



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

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| Name(s) Jack Bayless; Gian Pepe | Project Number J0403 |
| Project Title How Does Xylitol Affect the Acidity of Plaque? | |
| Abstract Objectives/Goals The objective of our project was to test the effectiveness of xylitol in reducing the acidity of the plaque. Methods/Materials We tested five subjects. The night before the testing they did not brush their teeth. Then in the morning we tested the acidity of the subjects' mouths. Then they ate Frosted Flakes, and we recorded their mouth's acidity every five minutes for the next thirty minutes. On a different occasion, we had the same subjects repeat the experiment chewing Spry gum with xylitol after eating the Frosted Flakes. We ran these trials twice on five subjects to ensure the integrity of the data. Results In the #Without Xylitol# graph, the acidity level slowly increases until a certain point (usually around 15 minutes), where it goes back to normal. Our hypothesis stated that the xylitol would affect the acidity of the mouth. In the graph that includes the average of all subjects, the trials with xylitol have a consistently lower acidity than the trials without xylitol. The plaque without xylitol reached a pH of 5.8, and the plaque with xylitol reached a pH of only 6.45. The graph of the plaque tested directly after the consumption of the complex carbohydrate, without the introduction of xylitol, illustrates the Stephan Curve. Conclusions/Discussion Having the cariologist Dr. Featherstone, run tests on our data, it was concluded that the baseline (before chewing the gum) was not statistically significant between the two groups, from a Student t-test, showing that they do not differ at the baseline ($p > 0.05$, by the Student t-test, two tailed. The p value was 0.008). After ten minutes the data did show to be statistically different between the two groups ($p > 0.05$ by Student t-test, two tailed. The p value was 0.008). The trials with xylitol did show a significant difference overall between the two groups, with the acidity not increasing a great amount, and when it did, coming back down fairly quickly as shown by the t-test with $p > 0.05$. Xylitol does affect the plaque, hindering its growth and by-product of acid. Our experiment is pertinent to our daily lives, because we should each brush our teeth, but many people cannot find time to do so, or are away from a place where they are able to do so. Our experiment shows that if people are unable to brush their teeth, they can chew xylitol, which will reduce the acidity in their mouth, and hopefully prevent cavities. | |
| Summary Statement In our project, we tried to find out the effect that xylitol gum has on the acidity of plaque. | |
| Help Received Dr. Featherstone ran a statistical analysis for us; Dr. Bayless consulted with us about our project. | |