning electron micrographs of the intermediate-moisture apple and cantaloupe clearly demonstrated that the *L. acidophilus* cells were impregnated in the apple and cantaloupe tissues.*

Keywords: *Lactobacillus acidophilus*, *Lactobacillus casei*, Intermediate-moisture fruits, Apple, Cantaloupe

INTRODUCTION

The development of functional food products from fruit and vegetables with high number of beneficial microorganism provides an opportunity for the functional food industry, and can also be used to reduce the disadvantages and side effects of milk-based products (Betoret et al., 2012). The interest in fruit products containing probiotics, with their potential health benefits, is growing globally (Lavermicocca, 2006). *Lactobacillus acidophilus* and *Lactobacillus casei* are lactic acid bacteria with probiotic capacity, imparting beneficial effects on the host when administered in appropriate amounts (Nighswonger et al., 1996; Chaikham et al., 2013).

Vacuum impregnation is a useful technique to introduce desirable solute into the porous structure of food. The method can conveniently modify the original composition of a food product to develop new products; it has been applied with fruits and vegetables (Zhao and Xie, 2004). According to Chiralt et al. (1999), the application of vacuum impregnation does not disrupt the cellular structure of food, including fruit and vegetable products. Alzamora et al. (2005) fortified apple cylinders with *Bifidobacterium* spp., *Saccharomyces cerevisiae*, *L. acidophilus* and *Phoma glomerata* using vacuum impregnation. Betoret et al. (2003) applied