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Vegetable Oils May Boost Heart Disease Risk, But Fish and Olive Oils Are Protective

For decades, people have been urged to eat more vegetable-source polyunsaturated fats and less animal-based saturated fats. These recommendations have been based on the belief that polyunsaturated fats reduce the risk of coronary artery disease, whereas saturated fats increase the risk.

But there are two distinctively different families of polyunsaturated fats. Common vegetable oils (corn, peanut, safflower, and soy) are rich in omega-6 polyunsaturated fats. In contrast, fish, leafy greens, and flaxseed contain large amounts of omega-3 polyunsaturated fats. Both types of fats are essential for health, and historically people consumed them in relatively equal amounts. Today, most Americans consume 20 to 30 times more of the omega-6s.

This lopsided intake of omega-6s may actually increase the risk of coronary artery disease. A large body of research now shows that omega-6s promote inflammation. That's significant because heart disease is increasingly regarded as an inflammatory disease of the blood vessels. Conversely, research has shown that people eating diets with large amounts of omega-3s have less inflammation and a relatively low risk of heart disease.

Michal Toborek, PhD, of the University of Kentucky Medical Center, Lexington, exposed human endothelial (blood vessel) cells to three types of fat: omega-6, omega-3, and omega-9. The omega-9 fat, oleic acid, is a monounsaturated fat found in olive oil, avocado, and macadamia nuts.

The omega-6 fat (linoleic acid) substantially increased the activity of two proteins that activate inflammation-causing genes and, in effect, initiate the body's inflammatory response. The omega-3 fat (linolenic acid) led to less of an increase in these inflammation-promoting proteins, and the omega-9 fat actually decreased inflammatory activity in the cells.

Meanwhile, Eric Dewailly, PhD, of the Laval University Medical Research Center, Canada, investigated the diets of the Inuit of Nunavik, Canada.

Although many of the 426 Native Americans in the study ate modern foods, they also included many traditional fish foods in their diets. These fish provide large amounts of inflammation-reducing omega-3 fats.

"The traditional Inuit diet, which is rich in omega-3 fatty acids, is probably responsible for the low mortality rate from ischemic heart disease in this population," Dewailly wrote.

In the third study, Trine Madsen, MD, of Aalborg University, Denmark, studied the relationship between omega-3 fats and C-reactive protein (CRP) in 269 patients undergoing tests for heart disease. CRP promotes inflammation and is increasingly being used to assess the risk of heart attack.

Madsen found that patients with serious heart disease also had elevated CRP levels, but low blood levels of omega-3 fats. In contrast, patients with high levels of omega-3 fats had lower levels of CRP and more "stable" heart disease.

References: Toborek M, Lee YW, Garrido R, et al. Unsaturated fatty acids selectively induce an inflammatory environment in human endothelial cells. *American Journal of Clinical Nutrition*, 2002;75:119-125. Dewailly E, Blanchet C, Lemieux S, et al. n-3 fatty acids and cardiovascular disease risk factors among the Inuit of Nunavik. *American Journal of Clinical Nutrition*, 2001;74:464-473. Madsen T, Skou HA, Hansen VE, et al. C-reactive protein, dietary n-3 fatty acids, and the extent of coronary artery disease. *American Journal of Cardiology*, 2001;88:1139-1142. □

Lendon H. Smith, MD

1921-2001

Lendon H. Smith, MD, our first medical advisor, did what he loved doing: making nutrition and pediatrics fun and entertaining. "Dunny," as he was known to his friends, wrote more than a dozen health books and was on Johnny Carson's Tonight Show more than 60 times, a testament to his popularity. He was a tireless advocate of nutritional therapies, and his voice and smile will be missed. -JC

Taking Folic Acid During Pregnancy Lowers Cancer Risk in Children

Adequate intake of the B-vitamin folic acid during pregnancy is known to prevent neural-tube birth defects, such as spina bifida. But a new study suggests that pregnant women who supplement with folic acid, in combination with iron, may protect their children from acute lymphoblastic leukemia.

