

The Nutrition Reporter™

© Jack Challem January 2003 Vol 14 No 1

The independent newsletter that reports vitamin, mineral, and food therapies

Eating Fish, Fish-Oil Supplements Protect Joints and Lead to Better Mental Health

Three new studies have confirmed that the “good” fats found in fish have diverse and positive effects on health: they can reduce the breakdown of joint cartilage known as osteoarthritis, reverse depression, and may even prevent Alzheimer’s disease and other forms of dementia.

Fish is rich in a family of essential dietary fats called omega-3s. These fats are essential for the body’s production of anti-inflammatory compounds, as well as for maintaining normal heart function and preventing abnormal blood clots.

In the first study, Bruce Caterson, Ph.D., and his colleagues at Cardiff University, Wales, tested the effects of omega-3 and omega-6 fatty acids on cartilage cells obtained from either humans or cows. The human cartilage cells were obtained from the diseased knees of osteoarthritis patients, whereas the bovine cartilage come from healthy animals.

The bovine cells were exposed to interleukin-1 (IL-1), an inflammation-promoting substance, to mimic the breakdown of cartilage in osteoarthritis. Because the human cells came from inflamed tissues, no IL-1 was needed.

The inflamed cells were then cultured in a medium containing either anti-inflammatory omega-3 or pro-inflammatory omega-6 fats (which are found in corn, safflower, soy, and many other cooking oils).

Inflammation led to the osteoarthritis-like breakdown of cartilage cells. However, adding omega-3 fats prevented this breakdown.

The inflamed cells also produced large amounts of Cox-2, an enzyme involved in inflammation. The omega-3 fats blocked the activity of Cox-2, whereas the omega-6 fats had no effect. This finding is consistent with earlier research showing that omega-3 fats inhibit the activity of aggrecanase enzymes involved in breaking down joint tissue.

In a separate study, Malcolm Peet, MB, and David F. Horrobin, PhD, BM, of Laxdale Research, Scotland, treated 70 depressed patients with either placebos or ethyl-eicosapentaenoate (EPA), an

omega-3 fat similar to the one found in fish oils. All of the patients had failed to improve on conventional anti-depressant medications.

Sixty-nine percent of the patients receiving 1 gram daily of EPA daily had a 50 percent reduction in depression symptoms, according to their scores on the Hamilton Depression Rating Scale. Higher dosages – 2 or 4 grams daily – had no benefits, and only 25 percent of patients taking placebos had a significant improvement.

Peet and Horrobin noted that EPA has several beneficial side effects, including lowering triglyceride levels, reducing blood clotting, and inhibiting heart arrhythmias.

Finally, Pascale Barberger-Gateau, PhD, and colleagues at the Université Victor Segalen Bordeaux, France, and colleagues tracked more than 1,600 elderly patients for two to seven years after analyzing their dietary habits.

People who ate fish or some other type of seafood at least once a week were 34 percent less likely to develop Alzheimer’s disease or any other form of dementia. People who ate the most seafood were also the best educated, and higher education accounted for about 7 percent of the reduced risk.

“In addition to providing vascular protection, the omega-3 fatty acids contained in fish oils could reduce inflammation in the brain and may have a specific role in brain development and regeneration of nerve cells,” wrote Barberger-Gateau.

References: Curtis CL, Rees SG, Cramp J, et al. Effects of n-3 fatty acids on cartilage metabolism. *Proceedings of the Nutrition Society*, 2002;61:381-389. Peet M, Horrobin DF. A dose-ranging study of the effects of ethyl-eicosapentaenoate in patients with ongoing depression despite apparently adequate treatment with standard drugs. *Archives of General Psychiatry*, 2002;59:913-919. Barberger-Gateau P, Letenneur L, Deschamps V, et al. Fish, meat, and risk of dementia: cohort study. *British Medical Journal*, 2002;325:932-933. □

SAMe May Ease Feelings of Depression – and Faster than Medications

SAMe – known more technically as S-adenosyl-L-methionine – blazed to popularity a couple of years ago as a supplement beneficial in the treatment of depression. A recent review of SAMe studies confirms its benefits.

