XYLITOL

Xylitol is a natural sugar alcohol that sweetens without causing decay. It actually inhibits caries formation. Below are some facts about xylitol.

- Xylitol is a naturally-occurring 5-carbon sweetener found in berries, fruits, vegetables, and mushrooms, etc., and is even produced in the human body. It is also known as pentose, pentitol, polyalcohol, and polyol.
- The xylitol used in most products is produced from birch trees
- Its taste is indistinguishable from sucrose and it is 40% less caloric
- Slow absorption evokes low glycemic response
- Mutans streptococci are unable to metabolize Xylitol. This prevents the bacteria from forming acids that cause caries.
- Xylitol enhances remineralization
- Xylitol is unique among the polyols because it inhibits the growth of mutans streptococci, thereby reducing caries susceptibility. Continued use of xylitol will help to reduce the number of bacteria in plaque
- Xylitol is significantly more effective than other sugar substitutes in reducing the weight of plaque in the oral cavity. It also reduces the proportion of insoluble polysaccharides and increases the proportion of soluble polysaccharides present in plaque which results in plaque that is less adhesive.
- Regular use (5 to 10 grams per day) has been shown to reduce caries by 30 to 85%
- Works well in conjunction with fluorides
- Lowers the rate of otitis media in children (gum by 40%, syrup by 30%)
- Xylitol is safe and approved by the FDA for use as a food additive in “sugar-free” products since 1993
- It is safe to use for diabetics since it does not raise blood sugar levels
- Xylitol comes in a crystal form which gives a strong, pleasant cooling sensation when dissolved in the mouth
- Xylitol gum is being used in Head Start programs as a preventive measure to help reduce caries formation

- The US Army has found the evidence supporting Xylitol so compelling that it has added xylitol-containing chewing gum to all MREs and all base exchanges

- Xylitol gum is effective when 3- 5 pieces (each containing 1.6 grams or more of xylitol) are chewed daily for 5 to 15 minutes

- Xylitol gum can be purchased online and at health food stores such as Wild Oats, and Whole Foods

- Xylitol causes GI laxative effects at very high doses (over 50 to 70 grams per day)

The most fundamental difference between xylitol and other sweeteners is that xylitol reduces the amount of plaque and the virulence of mutans streptococci in plaque. Xylitol functions as a modulator of the oral flora. Oral bacteria will not adapt to metabolize xylitol regardless of the duration of its use, so its benefits continue while it's being consumed and after Xylitol is no longer a part of daily use. This effect has been shown to persist for at least five years.

A study published in the Journal of Dental Research (March 2000) demonstrated significant reductions in the transmission of mutans streptococci (MS) from mother to child as a direct result of the consumption of chewing xylitol-containing chewing gum by their mothers.

Soderling E. et al; J Dent Res 2000 Mar; 79(3)882-7

- 169 mother-child pairs, 2 year study
- All mothers had high S. mutans during pregnancy
- Study group chewed 2-3 sticks of xylitol gum per day starting 3 months after delivery
- 2 control groups, 1 treated with chlorhexidine and 1 treated with fluoride varnishes at 6, 12, and 18 months post delivery
- At 2 years of age, 9.7% of the children of mothers in the xylitol group had detectable S. mutans levels compared with 28.6% in the chlorhexidine group and 48.5% in the varnish group
- Appears to work by selecting for S. mutans with impaired adhesion properties

A follow-up study published in the Journal of Dental Research looked at whether maternal consumption of sugar free chewing gum sweetened with xylitol could reduce the risk of dental caries in their children. Earlier published studies have demonstrated that prevention of colonization by these bacteria in early childhood can lead to reduction of dental decay and that mothers are the primary source of infection with mutans streptococci. These bacteria are passed from mother to child through everyday contacts such as kissing and tasting of food.

Isokangas P et al; J Dent Res 2000 Nov;79(11):1885-9

- Follow-up of the same children in the previous study
- Examined annually out to 5 years by double blinded examiner
- dmf of xylitol group at 5 years was 70% of that in the fluoride or chlorhexidine group

In study in which xylitol was placed in a reservoir in the pacifiers of one year old children (Aaltonen et al. Acta Odontol Scand. 2000 Dec; 58(6):285-92.), xylitol was shown to produce the following results:

- Reduced mutans strep infection by 16%
- Reduced caries to zero in test group ($p<0.001$)
- Reduced otitis media by 19% - 38%

IHS dental staff can easily implement a xylitol gum program by providing the gum to post-natal mothers as an indirect preventive method (to decrease the transmission of S. Mutans from mother to child) or by providing the gum to a fixed group of children, such as Head Start, working in collaboration with the Head Start teachers.

Additional information about Xylitol and its use in caries-prevention programs can be found at the following links:

http://www.aapd.org/media/Policies_Guidelines/P_Xylitol.pdf

http://www.xylitol.org/

http://jada.ada.org/cgi/reprint/137/2/190 (you will need to be an ADA member to access this article)

Xylitol Abbreviated Bibliography

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