

Fish Oils and Diet/Weight Control

Summaries of the latest research concerning fish oils and diet and weight control

Low fat diet increases EPA and DHA levels

MINNESOTA, MINNEAPOLIS. Blood levels of fatty acids are believed to reflect the dietary intake of fatty acids. Researchers at the University of Minnesota now report that while high fat diets tend to increase the level of omega-6 fatty acids (generally undesirable) low fat diets tend to increase the level of beneficial omega-3 acids such as EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid). Their clinical trial involved 10 healthy subjects who were randomized to receive a high fat diet (45% fat) for a 28-day period or a low fat diet (20% fat) for the same period. After a 3-4 week washout period the participants were fed the other diet for an additional 28 days. Blood samples were taken at the beginning and end of each feeding period. The two diets provided the same amount of calories (isoenergetic) and had equivalent proportions of the different fatty acids notably linoleic and linolenic acids. The researchers noted that the high fat diet produced a significant increase in the proportion of omega-6 fatty acids, particularly the long chain ones, in the phospholipids and cholesterol fractions of the blood. In contrast, the low fat diet produced a significant increase in the proportion of omega-3 fatty acids, particularly EPA and DHA, in the phospholipids and cholesterol fractions and also resulted in a lower overall omega-6 content in these fractions. The researchers speculate that the benefits of a low fat diet may, in part, be due to the higher blood levels (phospholipids and cholesterol fractions) of beneficial omega-3 fatty acids (especially EPA and DHA) engendered by a low fat diet. *Raatz, Susan K., et al. Total fat intake modifies plasma fatty acid composition in humans. Journal of Nutrition, Vol. 131, February 2001, pp. 231-34/*

Alpha-linolenic acid and DHA

GRONINGEN, THE NETHERLANDS. Alpha-linolenic acid (ALA) and docosahexaenoic acid (DHA) have both been shown to reduce the risk of heart disease. Studies using isotopically labeled ALA have shown that it can be converted by the body to EPA (eicosapentaenoic acid) and DHA, but how significant this conversion is in actual practice is not known. Dutch researchers now report that the conversion of ALA to DHA in vegans (strict vegetarians) is negligible and that supplementation with ALA does not increase DHA levels significantly. Their trial included 6 healthy men and 3 healthy women between the ages of 20 and 60 years who were adhering to a vegan diet (no meat, fish, eggs or dairy products). The participants were randomized to receive either 2.01 grams of ALA (4 ml linseed [flax] oil) daily or 1.17 grams of gamma-linolenic acid (6 ml borage oil) daily for a four-week period. This was followed by a four-week period during which all the participants received both supplements. Blood samples were taken and analyzed for fatty acid content at the start of the trial and after four and eight weeks. Neither the linseed oil nor the borage oil by themselves increased blood levels of EPA or DHA, but their combination did produce a statistically significant, but nevertheless negligible, increase in EPA and DHA in the cholesterol and triglyceride fractions of the blood. The researchers point out that a clinical trial involving omnivores (meat and fish eaters) gave similar results and conclude that ALA supplementation is not effective in increasing DHA levels significantly. *Fokkema, M.R., et al. Short-term supplementation of low-dose gamma-linolenic acid (GLA), alpha-linolenic acid (ALA), or GLA plus ALA does not augment LCP omega-3 status of Dutch vegans to an appreciable extent. Prostaglandins, Leukotrienes and Essential Fatty Acids, Vol. 63, November 2000, pp. 287-92/*

