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Choose Your Dietary Oils Carefully: Some Promote Cancer, While Others Protect

Researchers have known for years that one member of the omega-6 family of fats – found in corn, safflower, and soybean oils – can promote the growth of cancers in laboratory experiments. In recent studies, researchers have identified at least some of the reasons behind the cancer-promoting effect, while other researchers have confirmed that a second family of fats can block the growth of cancer cells.

Both studies focused on the growth of prostate cancer cells, but the mechanisms behind their growth and inhibition likely apply to other types of cancer.

In the first study, Millie Hughes-Fulford, PhD, and her colleagues at the Veterans Affairs Medical Center, San Francisco, investigated the role of arachidonic acid (AA), which the body makes from linolenic acid, the principal omega-6 fat in common cooking and frying oils. Corn oil is about 57 percent linolenic acid.

Normally, linolenic acid and arachidonic acid play essential roles in health. Both are used to make another substance, prostaglandin E2 (PGE2), which is involved in inflammation. But while the ancient diet contained relatively modest amounts of arachidonic acid and other omega-6 fats, current dietary levels are substantially higher.

In experiments, Hughes-Fulford found that adding AA to prostate cancer cells increased the production of PGE2 in just five minutes. That led, within two hours, to an increase in the activity of 13 genes involved in promoting inflammation and cancer. "Moreover, arachidonic acid was shown to induce proliferation of cancer cells within 24 hours," Hughes-Fulford wrote.

In separate experiments, Mick D. Brown, PhD, and his colleagues at the Paterson Institute, Manchester, England, found that AA and PGE2 increased the aggressiveness of prostate cancer cells, leading to increased metastasis.

However, the cancer-promoting effects of AA and PGE2 were blocked by adding two omega-3 family fats – eicosapentaenoic acid (EPA) and

docosahexaenoic acid (DHA) – which are found in fish oils and fish oil supplements. In fact, only half as much EPA and DHA (combined) was needed to offset the cancer-promoting effects of AA and PGE2.

Healthy cooking oils include live oil, macadamia nut oil, and canola oil, which tend to be low in omega-6 fats and high in anti-inflammatory fats.

References: Hughes-Fulford M, Li CF, Boonyaratanakornkit J, et al. Arachidonic acid activates phosphatidylinositol 3-kinase signaling and induces gene expression in prostate cancer. *Cancer Research*, 2006;66:1427-1433. Brown MD, Hart CA, Gazi E, et al. Promotion of prostatic metastatic migration toward human bone marrow stroma by omega 6 and its inhibition by omega 3 PUFAs. *British Journal of Cancer*, 2006;94:842-843. □

Perspectives...

Tackling the High Cost of Health Care

Any way you look at the cost of health care – or rather, disease care – in the United States it's extraordinarily expensive. If you pay your own health and medical insurance, or at least contribute to its cost through your employer, you know that the premiums are always increasing. And the cost of health care is going to get much worse.

Different experts come up with different numbers, but they're all pretty chilling. In one analysis, health-care spending is expected to double from \$2 billion annually to \$4 billion annually in just 10 years. That amount would add up to one out of every five dollars spent in the United States. Another analysis projects that more than \$8 billion dollars will be spent just to cover the new Medicare prescription drug plan over the next four years. I know, and you probably do as well, many people who take five to 10 prescription medications each day, putting them and our nation at risk of financial ruin.

There are many reasons behind these enormous increases in health-care spending. One is the aging of

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the population. Another is the aggressive advertising by pharmaceutical companies to sell their proprietary drugs. Still another is the competitive hospital environment – though many hospitals are technically nonprofit, they seek earnings and market share the way any for-profit corporation does.

With so many businesses and organizations intent on profiting from disease care, genuine efforts at prevention get the short shrift. After all, many businesses would suffer financially if large numbers of people got healthier and didn't need drugs and medical services. Yet our financial security, as individuals, families, and a nation, depends on significantly reducing the costs of medical care.

