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The Use of Probiotic Bacteria to Inhibit Staphylococcus Aureus in Brined White Cheese

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Abstract

This study aimed to investigate the antimicrobial activity of selected strains of probiotic lactic acid bacteria (LAB) against Staphylococcus aureus in brined white cheese (BWC). A cocktail of three strains of Staph. aureus was inoculated into the BWC to reach ca. 6.5 log10 CFU/g. Thereafter, the probiotics (L. acidophilus, L. delbrueckii, L. rhamnosus, L. paracasei, Lmb. reuteri, and L. gasseri) were delivered into BWC by inoculating each of the bacteria individually into the brine surrounding BWC at levels that ranged between ca. 6.0-6.5 log CFU/g. The BWC was then stored for 30 d at 4, 10, or 24 °C. The counts of Staph. aureus, total mesophilic bacteria (TMB), and yeast and mold were monitored. The pH of the probiotic-inoculated BWC was examined initially and at the end of the storage period. Also the salt content and water activity (aw) of BWC were evaluated. At 4° C, the probiotics, L. reuteri, and L. gasseri resulted in the most prominent antibacterial activity against Staph. aureus, where they resulted in ca.1.0-1.5 log reduction in Staph. aureus count and the inhibitory effect persisted till the end of the 30-d storage period. An equivalent inhibitory pattern was obtained at 10 °C by L. reuteri, and L. gasseri compared to the control and the other probiotic LAB. However, at 24 °C, L. reuteri, was the most effective and imparted the most pronounced inhibitory activity compared to the other probiotics. Yet, L. gasseri and L. paracasei also resulted in significantly lower counts of Staph. aureus compared to the other probiotics. TMB and yeast and mold counts reached to counts of > 9.0 log CFU/g by the end of the 30-d storage period. The use of probiotic LAB such as L. reuteri, L. paracasei and L. gasseri, were effective in exerting a considerable antimicrobial activity against Staph. aureus in BWC (7.5% brine).

Keywords: Inhibition, Probiotic LAB, Staphylococcus aureus, Brined white cheese

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