

The Nutrition Reporter™

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Researchers Find that High-Glycemic Carbohydrates Promote Inflammation

There's new evidence that refined carbohydrates and other high-glycemic foods are bad for your health. Researchers have found that people who eat "low-quality carbohydrates" have high blood levels of C-reactive protein (CRP), a powerful promoter of inflammation.

The finding is significant because growing research indicates that inflammation of blood vessels is at the root of heart disease and many other common degenerative diseases. High CRP levels increase the risk of heart attack by 4.5 times.

In a recent study, Simin Liu, MD, ScD, and his colleagues at the Harvard Medical School, analyzed the relationship between high-glycemic foods and CRP levels in 244 women in their 50s and 60s. High-glycemic foods are rapidly digested and absorbed, quickly boosting blood sugar and insulin levels and, in the long run, setting the stage for diabetes.

Liu found that women who consumed large amounts of potatoes (mostly mashed and baked), breakfast cereals, white bread, muffins, and white rice had the highest CRP levels. In addition, overweight women also had elevated CRP levels – most likely because fat cells around the waist generate large amounts of CRP.

While the data do not directly prove cause and effect, Liu noted, "they suggest that exacerbation of the proinflammatory process may be a mechanism whereby a high intake of rapidly digested and absorbed carbohydrates increases the risk of ischemic heart disease, especially in overweight women, who are prone to insulin resistance."

According to Liu, recent experiments have found that elevated levels of insulin, a prediabetic sign, increase the body's production of CRP. That may partly explain why people who have prediabetic insulin resistance and full-blown diabetes commonly have elevated CRP levels.

In a separate study, André Tchernof, PhD, of the University of Vermont, Burlington, also reported that higher levels of CRP were associated with greater

body mass in 61 obese women. However, when women went on a weight-reduction diet, their CRP levels declined by about one-third.

The implications of Liu's study may go far beyond that of heart disease and diabetes. It is conceivable that high-glycemic foods may also stimulate the inflammation characteristic of arthritis, asthma, and many other diseases.

Relatively low-glycemic foods include fish, meat, and high-fiber vegetables and fruits, such as lettuce, broccoli, cauliflower, apples, and berries. Normal CRP levels, based on the high-sensitivity CRP test, are less than 0.11 milligrams per deciliter (mg/dL) of blood. Moderate CRP levels are 0.12-0.19 mg/dL, and high CRP levels are 0.20-1.50 mg/dL.

References: Liu S, Manson JE, Buring HE, et al. Relation between a diet with a high glycemic load and plasma concentrations of high-sensitivity C-reactive protein in middle-aged women. *American Journal of Clinical Nutrition*, 2002;75:492-498. Tchernof A, Nolan A, Sites CK, et al. Weight loss reduces C-reactive protein levels in obese postmenopausal women. *Circulation*, 2002;105:564-569. □

Vitamin E Can Reduce Inflammation in Arthritis and Heart Disease

Two human clinical trials have found that vitamin E supplements can ease the symptoms of rheumatoid arthritis. Now, an animal study may explain how.

Michel De Bandt, MD, PhD, of the Xavier Bichat University Hospital, Paris, and his colleagues tested the effect of vitamin E on mice bred to develop rheumatoid arthritis. Bandt gave the mice either natural vitamin E (a dosage equivalent to 400 IU in a person) or a placebo every other day for six weeks.

Although the vitamin E did not have any apparent effect on joint swelling, it did significantly reduce the destruction of joint cartilage and bone.

Continues on next page

Bandt found that vitamin E lowered levels of interleukin-1 beta, an inflammation-causing cytokine, and the principal cytokine involved in the breakdown of joint cartilage. Cytokines are proteins that regulate the body's inflammatory response.

Vitamin E's role as an antioxidant might also have played a role in reducing joint destruction. Activated white blood cells release harmful free radicals, which can break down joints, but mice receiving vitamin E had lower levels of free radicals.

