

## FOOD SUPPLEMENTS: THEIR EFFECTS ON THE BODY

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You are advised to consult a knowledgeable physician before using any of the nutrients listed herein. See note 10 for information on obtaining a list of this rare breed of medical doctors.

## MINERALS

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BORON 3 mg 1 a day

Enhances calcium absorption, increases synthesis of vitamin D, helps prevent osteoporosis, and is required for brain functioning. In post-menopausal women 3 mg per day reduced urinary magnesium and phosphorus excretions, and calcium excretion by 44 percent. Increases serum concentration of ionized calcium and estradiol. While this form of estrogen is a carcinogen<sup>24</sup> it does not pose as great a risk as oral estrogen which is mostly converted to estrone rather than the more desirable estradiol.<sup>14</sup> Estrogen aids the absorption of calcium by the bones, lowers cholesterol, and may also be a factor in relief from arthritis. Increase intake to 9 mg/day for treatment of osteoporosis patients. Toxic at doses greater than 500 mg per day.<sup>27</sup>

Prostate cancer risk for men eating the most boron, 1.8 mg/day was less than a third that of those eating less than 0.9 mg/day. Animal studies show immunity benefits from dietary boron. See Science News 4-14-01 for the complete story.

CALCIUM CITRATE 1000 to 1500 mg a day

Deficiency results in kidney stones, osteoporosis, leg cramps, bleeding gums, peeling nails, and hypertension. Reduces incidence of colorectal cancer,<sup>20</sup> platelet clumping, aids hypoglycemics, improves memory, lowers cholesterol, and is a chelator. Sugar, high protein, and high phosphate foods and vitamin K deficiency cause increased excretion of calcium in the urine. One source for phosphate is the phosphoric acid found in carbonated beverages. This acid also picks up aluminum from pin holes in the coating in aluminum cans. Nearly one-third of all women and one sixth of all men will fracture their hips in their lifetimes. Tests have shown that elderly patients could absorb about 4 percent of the calcium in calcium carbonate, down from a normal of 22 percent, but would absorb about 45 percent of the calcium from calcium citrate. Calcium citrate is the best form of calcium because of better absorption and decreased risk of kidney stone formation. Boron and vitamin D enhances calcium absorption. Copper is involved in bone strengthening. A shortage of calcium and magnesium will enhance the deposition of aluminum in nerve cells. Calcium may reduce the absorption of zinc. In tests all dolomite and bone meal products and 23 out of 25 unrefined carbonates had lead levels that exceeded the maximum allowed by law of 1 mcg per 800 mg of calcium.<sup>27</sup>

CHROMIUM PICOLINATE      200 mcg (minimum) a day

Required for sugar metabolism, lowers LDL cholesterol<sup>14</sup>, triglycerides, body fats and reduces incidence of atherosclerotic plaques. Used by the body to make glucose tolerance factor which is secreted with insulin to control blood sugar levels. 400 to 600 micrograms (mcg) per day used to treat impaired glucose tolerance and for weight loss. Claimed to be a muscle builder (400 mcg per day) for those who exercise. Shortage of chromium is a factor in arteriosclerosis, acne and diabetes.<sup>20,27</sup> It appears that chromium stimulates the production of insulin by the body. All diabetics have a shortage of chromium and zinc.<sup>20</sup> A study has shown that chromium will increased the life span of lab animals by 33 percent. Another study showed that high doses may cause chromosomal damage in animal cells.

COPPER      2 or 3 mg a day

Anti-inflammatory agent. Required for many body functions,

prevents radiation damage, inhibits bone resorption (osteoporosis), involved in strengthening bones and connective tissue by cross-linking collagen strands, increases life span and is part of the SOD antioxidant enzyme.<sup>14</sup> This enzyme is the main antioxidant in the eye lens and protects the lens from oxidative damage such as cataracts. Essential for operation of enzymes that lower cholesterol and for glucose tolerance. Deficiency raises blood pressure, causes abnormal electrocardiograms and some types of anemia. Protects against cancer and provides relief from pain and joint stiffness similar to arthritis. Vitamin C may hinder absorption. Excess copper lowers zinc level. The optimum ratio of copper to zinc is 1:10. Maximum copper supplement should not exceed 3 milligrams per day.<sup>27</sup> Toxic at 15 mg per day. See note 8.

### GERMANIUM

Reported as a "miracle cure", to reduce arthritis and to have antiviral and antitumor effects in Japan. Dosage was 300 mg three times a day. Garlic is a source. Further data not available.

### IODINE 150 mcg 2 or ? a day

Required for the proper functioning of the thyroid gland, conversion of beta carotene to vitamin A, and memory. Thyroid function test can be made by taking armpit temperature the first thing in the morning upon awakening and before arising. If the temperature is consistently at or below 97.6 degrees it suggests that the thyroid is not supplying a sufficient amount of the hormone. This could indicate an under active thyroid caused by a lack of iodine or other nutrients. A thyroid deficiency has been reported to cause an increase in cholesterol and atherosclerosis or hardening of the arteries. Iodine deficiency can cause thyroid cancer and allows estrogen to excite the development of cystic mastitis and breast cancer. Breast tissue requires the elemental form of iodine. Cystic mastitis responds only to the elemental forms of iodine supplements such as kelp and iodine caseinate<sup>27</sup>, and to the natural form of vitamin E. Non toxic up to 1000 mcg per day.

### IRON 10 to 18 mg a day

There are two forms of dietary iron, heme and nonheme. Heme iron is bound to hemoglobin and myoglobin. It is found in animal products such as red meats and is the most easily absorbed form. Nonheme iron is in plant foods and is poorly absorbed in the elderly due to a lack of hydrochloric acid in the stomach. Unbound nonheme iron gives off pro-oxidants which leads to the formation of free radicals<sup>27</sup>. Required for metabolization of B vitamins, blood cells, memory and other. Deficiency results in fatigue, impaired immune function, learning disabilities, and anemia. Eggs, coffee, tea and bran cereal inhibit absorption. Copper, cobalt, manganese and vitamins A & C are necessary for assimilation. Excess manganese hinders absorption. Ferrous sulfate form of iron destroys vitamin E. Sources are liver, farina, clams, dried peaches, red meat, egg yolks, oysters, nuts, beans, asparagus, molasses, and oatmeal. A relationship between high levels of iron and cancer has been reported.<sup>14</sup> However, iron deficiencies in lab animals reported to increase susceptibility to certain carcinogens (C&EN, Jan. 17, 1977). Serum ferritin is the best laboratory test for determining body iron stores<sup>27</sup>.

MAGNESIUM One-to-three ratio with calcium or 500 to 700 mg a day

Chelator. Raises HDL/LDL ratio. Required for bones. With taurine regulates amount of calcium in heart and artery muscles. Reduces arrhythmia, angina, and blood pressure, improves blood flow to the heart, prevents calcium deposits, kidney stones, and gallstones. Animal studies have shown that high doses of magnesium can reverse atherosclerotic plaques. Has anti-cancer action and helps memory. Improves glucose handling in people with insulin resistance. Required for B-2 metabolism. Diuretics, anticholinergics, alcohol, and phosphates in soft drinks depletes magnesium. Vitamin B-6 required for metabolization. Toxic above 10 grams a day. "In recent lab tests a deficiency of magnesium reduced work efficiency of the body, causing a 15 percent increase in oxygen consumption and an increased pulse rate." H. Lukaski, Ph.D., USDA Nutr. Res. Ctr. (Science News:5-3-97). Preferred forms are: aspartate, fumarate, citrate, malate or succinate.<sup>27</sup>

Do not take a magnesium supplement if you have kidney disease.

## MANGANESE 2.5 to 5 mg a day

Part of the antioxidant enzyme superoxide dismutase, SOD (q.v.). Helps prevent allergies, cataracts, osteoporosis, memory loss, multiple sclerosis, dizziness, aids thyroid gland, regulates insulin level. Essential for the utilization of vitamin B1. High intakes of manganese inhibits the absorption of iron, copper, and zinc, while high intakes of zinc, iron, calcium, phosphorus, magnesium, bran fiber, spinach, and tannin in tea hinders absorption of manganese. The picolinate or gluconate forms of manganese are preferred. 50 to 200 mg in divided doses for 2 weeks used for tendonitis.<sup>27</sup> "Provided cancer protection for lab animals exposed to nickel subsulfide, one of the most deadly carcinogens known." Dr. F. W. Sunderman, Jr., Univ. of Connecticut, Farmington (C&EN, Jan.17, 1977).

