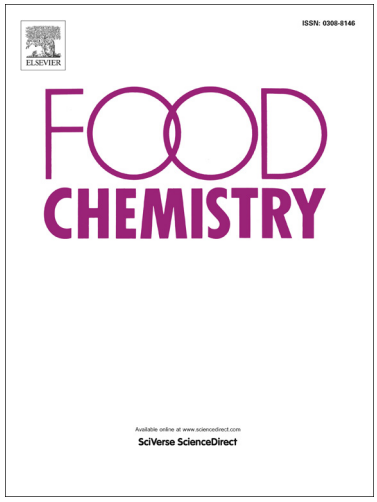

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Development of bionanocomposite materials and its use in coating of Ras cheese

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Abstract

The aim of the present study was to prepare and characterize bionanocomposite materials, and to evaluate its use in the coating of Ras cheese. The bionanocomposite materials were made from mixture of chitosan/polyvinyl alcohol with loading of titanium dioxide nanoparticles (TiO_2-NPs) from (0.5-2%). The prepared nanoparticles as well as the bionanocomposites were evaluated using, XRD, SEM, TEM, FT-IR and final contact angle. Furthermore, the mechanical properties and water vapor transmission rate (WVTR) of the fabricated bionanocomposites were evaluated. The impacts of coating Ras cheese with the prepared bionanocomposite on weight losses and microbiological, chemical, and physical characteristics of the Ras cheese were assessed during ripening in comparison to the uncoated cheese. Coating of cheese decreased the weight and moisture losses but didn't affect the normal ripening changes in the microbiological, chemical and textural properties of Ras cheese. Coating cheese with film containing 2% TiO_2-NPs eliminated mold growth on the cheese surface.

Keywords: CS; PVA; TiO_2-NPs; Coating materials; Bionanocomposite; Packaging; Ras cheese.

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1. Introduction

Packaging is an essential step for perishable food products in order to extend its shelf life, reduce its post-contamination and to insure its safety during marketing. Also, packaging can play an effective role in product acceptability and marketability (Youssef and El-Sayed, 2018; Youssef *et al.*, 2018). Cheeses are favorable medium for the growth and activity of wide range of spoilage