What’s Missing From Your Coffee?

Block Deadly Impact Of Chronic Stress

Halt Sugar Induced Cell Aging

Epidemic of Hidden Liver Disease

MARK L. GORDON, MD

USING HORMONES TO HEAL TRAUMATIC BRAIN INJURY
The Ultimate Two-Per-Day Formula

NOW IN CAPSULES OR TABLETS!

The following table compares the daily dosage of key nutrients included in both the Life Extension Two-Per-Day Formula and Centrum®'s Daily Tablet:

<table>
<thead>
<tr>
<th>Sample Ingredient Comparison</th>
<th>LIFE EXTENSION TWO-PER-DAY</th>
<th>Centrum*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin C</td>
<td>500 mg</td>
<td>60 mg</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>2,000 IU</td>
<td>400 IU</td>
</tr>
<tr>
<td>Vitamin B1</td>
<td>75 mg</td>
<td>1.5 mg</td>
</tr>
<tr>
<td>Vitamin B2</td>
<td>50 mg</td>
<td>1.7 mg</td>
</tr>
<tr>
<td>Vitamin B6</td>
<td>75 mg</td>
<td>2 mg</td>
</tr>
<tr>
<td>Vitamin B12</td>
<td>300 mcg</td>
<td>6 mcg</td>
</tr>
<tr>
<td>Niacin (as niacinamide)</td>
<td>50 mg</td>
<td>20 mg</td>
</tr>
<tr>
<td>Pantothenic acid</td>
<td>100 mg</td>
<td>10 mg</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>100 IU (natural)</td>
<td>30 IU (synthetic)</td>
</tr>
<tr>
<td>Natural Folate</td>
<td>400 mcg</td>
<td>400 mcg</td>
</tr>
<tr>
<td>Zinc</td>
<td>30 mg</td>
<td>11 mg</td>
</tr>
<tr>
<td>Selenium</td>
<td>200 mcg</td>
<td>55 mcg</td>
</tr>
<tr>
<td>Lutein</td>
<td>5 mg</td>
<td>(none)*</td>
</tr>
<tr>
<td>Lycopene</td>
<td>2 mg</td>
<td>(none)*</td>
</tr>
<tr>
<td>Biotin</td>
<td>300 mcg</td>
<td>30 mcg</td>
</tr>
<tr>
<td>Boron</td>
<td>3 mg</td>
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</tr>
<tr>
<td>Chromium</td>
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<tr>
<td>Molybdenum</td>
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<td>45 mcg</td>
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<tr>
<td>Magnesium</td>
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<td>50 mg</td>
</tr>
<tr>
<td>Manganese</td>
<td>2 mg</td>
<td>2.3 mg</td>
</tr>
<tr>
<td>Iodine</td>
<td>150 mcg</td>
<td>150 mcg</td>
</tr>
<tr>
<td>Potassium</td>
<td>25 mg</td>
<td>80 mg</td>
</tr>
<tr>
<td>Vitamin A (preformed)</td>
<td>500 IU</td>
<td>1,015 IU</td>
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<tr>
<td>Vitamin A (as beta-carotene)</td>
<td>4,500 IU</td>
<td>2,485 IU</td>
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<tr>
<td>Choline (as bitartrate)</td>
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<tr>
<td>Inositol</td>
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<td>PABA</td>
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<tr>
<td>Calcium</td>
<td>12 mg</td>
<td>200 mg</td>
</tr>
<tr>
<td>Alpha Lipoic Acid</td>
<td>125 mg</td>
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</tbody>
</table>

For many years, Life Extension® members had to rely on commercial “one-a-day” supplements that provide very low potencies.

In response to requests for a science-based multi-nutrient, a special formula was compounded to provide the greatest potencies that can fit into two tablets. When compared to conventional “one-a-day” products, Life Extension Two-Per-Day contains up to 50 times more potency! This Two-Per-Day formula is now available in tablet or capsule form.

The box on this page reveals how much more potent the Two-Per-Day formula is compared to the leading commercial multi-vitamin. Few consumers realize that commercial supplements often contain the cheapest form of nutrients that don’t provide optimal benefits. For example, the 30 IU of synthetic vitamin E contained in Centrum® may provide relatively little vitamin E to the bloodstream. The 100 IU of natural vitamin E contained in Two-Per-Day provides over 3 times more vitamin E activity than does Centrum®.

Compared to Centrum®, Two-Per-Day Tablets or Capsules provide about:

- 5 times more Vitamin D
- 8 times more Vitamin C
- 3 times more Vitamin E
- 10 times more Biotin
- 40 times more Boron
- 4 times more Selenium
- 37 times more Vitamin B6
- 50 times more Vitamin B1
- 50 times more Vitamin B12
- More than twice as much niacin, zinc, and many other nutrients

Life Extension Two-Per-Day Tablets provide much higher potencies of key nutrients and represent a better value than many commercial brands. A bottle of 120 Life Extension Two-Per-Day tablets retails for $20. If a member buys four bottles during Super Sale, the price is reduced to $12.15 per bottle. (The retail price for 180 tablets of Centrum® is around $14.) (Item# 01615)

A bottle of 120 Life Extension Two-Per-Day vegetarian capsules retails for $22. If a member buys four bottles during Super Sale, the price is reduced to $13.50. (Item# 01614)

Contains soybeans, rice, and corn.

* Centrum® no longer contains significant amounts of lycopene nor lutein.

To order Life Extension Two-Per-Day Tablets or Two-Per-Day Capsules, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
24 BLOCK DEADLY IMPACT OF CHRONIC STRESS
Chronic stress has reached epidemic levels, affecting 80% of Americans. Its profoundly detrimental impact on human health increases risk of death from all causes by 170%. New confirmatory data show that nutritional interventions can favorably target the physiological factors that cause stress-related problems.

58 HALT SUGAR-INDUCED CELL AGING
Blood glucose levels above 85 mg/dL accelerate a deadly process known as glycation—the binding of sugars to the body’s life-sustaining proteins. Glycation reactions “cook” living tissue and hasten cell death. A fat-soluble form of vitamin B1 called benfotiamine acts via multiple pathways to block the glycation process and protect eyesight, heart health, kidney function, and more.

70 NEW WAY TO COMBAT OXIDATIVE LIVER DAMAGE
Up to 100% of overweight and obese individuals suffer the silent affliction of nonalcoholic fatty liver disease, or NAFLD, in which oxidized liver tissue turns rancid. A synergistic combination of the adaptogen Schisandra chinensis and a patented extract of the melon Cucumis melo has been shown to offer unique protection against the mitochondrial oxidant damage that triggers NAFLD.

82 USING HORMONES TO HEAL TRAUMATIC BRAIN INJURY
Nearly 2 million Americans sustain traumatic brain injuries annually. Conventional medical interventions largely fail to treat the often devastating cognitive, physical, and mental deficits that result. Pioneering specialist Dr. Mark L. Gordon explains how his work with wounded soldiers returning from Iraq and Afghanistan led to a novel, highly effective approach that may heal traumatic brain injury using individually tailored hormone therapy.
**ARE YOU GETTING Curcumin’s BENEFITS?**

Curcumin is the health-promoting trace compound derived from the Indian spice turmeric. But not all turmeric is alike.

The curcumin found in the vast majority of dietary supplements is derived from turmeric that is nutritionally inferior.

Why? Almost all growers harvest turmeric at the point when the turmeric root turns its signature yellow color, but before it has fully matured.

The turmeric root requires more time in the ground for highly beneficial phytonutrients called curcuminoids and sesquiterpenoids to attain peak concentrations.

Life Extension’s Super Bio-Curcumin® derives from turmeric that is organic, cultivated to maturity, then specially transported and processed to preserve and deliver the root’s most complete nutritional profile.

In recent studies comparing the effects of standard curcumin against turmeric extracts comparable to Super Bio-Curcumin®, researchers observed:1,2

- Nearly **twice** the support for immune health.
- Approximately twice the support for inflammatory issues.
- Almost **double** the antioxidant support.

A separate study indicated that an antioxidant-rich curcumin extract provided powerful support for heart health.

Unrivaled Potency and Absorability with BCM-95®

Curcumin is neither absorbed nor retained well in the blood, which is another challenge facing those who wish to maximize its benefits.

The highly popular Super Bio-Curcumin® uses BCM-95®, a patented, bioenhanced preparation of curcumin. It has been shown to reach 7 times higher concentration in the blood than standard curcumin.

The graphs on this page illustrate that one 400 mg vegetarian capsule per day of Super Bio-Curcumin® supplies the equivalent of 2,500-2,800 mg of commercial curcumin supplements.

A bottle containing 60 vegetarian capsules of Super Bio-Curcumin® retails for $38. If a member buys four bottles during Super Sale, the price is reduced to only $23.63 per bottle. Contains rice.

**References**


**CAUTION:** Do not take if you have gallbladder problems or gallstones. If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product.

Bio-Curcumin® and BCM-95® are registered trademarks of Dolcas-Biotech, LLC. U.S. Patent Nos. 7,883,728, 7,736,679 and 7,879,373.

To order Super Bio-Curcumin®, call 1-800-544-4440 or visit www.LifeExtension.com

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Patrick M. Fratellone, MD, is an oncologist who specializes in radiation oncology and anti-aging research for Intramedicine, a NIH Fellowship in nutrition at UAB. Board certified in family medicine with a CNS in nutrition, he currently attends the medical director at Leon County Jail. He is responsible for 1,100–1,200 inmates’ medical needs.

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Philip Lee Miller, MD, is a founder and medical director of the Los Gatos Longevity Institute in Los Gatos, CA.

Michele G. Morrow, DO, FAAP, is a board-certified family physician who merges mainstream and alternative medicine using functional medicine concepts, nutrition, and natural approaches.

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Paul Wand, MD, is a clinical neurologist with special expertise in treating and reversing diabetic peripheral neuropathy and brain injuries from various causes.

Charles E. Williamson, MD, focuses on anti-aging, longevity, and pain management.

Jonathan V. Wright, MD, is medical director of the Tahoma Clinic in Renton, WA. He received his MD from the University of Michigan and has taught natural biochemical medical treatments since 1983. Dr. Wright pioneered the use of bioidentical estrogens and DHEA in daily medical practice. He has authored 11 books and publishes Nutrition and Healing, a monthly newsletter with a worldwide circulation of more than 100,000.
Örn Adalsteinsson, PhD, holds a master’s and doctorate from the Massachusetts Institute of Technology (MIT). He has specialized in human therapeutics including vaccines, monoclonal antibodies, product development, nutraceuticals, formulations, artificial intelligence, hormones, and nutritional supplementation. He has also authored articles and contributed to peer-reviewed publications and served as an editor for the Journal of Medicinal Food.

Russell L. Blaylock, MD, is a board-certified neurosurgeon, author, and lecturer. He recently retired from his neurosurgical practice to devote his time to nutritional studies and research. He has written numerous journal articles and three books (Excitotoxins: The Taste That Kills, Health and Nutrition Secrets That Can Save Your Life, and Natural Strategies for the Cancer Patient) and currently publishes a monthly nutrition newsletter, The Blaylock Wellness Report.

John Boik, PhD, is the author of two books on cancer therapy, Cancer and Natural Medicine (1996) and Natural Compounds in Cancer Therapy (2001). He obtained his doctorate at the University of Texas Graduate School of Biomedical Sciences with research at the MD Anderson Cancer Center, focusing on screening models to identify promising new anti-cancer drugs. He conducted his postdoctoral training at Stanford University Department of Statistics. He is currently president of New Earth BioMed, a nonprofit cancer research corporation that studies mixtures of natural products.

Eric R. Braverman, MD, is director of the Place for Achieving Total Health (PATH Medical and the PATH Foundation) in New York City. Dr. Braverman received his BA from Brandeis University Summa Cum Laude/ Phi Beta Kappa and his MD from New York University Medical School with honors. He is the author of Younger You (2006) and Younger Thinner You (2009) and over 100 research papers and is clinical assistant professor of integrative medicine in the Department of Neurosurgery at Cornell Weill Medical College, as well as a lecturer on mild cognitive decline.

Frank Eichorn, MD, is a urologist specializing in prostate cancer for 10 years. He has a private practice in Bad Reichenhall, Germany, and is prostate cancer consultant at the Urologische Klinik Castringius, Planegg, Munich. In his integrative approach to prostate cancer he is working together with an international network of experts to improve treatment outcomes for prostate cancer patients with a special focus on natural and translational medicine.

Deborah F. Harding, MD, is founder of the Harding Anti-Aging Center. She is triple board-certified in internal medicine, sleep disorder medicine, and anti-aging medicine. She also earned the Cenegenics certification in age management medicine. She is a faculty member of the new University of Central Florida Medical School.

Steven B. Harris, MD, is president and director of research at Critical Care Research, a company that grew out of 21st Century Medicine in Rancho Cucamonga, CA. Dr. Harris participates in groundbreaking hypothermia, cryothermia, and ischemia research. His research interests include antioxidant and dietary-restriction effects in animals and humans.

Stanley W. Jacob, MD, is Gerlinger Distinguished Professor, Department of Surgery, Oregon Health and Science University. He has authored 175 scientific articles and 15 books and holds 3 patents, including the initial patent on the therapeutic implications of dimethyl sulfoxide (DMSO).

Richard Kratz, MD, DSc, is clinical professor of ophthalmology at the University of California, Irvine, and the University of Southern California (Los Angeles). Dr. Kratz pioneered the cataract-removal technique called phacoemulsification and developed intraocular lenses to replace the crystalline lens. He is currently involved in projects relating to glaucoma, cataract extraction, and facilitating eyesight for the totally blind.

Peter H. Langsjoen, MD, FACC, is a cardiologist specializing in congestive heart failure, primary and statin-induced diastolic dysfunction, and other heart diseases. A leading authority on coenzyme Q10, Dr. Langsjoen has been involved with its clinical application since 1983. He is a founding member of the executive committee of the International Coenzym Q10 Association, a fellow of the American College of Cardiology, and a member of numerous other medical associations.

Ralph W. Moss, PhD, is the author of books such as Antioxidants Against Cancer, Cancer Therapy, Questioning Chemotherapy, and The Cancer Industry, as well as the award-winning “The Cancer War”. Dr. Moss has independently evaluated the claims of various cancer treatments and currently directs The Moss Reports, an updated library of detailed reports on more than 200 varieties of cancer diagnoses.

Michael D. Ozner, MD, FACC, FAHA, is a board-certified cardiologist who specializes in cardiovascular disease prevention. He serves as medical director for the Cardiovascular Prevention Institute of South Florida and is a noted national speaker on heart disease prevention. Dr. Ozner is also author of The Great American Heart Hoax and The Miami Mediterranean Diet (2008, Benbella Books). For more information visit www.drozner.com.

