Title Antimicrobial films based on sodium caseinate

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Abstract

The antagonism of lactic acid bacteria (LAB) and their antimicrobial metabolites such as bacteriocins can be used in food biopreservation to control the growth of bacterials foodborne pathogens. A sodium caseinate (SC) based edible film containing an antimicrobial agent in its biopolymeric surface structure was prepared to examine the antimicrobial effect and mechanical properties. The use of biologically-derived bacteriocins as antimicrobial additives in the SC films is desirable because of their potential safety advantages for packaged foods. A study of the antagonistic effect against a pathogenic bacteria was conducted on a bacteriocinogenic LAB isolated from cheese, identified as *Lactococcus lactis* UQ2. The bacteriocin activity was quantified by the agar diffusion method. The bacteriocin activity was produced in a fermenter using whey as alternative culture media, at 30 °C. *L. monocytogenes* was found to be sensitive to the bacteriocin produced by *Lactococcus lactis* UQ2. Sodium caseinate films containing 500 AU/mL were prepared, in 90 μm thick layers. Physico-chemical and antimicrobial tests were conducted on the prepared films, to evaluate their effect on food quality preservation. Tensile strength values were weaker and elongation before breakage was less frequent for films with antimicrobial compounds compared to that of films without the antimicrobial compounds. The use of natural antimicrobials in active packaging may minimize contamination on the food surface due to post-processing contamination, leading to extension of the shelf-life, while maintaining the food safety.