#25: Efficacy of Chewing Gum as a Delivery System for Water and Fat Soluble Vitamins

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Chewing gum is a popular product among consumers. Some commercially-available chewing gums contain functional ingredients including botanical extracts and vitamins. In the present study, we examined the release kinetics and plasma bioavailability of a panel of water-soluble and fat-soluble vitamins from two commercially available vitamin supplemented gums. We recruited 15 healthy subjects (age: 22-52 yrs, 60% women) and employed a single-blind, placebo-controlled cross-over study design. Time-dependent changes in saliva and plasma levels of vitamins were determined by high-performance liquid chromatography using both ultraviolet light and electrochemical detection methods. In general, the water- and fat-soluble vitamins in the gums were released from the gum matrix into the saliva, and these levels in the plasma were elevated compared to levels following the placebo. We found that there was release of water-soluble and fat-soluble vitamins from the gum into the saliva during chewing. In the plasma, ascorbic acid and niacinamide levels were increased by 78.8-82.8% and 215.1-273.4%, respectively, in vitamin-supplemented chewing gums compared to baseline. Levels of plasma fat-soluble retinol and dl-alpha-tocopherol were increased by 5.93-6.89% and 11.33-20.80%, respectively, in vitamin-supplemented chewing gums compared to baseline. To the best of our knowledge, this is the first report of the efficacy of chewing gum to deliver vitamins to human subjects. Further studies in deficient subjects are needed to determine whether chronic use of vitamin-supplemented chewing gum is an effective approach to correct deficiency.