

# What is the evidence that xylitol chewing gum decreases cariogenic bacteria population in college-aged students?

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## Introduction

- Dental caries represent the most widespread disease in humans with 91% of United States' adults aged 20-64 experiencing at least one cavity in a permanent tooth (CDC).
- The interaction of plaque and fermentable carbohydrates lowers pH and perpetuates tooth decay.
- Xylitol, a five carbon sugar polyol, is an FDA approved sweetener used as a sugar substitute in chewing gum.
- Xylitol inhibits *S. mutans* growth and decreases adhesion of plaque to teeth when chewed in gum.

## Purpose

To determine if xylitol chewing gum decreases cariogenic bacteria in college-aged students.

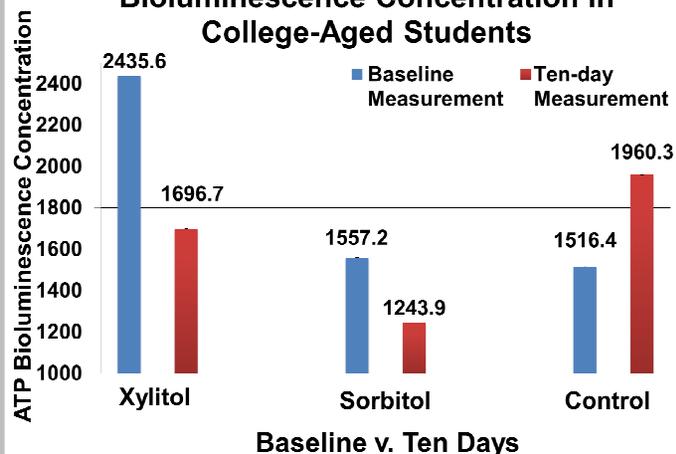
## Methods

- Institutional Review Board Approval was received.
- Education majors aged 18-22 years old (N=30) were recruited and completed informed consents.
- The World Health Organization: *Oral Health Questionnaire for Adults* survey was completed.
- Participants were randomly assigned to the xylitol, sorbitol, or control group with ten subjects in each group.
- The CariScreen Caries Susceptibility Meter was used to determine cariogenic bacteria population via ATP bioluminescence at baseline and on day ten.

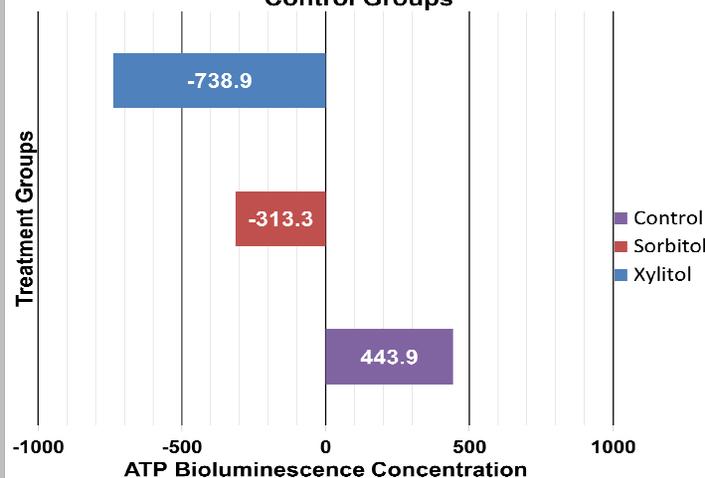


- Students chewed gum for twenty minutes for ten days excluding one weekend.
- The SAS system was utilized to run an ANOVA to test for significant differences between treatment groups.

## Baseline v. Ten Day Averages of ATP Bioluminescence Concentration in College-Aged Students



## Average Change in ATP Bioluminescence Concentration for Xylitol, Sorbitol, and Control Groups



## Results

- A score <1500 indicates a healthy mouth while a score >1500 signifies heightened risk of caries development.
- Xylitol group decreased 30% from baseline measurements with trending statistical significance ( $p=0.094$ ).
- Sorbitol group decreased 20% from baseline measurements but without statistical significance ( $p=0.69$ ).
- Control group increased 29% from baseline measurements but without statistical significance ( $p=0.29$ ).
- High soft drink and lemonade consumption linked to higher measurements of ATP Bioluminescence ( $p=0.007$ ).

## Conclusions

- Individuals in the xylitol group experienced the greatest attenuation of potential cariogenic bacteria.
- The sorbitol group also decreased in potential cariogenic bacteria.
- Chewing gum with sugar substitutes like xylitol or sorbitol can decrease cariogenic bacteria population.
- Chewing xylitol or sorbitol gum could have protective effects against dental caries.



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