## MOLYBDENUM 200 to 500 mcg a day

Deficiencies related to anemia, premature aging, esophageal and stomach cancer, and sulfite sensitivity. Creates enzymes to detoxify sulfites and produce antioxidants. Required for tooth enamel. Excess molybdenum, 10 to 15 mg/day can increase production of uric acid, causing gout.<sup>27</sup> Uric acid neutralizes peroxy nitrite generated by the immune system to fight bacteria and viruses. Uric acid deficiency has been linked to multiple sclerosis in animals. A study of 20 million Medicare and Medicaid records, found no overlap between MS and gout. Lower amounts of uric acid were found in patients with MS than in other types of neurological diseases: (Science News, 1-31-98.) It might behoove those with MS or other autoimmune diseases to give molybdenum a try along with the gamma tocopherol form of vitamin E.

NICKEL Required trace element. Source is unprocessed grains.

## PHOSPHORUS

Required for most physiological chemical reactions, bones, teeth, heart regularity, kidney functioning, and helps prevent arthritis. Milk, fish, poultry, meat, eggs, nuts and seeds are sources. High-protein food, sugar and high-phosphorus diets are

associated with urinary excretion of calcium. Avoid phosphoric acid beverages. A can and a half of cola daily, doubles the risk of bone fracture in women over 40.<sup>20</sup> Supplements not normally required.

#### POTASSIUM 100 to 600 mg a day

Take with food. Increases oxygen in brain, reduces blood pressure, strokes, allergies and helps memory. Hypoglycemia, alcohol, coffee, sugar and mental and physical stress depletes potassium. Displaced by excess sodium. Recommended forms are the gluconate, citrate, and fumarate. Sources are bananas, milk, fish, apricots, avocados, potatoes, lima beans, citrus fruits, cantaloupe, tomatoes, green leafy vegetables, sunflower seeds, and poultry. A banana and a baked potato contain approximately 1200 mg of potassium. The minimum daily requirement for an adult is approximately 2000 mg. If you eat well and hold off on the coffee, sugar and salt, potassium supplements should not be required. People with kidney disease should not take a potassium supplement.

#### SELENIUM 200 to 400 mcg + a day

Antioxidant, anti-inflammatory. Reported to kill tumor cells<sup>27</sup> and to cause cancer regression.<sup>20</sup> Reduces incidence of cardiovascular diseases, lung, colon and breast cancers, cataracts, arthritis, (macular degeneration?), inflammatory conditions, and is part of the body's natural antioxidant glutathione peroxidase. Enhances immune system, synergistic with vitamin E and may have a similar synergism with vitamin A (retinol). (synergism: effect of combination greater than each working alone.) Selenium and vitamin E may help reduce the risk of Alzheimer's. Vitamin C and high intakes of zinc and other trace elements may reduce selenium absorption.<sup>27</sup> With vitamin E, selenium will detoxify mercury, cadmium, lead, tin, and arsenic.<sup>24</sup> Two studies have shown that people with low blood concentrations of selenium are more likely to develop skin cancer. A third study found that counties where diets are naturally rich in selenium report lower death rates from cancer than those where dietary selenium is scarce.<sup>25</sup> Later tests have shown that by adding 200 micrograms of selenium daily to the diets there were 63 percent fewer prostate cancers, 58 percent

fewer colorectal cancers and 46 percent fewer lung cancers than in the placebo group. (Journal of The American Medical Association, 12-25-96). After a review of studies on selenium and cancer the Food and Nutrition Board's Committee on Diet and Health stated, "Low selenium intakes or decreased selenium concentrations in the blood are associated with increased risks of cancer in humans."<sup>27</sup> Selenium is deficient in the farm soils of all states east of the Mississippi River and in most of the Pacific N.W. Sulfur-based fertilizers prevent plant uptake of selenium that is available.

We have the distinction of ranking near the top in breast cancer mortality rate. Our total apparent selenium intake is about 170 micrograms per day. In countries where intake per person is about 275 mcg per day the breast cancer mortality rate is less than one-third of ours.<sup>20</sup> In Japan the selenium intake is about 500 mcg/day. Japan's cancer rate is less than one fifth that of countries where the intake is 250 mcg/day.

In one study of a large group of people, the 10 percent with the highest serum selenium, 0.225 micrograms per milliliter, had the lowest level of cancer while the 10 percent with the lowest selenium level had the highest incidence of cancer. (Nutrition And Cancer, 1984 Vol 6, No 1)

Another study of selenium levels in 48 patients with cataracts and compared to matched controls, the serum selenium level was found to be less in the patients with cataracts, 0.28 versus 0.321 mcg/ml. The aqueous humour selenium level was 0.19 versus 0.31 mcg/ml. Hydrogen peroxide levels in the aqueous humour was 25 times the normal level for patients with cataracts. (Karakucuk S. et al., Selenium concentrations in serum, lens, and aqueous humour of patients with senile cataract. Arch Ophthalmo Scand 73, 329-332, 1995)

Since selenium-dependent glutathione peroxidase is responsible for eliminating hydrogen peroxide, low selenium levels appear to be a factor in the development of cataracts.<sup>27</sup>

Other tests have shown that areas with high selenium levels in food or forage crops have lower cancer incidence. (THE LANCET, July 16, 1983)

From the above data, the author believes that one should maintain a serum selenium level of at least 0.32 micrograms per ml. The author had a serum selenium level of 0.183 mcg/ml after taking

200 mcg of selenium each day and 0.286 mcg/ml with an input to 400 mcg per day. With an input of 400 mcg per day his wife has a serum selenium of 0.318 mcg/ml. This difference may be due to differences in our weight and vitamin C input. I take 8 grams of vitamin C each day, twice her's. Long term toxicity is 2400 to 3000 mcg per day. Supplements can be up to 500 mcg per day if diet does not exceed 250 mcg per day. Our diet ranges from 50 to 160 mcg per day.<sup>25</sup>

#### SILICON 5 to 20 mg a day

The silicon content of the aorta, thymus, and skin tends to decline with age.<sup>27</sup> Required, along with vitamin C, for connective tissue (collagen) formation, nails, skin, hair, and for prevention of osteoporosis, hardening of the arteries, and (Alzheimer's?). One use for collagen is in the formation of blood vessels. Copper is also required for cross-linking the collagen strands. Scurvy is caused by a lack of these nutrients. Found in the skins of fruit and vegetables and the outer coats of cereals. See sulfur, copper, folic acid and vitamins B-6 and C.

#### SODIUM (table salt)

Excess depletes potassium and may raise the risk of cancer by reducing cell membrane fluidity, slowing nutrient inflow and toxin outflow. Hypertension is rare in populations with low sodium intake. Intake of sodium should not be greater than 10 percent of potassium intake.

#### SULFUR

Aids production of collagen. Helps hair, skin, and arthritis. Sources are lean beef, dried beans, fish, eggs, and cabbage. A spoonful will repel ticks but stay up wind of yourself.

#### VANADIUM 50 to 100 mcg a day

A required trace element, beneficial in treating some forms of high blood pressure and for reducing the body's production of cholesterol. Reported to reduce insulin requirements in type I diabetes. In type II diabetes insulin sensitivity increased due to a greater inhibition of glucose production in the liver and



from greater stimulation of glucose utilization in tissues by insulin. Storage of glucose as glycogen in muscles was also increased. Cohen, N. et al. (1995) Journal of Clinical Investigation;95:2501. Excess glucose is a causative factor in arteriosclerosis. The safety of high dosages of vanadyl sulfate, 15 to 100 mg, commonly promoted for body building and for diabetic patients has not been established. Excessive levels of vanadium have been linked to manic depression. Less than one percent of the vanadium in food is absorbed.<sup>27</sup>

ZINC PICOLINATE 15 to 30 mg a day \*

Antioxidant. A component of insulin. Deficiencies related to osteoporosis, low male testosterone levels, loss of sense of taste, mental disorders, rheumatoid arthritis, blood cell production, cataracts, and cancer. Required for thymic activity, aids immune system, pregnancy, acne, decreases cholesterol deposits and is part of the superoxide dismutase (copper-zinc SOD) antioxidant enzyme.<sup>27</sup> Reduces body's level of prolactin, a hormone that stimulates synthesis of dihydrotestosterone, DHT, believed to promote malignant growth of prostate cells. Men with prostate disorders and all cancer patients have a shortage of zinc. They may also have an omega-3 fatty acid deficiency. The picolinate form of zinc is most easily absorbed. Next are the citrate, gluconate, and acetate forms while the sulfate form is the most poorly absorbed. Diabetics have a shortage of zinc and chromium in their blood. Autopsies have shown below normal amounts of zinc in several distinct areas of the brains of deceased Alzheimer's patients.