In a separate study, researchers at St. James's Hospital, Dublin, gave 110 heart patients 400 IU of vitamin E or placebos daily for six months. During the study, levels of C-reactive protein and interleukin-6 – both promoters of inflammation – decreased by about one-fourth. Patients receiving placebos did not benefit from any significant changes.

References: De Bandt M, Grossin M, Driss F, et al. Vitamin E uncouples joint destruction and clinical inflammation in a transgenic mouse model of rheumatoid arthritis. *Arthritis & Rheumatism*, 2002;46:522-532. Murphy R, Foley JB, Crean P. Vitamin E lowers CRP levels in patients with acute coronary syndromes. *European Heart Journal*, 2001;22 (Suppl):241, Abstract 1304. □

Eating Lycopene-Rich Tomato Sauces May Reduce Risk of Prostate Cancer

Eating two servings of tomato sauce each week can significantly reduce the risk of prostate cancer, particularly for men over age 65. Tomato consumption had no effect on the risk of prostate cancer in younger men, perhaps because such cancers are more related to genetics.

Edward Giovannucci, MD, ScD, and his colleagues at the Harvard School of Public Health, analyzed data from dietary questionnaires completed by more than 47,000 male health professionals between 1986 and 1994. By 1998, almost 2,500 of the men had developed prostate cancer.

Giovannucci found that men with the highest consumption of lycopene, the principal antioxidant carotenoid found in tomatoes, were 16 percent less likely to develop prostate cancer.

However, tomato sauce may be the best source of lycopene. Men who consumed at least two servings of tomato sauce weekly were 23 percent less likely to develop prostate cancer. They were also less likely to develop metastatic or fatal prostate cancers.

According to Giovannucci, tomato sauce "is an ideal source of lycopene" because heating breaks down the plant fiber and makes the lycopene more bioavailable. In addition, the sauce's oil base enhances lycopene absorption.

However, Giovannucci noted that tomato products provide several other carotenoids, including neurosporene, gamma-carotene, phytoene, and phytofluene.

"From the available data," he wrote, "we suggest that increased consumption of tomato and tomato-based products may be prudent; such a recommendation is consistent with current health guidelines to increase fruit and vegetable consumption."

Reference: Giovannucci E, Rimm EB, Liu Y, et al. A prospective study of tomato products, lycopene, and prostate cancer risk. *Journal of the National Cancer Institute*, 2002;94:391-398. □

Soy Isoflavone Supplements Ease Menopausal Symptoms

Women who take isoflavone supplements may be able to significantly reduce their menopausal symptoms.

Kyung K. Han, MD, and coresearchers at the Federal University of Sao Paulo, Brazil, asked 80 women, ages 45-55 years, to take either 100 mg of soy isoflavone supplements or placebos daily for four months. The specific isoflavones included 69.9 mg of genistein, 18.6 mg of daidzein, and 11.4 mg of glycitein daily.

All of the subjects had experienced menopausal symptoms for at least a year and were not on any type of hormone therapy for at least 12 months. Nor had they been consuming soy products or taking any herbal remedies.

Their responses were assessed using the Kupperman index, a method of measuring 11 menopausal symptoms, including hot flashes, nervousness, weakness, depression, headache, insomnia, and vertigo.

Women taking the isoflavones for the four-month study had an average decrease of 44 percent in menopausal symptoms, with improvements noted in all symptoms. No changes occurred among women taking the placebos.

In addition, women taking the isoflavone supplements had significant declines in total cholesterol and low-density lipoprotein cholesterol.

Han and his colleagues noted that soy isoflavones may be a safe alternative to hormone-replacement therapies. They explained that estrogens can increase the risk of endometrial cancer, and progestins may cause additional side effects.

Reference: Han KK, Soares JM, Haidar MA, et al. Benefits of soy isoflavone therapeutic regimen on menopausal symptoms. *Obstetrics & Gynecology*, 2002;99:389-394. □

Licorice Root Extract Lowers Blood Fats, Other Risk Factors for Heart Disease

An extract of licorice root, an herb used extensively in Asia as a sweetener and spice, can lower cholesterol levels and other major risk factors for coronary artery disease.

