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BOOK OF ABSTRACT

Physicochemical, Mechanical and Antimicrobial Properties of an Edible Coating Based on Chitosan and Pea Protein Crosslinked with Transglutaminase

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Consumer´s growing demand for more natural foods and an interest in protecting the environment have led to the design of edible coatings. Transglutaminase can improve the mechanical and barrier properties of proteins based edible coatings. Moreover, the incorporation of antimicrobial agents like nisin may prevent food spoilage. The objective of this work was to study the mechanical, physicochemical and antimicrobial properties of an active edible coating based on chitosan and pea proteins crosslinked with transglutaminase and containing nisin. A full factorial design 2^3 was used, factors were chitosan, transglutaminase, nisin, with two levels (presence or absence). Filmogenic suspensions (FS) were cast on polystyrene petri dishes and dried at 25°C, 45% RH. The obtained results showed that nisin and chitosan decrease significantly the particle size, the polydispersity index (PDI) and the ζ potential of FS, although the best FS stability was observed in the absence of nisin. The particle size and PDI decreased for treatments including nisin. The thickness and the tensile strength of the films increased significantly in the presence of chitosan. Elongation at break was significantly affected by the interaction of chitosan with transglutaminase and chitosan with nisin. Films containing nisin showed good antimicrobial effect, but it was affected by transglutaminase reducing 19% the inhibition zone of *M. luteus*. Nisin incorporation decreased the physicochemical stability of FS, but did not affect mechanical and barrier properties. Transglutaminase addition did not significantly affect mechanical properties, although it contributed to smoother structure of films surface. The active coating obtained may be used to extend the shelf life of foods.

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