The prevalent use of chewing gum has prompted interest in its dental effects. Important defining aspects are the ability to use sugar substitutes in gum manufacture and the prolonged stimulation of a protective flow of saliva. The main sugar substitutes used are sorbitol and xylitol. Because it is not fermented by oral bacteria, xylitol is considered to be non-cariogenic, and while sorbitol in solution can be fermented slowly by mutans streptococci, chewing sorbitol-sweetened gum does not cause a fall in plaque pH. Effects of chewing sugar-free gum on the ability of plaque to form acid from sucrose are equivocal, although the tendency is for the plaque acidogenicity to be reduced with the use of xylitol gum for 2-3 weeks, due to its inhibitory effects on mutans streptococci. Gum-chewing also stimulates a protective salivary flow when used after an acidogenic stimulus, and may enhance salivary function, especially in subjects with low flow rates. Sorbitol and xylitol gums have similar beneficial effects in promoting enamel remineralisation in short-term in-situ experiments. Clinical trials indicate that xylitol gum has a useful anticaries role, superior to the effects of sorbitol gum. In conclusion, both sorbitol and xylitol chewing gums are non-cariogenic in contrast to sugared gum, and exhibit beneficial anticaries properties through salivary stimulation. In addition, xylitol's antibacterial properties seem likely to lead to caries reductions superior to the more modest reductions with sorbitol gum.