

Latest Scientific Research -Continued

Effects on the AIDS Virus, Cancer and the Immune System.

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Cholesterol reduction

By now, Americans are well aware of the need to lower cholesterol levels in order to lower the risks of heart attacks and strokes, the number one cause of death. Besides dietary improvements, the search is underway to identify natural foods having a cholesterol reducing effect, such as fish oil or oat bran.

Spirulina is one of these foods. In Japan, thirty male employees with high cholesterol, mild hypertension, and hyperlipidemia showed lower serum cholesterol, triglyceride and LDL (undesirable fat) levels after eating spirulina for eight weeks. These men did not change their diet, except adding spirulina.

Group A consumed 4.2 grams (about 8 tablets) daily for eight weeks. Total serum cholesterol dropped a significant 4.5% within four weeks from 244 to 233. Group B consumed spirulina for four weeks, then stopped. Serum cholesterol decreased but then returned to the initial level. Researchers found triglyceride levels decreased slightly and LDL cholesterol decreased a significant 6.1% within four weeks. The reduction of serum cholesterol was even greater in those men with the highest cholesterol levels.

This study conducted by the Department of Internal Medicine of Tokai University concluded spirulina did lower serum cholesterol and was likely to have a favorable effect on alleviating heart disease since the arteriosclerosis index improved. No adverse effects were noted. The study did not speculate on how it lowered cholesterol. ⁷

Researchers in West Germany had previously discovered cholesterol reduction during a weight loss study with spirulina. ⁸ Japanese research showed lower cholesterol without weight loss, suggesting that cholesterol reduction was not related to weight loss. Spirulina was chosen because it previously lowered serum cholesterol in rats. ^{9,10}

A recent study with rats attempted to find the compound in spirulina that lowered serum cholesterol. Researchers discovered that the benefit may be through its effect on metabolism of lipoproteins. The oil soluble portion was found to suppress cholesterol levels in the serum and liver of rats. ¹¹

Natural beta carotene and cancer prevention

Cancer is the number two cause of premature death in Americans. Increasing cancer rates seem to be caused by environmental factors, especially diet. Scientists are examining foods and substances having protective factors. Beta carotene is one of the most well known natural anti-cancer substances. Over the past 20 years, cancer health authorities, National Cancer Institute and dozens of publicized studies have shown evidence that eating vegetables rich in beta carotene reduces the risk of all kinds of cancer.

Beta carotene is the main source of Vitamin A for humans. Our bodies convert beta carotene to Vitamin A as we need it. Although very high dosages of Vitamin A supplements are toxic, high

amounts of beta carotene from foods and supplements are safe. Spirulina is the richest beta carotene food known, having over ten times more beta carotene than any other food, including carrots.

Beta carotene is one of the most effective substances for deactivating free radicals, which damage cells, leading to cancer. Free radicals are molecular fragments from environmental pollution, toxic chemicals, drugs, and physical and emotional stress. Beta carotene prevents free radicals from reacting, and decreases incidence of lung cancer, prevents chemically induced tumors in animals, prevents precancerous prechromosome damage and enhances immunological resistance.

Over 100 animal studies confirm Vitamin A and beta carotene inhibit the development of various cancers and tumors. Many human epidemiological studies correlated high Vitamin A intake with decreased cancer risks.¹² Beta carotene (and not the preformed Vitamin A from animal sources) correlated with lower cancer rates.¹³

Over 15 studies from 1975-1986 correlated lower incidence of lung cancer with beta carotene and Vitamin A. One study found the lower the serum level of beta carotene, the higher incidence of lung cancer.¹⁴ Nine studies from 1974-1986 correlated lower digestive tract cancer (oral, stomach, colon, gastrointestinal) with beta carotene and Vitamin A. Two studies with women correlated lower breast and cervix cancer. A five year study in China completed in 1993 with 29,000 people revealed daily doses of beta carotene, vitamin E and selenium reduced the incidence of cancer deaths by 13%.¹⁵