"Some 90 percent of the population consume diets deficient in zinc," Dr. Denham Harman, M.D., Ph.D, professor emeritus at the Univ. of Nebraska School of Medicine and founder of the free radical theory of aging.

Vitamin B-6 required for absorption. Caffeine, dairy products, and bran may decrease the absorption of zinc. Excess zinc reported to offset the protective effect of selenium against cancer in lab animals. Dr. Gerhard Schrauzer, UCSD, Dept. of Chemistry (C&EN, Jan. 17, 1977). Excess zinc also hinders absorption of copper which can cause RBC microcytosis and neutropenia.

"Zinc Shakes, reported in mine workers is caused by inhalation of

zinc oxide fumes and results in neurological damage.

\* Increase intake to 150 mg per day for prostate problems. 120 mg per day used to treat macular degeneration.

## AMINO ACIDS, ENZYMES, BOTANICALS

### ACETYLCYSTEINE 1,500 mg a day

Antioxidant. Stimulates and restores neurons, increases mitochondrial energy, slows dementia, and helps membrane function. A building block for Glutathione (q.v.). Used in treatment of macular degeneration.

### ACIDOPHILUS 2 caps 3 a day

Lactobacillus acidophilus is one of the good bacteria that inhabit the intestines. Readers who enjoy a low-fat high-fiber diet should have a large supply of good (aerobic) bacteria and can skip this supplement. Others should know that a low-fiber diet promotes the bad (anaerobic) bacteria which produce chemicals that cause colon cancer. Some of the fats in a high-fat diet escape digestion and absorption and end up in the colon where they are oxidized and produce free radicals. However, low fiber and high-fat diets are bad in regard to bowel cancer only when the transit time through the bowel is slow. Transit time can be measured by taking a few charcoal tablets and noting when they reappear. Transit times greater than two days may be a link to bowel cancer.<sup>20</sup> If the transit time is greater than four days cancer risk is greatly increased. There is also an association between constipation and breast cancer.<sup>24</sup>

Diet supplements that protect fat from oxidation and destroy free radicals are called antioxidants. There are several described in this list. All would be beneficial. Dietary fiber should be increased. Some fibers lower blood cholesterol, others decrease transit times. Those that decrease transit time are: wheat bran, wheat products, brown rice, cooked lentils, beans, and green peas. Avoid white bread like the plague.

Vitamin C (ascorbic acid) intake approaching your bowel-tolerance limit decreases transit time and helps prevent cancer by keeping the bowel slightly acidic which may hinder the formation of carcinogens. It is also a very good antioxidant. In addition to acidophilus, acidophilus milk is also beneficial. *L. bulgaricus*, the primary Lactobacilli used for Yogurt has demonstrated potent antitumor activity, however it does not colonize the colon and has to be ingested often.<sup>27</sup>

Selenium is reported to prevent bowel cancer.<sup>20</sup> A high fiber diet may have a tendency wash out minerals so mineral supplements are recommended. Good bacteria are destroyed by chlorinated water and antibiotics, such as Amoxicillin and especially Erythromycin. For further information references 20 and 27 are recommended.

### ADAPTOGENS

Adaptogens are botanicals that adapt themselves to the physiological needs of the individual. They include garlic, echinacea, ginseng, licorice, ginger, schisandra root, ginkgo biloba and others.

### ALANINE

Amino acid. Reported to be useful in treating prostate problems. See glutamic acid.

### ALKYGLYCEROLS

Promotes the production of white blood cells (leukocytes) including T cells and macrophages. Source is shark liver oil.

### ALLIUM SATIVUM

Chelator. Herb, garlic (q.v.), reported to reduce cholesterol, blood pressure and stimulate immune response.

### ANTHOCYANINS                      see proanthocyanins

L-ARGININE 2000 mg a day 2 hrs after eating

Amino acid. With lysine and ornithine, stimulates pituitary gland production of human growth hormone<sup>20</sup>, (HGH), which stimulates thymus gland boosting immune response and is claimed to reverse aging process. Inhibited cancer growth in animals. Production by the body decreases with age. Destroys nitric oxide produced around inflamed arthritic tissue. The nitric oxide destroys T-cells which enhance the production of anti-bodies to fight inflammation. Earl Mindell<sup>6</sup> recommends that arginine be taken in combination with 2000 mg of ornithine and 1000 mg of lysine. Should not be taken by those who have herpes or schizophrenics. Sources are nuts, sunflower seeds, chocolate, raisins and brown rice.

ASTRAGALUS 400 mg 1 to 3 a day

Herb claimed to improve immunity and may be beneficial in treatment of heart disease.

L-ASPARTIC ACID

L-Aspartate is an amino acid and chelating agent. Binds with magnesium to displace calcium build up in arterial tissues.

BHT 250 to 500 mg a day ?

Butylated hydroxytoluene (BHT), an antioxidant and food preservative, has been proven to be effective in the treatment and cure of herpes viruses HSV-1 (cold sores), HSV-2 (genital herpes) and herpes varicella-zoster (shingles).<sup>22</sup> Requires dietary fat for absorption. A 1977 study showed that BHT enhances certain animal cancers. A 1978 study reported BHT to inhibit certain carcinogens.

BLUEBERRIES

Reported to improve balance, coordination and short term memory in lab animals. USDA Human Nutrition Res. Center on Aging, Tufts

University.

Journal of Nutrition, Sept. 15, 1999.

### CAPSICUM ANNUM

Herb, cayenne, reported to improve circulation and to lower LDL cholesterol and triglycerides in animals.

### L-CARNITINE 1500 to 4000 mg a day in divided doses \*

Amino acid. Chelating agent. Synergistic with Coenzyme Q-10. Vitamins C, niacin, and B-6, and iron are required for synthesis from lysine and methionine by the liver. Some people are unable to synthesize adequate amounts of carnitine.<sup>27</sup> Raises HDL/LDL ratio, decreases risk of liver, kidney and cardiovascular diseases in diabetes, lowers blood fat level, increases muscular strength and reduces fatigue and angina. The rate at which fat is made available as fuel for muscle is determined by amount of carnitine in the muscle. Enhances the effectiveness of antioxidant vitamins E and C. May have some anti-aging benefits for the brain by reducing lipofuscins. Lipofuscins are excess fats and wastes from damaged cells. For Alzheimer's disease L-acetylcarnitine, LAC, may be the best form.<sup>27</sup> Choline reduces urinary carnitine excretion. Alcohol impairs synthesis of carnitine. Source is red meat and dairy products. The mirror-image form, D-carnitine which does not occur in nature, may be toxic. \* Those with impaired liver function should seek the advice of a physician on amount of supplement.<sup>27</sup>

### CHOLINE 500 mg 1 to 3 + a day

Crucial for normal brain function and memory. Choline becomes changed at the ends of certain brain cell nerves to acetylcholine, a chemical messenger which is lacking in the brain of Alzheimer's disease victims. Enhances the effect of vitamin E. Also participates in metabolism of cholesterol and fat and is a chelator. Deficiency is related to cirrhosis of the liver, hardening of arteries and Alzheimer's disease. Sources are egg yolks, green leafy vegetables, yeast, liver, wheat germ, and lecithin. Should not be used by persons who are manic depressive. The phosphatidyl form of choline may be more readily used by the brain. Passwater<sup>20</sup> recommends 2000 mg of choline

and 1000 mg of B-5 be taken by students just before an exam.  
CAUTION: See note 10.

## CINNAMON

May help control blood sugar levels by increasing the ability of insulin to metabolize glucose.

