

# True Health

Bi-Monthly Newsletter of Carotec, Inc.

March/April 2008

## New Lutein/Zeaxanthin For Vision Care Now Available

*By Tom Valentine*

In the everyday world, vision is considered the most important of all our senses and wise people strive to protect their eyes and vision at all times.

Now comes something new, and good – and another major change has come to nutrition science. Get ready to become familiar with zeaxanthin, pronounced zee-uh-zan-thin, and a new trademarked name: EZ Eyes™.

Not all the famous dietary carotenoids – lutein, beta-carotene, alpha carotene, lycopene and zeaxanthin – are equal and *True Health*, as usual, brings you the story.

Science has known for the last 30 years or so that lutein and its molecular soul mate zeaxanthin have been the nutritional pathway to optimal eye health. And for a long time, Carotec's excellent Carotenoid formula provided 6 milligrams of lutein and 258 *micrograms* of zeaxanthin in each softgel capsule. A microgram is exponentially smaller than a mg, being a millionth of a gram

while the mg is one/thousandth of a gram.

Now a tremendous advancement has been made. Carotec is announcing a new EZ Eyes™ lutein/zeaxanthin formula to be available after April 1, 2008. The new softgel capsules will contain at least 15 mg of lutein and nearly 5 mg of zeaxanthin.

We are replacing our present Mixed Carotenoid formula with two new products. EZ Eyes™ will be joined by our new Lycopene Plus formula, which will contain 15 mg of Lycopene, 5 mg of alpha carotene and 10 mg of beta carotene.

A 2003 study conducted by Duke University reported that half of American people over the age of 65 eventually develop one of three major eye diseases: Glaucoma, Diabetic Retinopathy or Age-Related Macular Degeneration (AMD).

So, as the Baby Boomer generation reaches their late 50s and early 60s, the focus has been on visual impairment and eye health. It's no secret that getting older deteriorates vision,

so today many Americans are finding themselves suffering from severe eye problems.

Zeaxanthin, in combination with lutein, is a critical nutrient complex for eye health that can help guard against vision problems such as Age-Related Macular Degeneration (AMD) and cataracts. Zeaxanthin and lutein molecules, both derived from marigold flowers, always exist in tandem, but the ratios differ.

A typical marigold flower carotenoid profile is 80 percent lutein and 5 percent zeaxanthin. However, decades of special cultivation (but not genetic tinkering or modification) has resulted in a wide range of proprietary zeaxanthin-lutein marigolds with profiles that range from 75 percent zeaxanthin and 5 percent lutein to 50 percent zeaxanthin and 50 percent lutein. Chrysantis' branded extracts are called EZ Eyes™.

Zeaxanthin is a dietary carotenoid found predominately in the brain and in the macula, the central part of the retina in the eye that is responsible for most fine vision. Zeaxanthin and

lutein are critical nutrients for eye health and can help guard against age-related vision loss. Also, the recently discovered potential new benefit of zeaxanthin to help prevent cognitive dysfunction and aid in the prevention of such diseases as Alzheimer's is a significant development. New research has shown a link between zeaxanthin and cognitive function. EZ Eyes™ zeaxanthin, made from marigolds, is the only natural free zeaxanthin on the market and is the same form of zeaxanthin found naturally in fruits and vegetables. There are synthetic versions on the market.

When the Association for Research in Vision and Ophthalmology held its annual conference late in 2007, a record 10,250 people attended the conference. Attendees were presented with the latest advances in the fields of Clinical and Epidemiological Research, Retinal Cell Biology, and Biochemical and molecular biology, among others.

"This is the first time we

have seen so many important papers and posters about zeaxanthin and its role in eye health being presented at the conference," a conferee reported. The value of lutein has been thoroughly documented by clinical research.

Researchers talked about how zeaxanthin supplementation could be part of a therapy to inhibit the development of retinopathy in diabetics. Which is very important because of the growing number of type 2 diabetics.

It is well documented that people with diabetes have 25 times greater risk for blindness from cataracts, glaucoma, and macular degeneration and that diabetes is the leading cause of new cases of blindness among adults 20 to 74 years of age. The work presented by Dr. Gierhart and Dr. Kowluru at the ARVO conference showed that zeaxanthin supplementation to diabetic rats inhibited the increase in retinal oxidative stress and nutritive stress that is associated with the pathogenesis of retinopathy in diabetics.

Also, the scientists talked about how long-term use of statins to lower cholesterol might decrease the density of the macular pigment. This is especially interesting because macular pigment is composed of zeaxanthin and lutein. Millions of Americans now take statin drugs.

Based on the fact that statins change serum lipid concentrations and that the serum

lipid fractions do transport zeaxanthin and lutein to the retina, Dr. Renzi et al wanted to see if altering lipid serum concentrations influence macular pigment levels. They learned that macular pigment concentration was inversely related to duration of statin use.

Just as it is recommended statin users supplement with CoQ-10 because the drug depletes the nutrient, so it is recommended they also supplement with EZ Eyes™

Researchers also discussed how people with high lutein/zeaxanthin intake had 30% reduced likelihood of developing moderate or mild cataract.

Additionally, recent research indicates that zeaxanthin supplementation is particularly important for women; this is being recognized by the National Eye Institute, which is sponsoring a study called: *Carotenoids and Age-Related Eye Disease in Women's Health Study*.

A study by the Lewin Group in 2005 determined that by taking certain dietary supplements, specifically, lutein with zeaxanthin, and omega 3 fatty acids (Krill Oil), senior citizens can lead healthier, more productive and more independent lives resulting in more than \$5 billion in savings to the Medicare system over five years in reduced hospitalizations and physician services.

