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Choosing Supplements

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Introduction

The *Journal of the American Medical Association* suggested in 2002 that the time had come where virtually everyone should supplement the diet for prevention of chronic disease. This paper discusses the reasons why quality is important in supplementation if one expects to obtain the full range of benefits supplements have to offer.

The principles of supplement selection discussed here can be applied to selection of foods. Foods should be free from toxin contamination, they should not be fragmented, and they should be selected and prepared for optimal content of the widest possible spectrum of nutrients.

References:

Fletcher, Robert H., and Fairfield, Kathleen M., Vitamins for chronic disease prevention in adults, *JAMA*, 2002;287:3127.

Free from Contamination

The first aspect of quality in both foods and supplements is that they be free from contamination and do no harm. This is often referred to as quality control.

People generally assume that supplements and foods are safe. The problems are more common than one would think. An examination of 23 calcium products in 2000 found that 8 were contaminated with lead.

Lead can occur in other supplements as well. Doctor's Data identified one ayurvedic herbal product with 56,185 mcg/gm of lead. This discovery came about as a physician was trying to help a very sick patient who thought taking large quantities of this herb would improve his health!

Colloidal mineral products can be contaminated with aluminum. Dr. Alexander Schauss found one colloidal product which had 272 mg of aluminum per liter.

Even food based products must be checked for contamination. In 2011 mice were divided into two groups. One group of animals was fed salmon contaminated with Persistent Organic Pollutants (POP's). These are contaminants found almost everywheree in the environment. Another group of mice was fed salmon which were pollution free. The mice fed the contaminated salmon developed several metabolic disorders linked to type 2 diabetes and obesity. The animals fed the pollution free salmon showed only benefit from the supplementation.

In 2007 blood levels of six common POP's were assessed in a population. The 10 percent of the population with the highest levels of these pollutants had 38 times more diabetes than the 25 percent with the lowest blood levels of the pollutants.

The NeoLife supplements are manufactured using carefully developed quarantine and quality control procedures. Toxicological protocols established by Dr. Arthur Furst, one of the founders of the American College of Toxicology, are also in place. Calcium products have always been tested for lead contamination and fish oils receive careful scrutiny.

References:

. "Lead still in calcium supplements," CNN.com, Sept. 20, 2000.

Quig, D.W., and Crinnon, W., "Clearance of lead from a patient with lead poisoning from Ayurvedic herbs," 2006, IAACN Conference, San Diego

Schauss, Alexander, Ph.D., Colloidal minerals: Clinical implications of clay suspension products sold as dietary supplements, *American Journal of Natural Medicine*, Vol. 4, No. 1, January/February 1997, 5-10.

Ibrahim, M.M., et al., Chronic consumption of farmed salmon containing persistent organic pollutants causes insulin resistance and obesity in mice, *PLoS One*, 2011; 6(9):e25170.

Gaby, Alan, *Townsend Letter for Doctors*, May 2007, 131.

Human Food Chain

Supplements derived from foods humans have a history of eating have an extra margin of safety.

Spirulina products have never been a normal component of the human food chain. An article written by aquatic toxicologist Wayne Carmichael in 1994 warned that spirulina is potentially contaminated with neurotoxins and liver carcinogens. He wrote, "the toxicity of many chemicals produced by cyanobacteria is undeniable. For this reason, I am becoming increasingly worried by a modern fad: the eating of cyanobacteria from the genus Spirulina as a health food."

Noni juice is a popular supplement, but has never been used by humans as a food. The French food safety authority issued a warning to consumers to avoid consuming more than 30 ml of the juice at a time as it could pose a hazard for hepatitis.

Krill is widely promoted as a source of omega-3 fatty acids although it has never been consumed by humans. Jacques Cousteau shared his own experience with using krill as a human food, "Fishery spokesmen wax ecstatic: With krill we can triple our catch; with krill we can feed the hungry. Good luck to them. In the Antarctic we caught fresh krill, fried them, ate them, and instantly suffered diarrhea." Krill is also promoted for its content of astaxanthin. The form of astaxanthin is different in structure, however, for that in salmon.

References:

Carmichael, Wayne, The Toxins of Cyanobacteria, *Scientific American*, January 1994, 78-84.

Millonig, G., et al., *European Journal of Gastroenterology and Hepatology*, 2005; 17:445-7.

Cousteau, Jacques, and Schiefelbein, Susan, *The Human, the Orchid, and the Octopus*, New York: Bloomsbury, 207, 176.

http://www.astaxanthin.org/chemforms.htm

Completeness

It is preferable to supplement with whole nutrient complexes or families rather than isolated nutrients. There are several reasons for this.

