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Pre-Sleep Low Glycemic Modified Starch Does Not Improve Next Morning Running Performance in Endurance Athletes

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PURPOSE: To determine the effects of pre-sleep supplementation with a novel low glycemic index (LGI) carbohydrate (CHO) on next morning substrate utilization, gastrointestinal distress (GID), and endurance running performance (5km time trial, TT) using a double-blind, randomized placebo-controlled, crossover design. **METHODS:** Trained participants ($n=14$, 8/6 male/female; 28 ± 9 yrs) were familiarized with the procedures and completed a VO_{2peak} test (to determine eligibility). For the experimental trials (3 total), participants were randomly assigned to consume 270 kcal of LGI CHO, 270 kcal of high glycemic index (HGI) CHO, or 0 kcal of placebo (PLA) at least 2 hours after their last meal and within 30 minutes prior to sleep the evening before each trial. Each trial was separated by a minimum of 72 hours. Upon arriving to the lab in a fasted state, baseline measures of energy expenditure (REE), substrate utilization, blood glucose, satiety, and GID were assessed. Next, an incremental exercise test (IET) was performed at 55, 65, and 75% of the participants VO_{2peak} ($VO_{2peak} 55 \pm 7$ ml/kg/min). GID and rating of perceived exertion (RPE) was recorded every five minutes and substrate utilization was obtained on a 15 second interval. Finally, participants were instructed to complete a best effort 5km TT on a treadmill. Significance was established at $p\leq 0.05$. **RESULTS:** There were no differences across supplement in any measure at baseline. During IET, there was a trend for greater CHO utilization with LGI compared to HGI (PLA, 56 ± 11 ; HGI, 60 ± 14 ; LGI, $63\pm 14\%$, $p=0.16$, $\eta^2=0.14$). Supplement had no significant effect on GID at any point. 5km TT performance was also unaffected by supplement (PLA, 21.6 ± 9.5 ; HGI, 23.0 ± 7.8 ; LGI, 24.1 ± 4.5 min, $p=0.94$, $\eta^2=0.01$). **CONCLUSION:** Pre-sleep CHO supplementation did not affect next-morning resting substrate utilization, BG, GID, or 5km TT performance. The trend towards higher CHO utilization during IET after pre-sleep LGI, might suggest that such supplementation increases morning CHO availability.