The study identified visual impairment as one of the top reasons elderly people lose their independence. It is both common, with 35 percent of

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Carotec Inc.  
P.O. Box 9919  
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239-353-2348

individuals aged 75 and older having Age-Related Macular Degeneration (AMD), and costly. The study uses as an example the fact that eighteen percent of all hip fractures among seniors are attributed to age-related vision loss. The decreased independence resulting from loss of vision places a significant financial burden on the person, their family and the entire health care system.

The Lewin Group estimated a \$2.5 billion net savings over five years (2006-2010) from a reduction in the relative risk of AMD through daily intake of 6-10 milligrams of lutein with zeaxanthin.

The demand for supplements to preserve vision reflects how concerned people are about eye health, as evidenced by the results of a study conducted at the Boston University School of Public Health two years ago. Researchers found supplements with lutein to be the most commonly used natural dietary supplement in all age groups (*Archives of Internal Medicine* 2005; 165: 281-286).

It has been long known that lutein could prevent the degeneration of the macula but in 2004 a study published by the North Chicago VA Medical Center indicated that the popular supplement could *reverse* some symptoms of age-related macular degeneration.

The study was dubbed LAST, Lutein Antioxidant Supplementation Trial, and featured the material used in

Carotec's Mixed Carotenoid formula.

It was the first trial to record actual improvement in several key areas of visual function with AMD patients.

Dr. Stuart Richer of the VA Center and associate professor at the Illinois College of Optometry headed the study involving 90 patients from the VA Center.

Prior to this small but elegant clinical study it was believed lutein and other antioxidants such as vitamin A, vitamin C, vitamin E, and beta carotene were merely preventative in reducing the risk of AMD.

Dr. Richer said, "This is by no means a cure, but the study showed improvement among several disease symptoms in AMD patients."

Patients taking the lutein supplement experienced significant improvements versus placebo in several objective measurements of visual function including glare recovery, contrast sensitivity, and visual acuity. Patients also experienced a 50% increase in macula pigment density relative to those on placebo.

Patients in the trial were given 10 mg of lutein, or 10 mg of lutein with mixed antioxidants, or placebo daily for one year.

The average American is said to ingest between one and two mg of lutein daily.

Now there is EZ Eyes™ adding fuel to the vision supplement fires.

## China: Cheap Nutrients Far Costlier In Long Run

It was hard to miss the news about tainted heparin from China in recent weeks, just as it was hard to miss many news stories about shoddy quality controls and business before safety and common sense in toy manufacturing in China during the holiday season.

Quality control and product testing cost money and short-cutters seem to try almost anything to get mere pennies per unit price advantage – and hang the thought of inferior materials being consumed.

Our "consumer" oriented society, in which price is generally the prime concern, has evolved a junk-food, junk-supplement world that is helping chronic metabolic disease break the bank. The only thing costlier to our society than chronic disease is chronic war.

At Carotec we have warned against the preponderance of cost-cutters in the nutritional supplement industry for decades. We have proudly searched the world to provide only high quality, more costly nutrients for nearly a quarter of a century.

Shaving pennies off the supplement budget can lead to very, very expensive often tax-supported catch-up measures.

# More New Studies Bolster Vitamin D Supplementation

A year ago we were the first supplement company to break the mythical “fear barrier” when it comes to vitamin D and vitamin A by breaking the news that the establishment’s propaganda about these two fat-soluble vitamins was flat out wrong.

In recent months study after study has popped out supporting the idea of taking vitamin D supplements for optimal health and I’m going to run through several of them, but first a reminder of what we said in the May/June 2007 issue of *True Health* to stimulate your memory:

*Insufficient levels of vitamin D have been linked to an amazing number of disease conditions including high blood pressure and heart disease, osteoporosis and rickets, multiple sclerosis, lupus, psoriasis, tuberculosis, diabetes, rheumatism, Crohn’s disease, depression and a number of different forms of cancer, including breast, prostate and colon cancers.*

*And now we learn that our immune systems are so dependent on vitamin D that it offers an explanation for why influenza and colds are “seasonal” diseases.*

*Many biologists and medical experts are saying that the “seasonal stimulus intimately*

*associated with solar radiation” is the reason colds and especially influenza are more common in winter months.” The formula is simple – less sunlight exposure equals less vitamin D equals less immune system quality.*

*The technical abstract of a paper written by Dr. John Cannell director of the Vitamin D Council said it this way:*

*“(Vitamin D3) acts as an immune system modulator, preventive excessive expression of inflammatory cytokines and increasing the oxidative burst potential of macrophages. Perhaps most importantly, it dramatically stimulates the expression of potent antimicrobial peptides, which exist in neutrophils, monocytes, natural killer cells, and in epithelial cells lining the respiratory tract where they play a major role in protecting the lung from infection...”*

*Clinical studies have verified the connection between low levels of vitamin D and seasonal infections.*

*Vitamin D is not a vitamin at all. It’s a steroid hormone necessary for robust health. The human body makes it from sunlight and diet provides it from fatty animal foods – nevertheless, the evidence is overwhelming – modern*

*American bloodstreams are generally deficient in cholecalciferol (D3), which is the form this steroid takes when made from sunlight and cholesterol.*

*We did it to ourselves with food and lifestyle changes, including the general acceptance of the notion that animal fat and cholesterol are “bad” and should somehow be eliminated. The theory was wrong and the anti fat and cholesterol campaigns have taken a toll from vitamin D levels.*

*On top of the avoid-fats-phobia, we have also been told that sunshine is a killer so we go out of our way to screen the rays and shade our heads. No wonder a dietary supplement is needed.*

*Vitamin D not only bolsters immunity, it helps the body regulate the transport of calcium from the digestive system through the bloodstream and to the bone. It also assists in the retention of calcium and phosphorus, which are crucial metabolic minerals.*

*However, another widely believed notion plays a role in our general deficiency – we have been told over and over again that vitamin D supplementation can be dangerous, even deadly if we somehow get too much. This is hype from the*

*folks who hate and fear supplements for various reasons.*

Okay, we're up to speed, now for the recent research.