In 1982, the famous monograph "Diet, Nutrition and Cancer" published by the US National Research Council reviewed this overwhelming literature. It concluded "the epidemiological evidence is sufficient to suggest that foods rich in carotenes or Vitamin A are associated with a reduced risk of cancer." The study recommended a diet including beta carotene rich vegetables to reduce cancer risks.¹⁶

A 1987 Israeli study demonstrated natural beta carotene is more effective than synthetic. Natural beta carotene is better assimilated by the body because it contains the 9-cis carotenoid isomer, lacking in synthetic carotene molecules. This means beta carotene in algae and vegetables greater antioxidant power than synthetic beta carotene.¹⁷

Controversy arose in 1995 when synthetic beta carotene was found ineffective preventing cancer in Finnish and U.S. smokers, and could even be harmful. Yet, these studies were flawed. Researchers chose only synthetic beta carotene lacking the cis isomer and gave high megadoses which may have caused nutrient imbalance. These studies reinforced the interest in natural carotenoids in whole foods.

Anti-cancer tumor effects

Because it is the richest natural beta carotene food, spirulina has been tested for anti-cancer effects. The Harvard University School of Dental Medicine reduced oral cancer cells with spirulina extracts. A beta carotene solution applied to cancerous tumors in mouths of hamsters reduced the number and size of tumors or caused them to disappear.¹⁸ When a beta carotene extract was fed to 20 hamsters pretreated to develop mouth cancer, none developed the disease. Tissue samples contained an immune stimulating substance believed to have destroyed cancer cells before they could multiply.¹⁹

In 1995, spirulina reversed oral cancer in pan tobacco chewers in Kerala, India. Complete regression of oral leukoplakia was found in 45% of those using one gram a day for one year, compared to only 7% with a placebo. Within one year of discontinuing spirulina, 45% of the lesions returned. This was the first human study of its chemopreventive potential.²⁰

Evidence linking natural beta carotene and cancer prevention is impressive. For those who do not eat 4-9 servings of fruits and vegetables daily, spirulina will add natural carotene insurance.

Phycocyanin enhances the immune system

Part of the global effort to identify natural substances with an immune system boosting or anti-cancer effect focuses on blue-green algae. One unusual phytonutrient in blue-green algae is the natural blue protein pigment, phycocyanin.

In research in Japan, phycocyanin was taken orally by mice with liver cancer. The survival rate of the treatment group was significantly higher than the control group not given phycocyanin. After five weeks, 90% of the phycocyanin group survived, but only 25% of the control group. After eight weeks, 25% of the phycocyanin group still survived, yet none of the control group was alive. This suggests eating phycocyanin may increase survival of cancer stricken organisms.

In another study, after two weeks the white blood cells (lymphocyte activity) of a phycocyanin group were higher than the control group and higher than or equal to a normal group without cancer. This suggests phycocyanin raises lymphocyte activity.²¹

The lymph system's general function is to maintain healthy organs in the body, and protect against cancer, ulcers, bleeding piles and other diseases. These results suggest phycocyanin acts not by a limited attack on local cancer, but by strengthening the body's resistance through the lymph system. Phycocyanin may be active in preventing a host of degenerative organ diseases by increasing immunity.

A Japanese patent states a small dosage of phycocyanin daily maintains or accelerates normal control cell functions that prevents generation of malignancy such as cancer or inhibits its growth or recurrence.²² The patent recommends a phycocyanin dosage in a range of 0.25 to 2.5 grams per day. Spirulina from Earthrise Farms, California and Siam Algae, Thailand have a high 15% phycocyanin content. This means the patent recommended adult dosage would be filled by consuming 1.7 to 17 grams per day, making about ten grams a day a useful level.

Chinese scientists documented phycocyanin stimulates hematopoiesis (creation of blood), emulating the hormone erythropoietin (EPO). EPO is produced by healthy kidneys and regulates bone marrow stem cell production of red blood cells. They claim phycocyanin regulated white blood cell production, even when bone marrow stem cells are damaged by toxic chemicals or radiation.²³

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