Improving eating habits and encouraging people to take dietary supplements to prevent (as well as to treat) disease is a sensible, low-cost approach. Nutrients are cheaper than drugs, and they correct the underlying causes of disease, not just its symptoms. With this credible approach to preventing disease, drugs and hospitalization would be reserved for when there is no reasonable alternative. It would certainly require a retooling of our economy, one that would probably be greater than retooling from manufacturing to high tech, but the economic payoff would (along with our health) would be impressive: healthier people are more productive people.

Spread the word. Explain this to your friends, your employer, and your insurer, and convey these thoughts to your senators and congressman. We have to start sometime, and there's no better time than now. The alternative, sometime in the future, will be economic collapse. –JC

L-Carnitine Supplements Ease Fatigue Resulting from Cancer Therapies

Patients with advanced cancers often feel extreme fatigue, particularly when undergoing radiation or chemotherapy. But supplements of L-carnitine can help reduce cancer-related fatigue, according to a recent study.

L-carnitine, found in animal protein, is a “trimethylated” amino acid. It is needed to convert long-chain fats into acyl-carnitines, which are transported into cells and subsequently burned for energy. The process provides fuel for the heart and skeletal muscles.

Giovanni Mantovani, MD, and his colleagues at the University of Cagliari, Monserrato, Italy, studied 10 women and two men who were undergoing radiation or chemotherapy for advanced cancer. The types of cancer varied and included tumors of the head and neck, breast, ovary, uterus, and stomach. The patients had reported suffering from fatigue either every day or almost every day.

Mantovani asked the patients to take 2 grams of L-carnitine three times daily for four weeks.

Using a standard clinical test to assess fatigue, Mantovani found that the L-carnitine supplements led to significant reductions in fatigue. In addition, their overall quality of life improved greatly.

Patients benefited in two other ways. Their appetites improved, and so did the amount of their lean (muscle) mass. That was important because muscle wasting occurs in about half of all patients undergoing cancer therapies and in 80 percent of terminal patients.

Mantovani wrote that “chemotherapy with ifosfamide and cisplatin-based agents may result in increased urinary excretion and serum carnitine deficiency because they compete with carnitine reabsorption...”

Reference: Gamignano G, Lusso MR, Madeddu C, et al. Efficacy of L-carnitine administration on fatigue, nutritional status, oxidative stress, and related quality of life in 12 advanced cancer patients undergoing anticancer therapy. *Nutrition*, 2006;22:136-145. □

B-Vitamins Reduce the Need for Pain-Relieving Drugs After Surgery

Several studies have found that the B-complex vitamins have an analgesic, or pain-reducing effect. In a recent study, researchers found that the B vitamins reduced requirements for a potent pain-relieving drug after surgery.

Francisco J. Flores-Marrieta, PhD, of the Instituto de Enfermedades Respiratorias, Mexico City, and his colleagues treated 40 adult patients who had undergone a tonsillectomy. This type of surgery is often associated with severe pain, and the risk of gastrointestinal side effects from conventional analgesic drugs may be reduced if the dosage of those drugs could be lowered.

All of the patients received an intravenous drip providing 50 mg of the analgesic drug diclofenac before and after surgery. In addition, half of the patients received intravenous B vitamins for 12 hours before surgery and a second B-vitamin IV after surgery.

Although the level of pain in the two groups was similar, those given the B vitamins needed 30 percent less diclofenac to reduce pain after surgery.

Each B-vitamin IV provided 100 mg of vitamin B1, 100 mg of vitamin B6, and 5 mg of vitamin B12. Diclofenac is a prescription nonsteroidal anti-inflammatory drug.

The B vitamins are needed in the body's production of neurotransmitters, including serotonin and norepinephrine. Higher levels of these neurotransmit-

ters may reduce the sensation of pain.

Reference: Medina-Santillan R, Perez-Flores E, Mateos-Garcia E, et al. A B-vitamin mixture reduces the requirements of diclofenac after tonsillectomy: a double-blind study. *Drug Development Research*, 2006;66:36-39. □

Green Tea Consumption May Help Keep Your Brain Sharp as You Get Older

Drinking at least one cup of green tea daily may significantly reduce the risk of mental decline as you age, according to a Japanese study.

