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Evaluation of immobilized *Lactobacillus casei* ATCC 393 on whey protein as starter culture in probiotic Feta-type cheese production

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Nowadays an upsurge of interest in developing novel foods containing probiotic microorganisms, such as lactic acid bacteria, is observed. Such functional foods have a great potential in promoting human health. In order to deliver the health benefits, probiotics need to contain an adequate amount of live bacteria (at least 10^6 cfu/g), able to survive the acidic conditions of the upper gastrointestinal tract and proliferate in the intestine, a requirement that is not always fulfilled. Since it is well established that cell immobilization enhances the viability of cultures, the aim of the present study was to evaluate the use of immobilized *L. casei* ATCC 393 on whey protein as starter culture in probiotic Feta-type cheese, during 70 days ripening. The immobilized cells resulted in increased lactic acid concentrations, lower pH values, improved quality characteristics and extended shelf-life compared to free *L. casei*. Likewise, increased numbers of lactobacilli and reduced counts of coliforms, enterobacteria and staphylococci were also reported. Noticeably, *L. casei* ATCC 393 was detected by microbiological and molecular analysis using strain-specific primers at the minimum levels for conferring a probiotic effect ($\geq 6 \log cfu/g$) at the end of ripening in cheese samples produced by both free and immobilized cells. The effect of starter culture on production of volatile compounds responsible for cheese flavor was also investigated using the SPME GC/MS technique, showing that immobilized *L. casei* cells resulted in an improved profile. Finally, the sensory evaluation ascertained the soft and fine taste of the novel cheese samples produced with immobilized cells.

Biography

Panagiotis Kandylis received his BSc in Chemistry (2003), his degree in Oenology (2010), his PhD (2009) degree in Chemistry from University of Patras and his MSc in Food Biotechnology (2005) from the University of Ulster, U.K. He is a researcher and part-time lecturer in the Department of Chemistry at University of Patras. He has published more than 13 papers in peer-reviewed international journals, 2 chapters in scientific books and has presented results (lectures, posters) in more than 12 international conferences. He is serving as an editorial board member of peer-reviewed international journals "Fermentation Technology" and "Food Research International".

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