## COENZYME Q-10 50 to 150 mg a day \*

Antioxidant and anti-aging. Reported to reverse cardiac failure and arrhythmia<sup>6</sup>. Studies have shown that CoQ-10 will reduce the diastolic and systolic pressures of those with high blood pressure but has no effect on the blood pressure of those with normal blood pressure. Required for the production of energy in heart cells. Reported to be effective in treating periodontal disease,<sup>24</sup> angina, diabetes,<sup>27</sup> enhance immunity, increase production of antibodies and to enhance the clearance of foreign antigens (phagocytosis). The complete elimination of lung and breast cancer has been reported in patients taking large doses, 300 to 400 mg a day, for several months.<sup>24</sup> Exercise stimulates the production of CoQ-10 by the body. Blood levels of CoQ-10 decrease with age. Deficiency is common in cardiac patients. Mevacor, and other cholesterol lowering drugs, depletes CoQ-10.<sup>27</sup> Sources are organ meats, eggs, rice bran, wheat germ, soy products, peanuts, spinach, broccoli, mackerel, and sardines. No known toxicity. Safety during pregnancy and lactation not established. \* 300 mg per day given for severe heart disease.<sup>27</sup>

## COFFEE

### THE EVILS OF DRINKING COFFEE:

1. Oils in unfiltered coffee can raise cholesterol levels.
2. There is a coffee homocysteine (HCY) link.
3. There is no decaffeinated coffee HCY link.
4. This seems to imply a caffeine effect but no tea HCY link has been found.
5. Blood levels of HCY are usually controlled by B vitamins such as folic acid. However, the additive effect

of

coffee and smoking increases HCY levels.

cardio-

6. HCY damages arteries and as such is a potent vascular risk factor.
7. Heart attack risk increases with coffee use.

#### HOW TO IMPROVE YOUR ODDS:

1. Supplement your diet with vitamins B-1, B-6, B-12, folic acid, inositol and vitamin C.
2. Reduce your consumption of coffee if possible.
3. Monitor your HCY level to determine an allowable level of coffee consumption, and while you're at it check your folate and B-12 blood levels.

#### CRANBERRY JUICE     One or two glasses a day

Helps prevent urinary track infections.<sup>6</sup>

#### CRATAEGUS OXYACANTHA

Herb, Hawthorn. Chelating agent and dilator reported to increase blood flow, and to reduce blood pressure, cholesterol levels, and to prevent deposition of cholesterol in arterial walls.

#### CURCUMIN

Reported to suppress the development of colon cancer in laboratory animals.

#### L-CYSTEINE     20 mg ? a day

Amino acid, antioxidant, and chelating agent. Synthesized from L-Methionine. Protects cells from radiation, free radicals, pollution and is claimed to be a chelator for lead and other toxins. Has high sulfur content.

## DHEA ?

Dehydroepiandrosterone (DHEA) is a naturally-occurring phospholipid nutrient; a steroid hormone produced by the adrenal glands. It is the precursor for the manufacture of many other hormones by the body. In animal test it has been shown to reverse aging, restore youthful vigor, cure cancer, and increase immune response. Many studies have shown that low DHEA levels in humans correlate to increased risk of cancer, heart disease, osteoporosis, obesity, diabetes and premature aging. A positive correlation between DHEA levels and mental acuity in older people has been reported by Baulieu, French endocrinologist and inventor of RU486. "Alzheimer's patients have 48 percent lower DHEA than control group," (Dr. C.R. Merrill, Lab of Biochemical Genetics, Bethesda, MD). The anti-obesity, anti-diabetic and anti-tumor actions of DHEA are thought to be due to its inhibition of the G6PD enzyme. The average blood levels of DHEA in young people are 300 to 500 mcg per deciliter and drops to 30 to 100 mcg per deciliter with age. The author recommends taking DHEA only under the guidance of a physician experienced in its use.

## DMAE 100 mg 4 a day

Dimethylaminoethanol (DMAE) is a metabolite of procaine. Procaine was used in Romania by Ana Aslan in the treatment of age-related problems. She found that procaine would reduce monoamine oxidase (MAO), an enzyme that increases with age and correlates with age-related problems. Over a period of many years she claimed to have increased the average life span of her patients by 29 years. Her formula was called Gerovital H3. Another metabolite of procaine is para-aminobenzoic acid (PABA). DMAE and PABA are claimed to be the oral equivalent of the Aslan injection.<sup>14</sup> Recommended daily amounts are 400 mg for DMAE and 200 mg for PABA. DMAE can cross the blood-brain barrier and is claimed to be superior to choline for the biosynthesis of acetylcholine, a brain messenger, and may be beneficial in Alzheimer's and other mental problems. No data on toxicity.

## DIMETHYLGLYCINE (DMG) 100 to 300 mg a day



Amino acid claimed to increase defense functions, lower cholesterol, aid heart patients and to enhance immune response.<sup>20</sup> Synergistic with phycotene. Sources are liver, seeds, and nuts.

ECHINACEA 400 mg a day + ?

Herb reported to stimulate production of T lymphocytes (T-cells), the white blood cells responsible for immunity.

EPA eicosapentaenoic acid, see omega-3 fatty acid

### EVENING PRIMROSE OIL

Contains 9 percent gamma-linolenic acid (GLA) and 72 percent linoleic acid. both of which are omega-6 oils. Omega-6 is a precursor for the favorable 1 series prostaglandins, hormones widely used by the body. B-6 is required for conversion of linoleic fatty acid to GLA and the GLA to the 1 series prostaglandins and partly to arachidonic acid which leads to inflammatory leukotrienes and production of the unfavorable 2 series prostaglandins. The available data appears to conflict with claims of reduced inflammation. Other claims are for reducing high blood pressure, and symptoms of PMS. A combination of GLA and EPA has been used in the treatment of rheumatoid arthritis and may be beneficial for treatment of other autoimmune diseases. It appears that omega-3 oils would be better for reducing inflammation than the omega-6 oils.<sup>27</sup> See flaxseed oil.

### FATS

No tests have shown any difference in fat consumption between people with and people without coronary diseases. However, T cell function is impaired by a high fat diet. Body fat is the storage site for many carcinogens that we get from food and other sources.<sup>6</sup> The increased risk of cancer caused by the consumption of margarine can be offset by selenium, and vitamins E and C. Natural polyunsaturated oils such as canola, soy, safflower and flaxseed are preferred types. See note 1.

### FLAXSEED OIL 1 tablespoon a day

Unrefined flaxseed oil contains two essential fatty acids. It is a rich source for alpha linolenic (an omega-3 fatty acid), 58 percent by weight, and linoleic acid (an omega-6 fatty acid). The omega-6 to omega-3 ratio is 1:3. We consume 10 to 20 times more omega-6 than we need. Omega-6 is the main oil added to foods during processing and is the main component of the low quality oils found in the grocery stores. As a result of this our omega-6 to -3 ratio to about 20:1. The optimum ratio is 4:1. High levels of omega-6 have been shown to promote the spread of cancer in animals while low levels of omega-3 fatty acids were the most significant factor in the spread of cancer in humans. Fatty acids are used by the body as components of nerve cells, cellular membranes and for the production of prostaglandins. They are protective and therapeutic against heart disease, cancer, autoimmune diseases such as rheumatoid arthritis and multiple sclerosis and others.<sup>27</sup> See omega-3 fatty acid.

### GARLIC 300 mg a day + ?

Reduces platelet clumping, increases immunity, lowers cholesterol, blood pressure and might help relieve pain of arthritis. Reduces excess glucose in blood which is a causative factor in arteriosclerosis and heart attacks. Source for germanium. See SAMC.

A recent report stated that deodorized garlic was less beneficial than regular garlic.

### GINKGO BILOBA 80 mg 3 a day

Claimed to provide relief from stress, depression, headache, ear-ringing, vertigo, and to improve memory and prevent accumulation of lipofuscin in brain cells. Increases blood flow to brain. May be helpful in treatment of hemorrhoids. Three to six months may be required to show improvement.

### GINSENG

Herb, antioxidant, adaptogen. Reported to inhibit growth of cancer cells, convert diseased cells to normal cells, increase mental and physical endurance and to control blood pressure. Vitamin C may hinder absorption. Take two hours before or after taking vitamin C. If you have high blood pressure or irregular heartbeat do not take ginseng.

#### GLUCOSAMINE SULFATE 500 mg 2 or ? a day

Aids injured or overworked joints. Panacea for knee joints of elderly bicycle riders. A few weeks may be required to show improvement. Value of other forms of glucosamine such as N-acetyl- (NAG) and -hydrochloride (HCL) have not been shown in any tests. NAG is quickly digested by intestinal bacteria and HCL is not a nutrient that is utilized by the connective tissue. Sulfur is an essential nutrient for joint tissue. The absorption rate for chondroitin sulfate is not over 8 percent due to the large size of the molecule while up to 98 percent of the glucosamine sulfate is absorbed. The sulfur from glucosamine sulfate is used by cartilage and other joint structures where it stimulates the production of chondroitin sulfate.<sup>27</sup>

#### L-GLUTAMIC ACID 500 mg a day + ?

Amino acid. With alanine and glycine useful in treating prostate problems. Required for the synthesis of glutathione. Synthesized by brain cells from glutamine and then converted to energy for use by the brain cells. Glutamic acid does not cross the blood/brain barrier.

