

Avocado oil: The 'olive oil of the Americas'?

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Atmospheric oxygen facilitated the evolution and complexity of terrestrial organisms, including human beings, because it allowed nutrients to be used more efficiently by those organisms, which in turn were able to generate more energy. However, as we find out more about how oxygen molecules work inside the body, more attention is being paid to their not-so-good effects, and researchers are seeking ways to thwart them.

A number of [environmental factors](#) -- such as pollution, [cigarette smoke](#) and radiation -- can turn the [oxygen molecules](#) found in mitochondria, the [power plants](#) of cells, into free radicals. These unstable molecules destroy virtually all the normal molecules forming cells, such as lipids, proteins and even DNA, by turning them into free radicals, too. This destructive phenomenon is associated with aging and occurs in a variety of diseases, including [hypertension](#) and diabetes, which represent major challenges for [health systems](#) due to their great social and [economic costs](#). Those costs have motivated scientists worldwide to undertake intensive searches for substances that bolster cell resistance to the harmful effects of free radicals.

Many studies of [antioxidants](#) in [vegetables and fruits](#), such as [carrots](#) and tomatoes, have been completed with few encouraging results, says Christian Cortés-Rojo, a researcher at Universidad Michoacana de San Nicolás de Hidalgo in Morelia, Michoacán, México. "The problem is that the antioxidants in those substances are unable to enter mitochondria. So free radicals go on damaging mitochondria, causing energy production to stop and the cell to collapse and die. An analogy

would be that, during an oil spill, if we cleaned only the spilled oil instead of fixing the perforation where oil is escaping, then the oil would go on spilling, and fish would die anyway."

But Cortés-Rojo is prepared to reveal next week the first research results showing the protective effects of avocado oil against free radicals in mitochondria. Sunday, April 22, Cortés-Rojo presented his group's work at the annual meeting of the American Society for Biochemistry and Molecular Biology, held in conjunction with the Experimental Biology 2012 conference in San Diego.

The research team used yeast cells - those used in wine and beer production - to examine avocado oil's properties.

"The reason why we have chosen yeast," explains Cortés-Rojo, "is that (a) this microorganism is easier to study than other biological models due to its relative simplicity and (b) because studies our group published in 2009 and 2011 found that yeast mitochondria are very resistant to free radicals due to the sort of fat that forms its envelope, which is highly resistant to oxidation. The same kind of fat can be found in avocado oil; but, in addition, avocados also contain some plant pigments that inhibit oxidation. That is why we decided to test whether these avocado properties could increase even more the yeast's resistance to mitochondrial oxidation."

The results of this research, he says, show that avocado oil allowed the yeast cells to survive exposure to high concentrations of iron, which produces a huge amount of free radicals, "even to higher levels to those found in some human diseases."

He continues: "These results could be attributed to the fact that avocado oil caused accelerated respiration in mitochondria, which indicate that the use of nutrients for producing energy for cell functions remains

effective even in cells attacked by free radicals and that mitochondria itself could produce little amounts of damaging [free radicals](#)."

Cortés-Rojo emphasized that these findings reinforce the good reputation the avocado has when it comes to health maintenance. He points to pioneering research by Mario Alvizouri-Muñoz, a doctor at the Morelia General Hospital, who demonstrated that avocado lowers the blood concentration of cholesterol and certain fats that are increased in diabetic patients and that may lead to stroke or heart attack.

"Our results are promising because they indicate that avocado consumption could improve the health status of diabetic and other patients through an additional mechanism to the improvement of blood lipids," he says. "We'll need to confirm that what has been observed in yeasts could occur in higher organisms, such as humans. We hope this will be the case, because there are many vital processes conserved in organisms that seem very dissimilar to humans."

Moreover, Cortés-Rojo says, the findings, and the fact that México is the largest producer of avocados in the world, could promote the use of avocado oil or some of its components to reduce the socioeconomic impact of chronic degenerative diseases. "In some Mediterranean countries, low or almost no appearance of these kinds of diseases has been associated with the high olive oil consumption," he explains. "Olive oil has a fat composition similar to that found in avocado oil. Therefore, avocado oil could eventually be referred to as the olive oil of the Americas."

Provided by American Society for Biochemistry and Molecular Biology

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