Bianca Fuhrman, DSc, and her colleagues at the Rambam Medical Center, Israel, studied the effect of licorice root extract on 12 patients with moderately elevated cholesterol levels (222 to 260 mg/dL). Fuhrman gave 0.1 gram of licorice root extract daily to the patients for 30 days, followed by placebos for another 30 days.

Overall, the licorice root reduced levels of total blood cholesterol levels by 5 percent, low-density lipoprotein (LDL) cholesterol by 9 percent, and triglyceride by 14 percent. In addition, LDL oxidation by free radicals – a step that turns LDL “bad” – decreased by 19 percent.

Furthermore, the licorice root significantly reduced other changes to LDL that would have increased its ability to promote heart disease.

Fuhrman also noted that the licorice root lowered systolic blood pressure by 10 percent, but had no significant effect on diastolic blood pressure.

All of the improvements observed during licorice root supplementation disappeared when the subjects took placebos.

Reference: Fuhrman B, Volkova N, Kaplan M, et al. Antiatherosclerotic effects of licorice extract supplementation on hypercholesterolemic patients: increased resistance of LDL to atherogenic modifications, reduced plasma lipid levels, and decreased systolic blood pressure. *Nutrition*, 2002;18:268-273. □

High Intake of Antioxidants Reduces Risk of Cataracts in Women

Women who consume a lot of vitamin C, carotenoids, and the B-vitamin folic acid have a low risk of developing two types of cataracts.

Cataracts, which are a clouding of the lens of the eye, are likely caused by free radical damage from excessive exposure to ultraviolet rays in sunlight. Surgery to correct cataracts is the most common surgery paid for under Medicare.

Allen Taylor, PhD, of Tufts University, Boston, and his colleagues analyzed the diets and supplement habits of 492 middle-age and elderly women over 15 years. Women who consumed 362 mg or more of vitamin C daily were 57 percent less likely to develop cortical cataracts, which affect the outer central area of the lens. Furthermore, women who took vitamin C supplements for at least 10 years had a 60 percent lower risk of developing cortical cataracts.

Nonsmoking women with a high dietary intake of carotenoids and folic acid had a very low risk of developing posterior subcapsular cataracts (PSCs), which affect the outermost part of the lens and have the greater impact on vision.

High intake of alpha-carotene, beta-carotene, and total carotenoids were associated with 71, 72, and 81 percent reductions in PSC risk, respectively. Similarly, high intake of folic acid, found along with carotenoids in leafy green vegetables, was associated with a 74 percent reduction of PSC risk.

Reference: Taylor A, Jacques PF, Chylack LT Jr, et al. Long-term intake of vitamins and carotenoids and odds of early age-related cortical and posterior subcapsular lens opacities. *American Journal of Clinical Nutrition*, 2002;75:540-549. □

Folic Acid Supplements Block Development of Stomach Cancer

Large amounts of supplemental folic acid can significantly reduce the risk of gastric cancer, according to a study of beagles.

Shu-Dong Xiao, PhD, of the Shanghai Institute of Digestive Diseases, China, fed a chemical known to cause stomach cancer to 16 beagles for eight months. Half of the dogs were also given a very large daily dose of folic acid – 20 mg daily – for months before and during exposure to the chemical.

By the end of the experiment, three of the beagles receiving folic acid developed stomach cancer. In contrast, all of the animals receiving the cancer-causing chemical, but no folic acid supplements, developed cancer.

Folic acid is involved in the normal synthesis of deoxyribonucleic acid (DNA) and ribonucleic acid (RNA), as well as in DNA repair. Cancer cells form when DNA is mutated or damaged. Previous studies have found that low levels of folic acid increase the risk of cancer, whereas supplementation is often protective.

“Our study has shown that high dose folic acid has a marked interventional effect on gastric carcinogenesis...” Xiao wrote.