#### L-GLUTAMINE 500 mg 4 a day + ?

Amino acid. Increases human growth hormone, HGH. Anti-aging. Crosses the blood/brain barrier and is converted to glutamic acid by brain cells.<sup>20</sup> Relieves depression, impotence and fatigue. Body builders reported to take up to 10 grams a day.

#### GLUTATHIONE PEROXIDASE ENZYME

A component part of Glutathione Peroxidase one of the body's natural antioxidant enzymes. Activity is stimulated by the

presence of both vitamin E and selenium even though selenium is a component of this enzyme. It protects the aqueous portion of cells.

### L-GLUTATHIONE 50 mg 1 to 2 times a day ?

Amino acid. Antioxidant, anti-aging, anti-inflammatory, chelator and immunity booster. Deficiency reported to be the leading cause of cataracts. Made in the body from cysteine, glutamic acid and glycine. Selenium and vitamin C<sup>6</sup> required for synthesis. Exercise may increase synthesis in older people. Production declines with age. More beneficial for older people than the young. Contains sulfur. See selenium.

### GLYCINE

Amino acid. Useful in treating prostate problems. See glutamic acid.

### GREEN TEA

Reported to contain a variety of antioxidants and to offer protection against cancer, heart disease and stroke in animals. M. Gaynor, MD, Cornell Univ. Cancer Prevention Center; J. Klaunig, PhD, Division of Toxicology Indiana Univ. Black tea, which is oxidized green tea, is not as effective. Oolong tea is only partially oxidized and would be more effective than black tea.

### GYMNEMA SYLVESTRE

Normalizes blood sugar levels. Reduces cholesterol, free fatty acids, and triglycerides. Promotes regeneration of beta cells responsible for releasing insulin in the pancreas. (Ancient Science of Life, 1988; Journal of Ethopharmacology, 1990)

### LECITHIN 1200 mg 2 a day

Source for inositol and choline which also enhance phosphorus levels. An ounce a day reported to lower cholesterol. One large egg contains over 2000 mg of lecithin.

## LYCOPENE

Antioxidant. Predominate carotenoid in plasma, and various tissues including the prostate gland. Reported to be more protective against cardiovascular diseases and some cancers than beta carotene. "Of 46 fruits and vegetables checked only tomatoes and strawberries offered protection against prostate cancer. Ten or more servings of tomatoes, tomato sauce or pizza per week caused a 45 percent reduction of prostate cancer. Lycopene from tomato juice appears to have low bioavailability, but cooking the juice in an oil-based medium enhances intestinal absorption. Tomatoes, tomato products and strawberries accounted for 90 percent of the lycopene in the diet of those studied." (Dr. Edward Giovannucci, Harvard Univ. School of Public Health, Journal of Natl. Cancer Inst. 12-6-95). Studies have shown a link between low blood serum levels of lycopene, and prostate cancer, bladder cancer, cervical dysplasia (a precancerous condition in women) and pancreatic cancer. Not a precursor of vitamin A. Available at health food stores. However, all studies have used natural foods and not supplements. May also offer protection against peroxynitrite believed to cause MS.

## LYSINE 500 mg a day + ?

Amino acid and chelator. Required for the synthesis of carnitine (q.v.). When combined with arginine (q.v.) reported to reverse decline of thymic hormonal activity. "Deficiency of ascorbic acid and lysine caused arteriosclerosis in laboratory animals. Adding these two supplements to their diet reversed this condition".<sup>16</sup> Source is meat, fish and eggs.

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## MELATONIN 3 mg a day + ?

Main secretion of the pineal gland. It preserves T-cell function, corrects reduced thymus activity, aids immune system, delays aging, may be beneficial in some types of depression and offers some protection from breast cancer. Electric and electromagnetic fields and light shut down production of melatonin in the body. Low levels of melatonin have been linked to breast cancer and prostate cancer.<sup>25</sup> Users of electric blankets and those living near high voltage power lines take

note. Take in evening. Depression relief doubtful.<sup>27</sup>

### L-METHIONINE

Amino acid and chelator. Not synthesized by the body. Required for the synthesis of cysteine and carnitine (q.v.). A good source for sulfur, important for the breakdown of fat in liver and arteries. Digestive aid which helps detoxify harmful agents, aids muscle weakness, prevents brittle hair, beneficial for allergic chemical sensitivities and osteoporosis. Sources are meat, dairy products, fish and eggs. High meat and dairy product diets generate excess methionine which is converted into homocysteine, HCY. HCY damages arteries (arteriosclerosis) and can damage the heart. Vitamin B-6 helps by regulating the production of HCY. Vitamin B-12 and folic acid also help control HCY level.

### OMEGA-3 FATTY ACIDS

Reported to reduce cholesterol, blood pressure, and be beneficial in autoimmune diseases. A study has shown that omega-3 fatty acids have an inhibitory effect on mammary tumors. Another study has shown that women with the highest consumption of fish tend to have the lowest incidence of breast cancer. The data for use by diabetics is conflicting and further research is needed. Another study has shown that a diet low in omega-3 and zinc promotes enlargement of the prostate gland. This gland produces prostaglandins and tries to compensate for this deficiency by enlarging. This enlargement can be reduced by adding omega-3 and zinc picolinate to the diet. Sources for omega-3 are salmon, mackerel, albacore tuna, cod, herring, halibut, sardines, flaxseed oil, green vegetables and some nuts. Fifty percent of the total dietary polyunsaturated fat should be omega-3. Recent animal studies show that omega-3 fat aids bone growth. If the same hold true for humans it would prevent osteoporosis. Animal studies also show that omega-3 protects the body against attack by its own immune system in autoimmune diseases such as rheumatoid arthritis and lupus erythematosus. Since omega-3 fatty acids are blood thinners supplements should not be taken by those on blood thinners. In this instance whole fish would be better than the oil capsules. See flaxseed oil.

### PHYCOTENE

Extract from spirulina and dunaliella algae. Shown to cause cancer regression and to prevent cancers in test animals. Synergistic with dimethylglycine.

### PHYTOCHEMICALS

Many have anticancer properties. They can induce certain enzymes to destroy certain carcinogens.<sup>24</sup> The most potent sources of these enzymes are cabbage, broccoli, cauliflower, brussels sprouts and tomatoes.

See lycopene.

### PREGNENOLONE 10 mg 2 or ? a day

Pregnenolone is a natural hormone made in the body by the mitochondria. It is a precursor for all human steroid hormones and is claimed to increase productivity, reduce stress, enhance detoxifying enzymes in the liver and brain, improve mood, and to have a mild anti-depressant effect. It is also an anti-inflammatory agent. Further data not available.

### PROANTHOCYANIDINE 50 to 300 mg a day

Bioflavonoids sold under Pycnogenol and Adoxynol trade names. First reported use in 1543 by Quebec Indians to save crew of French ship. Claims: blocks accumulation of cholesterol, prevents cancer, improves skin texture and elasticity, anti-inflammatory agent, antioxidant, potentiates vitamin C, reduces capillary fragility, diabetes, allergies, arthritis, and protects against cataracts. Found in plums, tart cherries, blueberries, cranberries, fruits, vegetables and grapeseeds. See quercetin, vitamin p.

### PROPOLIS 500 mg 1 to 3 a day

Claimed to be anti-cancer, antioxidant, anti-inflammatory, antiviral and immune system enhancer. Source is honey.

### QUERCETIN 250 to 750 mg a day

A bioflavonoid found in red and yellow onions, broccoli, and

squash. Claimed to inhibit bowel cancer, protects against heart disease, cataracts, some major diabetic complications, anti-allergy and to be a cell membrane stabilizer<sup>20</sup>. May also offer protection from estrogen induced cancer. See vitamin p

RU-486          Reported to shrink tumors.

