

# EFFECTS OF SPORTS DRINK CONSUMPTION ON SALIVARY PH DURING EXERCISE

Charlie Wenner | Emily Heying, PhD

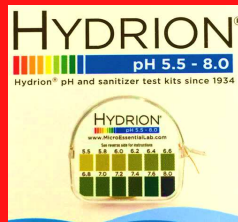
Nutrition Department | College of St. Benedict – St. John's University

## Introduction

- Individuals who regularly exercise appear to be at higher risk for developing dental caries and erosion (1).
- Dental erosion is a breakdown of tooth surface due to exposure to acids when oral pH drops below 5.5.
- Typical sports drinks have a pH between 3 and 4.
- Sports drinks can help maintain hydration status and help increase saliva flow rate which can help protect teeth.

## Purpose

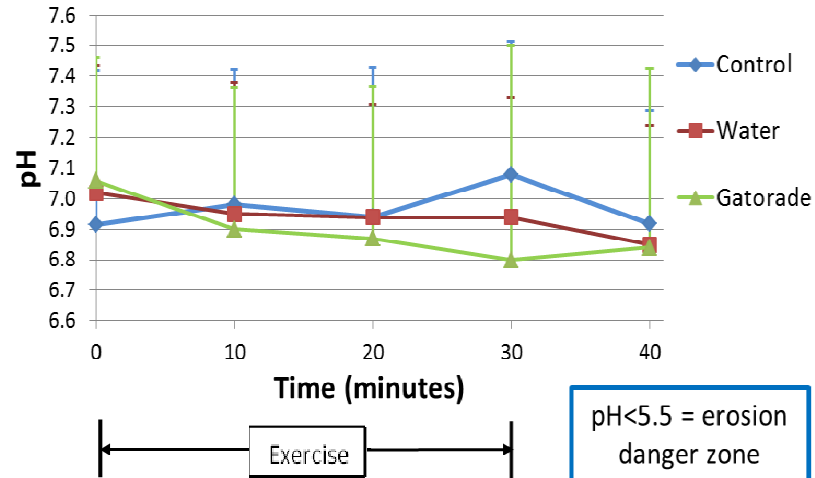
- Observe the effects of water and sports drink consumption on salivary pH during exercise in college-aged students.



## Methods

- Received IRB approval and informed consents from 10 recreationally active CSB/SJU students.
- Subjects participated in three 30 minute exercise sessions on an ergometer at 70%-85% of maximal heart rate on separate days.
- Participants consumed 80 mL of one of three treatments (no beverage, water, or Gatorade) every 10 minutes during the exercise session.
- Beverage consumption occurred after 5, 15, and 25 minutes.
- Saliva pH was tested after 0, 10, 20, 30 minutes, and 10 minutes post-exercise.

## Saliva pH during exercise while consuming different beverages



## Results

- Saliva pH increased by 0.165 with no beverage consumption, decreased by 0.08 with the water treatment, and decreased by 0.26 with the Gatorade treatment.
- None of the treatment groups were significantly different after the 30 minute exercise session (two-way ANOVA,  $p=0.057$ ).
- Saliva pH was converted to change scores because of differing initial pH among groups.
- The change score of the Gatorade and control pH were significantly different from each other at the end of the exercise session (post-hoc LSD,  $p=0.018$ ).

## Conclusions

- Saliva pH never dropped below 5.5 with any treatment, indicating a minimal risk for erosion.
- Sports drinks can help maintain adequate hydration status, which can increase saliva output and oral buffering capacity minimizing pH change.
- Exercise and hydration status may change the composition of saliva, and method of saliva collection may yield different results.

## Acknowledgments

- Thank you to Dr. Amy Olson, Dr. Don Fischer, Dr. Ben Faber, and Dr. Richard Wielkiewicz for guiding me through my research.
- I also want to thank the CSB/SJU students who participated in my study.

## Literature Cited

1. Mulic, A., Tveit, A. B., Songe, D., Sivertsen, H., & Skaare, A. B. (2012). Dental erosive wear and salivary flow rate in physically active young adults. *BioMed Central Oral Health, 12*(8), 1-8. doi:10.1186/1472-6831-12-8.

## Change in pH during exercise while consuming different beverages

