proceedings

MDPI

Abstract

The Effect of Betaine Supplementation on Crossfit Performance, Testosterone, and Inflammatory Cytokines †

Emilia Zawieja [1,*], Marcin Sadowski [1], Agata Chmurzynska [1], Krzysztof Durkalec-Michalski [2] and Natalia Główka [2]

[1] Department of Human Nutrition and Dietetics, Poznan University of Life Sciences, 60-637 Poznan, Poland; marcin.sadowski@up.poznan.pl (M.S.); agata.chmurzynska@up.poznan.pl (A.C.)
[2] Department of Sports Dietetics, Poznań University of Physical Education, 61-871 Poznan, Poland; durkalec-michalski@awf.poznan.pl (K.D.-M.); glowka@awf.poznan.pl (N.G.)
* Correspondence: emilia.zawieja@up.poznan.pl
† Presented at the 14th European Nutrition Conference FENS 2023, Belgrade, Serbia, 14–17 November 2023.

Abstract: Betaine (BET) is a natural substance found in a variety of foods. BET is also a popular ingredient in dietary supplements. Athletes and physically active people are among those most interested in supplementing BET, because of its beneficial effect on health and, hypothetically, sports performance. The aim of this study was to evaluate the effect of 3-week BET supplementation on Crossfit performance, muscular power, cytokines, and hormones concentrations in Crossfit-training males. The secondary aim was to compare two different BET doses (2.5 g/d and 5.0 g/d). The study was designed in a double-blinded randomized cross-over fashion. Forty-three participants completed the entire study. Crossfit performance was measured using the Fight Gone Bad (FGB) workout and muscle power was evaluated in a 30 s WAnT. Body composition was determined by air-displacement plethysmography. Blood was drawn in the morning of each of the four study meetings, when fasted. Total FGB improved with BET by 8.7 ± 13.6% ($p < 0.001$), but no significant changes were observed with the placebo (−0.4 ± 10.0%, $p = 0.128$). No changes were observed in WAnT and body composition with BET. After BET supplementation, testosterone concentrations increased by 7.0 ± 15.4% ($p = 0.046$) (no change with the placebo: 1.5 ± 19.6%, $p = 0.884$) but no effect was observed for concentrations of insulin-like growth factor or cortisol. Our results show that BET supplementation significantly decreased homocysteine concentration (from 17.1 ± 4.0 µmol/L before BET to 15.6 ± 3.5 µmol/L after BET, $p = 0.009$, $\eta^2 = 0.164$), but had no effect on cytokines concentrations (IL-1β, IL-6, and TNF-α). There was no significant interaction with BET dose for any measured outcome. In conclusion, 3-week BET supplementation may improve Crossfit performance, increase testosterone concentrations, and decrease homocysteine concentrations in training males. However, BET had no influence on anaerobic muscular power, body composition, and inflammatory status in our population. The application of our results might refer to males who want to improve their Crossfit performance, and also to populations with decreased testosterone levels, e.g., older males. However, further studies should determine the effect of BET in different populations. Key words: Wingate; Fight Gone Bad; body composition; betaine.

Keywords: betaine; testosterone; exercise; crossfit; cytokines

Citation: Zawieja, E.; Sadowski, M.; Chmurzynska, A.; Durkalec-Michalski, K.; Główka, N. The Effect of Betaine Supplementation on Crossfit Performance, Testosterone, and Inflammatory Cytokines. *Proceedings* **2023**, *91*, 26. https://doi.org/10.3390/proceedings2023091026

Academic Editors: Sladjana Sobajic and Philip Calder

Published: 14 November 2023

Author Contributions: E.Z., A.C. and K.D.-M. planned the study; E.Z., N.G., M.S. and K.D.-M. conducted study meetings, supervised the intervention and collected data; E.Z. analyzed blood samples; E.Z. and A.C. analyzed data; E.Z. prepared the presentation. All authors have read and agreed to the published version of the manuscript.

Funding: This work was funded by the Polish National Science Centre under Grant DEC-2017/27/N/NZ9/00750.

Institutional Review Board Statement: The study was approved by the local ethical committee (Bioethics Committee at Poznan University of Medical Sciences, Poznan, Poland. Decision no. 1092/17, November 9, 2017).

Informed Consent Statement: Written informed consent was obtained from all participants before the study began.

Data Availability Statement: Data is available for the corresponding author on request.

Conflicts of Interest: The authors declare no conflict of interest.