



Fayoum University



Faculty of Agriculture

BIOTECHNOLOGICAL STUDIES ON PROBIOTIC RAS CHEESE PRODUCED USING ULTRAFILTRATION

By

Warda Mostafa Abd-Eltawab Ebid

B. Sc. of Agric. (Dairy Sci.), Fac. of Agric., Fayoum Branch. Cairo Univ. (٢٠٠١)

M.Sc. of Agric. (Dairy Sci.), Fac. of Agric., Fayoum Univ. (٢٠٠٨)

A thesis submitted in partial fulfillment

of

the requirements for the degree of

Doctor of Philosophy

in

Agricultural Sciences

(Dairy Science)

Faculty of Agriculture, Fayoum

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ABSTRACT

The main target of this study was to know; the Effect of using different probiotic starter culture on the accumulation of conjugated linoleic acid (CLA) in UF Ras cheese during ripening period. Microbiological, chemical and organoleptic properties were investigated for all treatments during ripening period at $12 \pm 1^\circ\text{C}$ for 90 days. The results indicated that, probiotic starter could develop the content of Ras cheese in CLA, lipolysis, proteolysis, improved organoleptic properties and the microbiological quality of Ras cheese. Finally, Ras cheese could be considered as an excellent source of viable probiotic starter and CLA.

On the other hand, nanochitosan was prepared from chitosan and examined its effects as natural antimicrobial against many pathogenic and spoilage microorganisms (bacteria and fungi) compared with chitosan. Antimicrobial properties were determined by minimum inhibitory concentration (MIC), minimum lethal concentration (MLC) and agar well diffusion method. Formulation of chitosan into nanoparticles form was found to increase its antimicrobial effect. Therefore, it is anticipated that nanochitosan have the potential of becoming a powerful and safe natural antimicrobial agent.

Also, coating of Ras cheese surface with incorporation of nanochitosan into an edible coating prepared with whey protein isolate (WPI) or chitosan reduced growth of microbial contaminants, does not affect the growth of lactic acid bacteria (LAB), saving the functional dairy microbiota, and improve the quality during ripening period of Ras cheese. Chemically and sensory evaluated when fresh and throughout of ripening period, all treatments had a good quality. These results demonstrate that the possible use of edible coating with nanochitosan as a coating in Ras cheese. That may be useful to produce high quality Ras cheese without detrimental effect on LAB. That can be used as a less expensive and improve