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***The Influence of Pre-Exercise Solid and Liquid Caloric Ingestion on Blood Glucose and Lactate***

Energy supplements for endurance training and racing are often used as an effective way of improving performance. Pre-exercise feedings may increase glycogen synthesis and provide additional substrate for exercise, yet most athletes prefer not to eat solid food right before an endurance activity due to potential gastrointestinal issues and possible side effects in regard to blood glucose response to the feeding. Caloric feedings may be desirable before certain sub-maximal training events. However, it is not known whether a cereal feeding would be tolerated, compared to liquid feeding, when ingested prior to exercise. **PURPOSE.** The purpose of this study was to investigate blood glucose levels (BG), lactate, rating of perceived exertion (RPE), and respiratory exchange ratio (RER) when iso-caloric liquid or solid food was consumed 10 min prior to moderate intensity exercise. **METHODS.** Nine low-risk subjects, six males and three females, participated in the study. Each subject completed a maximal heart rate test prior to the two exercise trials to determine target heart rate throughout the study. For one trial, subjects consumed a sports drink containing 40g carbohydrate and 10g protein 10 min prior to exercise. For the second trial, subjects consumed cereal with skim milk consisting of 44g of carbohydrate and 6g protein 10 min prior to exercise. Each exercise trial consisted of riding a cycle ergometer at 65% of maximal heart rate for 50 min. Blood glucose lactate, and RPE were recorded at 25 and 50-minute time points. RER was collected between 20-25 minutes and 45-50 minutes. An ANOVA with repeated measures was performed on the dependent variables. Alpha level of significance was set at  $p < 0.05$ . **RESULTS.** Average BG and lactate were significantly greater for the Liquid trial ( $4.93 \pm 0.94$  mM/L and  $3.7 \pm 2.2$  mM/L) compared to Solid trial ( $4.52 \pm 0.5$  mM/L and  $2.3 \pm 1.2$  mM/L). There were no significant differences between trials for RPE and RER. **CONCLUSIONS.** The blood glucose findings support the idea that gastric emptying is slower with solid feeding than with fluid feeding. Although the effect was small, the increased blood glucose concentration secondary to liquid feeding represents increased energy available to muscle cells. Interestingly, the women in the study seemed to have overall lower BG and lactate levels compared to the men. One limitation of the study is that only one dosage and one timing of pre-exercise ingestion was investigated. By varying dosage and timing, the exact differences on gastric emptying and subsequent physiological variables could be quantified.