

# Got fish? Nutrition studies explore health benefits

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Some of America's most popular fish--salmon and albacore tuna, for example--are rich in healthful natural compounds known as omega-3 fatty acids. Ongoing studies by U.S. Department of Agriculture (USDA) chemist Darshan S. Kelley and co-investigators are helping uncover new details about how these fish-oil components help protect us from chronic diseases.

Kelley is with the USDA Agricultural Research Service (ARS) Western Human Nutrition Research Center at the University of California-Davis. ARS is the USDA's principal intramural scientific research agency.

In an early study with laboratory mice, Kelley and colleagues investigated the interplay of two [omega-3 fatty acids](#) from [fish oil](#)--DHA (docosahexaenoic acid) and EPA (eicosapentaenoic acid)--and a third fatty acid, CLA (as trans-10, cis-12 CLA) found in some dietary supplements.

Kelley's 8-week test with 50 laboratory mice indicated that DHA protected the animals against two harmful side effects of CLA: CLA-induced insulin resistance and CLA-induced non-alcoholic fatty-liver disease. In contrast, EPA offered only partial protection against CLA-induced non-alcoholic fatty liver disease and provided no protection against insulin resistance.

If untreated, insulin resistance can lead to diabetes. An estimated 36 million to 57 million Americans are insulin-resistant. Non-alcoholic fatty

liver disease can result in cirrhosis of the liver or liver cancer. The study appeared in a 2007 issue of *Metabolic Syndrome and Related Disorders*.

In related work, published in a 2009 article in *Current Opinion in Clinical Nutrition and Metabolic Care*, Kelley and University of California-Davis graduate student Dawn Fedor reviewed results from several dozen EPA and DHA studies. In their review, the scientists indicate that findings reported in the past decade have been inconsistent in regard to the effects of EPA and DHA on [insulin resistance](#) in human volunteers.

Their review underscores the need for new investigations, with larger numbers of volunteers. Kelley, for example, would like to determine whether DHA can improve the ability of adult, pre-diabetic volunteers to use insulin efficiently, and thus help delay onset of diabetes. Such research might reveal more about the mechanisms of action that DHA and EPA use, the sites upon which they act in the human body, and the genes that control these mechanisms.

**More information:** Read more about the research in the October 2010 issue of *Agricultural Research* magazine, available online at: [www.ars.usda.gov/is/AR/archive ... 10/nutrition1010.htm](http://www.ars.usda.gov/is/AR/archive...10/nutrition1010.htm)

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