

Effect of L-Citrulline on Muscle Recovery after Anaerobic and Aerobic Exercise

Stephanie Zybert, Alexa Chandler, Jonathan Jones, Hyechang Rhim, Anthony Spinelli, Pauline Werner, Rolf Krauss, Suma Kulkarni, Tamara Meuwissen, Thomas Swensen.
Ithaca College, Ithaca NY

PURPOSE: Previous research shows that acute L-citrulline supplementation improves anaerobic performance and reduces muscle soreness, suggesting it may improve muscle recovery following exercise. With a double blind crossover design, we evaluated the acute effect of L-citrulline supplementation on muscle recovery and cycling sprint and 2 mi time trial (TT) performance.

METHODS: 22 college students (19.5 ± 1.3 y) completed a preliminary cycling VO_2 max test (43.2 ± 10.8 ml·kg⁻¹·min⁻¹) and were then twice familiarized with the sprint test (4 x 12 s sprints at 5.5% of body mass, separated by 2.5 min of active recovery) and the TT; testing sessions were separated by 48 h. Approximately 5 d later and 1 hr before repeating the tests, 11 subjects consumed 6 g of citrulline, while the other 11 ingested 6 g of a cornstarch placebo; to assess recovery, the tests were repeated 24 hr later. After a 1 wk washout, subjects repeated the tests with the other treatment. Data were analyzed with two-way repeated measures ANOVA; where indicated, specific differences were located with Bonferroni post-hoc analyses. α was set at 0.05. **RESULTS:** Table 1 shows mean power in watts (W) for maximum peak power (MPP), average peak power (APP), maximum mean power (MMP), and average mean power (AMP) for the sprint tests, and mean time in seconds and power (W) for the TT.

CONCLUSION: The data show that citrulline did not improve any measure of performance or muscle recovery. Indeed, it decreased TT performance relative to the placebo. In contrast, 6 g or 24 kcal of cornstarch ingested 1 h before exercise improved sprint performance 24 h after a bout of similar exercise.

Table 1.

	CT	CR	PT	PR
MPP	996.5	991.1	983.4	1030.3*
APP	947.2	948.2	937.7	993.3*
MMP	894.1	888.6	890.7	927.23*
AMP	844.6	837.4	851.9	891.7*
TT Time	478.4	461.5	455.6 [#]	461.1 [#]
TT Power	146.8	157.1 [#]	158.1 [#]	155.3

Notes: CT = citrulline treatment; CR = citrulline recovery; PT = placebo treatment; PR = placebo recovery. *Significantly different than PT; [#] Significantly different than CT
Ithaca College funded this project.