

REPLACEMENT OF CONVENTIONAL CHEESE COATINGS BY NATURAL WHEY PROTEIN EDIBLE COATINGS WITH ANTIMICROBIAL ACTIVITY

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Abstract

The present work assesses the efficacy of whey protein edible coatings with antimicrobial properties applied to ripened cheese as alternatives to commercial cheese coatings. Whey protein edible coatings were produced from ovine whey protein concentrate (WPC) with lactic acid and natamycin as antimicrobials. Two methods of coating polymerization were performed separately and in combination; the heat denaturation method (HD) and the innovative UV polymerization method (UV). Their effectiveness was evaluated by measuring the physico-chemical, microbiological and sensorial properties of coated cheeses throughout 45 days.

Coatings produced only by HD did not significantly improve the coating efficiency; however, the UV polymerization in combination with thermal treatment (HD+UV) originated coatings that showed good performance. With regard to physico-chemical evaluation, no significant differences were found between cheeses bearing commercial coatings or edible coatings (UV and HD+UV) in terms of weight loss, fat, protein and salt contents, as well as aw, pH and hardness, revealing that the antimicrobial edible coatings could be used as an alternative to their commercial counterpart(s). Microbiological analysis proved that edible coatings prevented growth of *Staphylococcus* spp., *Pseudomonas* spp., *Enterobacteriaceae*, yeasts and molds what demonstrates their ability to assure the safety of cheese. In fact, coatings produced by HD+UV showed better inhibition or reduction in microbial growth as a result of the synergistic effect of the antimicrobials and UV light. The commercial coating had the best performance against yeasts and molds due to its higher amount of natamycin. With regard to sensorial analysis, cheeses with antimicrobial edible coatings did not show significant differences with the commercial coated ones.

Key words: *Whey protein edible coatings, Antimicrobial coating, UV-polymerization.*