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The Influence of Carbohydrate vs. Carbohydrate plus Protein Supplementation on Muscle Force Production After Exercise Induced Muscle Damage

Consuming a protein (PRO)-carbohydrate (CHO) supplement is a common way to reduce muscle soreness and speed up muscle recovery post exercise. While most research focuses on measuring muscle force production as a marker of recovery post aerobic exercise, the present study aims to examine this effect after anaerobic muscle damaging exercise. Utilizing a parallel, double blind design, two groups of 6 healthy active males participated in this study. The participants were instructed not to perform any type of exercise and consumed only the food provided to them by the study. The participants receive either a control supplement containing only CHO or a PRO-CHO supplement (2:1 ratio). The supplements are consumed twice a day for four days prior to the muscle damaging exercise and three days post exercise. Two supplements are also consumed immediately following the damaging bout of exercise. Baseline muscle force production and peak muscle torque are measured on day one before a bout of damaging exercise using the ACES and Biodex machines. Muscle force and torque are then monitored for three days post damage using the same protocol as the baseline measurements. The ACES is a multi-joint, closed chain exercise device which measures muscle force in $\text{lbs} \cdot \text{deg} \cdot \text{sec}^{-1}$ and responds accordingly (Williams et al., 2013) and the Biodex is an isokinetic dynamometer that measures peak torque of the leg muscles during leg extension and flexion in $\text{ft} \cdot \text{lbs}^{-1}$. It is hypothesized that the muscle force and torque will return to baseline faster in the participants consuming the PRO-CHO supplement, thus muscle force in the damaged muscles will return to baseline at a faster rate.

Keywords: Carbohydrate and Protein Supplementation, Muscle Damage, Muscle Recovery, Force Output