

## **Does Rinsing Out Your Mouth With a Carbohydrate Drink Before Exercising, as well as Oral vs. Nasal Breathing Have an Effect on the RER?**

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### **ABSTRACT**

The Respiratory Exchange Ratio (RER) is a commonly used indicator of the body's metabolism in exercise studies. The RER is defined as the ratio of carbon dioxide produced to oxygen consumed and is used to estimate carbohydrate and fat oxidation in the body. An RER of 0.7 is indicative of fat breakdown with an RER of 1.0 indicative of high rates of carbohydrate metabolism. During steady-state exercise, the RER is thought to be a reliable indicator of whole-body metabolic demand, however, the introduction of carbohydrates to the mouth might have an immediate effect on the RER, affecting the reliability of using the RER as a measure of exercise metabolism. **PURPOSE:** The purpose of this study was to determine if a carbohydrate sports drink mouth rinse during steady-state (SS) exercise, as well as oral vs. nasal breathing affects the RER values. **METHODS:** 33 participants (14 male, 19 female) went through four trials (mask/water, mask/sports drink, mouthpiece/water, mouthpiece/sports drink) in random order after a short 5-10 minute warm-up. During each trial, the participants were asked to thoroughly rinse their mouths with either water or a sports drink and walk on the treadmill at steady-state exercise for 5 minutes with either the mask or mouthpiece. Heart rate (HR), RPE, and RER were measured throughout the trials. Average steady-state RER was compared between groups and timepoints using a 2-way ANOVA with significant differences determined when  $p < 0.05$ . **RESULTS:** RER of the sports drink trials was significantly higher than the RER of the water trials ( $F_{(1,32)} = 30.042$ ,  $p < 0.001$ ). The results also suggest that the RER of the mouthpiece (oral) trials was significantly higher than the facemask (nasal) trials ( $F_{(1,32)} = 44.479$ ,  $p < 0.001$ ). **CONCLUSION:** This study found that rinsing your mouth with a carbohydrate sports drink before steady-state exercise significantly increased the RER value. It also found that breathing orally significantly increased RER values compared to breathing nasally. This indicates that in some circumstances, RER might not be a reliable indicator of whole-body metabolism.