### SAMC

Sallylmercaptocystein (SAMC) is a sulfur compound that forms as garlic ages. It has been shown to slow the growth of prostate cancer cells and to decrease the prostate specific antigen, PSA. (R.S. Revlin and J.T. Pinto, Sloan-Kettering Cancer Center, NY.) Science News 4-19-97. Fresh garlic does not have this effect. Garlic used in test was commercially aged for at least one year.

### SAW PALMETTO

Claimed to relieve some prostate problems and urinary tract problems of men and women.

### SHARK CARTILAGE    800 mg   2 a day ?

Reported to stop growth and to kill tumors by inhibiting the growth of new blood vessels (anti-angiogenesis). New blood vessels are required to provide food for the tumor and to remove waste products.<sup>14</sup> It might be that the waste products cause the tumors to self-destruct. Also reported to reduce pain in some forms of arthritis. Those on exercise programs to increase muscle size might be hindered by this supplement.

### SUGAR

The per capita consumption of Sugar (sucrose) in the United States is about 125 grams per day. Each 125 grams when digested becomes 66 grams of glucose and 66 grams of fructose. Add to this the fructose from fruit and honey, the average daily intake becomes 74 grams per day. The fructose undergoes reactions in the body leading to acetate, which is then in part converted to cholesterol.<sup>17</sup> Tests have shown a direct correlation between the amount of sugar eaten and the level of cholesterol in the blood.



There is also a positive correlation between dietary sugar and breast cancer. Insulin has an effect similar to estrogen and prolactin.<sup>24</sup> Sugar causes increase in urinary excretion of calcium.<sup>27</sup>

### SULFHYDRYL GROUP

Sulfur when combined with hydrogen, form sulfhydryl groups which are effective in removing poisons and toxins. Foods that contain a relatively large amount of this natural chelator of aluminum and other toxic metals are: onions, garlic, chives, red pepper, and egg yolks. Others are asparagus, dry beans, soybeans, and sesame, pumpkin, and sunflower seeds.

### ST. JOHN'S WORT 300 mg 1 to 3 a day

Herb claimed to relieve depression. 0.3% hypericin per capsule.

### SUPEROXIDE DISMUTASE (SOD)

Main antioxidant in the eye lens. One of the body's two natural antioxidant enzymes. Zinc, copper, selenium and manganese required for synthesis. Reduces high blood pressure and prevents cataracts. In animals of any species those with the highest level of SOD live the longest. Supplements are poorly absorbed.

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### TAURINE 500 mg 1 a day + ?

Amino acid. Helps normalize irregular heart beating and stabilize cell membranes in heart. "Lowers blood pressure 24 percent in 4 to 16 weeks." (RE: Dr. H. Trachtman, American Journal of Hypertension). Has been shown to raise acetylcholine levels in animals, reverse macular degeneration and stimulate immune system. Produced by the body from cysteine. Vitamin B-6 required for this conversion. Taurine deficiency causes congestive heart failure in animals.

### THYMUS EXTRACTS

Reported to stimulate production of T lymphocytes (T-cells), a type of white blood cell responsible for immunity against bacterial, and viral infections.<sup>27</sup>

### TUMERIC

Herb reported to prevent blood clots and to reduce cholesterol and the inflammation and pain associated with arthritis.

### TYROSINE 100 to 2000 mg 3 a day

An amino acid reported to aid in treatment of depression and Parkinson's disease. However a study has shown that restricting tyrosine and phenylalanine in animal diets stopped the spread of cancer.<sup>25</sup> Sources are meat, fish, eggs, dairy products, seeds and nuts.

### WATER 8 cups +

A study has shown that those who drink 14 or more cups of fluid eaach day had a greater risk of developing bladder cancer than those who drank 7 cups. Later it was shown that tap water was the culprit. Further research pointed to the chlorine in tap water as the culprit that may promote cancer.<sup>6</sup>

## VITAMINS

A 25,000 IU 1 a day (see note 3)

Main antioxidant in the mucous membranes and is a chelator.

"Vitamin A and beta carotene caused remission of precancerous areas called oral leukoplakias and prevented new lesions from forming." (Vitamin A therapy and Oral Cancer: Sci. News 6-11-88) Required for many body functions. Enhances immunity to infections including some forms of cancer and is anti-aging. Some studies have shown an inverse correlation between retinol, (preformed vitamin A) intake and prostate cancer particularly among men aged 70 years and older while other studies do not. Zinc, B Complex, E, calcium, and phosphorus required for assimilation. Alcoholics have a shortage of this vitamin. Source is fish liver oil. Others may be toxic. Dosage over 10000 IU per day caused birth defects.<sup>27</sup> See note 3.

A      ALPHA CAROTENE      25,000 IU      1    or 2    a day +

Reported to be a 10 times more effective cancer fighter than beta carotene for certain types of cancer. Mixed palm oil carotenes have best antioxidant activity and consists of 60% beta, 34% alpha, 3% gamma and 3% lycopene. Carotenes from natural sources are absorbed 4 to 10 times better than synthetic.<sup>27</sup> Sources are carrots and mixed vegetables. Supplements containing mixed carotenes are available in natural food stores. See lycopene. Cataracts and macular degeneration have been successfully treated with carotene, and vitamins E and C.<sup>25</sup> Eating a lot of carrots or ingesting sufficient carotene to color the skin slightly orange is well tolerated by the body.<sup>25</sup> This may prevent the development of skin cancer from sunburn damage to the skin.

A      BETA CAROTENE      25,000 IU      1    or 2    a day +

Antioxidant and nontoxic precursor of vitamin A. When combined with vitamin E there is a synergistic anti-tumor effect. Beta carotene and other carotenoids reported to have anti-cancer properties not related to vitamin A. Proven in tests to reduce heart problems by almost 50 percent, boost immunity, and to help prevent cataracts. Sources are broccoli, brussels sprouts, cabbage, carrots, kale, pumpkin, spinach, squash (Hubbard & butternuts), sweet potatoes, apricots and others.

## ASCORBYL PALMITATE

Fat soluble forms of vitamin C. They extend vitamin C free radical protection into the fat parts of the body.<sup>20</sup>

### B-1 THIAMIN 500 mg 1 a day

Required for normal functioning of the heart, nervous systems, memory, anti-stress, coordination and is a chelator. Helps prevent constipation. Repels insects. Fever and physical exercise uses a lot of B-1. Alcohol destroys all B vitamins especially B-1. Caffeine, sugar, antacids, and aspirin destroys B-1. One quart of coffee in 3 hours destroys most of the body's B-1. Should be taken with B2, B5, B6, B12, folic acid and manganese for best utilization. Deficiency of thiamine and folate leads to DNA changes that have been correlated with cancer. No known toxicity.

### B-2 RIBOFLAVIN 100 mg 1 to 3 a day

Boosts immunity and reduces risk of cancer and cataracts. Women who take estrogen need to take a B-2 supplement.<sup>6</sup> Aids growth, reproduction, skin, migraine headaches, nails, hair, vision, alleviates eye fatigue. Sources are milk, liver, yeast, cheese, leafy green vegetables, fish, and eggs. Destroyed by alcohol, sulfa drugs, estrogen, light, and alkalies. 3 to 8 grams per day improved mental function in elderly.<sup>27</sup> Non-toxic.

### B-3 NIACIN

This form of B-3 is a vasodilator. Dosage: 100 mg under age 30; 300 mg age 30 to 39; 500 mg age 40 to 49; 1000 mg age 50 and over; taken twice a day after meals. Start with lesser amount if flushing is objectionable. Converts food to energy, lowers blood pressure, cholesterol, helps skin, memory and prevents clumping of red blood cells. May offer some protection against cancer and arthritis. Evidence of niacin causing a reversal of atherosclerosis has been reported. Alcoholics have shortage of this vitamin. Reported to be nontoxic up to 3000 mg per day. The author takes 1000 mg twice a day. Diabetics use with caution. Those who are prone to attacks of gout should avoid high doses of niacin.<sup>6</sup>

Do not use delayed or timed-release form which can cause liver damage.

Those who take statins, cholesterol-lowering drugs, should not take niacin except under the advice of a physician.<sup>1</sup>

B-3 NIACINAMIDE 500 mg 1 or ? a day

Niacinamide is not a vasodilator and cannot replace niacin. 3 to 18 grams of niacinamide with a like amount of ascorbic acid have been used in the treatment of mental disease. It is an essential part of two important coenzymes which are involved in several hundred enzyme systems. Used in the treatment of arthritis, diabetes and hyperactivity.<sup>17</sup> Delayed release type may be preferable. No known toxicity.

