The effects of protein and carbohydrate supplementation, with and without creatine, on occupational performance in firefighters

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Background: The purpose of this study was to assess the effects of protein and carbohydrate supplementation, with and without creatine, on occupational performance in firefighters.

Methods: Using a randomized, double-blind approach, thirty male firefighters (age: 34.4 ± 8.4 yrs., height: 1.82 ± 0.07 m; weight: 88.6 ± 12.5 kg; BF%: 17.2 ± 5.8 %) were randomized to receive either A.) 25 g of whey protein isolate + 25 g of carbohydrate powder (ProCarb group); B.) ProCarb + 5 g of creatine (Creatine group) in a double-blind fashion over a period of 21-26 days (depending on shift rotations) to evaluate the impact of supplementation on occupation-specific performance. At baseline and following supplementation, firefighters completed a battery of tests. These tests included an aerobic speed test on an air-braked cycle ergometer followed by the hose carry, body drag, stair climb, and Keiser sled hammer for time.

Results: No significant differences in measures of performance were observed at baseline ($p > 0.05$). There was a significant main effect for time observed for rescue, stair climb, total time to completion, and time trial performance ($p < 0.05$). There was a significant group x time ($p < 0.05$) interaction for rescue and forcible entry. Independent-sample t-tests indicated that the Creatine group experienced a greater reduction (from baseline) in completion for the rescue (1.78 ± 0.57 sec, 95% CI: 0.61, 2.95 sec, $p = 0.004$) and forcible entry (2.66 ± 0.97 sec, 95% CI: 0.68, 4.65 sec, $p = 0.01$) tests compared to the ProCarb group. No significant group x time interactions were observed for hose line advance, stair climb, total time to completion, and time trial performance ($p > 0.05$).

Conclusions: The addition of supplemental creatine to a protein and carbohydrate supplement to the diet of career firefighters throughout a three-week period improves occupational performance in firefighters in specific areas of high-intensity, repetitive actions.