Judith R. Thompson, MMedSc, of the Cancer Foundation of Western Australia, and her colleagues compared supplement use among the mothers of 83 children diagnosed with acute lymphoblastic leukemia and the mothers of 166 healthy children. Acute lymphoblastic leukemia is the most common type of childhood cancer in developed nations.

Thompson's analysis of the data found that mothers who took folic acid and iron supplements during pregnancy seemed to reduce the risk of leukemia in their children by 67 percent.

"Use of iron alone was only weakly protective, suggesting that if iron or folate has a protective effect, it lies mainly with folate or the combination of folate and iron," wrote Thompson. Folic acid plays essential roles in the synthesis and repair of DNA and in cell growth. Poor DNA repair is involved in cancer, aging, and other diseases.

Previous studies have found that mothers who take multivitamin supplements during pregnancy give birth to children with a relatively low risk of brain cancer.

Reference: Thompson JR, FitzGerald P, Willoughby LN, et al. Maternal folate supplementation in pregnancy and protection against acute lymphoblastic leukaemia in childhood: a case-control study. *Lancet*, 2001;358:1935-1940. □

Cholesterol-Lowering Margarine Also Reduces Antioxidant Levels

If you use a cholesterol-lowering margarine, be warned: it does more than just lower your cholesterol. These popular spreads also reduce your blood levels of antioxidant carotenoids, such as beta-carotene, lutein, and lycopene.

These products contain compounds known as sterols and stanols, which are found in plants. They block the absorption of some cholesterol from the digestive tract and, as a consequence, can reduce blood cholesterol levels by 10-12 percent in people eating high-fat diets.

But because sterols and stanols can also decrease blood carotenoid levels by about 7 percent, a team of Australian researchers investigated whether dietary changes could compensate for this drop.

Manny Noakes, PhD, of Australia's Com-

monwealth Scientific and Industrial Research Organization and his colleagues asked 46 people to follow a low-fat diet and to use one of three types of margarine during each three-week phase of the study. During one phase, they used regular margarine, and during the other two phases they used sterol- and stanol-containing margarines. They were also asked to consume five daily servings of carotenoid-rich fruits and vegetables during the study.

Noakes found that the sterol- and stanol-containing spreads lowered the subjects' blood cholesterol levels by 7.7 to 9.5 percent. However, they found that the extra fruits and vegetables led to an average 13 percent increase in blood beta-carotene levels, clearly offsetting the carotenoid-lowering effect of the margarines.

Unfortunately, the researchers failed to address an important related issue. If cholesterol-lowering margarines reduce carotenoid levels, they very likely also reduce levels of other fat-soluble nutrients, such as vitamins A, D, and E. Supplementation of all fat-soluble nutrients may be justified.

Reference: Noakes M, Clifton P, Ntanio F, et al. An increase in dietary carotenoids when consuming plant sterols or stanols is effective in maintaining plasma carotenoid concentrations. *American Journal of Clinical Nutrition*, 2002;75:79-86. □

Antioxidant Combination Buffers Some of the Damage Caused by Tobacco

Tobacco smoke is one of the most dangerous of all air pollutants. The consequences of smoking, including lung cancer, heart disease, and emphysema, kill an estimated 2,000 Americans each day in the United States. Many of the 4,000 chemicals identified in tobacco smoke are free radicals, which can damage the body's cells. Other free radicals are formed in the liver as the body tries to break down and neutralize these chemicals.

Scientists have sought to block at least some of the damage caused by tobacco smoke, but individual supplements do not seem to offer much protection. However, a recent study has found that an "antioxidant cocktail" may lessen some of the effects of breathing in second-hand cigarette smoke.

Ronald R. Watson, PhD, of the University of Arizona, exposed laboratory mice to second-hand cigarette smoke daily for several months. Some of the mice received 11 antioxidants and other nutrients as part of their chow. These supplemental nutrients included natural vitamins E and C, beta-carotene, selenium, flavonoids, coenzyme Q10, carnitine, magnesium, N-acetylcysteine, vitamin A, and zinc.

Mice not receiving the supplements developed higher levels of free radicals in their livers and had

increases in interleukin-6, an inflammation-causing protein. However, mice getting the antioxidant supplements were able to maintain normal levels of free radicals and interleukin-6.

