

## Beetroot juice may boost endurance: Study

By Stephen Daniells, 07-Aug-2009

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**Consuming beetroot juice may boost stamina and allow people to exercise for up to 16 per cent longer, according to a new study from the UK.**

The vegetable juice's nitrate content may reduce oxygen uptake to an extent that cannot be achieved by any other known means, making exercise less tiring, according to findings published in the *Journal of Applied Physiology*.

"Our study is the first to show that nitrate-rich food can increase exercise endurance," said Professor Andy Jones from the University of Exeter. "We were amazed by the effects of beetroot juice on oxygen uptake because these effects cannot be achieved by any other known means, including training."

"I am sure professional and amateur athletes will be interested in the results of this research," added Prof Jones. "I am also keen to explore the relevance of the findings to those people who suffer from poor fitness and may be able to use dietary supplements to help them go about their daily lives."

The study could see beetroot juice positioned as a unique beverage in the growing sports nutrition market. Frost & Sullivan estimates the European sports nutrition market will surpass the €4 billion by 2010 – and it is a food industry segment that is growing more rapidly than most.

In addition to the potential benefits for athletes, the Exeter researchers report that the findings could be relevant to elderly people or those with cardiovascular, respiratory or metabolic diseases.

### Study details

Prof Jones and his co-workers recruited eight men aged between 19 and 38, and assigned them to consume 500 ml per day of organic beetroot juice for six days. After this time the men underwent a series of tests, involving cycling on an exercise bike.

The 'placebo' phase involved consuming blackcurrant cordial for six days before completing the same cycling tests.

The researchers report that, following consumption of the beetroot juice, the volunteers were able to cycle for an average of 11.25 minutes, which is 92 seconds longer compared to their performance after placebo.

This would translate into an approximate 2 per cent reduction in the time taken to cover a set distance. The group that had consumed the beetroot juice also had lower resting blood pressure, a finding that supports the findings of an earlier study from London-based researchers who reported blood pressure reductions on consuming beetroot juice (*Hypertension*, Mar 2008; Vol. 51, pp. 784-790).

"The principal original finding of this investigation is that three days of dietary supplementation with nitrate-rich beetroot juice (which doubled the plasma nitrite) significantly reduced the O<sub>2</sub> cost of cycling at a fixed sub-maximal work rate and increased the time to task failure during severe exercise," wrote Jones and his co-workers.

"That an acute nutritional intervention (ie, dietary supplementation with a natural food product that is rich in nitrate) can reduce the O<sub>2</sub> cost of a given increment in work rate by about 20 per cent is therefore remarkable," they added.

### Mechanism

It is unclear what the exact mechanism behind the apparent benefits is, said the researchers. They do, however, suspect it could be a result of the nitrate turning into nitric oxide in the body, reducing the oxygen cost of exercise.

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"Dietary nitrate supplementation reduces the O<sub>2</sub> cost of low-intensity exercise and enhances tolerance to high-intensity exercise in humans"

Authors: S.J. Bailey, P. Winyard, A. Vanhatalo, J.R. Blackwell, F.J. DiMenna, D.P. Wilkerson, J. Tarr, N. Benjamin, A.M. Jones

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