Robert Pastore, PhD, CNS, is a clinical nutritionist practicing in New York City. Due to his thorough nature and focus on organic chemistry and biochemistry, his colleagues have termed his practice forensic nutrition. He is a member of Harvard Medical School Postgraduate Association, the American College of Nutrition, New York Academy of Sciences, and the American Association of Pharmaceutical Scientists.

Stephen B. Strum, MD, is a medical oncologist who has specialized in prostate cancer treatment since 1983. He is co-founder and past medical director of the Prostate Cancer Research Institute. Currently, he directs a practice for prostate cancer patients in Ashland, OR.

Jonathan Treasure, AHG, MNIMH, is a British medical herbalist at the Centre for Natural Healing in Ashland, OR. Originally a medical sciences graduate from Cambridge University, he studied herbal medicine at the UK School of Phytotherapy. His clinical specialty is integrative botanical medicine for cancer, and his principal research interest is herb/drug interactions.

Jonathan V. Wright, MD, is medical director of the Tahoma Clinic in Renton, WA. He received his MD from the University of Michigan and has taught natural biochemical medical treatments since 1983. Dr. Wright pioneered the use of bioidentical estrogens and DHEA in daily medical practice. He has authored 11 books and publishes Nutrition and Healing, a monthly newsletter with a worldwide circulation of more than 100,000.
Ceramides are essential for preserving healthy-looking skin. That’s why they’re included in so many anti-aging face creams.

Your body’s production of ceramides declines with age. That’s bad news, since ceramides make up 35-40% of the binding matrix that maintains moisture balance and protects the skin’s surface. It’s therefore critical that ceramides lost to aging are replaced.

Restore Ceramides Naturally from Within!
The ceramides that young skin naturally produces to retain its supple appearance are identical to those present in wheat!
Wheat-derived oils have been used topically for centuries as a natural moisturizer. But you can’t get enough ceramides from topically applied wheat oil to have a long-term impact on your skin’s appearance. And they don’t appear in sufficient concentration in your diet.

That’s why Life Extension® brought together these skin-nourishing oils in a new concentrated oral formula called Skin Restoring Ceramides with Lipowheat™.

Lipowheat™ is a proprietary ceramide blend that offers nutritional support for aging skin to complement the topical products you may already be using.

The Moisturizing Pill the Japanese Have Enjoyed for a Decade!

Lipowheat™ ceramides have been available to Japanese women as a functional food since 2000. The hydrating action of Lipowheat™ ceramides have proven effective in clinical trials.

To take one example, after just three months ingesting 200 mg per day of Lipowheat™, a group of people suffering from dry, flaking skin reported dramatic improvement in the look and feel of their skin. These results were verified by electrochemical analysis showing that 95% of participants exhibited improved skin hydration. Even better, all subjects who at the onset of the study experienced chronic itching reported sharply decreased itching or complete elimination of the problem by the end of the study!

Aging Americans can now offset the visible impact of the gradual decline in their ability to produce enough ceramides using Skin Restoring Ceramides with Lipowheat™.

One bottle containing 30 350 mg liquid capsules of Skin Restoring Ceramides with Lipowheat™ retails for $25. If a member buys four bottles during Super Sale, the price is reduced to just $15.53.

Contains wheat. Contains rice and trace amounts of gluten.

Lipowheat™ is a trademark of LAVIPHARM Group of Companies.

References
5. www.fda.gov/ohrms/dockets/dockets/95s0316/ 95s-0316-rpt0275-04-Udell-vol211.pdf

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Some facts are so terrifying that people pretend they are not real. A recent survey found Alzheimer’s is the second most feared disease…cancer ranked number one.¹

Yet most cancers are curable, while Alzheimer’s insidiously kills every one of its victims.

Alzheimer’s incidence increases exponentially as humans age. If we make it to 80-85 years, Alzheimer’s prevalence rises to a startling 25%-30%.²³

It is unsettling to think that our odds of developing Alzheimer’s are so high, but there is reason for optimism. Scientists have identified factors that increase Alzheimer’s risk. This enables enlightened individuals to neutralize underlying causes of Alzheimer’s and spare themselves the frightening statistical probabilities faced by the general population.

Life Extension® members do a lot to reduce senility risk, such as suppressing destructive inflammatory reactions in the brain (with nutrients like curcumin),⁴⁷ while ingesting structural components required by brain cell membranes (such as DHA from fish oil).⁸¹¹

In a remarkable discovery, the loss of synapses has been shown to occur early in the process of Alzheimer’s and may trigger onset of the disease.¹²

Fortunately, a highly absorbable form of magnesium not only protects the integrity of delicate brain synapses, but also increases synaptic density, thus helping to reverse the structural loss of this critical brain component.¹³
What Is a “Synapse?”

Our brain consists of about 100 billion cells called neurons. In order for neurons to communicate in a way that enables you to exist, they must connect to one another.

A synapse is the connection that allows information to pass from one neuron to the next. Your synapses control electrical impulses and the release of neurotransmitters between neurons. Brain synapses serve as a junction that enables neurons to pass signals in a synchronized/organized pattern.

Synapses, as you might imagine, are essential to neuronal function. Not only are synapses crucial to short-term memory in the young, but their structural integrity is imperative in aging individuals seeking to stave off cognitive impairment and senility.

What Happens When Our Synapses Degrade?

Alzheimer’s disease is characterized by the pathological accumulation of non-functioning plaque in neurons and loss of normal neurotransmitter flow between neurons.

Before neurons encounter this severe damage, scientists have found a marked decline in synaptic density. This loss of synaptic density causes a decline in neuronal connectivity that strongly correlates to the cognitive impairment observed in Alzheimer’s disease.14-17

In fact, a consistent finding in the brains of Alzheimer’s victims is a significant loss of synaptic contacts. This led one group of researchers to conclude:

“...synapse loss is an early event in the disease process and suggests that mild cognitive impairment may be a transitional stage between early Alzheimer’s disease and no cognitive impairment, with synaptic loss a structural correlate involved in cognitive decline.”18

Another group of scientists looked at synaptic decay and concluded that it ”may represent an early and subtle alteration able to trigger the development of senile plaques and neurodegenerative events.”19

There are about 5 million Americans suffering from Alzheimer’s today. That number will spike upward to 8.6 million by the year 2030 and to an astounding 16 million by 2050.20 America does not have the economic or human resources to care for this many Alzheimer’s victims.

A compelling need exists for an intervention that prevents the downward cascade of neurodegeneration that will manifest as Alzheimer’s in 25%-30% of aged individuals.21

Magnesium Protects and Restores Synaptic Density

In a series of unprecedented laboratory experiments, a highly absorbable form of magnesium was shown to not only increase magnesium blood levels, but it also substantially increases magnesium brain concentrations.13

In response to this elevation in cerebral magnesium, there were significant increases in synaptic density and corresponding improvements in synaptic functioning and neuronal signaling.13

These improvements in synaptic structure and function translated into improvements in measurements of cognitive function.

Restoration of Short- and Long-term Memory

Using this highly absorbable magnesium (magnesium-L-threonate), scientists were able to obtain remarkably high brain magnesium concentrations compared to other forms tested.
In one study, just 24 days oral supplementation with magnesium-L-threonate produced an increase in cerebrospinal magnesium sufficient to boost short- and long-term memory scores. Other forms of magnesium (such as magnesium chloride, magnesium citrate, magnesium glycinate, and magnesium gluconate) did not significantly elevate brain magnesium compared to the control group.13,22

Another test on aging animals (rats) that had suffered memory decline showed that magnesium-L-threonate could reverse the kind of cognitive dysfunction that occurs in normal aging humans. The animals had magnesium-L-threonate added to their drinking water for one month. The findings showed improvements of 18% in short-term memory in animals treated with magnesium-L-threonate. In a validated test for long-term memory, these same animals supplemented with magnesium-L-threonate exhibited 100% enhanced performance.13

Enhancement of Spatial Short-term Memory

Spatial memory relates to how an organism functions in a particular space. In this study, groups of animals were reward-trained in a maze. At the end of training, some groups received magnesium-L-threonate while the others served as controls.

In the young animal control group, there was no change in ability to navigate the maze. In young animals supplemented with magnesium-L-threonate, there was better performance (up to 13% improvement). Aged animals supplemented with magnesium-L-threonate performed 18% better than the aged control group (not given magnesium-L-threonate).13

The scientists stated that a significant improvement in choice accuracy was apparent 6 days after initiation of magnesium-L-threonate supplementation and this improvement continued for more than 30 days after cessation of magnesium-L-threonate in young animals. This finding helps validate the longer-term benefit of the increase in synaptic density. Strikingly, spatial performance of aged animals was re-enhanced within 12 days of re-initiation of magnesium-L-threonate supplementation.13

The scientists concluded that magnesium-L-threonate treatment can enhance the spatial working memory in young and aged rats.13

Enhanced Long-Term Spatial Performance

Young and old animals underwent maze training with a delay interval. Animals supplemented with magnesium-L-threonate learned to find the hidden platform in the maze faster than non-supplemented animals. In addition, the degree of learning ability enhancement in the aged animals was greater than in young animals. This makes sense since aged animals suffer from loss of synaptic density that magnesium-L-threonate has been shown to restore.13

To test the long-term spatial memory, a second trial test was performed 24 hours later. The unsupplemented “control” group forgot how to perform in the maze, whereas young and aged animals supplemented with magnesium-L-threonate retained their ability to navigate the maze. This might be equivalent to an older human being able to find their car in a crowded parking lot. In statistical terms, supplementation with magnesium-L-threonate resulted in long-term spatial memory improvement of 122% in younger animals—and 100% in older animals.13

The researchers concluded, “magnesium-L-threonate significantly enhanced hippocampus-dependent spatial learning and memory in both young and aged rats.”13

Correlation Between Increased Synaptic Density and Memory

To verify that the mechanism behind these improvements in memory and cognitive performance was due to increased density of the synapses, studies were done to precisely measure the various synaptic structural components in the brain.

The rats supplemented with magnesium-L-threonate showed across-the-board improvements in synaptic protein expression, function, and structure, along with long-term potentiation of synaptic strength.13
Aging and Synaptic Decline

Several studies indicate that synaptic connections decline in the portion of the brain essential for memory, and the degree of loss of synapses correlates with the impairment of memory functions.\textsuperscript{23-25}

To evaluate the impact of magnesium-L-threonate on old animals, one group received the supplement while an unsupplemented group served as controls. After only 1 month, autopsy findings showed synaptic density was 67\% higher in the group supplemented with magnesium-L-threonate. This study showed that even in old animals, magnesium-L-threonate increased the density of synaptic components essential for youthful neurotransmitter release.\textsuperscript{13}

Critical Importance of Magnesium

Since 1981, Life Extension has recommended high-potency magnesium supplements. The reason is that magnesium is perhaps the most deficient mineral in the American diet.

With all the research linking low magnesium intake with high cardiovascular risks, this mineral would appear to be a simple way to help counter the heart attack and stroke epidemic plaguing aging Americans.

A government study shows a staggering 68\% of Americans do not consume the recommended daily intake of magnesium.\textsuperscript{26} Even more frightening are data from this same study showing that 19\% of Americans do not consume even half of the government’s recommended daily intake of magnesium.\textsuperscript{26} Is it any wonder that disability and death from heart attack and stroke are the nation’s leading killers?

In the early 1980s, the Life Extension Foundation\textsuperscript{®} was criticized by mainstream doctors for recommending high doses of magnesium relative to calcium. We even had our magnesium supplements seized by the FDA because we presented evidence that it could help prevent heart attack.

While the FDA refuses to recognize the value of magnesium, the National Institutes of Health (NIH) published the following on its website:

“Magnesium is needed for more than 300 biochemical reactions in the body. It helps maintain normal muscle and nerve function, keeps heart rhythm steady, supports a healthy immune system, and keeps bones strong. Magnesium also helps regulate blood sugar levels, promotes normal blood pressure, and is known to be involved in energy metabolism and protein synthesis. There is an increased interest in the role of magnesium in preventing and managing disorders such as hypertension, cardiovascular disease, and diabetes.”\textsuperscript{27}

The nation’s leading health agency (NIH) acknowledges magnesium’s critical role in keeping us alive, yet the FDA has done everything it could to keep this mineral out of Americans’ bodies. The death toll from the FDA’s censorship of magnesium is beyond comprehension.
Potential to Stave Off Health Care Cost Crisis

The cost of caring for those stricken with Alzheimer’s and other neurological disorders is adversely impacting this nation’s health care system. The enormous burden placed on families with senile loved ones destroys their productivity during critical working years.

Magnesium supplements are widely available, but many do not provide optimal absorption into the bloodstream and virtually none into the brain to restore critical synaptic density.

Widespread supplementation with magnesium-L-threonate has the potential to slash the incidences of many neurological disorders afflicting the aging population.

Clinical trials are now beginning to assess whether magnesium-L-threonate functions as well in aging humans as it does in rodents.

With the wealth of data validating the systemic benefits of magnesium, those who don’t want to wait years for the human studies to conclude should consider supplementing with 2,000 mg each day of magnesium-L-threonate. Based on animal data, noticeable improvements might occur within a relatively short time.

Battling Government Inertia

Even if human trials corroborate the unprecedented laboratory research you have just read about magnesium-L-threonate, there might not be enough money available to have the FDA approve it for conventional human use.

Life Extension is on the front lines battling these kinds of bureaucratic roadblocks that keep safe and effective natural therapies out of the reach of most Americans.

Startling Discoveries Revealed at 2011 Alzheimer’s Conference

In a series of explosive findings, researchers confirmed that destructive changes begin ravaging the brain years or decades before patients have enough memory loss symptoms to be diagnosed.

At the most recent Alzheimer’s Association International Conference in Paris, more than 100 papers were presented showing that Alzheimer’s changes occur earlier in life than mainstream medicine originally thought. This means that people can initiate interventions today that may afford substantial protection against future Alzheimer’s senility.

In a separate study released in 2011, a group of transgenic mice were fed a diet fortified with nutrients already consumed by most Life Extension members. The supplemented nutrients were curcumin, EGCG (a principal active polyphenol in green tea) lipoic acid, N-acetyl cysteine, vitamin C, folate, and B vitamins.

There is evidence to suggest these nutrients (and others) protect human brains from pathological deterioration that eventually manifests as Alzheimer’s. In this mouse model of Alzheimer’s, feeding these nutrients for 6 months resulted in spatial learning abilities in this animal model of Alzheimer’s disease indistinguishable from normal (control) mice.

Remarkably, other test parameters indicated that the nutrient cocktail, similar to what many Life Extension members have consumed for many years, restored both acquisition and memory deficits to normal (non-transgenic) levels in transgenic mice doomed to develop Alzheimer’s disease cognitive damage.

Even more compelling was a decrease in certain types of amyloid-beta from the Alzheimer’s disease–prone supplemented animals’ brains. A hallmark pathological feature of Alzheimer’s is the accumulation of amyloid-beta that clogs and destroys tiny structural machinery inside neurons resulting in full-blown senility. Specifically, supplemented transgenic animals experienced decreases in soluble Aβ40 and Aβ42, as well as a decrease in insoluble Aβ40. Soluble amyloid-beta is much more toxic and can cause neuron death in as little as 12 hours.