While it would be far better for a smoker to stop using tobacco products, this study suggests that a multi-antioxidant supplement might block at least some of the damage. It is also possible that such a supplement would protect against other types of air pollution.

Reference: Zhang J, Jiang S, Watson RR. Antioxidant supplementation prevents oxidation and inflammatory responses induced by sidestream cigarette smoke in old mice. *Environmental Health Perspectives*, 2001;109:1007-1009. □

Studies Identify Novel Ways to Help People Build Strong Bones

From all the advertising sponsored by the dairy industry, you would think that you need only calcium for strong bones. But numerous other nutrients, including vitamin D, magnesium, boron, and vitamins B12 and K, also play key roles in bone formation and reduce the risk of osteoporosis.

Two recent studies shed new light on surprising sources of bone-building nutrients.

In one study, Magalie Sabatier, PhD, and her colleagues at the Perrier Vittel Water Institute, France, measured the bioavailability of magnesium from Hepar brand mineral water, the brand with the highest magnesium content of any water sold in France. The water contains 110 mg of magnesium per liter, about one-third the recommended amount for women and one-fourth that for men.

Sabatier found that healthy young women absorbed about 45 percent of the magnesium from the water. The amount of magnesium absorbed and retained was substantially higher when the water was consumed with a meal.

"The increase in the consumption of processed foods during the 20th century has led to a decrease in the average daily intake of magnesium..." Sabatier and her colleagues wrote.

In a separate study, John J. B. Anderson, PhD, of the University of North Carolina, Chapel Hill, investigated the bone-developing effect of *Ginkgo biloba*. Ginkgo was tested because it is a potent antioxidant and may quench free radicals involved in breaking down bone cells.

Anderson grew cells similar to the osteoblast cells that form bone. When the cells were exposed to ginkgo, their growth rate increased by almost four times. Anderson theorized that the antioxidant properties of ginkgo may protect cells from damage and death from free radicals.

Reference: Sabatier M, Arnaud MJ, Kastenmayer P, et al. Meal effect on magnesium bioavailability from mineral water in healthy women. *American Journal of Clinical Nutrition*, 2002;75:65-71. Brayboy JR, Chen XW, Lee YS, et al. The protective effects of *Ginkgo biloba* extract (EGb761) against free radical damage to osteoblast-like bone cells (MC3T3-E1) and the proliferative effects of EGb 761 on these cells. *Nutrition Research*, 2001;21:1275-1285. □

Antioxidant Herbal Supplement May Ease Inflammatory Symptoms in Lupus

A small study has found that Pycnogenol®, an anti-inflammatory botanical, may reduce inflammation in people with lupus erythematosus.

Lupus is an auto-immune disease characterized by inflammation of connective tissue, sensitivity to sunlight, and other symptoms similar to rheumatoid arthritis. It is often treated with immune-suppressing drugs, such as prednisone. Pycnogenol® is an extract from the bark of French maritime pine trees, and it is high in antioxidant flavonoids and organic acids, such as ferulic acid.

Maria Stefanescu, PhD, of the Cantacuzino Institute, Romania, and his colleagues treated 11 lupus patients conventionally, but gave Pycnogenol® supplements to six of them and placebos to the other five. Pycnogenol dosages were 120 mg daily for the first month and 60 mg daily for the second month.

Stefanescu monitored various aspects of their disease activity, including their erythrocyte sedimentation rate (sed rate), a general marker of inflammation, and a standard clinical test for tracking lupus-related symptoms.

Most of the patients taking Pycnogenol® fared better than those taking placebos. In addition, those taking Pycnogenol® had a greater reduction in their sed rates. "Due to its antioxidant activities, this natural extract could be used in systemic lupus erythematosus treatment as a second-line therapy," wrote Stefanescu.

Reference: Stefanescu M, Matache C, Onu A, et al. Pycnogenol® efficacy in the treatment of systemic lupus erythematosus. *Phytotherapy Research*, 2001;10:698-704. □

Vitamin C Improves Heart Function in Patients with Cardiomyopathy

Coenzyme Q10, a vitamin-like nutrient, can improve the hearts of patients with idiopathic dilated cardiomyopathy, a weak and enlarged heart that often precedes heart failure. Now, a new study has shown that vitamin C can also help heart function in patients with this condition.

