

# ASSOCIATION BETWEEN MILK TEMPERATURE AND MICROHARDNESS OF ENAMEL CARIES

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**Abstract.** Cow's milk has been found to enhance remineralization of initial caries but it is unclear if the temperature of the milk plays a role in the efficacy of this remineralization. Therefore, the aim of this *in vitro* study was to investigate the effect of cow's milk and buffalo milk temperature on the microhardness of enamel caries. For this study we used 80 bovine teeth and cut each tooth to 8 x 10 mm<sup>2</sup> and placed it in a resin acrylic block. Each tooth was then treated with a demineralizing agent until the enamel had a microhardness of 35-65 VHN. The teeth were then randomly divided into 8 groups (10 teeth per group). Group 1 was a negative control (no treatment) group; Group 2 was a positive control group [treated with casein phosphopeptide-amorphous calcium phosphate (CPP-ACP)]; Group 3 was treated with cow's milk at 4°C; Group 4 was treated with cow's milk at 25°C; Group 5 was treated with cow's milk at 40°C; Group 6 was treated with buffalo milk at 4°C; Group 7 was treated with buffalo milk at 25°C; Group 8 was treated with buffalo milk at 40°C. Both the cow's milk and buffalo milk were fortified with calcium. Group 2 was treated for 5 minutes and Groups 3-8 were treated for 2 hours each group, then rinsed with deionized water. The data were analyzed statistically using a paired *t*-test, independent *t*-test, one-way ANOVA and Tukey's test with a 95% confidence interval. After treatment, the mean microhardness values of all the groups were significantly higher ( $p=0.00$ ) except for the negative control group. The groups treated with cow's milk and buffalo milk at 40°C had significantly higher percentage increases in microhardness than the CPP-ACP treatment group ( $p<0.05$ ). The mean percentage increases in microhardness values for the cow's milk and buffalo milk at 40°C were higher than the mean percentage increases in microhardness values for the cow's milk and buffalo milk at 4°C ( $p<0.05$ ). The buffalo milk had a significantly greater increase in the mean microhardness value than cow's milk at 4°C ( $p=0.00$ ). In conclusion, cow's milk and buffalo milk at higher temperatures had better remineralizing capability than at low temperatures and better than CPP-ACP.

**Keywords:** buffalo milk, cow's milk, enamel caries, microhardness, temperature

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