Shinichi Kuriyama, MD, PhD, of the Tohoku University Graduate School of Medicine, Sendai, Japan, and his colleagues, analyzed the dietary habits and mental performance of 1,003 subjects at least 70 years of age.

He found that “higher consumption of green tea was associated with a lower prevalence of cognitive impairment.”

Specifically, people who consumed four to six cups of green tea each week had a 38 percent lower risk of mental decline as they aged. Those who drank at least two cups of green tea each day had a 54 percent lower risk.

Green tea is rich in antioxidants, such as epigallocatechin-3-gallate (EGCG), that laboratory experiments have previously found to reduce the risk of Alzheimer’s-like changes in brain cells. Tea is also rich in L-theanine, an amino acid that improves both mental focus and relaxation.

Reference: Kuriyama S, Hozawa A, Ohmori K, et al. Green tea consumption and cognitive function: a cross-sectional study from the Tsurugaya Project. *American Journal of Clinical Nutrition*, 2006;83:355-361. □

Eating Cherries May Ease Inflammation and Related Aches and Pains

Eating 10 ounces of sweet Bing cherries daily may reduce inflammation, an undercurrent in almost every disease, including arthritis and heart disease.

Darshen S, Kelley, PhD, of the University of California, Davis, and his colleagues asked 18 healthy men and women to consume about 10 ounces of sweet Bing cherries daily for 28 days. Kelly compared blood samples from the subjects taken before the study, after two and four weeks of cherry consumption, and then after the study was completed.

The cherries reduced blood levels of two key markers of inflammation. C-reactive protein levels decreased by 25 percent, and T-cell activity declined by 21 percent. Other markers, such as interleukin-6, did not change. Nor did cholesterol levels.

“Such anti-inflammatory effects may be benefi-

cial for the management and prevention of inflammatory diseases,” Kelley wrote.

Reference: Kelley DS, Rasooly R, Jacob RA, et al. Consumption of Bing sweet cherries lowers circulating concentrations of inflammation markers in healthy men and women. *Journal of Nutrition*, 2006;136:981-986. □

Vitamin E and Beta-Carotene Help Curb Prostate Cancer Risk in Some Men

Supplements of vitamin E and beta-carotene may help some men reduce the risk of developing prostate cancer, according to a study by researchers at the National Cancer Institute and other institutions.

Richard B. Hayes, PhD, tracked more than 29,000 men participating in an ongoing trial investigating on prostate, lung, and colorectal cancer. Of this group, 1,338 men developed prostate cancer during eight years of follow up.

Supplements of vitamin E and beta-carotene benefited two subgroups of men. Among current smokers and those who had stopped smoking within the previous 10 years, taking 400 IU of vitamin E reduced the risk of advanced prostate cancer by 71 percent, compared with similar men who did not take vitamin E. In addition, the long-term use of vitamin E supplements reduced the risk of prostate cancer by 70 percent among current smokers and those who had recently quit.

Men taking supplements containing 3,333 IU (2 mg) of beta-carotene reduced their risk of prostate cancer by 48 percent, if they had low dietary carotenoids intake.

Reference: Kirsh VA, Hayes RB, Mayne ST, et al. Supplemental and dietary vitamin E, beta-carotene, and vitamin C intakes and prostate cancer risk. *Journal of the National Cancer Institute*, 2006;98:245-254. □

Calorie Restriction Leads to Changes Associated with Longer Lives

Significantly reducing calorie intake, or combining more modest calorie restriction with increased exercise can lead to a variety of biochemical changes associated with longer life span.

Based on animal experiments, researchers have known since 1935 that severely restricting calorie intake, while maintaining adequate intake of vitamins and minerals, can extend life span by up to 30 percent. Now, in an experiment with 48 men and women, researchers documented that such dietary changes can reduce weight, body temperature, insulin levels and other changes associated with a longer life.