These findings, along with newly released studies about magnesium-L-threonate, suggest that proactive steps can be taken today to slow and reverse pathological changes that manifest as Alzheimer’s disease in far too many of us.
The issue of Life Extension Magazine® you’ll receive in January 2012 provides a technical review of the multiple mechanisms by which magnesium-L-threonate has been shown to reverse neurologic decay. We are introducing it now so that members who want to try it are not delayed.

Once a year, we discount all of our advanced formulas so that members can stock up at extra low prices. We hope you’ll take advantage of these Super Sale prices to obtain premium-grade supplements to protect your health today, while helping us battle the oppressive forces of censorship and overregulation that are suffocating medical innovation.

For longer life,

William Faloon

References


There’s no debating the power of omega-3 fatty acids. From support for heart health and brain function to help with inflammation, their broad-spectrum benefits have been firmly established in a wealth of studies.1-5

To ensure the purest, most stable, easy-to-tolerate fish oil supplement, Life Extension® SUPER OMEGA-3 EPA/DHA is molecularly distilled. This proprietary process ensures any pollutants are reduced to virtually undetectable levels. The result? Our fish oil enjoys a 5-star rating for purity, quality, and concentration from the International Fish Oil Standards program (IFOS)—the highest possible rating from the world’s premier testing laboratory.

**Sesame Lignans and Standardized Olive Fruit Extract for Enhanced Benefits**

Fish oils (and other fatty acids) have a tendency to oxidize, rendering them nutritionally inferior. Scientific studies show that when added to fish oil, sesame lignans safeguard against oxidation and direct fatty acids toward pathways that help with inflammatory reactions.6

To further emulate the benefits of a Mediterranean diet, Super Omega-3 delivers standardized, high-potency olive fruit extract. Research shows that when combined with olive oil, fish oil supplements help with inflammation better than fish oil alone.7

Olive also contains the compounds hydroxytyrosol, tyrosol, and oleuropein. Together these nutrients counter the action of free radicals, delay aging in specialized skin cells, prevent undesirable LDL oxidation, and help maintain normal platelet activation.8,9

Super Omega-3 supplies the equivalent content of 6 ounces of extra virgin olive oil. Take two softgels twice daily with meals.

A bottle containing 120 softgels of Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract retails for $32. If a member buys four bottles during Super Sale, the price is reduced to just $18.90 per bottle. If 10 bottles are purchased during Super Sale, the cost is just $16.81 per bottle. Serving size 8 softgels daily. (Item #01482)

**Just four softgels of SUPER OMEGA-3 EPA/DHA with Sesame Lignans & Olive Fruit Extract provide:**

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<thead>
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<tr>
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<tr>
<td>DHA Pure+™ Extract (DHA)</td>
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<tr>
<td>Sesame Seed Lignan Extract</td>
<td>20 mg</td>
</tr>
</tbody>
</table>

*Eight softgels for Item #01619

Introducing a SMALLER SOFTGEL for easier swallowing!

A bottle containing 240 softgels of Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract retails for $32. If a member buys four bottles during Super Sale, the price is reduced to just $18.90 per bottle. If 10 bottles are purchased during Super Sale, the cost is just $16.81 per bottle. Serving 8 softgels daily. (Item #01619)

For those with sensitive stomachs, Super Omega-3 is also available with enteric coating and retails for $34. If a member buys four bottles, the price is reduced to $20.93 per bottle. If 10 bottles are purchased during Super Sale, the cost is just $18.90 per bottle. (Item #01484)

To order the most advanced fish oil supplement, Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract (with or without enteric coating), call 1-800-544-4440 or visit www.LifeExtension.com

CAUTION: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product. Contains fish (anchovy, mackerel), sesame, and corn.

Supportive but not conclusive evidence shows that consumption of EPA and DHA omega-3 fatty acids may reduce the risk of coronary heart disease.

IFOS™ certification mark is a registered trademark of Nutrasource Diagnostics, Inc. These products have been tested to the quality and purity standards of the IFOS™ program conducted at Nutrasource Diagnostics, Inc.

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure or prevent any disease.
YOU MAY BE ONE OF THEM.
Optimal amounts of magnesium may now be obtained in a novel, highly absorbable form called Neuro-Mag™ Magnesium L-Threonate, available in capsules or tasty lemon-flavored powder.

A Critical Brain Booster. . .
Magnesium is needed for more than 300 biochemical reactions in the body. Long known for its role in cardiovascular and bone health, energy metabolism and mood, researchers are now focusing intensely on magnesium’s benefits for cognitive function. Unfortunately, it is very hard for your body to maintain optimal levels of magnesium in the brain. This problem is of special concern for maturing individuals, as magnesium deficiency increases over time.

Scientifically Advanced, Lab Tested
Most commercially available magnesium supplements are not readily absorbed into the central nervous system. To overcome this obstacle, an innovative form of magnesium is being introduced called Neuro-Mag™, shown to specifically target the aging brain and nervous system.

In pre-clinical models, L-threonate contained in Neuro-Mag™ boosted magnesium levels in spinal fluid by an impressive 15% compared to no increase with conventional magnesium. Even more compelling, animal models revealed improvements of 18% for short-term memory and 100% for long-term memory using the Neuro-Mag™ form of magnesium.

Capsules or Powder…Value Priced
The suggested daily dose of three Neuro-Mag™ Magnesium L-Threonate Capsules provides 2,000 mg of Magnesium-L-Threonate. While this supplies a modest 144 mg of elemental magnesium, its superior absorption into the bloodstream and nervous system make it a preferred choice for aging humans to supplement with.

This highly absorbable brain health-supporting magnesium is also available in a good tasting powder mix called Neuro-Mag™ Magnesium L-Threonate Powder with Calcium and Vitamin D. In addition to its appealing lemon flavor, the one-scoop per day serving size supplies the same amount of magnesium plus 500 mg of calcium (as calcium lactate gluconate—a highly soluble form of calcium) and 1,000 IU of vitamin D3.

This offers maturing individuals an easy way to obtain these key nutrients in one simple formula.

A bottle containing 90 capsules of Neuro-Mag™ Magnesium L-Threonate or 20 scoops of Neuro-Mag™ Magnesium L-Threonate Powder with Calcium and Vitamin D retails for $40. If a member buys four bottles during Super Sale, the price is reduced to $24.30 per bottle. Contains corn.

Magtein™ is a trademark of Magceutics, Inc, distributed exclusively by AIDP, Inc. Patent pending.

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Vitamin D3 1,000 IU
250 capsules
Retail: $12.50
Four-bottle Member Price during Super Sale: $7.59 ea.
Commercial companies offered only 400 IU vitamin D products when Life Extension long ago introduced this 1,000 IU version. For most people, this 1,000 IU potency is insufficient to attain optimal vitamin D blood levels. For smaller individuals who obtain 2,000-3,000 IU in their multi-nutrient formulas (and children), this potency of vitamin D may be suitable.

Item # 00251
Please refer to website for allergen information.

Vitamin D3 5,000 IU with Sea-Iodine™*
60 vegetarian capsules
Retail: $14
Four-bottle Member Price during Super Sale: $8.44 ea.
Most people do not ingest enough vitamin D and iodine, especially those seeking to reduce their salt intake. Combining 5,000 IU of vitamin D3 and 1,000 mcg of iodine into one capsule makes taking these two nutrients economical and convenient.

Item # 01372
Please refer to website for allergen information.

Vitamin D3 Liquid Emulsion 2,000 IU
1 ounce
Retail: $28
Four-bottle Member Price during Super Sale: $16.88 ea.
For those rare individuals who have difficulty absorbing enough vitamin D3 from powdered capsules, this liquid emulsion of vitamin D can be used.

Item # 00864

To order any of these high-potency vitamin D3 supplements, call 1-800-544-4440 or visit www.LifeExtension.com

Study after study confirms the vital importance of maintaining optimal levels of vitamin D for broad-spectrum health benefits. Research often indicates that a blood level of 50 ng/mL of 25-hydroxyvitamin D is ideal.

Because people have individual requirements, Life Extension® has created the largest selection of vitamin D supplements available to ensure that you achieve your vitamin D3 goals.

Keep in mind that you may already be getting 1,000-3,000 IU of vitamin D in your multi-nutrient formula.

CAUTION: Individuals consuming more than 2,000 IU/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxyvitamin D measurement. Do not exceed 10,000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with hypercalcemia (high blood calcium levels). People with kidney disease, certain medical conditions (such as hyperparathyroidism or sarcoidosis), and those who use cardiac glycosides (digoxin) or thiazide diuretics should consult a physician before using supplemental vitamin D.

* If you have a thyroid condition or are taking antithyroid medications, do not use without consulting your healthcare practitioner.

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Egg Consumption Sharply Increases Prostate Cancer Risk

In a recent study published in the journal Cancer Prevention Research, scientists from the University of California, San Francisco, discovered that eggs may increase men’s risk of developing the more lethal form of prostate cancer.*

Using dietary data from 27,607 men who were followed from 1994 to 2008 who had no cancer at the start of the study, the scientists sought to find a correlation between egg consumption and prostate cancer. To analyze the risk, they compared the number of observed cancer events (199) with the total number of person-years (306,715) in the study.

They found that men who ate 2.5 eggs or more a week had an 81% higher risk of developing lethal prostate cancer compared to men who ate fewer than 0.5 eggs a week on average. This is not the first study to associate egg consumption with increased cancer risk.

Editor’s Note: Eggs are a rich source of arachidonic acid. High dietary intake of arachidonic acid induces formation of 5-LOX and COX-2 enzymes, both that promote tumor formation and progression. Life Extension® has previously written about how arachidonic acid causes prostate cancer. Members take curcumin, fish oil, and highly absorbable boswellia extract to impede conversion of arachidonic acid to leukotriene B4 via 5-LOX. Aspirin and other nutrients like gamma tocopherol impede COX-2.

-Dual Plant Extract Promotes Weight Loss

A combination of two plant extracts reduced body weight by an average of 11.5 pounds after 8 weeks in obese adults, according to two clinical trials recently presented at the 29th Annual Scientific Obesity Meeting in Orlando, Florida.*

In randomized, double-blind, placebo-controlled trials, 100 subjects received placebo or 400 mg twice daily of an extract prepared from Sphaeranthus indicus flower heads and mango-steen (Garcinia mangostana) fruit rind. All participants were placed on a 2,000 cal/day diet and instructed to perform moderate walking exercise 5 times weekly.

After 2 weeks, the plant extract group lost 4.5 pounds—2.7 times more than the placebo group. At 8 weeks, the plant extract group had significantly reduced waist and hip circumference, by 4.7 inches and 2.5 inches, respectively. In addition to loss of weight and inches, the plant extract group experienced improvements in blood glucose and serum lipid profiles. Increased adiponectin levels in the plant extract recipients indicate that the dual plant extract works by enhancing fat metabolism.

Editor’s Note: Life Extension members have had access to this dual combination of Sphaeranthus indicus and Garcinia mangostana since June 2011.

–Elizabeth Wagner, ND


How Resveratrol Helps Combat Breast Cancer

FASEB Journal reports the finding of Italian and US researchers of an ability for resveratrol to inhibit the growth-promoting effects of estrogen in breast cancer cells.* Resveratrol occurs in red grapes and wine, and it is believed to be one of the compounds responsible for the benefits associated with consuming these foods.

Sebastiano Andò and colleagues evaluated the effects of resveratrol in several estrogen receptor-positive breast cancer cell lines, including cells that are resistant to treatment with the estrogen receptor antagonist drug tamoxifen. They observed a reduction in the proliferation of treated cells compared to cells that were not treated with resveratrol. Further experimentation revealed that resveratrol significantly lowered the cells’ estrogen receptor levels in addition to acting via other mechanisms to inhibit their growth.

“Resveratrol is a potential pharmacological tool to be exploited when breast cancer becomes resistant to hormonal therapy,” stated Dr. Andò.

Editor's Note: While FASEB Journal Editor-in-Chief Gerald Weissmann, MD, does not recommend that breast cancer patients drink wine in an attempt to treat their disease, he predicted that, “Scientists haven’t finished distilling the secrets of good health that have been hidden in natural products such as red wine.”


Vitamins B6 and B12 May Protect Against Depression in Older Adults

A recent study published in the American Journal of Clinical Nutrition examined a long-hypothesized link between depression and B vitamin deficiency.* Scientists from the Rush University Medical Center in Chicago, Illinois, examined diet and supplement questionnaires of 3,503 adults age 65 or older. The focus of the examination was on vitamin B6, B12, and folic acid intake.

The scientists controlled for use of depressants, age, race, and other variables. Each additional 10 mg of B6 and 10 mcg of B12 derived from both food and supplement form was associated with a 2% reduction per year in the odds of developing symptoms of depression. Food intake alone was not associated with a lower risk of depressive symptoms.

These results support the scientists’ hypothesis that high total intakes of vitamins B6 and B12 are protective of depressive symptoms over time.


Green Tea Protects Against Weight Gain in Mice

An article published in Obesity reports the finding of a team from Penn State University of a benefit for epigallocatechin-3-gallate (EGCG), a compound that occurs in green tea, in reducing weight gain in a mouse model of obesity.

Joshua D. Lambert and his associates utilized a breed of mice susceptible to the development of diet-induced obesity, type 2 diabetes and atherosclerosis. The mice were allowed to eat as much as they wanted of a high-fat diet, and half were supplemented with EGCG. After six weeks, mice that received EGCG-enhanced diets were found to have gained weight 44% less rapidly than those that did not receive the compound. The group that received EGCG also had a 29.4% increase in fecal lipids, indicating a reduction in fat absorption. In an in vitro experiment, epigallocatechin-3-gallate was shown to inhibit the pancreas’ production of lipase, an enzyme that breaks down fat.

Editor’s Note: One capsule of Life Extension’s Mega Green Tea Extract provides more polyphenols than drinking the equivalent of three cups of green tea. Although the human equivalent of the amount of EGCG used in this study would be found in ten cups of green tea per day, Dr. Lambert remarked that, “Human data—and there’s not a lot at this point—shows that tea drinkers who only consume one or more cups a day will see effects on body weight compared to nonconsumers.”

*Obesity (Silver Spring). 2011 Jun 2.

*Obesity (Silver Spring). 2011 Jun 2.
Melatonin Prolongs Life in Animal Model of Huntington’s Disease

An article published in the Journal of Neuroscience reveals the discovery of a protective effect for melatonin against disease progression and premature death in a mouse model of Huntington’s disease, an inherited disorder that results in involuntary movement and other effects stemming from the loss of neurons in the brain due to a mutant protein.*

The team injected mice bred to develop Huntington’s disease with melatonin or a placebo. Animals that received the hormone experienced a 19% delay in the onset of disease, a reduction in disease progression, and an 18% longer life span compared with the placebo group. When normal animals’ brain tissue was studied, type 1 melatonin (MT1) receptors were found on the cells’ mitochondria, which produce energy. The researchers observed that the receptors were depleted in animals with Huntington’s—a finding that was also detected in brain tissue derived from humans afflicted with the disease.

