

## **The Effect of Carbohydrate, Caffeine and Combined Rinses on College Aged Females' Cycling Endurance Performance**

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Carbohydrate mouth rinses are thought to provide an ergogenic effect in endurance activity, similar to that of carbohydrate ingestion. These rinses could be useful in limiting gastrointestinal discomfort during athletic performance while still providing ergogenic benefits. While the ergogenic effect of caffeine ingestion during endurance activity has also been shown, the effect of a caffeine rinse on endurance performance is unclear. **PURPOSE:** To investigate the effects of carbohydrate, caffeine and carbohydrate-caffeine mouth rinses on a cycling time trial with recreationally active college-aged females. **METHODS:** Seven volunteers (age:  $21.86 \pm 0.10$  yrs, height:  $165.48 \pm 1.24$  cm, mass  $65.40 \pm 1.42$  kg, BMI  $23.80 \pm 0.34$  kg/m<sup>2</sup>, Vo<sub>2</sub>max  $37.99 \pm 0.92$  ml/kg/min) gave their written informed consent to participate in the study. The participants completed four trials on the cycle ergometer. The first was a VO<sub>2</sub>max and Workloadmax test until volitional fatigue. The following visits included a 5 minute warm-up at 40% W<sub>max</sub> followed by completing a set amount of work of  $.6 * W_{max} * 3600$ . Every 12.5% of work completed the subject rinsed their mouth for 5 seconds with 25 mL of either 1.2% caffeine (CAF), 6% carbohydrate (CHO) or caffeine-carbohydrate (CAF-CHO) solutions. **RESULTS:** No significant differences in time trial completion were observed between the CHO ( $61.56 \pm 3.10$  min), CAF ( $61.63 \pm 2.70$  min), and CAF-CHO ( $63.89 \pm 3.75$  min) trials ( $p=0.70$ ). Split times between the CHO, CAF, and CAF-CHO trials approached significance ( $p=0.08$ ). There were no significant differences observed in mean power (CHO:  $125.35 \pm 11.04$ W, CAF:  $124.87 \pm 10.53$ W, CAF-CHO:  $121.65 \pm 11.85$ ,  $p=0.98$ ) or peak power (CHO:  $184.14 \pm 17.38$ W, CAF:  $204.71 \pm 32.18$ W,  $167.00 \pm 12.67$ W,  $p=0.29$ ) during any trial. Split power outputs between the CHO, CAF, and CAF-CHO trials approached significance ( $p=0.10$ ). **CONCLUSION:** The current study found that a caffeine rinse does not appear to improve endurance cycling performance in females.