The association between bone loss or osteoporosis and vitamin D has long been established. A recent study involving 2,924 osteoporosis patients seeking advice from the Bone & Mineral Research Laboratory, Henry Ford Hospital, Detroit found that vitamin D depletion was highly prevalent.

The study took place over five years and the mean age of the patients was 68.3 years. 72% of them were found to have insufficient levels of vitamin D with men and blacks having a higher prevalence of insufficiency. The researchers found that the prevalence of vitamin D insufficiency in these patients was "high, and did not change over the 5 years of the study."

A review article in the *Orthopedic Nurse Researcher*, St. Luke's Episcopal Hospital, Houston, Texas looked at the prevalence, implications of, and treatment for suboptimal vitamin D status in both hospitalized patients and the general population.

Suboptimal or insufficient vitamin D status was found to be quite prevalent in both populations, and supplementation with 50,000 IU/day of vitamin D was found to be an inexpensive, safe, and effective treatment to replete vitamin D status.

Data was gathered from a literature review using PubMed

and CINAHL, as well as results from the authors' recent prospective study involving 100 hospitalized patients and 51 non-hospitalized subjects. Results found that poor vitamin D status – ranging from suboptimal to overt deficiency – was common to hospitalized patients and ostensibly healthy members of the general population.

Suboptimal vitamin D status was found to be associated with muscle weakness, functional deficits, and longer length of stay in hospitalized patients. Race, poor nutrition, advanced age, use of multivitamins, UV light exposure, and grip strength were found to be predictors of vitamin D status.

"Supplementation with 50,000 IU per day vitamin D for several weeks was found to be effective at normalizing vitamin D status. The authors of this review conclude, "Improving vitamin D status may improve a patient's functional ability, therefore decreasing falls and preventing fractures, decreasing length of stay in the hospital, and decreasing the cost of health care. Providers can potentially improve the life of older adults by educating patients on the importance of vitamin D supplementation."

Well, hear, hear! But why wait till you're hospitalized?

Going from geezers to infants there were two studies of vitamin D and pregnancy/new borns in the recent literature.

From London came a study suggesting that vitamin

D supplementation when a person is an infant appears to program long-term immune response actually helping to prevent pre-eclampsia when the infant matures and becomes pregnant.

In a study involving data from 2,969 women, risk of pre-eclampsia was significantly reduced among participants who had received supplementation with vitamin D during the first year of life.

"Subjects were women born in the Northern Finland Birth Cohort 1966. In this cohort, 68 of the women (2.3%) developed pre-eclampsia during their first pregnancy. Even after adjustment for birth order, birth weight, gestational age, social class in 1966, hospitalizations or pregnancy-induced hypertension of their mothers, the risk of pre-eclampsia was reduced by half among participants who had received supplementation with vitamin D during the first year of life."

The authors discuss the role of the balance between T helper cells (Th1 and Th2-type cytokines) in the development of pre-eclampsia. Late development of pre-eclampsia appears to be dominated by Th1 response, while vitamin D appears to favor Th2 domination, suggesting a possible mechanism by which vitamin D may protect against pre-eclampsia.

The authors conclude, "Together with earlier observations on a reduced risk of type 1 diabetes after vitamin D supplementation, these data

suggest that vitamin D intake in infancy may affect long-term programming of the immune response pattern.”

And this research from Istanbul, Turkey: In a hospital-based case-control study involving 25 newborns with acute lower respiratory infection (ALRI) and their mothers (study group), and 15 healthy age-matched newborns and their mothers (control group), results indicate that serum vitamin D levels in newborns may be inversely associated with the risk of ALRI, and positively associated with *maternal* serum vitamin D concentrations.

The mean serum vitamin D concentrations in newborns and their mothers study group were significantly lower than those in newborns and their mothers in the control group. Additionally, a strong positive correlation was observed between maternal and newborn serum vitamin D concentrations. 87.5% of newborns and 67.5% of mothers had serum vitamin D concentrations lower than 20 ng/ml.

Thus, the authors of this study conclude, “Our findings suggest that newborns with sub-clinical vitamin D deficiency may have an increased risk of suffering from ALRI. The strong positive correlation between newborns’ and mothers’ vitamin D concentrations shows that adequate vitamin D supplementation of mothers should be emphasized during pregnancy especially in winter months.”

Let’s not forget blood pres-

sure. Published in the *Journal of Clinical Nutrition*, the Third National Survey of Health and Nutrition found an inverse association between vitamin D blood levels and high systolic blood pressure in normal white subjects.

The evaluation of 4,663 white men and 3,036 black subjects who apparently had “normal” blood pressure found the statistically significant association in younger white males.

“This association was not statistically significant when age was included in the model, nor was it significant in the black subpopulation. However, the age-associated rise in systolic pressure was observed to be 20% lower in white participants who had sufficient circulating concentrations of vitamin D compared with white participants having vitamin D concentrations less than 50 nmol/L.”

Only 8% of blacks had vitamin D concentrations more than 80 nmol/L. Thus, the authors concluded that this observation provides a rationale for studies on the potential effects of vitamin D supplementation as a method to reduce systolic blood pressure in persons at risk of hypertension.

Finally there have been studies on vitamin D in the system and the risk of breast cancer. Out of Heidelberg, Germany two population-based case-control studies found vitamin D was *significantly* inversely associated with breast

cancer risk. The first study involved 278 premenopausal women with breast cancer and 666 age-matched controls. The second study had 1,394 subjects with breast cancer and 1,365 controls (between the ages of 50 and 74).

Vitamin D supplementation is very wise, indeed.

## *Mercury In Vaccine Is Conceded In Autism Case*

“The government has not conceded that vaccines cause autism,” stated a lawyer for the Feds, who continue to maintain that thimerosal mercury in vaccines does not cause autism, just as they conceded that childhood vaccines in one case worsened a child’s condition ultimately leading to autism.