Editor’s Note: Melatonin is a hormone involved in sleep and immune function that has been found to be reduced in other neurodegenerative disorders, such as Alzheimer’s and Parkinson’s diseases.

—D. Dye

Study Finds Significant Potential for Omega-3 Fatty Acids in the Prevention and Treatment of Arthritis

Writing in the journal Osteoarthritis and Cartilage, British researchers report the results of an animal experiment which found that omega-3 fatty acids reduced many of the signs of osteoarthritis.*

John Tarlton of the University of Bristol’s School of Veterinary Sciences and his associates compared the effect of a standard high omega-6 diet containing corn oil or a diet enhanced with fish oil that is high in omega-3 fatty acids in a breed of guinea pigs that naturally develop arthritis. An arthritis-resistant breed of guinea pigs was used as controls. The animals received the diets for 20 weeks, after which cartilage, bone, and blood factors were examined for signs of the disease. Among the arthritis-prone guinea pigs given omega-3, the majority of disease indicators were reduced in comparison with animals that received diets that did not contain fish oil.

Editor’s Note: “Most diets in the developed world are lacking in omega-3, with modern diets having up to 30 times too much omega-6 and too little omega-3,” Dr. Tarlton observed. “Taking omega-3 will help redress this imbalance and may positively contribute to a range of other health problems such as heart disease and colitis.”

—D. Dye

IN THE NEWS

CoQ10 May Combat Chronic Tinnitus

A recent study by German scientists sought to determine the short-term effects of coenzyme Q10 on tinnitus expression in patients with chronic tinnitus aurium.* Chronic tinnitus is often simply described as an unexplained buzzing or ringing inside a person’s ear, when there is no cause for the noise from an external source.

The scientists performed a 16-week clinical trial comparing the presence of tinnitus with CoQ10 levels and total antioxidant status in individuals. The participants were then evaluated using a TQ score, which is a questionnaire designed to measure a person’s level of experiencing tinnitus.

In a subgroup of 7 patients with low initial CoQ10 concentration in their system and significant increase in the CoQ10 level following the trial, a clear decrease in the TQ score was observed. The scientists concluded that in patients with a low plasma CoQ10 concentration, CoQ10 supply may decrease the tinnitus expression.


Eliquis™ May Be Superior, Not Just Equivalent to Warfarin

A recent article in The New England Journal of Medicine titled “Apixaban versus warfarin in patients with atrial fibrillation,” studied the effects of the vitamin K antagonist apixaban (trade name Eliquis™) on preventing stroke in patients with atrial fibrillation.1 For more than 50 years, warfarin has been the primary medication used to reduce the risk of thromboembolic events in patients with atrial fibrillation, but warfarin has numerous interactions with other drugs and requires the need for regular blood monitoring and dose adjustments.

In an accompanying editorial, Jessica L. Mega, MD, MPH, says that for the above reasons, “…Clinicians and patients have been eager to embrace alternative oral anticoagulants that are equally efficacious but easier to administer.” One such alternative involves the direct factor Xa inhibitor apixaban.

In a randomized, double-blind trial, doctors at the Duke Clinical Research Institute compared apixaban (at a dose of 5 mg twice daily) with warfarin in 18,201 patients with atrial fibrillation and at least one additional risk factor for stroke. The primary outcome was ischemic or hemorrhagic stroke or systemic embolism. The trial was designed to test noninferiority, with key secondary objectives of testing for superiority with respect to the primary outcome and the rates of major bleeding and death from any cause.1

The results confirmed that in patients with atrial fibrillation, apixaban was superior to warfarin in preventing stroke or systemic embolism, caused less bleeding, and resulted in lower mortality.1

Editor’s Note: An exciting new age has dawned in the prevention of stroke and systemic embolism in the context of atrial fibrillation. New, oral anticoagulant options vs. warfarin are available that offer an improved safety profile. The ARISTOTLE trial involving 18,201 patients who were randomly given either warfarin or Eliquis™ (apixaban) showed a reduced rate of stroke or systemic embolism by 21%, and mortality was reduced by 11%. By comparison, Pradaxa® (dabigatran) reduced deaths by 12% in RE-LY (major registrational trial), and Xarelto® (rivaroxaban) in the ROCKET AF trial by 8%, but these results were not statistically significant. However, these were all different trials, and additional studies will need to be conducted to identify which of these drugs is best.


–J. Finkel
In 2003, the Life Extension Foundation® introduced a standardized resveratrol extract shown to favorably alter genes implicated in the aging process—many of the same genes that respond to calorie restriction.

Since then, we have identified additional compounds that simulate calorie restriction’s ability to trigger youthful gene expression—the process by which genes transmit signals that slow certain aspects of aging.

Compelling evidence reveals that certain compounds found in berries, such as pterostilbene and fisetin, possess potent “longevity gene” activators that work in synergy with resveratrol. For example, fisetin (found in strawberries) has been shown to stabilize resveratrol in the body by shielding it from metabolic breakdown, thus extending its beneficial effects.

High-Potency Resveratrol with Synergistic Activators

Life Extension members gain access to standardized trans-resveratrol combined with plant extracts that favorably influence longevity gene expression. Unlike many commercial formulas, Life Extension standardizes to trans-resveratrol, which researchers contend is the most active constituent.

A bottle containing 60 vegetarian capsules of Optimized Resveratrol with Synergistic Grape-Berry Actives retails for $46. If a member buys four bottles during Super Sale, the price is reduced to just $27.90 per bottle. The suggested dose of one capsule a day provides:

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<tr>
<td>Fisetin</td>
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Contains yeast.

References

To order Optimized Resveratrol, call 1-800-544-4440 or visit www.LifeExtension.com
Turns out, the advice you got as a child to “eat your greens” could pay major dividends as an adult. Scientists have recently identified extracts from green vegetables like broccoli, cabbage, and Brussels sprouts that help maintain healthy hormone levels. Having optimal hormone levels is essential to any anti-aging strategy. In addition, many of these extracts contain glucosinolates, isothiocyanates, carnosic acid, and carnosol – bioactive compounds that have a wide variety of favorable effects on estrogen metabolism and cell division.¹⁻⁴

**Triple Action Cruciferous Vegetable Extract with Apigenin** combines a broccoli Super Concentrate with watercress, Indole-3-Carbinol (I3C), rosemary extract, cat’s claw extract, cabbage extract, DIM, and apigenin, a powerful plant flavonoid found in plants such as parsley and celery, to form the most comprehensive cruciferous vegetable supplement available.⁵

For those who don’t have the time to consume each of the above vegetables each and every day, **Triple Action Cruciferous Vegetable Extract with Apigenin** is the perfect solution to making sure your body gets the important extracts it needs from these crucial food sources. For those weighing less than 160 pounds, just one vegetarian capsule a day provides optimal potencies. Those weighing over 160 pounds should consider taking two capsules a day. A 60-vegetarian capsule bottle of **Triple Action Cruciferous Vegetable Extract** retails for $24. If a member buys four bottles during Super Sale, the price is reduced to only $14.85 per bottle.

Those who want to obtain the benefits of resveratrol can order **Triple Action Cruciferous Vegetable Extract with Resveratrol**. Each capsule provides 20 mg of trans-resveratrol in addition to the vegetable extracts and retails for $32 per 60-capsule bottle. When a member buys four bottles during Super Sale, the price is reduced to only $19.98 per bottle.

**REFERENCES:**

To order **Triple Action Cruciferous Vegetable Extract**, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Ultimate Protection for Systemic Cellular Inflammation

Excess levels of the enzyme 5-lipoxygenase or 5-LOX set in motion inflammatory responses that have been linked to common degenerative effects in aging individuals.\textsuperscript{1,5} Normal aging results in higher-than-desired levels of 5-LOX.

The typical American diet adds to the danger. Foods rich in omega-6 fatty acids like red meat, poultry, eggs and dairy products, along with high-glycemic carbohydrates, trigger overproduction of arachidonic acid. In response to high levels of arachidonic acid, the body produces the 5-LOX enzyme.

5-LOX breaks down arachidonic acid to pro-inflammatory compounds like leukotriene B\textsubscript{4},\textsuperscript{6} a molecule that attacks joints, arterial walls, and other tissues. 5-LOX itself facilitates undesirable cell division changes.

The good news is that extract of the Indian plant Boswellia serrata has been shown to neutralize 5-LOX.

New Higher Absorbable Boswellia

Used for centuries to help with inflammatory issues, boswellia acts as a natural 5-LOX inhibitor, intervening at the cellular level to block its unwanted effects.

Confirmatory data reveal that a compound contained in boswellia called AKBA (3-O-acetyl-11-keto-ß-boswellic acid)\textsuperscript{7,8} is the key to its beneficial action.

The problem is that boswellia is not readily absorbed into the blood.\textsuperscript{9} For this reason, a patent-pending, standardized form of boswellia called AprèsFlex\textsuperscript{™} is being introduced that absorbs into the blood 52\% more than previously available boswellia extracts.\textsuperscript{9}

Each 100 mg vegetarian capsule of 5-LOX Inhibitor with AprèsFlex\textsuperscript{™} is standardized to provide 20\% of active AKBA from boswellia. Most people need only one capsule a day.

A bottle containing 60 100 mg vegetarian capsules of 5-LOX Inhibitor with AprèsFlex\textsuperscript{™} retails for $22. If a member buys four bottles during Super Sale, the price is reduced to just $13.50 per bottle.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Nutrients to Combat the Modern Stress Epidemic

BY JEFFREY CASTLE

Be it work, finances, relationships, or health issues, most of us experience stressful events at some point in our lives. But today, researchers are witnessing levels of stress that are virtually unprecedented.

A startling 80% of Americans now report experiencing intense, chronic stress over personal finances and the economy. And the problem is global: the World Health Organization estimates that stress-related disorders affect nearly 450 million individuals worldwide.

The effects of this pandemic on the public health are profound. Researchers have linked the cumulative impact of stress to a host of age-accelerating conditions and degenerative diseases.

These range from cardiovascular disease to diabetes to various cancers.

The good news is that recent confirmatory data show targeted nutritional interventions exert a beneficial effect on many of the biological risk factors produced by stress.

Two natural compounds in particular have been shown to reduce stress levels, enhance attention and productivity, and lower many stress-related factors associated with risk of death.

In this article you’ll learn the most recent data on the stress-relieving properties of lemon balm, a common garden herb, and L-theanine, an amino acid found exclusively in tea.

Lemon balm has been shown to exert a calming effect in healthy individuals, while L-theanine has been found to soothe anxiety, without side effects.
Natural Stress and Anxiety Relief

Lemon balm is a common garden herb closely related to mint. It has been prized in traditional cultures for its capacity to induce sleep and mild sedation, as well as for its memory-enhancing properties. Modern-day laboratory techniques reveal some of the underlying mechanisms of lemon balm’s clinically proven efficacy.

Lemon balm, and its chief components, rosmarinic acid, quercetin, gallic acid, quercitrin, and rutin, are potent antioxidants that protect brain cells and other tissues from reactive oxygen species (ROS). Lemon balm tea, for example, is used to protect radiology technicians from the oxidizing effects of chronic occupational exposure to low-level radiation.

Lemon balm and rosmarinic acid also boost levels of the relaxation-inducing neurotransmitter called GABA in the brain. They do so by inhibiting the enzyme that normally degrades GABA. The result of these lemon balm–induced elevations of GABA is a reduction in anxiety. Increasing brain GABA activity is the mechanism by which prescription anti-anxiety drugs act as well, though they can lead to chemical dependency and side effects.

Lemon balm also modulates the important neurotransmitter acetylcholine, the levels of which are reduced in Alzheimer’s disease and other neurodegenerative conditions. Rosmarinic acid inhibits acetylcholinesterase, the enzyme that breaks down acetylcholine and reduces its availability to brain cells. This effect is similar to that produced by prescription drugs meant to treat Alzheimer’s disease.

Animal studies reveal powerful anxiety- and stress-reducing effects of lemon balm. Mice demonstrate significantly reduced anxiety in maze experiments following supplementation with lemon balm extract, without any changes in overall activity level or memory.

Mice conditioned to experience chronic fear showed significantly reduced stress responses and more appropriate behavior following dosing with rosmarinic acid, an effect with substantial implications for humans living with chronic anxiety and stress. Lemon balm extracts also reduce pain from a variety of stimuli, further contributing to their soothing, stress-relieving effects.

Human studies of lemon balm are equally compelling, as demonstrated in a series of trials conducted in the Human Cognitive Neuroscience Unit at the University of Northumbria in the United Kingdom. Researchers there found that 600 mg of lemon balm produced sustained improvements in a test of “accuracy of attention.” Three hundred milligrams of lemon balm produced an increase in self-rated calmness in a group of healthy adults, while 900 mg of lemon balm reduced self-rated alertness. That latter finding is a desirable effect in a supplement meant to produce relaxation.

A subsequent study using higher doses demonstrated significant improvements in both calmness and memory performance at all time points following a single 1,600 mg dose.

The British researchers next evaluated lemon balm in a more challenging test, namely in a setting in which subjects are deliberately stressed in the laboratory.

Lemon balm
They gave 18 healthy volunteers doses of 300 or 600 mg of lemon balm, or a placebo, and then subjected them to the Defined Intensity Stressor Simulation, a battery of challenges designed to impose stress. The higher dose counteracted the negative mood effects of the stress test, while significantly increasing self-ratings of calmness and again reducing self-ratings of alertness. Similar results were later shown with a supplement containing both lemon balm and valerian root, another natural sedative.

Interestingly, the lower dose of lemon balm (300 mg) also increases the speed of mathematical processing, with no reduction in accuracy, in human studies. That observation, combined with some findings about the molecular actions of rosmarinic acid, has led scientists to examine lemon balm’s effects in Alzheimer’s disease and other conditions of cognitive impairment.

The antioxidant protection provided by lemon balm shows promise in reducing oxidant-related brain cell death, an important contributor to Alzheimer’s and Parkinson’s diseases as well as age-related cognitive decline. Lemon balm and its components are also highly effective at reducing accumulations of the harmful amyloid-beta, a protein that is a leading contributor to Alzheimer’s disease. Lemon balm’s ability to inhibit the enzyme acetylcholinesterase boosts brain levels of the neurotransmitter acetylcholine, which are low in Alzheimer’s. These and other mechanisms of lemon balm and its components are credited with improving cognitive performance in maze experiments with animals.