Dieting and depression

TUCSON, ARIZONA. Low-fat diets have been widely promoted for lowering cholesterol levels, for reducing body weight, and for preventing certain types of cancer. At least one study, however, has found that although a reduction in cholesterol may reduce mortality from heart disease it may increase the incidence of fatal accidents, violent deaths, suicides, and depression. Researchers at the University of Arizona now believe that they may have found an explanation for this phenomenon. They point out that fat restriction and cholesterol-lowering drugs may change the concentrations of polyunsaturated fatty acids (PUFAs) in the tissues including nerve tissue (neurons). Fat-restricting diets usually lead to a relative increase in the intake of omega-6 PUFAs and a relative decrease in the intake of omega-3 fatty acids. This can have serious consequences inasmuch as the omega-3 fatty acids, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) found in fish oils, are crucial for the proper functioning of the nervous system. Several large-scale studies have found a clear association between low blood levels of EPA and DHA and an increased risk of depression, violence and suicide; a recent study in Japan found that DHA supplementation reduced aggression among healthy Japanese students. Epidemiologic studies have found a clear correlation between a low intake of EPA and DHA and the prevalence of depression. In two studies of population groups in the USA the incidence of depression was found to be 3.7% and 2.9%. Average intake of EPA and DHA in the USA is estimated to be about 0.1 gram per day. In two Japanese studies, on the other hand, the incidence of depression was only 0.9% and 0% and the intake of EPA plus DHA was 1.5 grams per day and 4.2 grams/day respectively. Other studies have shown that on-off dieting can produce a serious imbalance in the ratio of fatty acids and may lead to depression. The researchers conclude that an extremely low-fat diet may be counter-productive and have deleterious psychological ramifications. They stress that dietary advice regarding cholesterol reduction, weight loss, and cancer prevention should emphasize the importance of an adequate intake of omega-3 fatty acids. *Bruinsma, Kristen A. and Taren, Douglas L. Dieting, essential fatty acid intake, and depression. Nutrition Reviews, Vol. 58, April 2000, pp. 98-108 [116 references] /*

Fish consumption combats hypertension and obesity

PERTH, AUSTRALIA. Obesity in patients with high blood pressure is associated with high cholesterol levels, poorer glucose control, and an increased risk of atherosclerosis and heart attacks. Researchers at the University of Western Australia have just released the results of a study that clearly demonstrates that a weight-loss diet combined with daily fish consumption is highly effective in reducing blood pressure, lowering triglyceride levels while increasing "good" (HDL2) cholesterol levels and in improving glucose tolerance. The study involved 63 men and postmenopausal women who were overweight and being treated for hypertension. The participants were randomly assigned to one of four groups. Group 1 included a daily fish meal (turbot, sardines, tuna or salmon) in their diet; group 2 consumed a calorie-restricted diet; group 3 consumed a calorie-restricted diet including a daily fish meal; and group 4 served as a control. Blood pressure, glucose tolerance, fatty acid profile, and cholesterol levels were measured at baseline and after 16 weeks on the diets. The two calorie-restricted diets resulted in an average weight loss of 5.6 kg (12 lbs) during the first 12 weeks of the experiment. No significant weight loss was observed in the control group and the daily fish meal group. Waking blood pressures decreased by 5.5 mm Hg (systolic) and 2.2 mm Hg (diastolic) in the calorie-restricted group and by 13.0 mm Hg and 9.3 mm Hg in the group combining a daily fish meal with a calorie-restricted diet. The combination of fish consumption and weight loss improved glucose and insulin metabolism significantly and also resulted in a 38% reduction in triglyceride levels and a 24% increase in the level of "good" cholesterol (HDL2). The researchers conclude that a combination of weight loss and daily fish consumption significantly reduces the risk of cardiovascular disease among obese, hypertensive patients. *Mori, Trevor A., et al. Dietary fish as a major component of a weight-loss diet: effect on serum lipids, glucose, and insulin metabolism in overweight*

hypertensive subjects. American Journal of Clinical Nutrition, Vol. 70, November 1999, pp. 817-25 [57 references]/

Fish oils combat weight loss in cancer patients

EDINBURGH, UNITED KINGDOM. Cachexia (abnormal weight loss) is a major problem in many types of cancer especially cancer of the pancreas. Preliminary research has shown that supplementing the diet with fish oils, about 2.2 grams of EPA (eicosapentaenoic acid) and 1.4 grams of DHA (docosahexaenoic acid) daily, will stabilize weight in patients with inoperable pancreatic cancer. Now researchers at the Royal Infirmary of Edinburgh report that patients with pancreatic cancer can actually gain weight by consuming a nutritional supplement fortified with fish oils. The experiment involved 20 patients with inoperable pancreatic cancer (aged 18 to 80 years). The participants were asked to ingest two cans of fish oil-enriched nutritional supplement per day in addition to their normal food intake. The nutritional supplement provided 310 kcal per can and contained 16.1 g protein, 49.7 g carbohydrate, 6.5 g fat, 1.09 g EPA, 0.46 g DHA, and 28 essential vitamins and minerals. After three weeks the patients had gained an average (median) of 1 kg in weight and at seven weeks an average of 2 kg. A significant improvement in performance status and appetite was also noted after three weeks on the supplement. Other research has shown that EPA inhibits the growth of pancreatic cancer cells /in vitro/. It is therefore of interest to note that the average survival time among the patients was over eight months. This compares very favourably with the normal survival time of 4.1 months and is at least as good as the survival time that can be obtained with aggressive chemotherapy. The researchers conclude that a fish oil-enriched nutritional supplement has the potential to be a safe and effective means of preventing weight loss in cancer patients and may even increase survival time in patients with cancer of the pancreas. NOTE: This study was partially funded by Abbott Laboratories, the maker of the nutritional supplement. *Barber, M.D., et al. The effect of an oral nutritional supplement enriched with fish oil on weight-loss in patients with pancreatic cancer. British Journal of Cancer, Vol. 81, No. 1, September 1999, pp. 80-86/*

