

Influence of bioactive edible coatings loaded with *Lactobacillus plantarum* on physicochemical properties of fresh strawberries

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Abstract

Carboxymethyl cellulose (CMC) edible coating used as a carrier to deliver an adequate amount of *Lactobacillus plantarum* on fresh strawberries and the shelf life of strawberries during the storage period was investigated. For this aim, different amounts of *L. plantarum* incorporated into CMC edible coatings and the physicochemical and microbiological characteristics of strawberries through storage at 4 °C were evaluated. The results showed that the number of viable probiotics in all treatments was higher than 6 log CFU g⁻¹ and it increased by inoculation of a higher amount of probiotics into the coating solution. The population of *L. plantarum* in all coating treatments remained constant over the storage period and it helped to reduce the growth of yeast and molds on the surface of strawberries compared to control samples which it is mainly due to competitive and antimicrobial properties of probiotics. The presence of *L. plantarum* improved some physicochemical properties of coated strawberries compared to control samples by reducing the amount of weight loss, decay, and slowing the deteriorations rate of ascorbic acid and phenolic compounds during the storage time. No significant difference between color, hardness, TSS, TA and total anthocyanin of different treatments was observed and strawberries loaded with *L. plantarum* showed similar sensorial properties to CMC coated and control samples. It can be concluded that using the edible coating with probiotics is a novel method to design new functional foods and helps to improve the shelf life of strawberries.