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B-5 PANTOTHENIC ACID 500 mg 2 + a day

Antioxidant. Essential for the conversion of choline to acetylcholine, conversion of fat and sugar to energy, synthesis of antibodies. Helps counteract allergies and regulate blood sugar level. Deficiencies related to hypoglycemia, duodenal ulcers, alcoholism,<sup>17</sup> peripheral neuritis (inflammation of nerve endings), blood and skin disorders. 1000 mg of B5 and 1000 mg of C with meals, twice a day, cured some allergies. The pantethine form (300 mg 3 times a day) lowers LDL cholesterol and triglycerides.<sup>27</sup> For rheumatoid arthritis, 2000 mg daily of pantothenic acid is recommended.<sup>27</sup> Destroyed by baking soda. No known toxicity.

B-6 PYRIDOXINE 200 mg maximum in divided doses

Riboflavin and magnesium required for converting pyridoxine to pyridoxal-5-phosphate. Oral supplements of pyridoxal-5-phosphate are poorly absorbed.<sup>27</sup> Enhances the utilization of zinc and magnesium. Involved in protein, fat and sugar metabolism, brain functioning, nervous and immune systems and will reduce allergies

when combined with B1 and B2. Prevents platelet clumping, calcium deposits, kidney stones, and gallstones. B-6 is a co-factor in the enzyme for cross-linking of collagen strands which increase the strength of connective tissue and bones.<sup>27</sup> It is also a co-factor for the conversion of amino acids tryptophan to serotonin and phenylalanine to norepinephrine, two neurotransmitters. Deficiency may result in carpal tunnel syndrome, osteoporosis and is a causative factor in asthma, arthritis, anemia, seborrheic dermatitis, glossitis, night leg cramps, arterial plaques and hand numbness. Homocysteinia is caused by deficiency of pyridoxine, cobalamin, and folate. Deficiency common in heavy drinkers and users of oral contraceptives.<sup>17, 27</sup> Sources are brewer's yeast, wheat bran, wheat germ, liver, cantaloupe, cabbage, blackstrap molasses, milk, eggs, and beef. See folic acid.

#### B-12 METHYLCOBALAMIN 500 mcg 1 or ? a day

Required for fat and carbohydrate metabolism and formation of blood cells. Deficiency results in mental confusion, anemia, homocystenia, brain damage, tinnitus, asthma, and depression. May benefit multiple sclerosis patients. Deficiency is widespread in people over sixty years of age. Blood test to determine B-12 level is recommended. Alcohol, estrogen, oral contraceptives, sleeping pills interfere with utilization. Natural sources are liver, beef, pork, eggs, milk, and cheese, except where soil is deficient in cobalt.<sup>19</sup> Needs calcium for absorption. Microwave cooking destroys B-12. In a study of 64 patients taking 500 mcg of oral B-12 daily the lowest absorption rate was 1.8 mcg. Since this is less than the 2 mcg daily requirement a 500 mcg dosage would be insufficient for some. In most cases the mean absorption rate is 1.2 percent of intake. No known toxicity.<sup>27</sup> For more information see "Oral Cobalamin for Pernicious Anemia, Medicine's Best Kept Secret", an editorial in the January 2, 1991 edition of the Journal of The American Medical Association.

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#### B-13 ORTIC ACID

Reported to be of value in preventing certain liver problems, premature aging, and in treatment of multiple sclerosis. Sources are root vegetables and whey. Available as calcium orotate.

BIOTIN 300 mcg a day

A B vitamin synthesized by intestinal bacteria and readily available from nuts, fruit, brewers yeast, liver, mushrooms, milk, brown rice and egg yolk. Enhances insulin sensitivity. Deficiencies related to increased cholesterol, skin eruptions, hair loss, graying hair, depression, anemia, insomnia, muscle pain, and weak nails. Supplements not normally required. No known toxicity. 1000 to 3000 mcg per day used to treat hair and nail problems. 3000 mcg taken twice daily by nursing mothers for treatment of cradle cap.<sup>27</sup>

C 1000 mg 4 to 20 + a day

Chelator and main antioxidant in the blood. It completely protects blood fats against peroxy free radical attack. It is the only antioxidant that can do this in the blood. Enhances the body's defense and healing mechanism, increases strength of scar tissue, reduces allergies, blood pressure and the effects of physical and mental stress, increases HDL/LDL ratio, and the production of collagen, lowers nitrosamines, blood clots, aids absorption of iron.

Protects liver from viral and bacterial infection. Stimulates the adrenal glands to form hormones such as cortisone, a natural anti-inflammatory substance, and epinephrine, a nerve stimulant. Prevents many cancers, arthritis, scurvy, cataracts, glaucoma, macular degeneration, periodontal disease and some degenerative diseases of the brain.

Several reports claimed that cancer can be cured by large doses of vitamin C taken either orally or intravenously. The collagen produced by vitamin C may encapsulate the tumor preventing its growth. Copper may also assist in the destruction of cancer cells. A gram of vitamin C per day lowers serum cholesterol by about 43 mg per deciliter<sup>16</sup> and a second gram will remove the guilt feeling and cholesterol that accompanies a five-egg omelet. Deficiency deters liver from converting cholesterol to bile. Destroyed by heat, alcohol, smoking, aspirin, estrogen, and oral contraceptives.

For some, the ascorbate form of vitamin C may be better tolerated

than ascorbic acid. Requires B6, B12, zinc, folic acid, choline and flavonoids for utilization. A correlation between low levels of ascorbic acid and high blood pressure has been reported. See lysine.

Excess vitamin C may have a laxative effect. When this point is reached the dosage can be reduced slightly and later the dosage can be increased. Others report that the laxative effect is temporary. It has been reported that the bowel-tolerance limit was more than 200 grams per day for severely ill patients. The body's requirement for vitamin C, and bowel-tolerance limit, will increase upon exposure to conditions that effect the immune system, such as infectious disease, injury, cigarette smoke, mental and physical stress. This makes it very difficult for one to determine when and how much to increase one's intake of vitamin C. By taking four or five times his usual intake, at the first symptoms, the author has been able to avoid all illnesses. Ascorbic acid and ascorbate forms of vitamin C are water soluble and are not stored in the body. Any excess over requirements is eliminated, mostly through the bladder where it destroys the carcinogens that cause bladder cancer.<sup>17</sup> The amount of vitamin C required varies from person to person by a factor of 20 to 100. Therefore it is impossible to specify a fixed amount that is correct for everybody. See ascorbyl palmitate.

#### D 400 IU 2 a day max

Needed for absorption of calcium and phosphorus. Amount required increases with age and a shortage is a link to osteoporosis. Vitamin D enhances the immune system, aids cell growth and maturation, inhibits cancer cell growth, inhibits the oncogene c-myc, decreases the risk of colon cancer.<sup>20</sup> A daily input of 100,000 to 150,000 IU can be tolerated by a healthy adult.<sup>25</sup> However there is no known need to much exceed 800 IU per day. Excess reported to cause calcium deposits, kidney stones and may interfere with magnesium absorption.<sup>27</sup>

#### E 400 IU 2 or 3 a day

Antioxidant, anti-aging, vasodilator, and chelator. Synergistic with selenium and vitamin A. Fat soluble, found in all body tissues. Increases oxygen carrying capacity of the blood. Helps prevent muscle damage resulting from vigorous exercise. Value in



the control of epilepsy seizure has been reported. Prevents and dissolves blood clots. Raises HDL/LDL ratio. Tests confirmed value for immunity, prevention of arthritis, cataracts, macular degeneration, fat accumulation in retina, and cancer. Cystic mastitis responds only to natural vitamin E.<sup>20</sup> Blocks conversion of nitrates and nitrites to nitrosamines. Applied externally to aid healing of burns. Destroyed by chlorinated water.

Natural E complex containing alpha, beta, delta and gamma tocopherols is available at health food stores. The gamma form may be more protective against heart disease.<sup>27</sup>

"Only the gamma form eliminates peroxynitrite, a highly destructive nitric oxide found at sites of inflammation. Peroxynitrite can start processes leading to cancer, MS and heart disease. Because alpha tocopherol supplementation suppress gamma tocopherol, a combination of the two that better reflects the ratio found in our diet may be more useful as a supplement than the formulations of vitamin E currently available. Gamma tocopherol is the principal form of vitamin E in the United States diet." Christen, S. et al, U.C. Berkeley, Proc. Natl. Acad. Sci., Apr, 1997. No known toxicity.