Human studies of lemon balm extracts in treatment of Alzheimer’s have been encouraging. In one study, supplemented patients with mild to moderate Alzheimer’s, aged 65-80 years, demonstrated significantly better outcomes on tests of cognitive function than did placebo recipients. That study also found a reduction in agitation in supplemented patients compared with placebo recipients. In a related study, aromatherapy with lemon balm essential oil reduced agitation in 60% of patients with severe dementia, compared with just 14% in a placebo group. Total agitation scores were reduced by an average of 35%, compared with just 11% in placebo recipients.

**Combating the Modern Stress Epidemic**

- Eighty percent of Americans experience chronic stress, which is a known causative factor of chronic disease and early death.
- Stress exerts a well-defined impact on all body systems, resulting in elevated plasma cortisol levels and abnormal release of inflammatory cytokines.
- New research designates lemon balm and L-theanine, two natural products, as significant contributors to reduced stress and anxiety.
- The two ingredients work by different but complementary mechanisms to lower the physical manifestations of stress and promote long life span.
- Both lemon balm and L-theanine also demonstrate substantial neuroprotective characteristics through mechanisms related to their calming effects on brain cells.

**L-theanine** is a non-protein amino acid found exclusively in green tea. It contributes significantly to the favorable taste of green tea and has numerous health-promoting benefits. It has traditionally been used to enhance relaxation and improve concentration and learning ability. Those features have
modern scientists interested in its potential as a natural stress-reliever.32

L-theanine is chemically related to the neurotransmitter glutamate and binds to glutamate receptors in the brain.36,37 Unlike glutamate, however, which can cause a state called excitotoxicity that can eventually damage nerve cells, L-theanine protects brain cells against excitotoxicity, calming the nerve networks in the brain.37-39

Animal studies verify the behavioral benefits of these biochemical effects. In isolated rat brain slices, L-theanine reduces electrical activity associated with anxiety.40 L-theanine reduces evidence of anxiety and depression in several different animal models of stress.41,42 In freely moving rats, L-theanine led to decreases in nearly all frequencies of brainwave activity, indicating a state of calmness and relaxation.43 That is hardly surprising: L-theanine is known to be synergistic with the GABA-enhancing anti-anxiety drug midazolam, a relative of Valium.42

Brainwave studies have shed some light on how L-theanine achieves its remarkable anxiety-reducing effects. In one study, healthy subjects took a soft drink containing green tea enriched with L-theanine while their brainwave power was measured.44 Power was initially reduced in all frequencies and areas during the first hour, indicating relaxation. Later changes indicated both an increase in mental performance and a higher degree of relaxation. In this case, L-theanine seemed to produce desirable increases in attention, accompanied by durable relaxation—that means subjects could concentrate better without being distracted by anxiety.

Another brainwave study demonstrated that L-theanine significantly increased activity in the frequency band indicating relaxation without inducing drowsiness.45 And a third concluded that L-theanine plays a general role in sustaining attention during a long-term difficult task.46 That's important, because it is known that while stress and anxiety can reduce your ability to maintain attention and focus, promoting attention and focus is an effective way of reducing your stress and anxiety.47

Life stressors and sleep disruptions dramatically increase your risk of bad health outcomes and premature death.
Another way to assess stress and anxiety is by measuring vital signs such as heart rate and salivary content of certain proteins that are increased during stress. Japanese researchers did just that with 12 subjects during a mental arithmetic test given as an acute stressor.8 Results showed that the supplement reduced heart rate and salivary protein responses to the acute stress task, compared with placebo. In addition, heart rate variability was improved, a sign that the L-theanine was reducing activation of the sympathetic nervous system, or “fight-or-flight” response. Improved heart rate variability is a protective factor against cardiovascular disease, so L-theanine’s anti-stress effects in this case are also indirectly cardio-protective.5

Several studies have now also shown that L-theanine substantially augments the known attention-focusing effects of caffeine. Adding L-theanine to caffeine leads to improved accuracy and speed of information processing, less susceptibility to distraction, improved switching between tasks, and less mental fatigue, while improving reaction time and reducing physical symptoms such as headache and tiredness.48-51

Unfortunately, the amounts of L-theanine in a regular cup of caffeinated green tea are not large enough to produce the anti-anxiety effects, meaning supplementation is necessary. Most studies of L-theanine showing benefits use doses of between 100 and 250 mg per day, while a cup of green tea typically contains 20 mg or less.45

Why “L”-theanine?

L-theanine is the amino acid that gives green tea its delightfully subtle taste and also provides many of its health benefits, particularly those involving the nervous system. Why do we refer to it as “L”-theanine, and what is the significance? Most biologically active compounds can occur in two forms, each the mirror-image of the other. Scientists use the prefixes “D” and “L” to distinguish between the two forms. Only one form (usually the “L” form) is biologically active, however.

When humans manufacture biological molecules, as opposed to extracting them from natural sources, we typically produce a mixture containing both forms in equal measure—a so-called “racemic” mixture. When you consume such a mixture, then, you are only getting 50% of the actual biological activity; the rest is simply wasted.

Not all supplements are alike; look for the designation “L-theanine” to be sure you are taking the most potent and biologically sound form of this valuable stress-relieving substance.

L-theanine’s many neuroprotective effects make it an attractive natural product for preventing and treating disorders such as Alzheimer’s disease.52 A placebo-controlled clinical study in mid-2011 examined the effects of L-theanine and green tea extract on memory and attention in a group of adults with mild cognitive impairment.53 Mild cognitive impairment is often seen as a precursor or risk factor for Alzheimer’s disease.54,55 The supplemented group experienced improvements in memory and selective attention (the ability to attend to one task without being distracted by others). Brain waves indicative of cognitive alertness were significantly increased by the supplement as well.

Summary

Stress and anxiety plague 80% of Americans. Far from being mere annoyances, these psychological conditions have profound physical implications. It is no exaggeration to say that stress can shorten your life.

Prescription sedatives and anti-anxiety drugs have some short-term benefit in reducing symptoms, but their long-term safety and effectiveness has not been established, and they carry risks of significant side effects, tolerance (loss of efficacy) and addiction.
Lemon balm and L-theanine, on the other hand, offer powerful protection against stress and anxiety through distinct and complementary mechanisms. Both have been shown to reduce not only stress but the biological manifestations it produces in the body and brain. And both have additional neuroprotective characteristics as well. If you suffer from stress and anxiety, consider adding a combination supplement containing high-quality lemon balm and L-theanine to your health maintenance regimen.

If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.

References

TABLE 2: Physical and Psychological Impact of Stress

<table>
<thead>
<tr>
<th>Physical Symptoms of Stress</th>
<th>Psychological Effects of Stress</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue</td>
<td>Irritability or Anger</td>
<td>51%</td>
</tr>
<tr>
<td>Headache</td>
<td>Feeling Nervous</td>
<td>44%</td>
</tr>
<tr>
<td>Upset Stomach</td>
<td>Lack of Energy</td>
<td>34%</td>
</tr>
<tr>
<td>Muscle Tension</td>
<td>Feeling a Need to Cry</td>
<td>30%</td>
</tr>
<tr>
<td>Change in Appetite</td>
<td></td>
<td>23%</td>
</tr>
<tr>
<td>Teeth Grinding</td>
<td></td>
<td>17%</td>
</tr>
<tr>
<td>Change in Sex Drive</td>
<td></td>
<td>15%</td>
</tr>
<tr>
<td>Feeling Dizzy</td>
<td></td>
<td>13%</td>
</tr>
</tbody>
</table>

Stress produces major physical and psychological changes in your mind and body. Problems in themselves, these changes also contribute to increased cortisol levels and increased inflammation that leads to chronic disease and early death.62,63


Feeble bones severely hamper quality of life and put aging humans at risk for injury due to possible breaks or fractures.

Bone Restore combines critical bone boosting nutrients into one superior formula.

Bone Restore includes highly absorbable forms of calcium, a bioavailable form of boron, along with vitamin D3, magnesium, zinc, manganese, and silicon.

Bone Restore now contains magnesium citrate, which is one of the most absorbable forms of magnesium.

The retail price for 150 capsules of Bone Restore is $22.50. If a member buys four bottles during Super Sale, the price is reduced to just $13.16 per bottle.

Just five capsules of Bone Restore provide:

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly Absorbable Calcium</td>
<td>1,200 mg</td>
</tr>
<tr>
<td>(as DimaCal® dicalcium malate, TRAACS® calcium glycinate chelate, calcium fructoborate)</td>
<td></td>
</tr>
<tr>
<td>Vitamin D3</td>
<td>1,000 IU</td>
</tr>
<tr>
<td>Magnesium (as magnesium citrate)</td>
<td>100 mg</td>
</tr>
<tr>
<td>Boron</td>
<td>3 mg</td>
</tr>
<tr>
<td>(calcium fructoborate as patented Fruitex B® OsteoBoron™)</td>
<td></td>
</tr>
<tr>
<td>Zinc</td>
<td>2 mg</td>
</tr>
<tr>
<td>Manganese</td>
<td>1 mg</td>
</tr>
<tr>
<td>Silicon</td>
<td>5 mg</td>
</tr>
</tbody>
</table>

Contains corn and rice.

Fruitex B® and OsteoBoron® are registered trademarks of VDF Futureceuticals, Inc. U.S. patent #5,962,049.

DimaCal® and TRAACS® are registered trademarks of Albion Laboratories, Inc. Malate is covered by U.S. Patent 6,706,904 and patents pending.

To order Bone Restore, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Ultra Natural Prostate with AprèsFlex™ and Standardized Lignans softgels combines cutting-edge natural ingredients that have been scientifically substantiated to protect the prostate gland and maintain its healthy function.*

The latest addition to this incredible formula is AprèsFlex™, an extract of *Boswellia serrata* that has been shown in studies to have two times the bioavailability of the leading boswellia extract. AprèsFlex™ inhibits the dangerous enzyme 5-lipoxygenase. Boron is included because of studies showing it may help slow elevation of prostate-specific antigen (PSA).

The formula provides saw palmetto extract and Graminex Flower Pollen Extract™ to interfere with DHT activity and help regulate inflammatory reactions in the prostate.* Lycopene is a carotenoid that has been added to the formula to help maintain healthy DNA gene function in prostate cells.

In order to boost its anti-estrogen capabilities, Ultra Natural Prostate Formula incorporates HMRLignan™, derived from Norway spruce, flax lignans, and nettle root extract.

Since normal aging can lead to potentially unsafe levels of prostaglandins in the prostate, *Pygeum africanum* extract is included to help suppress prostaglandins and thereby promote prostate comfort.* Beta-sitosterol has been added because it is the most biologically active component of *pygeum* and enhances its protective effects.

The retail price for one bottle of Ultra Natural Prostate Formula with AprèsFlex™ is $38. If a member buys four bottles during Super Sale, the price is reduced to $23.63 per bottle. If a member buys 12 bottles during Super Sale, the price is reduced to $21.60 per bottle. Contains soybeans and corn.

To order Ultra Natural Prostate Formula with AprèsFlex™, call 1-800-544-4440 or visit www.LifeExtension.com

* These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Experience Tranquility

Overstressed? Losing sleep?
Left unchecked, the inner turmoil created by these issues can lead to heart palpitations, muscle weakness, headaches, and even increased blood pressure. You need to take action to halt these symptoms immediately.

Fortunately, Life Extension® has created Natural Stress Relief, a calming formula made with lemon balm and L-theanine, two ingredients clinically proven to help promote sleep and relaxation.¹

The Cyracos® lemon balm extract used in this product is prepared from a special lemon balm chosen for its high concentrations of hydroxycinnamic and rosmarinic acids. These potent constituents may be mood enhancers that relieve everyday stress and alleviate sleep problems.¹

L-theanine, an amino acid derived from green tea, is a natural relaxant that has been used by the Japanese for years. Those who have taken L-theanine compare it to a massage, meditation session, and aromatherapy rolled into one.²

Based on a tremendous amount of published data, Life Extension® combined these two ingredients with the idea of providing the ultimate calming experience. Try it today.

Each vegetarian capsule of Natural Stress Relief provides:

- 300 mg of Cyracos® lemon balm extract
- 200 mg of Suntheanine® L-Theanine

Note that the amount of L-theanine in this product is double that of most L-theanine stand-alone supplements. The reason for this potency increase is reports of greater benefit when at least 200 mg of L-theanine are taken.

The retail price of a 30-count bottle of Natural Stress Relief is $28. If a member buys four bottles during Super Sale, the price of this potent stress-relieving formula is reduced to just $16.20 per bottle.

BEWARE OF IMITATIONS: The L-theanine used in the new Natural Stress Relief is Suntheanine®, the only pure form of L-theanine available worldwide and the only form protected by 40 internationally recognized patents and scientifically proven in clinical studies to be safe and efficacious. Independent laboratory analysis has verified that certain other products on the market claiming to contain "L-theanine" are only half L-theanine, the other half being a different form of theanine known as "D-theanine" that has not been scientifically evaluated in published studies. Suntheanine® is a registered trademark of Taiyo International, Inc. Use of Suntheanine® is protected by US Trademark Registration No. 2,548,957. Cyracos® is a registered trademark of Naturex, Inc.

References:

Contains rice.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Better Absorption for Optimum Benefit

AprèsFlex™ represents a quantum leap forward in the delivery to aging joints of boswellia, long prized for its ability to help with inflammatory issues. It is a superior inhibitor of the enzyme 5-lipoxygenase or 5-LOX.

Excess activity of 5-LOX results in the accumulation of leukotriene B4, a pro-inflammatory compound that affects aging joints. Boswellia has been shown to bind directly to the 5-LOX enzyme in our bodies, preventing it from facilitating production of pro-inflammatory leukotrienes.¹²

AprèsFlex™ boswellia absorbs into the blood 52% better than previously available forms of boswellia, for superior effectiveness.

Now with Dual-Action Support for Aging Joints!

As you grow older, age-related stiffness and discomfort in the joints becomes a fact of life. Activities once routine become a challenge as limited mobility hampers your every move.

You now have a more potent option to provide broad-spectrum support for aging joints.

ArthroMax™ Advanced with UC-II® and AprèsFlex™ is a multi-nutrient formula based on the very latest data on natural support for joint health. The new ArthroMax™ formula provides more joint support than ever before, enhanced with two innovative, clinically validated ingredients: AprèsFlex™ and UC-II®.

*These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
ArthroMax™ with Theaflavins and AprèsFlex™

ArthroMax is also available with Black Tea Theaflavins (without UC-II®) to protect against immune attack in the joints via a separate mechanism.

Inflammatory reactions are regulated by a series of “cytokines” produced in the body. Normal aging results in an unfavorable balance of these cytokines that contributes to persistent inflammatory conditions. Studies have shown that a special fraction found in black tea suppresses proinflammatory cytokines at the genomic level. Scientists have found that these compounds called theaflavins uniquely downregulate the expression of genes and cytokines associated with inflammatory conditions.

