The purpose of this study was to determine the ability of three commercially available chewing gums (Extra, Trident, and CareFree) to stimulate saliva flow and reverse the plaque acid and ionized calcium levels induced by a glucose challenge. Electrodes to measure pH and pCa were situated in a Hawley appliance. When the Hawley appliance was in place, the electrodes were inserted into three day old plaque at maxillary interproximal sites. A pressure sensor, located in the posterior center of the Hawley appliance, was used to record swallowing rates. After baseline values were determined, the test procedure consisted of first administering a 5% glucose challenge solution followed by a 10 minute challenge effect period, a 5 minute gum chewing or product period, and finally a 10 minute product effect period after the test gum was discarded. An ANOVA was used to compare the ability of each chewing gum to stimulate saliva and cause a return of the plaque acid and/or ionized calcium to baseline levels following product discard. The three chewing gum products varied in both time and level of pH attained while neutralizing plaque acidity (p less than .05) induced by the glucose rinse. No significant differences were found between the chewing gums for the pCa data and swallowing rates. All chewing gum products stimulated swallowing and effectively reversed plaque pH and pCa changes caused by the glucose rinse.