

The acute effects different quantities of branched-chain amino acids have on recovery of muscle function

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Purpose: Branched-chain amino acid (BCAA) supplementation has been shown to significantly reduce the undesirable effects commonly associated with high-intensity training, which include decreases in muscle function and increases in muscle soreness. However, the application of associated BCAA research to the athletic setting is limited, as supplementation protocols have contained either low (3 - 6g), or high (20g) dosages of BCAA, generally administered to untrained individuals. The present study investigated the acute effects of two different quantities of BCAA on the recovery of muscle function following high-intensity resistance training in trained individuals. The main aim was to examine whether there is a dose-response effect of using a higher dosage of BCAA on recovery when compared to a lower dosage.

Methods: Five resistance-trained males (mean \pm SD, age: 21.8 ± 0.8 years, stature: 1.81 ± 0.57 m, body mass: 83.3 ± 7.2 kg) were recruited and performed baseline assessments including, countermovement (CMJ) and squat jump (SJ), peak (PP) and mean (MP) power (6 s Wingate Cycle) and perceived muscle soreness (soreness). In a counterbalanced, single-blind fashion, participants were provided with either, placebo (blackcurrant squash with negligible calorie content) or 6g or 18g BCAA 20 min prior to, and immediately after completion of a high-intensity strength session (ST). At 24 h post ST, all assessments were completed under all three experimental conditions.

Results: Following ST, there were significant decrements in all measures of muscle function across conditions when compared to baseline values ($p < 0.05$). However, ingestion of 6g and 18g BCAA was shown to significantly attenuate these decrements in comparison to placebo ($p < 0.05$). A dose-response for BCAA was also present as significant differences ($p < 0.05$) were shown between ingestion of 6g and 18g; CMJ (18g: 59.1 cm, 6g: 57.7 cm, placebo: 56.6cm), SJ (18g: 54.0 cm, 6g: 52.8 cm, placebo: 51.7 cm), PP (18g: 1133 W, 6g: 1107 W, placebo: 1044 W), MP (18g: 1011 W, 6g: 986 W, placebo: 972 W), soreness (18g: 81 mm, 6g: 91 mm, placebo: 100 mm).

Conclusions: BCAA ingested both acutely before, and immediately following intensive resistance training attenuates the decrement observed in muscle function, while alleviating symptoms of muscle soreness. These small but significant findings not only support the proposed ergogenic benefits of BCAA supplementation, but also highlight a potential dose-response, with a higher dose (18g) having a significantly greater effect than a lower dose (6g) in trained individuals.