Locality & Specificity of Action

Nutrients have an affinity for specific tissues and have very specific forms of activity in body tissues. An example is the carotenoids lutein and zeaxanthin.

Richard Young, professor emeritus at UCLA and member of the Jules Stein Eye Institute, writes, "…lutein and zeaxanthin are found in relatively large amounts, concentrated in the yellow spot (macula lutea) directly in the center of the retina, where visual acuity is greatest. This is precisely the region of degeneration and visual loss in AMD (age related macular degeneration)."

"The xanthophylls appear to have the triple function of (1) absorbing violet/blue light before it can damage the visual cells and retinal pigment epithelium (the cells which deteriorate in AMD), (2) acting as retinal antioxidants, and (3) being situated in just the right place for protection against AMD—front and center in the retina."

The localization of lutein and zeaxanthin in the eye is even more specific than Young suggests. One paper describes how lutein appears to have an affinity for the peripheral retina and rods in the eye, while zeaxanthin is preferentially taken up by the cones of the macula.

Localization of other carotenoids has also been demonstrated. Lycopene protects the prostate. Astaxanthin protects the mitochondria where energy is produced. Alpha-carotene has been shown to have a very specific anti-tumor activity where the n-myc oncogene is involved. Researchers reported, "...alpha-carotene apparently inhibits cancer growth by locking malignant cells into the rest phase of their growth cycle. And they remain in this sort of suspended animation until the effects of the carotenoid begin wearing off."

References:

Young, Richard, Personal Communication.

Lutein and Zeaxanthin, *Alternative Medicine Review*, 2005; 10(2), 128.

Raloff, J., Colorful Cancer Protection, *Science News*, November 4, 1989, 294.

Competitive Absorption

At this point about 50 different carotenoids have been identified in human foods. It is significant that large amounts of one carotenoid can depress levels of other carotenoids. Preserving the integrity of nutrient families is rarely considered in supplement formulation.

One research study on three carotenoids found the following: "...the dietary intake of large amounts of any one of the three carotenoids depressed the concentrations of the other carotenoids in plasma and most tissues. The high lutein supplement decreased levels of zeaxanthin; the high zeaxanthin supplement decreased lutein levels; and the high beta-carotene supplement decreased levels of both lutein and zeaxanthin. In the face of these dietary perturbations, the retinal content of lutein and zeaxanthin varied considerably."

Stephan Christen, a researcher at U.C. Berkley, was one of the first individuals to demonstrate the phenomenon of competitive absorption. He supplemented animals with large quantities of isolated alpha-tocopherol, the most common form of vitamin E in supplements. Christen found that alpha-tocopherol administered by itself depleted levels of gamma-tocopherol, a different member of the vitamin E family which plays an important role in detoxification and cancer prevention.

Many vitamins and minerals can compete with one another and elaborate diagrams of this kind of activity

are readily available. The phenomenon of competitive absorption is much more likely in synthetic formulations than in food based nutrients.

References:

Wang, Yingming, et al., Competitive inhibition of carotenoid transport and tissue concentratios by high dose supplements of lutein, zeaxanthin and beta-carotene, *Eur J Nutr*, 2010; 49:334.

Christen, Stephan, et al., γ-tocopherol traps mutagenic electrophiles such as NO_x and complements α-tocopherol: Physiological implications, *PNAS*, April 1, 1997; 94(7):3217-3222.

Contingent Factors

Food based supplements have the advantage of providing not only the 21 vitamins and minerals considered essential, but also a wide variety of contingent factors and nutrients not yet recognized as being essential.

Between eight and ten of the 22 amino acids are considered essential for a healthy individual. Non-essential amino acids can become significant if one is ill or under stress or engaging in vigorous athletic competition. Michael Colgan notes that the human body holds onto amino acids better when essential and non-essential amino acids are combined. Chaitlow writes, "Recent research, however, has questioned the concept of essential and non-essential amino acids… it is now known that, under certain conditions, any amino acid can become essential."

Nutritional authorities have not yet identified a single phytonutrient as being essential. Some of them probably are. Without a doubt carotenoids, flavonoids, polyphenols, and cruciferous compounds can make a valuable contribution to prevention of chronic diseases.

Only one member of the omega-3 family of fats has been tagged as being essential (ALA). Research has clearly identified EPA and DHA as having valuable health benefits and preliminary research suggests that others like DPA may play important roles in health as well.

References:

Colgan, Michael, *Optimum Sports Nutrition*, (New York Advanced Research Press), 1993, pp.160-161.

Chaitow, Leon, *The Healing Power of Amino Acids*, Wellilngborough, England: Thorsons Publishing Group, 1989, p. 23.

Bioavailability

It is not enough that a supplement or food contain valuable nutrients. They must also be available for use by the body.

