



## Mid Atlantic Regional Chapter of the American College of Sports Medicine

Annual Scientific Meeting, November 1<sup>st</sup> – 2<sup>nd</sup>, 2019  
Conference Proceedings

International Journal of Exercise Science, Volume 9, Issue 8



### The Acute Effects of a Weighted Load on Glucose Metabolism

Haley Shaffer, Zachary Rollar, Samuel Tomlin, Joohee Sanders, Ph.D., William Braun, Ph.D., FACSM, Shippensburg University, Shippensburg PA

Pre-exercise carbohydrate (CHO) intake has the potential to induce rebound hypoglycemia during aerobic exercise. **PURPOSE:** To evaluate the effects of pre-exercise CHO ingestion on blood glucose (BG) response during weighted-vest (40 lb. ruck) treadmill exercise. **METHODS:** Four males and one female member of Shippensburg University's Army Reserve Officer Training Corps (ROTC) participated in a protocol consisting of 4 experimental trials. Trials consisted of a 20-minute simulated ruck march at a continuous speed of 3.5 mph with grade alternating between 0% and 7% incline every 5-min. A control trial (CON), pre-exercise glucose trial (CON-GL), ruck control trial (R-CON), and ruck with pre-exercise glucose trial (R-GL) were performed in sequential order. Glucose trials were performed after a four-hour fast and involved consuming 300 ml of a 13.3% CHO solution, delivering 40 g of glucose. CHO was consumed 10 min prior to exercise. Dependent variables included BG, heart rate, oxygen uptake ( $\text{VO}_2$ ), and respiratory exchange ration (RER). **RESULTS:** Blood glucose levels did not differ significantly between trials. However, RER was significantly different between CON-GL and R-GL ( $0.84 \pm 0.02$  vs.  $0.90 \pm 0.03$ ;  $p = 0.042$ ) and a trend ( $p=0.062$ ) was present for CON vs. R-GL.  $\text{VO}_2$  was different between CON and R-GL and R-CON ( $25.44 \pm 2.9$  vs.  $32.90 \pm 0.9$  (R-GL) and  $32.26 \pm 1.4 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$ ;  $p = 0.012$  and  $.007$ , respectively); a trend ( $p=0.075$ ) was also present for CON-GL  $\text{VO}_2$  to be different from R-GL  $\text{VO}_2$  ( $28.34 \pm 0.8$  vs.  $32.9 \pm 0.9 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$ ). **CONCLUSION:** CHO intake immediately prior to moderate-to-vigorous exercise may influence CHO oxidation but was not found to adversely affect BG concentration or other physiologic measures. While timing of pre-ex CHO ingestion may be relevant if seeking to avoid rebound hypoglycemia, CHO consumed 10 min prior to ruck marching did not induce a hypoglycemic response.