ArthroMax™ with Theaflavins formula provides these bioactive theaflavin fractions along with methylsulfonylmethane (MSM), which contains sulfur components that are critically important in maintaining comfortable joint function.* ArthroMax™ with Theaflavins also contains FruiteX B® OsteoBoron®, a patented form of boron that is identical to natural plant forms found in food. Considered more bioavailable than other forms of boron, FruiteX B® OsteoBoron® also supports healthy bones and joints.*

The retail price of a bottle of 60 capsules of ArthroMax™ Advanced with UC-II® and AprèsFlex™ is $36. If a member buys four bottles during Super Sale, the price is reduced to $21.60 per bottle.

References

*These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Discovering COFFEE’S UNIQUE Health Benefits

BY MICHAEL DOWNEY

Every morning, many of us sip our coffee with no real thought given to the beans behind the brew. But coffee beans are extraordinarily complex fruits containing over 1,000 compounds—only a handful of which have ever been individually investigated by scientists. Not only is coffee packed with antioxidants, but it is the greatest source of antioxidants in the American diet.

The average American coffee drinker consumes about 3.1 cups of coffee a day, but extensive research has found that higher volumes—as much as 4 to 12 cups daily—can help prevent most major killers, including cardiovascular disease, cancer, diabetes, liver disease, and Alzheimer’s disease.

For instance, in case-controlled human studies, compared to coffee abstainers, those who drank the most coffee cut their risks of breast cancer by 57% and diabetes by 67%.

In this article, you will learn about recent research into the benefits of coffee consumption, what’s missing from most commercial coffee beans, and what people should do who are overly sensitive to coffee beverages. > >
Diabetes Management

Health authorities expressed alarm over the mushrooming epidemic status of diabetes after a July, 2011, study in *Lancet* shocked even experts with its estimate of 347 million diabetics worldwide. Then, the *International Diabetes Federation* presented evidence on September 13, 2011, that the real total is closer to 366 million.

Scientific studies have found that regular coffee consumption (with its chlorogenic acid content) lowers the risk of type 2 diabetes by up to 67%. This appears to result from reduced levels of blood glucose, increased insulin sensitivity, and decreased storage of both fat and carbohydrate.

In one of a number of studies, a 2009 meta-analysis in the *Annals of Internal Medicine* combined data on over 450,000 people and found that every additional cup per day of caffeinated or decaffeinated coffee lowered the risk of diabetes by 5 to 10%.

Many epidemiological studies show that the risk of diabetes drops directly according to the amount of coffee consumed. For instance, scientists found that overall risk is reduced by:

1. 13% with one cup a day,
2. 47% with 4 cups a day,
3. 67% with 12 cups a day.

Scientists are beginning to learn how chlorogenic acid, a potent constituent of both raw and brewed coffee, can be directly tied to an anti-diabetic effect. Investigation has shown it substantially interferes with glucose synthesis and release in the body. It appears to accomplish this by inhibiting the pathway of glucose-6-phosphatase, a glucose-regulating enzyme, which in turn results in a reduction of sugar levels in the blood.

Chlorogenic acid also lessens the hyperglycemic peak associated with carbohydrate ingestion. This results in a downturn in insulin activity, and a reduced accumulation of adipose (fat-storing) tissue.

Unidentified compounds in coffee, as well as caffeine itself, may be boosting the preventive effect of chlorogenic acid against diabetes. Preliminary studies suggest that these chemicals may lower carbohydrate storage by 35% and improve insulin sensitivity.

Coffee was previously found to inhibit iron absorption. Later, in 2004, scientists found a direct link between reduced storage of iron in the body and a lower risk of diabetes type 2, independent of other risk factors.

Cancer Risk Reduction

Early studies are reporting an association between higher coffee consumption and a reduced risk of various cancers.

For instance, at a time when prostate cancer is the second leading cause of cancer death among American men (after lung cancer), a promising study appeared in the June 8, 2011, issue of the *Journal of the National Cancer Institute*. The research team reported that men who drank over 6 cups of coffee a day had an 18% lower risk of prostate cancer—and a 40% lower risk of aggressive or lethal prostate cancer. This effect was noted for decaffeinated as well as caffeinated coffee—indicating that compounds other than caffeine are responsible for this preventive effect. Constituents in coffee seem to improve insulin levels and sensitivity, hypothesized to play a role in prostate cancer progression.
With breast cancer ranked as the second leading cause of cancer death among American women (after lung cancer), potentially good news arrived recently in the form of a study finding that coffee consumption may help prevent a specific form of this disease. The May 14, 2011, issue of Breast Cancer Research reported that postmenopausal women who consumed 5 cups of coffee daily exhibited a 57% decrease in their risk of developing ER-negative (non-hormone-responsive) breast cancer, a form of cancer that is especially difficult to treat. This builds on an earlier study in which 2 or more cups of coffee per day was shown to delay the onset of breast cancer in women with a certain genetic type. Chlorogenic acid, caffeic acid, phytoestrogens, and caffeine—all found in coffee—are suspected of playing a major role.

Colorectal cancer is the second most common cause of cancer-related deaths in the US overall (when the statistics for both sexes are combined). While colonoscopy screening is a useful tool for detecting cancers or pre-cancerous polyps, researchers have long hoped to find ways to prevent these cancers in the first place. The good news is that a large meta-analysis has reviewed the combined data from 24 previous studies and found an overall 30% lower incidence of colorectal cancer among those categorized as heavy coffee drinkers. This confirms the findings from several earlier studies.

There is a 15% chance that patients who are diagnosed with an oral or pharyngeal cancer will be found to have another cancer somewhere in the same area of the body such as the larynx (voice box), esophagus, or lung. But early research suggests the promise of preventing these types of cancers from occurring. A case control study found that individuals who consumed more than three cups of coffee daily had a

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**Coffee’s Unique Health Benefits**

- Coffee is the greatest source of antioxidants in the American diet. And the good news is that sound scientific studies have found that the common fears about excess coffee consumption are invalid, and higher intake means bigger benefits.

- An impressive number of studies have shown a strong association between higher consumption of coffee and a significantly reduced risk of most chronic diseases, including diabetes, cardiovascular disease, cancer, Alzheimer’s disease, and others.

- With over 1,000 phytochemicals, coffee’s unparalleled antioxidant punch no doubt plays a role in its protection against disease. A multitude of direct biological actions on the body are suspected, such as an improvement in intracellular signaling, which may help prevent cancer, diabetes and more.

- Drinking just one cup of coffee a day—caffeinated or decaffeinated—can decrease the risk of developing diabetes by 13%. But at 12 cups a day, the risk of getting diabetes is slashed by 67%.

- Far from being a risky habit, coffee has now been shown to provide powerful protection against an epidemic of diabetes and a rising tide of other age-related diseases. It’s an all-natural and inexpensive elixir—to go!
COFFEE’S UNIQUE HEALTH BENEFITS

What’s Missing from Conventional Coffees?

Not all coffee provides the same powerful protection against chronic disease. Polyphenol availability varies with how long the beans are roasted and the roasting method itself.

Roasting method: All roasting destroys some polyphenols, the most important being chlorogenic acid. However, in a new patented roasting process, the coffee beans are soaked and drained prior to being roasted.156 Later, after roasting, the beans are deposited back into the same liquid in which they were originally pre-soaked, in a process designed to return substantial polyphenol content to the beans.

<table>
<thead>
<tr>
<th>Chlorogenic Acid Content of Conventional Roasted (Arabica) Coffee Compared to “Polyphenol-Retaining” Roasted Coffee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional Coffee</td>
</tr>
<tr>
<td>Polyphenol-Retaining Coffee</td>
</tr>
<tr>
<td>Conventional Decaffeinated Coffee</td>
</tr>
<tr>
<td>Polyphenol-Retaining Decaffeinated Coffee</td>
</tr>
</tbody>
</table>

You may have heard the common misconception that coffee raises blood pressure and increases the risk of CVD. However, scientific studies show that coffee’s compounds lower blood pressure over the long term,54 decrease the risk of cardiovascular disease,55-57 and may reduce the risk of stroke.58

Drinking coffee can raise blood pressure briefly, right after consumption.59-61 But its compounds have a longer-term benefit: daily coffee consumption decreases blood pressure readings after just 8 weeks, believed to be a result of the beneficial action of chlorogenic acids on the arteries.62

Longer-term, drinking coffee cuts the risk of death from cardiovascular disease. A 15-year study of over 41,000 women found that the risk of death from cardiovascular disease was 24% lower among those consuming 1 to 3 cups of coffee daily,6 which was confirmed by other studies on men and women.63,64

Preventing cardiovascular disease at the cellular level, just one cup of coffee inhibited platelet

40% lower risk of oral, pharyngeal, and esophageal cancers, compared to those who drank one cup of coffee or less each day.43 A second study made the same connection.44

For several decades, liver cancer has been on the rise among Americans.45 Liver cancer has become a leading cause of cancer deaths worldwide,45 due to higher rates in some other parts of the world. In recent years, however, studies have been accumulating that suggest a substantially reduced risk of this disease among coffee drinkers. In a 2005 study, for example, just one cup a day was associated with a 42% lower risk of liver cancer.46 A number of studies have reported similar conclusions.47-52

Cardiovascular Disease

As the leading cause of death, cardiovascular disease (CVD) kills over one third more Americans than cancer.53

Life Extension® offers two new coffees—(caffeinated and decaffeinated)—exclusively roasted using this patented polyphenol-retaining process. Studies clearly show the health benefits of coffee increase directly with the number of cups consumed per day. These patented “polyphenol-retaining” coffees provide far greater concentrations of the beneficial compounds found in coffee. As many as 4 to 12 cups a day of conventional coffee greatly reduce the risk of most major diseases, including cardiovascular disease,6-8 cancer,9-11 diabetes,12-14 liver disease,15-17 and Alzheimer’s disease.18-20 These new “polyphenol-retaining” coffees may provide equal benefits with only half the number of cups consumed.
In fact, one mouse study has far-reaching implications for humans. Researchers found that moderate caffeine intake—equivalent to human consumption of 5 cups of coffee daily—began to reverse Alzheimer’s damage in just 5 weeks.20

Although the mechanism by which coffee lowers the risk of cognitive decline is not known, a 2009 study on mice found that caffeine decreases levels, in both the blood and the brain, of amyloid-beta, a substance involved in the development of Alzheimer’s.78 Later, a 2010 review of previous mouse studies found that caffeine—the equivalent of 5 cups of coffee daily in humans—decreases levels of beta- and gamma-secretase, proteins used in amyloid-beta production in the first place.20

Then, in 2011, scientists concluded that coffee may be the best source of the caffeine shown to protect against cognitive decline. The reason is that another unknown component in coffee appears to synergize with the caffeine to increase blood levels of a factor (granulocyte colony-stimulating factor, or GCSF) associated with improved cognitive function in Alzheimer’s.79

Caffeinated coffee has also been associated with protection against Parkinson’s disease, the second most common neurodegenerative disorder after Alzheimer’s.80 A study of 29,000 individuals found that one to four cups daily decreased the risk of Parkinson’s by 47% and 5 or more cups decreased the risk by 60%.81 Increasing granulocyte colony-stimulating factor using drugs like Neupogen® is demonstrating efficacy in animal models of established Parkinson’s disease.82-85 Several other studies confirmed an inverse dose-dependent relationship—the greater the number of daily cups of caffeinated coffee, the lower the risk of Parkinson’s disease.86-88
COFFEE’S UNIQUE HEALTH BENEFITS

DNA Damage

DNA damage is characterized as a physical abnormality within the genetic makeup of a cell, such as a break in a DNA strand. It usually occurs to greater extent within cells that frequently divide. DNA damage can lead to genetic mutations that cause cancer. And when DNA damage occurs within cells that divide less frequently, it can promote aging.

It’s difficult to avoid the many causes of DNA injury. Oxidizing agents produced by normal metabolic processes promote this type of damage. Also, DNA defects can be triggered by numerous external agents such as ultraviolet light, radiation, chemotherapy, industrial chemicals, and certain environmental chemicals such as polycyclic hydrocarbons, found in smoke.

Scientists have discovered a surprisingly simple way to help decrease DNA damage. Studies show that higher coffee consumption decreases levels of oxidative DNA damage, which in turn inhibits both cancer and aging.

A 2011 study confirmed coffee’s DNA-related effect on cancer risk. The researchers found that regular coffee drinkers enjoyed a 13% decreased risk of cancers generally, and those who consumed high levels of coffee enjoyed an 18% decreased risk. Additionally, they enjoyed specific protection against prostate, breast, colorectal, pharyngeal, esophageal, hepatocellular, pancreatic, bladder, and endometrial cancers.

How Do Coffee Compounds Work?

Despite coffee’s powerful antioxidant punch, the mechanism for coffee’s protection against a host of diseases may involve a lot more than a fierce battle between antioxidants and free radicals. Scientists are beginning to discover that coffee’s phytochemistry also exerts direct biological actions on the body, which may underpin a web of indirect, protective effects against diseases from diabetes to cancer.

Early studies suggest that the polyphenols in coffee (both caffeinated and decaffeinated) may modify key enzymes that improve intracellular signaling, the communication system that facilitates cellular actions such as tissue repair, immunity, and homeostasis. Poor cell signaling may be a factor in cancer, diabetes, and more. (A subsequent study suggested in 2008 that this cellular signaling effect could also explain coffee’s inhibition of blood platelet aggregation and cardiovascular risk.)

Then, in 2009, a study found that by modulating specific cell signaling pathways (known as ERK1/2 and JNK), the various polyphenols in coffee—especially chlorogenic acid—help prevent the degeneration of those human cells that are rich in lipids. Brain cells are lipid-rich and this may explain coffee’s neuroprotective effect against cognitive decline and diseases of the brain.

Similarly, one study suggested that polyphenols—for which coffee is the prime dietary source—may affect cellular response and sensitivity by interacting with nuclear receptors. Receptors are molecules that pick up intracellular signals, determining whether a cell gets the right instructions to divide, die, or release molecules—thus regulating body functions to fight disease.

A 2006 review of animal and human studies found that coffee compounds raise levels of detoxifying enzymes that protect against DNA damage and—likely as a direct result—reduce the susceptibility of lympho-
cytes (white blood cells involved in immune response) to damage from reactive oxygen species (ROS). This may partly explain how coffee lowers the incidence of DNA damage and related diseases such as cancer.

One 2009 study on humans found that 3 cups of coffee daily for 3 weeks increased the number and metabolic activity of beneficial bacteria called bifidobacteria. These intestinal bacteria may explain one mechanism for coffee's benefits: bacteria can boost immunity, lower blood pressure, and increase mineral absorption.

In 2010, researchers discovered that the phenolics in 4-8 cups of coffee daily have the direct action of dampening inflammatory activity. Chronic low-level inflammation has been associated with diseases ranging from cancer to diabetes, as well as aging.

A 2011 randomized, controlled trial found that consumption of (caffeinated or decaffeinated) coffee produces specific improvements in the function of the liver and of adipocytes (fat-storing cells), both associated with a healthy metabolism. This provides further insight into the possible mechanisms behind coffee's benefits, because disrupted metabolic activity is a biological risk factor for a number of chronic diseases (including type 2 diabetes).