SAMe is known as a “methyl donor,” meaning that it donates carbon and hydrogen atoms to help build key molecules in the body. These molecules include hormones, nucleic acids, proteins, and phospholipids. In particular, SAMe is a major methyl donor in the brain, where it provides building blocks for a variety of neurotransmitters, including serotonin, dopamine, and norepinephrine.

David Mischoulon, MD, of Massachusetts General Hospital, noted that the body makes SAMe from the amino acid methionine, but the process requires adequate levels of folic acid and vitamin B12. Between 10 to 30 percent of depressed patients have low folic acid levels, which interferes with neurotransmitter production. Antidepressant drugs are of little benefit to these low folic acid patients, and some evidence suggests that SAMe may enhance the activity of antidepressants.

Many antidepressant drugs are designed to raise serotonin levels in the brain. Clinical studies have found that SAMe – in dosages from 200-1,600 mg daily – is as effective as tricyclic antidepressant drugs. It also appears to improve mood much more quickly, usually from within a few days to two weeks.

According to Mischoulon, SAMe may be worthwhile as an alternative to antidepressant drugs. “Between 19% and 34% of depressed patients still do not respond to acute antidepressant treatment, 29-46% may fail to achieve and sustain a full remission, and between 15% and 50% will have a recurrence of depression despite continuous antidepressant treatment.”

Although SAMe has no notable side effects, it is expensive, ranging from 75¢ to \$1.25 per capsule.

Reference: Mischoulon D, Fava M. Role of S-adenosyl-L-methionine in the treatment of depression: a review of the evidence. *American Journal of Clinical Nutrition*, 2002;76 (Suppl):1158S-1161S. □

New Study Adds to Beneficial Role of Lutein and Zeaxanthin in Vision

A minute deposit of two antioxidants – lutein and zeaxanthin – in the center of the eye’s retina may reduce the risk of age-related macular degeneration, the leading cause of blindness. That’s the finding of a new study utilizing an innovative technology to measure the “macular pigment.”

Many studies have shown that people with low levels of these two nutrients, found in vegetables, have a higher risk of developing macular degeneration. Lutein and zeaxanthin protect the region of the retina responsible for seeing details, and they also appear to function someone like polarizing lenses, absorbing stray and disruptive rays of light.

In the latest study, Paul S. Bernstein, MD, PhD, of the University of Utah School of Medicine, and his colleagues used a technique called resonance Raman spectroscopy to measure the amounts of lutein and zeaxanthin in the eyes of 63 patients with macular degeneration, as well as in the eyes of 138 healthy subjects. Basically, the technique uses a laser to measure how much light scatters within the eye.

Bernstein reported that patients with macular degeneration had an average of 32 percent less lutein and zeaxanthin in their macular pigments, compared with healthy people.

Patients with macular degeneration who had recently begun supplementing with lutein had normal eye levels of the nutrient. However, it was not possible, given the limitations of the study, to determine whether the lutein supplements slowed the disease’s progression.

Reference: Bernstein PS, Zhao DY, Wintch SW, et al. Resonance Raman measurement of macular carotenoids in normal subjects in age-related macular degeneration patients. *Ophthalmology*, 2002;109: 1780-1787. □

Researchers Report Two Herbal Products Have Sexual Benefits for Men

Two herbal products may improve male sexual performance and fertility, according to the results of recent studies.

Bumsik Hong, MD, of the Ulsan College of Medicine, Seoul, South Korea, and his colleagues treated 45 men who had been diagnosed with severe erectile dysfunction. Many of the men, who had an average age of 54 years, also had high blood pressure, diabetes, and elevated cholesterol levels.

Hong and his colleagues gave the men either placebos or 900 mg of Korean red ginseng three times daily for eight weeks. After a two-week break, each patient’s treatment was switched.

The men benefited from significant improvements in various aspects of sexual performance while taking the ginseng but not while taking the placebo. Overall, the men’s scores on the International Index of Erectile Function, a standard clinical test, improved by almost 30 percent while taking ginseng, but not at all on placebos.

Virtually all aspects of sexuality improved – erectile function, sexual desire, intercourse satisfac-

tion – though not always with statistical significance. Sixty percent of the men reported improved erection, including better penetration and maintenance, after taking ginseng, whereas only 20 percent improved after taking placebos.

