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## Effect of betaine supplementation on plasma nitrate/nitrite in exercise-trained men

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### Abstract

#### Background

Betaine, beetroot juice, and supplemental nitrate have recently been reported to improve certain aspects of exercise performance, which may be mechanistically linked to increased nitric oxide. The purpose of the present study was to investigate the effect of betaine supplementation on plasma nitrate/nitrite, a surrogate marker of nitric oxide, in exercise-trained men.

#### Methods

We used three different study designs (acute intake of betaine at 1.25 and 5.00 grams, chronic intake of betaine at 2.5 grams per day for 14 days, and chronic [6 grams of betaine per day for 7 days] followed by acute intake [6 grams]), all involving exercise-trained men, to investigate the effects of orally ingested betaine on plasma nitrate/nitrite. Blood samples were collected before and at 30, 60, 90, and 120 min after ingestion of 1.25 and 5.00 grams of betaine (Study 1); before and after 14 days of betaine supplementation at a dosage of 2.5 grams (Study 2); and before and

after 7 days of betaine supplementation at a dosage of 6 grams, followed by acute ingestion of 6 grams and blood measures at 30 and 60 min post ingestion (Study 3).

## Results

In Study 1, nitrate/nitrite was relatively unaffected and no statistically significant interaction ( $p = 0.99$ ), dosage ( $p = 0.69$ ), or time ( $p = 0.91$ ) effects were noted. Similar findings were noted in Study 2, with no statistically significant interaction ( $p = 0.57$ ), condition ( $p = 0.98$ ), or pre/post intervention ( $p = 0.17$ ) effects noted for nitrate/nitrite. In Study 3, no statistically significant changes were noted in nitrate/nitrite between collection times ( $p = 0.97$ ).

## Conclusion

Our data indicate that acute or chronic ingestion of betaine by healthy, exercise-trained men does not impact plasma nitrate/nitrite. These findings suggest that other mechanisms aside from increasing circulating nitric oxide are likely responsible for any performance enhancing effect of betaine supplementation.

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