The government maintains a “federal-vaccine- injury” fund and a recent concession allowed the family of a Georgia girl to receive compensation.

While numerous researchers have given solid evidence against the mercury-based thimerosal used in vaccines, the government has refused to face many apparent facts in this issue that threatens to cost taxpayers millions if the truth wills out.

# Reports & Comment

*The following briefs are taken from various technical journals and other sources by True Health editor Tom Valentine. The reports are invariably laced with the editor's strong opinions—therefore it has become a regular feature.*

## ***Vitamin C Every Day Supported By Research***

No sooner have we come up with our new and improved Vitamin C Plus product than researchers are publishing new studies on the value of vitamin C supplements.

A study out of India looked into the effect of vitamin C of levels of blood sugar, serum lipids (tryglycerides) and levels of insulin in the blood.

They observed 84 patients (mean age: 52.3 years) with type 2 diabetes supplementating with 1000 mg/day of vitamin C for a period of 6 weeks.

Subjects were randomly divided into 2 groups. One group received 500 mg/day vitamin C while the other group received 1000 mg/day vitamin C, both for a period of 6 weeks.

Subjects who received 1000 mg/day vitamin C showed significant decreases in fasting blood glucose, triglycerides,

LDL cholesterol level, and serum insulin levels. While subjects who received 500 mg/day did not show any significant improvements in glucose, insulin, and lipid levels, The authors conclude, "...Supplementation with 1000 mg/day of vitamin C in addition to the normal diet and treatment schedule may help in improving plasma glucose and lipid profile in patients with type 2 diabetes. This, in turn, may reduce the risk of micro- and macro-vascular complications associated with diabetes."

We have strong reasons to believe the results would have been more significant had the 500 mg version been our new Vitamin C Plus. We can expect more studies using our material in the near future.

The second study comes out of Cambridge University Gerontology Unit in Cambridge, UK.

The summary reads as follows – imagine a crisp British accent:

"In a population-based, prospective study involving 20,649 men and women aged 40-79 years without preva-

lent stroke at baseline, results indicate that higher plasma vitamin C concentrations may be associated with a lower risk of incident stroke. During a mean follow up of 9.5 years, 448 incident strokes were recorded. Using a Cox proportional hazards model adjusted for potential confounders, subjects in the upper quartiles of baseline plasma vitamin C concentrations showed a 42% reduced risk of incident stroke, compared with subjects in the lowest quartile..."

The authors of this study concluded that plasma vitamin C concentrations may serve as "a biological marker of lifestyle or other factors associated with reduced stroke risk and may be useful in identifying those at high risk of stroke."

In other words, supplement with a top-notch vitamin C like ours and keep your blood levels nice and high for optimal health.

# ***Junk in Food Is Linked To Hyperactivity In Children***

Observing 153 children aged 3 and 144 aged 8/9, researchers determined that common food additives such as sodium benzoate and artificial food coloring increased the risk of hyperactivity.

The study was titled: "Food additives and hyperactive behaviour in 3-year-old and 8/9-year-old children in the community: a randomised, double-blinded, placebo-controlled trial," coming out of the School of Psychology, Department of Child Health, University of Southampton, Southampton, UK).

In this randomized, double-blinded, placebo-controlled, crossover trial consumption of artificial food colors and food additives was found to increase hyperactive behavior. Children were randomized to consume a drink containing sodium benzoate and one of 2 AFCS mixes (A or B), or a placebo. Results found that compared with placebo, Mix A had significantly adverse effects on hyperactivity compared with placebo for both the 3-year olds and the 8-year olds. Mix B was only found to have such an effect in the 8-year old children. These results suggest that consump-

tion of foods containing artificial colors or sodium benzoate as a preservative may increase the risk of hyperactivity among youth.

If you have only suspected junk food in the past, now you know.

## **Lipoic Acid May Solve Diabetic Eyes**

The metabolic murmurs previously called type 2 diabetes and now called metabolic syndrome or syndrome X play havoc with the eyesight. The condition is called diabetic retinopathy.

As you can see by our cover story in this issue there are valuable dietary supplements one can safely take to help prevent serious eye problems, and research is ongoing.

For example, a study involving rats with experimental diabetic retinopathy alpha-lipoic acid was found to correct impaired apparent ion demand. Impaired ion demand is a way of describing some of the metabolic murmurs that take place when insulin metabolism goes haywire.

The researchers in this study set out to determine whether impairment of apparent ion demand within the retina develops early in the course of diabetes, and whether alpha-lipoic acid, a substance which inhibits vascu-

lar histopathology, may correct this impairment.

Results found that in untreated diabetic rats, manganese ion uptake by receptor and post-receptor retina were subnormal, and treatment with alpha lipoic acid corrected these deficiencies.

A difference existed in the effect between male and female rats. While in 3-month old male diabetic Sprague-Dawley rats, total and post-receptor retinal thickness increased without loss of blood-retinal barrier integrity, in female Lewis rats with untreated or treated diabetes, there was no increase in retinal thickening observed.

The authors conclude, "The present results support the hypothesis that alpha lipoic acid can correct the impaired apparent ion demand in experimental diabetic retinopathy."

Isn't this just another reason to supplement daily with high quality alpha lipoic acid?

## ***Bilberry Protects Eyes And Kidneys***

Potassium bromate (KBrO<sub>3</sub>) is a common food additive in commercial bread making and is also an oxidizing agent found in drinking water as a disinfectant by-product. There have been health concerns raised due to its discovery



in bottles of mineral water in both Europe and America.

KBrO<sub>3</sub> has been reported to cause clinical intoxications, which can result in severe and irreversible hearing loss and it has been linked to kidney damage and renal tumors. The toxin causes particular free radicals that can contribute to the aging process and chronic diseases.