In addition to the numerous other antioxidants in coffee, a 2011 study confirmed that caffeine itself is a potent scavenger of oxygenated free radicals. Caffeine was found in another 2011 study to work synergistically with other coffee antioxidants. However, caffeine may also work along direct cellular pathways unrelated to its antioxidant action.

**A Multitude of Benefits**

Those who drink the most coffee have a substantially reduced risk of developing diabetes, cancer, liver disease, cognitive decline, and DNA damage. But the health benefits of coffee’s complex phytochemistry don’t end there:

- Decaffeinated and caffeinated coffee lowered the risk of kidney stones in women by 9 and 10%, respectively.
- Caffeinated coffee reduced the incidence of gallstones and gall bladder disease in both men and women.
- Scientists found that coffee boosted regular weight loss by 8 pounds and promoted body fat metabolism.
- Sometimes-inconsistent findings have generally linked coffee drinking with reduced all-cause mortality and cardiovascular mortality.
- For athletes, caffeine reduced muscle pain, increased energy (ergogenic aid), and enhanced endurance.
- One study found caffeine, taken 2 hours before exercise, prevented exercise-induced asthma.
- Confirming earlier research, a 2011 study on over 50,000 women found that 4 cups of coffee daily lowered the risk of depression by 20%, compared to coffee abstainers.
- Antibacterials in coffee were found to inhibit plaque formation and prevent dental decay.
- Whether caffeinated or decaffeinated, coffee consumption prevents constipation and—despite the myth that coffee dehydrates the body—contributes to the body’s fluid requirements.
- Caffeine is believed to boost by 40% the effectiveness of pain relievers against headaches. Caffeine also helps the body absorb headache medications more quickly.
- A large, as-yet-unpublished study presented October 24, 2011, found that men and women with the highest coffee consumption have a 13% and 18% lower risk, respectively, for basal cell carcinoma (a type of skin cancer).
Scientists determined in 2011 that caffeine protects the integrity of the blood-brain barrier—which suggests that caffeine may reduce the risk of some diseases by limiting the transport of blood-borne pathogens, drugs, cells, and other substances into the brain, where they might affect brain synapses. The team also found that caffeine defends against the specific blood-brain barrier dysfunction linked to Alzheimer’s and Parkinson’s disease.105

Summary

Although many people assume they should limit their coffee intake, a wealth of scientific research suggests that its wide-ranging health benefits increase with the amount consumed.

Numerous studies show that higher daily coffee consumption results in a lower risk of diabetes, cardiovascular disease, cancer, Alzheimer’s, and a host of other chronic diseases, including obesity.

There are a number of phytochemicals, the most predominate being chlorogenic acid, that provide coffee’s disease-protecting punch. Of interest is the additional ability of coffee polyphenols to exert direct biological actions on cells. For instance, daily coffee intake may modify key enzymes that improve intracellular signaling,85,86 which can protect against diabetes, cancer, and many other diseases.

The benefit is dose-related. Drinking just one cup of coffee a day—caffeinated or decaffeinated—can decrease the risk of developing diabetes by 13%.24 But 12 cups a day slashes the risk of developing diabetes by 67%.21

While traditional medicine fights an impossible battle against a tidal wave of diabetes, cancer, Alzheimer’s, and other age-related diseases, extensive research suggests that coffee—far from being a guilty pleasure that should be limited—is an all-natural and inexpensive elixir. With the availability of new “polyphenol-retaining” coffees, moderate coffee drinkers can now obtain the myriad benefits that were once reserved only for so-called “heavy” coffee users.

There remain, however, a significant percentage of people who are sensitive to caffeine’s stimulating effects on the central nervous system, or find they encounter heartburn and other digestive problems in response to ingesting even a cup of coffee. The new polyphenol-retaining coffee bean beverages are less likely to induce gastric upset.

For those who don’t want to drink any coffee, there are now standardized chlorogenic acid supplements available that provide the high potencies of beneficial coffee compounds with only tiny amounts of caffeine.

How Coffee Protects Against a Spectrum of Diseases

Over 1,000 compounds make up coffee’s complex phytochemistry. Their documented protection against diabetes, Alzheimer’s disease, cancer, and a host of other chronic diseases may be due to an intricate web of chemically induced actions along various biological pathways. Suspected mechanisms include:

1. Combined antioxidant action.
2. Lowered storage of glucose.
3. Improved insulin sensitivity.
5. Stimulated muscular oxidation of fat.
6. Reduced inflammatory enzyme activity.
7. Higher levels of detoxifying enzymes.
8. Improved intracellular signaling.
9. Increased sensitivity of cells’ receptors.
11. Prebiotic stimulation of beneficial bacteria.
12. Protection against the death of neuron cells.
13. Chelation of metals such as iron.
14. Metabolic improvements to adipocyte and liver function.
15. Prevention of blood-brain barrier (BBB) dysfunction.
16. Lower levels of amyloid-beta plaque.
17. Suppression of enzymes that produce amyloid-beta plaque.

If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.

References


COFFEE'S UNIQUE HEALTH BENEFITS


The daily serving of 2 softgels of Endothelial Defense™ contains:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superoxide Dismutase/Gliadin Complex (GliSODin®)</td>
<td>500 mg</td>
</tr>
<tr>
<td>POMELLA® Pomegranate (Punica granatum) Extract (fruit) [std. to 30% punicalagins (120 mg)]</td>
<td>400 mg</td>
</tr>
<tr>
<td>Pomegranate (Punica granatum) 5:1 Extract (fruit)</td>
<td>100 mg</td>
</tr>
<tr>
<td>PomComplete™ Pomegranate (Punica granatum) Blend [flower extract and seed oil (standardized to 22% (30 mg) punicic acid)]</td>
<td>137.5 mg</td>
</tr>
</tbody>
</table>

POMELLA® Extract is covered under U.S. Patent 7,638,640. POMELLA® Extract is a registered trademark of Verdure Sciences, Inc. Isocell SA, France is the owner of US Patents Nos. 6,426,068B1 and the registered trademark of GliSODin®.

Contains soybeans and wheat. Contains gluten.

References

Next-Generation Pomegranate Power

The unique blend of pomegranate flower extract and seed oil in Endothelial Defense contains potent polyphenols that provide support for youthful lipid and glucose metabolism, and help with inflammatory factors.

A bottle containing 60 softgels of Endothelial Defense™ with Full-Spectrum Pomegranate™ retails for $56. If a member buys four bottles during Super Sale, the price is reduced to just $35.10 per bottle.

To Order Endothelial Defense™ with Full-Spectrum Pomegranate™, call 1-800-544-4440 or visit www.LifeExtension.com
Overlooked in the effort to support sexual function in aging men is the health of the vascular system. Blood flow through the delicate lining of the arteries (the endothelium) is essential to sexual arousal, so it should come as no surprise that endothelial function is closely associated with male sexual capacity.

Life Extension® has discovered supportive clinical research for a scientifically validated, natural dietary supplement formula to promote endothelial function and blood flow to the place men need it most—for maximum performance.

The ingredients found in Prelox® Natural Sex for Men® have yielded compelling and highly satisfactory results in five independent clinical studies.² ⁶

Our analysis also confirms that unlike some performance enhancement supplements marketed as “natural,” Prelox® Natural Sex for Men® is not adulterated with trace amounts of prescription drugs.

A Powerful Synergy to Support Sexual Health

The patented blend of the following natural ingredients positively affects the male physiology in three ways, to provide optimal support:

1. Pycnogenol® (standardized French maritime pine bark extract) activates endothelial nitric oxide synthase (eNO-S), the enzyme required to make nitric oxide. Nitric oxide (NO) relaxes the vessels that enable efficient blood flow — the key to healthy male sexual activity and overall vascular health. Pycnogenol® further amplifies this relaxing effect by extending the amount of time nitric oxide remains in the bloodstream.

2. L-Arginine is the biological precursor to nitric oxide synthesis in the endothelium. It interacts synergistically with Pycnogenol® to sustain nitric oxide levels sufficient for healthy sexual function.

3. Icariin—a natural plant extract used in traditional Chinese medicine — has been shown to deactivate the enzyme normally responsible for winding down male sexual response, further promoting sustained activity. Prelox® Natural Sex for Men® contains a standardized extract providing a proprietary form of pure, high-quality icariin.

The suggested dose of two Prelox® Natural Sex for Men® tablets each day provides:

- Prelox® Proprietary Blend 1440 mg
  - L-Arginine HCl, Aspartic Acid, Pycnogenol®
  - Dried French Maritime Pine (Pinus pinaster) Extract (bark)
- Natural Sex® Epimedium sagittatum Extract (aerial parts) providing 60 mg icariin

A 60-tablet bottle of Life Extension® Prelox® Natural Sex for Men® retails for $50. If a member buys four bottles during Super Sale, the price is reduced to just $32.40 per bottle. Contains corn.

References

CAUTION: If you have significant liver disease, please consult with your healthcare practitioner before using this product.

Prelox® and Pycnogenol® are registered trademarks of Horphag Research Ltd. Prelox® is protected by U.S. patent #6,565,851B2. Pycnogenol® is protected by U.S. patents #5,720,956 and #6,372,266 and other international patents. Cannot be sold outside the USA.

To order Prelox® Natural Sex For Men®, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
A Patented Organic Roast
Life Extension™’s new Rich Rewards Breakfast Blend and Decaffeinated Roast are made using a patented, 100% natural process called HealthyRoast™. It delivers a more complete nutritional profile of the coffee bean, yielding chlorogenic acid levels far greater than other premium brands.

Handpicked deep in the rainforests of Central America, Rich Rewards consists exclusively of 100% certified USDA organic arabica coffee beans, gently roasted in small batches and ground for easy brewing.

The Healthy Gourmet Choice
Not all coffee provides the same powerful protection. When it comes to obtaining coffee’s full range of health benefits, most people aren’t getting their money’s worth!

The reason? Most of the coffee bean’s polyphenol content is destroyed during the roasting process required to create a dark, rich blend.

Among the most beneficial of these polyphenols is chlorogenic acid, a potent antioxidant which promotes optimal health.

Comparison of Conventional Coffee to Life Extension’s Rich Rewards Blend

<table>
<thead>
<tr>
<th>Chlorogenic Acid</th>
<th>Chlorogenic Acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional Coffee (Caffeinated)</td>
<td>92 mg</td>
</tr>
<tr>
<td>Conventional Coffee (Decaffeinated)</td>
<td>52 mg</td>
</tr>
</tbody>
</table>

This chart shows Life Extension’s Rich Rewards Coffee Blend has up to 254% more chlorogenic acid, which can enable one to obtain the benefits of heavy coffee drinking in half the number of cups.
Savory Taste Without Stomach Upset

Have you given up coffee because it upsets your stomach? With Rich Rewards, you can enjoy coffee again. The HealthyRoast™ process also preserves special, naturally occurring compounds in coffee that soothe your stomach.

Concerned about caffeine but don’t like the weak taste of decaffeinated coffee? With Rich Rewards Decaffeinated Roast, you can limit your caffeine intake without compromising on flavor. The caffeine is removed through a completely chemical-free Water Process, which relies solely on water and carbon filters. It delivers the full flavor, aroma, and body of the arabica bean.

Life Extension®’s new Rich Rewards coffees give you a uniquely beneficial brew with superior flavor and up to 254% more chlorogenic acid.

To order either of the new Rich Rewards Antioxidant Coffees call 1-800-544-4440 or visit www.LifeExtension.com

References

* US Patent 6,723,368.
There are three forms of vitamin K that the human body can utilize to promote arterial health and bone support.1-8

Life Extension®’s Super K with Advanced K2 Complex provides the dynamic trio of vitamin K forms in one softgel, including vitamin K1, vitamin K2 (MK-4), and vitamin K2 (MK-7).

**Vitamin K1** is the form of vitamin K that is found in green vegetables. K1 is tightly bound to plant fiber, so only a fraction is absorbed into the bloodstream. Supplementation ensures ample K1 blood levels.

**Vitamin K2** is usually found in meats, dairy, and egg yolks. Since you may be avoiding these foods for health reasons, ingesting a K2 supplement is essential. MK-4 is the most rapidly absorbed form of K2, and MK-7 boasts a very long half-life in the body, making both forms the perfect complement to any vitamin K regimen.9

The retail price for a bottle containing 90 softgels (three-month supply) is $26. If a member buys four bottles during Super Sale, the price is reduced to just $15.53 per bottle.

The same Super K formula consisting of Vitamin K1, K2 (MK-4) and K2 (MK-7) can be found in the Life Extension® Super Booster. If you take the Super Booster, you do not need additional Super K softgels.

Contains tree nuts (coconut).

**Warning to Coumadin® (warfarin) Drug Users**

Patients prescribed vitamin K antagonist anti-coagulant drugs like warfarin should consult their physician before taking vitamin K supplements like Super K and Super Booster. There is evidence, however, that users of drugs like warfarin could benefit from a consistent low dose of supplemental vitamin K. Ask your doctor if you can take a low dose (45 mcg a day) of vitamin K2 in the long-acting MK-7 form for the purpose of stabilizing your INR levels and also protecting your body against long-term vitamin K deficit. Do not initiate any form of vitamin K supplementation without full cooperation of your treating doctor, as your doctor may need to increase your dose of warfarin to compensate for the vitamin K you supplement with. Life Extension provides several forms of low-dose vitamin K for physician consideration.

To order Super K or Super Booster, call 1-800-544-4440 or visit www.LifeExtension.com

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These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Five Strategies for Optimal After-Meal Glucose Control Featuring Green Coffee Bean Extract

Chlorogenic acid found in green coffee bean extract has been clinically shown to limit dangerous after-meal glucose surges.1-3 But some aging individuals may need additional support for healthy glucose control, body weight, and resting metabolic rate.

Life Extension® has enhanced its existing glucose control and weight management formulas to make this possible. These innovative nutrient blends give you a comprehensive set of multi-targeted approaches to metabolic wellness.

CoffeeGenic™ Green Coffee Extract with Glucose Control Complex

CoffeeGenic™ Green Coffee Extract with Glucose Control Complex contains 200 mg of CoffeeGenic™ Green Coffee along with 5 ingredients formulated to help support healthy blood glucose levels already within normal range. Take one capsule 20-30 minutes before each meal to obtain the following nutrients in addition to Green Coffee Bean extract:

- InSea®, a proprietary form of seaweed extract that blocks the action of glucosidase and amylase, enzymes used to break down carbohydrates into glucose, facilitating its transport into the bloodstream. In laboratory animal studies, InSea® reduced after-meal fluctuations in blood sugar by up to 40% when compared to non-supplemented animals and reduced blood insulin levels by as much as 30%.1
- Chromium optimized with standardized extract of Indian gooseberry and a proprietary form of an adaptogen called shilajit. This state-of-the-art Crominex® 3+ complex also supports healthy cellular glucose utilization.6-10
- Integra-Lean® African Mango (Irvingia gabonensis) extract helps slow the rate of carbohydrate absorption from the intestines, thereby reducing the caloric impact of starchy and sugary foods.11 It also moderates glycerol-3-phosphate dehydrogenase enzyme activity to reduce the amount of ingested starches that are converted to triglycerides and stored as fat.
- Green tea extract to boost resting metabolic rate and inhibit genes involved in adipogenesis.
- Iodine is a trace element involved in the production of thyroid hormones primarily responsible for regulating metabolism, thereby promoting healthy glucose absorption into cells, where it is used to produce energy.