In a separate study, Scott J. Roseff, MD, of the West Essex Center for Advanced Reproductive Endocrinology, New Jersey, treated 19 “subfertile” men with Pycnogenol®, an antioxidant complex derived from French maritime pine bark. The men were given 200 mg of Pycnogenol daily for 90 days.

After the supplementation period, the men had slightly lower sperm counts, but the quality of those sperm was higher than at the start of the study. For example, there were fewer misshapen sperm after three months of Pycnogenol supplementation.

Roseff wrote that the improvements may enable some couples to forgo in vitro fertilization and “either experience improved natural fertility or undergo less invasive and less expensive fertility-promoting procedures, such as intrauterine insemination.”

References: Hong B, Ji YH, Hong JH, et al. A double-blind crossover study evaluating the efficacy of Korean red ginseng in patients with erectile dysfunction: a preliminary report. *Journal of Urology*, 2002;168:2070-2073. Roseff SJ. Improvement in sperm quality and function with French maritime pine tree bark extract. *Journal of Reproductive Medicine*, 2002;47:821-824. □

Vitamin E Succinate May Enhance Radiation Effects in Cancer Therapy

In conventional medicine, there’s an ongoing controversy about the use of antioxidant vitamins during radiation and chemotherapy. The reason is that these therapies work primarily by generating large amounts of free radicals to destroy cancer cells. Some oncologists believe that antioxidants might reduce the effectiveness of radiation or chemotherapy.

In contrast, physicians seasoned in the use of vitamin therapy have found that vitamin and other types of supplements actually enhance the body’s immune system and innate cancer-controlling abilities. This latter view recently gained additional support with the publication of a cell-culture study with vitamin E succinate.

Kedar N. Prasad, PhD, of the University of Colorado Health Sciences Center, Denver, and his colleagues cultured normal human cells from connective tissue and cervical and ovarian cancer cells with natural d-alpha tocopheryl succinate, a form of supplemental vitamin E sold in health food stores. The cells were exposed to gamma radiation to mimic radiation therapy for cancer.

When the cancer cells were incubated with vitamin E, they experienced more extensive chromosomal damage after being irradiated, compared with radiation alone. However, vitamin E protected normal cells from radiation damage.

The anti-cancer properties of vitamin E succinate are consistent with earlier studies, which also showed the succinate form to have a greater anti-cancer effect than other forms of vitamin E. The limitation of this research is that it was done with cells, not in a clinical setting.

Reference: Kumar B, Jha MN, Cole WC, et al. D-alpha-tocopheryl succinate (vitamin E) enhances radiation-induced chromosomal damage levels in human cancer cells, but reduces it in normal cells. *Journal of the American College of Nutrition*, 2002; 21:339-343. □

Higher Intake of Vitamin C Associated with Better Long-Term Lung Function

Considerable research indicates that antioxidant vitamins can help preserve lung function in polluted cities and in the face of normal age-related declines. Now, following up on a 1991 study, researchers have confirmed the long-term benefits of vitamin C.

Tricia M. McKeever, MD, and her colleagues at the University of Nottingham originally studied 2,633 adults, ages 18 to 70. They used a questionnaire to obtain dietary information from the subjects, then looked at relationships between vitamins A, C, E, and magnesium and lung function. They found that higher dietary intakes of vitamin C and magnesium were associated with better lung function.

Nine years later, McKeever and her colleagues followed up on 1,346 of the original subjects. Again, they found that higher intake of vitamin C (more than 100 mg daily) and magnesium were associated with better lung function, as indicated by higher FEV1 (forced expiratory volume in one second, or the amount of air exhaled in one second).

McKeever then compared the subjects’ dietary intake of nutrients to the rate of decline in lung function, or reduced FEV1. People with higher intakes of vitamin C had a significantly slower rate of decline in lung function. Magnesium seemed to have less bearing on lung function, though high levels of the mineral were associated with a slight trend toward less wheezing.

The authors wrote that slowing the age-related decline in lung function is likely to reduce the long-term odds of chronic obstructive pulmonary disease.