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Calorie Restriction, Longer Lives...

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Eric Ravussin, PhD, of Louisiana State University, Baton Rouge, and his colleagues placed each of their subjects on one of three regimens: (1) 25 percent fewer calories than normally required, (2) 12.5 percent fewer calories combined with 12.5 increased physical activity, and (3) a very low-calorie diet consisting of 890 calories daily, until the subjects lost 15 percent of their weight, at which point they went on a weight-maintenance diet. A fourth group ate their regular diet and served as a "control" group for comparison's sake. All of the subjects were overweight, but not obese, men and women who were paid for participating and therefore motivated to follow the diets.

People in the first (calorie-restricted) group lost, on average, a little over 10 percent of their body weight. They also had reductions in core body temperature, resting metabolic rate (that is, the burning of energy), DNA damage, and an impressive 28 percent reduction in fasting insulin levels. All of these changes are associated with longer life spans, and low fasting insulin levels reflect greater resistance to diabetes and are strongly associated with longevity.

Subjects in the second (calorie-restricted, higher exercise) group had similar benefits, including a 20 percent reduction in fasting insulin levels. People in the third (very low-calorie) group lost almost 14 percent of their body weight, had an 8 percent decrease in fasting insulin levels, and also had reductions in body temperature, metabolic rate, and DNA damage.

During severe calorie restriction, body temperature and the metabolic rate decrease to conserve fuel. As a result, fewer harmful free radicals are formed, leading to less DNA damage.

Neither the hormone DHEA nor fasting blood sugar levels decreased significantly during the study. Ravussin suggested that DHEA levels change over longer periods of time, while glucose levels are not consistently lowered by calorie restriction.

All in all, he concluded, two key "biomarkers of longevity" – lower fasting insulin levels and body temperatures – were significantly decreased by calorie restriction. "Studies of longer duration are required to determine if calorie restriction attenuates the aging process in humans," he wrote.

Reference: Heilbronn LK, de Jonge L, Frisard MI, et al. Effect of 6-month calorie restriction on biomarkers of longevity, metabolic adaptation, and oxidative stress in overweight individuals. A randomized controlled trial. *JAMA*, 2006;295:1539-1548. □

Quick Reviews of Recent Research

• Fish oils reduce postpartum depression

In a study of 16 women who had recently given birth, supplements of omega-3 fish oils for eight weeks reduced symptoms of postpartum depression by about half. Fish oil dosages were 0.5 grams, 1.4 grams, or 2.8 grams daily, with all dosages yielding approximately the same benefits.

Freeman MP, et al. *Acta Psychiatrica Scandinavica*, 2006;113:31-35.

• Antioxidants reduce risk of macular degeneration

In an analysis of 5,836 people at risk of age-related macular degeneration (AMD), 560 of them developed AMD over eight years of follow up. People who had high dietary intakes of beta-carotene, vitamin C, vitamin E, and zinc had a 35 percent lower risk of developing AMD.

van Leeuwen R, et al. *JAMA*, 2005;294:3101-3107.

• Evidence supports echinacea in common colds

Researchers conducted a meta-analysis of three controlled studies in which the herb echinacea was compared with placebos for reducing symptoms of the common cold. After pooling the data from these studies, the researchers found that the odds of experiencing a cold was 55 percent higher for people taking placebos. Conversely, those taking echinacea were 45 percent less likely to have cold symptoms.

Schoop R, et al. *Clinical Therapeutics*, 2006;28:174-183.

• Tomato extract reduces blood pressure

Researchers treated 31 people with mild hypertension, giving them 250 mg of proprietary tomato extract daily for four weeks and then giving them placebos. The tomato extract contained 15 mg of lycopene as well as other antioxidants. Systolic blood pressure decreased by an average of 10 points and diastolic blood pressure declined by an average of four points among people taking the tomato extract.

Engelhard YN, et al. *American Heart Journal*, 2006; 151:100.e1-100.e6.

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