Protein

The government has a standard for bioavailability of protein products. It is called PDCAAS or Protein Digestibility Corrected Amino Acid Score. A perfect score is 1.0, a standard which most supplements fail to achieve. All NeoLife protein products meet this standard or surpass it. For example, the NeoLife Shake has a PDCAAS of 1.73, far superior to any other product this writer has seen. This superior bioavailability is achieved with the Protogard Process which involves breaking the protein down with enzymes at body temperature.

Tre-en-en

Tre-en-en is an extract of the biologically active lipids and sterols removed from whole grains and legumes in the process of making processed foods (white rice, wheat flour, and tofu). This supplement was extensively studied over a period of 12 years and shown to optimize cellular health. The important point here is that researchers discovered that nutrient bioavailability was compromised at the level of the cell membrane when these nutritive factors were missing from the diet. Adding Tre-en-en to the diets of rats improved overall nutrient utilization by 50%.

References:

http://www.gnldcontent.com/pages/BusinessGuide_CD1005/GNLDBusTools_WEB/content/pdf/PRODUCTS/NUTRITIONALS/TREENENGRAIN.PDF

Carotenoid

NeoLife Carotenoid Complex, unlike most carotenoid supplements in the marketplace, is derived from foods one would normally eat. Bioavailability of Carotenoid Complex was assured by developing testing to assess blood levels of carotenoids. The supplement was then given to test subjects and changes in blood levels measured. It was this assurance of bioavailability of the supplement which resulted in the choice of this product by the U.S. Department of Agriculture for evaluation of the benefits of carotenoids for health.

USDA studies showed that this specific product enhanced immune function as measured by production of white blood cells by 37% in 20 days. The component of the immune system that keeps cancer cells under control (natural killer cells) was enhanced by 20%. The researchers also demonstrated that the supplement increased antioxidants in blood cholesterol five-fold and reduced oxidative damage to cells by 44%.

Carotenoids have limited bioavailability in foods. NeoLife has patented a technology called the Nutrimax process which assures carotenoids are bioavailable. The carotenoids are handled in a nitrogen environment and placed inside a black gelatin capsule to protect them from light and oxygen. They are blended with olive oil to enhance absorption. One bottle of Carotenoid Complex will deliver the amount of carotenoids one would obtain by eating 250 pounds of raw fruits and vegetables.

References:

Kramer TR; Burri BJ. Modulated mitogenic proliferative responsiveness of lymphocytes in whole-

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blood cultures after a low-carotene diet and mixed-carotenoid supplementation in women. *American Journal of Clinical Nutrition*. Vol. 65(3): 871-875, Mar. 1997.

Salmon Oil Plus

One of the problems with supplementing with the omega-3 family of fats has been the tendency to burp oils or develop nausea. NeoLife has developed a technology called molecular differentiation which makes it possible to remove toxins, rancidity factors, fishy smell, and also to standardize for the entire omega-3 family. This product also contains a Ultra-High Potency Omega-3 Concentrate (UHPO3) which greatly reduces the size of the capsule while providing the same quantity of beneficial oils in a much larger capsule. The capsule size minimizes difficulty in swallowing the supplement and also the tendency to burp fish oil.

Human clinical trials have shown the bioavailability and effectiveness of NeoLife Salmon Oil Plus. Three capsules a day for 8 weeks lowered triglycerides 17%, raised the total omega-3 index to levels associated with the "zone of greatest protection" from cardiovascular disease, and lowered the inflammatory index by 68% indicating reduced risk for developing inflammatory conditions,

NeoLife has participated with Karsten Gronert in the unveiling of key mediators of the inflammatory response called resolvins and protectins. Put simply, the inflammatory response can not function normally without adequate intake of omega-3 fatty acids.

References:

Carughi, A. Effect of Omega-3 fatty acid supplementation on omega-3 index and red blood cell (RBC) membrane fatty acid composition. Annual meeting of Experimental Biology, April 2008.

Carughi, A. Effect of Omega-3 supplementation on markers of cardiovascular health and inflammation. *Journal of American College of Nutrition*; October 2008.

Carughi, A. Effect of Omega-3 fatty acid supplementation on cardiovascular risk factors and inflammatory markers. Annual Linus Pauling Institute's Diet and Optimum Health Conference, May 2009.

http://www.gnldcontent.com/omega3/us/index.html

Results

If you were to ask a scientist how you could duplicate the results of an experiment which he had conducted he would respond that you needed to follow the same protocols he did and use the same formulations. The supplement formulations discussed here have been tested in both animal studies and human trials and shown to produce beneficial changes in health. One should not expect the same results from other supplements from different raw materials and developed using different technologies.

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www.yourbodyssignlanguage.com

www.jimmcafee.com

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