

# Omega-3 shows benefits against 'oxidative stress:' Study

By Stephen Daniells, 23-Jun-2010

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## **The heart health benefits of omega-3 fatty acids EPA and DHA may be related to their ability to reduce oxidative stress, suggests new research.**

Oxygen-breathing organisms naturally produce reactive oxygen species (ROS), which play an important role in a range of functions, including cell signaling. However, over-production of these ROS from smoking, pollution, sunlight, high intensity exercise, or simply ageing, may overwhelm the body's antioxidant defenses and lead to oxidative stress.

Oxidative stress has been linked to an increased risk of various diseases including cancer, Alzheimer's, and cardiovascular disease.

Previous reports had suggested that [omega-3](#) fatty acids may actually increase levels of [oxidative stress](#) due to their susceptibility to oxidation. New findings in *Free Radical Research* indicate that EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) may actually reduce oxidative stress by reducing levels of a compound called F2-isoprostanes.

Scientists from the University of Western Australia and the University of Montpellier (France) report that daily supplements of four grams of either EPA or DHA for six weeks were associated with reductions (in oxidative stress markers) of about 20 per cent.

*"The data, therefore, suggest omega-3 fatty acids reduce oxidative stress, which is likely related, at least in part, to their anti-inflammatory actions and the expected reduction in leukocyte activity,"* wrote the authors, led by Dr Emilie Mas. *"These findings give further support for supplementation of the diet with [omega] 3 fatty acids for cardiovascular risk reduction."*

## Study details

Dr Mas and her co-workers recruited two sets of people to participate in their study. One group was composed of 59 overweight men with abnormal blood lipid levels, and the other group was composed of type-2 diabetics being treated for high blood pressure. The participants were randomly assigned to receive daily doses of 4 grams of EPA, DHA or olive oil (placebo) for six weeks.

At the end of the study, the researchers noted that EPA reduced urine levels of F2-isoprostanes by 24 per cent in the overweight men and by 19 per cent in the diabetics, while DHA was associated with a 14 and 23 per cent reduction in these groups, respectively, compared with the olive oil groups.

Furthermore, plasma levels of arachidonic acid (AA) were reduced following both EPA and DHA supplementation, said the researchers.

Dr Mas and her co-workers note that a previous study in healthy subjects also found benefits, which, combined with their findings, show that omega-3 supplementation may decrease F2- isoprostanes in both healthy and diseased populations.

*"Furthermore, the lack of association with changes in fatty acids is noteworthy, in view of the fact that F2-isoprostanes are derived from free radical oxidation of AA, which is significantly reduced following omega-3 fatty acids,"* stated the researchers. *"Therefore, the changes in F2-isoprostanes most likely reflect a true reduction in oxidative stress, rather than resulting from a reduction in the supply of substrate."*

*"These results show that in humans, EPA and DHA reduce in vivo oxidant stress as measured in human plasma and urine,"* concluded the researchers.

Authors: *Free Radical Research* Published online ahead of print, doi: 10.3109/10715762.2010.492830 *"The omega-3 fatty acids EPA and DHA decrease plasma F(2)-isoprostanes: Results from two placebo-controlled interventions"* Author: E. Mas, R.J. Woodman, V. Burke, I.B. Puddey, L.J. Beilin, T. Durand, T.A. Mori

## CHERNISKE COMMENTS

These results are notable, especially because the placebo was olive oil. Olive oil is composed mainly of monounsaturated fatty acids; (oleic and palmitic acids) along with other fatty acids and plant sterols.

Since these monounsaturated fatty acids and sterols are highly resistant to oxidation, they are hardly a placebo. What's more, olive oil contains potent antioxidant compounds, including tyrosol,

hydroxytyrosol, oleocanthal and oleuropein. So, to observe such a large difference between EPA/DHA and the olive oil treatments, *in spite* of olive oil's impressive profile, says a lot in favor of the EPA and DHA. If corn, soy or safflower oil had been used as placebo, the data from this study would have been far more striking.

This article gives us additional motivation to **STRONGLY ENCOURAGE** the consumption of EPA/ DHA omega-3 fats in healthy patients, as well as those with pathologies associated with obesity.