An elegant animal study by Chinese scientists published in the January 2008 *Journal of Agricultural and Food Chemistry* strongly indicates that the very active anthocyanins found in the high quality European bilberry extracts containing a standardized 25% are protective of kidney function and hearing nerves when this common toxin is encountered.

The marketplace has seen the use of cheaper products pretending to be the high quality European material. In some cases azo dyes have been used to mimic the color of bilberries in a commercial product.

The researchers gave doses of 50, 100 and 200 mg/kg of high quality bilberry extract to test animals over five days. A single dose of potassium bromate at 200 mg/kg was also administered to induce serious kidney damage.

The mice receiving the bilberry extract showed a reversal in the blood levels of urea nitrogen and creatinine back into normal levels. Decreases in levels of

malondialdehyde (MDA) in the kidneys, nitric oxide and xanthine oxidase were also noted in the treated animals.

The reduction of oxidative stress is considered by the researchers to indicate that the anthocyanin-enriched bilberry extract may be a pathway leading to amelioration of physiological dysfunction due to life-style related disease such as hypertension and metabolic disorder.

## **Lycopene, Lutein and Zeaxanthine Reduce Risk Of Cancer**

The results of two small but well-designed clinical studies suggest that getting plenty of mixed carotenoids by supplementation of the diet may reduce the risk of developing epithelial ovarian cancer and colon cancer.

In a case-control study involving 254 patients with blood and tissue confirmed epithelial ovarian cancer and 652 age-matched controls, higher intake of carotenoids was found to be associated with a reduced risk of epithelial ovarian cancer.

Results of unconditional logistic regression analyses adjusted for age, locality, education, BMI, smoking, tea

drinking, parity, oral contraceptive use, hormone replacement therapy, menopausal status, family history of ovarian cancer, physical activity, and energy intake, found that subjects in the highest quartile of carotenoid intake had a significantly reduced risk of epithelial ovarian cancer, as compared to subjects in the lowest quartile of intake.

The study, conducted by the researchers at the University of Western Australia in Perth, was reported in the *British Journal of Nutrition*, 2007; 98(1) pages 187-193.

The second study, was a population-based case-control study in the state of Arkansas where plasma levels of lycopene, lutein/zeaxanthin, and beta-cryptoxanthin were found to be inversely associated with prostate cancer risk.

The risk of prostate cancer was 55% less among subjects whose plasma lycopene levels were in the highest quartile, compared with those whose levels were in the lowest quartile. No significant associations were observed for plasma alpha-carotene and plasma beta-carotene levels.

The authors conclude that the results of their study, "...added to the emerging evidence that high circulating levels of lycopene, lutein/zeaxanthin, and beta-cryptoxanthin are associated with a low risk of prostate cancer."

# Ginkgo Extract And Heart Blood Flow

A study from China titled: "*Ginkgo biloba extract improves coronary blood flow in patients with coronary artery disease: role of endothelium-dependent vasodilation,*" was reported in *Clinical Pearls*.

In a double-blinded, randomized, placebo-controlled study involving 80 patients with coronary artery disease (CAD), treatment with ginkgo biloba extract (GBE) was found to improve coronary blood flow.

Subjects were randomly assigned to either receive an injectible solution of GBE or a placebo, for a period of 120 minutes.

After treatment with GBE, **significant increases** in left anterior descending coronary artery blood flow in maximal diastolic peak velocity, maximal systolic peak velocity and diastolic time velocity integral were found, as compared to after placebo.

Furthermore, flow-mediated dilation increased by 69.75%. The percentage changes in blood flow were found to be linearly correlated with the percentage change in brachial artery FMD following treatment with GBE.

The authors conclude, "... GBE treatment in patients with CAD had a beneficial effect on coronary flow, at least partially through endothelium-dependent vasodilation."

The study from the Department of Anatomy and Cell Biology, Wayne State University, in Detroit, merely confirms what has been known about Ginkgo Biloba extract supplements for decades. Thanks fellas.

## *Animal Study Indicates Green Tea Extract Helps Blood Pressure*

Green tea extracts have earned a solid reputation as a dietary supplement because of all the maladies they prevent. Two new studies add to the reputation of the epigallocatechin-gallate (EGCG) the key ingredient in the extract.

In a study involving male Sprague-Dawley rats 13 weeks of age, consumption of green tea extract was found to prevent hypertension and target organ damage, which were induced by a high dose of Angiotensin II.

In this study, rats were given Angiotensin (Ang) II, known to induce endothelial dysfunction – which in turn leads to the development of

hypertension and atherosclerosis. Rats were divided into 3 groups. For 13 days, via osmotic mini-pumps, one group of rats received a low-dose of Ang II (350 mug/kg/d), the second group received a high-dose of Ang II (700 mug/kg/d), and the third group received a vehicle. Within these groups, rats were fed water either containing green tea extract (6 mg/mL) or not containing any green tea.

Results found that the green tea extract blunted the increases in blood pressure, left ventricular mass index, media-to-lumen ratio, and hydroperoxide radicals induced by the high dose of Ang II. Furthermore, green tea extract prevented the increase in oxidative stress, through specifically preventing increases in HO-1 (heme oxygenase 1), p22(phox), and superoxide dismutase mRNA in the aorta – reducing them to levels even below baseline values.

Concentration-response curves of phenylephrine-precontracted arteries to acetylcholine were measured. Both doses of Ang II shifted rightward the curves to acetylcholine; green tea extract prevented this from occurring.

The results of this study suggest that green tea extract may exhibit powerful protective effects against the development of hypertension and target organ damage. The authors hypothesize that this may be due to the ability of green tea extract to prevent or scavenge superoxide anion generation.

A study from Japan was also reported. It involved 49,920 men aged 40-69 years, consumption of green tea was found to be associated with a reduced risk of advanced prostate cancer.

Subjects were followed from 1990 (cohort 1) and 1993 (cohort 2) through 2004. Four hundred and four men were newly diagnosed with prostate cancer during that time, out of which 114 had advanced stage prostate cancer, 271 had localized, and 19 had undetermined

stage prostate cancer.

