# Effect of a test dentifrice containing nano-sized calcium carbonate on remineralization of enamel lesions in vitro.

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The efficacy of a test dentifrice containing nano-sized (several tens to hundreds of nm) calcium carbonate (hereafter NC) on enamel lesion remineralization was studied in an in vitro system that employed collagen-coated wells for cell culture, as a model of oral surfaces for NC retention. The well surfaces were treated with the test dentifrice and briefly rinsed with distilled water. Thin sections of enamel with artificial subsurface demineralization were remineralized in the plate wells containing remineralizing solution. The dentifrice treatment was repeated twice a day (in the morning and evening) for 20 days. After remineralization, microradiographic analysis was performed to evaluate the rate of lesion remineralization on the sections. The test dentifrice showed a statistically significant mineral gain (48.8% decrease in DeltaZ % x microm from the baseline value), indicating lesion remineralization, whereas the placebo dentifrice without NC did not. An elevated Ca concentration in the remineralizing solution was also observed after a single treatment with the test dentifrice. We conclude that the test dentifrice has potential to remineralize incipient enamel lesions due to the unique properties of NC, which is retained on oral surfaces, thereafter releasing Ca ions into oral fluids (saliva, plaque).