

# Will a nutritional supplement help you run better?

July 11 2018, by Jeffrey Smith

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Credit: Paul Brennan/public domain

Whether you jog to keep fit or compete in marathons, the physically demanding sport of running can deplete the body of essential nutrients.

During a race like a half-marathon, a runner's metabolism —or ability to convert food and internal resources into energy —must work much harder to keep up with increased demand.

[Metabolites are essential molecules that flow through the blood](#) to keep the body functioning. Some of these hard-working metabolites are [amino acids that are absorbed and converted into protein needed for muscle strength and endurance](#).

During times of high demand, if nutrient intake is incomplete, [nutritional supplements](#) can help fill the gaps.

But how do you know if you need a [nutritional supplement](#)? It could all depend on your metabolism. And our team of scientists from the Carleton Mass Spectrometry Centre at Carleton University and Ottawa-based Staterra Inc. [have set out to research this](#).

## **No scientific consensus**

Endurance runners who train intensely lose critical metabolites due to increased energy expenditure and increased protein synthesis during the recovery period. As a result, both elite and non-elite athletes experiment with a variety of nutritional supplements in an attempt to improve their physical performance.

Recently, there has been an explosion in these [amino acid supplements](#). There is [very little scientific evidence](#) to back up the claims made about many supplements, and yet a wide variety are now being marketed to runners.

In some cases, [amino acid supplementation can improve training sessions and recovery in runners](#). However, we must consider that both training and diet can affect metabolism. Few studies investigate this relationship, which could explain why [scientific consensus](#) on the ideal supplementation for endurance runners is still highly debated.

If you misuse or take too much of a nutritional [supplement](#) it can [also](#)

[hinder your performance and have long-term, unwanted health effects](#), so it's important to understand and study the science behind any supplement.

## **Tailoring a 'smart supplement'**

The research team from Staterra Inc. and Carleton University [has set out to quantify exercise-induced changes in several metabolites in the body](#).

Using the technique of [mass spectrometry](#), methods have been developed to examine metabolites extracted from dried blood samples of athletes at set intervals over the course of a long-distance run.

This leading-edge technique allows for easy identification of important metabolites required during physical activity. With this information, a "smart supplement" can be tailored to aid in efficient performance and recovery.

Only the necessary and required metabolites are included —to avoid burdening the athlete's body with excretion of unnecessary components.

## **Focus on metabolic effect**

Significant knowledge gaps exist regarding the ways that metabolites, such as amino acids, impact athletic performance and recovery.

This study attempts to fill in these gaps by determining whether there is a specific metabolic pattern in endurance runners. To paint a clearer picture of what is happening to amino acids during endurance training, participants in the study do not take any type of amino acid supplementation.

Preliminary data indicate a clear pattern in several metabolites. More surprisingly, the data show that several [amino acids](#), which are currently very popular as fitness supplements, are dependent on the individual. This means that different athletes would have a different metabolic pattern as they exercise. This may explain why some athletes thrive on fitness supplements while others do not.

Our study suggests a new and innovative approach to fitness supplementation, where the metabolic changes at the cellular level are identified—to develop supplements that will enhance performance, increase recovery and prevent injury.

Focusing on metabolic effects during physical activity should be the new norm in developing safe and efficient supplements.

This article was originally published on [The Conversation](#). Read the [original article](#).

Provided by The Conversation

Citation: Will a nutritional supplement help you run better? (2018, July 11) retrieved 2 May 2024 from <https://medicalxpress.com/news/2018-07-nutritional-supplement.html>

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