Green tea consumption was assessed via questionnaires at baseline and through the follow up period. Results found that while green tea consumption was not associated with localized prostate cancer, it was associated, in a dose-dependent manner, with advanced prostate cancer. Men who consumed more than 5 cups/day of green tea were found to have a multivariate relative risk of 0.53, compared with men consuming less than 1 cup per day.

## *Dietary Potassium Lowers High Blood Pressure in Study*

Blood pressure is a huge topic in health circles, and despite all the advances in biology, pharmacology, nutrition and measuring it, there are still so many individual variables that good advice is hard to come by.

One man's high blood pressure is often another man's normal and the scientific community is still debating the role of table salt. With all the uncertainty flitting around, a small study from King's College, London is good information.

Researchers wanted to know about potassium supplements and normal blood pressure in young people described as healthy. So they randomized a double-blind, placebo-controlled study involving 85 "young, healthy, predominantly normotensive subjects."

The participants were ran-

domized to 1 of 3 groups for a period of 6 weeks: 1) KC group: (28 subjects) received dietary supplementation with potassium citrate; 2) K CL group: (26 subjects) received dietary supplementation with potassium chloride; 3) placebo group: (31 people) received placebo.

At intervention end, mean arterial pressure was reduced by 5.22 mm Hg in the KC group and by 4.70 mm Hg in the KCL group. Additionally, systolic pressure decreased 6.69 mm Hg in the KC group and 5.24 mm Hg in the KCL group, while diastolic pressure decreased 4.26 mm Hg in the KC group and 4.30 mm Hg in the KCL group, compared to baseline.

Subjects with higher systolic blood pressure showed a greater treatment response. Thus, the authors of this study

conclude, "Increasing dietary potassium could therefore have a significant impact on the progressive rise in BP in the entire population."

It's nice to see some supportive research, but we have provided a far superior form of potassium for more than 20 years. Just in case you haven't noticed, Carotec's Tropocor and Mynax not only provide potassium, but you also get magnesium and calcium.

Dr. Franz Koehler developed these "targeted" mineral supplements in the 1950s and they have an unsurpassed track record. The targeting of the minerals is done by the amino acid used as the "chelate" for gripping the element as it visits your busy metabolism. Potassium and Magnesium chelated in aspartic acid as in Tropocor go directly into body tissues while the minerals in Mynax, chelated in ethyl amino phosphoric acid (EAP) go directly into the nerves.

As for blood pressure, mentioned in the recent study, no wonder this German-made supplement is so popular. Together potassium and magnesium regulate cardiac rhythm, which is responsible for the pressure of your blood as it courses through tens of thousands of miles of vessels.

An insufficiency of these two vital minerals means the cardiac system will not be able to relax and recover between beats. It's that simple.

And nerves need these minerals to relax as well.

# ***Hawthorn Extract Shows Significant Heart Benefit***

In a systematic review of randomized, double-blind, placebo-controlled trials comparing the effects of hawthorn extract versus placebo in patients with chronic heart failure, it was concluded that supplementation with hawthorn extract offers significant relief from symptoms of chronic heart failure.

According to a paper in the *Cochrane Database of Systematic Reviews Issue 1, 2008*, after searching various databases, the authors identified 14 trials which met all the inclusion criteria, out of which 10 provided data suitable for meta-analysis. Results showed hawthorn extract to be more effective

than placebo for physiologic outcome of maximal workload and exercise tolerance. In addition, significant decreases were found in the pressure-heart rate product (an index of cardiac oxygen consumption), shortness of breath, and fatigue.

Infrequent, mild, and transient adverse effects reported included nausea, dizziness, cardiac complaints, and gastrointestinal complaints. The authors of this review conclude that as an adjunctive treatment for patients with chronic heart failure, supplementation with hawthorn extract may provide significant benefits.

inducing workload trials on a bicycle ergometer at fixed workloads twice for 2 hours, followed by 4 hours of rest. Thirty minutes after the start of the physical tasks (30-minute trial) and 30 minutes before the end of the tasks (210-minute trial), subjects performed non-workload trials with maximum velocity for 10 seconds.

Subjects were randomized to receive 3 different treatments: 1) 100 mg/day coenzyme Q10; 2) 300 mg/day coenzyme Q10; and 3) placebo. Results found that compared with placebo, supplementation with 300 mg/day coenzyme Q10 led to a higher change in maximum velocity from the 30-minute to the 210-minute trial. Furthermore, after taking 300 mg/day coenzyme Q10, subjective perception of fatigue, assessed using a visual analog scale, was significantly alleviated, as compared to placebo. The results of this study suggest that daily supplementation with coenzyme Q10 may reduce fatigue and improve physical performance.

Another new study, this one from Cornell University, suggests that supplementing with CoQ-10 is a promising therapeutic strategy for the treatment of Parkinson's disease.

In the first experiment, the researchers tested various doses of two different formulations of coenzyme Q10 in food and found that coenzyme Q10 administration in the diet led

## **CoQ-10 For Energy, And It Helps Against Parkinson's**

Since Japan apparently has the world wide manufacturing of CoQ-10 sewed up, it's only logical the government would get involved in research into just how important this nutrient is.

A study, "Antifatigue effects of coenzyme Q10 during physical fatigue," comes out of the Department of Physiology, Osaka City University Graduate School of Medicine, Osaka, Japan; The 21st Century COE Program "Base to Overcome Fatigue" (from the Ministry

of Education, Culture, Sports, Science and Technology, the Japanese Government), Osaka.

Whew! And I thought we had bureaucratic jargon.

Anyway, in a randomized, double-blinded, placebo-controlled, three crossover study involving 17 healthy volunteers, supplementation with coenzyme Q10 for a period of 8 days was found to significantly reduce subjective feelings of fatigue and improve physical performance.

