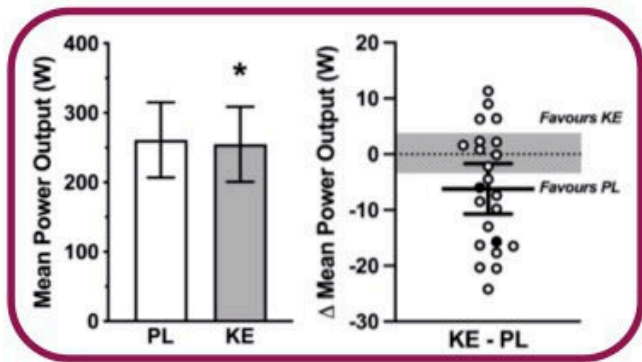
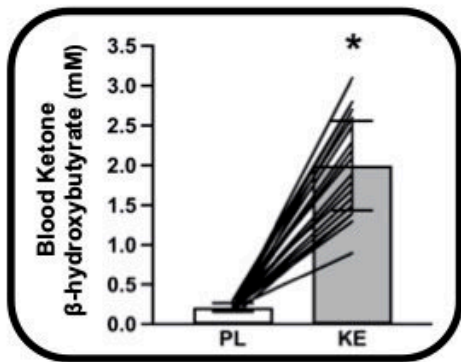
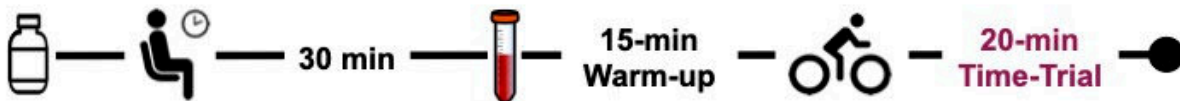


# Ketone supplements worsen performance in trained endurance athletes, researchers find

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## Exogenous Ketone Ingestion Impairs Time-Trial Performance

**Randomized, Crossover, Double-Blind**  
**Ketone Monoester (KE, 0.35 g/kg body mass) vs Placebo (PL)**  
**Trained Cyclists ( $n = 23$ , peak  $O_2$  uptake =  $65 \pm 12$  mL/kg/min)**



McCarthy et al. (2023) *Int J Sports Nutr Exerc Metab.* doi: 10.1123/ijsnem.2022-0255

Graphical abstract. Credit: *International Journal of Sport Nutrition and Exercise Metabolism* (2023). DOI: 10.1123/ijsnem.2022-0255

Kinesiologists at McMaster University have found ketone supplements, used by some athletes hoping to cross the finish line faster, may in fact worsen performance.

The new study, published in the *International Journal of Sport Nutrition and Exercise Metabolism*, tackles contradictory research findings related to the effectiveness of ketone supplements, which have gained popularity among athletes seeking a competitive advantage.

Some previously published studies had shown the supplements improve performance, while others have reported they had no effect or even worsened performance.

Natural ketones can serve as fuels for the brain and muscles. A [ketogenic diet](#)—characterized by very low carbohydrate and typically high fat intake—causes the body to produce more organic ketone compounds and increase their use for energy.

Ketone supplements speed up that process, without the [strict diet](#).

"One of the main perceived benefits is that ketones may serve as an alternative fuel source during exercise or potentially alter the utilization of other major fuel such as carbohydrates and fats, and in turn enhance endurance capacity," explains Martin Gibala, supervising author of the study and a professor in the Department of Kinesiology at McMaster University. "But our findings suggest that isn't the case."

The McMaster researchers recruited well-trained endurance athletes who cycled five or more hours per week, selecting them because their athletic performance is consistent from day to day. The experiment was conducted in a lab but simulated race conditions and the participants prepared as they normally would for a cycling competition.

Each participant completed two trials that differed only in the drink provided before they completed a 20-minute cycling time trial that closely predicts 40-km race performance. The drinks contained either a ketone [supplement](#) or a similar-tasting placebo.

The research was structured as a double-blind study, meaning neither the researchers nor the athletes knew whether the ketone supplement or the placebo was provided.

"The main observation from this study was that the speed that the cyclists could sustain during the test was lower after drinking the ketone supplement compared to the placebo," says Devin McCarthy, lead author of the study and graduate student in the Department of Kinesiology at McMaster.

Researchers say the findings align with their previous [work](#) which found ketone supplements increased cardiorespiratory stress during exercise.

They are currently investigating responses to varying doses of the supplements at different exercise intensities to better understand how ketones may affect performance, and the potential underlying mechanisms.

**More information:** Devin G. McCarthy et al, Acute Ketone Monoester Supplementation Impairs 20-min Time-Trial Performance in Trained Cyclists: A Randomized, Crossover Trial, *International Journal of Sport Nutrition and Exercise Metabolism* (2023). [DOI: 10.1123/ijsnem.2022-0255](#)

Provided by McMaster University

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