McKeever TM, Scrivener S, Broadfield E, et al. Prospective study of diet and decline in lung function in a general population. *American Journal of Respiratory and Critical Care Medicine*, 2002;165:1299-1303. □

Quick Reviews of Recent Research

• N-acetylcysteine helpful in lung disease

Researchers used various dosages of N-acetylcysteine to treat workers who had developed chronic obstructive pulmonary disease at the Chernobyl nuclear power plant. NAC reduced coughing, and 1,200 mg daily improved expectoration (clearing of mucous). Also, levels of free radical markers decreased when 1,200 mg of NAC was consumed daily. However, 1,800 and 2,400 mg of NAC resulted in more expectoration difficulties.

Chikina SY, et al. *Terapevticheski Arkhiv*, 2002;74:62-65.

• Ginkgo has anti-inflammatory properties

Individual flavonoids extracted from ginkgo leaves have been found to reduce levels of the pro-inflammatory Cox-2 enzyme and, in animal studies, to have anti-arthritis activity. In this study, researchers found that ginkgo leaf extracts were effective in reducing skin inflammation in laboratory mice.

Kwak WJ, et al. *Planta Medica*, 2002;68:316-321.

• Lycopene may have some benefits to eyes

Although the roles of lutein, zeaxanthin, and beta-carotene in vision have been studied extensively, lycopene (a carotenoid found in tomatoes) has not. Researchers obtained eyes from an eye bank, and lens epithelial cells were cultured with either galactose (a sugar) or galactose and lycopene. The galactose-cultured eyes had increased levels of free radicals and the development of abnormal spaces. Lycopene protected against these changes, suggesting that this nutrient may have a role in reducing the risk of cataract.

Mohanty I, et al. *British Journal of Nutrition*, 2002;88:347-354.

• Vitamin E helpful for kidney dialysis patients

Patients with kidney failure or undergoing long-term dialysis have high levels of free radicals, which may increase the risk of heart disease. Researchers asked 14 kidney-dialysis patients to take 400 IU of vitamin E for six weeks. After six weeks, the patients had lower blood levels of malondialdehyde, a marker of free radical activity. They maintained lower levels of malondialdehyde for another six weeks after ceasing supplementation.

Mydlik M, et al. *International Journal of Artificial Organs*, 2002;25:373-378.

• Levels of carotenoids vary among children

Using data from the Third National Health and Nutrition Examination Survey (NHANES III), researchers analyzed individual carotenoid levels in 4,231 children and adolescents. Older and heavier subjects had lower levels of all carotenoids, and boys

had slightly higher carotenoid levels than did females. African-American and Mexican-Americans had higher levels of many carotenoids compared with white subjects. In addition, levels of C-reactive protein (a marker of inflammation and risk factor for heart disease) was higher in children and adolescents with low carotenoid levels. These differences in carotenoid levels, which may be reflective of fruit and vegetable intake, may influence the long-term risk of disease.

Ford ES, et al. *American Journal of Clinical Nutrition*, 2002; 76:818-827.

• Folic acid could be helpful in heart transplants

Researchers asked 17 of 48 heart-transplant patients to take folic acid supplements for one year after surgery. Patients receiving folic acid had comparatively lower homocysteine levels after one year. Those not receiving folic acid had substantially increased homocysteine levels and were more likely to develop new heart disease.

Potena L, et al. *Clinical Nutrition*, 2002;21: 245-248.

• Selenium blocks viruses that attack the heart

The coxsackie virus B3 is known to infect the heart and lead to cardiomyopathy in immune-compromised people and animals. Researchers studied laboratory mice who had been infected with both the coxsackie virus B3 and the mouse equivalent of AIDS. Concurrent infection caused heart lesions consistent with cardiomyopathy. When the mice were supplemented with selenium, at a dose nine times above the "recommended" dose, they developed fewer heart lesions. In addition, mice fed selenium lived longer than animals not receiving extra amounts of the mineral. Other animal studies have found that selenium deficiency increases the virulence of coxsackie virus and the AIDS virus.

Sepulveda RT, et al. *Cardiovascular Toxicology*, 2002;2:53-61.

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THE NUTRITION REPORTER™

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