

## Xylitol's Impact On Biofilm Formation

The first step in biofilm formation is the development of a salivary protein and enzyme layer on the tooth surface. The enzymes are glucosyltransferase and fructosyltransferase. Bacteria are attracted, form micro-colonies and continue to proliferate. Biofilms associated with caries and periodontal disease are difficult to control. Chemicals that control planktonic cells are not as effective against an organized biofilm.

Researchers have investigated anti-adhesion compounds to prevent the bacteria from colonizing tooth surfaces. Xylitol seems to be a promising molecule as a non-cariogenic sweetener that inhibits growth and acid production of *Strep. Mutans*.

Researchers at the Université Victor Ségalen in Bordeaux, France compared the effects of xylitol and saline on biofilm growth in the laboratory. Bacteria associated with both caries and periodontal disease were grown in the biofilm. Bacteria included: *M streptococci*, *S sobrinus*, *L rhamnosus*, *A viscosus*, *P gingivalis* and *F nucleatum*. Before anaerobic incubation, three treatments were provided and one control group. One group of biofilm samples was treated with one percent xylitol, another with three percent xylitol. The third group of biofilm samples was treated with saline. The fourth group of biofilm samples were untreated controls.

The saline-treated biofilms were similar to the control biofilms in thickness and bacterial growth. The xylitol-treated biofilms lacked cohesive formation and four of the bacterial species were not recovered at all and the other two were significantly reduced.

### **CLINICAL IMPLICATIONS:**

***Xylitol reduces both the acid produced by caries-causing bacteria and the ability of bacteria to form a biofilm. Xylitol has benefits for prevention of both caries and periodontal disease.***

*Badet, C., Furiga, A., Thébaud, N.:  
Effect of Xylitol on an In Vitro Model of Oral Biofilm. Oral Health and Preventive Dent 6: 337-341, 2008.*

