

The Effect of Liposome-Encapsulated Cyprosins on Manchego Cheese Ripening

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Cyprosins, the proteinases present in cardoon rennet, were extracted from dried flowers of cardoon (*Cynara cardunculus* L.) and encapsulated in dehydration-rehydration liposomes. Liposomes were added to pasteurized ovine milk to accelerate the ripening of Manchego cheese. Encapsulated proteinases had no effect on whey composition, but DM and protein content were lower in 1-d-old experimental cheese than in the respective control cheese. Enhancement of proteolysis by encapsulated cyprosins was evident 24 h after manufacture; 38.3% of α_s -CN and 47.7% of β -CN that were initially present in milk had been degraded in 1-d-old experimental cheese and 20.3 and 37.5%, respectively, in control cheese. At that time, amounts of N that were soluble at pH 4.6, in TCA, and in phosphotungstic acid were 15.70, 5.47, and 2.09% in experimental cheese and 9.32, 4.16, and 1.34% in control cheese, respectively. The hydrophobic and hydrophilic peptides that were separated by HPLC and measured at 214 and 280 nm, and their ratio, were also higher in experimental cheese than in control cheese on d 1. However, some of the indices of proteolysis were higher in control cheese than in experimental cheese after 60 d of ripening. Experimental cheese was softer than control cheese 24 h after manufacture, but texture was not different thereafter. Addition of encapsulated cyprosins to milk perceptibly accelerated development of flavor intensity in experimental cheese through 15 d of age without enhancing bitterness.

Key Words: liposome • cyprosins • acceleration of ripening • Manchego cheese

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