Vegetable oils don't affect beneficial effects of fish oils

BATON ROUGE, LOUISIANA. Unsaturated fatty acids from fish and fish oils (eicosapentaenoic acid and docosahexaenoic acid) are highly effective in preventing death from cardiovascular disease. Fish oils have strong antiarrhythmic properties and help prevent death from ventricular fibrillation; they also help prevent blood clotting and lower cholesterol and triglyceride levels. Fish oils (n-3 polyunsaturated fatty acids) and n-6 polyunsaturated fatty acids (from vegetable oils) are metabolized in a similar way and n-3 polyunsaturated fatty acids (n-3 PUFAs) have been shown to block the conversion of linoleic acid, the major n-6 PUFA in vegetable oils, to arachidonic acid. These interactions and competitive metabolic pathways have raised concerns that the benefits of fish oil consumption may be reduced if the diet is high in n-6 PUFAs from vegetable oils. Researchers at the Louisiana State University have just released the results of a major study aimed at addressing these concerns. Their study involved 68 healthy men and women between the ages of 18 and 49 years. The participants consumed diets containing varying amounts of fish oils and vegetable oils for an eight-week period. The researchers found that fish oil supplementation lowered the blood plasma levels of triglycerides and arachidonic acid independent of the level of n-6 PUFAs in the diet. They conclude that vegetable oil in the diet does not reduce the benefits of fish oil in lowering the risk of death from heart disease. They also conclude that the fish oil intake required to effectively reduce triglyceride levels is less than six grams/day and that higher intakes do not confer added benefits. The daily intake required to affect a meaningful reduction in fibrinogen concentration (an indicator of blood clotting tendency) is less clear; it may be as low as 1.3 grams/day or as high as 15 grams/day. Further work is required to settle this question. [30 references] *Hwang, Daniel H., et al. Does vegetable oil attenuate the beneficial effects of fish oil in reducing risk factors for cardiovascular disease? American Journal of Clinical Nutrition, Vol. 66, July 1997, pp. 89-96 Connor, William E. Do the n-3*

fatty acids from fish prevent deaths from cardiovascular disease? American Journal of Clinical Nutrition, Vol. 66, July 1997, pp. 188-89 (editorial)/

Fish oil and margarine don't go together

ADELAIDE, AUSTRALIA. Fish oil supplements containing EPA (eicosapentaenoic acid) have an anti-inflammatory effect and may benefit people suffering from rheumatoid arthritis and psoriasis. This beneficial effect is significantly reduced when the diet is high in linoleic acid. A seven week controlled experiment involving 30 male volunteers was recently completed in Australia. The participants were given 1.6 gram EPA and 0.32 gram DHA (docosahexaenoic acid) daily. Half the volunteers were kept on a diet high in linoleic acid by using margarine as a spread and polyunsaturated oils for cooking. The other half used butter and olive oil which are low in linoleic acid. The experiment clearly showed that the incorporation of fish oil is enhanced by a diet containing butter and fish oil. Margarine and polyunsaturated oils had an inhibiting effect and should therefore be excluded from the diet in order to obtain maximum benefit from fish oil. / Cleland, Leslie G., et al. Linoleate inhibits EPA incorporation from dietary fish-oil supplements in human subjects. American Journal of Clinical Nutrition, Vol. 55, February 1992, pp. 395-99/ Coromega *OILOFPISCES.COM* *INTERNATIONAL HEALTH NEWS* Copyright © 2006 by Hans R. Larsen Oilofpisces.com does not provide medical advice. Do not attempt self-diagnosis or self-medication based on our reports.

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