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Presentation Abstract

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Presentation Title:	Changes on microbiological, physicochemical and diffusion properties of the cheese upon the application of chitosan-based edible coating incorporating natamycin
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Presentation Description/Abstract:	The complex cheese composition, along with the environmental conditions during handling and storage, often promote extensive mold and bacteria development on cheese surface, which considerably reduces its quality. Edible coatings can act as effective carriers of antimicrobials for treatment of cheese surfaces, which are a likely location for microbial contamination. Antimicrobials, such as natamycin, are slowly released onto the cheese surface, thereby maintaining a critical concentration for an extended period of time. The purpose of this work was to evaluate the effects of the application of chitosan coating containing natamycin on the physicochemical and microbial properties of semihard cheese stored at 4 ºC. Three groups of cheese samples were prepared: uncoated samples (control), samples coated with chitosan and samples coated with chitosan containing 0.50 $mg.mL^{-1}$ of natamycin whose MIC was previously determinated on cheese surface. The coating solutions contained 0.5% (w/v) chitosan, 0.5% (w/v) glycerol and 0.2% (w/v) Tween 80. Microbiological and physical-chemical analyses of the cheese samples were performed during 37 days. Physical and diffusional properties of the edible films with natamycin were also investigated. Microbiological analyses showed that cheese samples coated chitosan containing natamycin presented a decrease on moulds/yeasts of 1.1 log $(CFU.g^{-1})$ compared to control after 27 days of storage. The addition of natamycin also affects ($P < 0.05$) the physical properties of the films: O_2 permeability increased from 7.12 to 7.68×10^{-15} $g\cdot(Pa\cdot s\cdot m)^{-1}$; CO_2 permeability increased from 10.69 to 64.58×10^{-14} $g\cdot(Pa\cdot s\cdot m)^{-1}$; opacity

increased from 2.73% to 4.10%. The amount of natamycin released from chitosan films to aqueous solution increased until the equilibrium showing a diffusion coefficient of 3.61×10^{-14} m^2/s.
Therefore, this study demonstrated that chitosan-based coating containing natamycin could potentially be used to create an additional hurdle for moulds/yeasts in cheese and possibly extend its shelf-life, while controlling natamycin release.