

Effects of Multi-ingredient Pre-workout Supplements on Repetitions-in-Reserve and Subjective Measures of Energy, Fatigue, and Focus during Lower-Body Resistance Exercise

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ABSTRACT

Approximately 50% of the U.S. population regularly consumes dietary supplements to enhance their health and well-being. One popular category of dietary supplements is called “pre-workout” supplements, which claims to increase subjective feelings of energy and exercise performance. **PURPOSE:** The purpose of the study was to examine whether two commercially available pre-workout supplements could beneficially modify resistance exercise-specific perceived exertion and subjective measures of energy, focus, and fatigue during an acute bout of lower-body resistance exercise. **METHODS:** This was a counterbalanced, double blind, placebo-controlled trial. Resistance-trained (i.e. 2+ hours per week of weight training over the past 6 months) females and males who regularly consumed caffeine (100+ mg/d) were recruited for participation. Each subject completed 3 sessions in a counterbalanced order: placebo (P), non-caffeinated pre-workout (NC; Carbon Prep), and caffeinated pre-workout (C; Jym Supplement Science Pre-Jym). At each session, identical testing was conducted using an isokinetic squat machine. One initial maximum test of 3 repetitions was completed, followed by 5 sets of 6 repetitions using 80% of the maximal force measured during the initial set of 3 repetitions. Within a 2-minute rest between each set, subjective measurements of difficulty were obtained (i.e. estimated repetitions in reserve [RIR] and 10-cm visual analog scales [VAS] for energy, focus, and fatigue). RIR ratings were converted to resistance exercise-specific ratings of perceived exertion (RPE). VAS data was analyzed using two-way repeated measures ANOVA and RIR/RPE data was analyzed for males and females separately using two-way repeated measures ANOVA. **RESULTS:** Twenty-one participants completed the study (12 F, 9 M). Subjective measures of energy were acutely increased by ingestion of each supplement, including placebo, but decreased as the workout progressed (time main effect; $p < .001$). Fatigue progressively increased throughout the exercise session (time main effect; $p < .001$). Fatigue was higher during the NC condition than the C and P conditions (supplement main effect; $p = .019$). A significant supplement*time interaction was present for RPE in females, but not in males. In females, the caffeinated and non-caffeinated pre-workout supplements delayed the increase in RPE as compared to placebo. **CONCLUSION:** The studied commercially available pre-workout supplements may beneficially delay the increase in RPE observed

during acute lower-body resistance exercise in trained females. However, the results of subjective measurements should be interpreted in the context of the corresponding exercise performance.

