The sweet miracle of xylitol

By Dr Deborah Horch, Germany

There is a reason that the health departments of Italy, Japan and Finland recommend the use of xylitol for active oral care. An increasing number of national dental associations in Europe have also begun to follow that recommendation.

What is so special about xylitol? Is there any evidence to support its claimed properties, such as being anti-cariogenic and able to advance enamel remineralisation? These and other questions are matters of current debate among experts. It is fact that that the very extensive Turku study, which was conducted between 1970 and 1976 (Table I), showed a 85 per cent reduction in caries in patients consuming xylitol compared with a control group. These results sparked a wave of follow-up studies. Many studies conducted under the umbrella of the World Health Organization have since confirmed a significant caries reduction of between 50 and 85 per cent. Why then has xylitol not become commonplace by now and why is it still being debated? In addition to lack of awareness, a possible explanation could lie in economics. Xylitol as a raw material is 20 times more expensive than sugar in production and much more costly as well as more labour intensive, as well as more costly, and therefore less attractive for manufacturers. In contrast to synthetic sweeteners like aspartame and acesulfame, the taste of xylitol is not prolonged.

The latest analysis by German consumer watchdog publication ÖKO-TEST (September 2015 issue) of a variety of chewing gums only rated brands containing xylitol as “good” or “very good”, while some of the global competing products containing other sweeteners were rated only “fair” or “poor”. There are plenty of good alternatives to chewing gum, such as boiled sweets and xylitol powder, which compares almost one to one to granulated sugar in its sweetness. In order to benefit fully from its positive properties, five grams of xylitol a day is generally recommended. An intake of 50 grams for adults and 30 grams for children is well tolerated. In order to ensure that products only contain xylitol and no other sweeteners, the list of ingredients should be checked.

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Table I: Overview of relevant studies. © Mäkinen KK, et al. (1989) Caries Res 23, 261-267 — Fig. 3: Molecular structure of xylitol — Fig. 5: Glycaemic Index

Research center | Duration in years | Dose g / day | Reduction of caries incidence %
--- | --- | --- | ---
1. Turku, Finland | 2 | 67 | > 85
2. USSR | 2 | 39 | 73
3. WHO – Thailand Polynesia Hungary | 2.3–2.7 | 20 bis 20 | 58–68
3 | 3 | 14–20 | 37–45
4. Montreal, Canada | 1–2 | 1–3,9 | 52
5. Ylivieska, Finland | 3 | 7–10 | 59–84
6. Dayton, OH* | 1.8 | bis 8.5 | 80
7. Ylivieska, Finland “Von der Mutter – Kind” | 21 months | 6–7 | 70

Fig. 1: Xylitol was originally harvested from birch bark.

Glycaemic Index

<table>
<thead>
<tr>
<th>Carb</th>
<th>Control</th>
<th>Xylitol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muesli</td>
<td>20</td>
<td>60</td>
</tr>
<tr>
<td>Sugar</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>Honey</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>Milk</td>
<td>80</td>
<td>20</td>
</tr>
</tbody>
</table>

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Fig. 2: Xylitol blocks streptococcus mutans. © Mäkinen KK, et al. (1989) Caries Res 23, 261-267 — Fig. 3: Molecular structure of xylitol — Fig. 5: Glycaemic Index

Fig. 3: OpenGL rendered view. © Mäkinen KK, et al. (1989) Caries Res 23, 261-267

Xylitol cannot replace fluoride entirely. It should rather be regarded as a valuable addition to dental prophylaxis.

Fig. 4: Chewing Gum sweetened with 100% xylitol. © Hager & Werken — Fig. 5: Molecular structure of xylitol — Fig. 5: Glycaemic Index

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