Continues on next page

Quick Reviews of Recent Research

• Ginger extract found helpful in osteoarthritis

Ginger root, a common herb and supplement, has long been regarded as a natural anti-inflammatory botanical. Researchers asked 261 patients with osteoarthritis of the knee to take either a daily extract of ginger or a placebo for six weeks. Patients taking ginger had moderate to significant improvements compared with those taking placebos. Ginger resulted in reductions in knee pain on standing, less pain after walking 50 feet, and improvements in other symptoms of osteoarthritis. It was not clear, however, whether ginger simply provided relief from inflammation or whether it slowed the disease process.

Altman RD, et al. *Arthritis & Rheumatism*, 2001;44:2531-2538.

• Black raspberry may protect against cancer

Berries contain a wide variety of antioxidant flavonoids and polyphenols, which may reduce free-radical damage and cancer risk. In a laboratory study, researchers exposed laboratory rats to a chemical

known to cause esophageal cancer. Some of the rats received supplemental black raspberries, accounting for 5-10 percent of their diets. Rats that ate the largest amount of black raspberries before and after exposure to the cancer-causing chemical had 49 percent fewer tumors, compared with animals that were not fed berries. Rats receiving berries only after exposure to the cancer-causing chemical fared better than animals not eating berries at all, but not as well as those that had previously been eating berries.

Kresty LA, et al. *Cancer Research*, 2001:6112-6119.

• Tomato sauces benefit prostate cancer patients

Several studies have found that lycopene and other lesser known antioxidants in tomato sauces may reduce the risk of prostate cancer in men. In a recent study, 32 men scheduled for prostate cancer surgery were asked to consume one meal daily with tomato sauces for three weeks, providing about 30 mg of lycopene daily. After the men consumed the sauces, DNA damage in their prostate cells decreased by almost 30 percent, and prostate-specific antigen levels (an indicator of enlarged prostate and prostate cancer risk) declined by almost 20 percent.

Chen L, et al. *Journal of the National Cancer Institute*, 2001;93:1872-1879.

• Echinacea reduces common cold symptoms

Originally native to North America, the herb echinacea has long been used to enhance immunity and reduce the risk of contracting colds. It is now one of the most popular medicinal herbs in Europe. In a recent study with 80 men and women, researchers found that consumption of a juice made from echinacea, taken at the first onset of symptoms, reduced the duration of colds from nine to six days. In addition, many cold symptoms, including sneezing, congestion, and sore throat, were milder compared with the placebo group.

Schulten B, et al. *Arzneimittel-Forschung/Drug Research*, 2001;51:563-568

Vitamin C and Cardiomyopathy...

Continues from previous page

Hans R. Figulla, MD, of Friedrich-Schiller University, Jena, Germany, and his colleagues treated 11 patients with cardiomyopathy who also suffered from severe endothelial dysfunction. Endothelial dysfunction describes and abnormal constriction of blood vessels, which substantially reduces blood flow to the heart and throughout the body.

Figulla and his colleagues intravenously administered 3 grams of vitamin C to the patients in 15 minutes. The dose and administration time were intended to be faster than those in previous studies of endothelial dysfunction and vitamin C.

After vitamin C administration, the cross-sectional diameter of the 11 patients' left anterior descending coronary artery increased by 11-15 percent in the patients. In addition, the peak velocity of blood flow increased by 20-41 percent, and coronary blood flow improved by 38-82 percent in the patients.

"This study demonstrates that impaired endothelial function is present in idiopathic dilated cardiomyopathy and can be acutely reversed by intravenous doses of the antioxidant vitamin C," Figulla wrote.

Reference: Richartz BM, Werner GS, Ferrari M, et al. Reversibility of coronary endothelial vasomotor dysfunction in idiopathic dilated cardiomyopathy: acute effects of vitamin C. *American Journal of Cardiology*, 2001;88:1001-1005. □

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