Subjects underwent fatigue-

to marked increases in plasma coenzyme Q10 levels, and significantly protected against loss of dopamine.

In the second experiment, researchers investigated the effects of coenzyme Q10, and coenzyme Q10 emulsions in the MPTP model of Parkinson's disease, and found that coenzyme Q10 exerted similar neuroprotective effects against MPTP induced loss of dopamine.

In the third experiment, researchers administered coenzyme Q10 in the diet in a chronic MPTP model and found that coenzyme Q10 exhibited neuroprotective effects against dopamine depletion, loss of tyrosine hydroxylase neurons, and induction of *alpha-synuclein inclusions in the substantia nigra pars compacta*.

No, it's not Greek to me, it's Latin but I get it – supplement your diet with CoQ-10 and improve biochemically all over.

## ***L-Carnitine Curbs Fatigue In Old Folks***

A centenarian is a person who reaches 100 years of age or more. Now comes a study out of Italy involving 66 active centenarians.

In a randomized, double-blind, placebo-controlled study

involving 66 centenarians with onset of fatigue after even slight physical activity, results indicate that supplementation with L-carnitine may exert beneficial effects on physical and mental fatigue and on cognitive functions.

The subjects were randomized to 2 grams L-carnitine or placebo daily for a period of 6 months. At intervention end, subjects in the L-carnitine group showed significant reductions in total fat mass and significant increases in total muscle mass, plasma concentrations of total carnitine, and plasma concentrations of short and long-chain acetylcarnitine, compared with subjects in the placebo group.

Additionally, subjects in the L-carnitine group showed significant decreases in physical fatigue, mental fatigue, and fatigue severity, along with significant improvement in Mini-Mental State Examination scores, compared with subjects in the placebo group.

Thus, the authors concluded, "Our study indicates that oral administration of L-carnitine produces a reduction of total fat mass, increases total muscular mass, and facilitates an increased capacity for physical and cognitive activity by reducing fatigue and improving cognitive functions."

You don't have to wait so long to benefit from L-Carnitine supplements however, everyone over 40 can use them for optimal energy.

## **Red Wine Benefits Found By New Studies**

Consuming red wine with a meal has long been observed to have beneficial effects, so much so that a mythology built up called the "French Paradox."

Now various studies pop up from time to time to add to the reputation of red wine drinking.

From Grenoble, France a randomized, cross-sectional study involving patients with coronary heart disease (CHD), moderate wine drinking was associated with higher marine omega-3 fatty acid concentrations, as compared to no alcohol use.

Ethanol intake and plant and omega-3 fatty acid intake in the diet were assessed. Subjects were classified according to their habitual consumption of ethanol, which is a "high alpha-linolenic acid group" and a group of control subjects who were the "low alpha-linolenic acid group."

The two groups were analyzed separately. In both groups, increasing alcohol intake was associated with increasing marine omega-3 fatty acid levels. In the low ALA group, alcohol intake was associated with an increase in the level of eicosapentaenoic

acid (EPA) up to 50%, and in the high ALA group, alcohol intake was associated with an increase in the level of EPA by up to 37%.

The results of this study suggest that moderate wine drinking is associated with higher levels of marine omega-3 fatty acid concentrations. The authors conclude, "Although the data have to be confirmed in large groups, this effect of wine comparable to that of fish may partly explain the protective effects of wine drinking against CHD."

From Jerusalem, the following report popped up:

In a randomized, crossover study involving 10 healthy volunteers, consumption of turkey accompanied by red wine was found to prevent the elevation of postprandial plasma MDA (nasty cell-toxic lipid peroxidation products) found after consumption of turkey cutlets supplemented with water.

Subjects consumed 3 meals consisting of 250 gram turkey cutlets. One meal was supplemented with water, another was supplemented with 200 ml of red wine (plus the turkey was soaked in red wine *after* heating); and a third was supplemented with 200 ml of red wine (plus the turkey was soaked in red wine *prior to* heating).

At baseline, plasma MDA levels were 50 nM. After consumption of turkey cutlets, these levels increased by 160 nM. However, after consumption of the turkey meal soaked in red wine *after* heating and

accompanied by 200 ml red wine, this increase in plasma MDA was reduced by 75%.

After consumption of the turkey meal soaked in red wine *before* heating and accompanied by the glass of red wine, the increase in plasma MDA was completely prevented.

The authors conclude, "Our study suggests that red wine polyphenols exert a beneficial effect by the novel new function – absorption inhibition of the lipotoxin MDA. These findings explain the potentially harmful effects of oxidized fats found in foods and the important benefit of dietary polyphenols in the meal."

## *Studies Now Showing Trans Fats Are Bad*

Now that the establishment has been forced to admit that trans fats from the artificial hydrogenation of vegetable oils is indeed harmful to human health as healthnuts pointed out for more than 50 years, studies are popping up adding fat to the fire, so to speak.

First a monkey study from Wake Forest University School of Medicine titled: "Trans fat diet induces abdominal obesity and changes in insulin sensitivity in monkeys."

This study involved 42 male African green monkeys,

consuming a diet containing trans fatty acids (TFAs) as 8% of total caloric intake for a period of 6 years. The diet was found to induce significant weight gain, particularly intra-abdominal fat, and was associated with the development of insulin resistance.

Monkeys were divided into 2 groups: Group1 was fed a diet containing cis-monounsaturated fatty acids, and Group2 was fed a diet containing trans-isomers (8% of total energy intake).

After 6 years, monkeys fed the fast-food, supermarket-like trans fatty acid-containing diet were found to have significant weight gain, increased intra-abdominal fat deposits, impaired glucose disposal, significant post-prandial hyperinsulinemia, elevated fructosamine, trends toward higher glucose concentrations, and significant reductions in muscle Akt phosphorylation.