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### FOLIC ACID 800 mcg a day + ?

Folate deficiencies are common in infants and is crucial in fetal development in the first weeks of pregnancy.

"Folic acid reduces risks of neural tube defects in unborn babies, including spina bifida (incomplete closure of the spinal column) and the absence of all or part of the brain and skull." Jacob Selhub, senior scientist and professor at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University in Boston. (USA Today:10-26-98)

Reported to reduce neural tube birth defects by about 70 percent. (Science News:3-30-96).

Reported to reduce heart attacks and strokes by: "15 to 20 percent", Dr. J. Selhub, (New England Journal of Medicine:2-95), or by: "30 to 40 percent", Dr. J. Hall, Univ. of British Columbia.

"1 to 5 mg per day required to control homocysteine (HCY) levels in some people." (Harvard School of Medicine Research Lab:1995).

Folic acid has been shown to reduce HCY levels but vitamin B-6 and B-12 are also required. HCY interferes with vitamin C's attempt to repair artery walls, creates blood clots, and generates free radicals which oxidize LDL cholesterol allowing it to clog arteries.

"10 mg per day along with 500 mcg of B-12 reversed precancerous lesions in lungs induced by smoking, and reversed precancerous lesions of the cervix." C. Butterworth, MD (The Medical Post:12-23-86).

Folic acid deficiency causes cell changes that lead to cervical cancer. Several studies have also shown an inverse relationship between levels of beta carotene, vitamins C, vitamin E and cervical cancer.

Needed for utilization of sugar and amino acids, division of body cells, memory, and production of RNA and DNA, protein metabolism, red blood cells and may help prevent cataracts.

There appears to be a link between high HCY levels and osteoporosis. HCY levels are much greater in post menstrual than in premenopausal women. It has been reported that there is an increased requirement for folic acid after menopause. This requirement is much greater than the recommended dietary allowance. Cooking destroys some of the folate in food. Also destroyed by alcohol, aspirin, estrogen and oral contraceptives. Sources are dark green leafy vegetables, carrots, torula yeast, liver, egg yolk, cantaloupe, apricots, pumpkins, avocados, beans, whole wheat and dark rye flour. No known toxicity. See L-methionine, coffee, and inositol.

Do you suppose that folic acid will, in the future, reduce the need for partial birth abortions? How about educating our MDs and future mothers on the value of folic acid and other nutrients?

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INOSITOL 250 mg a day + ?

Prevented neural tube birth defects in lab animals that were susceptible to developing folate-resistant neural tube defects. (Sci. News 1-11-97). Lowers cholesterol, atherosclerosis, aids diabetics, helps with stress, hair growth, eczema, constipation, insomnia, and those taking antibiotics. Enhances effect of vitamin E. It is used by brain cells and is a chelator. Sources are lima beans, liver, wheat germ, brown rice, molasses, peanuts, cabbage, raisins, cantaloupe, grapefruit and lecithin. Coffee destroys inositol. No known toxicity.

K      50 to 100 mcg   a day                      (see note 9)

A small study has shown that patients with osteoporosis had vitamin K levels that were only 35 percent that of age-matched controls. Vitamin K supplementation reduced urinary excretion of calcium,<sup>6</sup> accelerated healing of fractures in animals and may enhance the immune system. Antibiotics destroy vitamin K producing bacteria in the intestine. Sources are green leafy vegetables, egg yolk, soybean oil, safflower oil. Requirement increases with age due to decreased absorption. Dosage greater than 500 mcg per day not recommended. Bile fats required for absorption. No reported toxicity.

P      BIOFLAVONOIDS      1000 mg   a day

Antioxidant, anti-inflammatory. Reduces capillary permeability. Not a true vitamin, no deficiency state has been established. Bioflavonoids consists of over 4000 different compounds. They increase the capillary (small blood vessel) strength and reduces bruising.<sup>27</sup> Rutin has been used to treat bleeding gums. May enhance the function and absorption of vitamin C, prevent heart disease, cancer, and has antiviral activity. Used in the treatment of allergies and asthma. Sources are the white skin and segment part of citrus fruits, red and yellow onions, apples, blackberries, cherries, apricots, red wine, green tea polyphenols and buckwheat. See proanthocyanidine and quercetin.

PABA      100 mg   2   a day

Para-aminobenzoic acid. Required for normal skin and hair growth and color. A metabolite of procaine (see DMAE). Sources are liver, brewer's yeast, whole grains, rice, bran, wheat germ, and

molasses. No known toxic effects but long term high usage not recommended.

## T

Helps in blood coagulation and the forming of platelets. Sources are sesame seeds and egg yolks.

## U

Plays a role in the healing of ulcers. Source is raw cabbage or cabbage juice. No known toxicity.

## NOTES

1. Linoleic acid found in polyunsaturated vegetable oils and diets high in omega-6 fatty acids reported to suppress immune response. Elimination of partially hydrogenated oils, fats, fried food, and certain polyunsaturated cooking oils from diet is recommended.

2. Zinc, copper, and manganese may create free radicals if taken with ascorbic acid. However, from reference 16, "The inactivation of the virus occurs only in the presence of free oxygen, as well as ascorbate, and is blocked by scavengers of free radicals.....Also the rate of inactivation is increased by even very small concentrations of copper ions. These facts indicate that ascorbic acid reduces the oxygen molecules to an odd-electron molecule (free radical), probably hydrogen superoxide, HO then attacks the nucleic acid of the virus."

2

Another report claimed there may be an anti cancer effect from the oxidation of copper by ascorbic acid. Some free radicals may serve a useful purpose.

3. Dosage greater than 10000 IU per day of vitamin A during the first 7 weeks after conception caused birth defects. Women who are at risk of becoming pregnant should keep their supplemental

27

vitamin A intake below 5000 I.U. or better yet, take carotenes. 100,000 IU per day can be tolerated by adults with no serious side effects but children who ingest 50,000 IU per day do show

toxicity.<sup>25</sup>

4. This from a medical journal on oral contraceptives: "Levels of pyridoxine, folic acid, and most other B vitamins as well as ascorbic acid, calcium, manganese, and zinc, are decreased while vitamin A levels are increased. These changes have no known clinical significance and women taking oral contraceptives do not need vitamin supplements." How about mineral supplements? Are they saying, "What we don't know won't hurt you?"

5. There are nine essential amino acids that cannot be synthesized by the body, and must be present in the food that is ingested. They are threonine, valine, methionine, lysine, histidine, phenylalanine, tryptophan, isoleucine and leucine.

6. Antioxidants intercept free radicals before they damage cells. The mechanism for this as reported by T.G. Truscott of Keele University in England may explain the results of studies which show that beta carotene increases cancer in smokers. First vitamin E restores free radicals to their harmless state but in the process vitamin E becomes damaged. Beta Carotene then restores the vitamin E to its original state but in the process it too is damaged. Vitamin C then repairs the carotene radical and being water-soluble the vitamin C free radical is washed out of the body. Since smoking destroys vitamin C most smokers would not have enough of this vitamin to protect them from the carotene radical. (Science News:2-15-97)

7. On cholesterol, a report from the Netherlands claims that in people 85 years and older the risk of dying during a 10-year study fell by 15 percent for each additional 39 mg/dl increase in their cholesterol. Cholesterol readings ranged from less than 200 mg/dl (for 24%), 200 to 250 (48%) to over 250 for the remainder of the group. (Science News 10-25-97)

8. Patients wearing copper bracelets absorbed 13 milligrams of copper per month. Absorption through the skin is more efficient than dietary absorption of copper and could explain their reduced arthritic pain.<sup>20</sup> Blood copper level should be monitored.

9. Those taking blood thinners should not take vitamin K unless under the supervision of a physician. See note 10 below.

10. Always consult a competent physician before using any of the nutrients listed herein. For information on publications in the field of Smart Pills write to:

Cognitive Enhancement Research Institute,  
P.O. Box 4029,  
Menlo Park, CA 94026.

For a list of those specializing in use of nutritional supplements and new therapies write:

American College of Advancement in Medicine  
23121 Verdugo Dr., Suite 204, Laguna Hills, CA 92653  
(714) 583-7666 or search for ACAM on WWW and then use  
area code to find one in your area. email [acam@acam.org](mailto:acam@acam.org)

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\* These references are highly recommended. Others are of value  
also.

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