Reference: Xiao SD, Meng XJ, Shi Y, et al. Interventional study of high dose folic acid in gastric carcinogenesis in beagles. *Gut*, 2002;50:61-64. □

Women Who Eat Little Fish May Have Greater Risk of Premature Delivery

The omega-3 fatty acids – fish oils – are known to be essential for fetal and infant neural development. Some research has shown that these good fats can prolong gestation and increase birth weight.

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Quick Reviews of Recent Research

• Alpha-lipoic acid may be useful in male impotence

Erectile dysfunction is a common side effect of diabetes. Researchers gave 600 mg daily of alpha-lipoic acid, an antioxidant, to 47 men with various complications of diabetes, including reduced nerve function and erectile dysfunction. A control group of 31 men received a placebo during the two-month study. Those receiving alpha-lipoic acid had improvements in nerve function, including heart variability and nerve sensation in the feet. In addition 80 percent of the men reported that alpha-lipoic acid improved their erectile dysfunction.

Serhienko VO, et al. *Diabetologia*, 2001;44 (Suppl):A295, Abstract 1132.

• Elevated homocysteine linked to cervical cancer

Researchers compared blood levels of homocysteine, a known risk factor for heart disease, among 183 women with cervical cancer and 540 healthy subjects. Women with elevated levels of homocysteine were 2.4 to 3.2 times more likely to have cervical cancer. The high levels of homocysteine may reflect low intake of folic acid, vitamin B6 or vitamin B12, or they may represent relatively common genetic defects

Fish, Premature Delivery...

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Now, Danish researchers have reported that pregnant women who eat little or no fish are more likely to have either premature deliveries or low birth weight infants.

Sjurour Frooi Olsen, PhD, of the Danish Epidemiology Science Center, and Niels Jorgen Secher, MD, of Skejby University Hospital, analyzed the dietary habits of almost 9,000 pregnant women.

"Low consumption of seafood was a strong risk factor for preterm deliver and low birth weight," the researchers wrote.

Women who consumed no fish had a 7 percent incidence of premature births. In comparison, women who ate fish at least once a week had only a 2 percent risk. That translated into a three and one-half time greater risk of premature delivery among women not eating fish.

However, some types of fish contain high levels of mercury and should be avoided by pregnant women, accord to a recent report from the Food and Drug Administration. These fish include swordfish, shark, and king mackerel.

Reference: Olsen SF, Secher NJ. Low consumption of seafood in early pregnancy as a risk factor for preterm delivery: prospective cohort study. *BMJ*, 2002;324:1-5. □

that interfere with methylenetetrahydrofolate reductase, a key enzyme involved in the body's metabolism of folic acid.

Weinstein SJ, et al. *Cancer Causes and Control*, 2001;12:317-324.

• Some vegetarians may have elevated homocysteine

Researchers compared levels of folic acid, vitamin B12, and homocysteine in Taiwanese vegetarians and omnivores. Although the vegetarians had higher blood levels of folic acid, they had only one-fifth the blood levels of vitamin B12, compared with omnivores. The vegetarians also had mildly elevated homocysteine levels, likely a consequence of their low vitamin B12 intake.

Hung CJ, et al. *Journal of Nutrition*, 2002;132: 152-158.

• Low vitamin B1 dangerous to kidney patients

Researchers used intravenous vitamin B1 to treat 10 kidney-dialysis patients with loss of vision, dementia, and coma. Nine of the patients improved after receiving vitamin B1, but one patient failed to respond because of delayed treatment. Dialysis patients risk vitamin B1 deficiency because of poor intake and the loss of water-soluble vitamins during dialysis.

Hung SC, et al. *American Journal of Kidney Diseases*, 2001;38:941-947.

• Low magnesium increases risk of heart problems

Intravenous or supplemental magnesium is sometimes used to treat abnormally rapid heartbeats. Researchers placed 22 postmenopausal women on one of two dietary regimens for approximately three months: one with less than half of the Recommended Dietary Allowance (RDA) for magnesium and the other containing more than the RDA. While the women were on a low-magnesium diet, they experienced an increased number of heartbeats.

Klevay LM, et al. *American Journal of Clinical Nutrition*, 2002;75:550-554.

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