

Measurement of Respiratory Exchange Ratio (RER) with Oral Versus Oronasal Breathing After Sports Drink Mouth Rinse

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ABSTRACT

The ratio of carbon dioxide produced to oxygen consumed, the respiratory exchange ratio (RER), is often used to determine the balance of carbohydrate and fat oxidation during exercise. However, introducing carbohydrates into the mouth and pharynx could possibly influence the value while not actually changing the whole-body metabolism. **PURPOSE:** The purpose of this study was to determine if a sports drink mouth rinse during steady-state (SS) exercise affects RER. **METHODS:** Eleven participants exercised at steady state in 4 different, randomized conditions while respiratory gases were analyzed: 1) Breathing through the mouth after water rinse; 2), breathing through the mouth after carbohydrate solution rinse; 3) breathing through the nose and mouth after water rinse; 4) breathing through the nose and mouth after carbohydrate solution rinse. RER and heart rate were measured continuously through each 5-minute trial. **RESULTS:** RER values of the oral breathing trials, 0.838 ± 0.055 and 0.859 ± 0.076 , were significantly higher than oronasal trials, 0.801 ± 0.054 and 0.804 ± 0.042 . RER values of the sports drink trials, 0.859 ± 0.076 and 0.804 ± 0.042 , were significantly higher than the water trials, 0.838 ± 0.055 and 0.801 ± 0.054 . **CONCLUSION:** Swirling sports drinks before measuring RER values significantly increases the RER values. This could potentially bring the reliability of the RER value into question.