

## Issue 63

### In a nutshell

There is good evidence that antioxidant supplementation (particularly vitamins C and E) is beneficial in its effects on lipid peroxidation following exercise.

However, the case for antioxidant supplementation of athletes is frustrated by the lack of consistent trial results showing benefits on actual physical performance.

## Vitamin C and sport

Arbor Clinical Nutrition Updates 1999 (Mar);63:1-2 ISSN 1446-5450

### ARCHIVES

The full list of archived issues can be found at [www.arborcom.com/archives/](http://www.arborcom.com/archives/). Some issues of our translated language editions are also available in archive, for Spanish, Portuguese and French.

### COPYRIGHT, disclaimer and terms of use

This copy from our archives is for your private use only, and is NOT to be forwarded to any other party. Your use of these Updates constitutes your agreement to our disclaimer and terms of use: see section at the end of this publication.

## NUTRITION RESEARCH REVIEW

### Study one: Vitamin C and lung function in cyclists

Supplementation with the vitamins C and E confers partial protection against the acute respiratory effects of ozone in cyclists, according to Dutch research.

Subjects: Thirty eight Dutch bicyclists.

Method: Change in lung function in response to ozone was measured in these cyclists before and after training sessions on a number of occasions. Twenty subjects received vitamin C (500mg) and vitamin E (100mg) supplements daily for 15 weeks, the others placebo.

Results: The subjects receiving antioxidant supplementation showed much less negative effect from ozone on respiratory function than those on placebo.

Ref: *Am J Epidemiol* 1999;149:306-14

### Study two: Vitamin C and exercise oxidation

Vitamin C supplementation decreases oxidant processes during recovery, but not during exercise itself, according to Finnish research.

Subjects: Nine endurance athletes.

Method: Serum diene conjugation was measured as an index of oxidative stress during a 10.5 km endurance run. It was tested before and after exercise, and then again after recovery. This process was repeated twice - with or without supplementation with 2 gm of vitamin C between runs.

Results: Vitamin C supplementation was associated with an 11% decrease in serum diene conjugation concentration between post-exercise and recovery phases ( $p = 0.028$ ). There was no significant difference between pre- and post-exercise samples.

Ref: *J Sports Med Phys Fitness* 1998;38:281-5

**Table 1:** Difference in lung function after ozone

	Vitamin C	Placebo
FEV1 (SD)	-1 ml (-92 to +132)	-95 ml (-265 to -53)
FVC	-42 ml (-130 to 35)	-125 ml (-384 to -36)
	p<0.05	

## Comments

Oxidative processes are inevitable in exercise, through a number of possible mechanisms. For example, the production of superoxides by mitochondria as part of their role in energy production, the cycle of ischaemia and reperfusion and the oxidation of catecholamines. Much research has focussed on lipid peroxidation, although this is not the only form of oxidative process in exercise.

Antioxidants would seem particularly crucial in athletes. Yet it has been hard to get a clear picture of exactly what that role is, how diet might be relevant, and whether there is a benefit to be had in taking antioxidant supplementation, particularly for the elite athlete.

Another issue is whether conditioning through physical training induces an enhanced antioxidant capacity naturally within the athlete.

These two studies contribute to this debate. As with many others, they show that antioxidant doses well in excess of dietary intake have antioxidant effects, in

one case on lung function and in another more directly on oxidative metabolism.

But the second study also shows the difficulty in defining their role - the supplements were effective in recovery phase, but not during exercise itself.

A recent review of this subject <sup>1</sup> concluded that the evidence on the whole supports the idea that antioxidant supplementation (particularly vitamins C and E) is beneficial in its effects on lipid peroxidation following exercise, and that some prudent use of antioxidant supplementation might be justifiable.

Yet it remains frustratingly difficult to show consistent benefits from such supplementation on actual physical performance in good controlled trials, whatever athletes may say about their anecdotal experience. Trials showing positive impact on recovery rates are more promising, but we clearly still have a way to go in this aspect of sports nutrition.

### References:

1. *Proc Nutr Soc* 1998;57:9-13

## Disclaimer, copyright and terms of use

Your use of these Updates constitutes your agreement to our disclaimer and terms of use which can be found on our web site at: <http://arborcom.com/disclaim3.htm>. You can also obtain the disclaimer and terms of use by emailing us at: [upD@arborcom.com](mailto:upD@arborcom.com).

© Copyright Arbor Communications PTL 1999. All rights reserved. This publication may NOT be forwarded onto others without our written permission.

If you want to receive the Clinical Nutrition Updates on an ongoing basis, please send us a request email to [upD@arborcom.com](mailto:upD@arborcom.com). This is a FREE service to health professionals and students. Include details of your name, email address, which country you live in, institution you are associated with (if relevant) and professional background. The Updates are available in English, Spanish, Portuguese, Italian, French, Korean and Russian