The researchers concluded, in standard technical jargon that "the results of this animal study suggest that consumption of trans fatty acids may have negative implications on health in the long-term through inducing abdominal obesity and negatively affecting insulin sensitivity."

A second study from Children's Hospital, Cincinnati, Ohio was titled: "Dietary trans fatty acid intake is associated with increased fetal loss."

In a retrospective study involving 104 women reporting one or more pregnancies (participants in the Princeton

School cardiovascular risk study), followed up for 25-30 years, results indicate that increased dietary intake of trans fatty acids (TFA) may be associated with an increased risk of fetal loss.

Dietary data on TFA and total calories was obtained by a food frequency questionnaire. Using stepwise logistic regression adjusted for potential confounders, percent of total calories intake from TFA was positively and independently associated with risk of fetal loss. Thus, the results of this study suggest that lower dietary intake of TFAs may be associated with a lower the risk of fetal loss in women.

The edible oils industry may think it was nice while it lasted, but I am reminded of all the shelf life that industry traded for better life and health.

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terials. A proactive approach is required and the regulatory decisions should follow from there. In addition to facilitating the safe manufacture and implementation of engineered nanoproducts, an understanding of nanotoxicity could also have a positive sequel. For instance, ***the propensity of some nanoparticles to target mitochondria and initiate programmed cell death*** could be used as a new cancer chemotherapy principle.” (emphasis ours)

As usual, the money cart is before the horse. Stronger tennis racquets and airplane bodies are nice, but what happens when all those nanocarbon materials go to the dump and get incinerated?

What the heck is this: Some nanoparticles have a “propensity to target mitochondria and initiate programmed cell death?”

That’s a red flag if we ever saw one.

End of original story – now, two years later we read articles in the technical literature and in the *Economist* that nothing has been done by the mainstream manipulators to keep this potential health hazard under control.

Why not? Because authorities don’t know enough about it to figure how best to regulate in order to protect public health, and nobody seems to be motivated to conduct the research to find out.

The failure to carry out the necessary research is holding industry back because nobody wants to put out a product only to have it recalled while facing lawsuits.

In the UK, the Soil Association, which is the organic farm production certifier, has taken a firm stand:

“Ahead of the government, we are the first organization in the world to take action against this hazardous, potentially toxic technology that poses a serious new threat to human health,” a Soil Association statement said

in January 2008.

The group’s policy manager said: “ There should be no place for nanoparticles in health and beauty products or food...As we saw with genetic modification, the government is ignoring indications of risk and giving the benefit of the doubt to commercial interest rather than the protection of human health.”

Many researchers say the fears are overblown, but like genetic tinkering the jury is still out. A recent *in vivo* rat study contradicted the test tube data on the toxicity of nano-sized fullerenes, which are carbon sphere molecules treasured by industry.

Early lab tests showed the tiny fullerenes to be toxic to human cells, especially cells in the lung and skin fibroblasts. However the same particles did not prove to be toxic in living animals.

The upshot of this one study is that the understanding of how nano-materials interact with the human body is more complex than can be determined from lab studies alone.

Commerce will march on, as it must, but we are reminded of the hydrogenation of vegetable oils, an important technology since the 1940s that has now proved to have been a public health disaster.

# Nanotechnology Poses Health Threats – Regulators Stumped

In our May/June 2006 issue we introduced you to the ever-enlarging technology of itty bitty nanoparticles with the following introductory paragraphs. After you catch up by reading the two-year old information, we will bring you up to date on what the experts and the regulators are doing, which is not much.

A millimeter is a thousandth of a meter; a micrometer is a millionth of a meter and a nanometer is a billionth of a meter. The nanometer is really, really small.

Chances are you have heard about nanotechnology – the so called nanomaterials – another of those technical and scientific advances that promises to generate a lot of new business and investment, and at the same time a lot of controversy over potential public health issues.

You may have already heard some news about certain cleaning compounds in Germany having to be removed from the market because they made people sick.

You may be surprised to learn that there are more than 200 (now 300) products now on the market that contain nanoparticles or nanomaterials, including face creams and other cosmetics.

The best definition comes from *Science*, February 3, 2006,

which features a thorough technical analysis of the subject:

“Nanomaterials are engineered structures with at least one dimension of 100 nanometers or less. These materials are currently being used for commercial purposes such as fillers, opacifiers, catalysts, semiconductors, cosmetics, microelectronics and drug carriers.”

Are these products safe? Or, do we have another genetic engineering, or water fluoridation, or mercury amalgam, or trans fatty acid controversy developing?

Nobody knows; everybody suspects.

The facts are relatively simple. The main characteristic of nanomaterials is their size, which lies in between what physicists describe as the “transitional zone” between individual atoms and molecules with only a few atoms.

Shrinking material down this small can “modify the physicochemical properties” and “create the opportunity for increased uptake and interaction with biological tissues.”

In simpler terms, nanoparticles are capable of effects that generate adverse biological activity in living tissue that would otherwise not be possible with the same material in larger form. The properties of nanomaterials may differ

substantially from those of the same material in bulk with “ability to perform exceptional feats of conductivity, reactivity, and optical sensitivity.”

Particle toxicology is already an established science, especially where human lungs are concerned. We already know that nanoparticles, like those created by the unusual heat in the basement wreckage of the World Trade Center can cause inflammation in the lungs, oxidative stress and organ involvement.

Asbestos fibers are a good example of nanotoxicity.

So even in materials known to be relatively inert in larger form we can have serious toxicity when particle size shrinks into the nano ranges.

The summary from the feature in *Science* soft-pedals the issue and, typically, ends with a suggestion that new drugs may evolve from this technology:

“Although it is possible that engineered nanomaterials may create toxic effects, there are currently no conclusive data or scenarios that indicate these effects will become a major problem or that they cannot be addressed by a rational scientific approach. At the same time, we can no longer postpone safety evaluations of nanoma-

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