Each vegetarian capsule of CoffeeGenic™ Green Coffee Extract with Glucose Control Complex provides:

- CoffeeGenic™ Green Coffee (Coffea arabica) Extract (bean) 200 mg (std to 50% Chlorogenic acid (100 mg))
- Iodine 25 mcg (typical value naturally occurring from Ascophyllum nodosum and Fucus vesiculosus)
- Chromium 150 mcg [as Crominex® 3+ chromium stabilized with Capros® (Phyllanthus emblica) Extract (fruit) and PrimaVie® Shilajit]
- InSea® [proprietary composition of demineralized polyphenols from brown seaweeds Kelp (Ascophyllum nodosum) and Bladderwrack (Fucus vesiculosus)] 125 mg
- Integra-Lean® African Mango (Irvingia gabonensis) proprietary Extract (seed) 100 mg
- Green Tea (Camellia sinensis) Decaffeinated Extract (leaf) 100 mg (std. to 98% polyphenols by UV (98 mg), 45% EGCG by HPLC (45 mg))

CoffeeGenic™ Green Coffee Extract with Glucose Control Complex • Item #01607 *

A bottle containing 90 200 mg vegetarian capsules of CoffeeGenic™ Green Coffee Extract with Glucose Control Complex retails for $38. If a member buys four bottles during Super Sale, the price is reduced to just $35.10 per bottle.

CAUTION: Because these products may lower blood glucose, consult your healthcare provider before taking these products if you are taking blood glucose-lowering medication.

*These supplements should be taken in conjunction with a healthy diet and regular exercise program. Results may vary.
New Improved Flavor!
Calorie Control Weight Management Formula with CoffeeGenic™ Green Coffee Extract

The popular Calorie Control Weight Management Formula powder capitalizes on the proven benefits of slowing absorption of carbohydrate calories after each meal and targeting digestive enzymes to support healthy after-meal glucose metabolism.

LuraLean® propolmannan slows the rapid emptying of ingested food into the small intestine, reducing the surge of glucose entering the bloodstream. It has also been shown to significantly lower after-meal glucose surges.13,14

White Kidney Bean extract (Phaseolus vulgaris) inhibits amylase, the digestive enzyme that breaks down carbohydrates to be absorbed into the bloodstream as glucose.

Along with the benefits of Irvingia African Mango extract, a proprietary green tea phytosome enhances the metabolic effects of green tea through better absorption of green tea polyphenols in the blood, including EGCG.15

The new Calorie Control Weight Management Formula has a great new smooth natural blueberry flavor that is much more satisfying to drink than the previous version.

Each appetizing blueberry flavored stick pack or scoop of the new Calorie Control Weight Management Formula powder provides:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>CoffeeGenic™ Green Coffee (Coffea arabica) Extract (bean)</td>
<td>200 mg [std to 50% Chlorogenic acid (100 mg)]</td>
</tr>
<tr>
<td>LuraLean® propolmannan</td>
<td>2,000 mg (Amorphophallus konjac K. Koch, ssp. Amorphophallus japonica) fiber Extract (root)</td>
</tr>
<tr>
<td>Phase 2® Phaseolus vulgaris white kidney (bean) Extract</td>
<td>445 mg</td>
</tr>
<tr>
<td>Integra-Lean® African Mango (Irvingia gabonensis) proprietary extract (seed)</td>
<td>150 mg</td>
</tr>
<tr>
<td>Tea Slender™ Green Tea Phytosome Green Tea (Camellia sinensis) Phytosome Decaffeinated Extract (leaf) bound to phosphatidylcholine (from lecithin)</td>
<td>150 mg</td>
</tr>
</tbody>
</table>

Calorie Control Weight Management Formula with CoffeeGenic™ Green Coffee Extract • Item #01693
(Each serving contains approximately 6 mg caffeine)

A bottle containing 60 servings of Calorie Control Weight Management Formula with CoffeeGenic™ Green Coffee Extract natural blueberry flavor powder retails for $60. If a member buys four bottles during Super Sale, the price is reduced to just $36.45 per bottle.

For added convenience of use, this new formula also comes in 60 individual stick packs. Each box containing 60 servings of Calorie Control Weight Management Formula with CoffeeGenic™ Green Coffee Extract® natural blueberry flavor powder retails for $64. If a member buys four bottles during Super Sale, the price is reduced to just $40.50 per bottle. Item #01694

Contains soybeans. Contains corn.

Mega Green Tea with CoffeeGenic™ Green Coffee Extract

During the past decade, green tea has received attention for its role in promoting healthy body weight. Its principal polyphenolic component, epigallocatechin-3-gallocate or EGCG, works via multiple mechanisms, supporting healthy glucose absorption and insulin levels already within normal range. It may also promote a healthy resting metabolic rate.4,5

Life Extension’s advanced green tea extract contains 98% total polyphenols and 45% EGCG and is now enhanced with chlorogenic acid from CoffeeGenic™ Green Coffee Extract.

For members concerned about caffeine, a low caffeine formula is also available at the same value price.

Each vegetarian capsule of Mega Green Tea with CoffeeGenic™ Green Coffee Extract provides:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Tea (Camellia sinensis) Extract (leaf)</td>
<td>362.5 mg [std to 98% polyphenols by UV (355.25 mg), 45% EGCG by HPLC (163.125 mg)]</td>
</tr>
<tr>
<td>CoffeeGenic™ Green Coffee (Coffea arabica) Extract (bean)</td>
<td>75 mg [std to 50% Chlorogenic acid (37.5 mg)]</td>
</tr>
</tbody>
</table>

Mega Green Tea with CoffeeGenic™ Green Coffee Extract • Item #10605
(Each serving contains approximately 15 mg caffeine)

Mega Green Tea with CoffeeGenic™ Green Coffee Extract Low Caffeine Formula • Item #10606
(Each serving contains approximately 4.25 mg caffeine)

A bottle containing 120 vegetarian capsules of either Mega Green Tea with CoffeeGenic™ Green Coffee Extract formula retails for $32. If a member buys four bottles during Super Sale, the price is reduced to just $18.90 per bottle.

To order any of the new Green Coffee Extract formulas, call 1-800-544-4440 or visit www.LifeExtension.com

References
1. Rajendran MV. Effect of Green Coffee Bean Extract (GCE), High in Chlorogenic Acid, on Glucose Metabolism. Poster presentation number: 45-L8-P. Obesity 2011, the 29th Annual Scientific Meeting of the Obesity Society, Orlando, Florida, October 1-5, 2011.

CAUTION: Take at least two hours apart from medications. Because this product may lower blood glucose, consult your healthcare provider before taking this product if you are taking blood glucose-lowering medication. Taking fiber products without adequate liquid may increase the risk of choking. Consult your healthcare provider before taking this product if you have difficulty swallowing or esophageal narrowing.

Integra-Lean® Irvingia is protected by U.S. Patent No. 7,537,790. Other patents pending. InSea2® is a registered trademark of innovixa™. Crominex 3+, Capros® and PrimaVie® are registered trademarks of Natreon, Inc. Phase 2™ is used under license. LuraLean® is a registered trademark of AHD International LLC.

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Diabetics have long been known to age faster than healthy individuals. The mechanism behind the accelerated destruction of cells, tissues, and organs observed in diabetics is called glycation, the dangerous binding of sugars to proteins.¹ The resulting sugar-protein complex is known as an advanced glycation end product or AGE.

In the laboratory, glycation's effect on living tissues was found to be identical to the process by which meat is browned when cooked at high temperatures. Healthy proteins also turn brown in the presence of excess glucose and become functionally impaired.

Scientists have confirmed that this destructive process may also occur in healthy individuals when blood glucose levels are sustained above 85 mg/dL, a commonplace occurrence after a heavy meal is consumed.²⁻⁶

The damage inflicted by glycation is irreversible.⁷⁻⁸

Fortunately, a relative of vitamin B1 called benfotiamine protects cells to prevent glycation and the accelerated aging triggered by elevated sugar levels.⁹ Used as a prescription drug in Europe, benfotiamine is available in this country as a low-cost supplement.

Compelling new data confirms benfotiamine’s power to lower risk of heart disease, stroke, kidney damage, and vision loss by neutralizing the impact of excess glucose and subsequent glycation. > >
Raising cellular thiamine levels with benfotiamine has been found to block the effects of glucose damage to your body’s tissues. Benfotiamine activates a vital enzyme (transketolase) which converts toxic metabolites induced by high glucose levels into harmless byproducts. Benfotiamine also inhibits its activation of nuclear factor-kappaB (NF-kB), an underlying cause of deadly inflammatory reactions in the body.

Through its multi-targeted mechanisms, benfotiamine helps mitigate the multiple negative effects of excess glucose on body tissues. Let’s now examine the evidence for benfotiamine’s beneficial effects on several of the most common causes of death and chronic illness in America.

Preventing Glucose-Induced Cardiovascular Damage

Blood vessels are lined by a thin layer of cells called the endothelium which constantly regulates blood pressure and flow. Damage to the endothelium, which occurs in response to elevated glucose levels, is an important first step in producing heart attacks, heart failure, and stroke.

Benfotiamine Blocks Glucose Damage

Your body has several natural mechanisms to cope with the chemical toxins produced by excess glucose. These defense systems all require vitamin B1 (thiamine) as a cofactor. When your system is awash with excess glucose, however, your thiamine supplies become depleted. In fact, elevated blood sugar and diabetes have been referred to as states of “relative thiamine deficiency.”

Taking additional thiamine as a supplement doesn’t significantly protect against the glucose-induced tissue damage because thiamine is water-soluble and your body can’t retain thiamine at levels high enough to prevent cumulative damage. A thiamine derivative called benfotiamine, however, is fat-soluble and can significantly increase thiamine levels within tissues and sustain them throughout the day.

Conditions Associated With Elevated Blood Glucose and Advanced Glycation End Products

<table>
<thead>
<tr>
<th>Condition</th>
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<tbody>
<tr>
<td>Elevated cholesterol and atherosclerosis</td>
</tr>
<tr>
<td>Symptoms of carotid artery atherosclerosis (major risk for stroke)</td>
</tr>
<tr>
<td>Risk of developing high risk cardiac rhythm disturbances following heart attack</td>
</tr>
<tr>
<td>Cataracts of the eye</td>
</tr>
<tr>
<td>Overall risk of developing cancer</td>
</tr>
<tr>
<td>Risk of developing fatal cancer</td>
</tr>
<tr>
<td>Increased prostate size in benign prostatic hyperplasia (BPH)</td>
</tr>
<tr>
<td>Abnormal elevation in liver enzymes, markers of liver damage</td>
</tr>
<tr>
<td>Incidence and severity of obstructive sleep apnea</td>
</tr>
</tbody>
</table>
Studies now show that benfotiamine can prevent endothelial dysfunction and substantially improve blood vessel and heart muscle function, even in the face of glucose-induced tissue damage.\textsuperscript{24,25} The process of healthy endothelial cell replication is vital to maintaining healthy arteries. Excess levels of glucose can reduce endothelial cell replication.\textsuperscript{26} The addition of benfotiamine to endothelial cells grown in a high-glucose environment corrects the defective replication. Benfotiamine accomplishes this through normalization of advanced glycation end product production.\textsuperscript{26}

High glucose levels also trigger early death of endothelial cells through the process called apoptosis; benfotiamine supplementation reverses increased apoptosis in cultures of endothelial cells by several mechanisms.\textsuperscript{27-29}

The body produces toxic alcohol-like compounds called polyols during periods of high blood sugar. Polyols disrupt endothelial and cardiovascular cell function. Benfotiamine reduces production of polyols, accelerates the rate of glucose breakdown, and reduces free glucose levels within cells.\textsuperscript{30} All of these effects further contribute to protection of endothelial cell function.

After a heart attack, or as a result of persistently high blood pressure, heart muscle cells beat more weakly than they should, resulting in heart failure. High glucose levels and advanced glycation end products substantially contribute to this diminished heart muscle function. Studies show that benfotiamine abolishes many of the abnormalities in heart muscle cell contractility, which may “rescue” impaired heart muscle and improve its ability to pump blood effectively.\textsuperscript{31} Benfotiamine activates important cell survival signaling pathways in heart muscle cells failing under the effects of elevated glucose.\textsuperscript{31}

Not all advanced glycation end products (AGEs) are produced internally in the body. Consuming a meal rich in AGEs (such as one abundant in browned meats or caramelized sugars) can increase blood levels of AGEs and impair endothelial function.\textsuperscript{32} Supplementation with benfotiamine, 1,050 mg/day for 3 days, completely prevented the changes in endothelial function and blood flow produced by such a meal in a group of human subjects.\textsuperscript{32}

In addition to its effective control of AGE-related endothelial dysfunction, benfotiamine exerts powerful direct antioxidant effects. In rats with experimentally induced vascular endothelial dysfunction, benfotiamine reduced oxidative stress and enhanced favorable generation of nitric oxide, a compound that contributes to blood vessel relaxation.\textsuperscript{33,34} The result was an improvement in endothelial integrity and function.
All of these endothelium-protecting effects make benfotiamine an essential nutrient in your fight against the devastating effects of elevated blood glucose on your cardiovascular system.

**Protection Against Age-Related Vision Loss**

Diabetes is a major cause of blindness in the world. Even in non-diabetics, elevated blood sugar levels increase the rates of cataract and retinal damage.85,86 Tissues in the eye are especially vulnerable to glucose-related damage, because of the eye's high blood flow, constant oxidant exposure, and the high-energy environment produced by steady influx of light. The devastation of high-glucose tissue damage is constantly at work in the retina, the light-sensitive layer of nerve cells that converts optical images into vision.21

German scientists showed that benfotiamine treatment could prevent experimentally induced diabetic retinal disease by inhibiting the pathways of glucose-related damage.21 Subsequent studies by other European groups revealed that benfotiamine reduced the enzymes that produce the dangerous polyol alcohols that contribute to retinal damage, while also increasing activity of enzymes that divert glucose into harmless byproducts.30

An exciting study appeared in 2010 showing that benfotiamine supplementation not only prevented tissue accumulation of AGEs in retinal tissue, but also increased their excretion in the urine.37

Apoptosis, or programmed cell death, is another consequence of elevated glucose concentrations and AGE formation in retinal tissue. Benfotiamine, applied to retinal blood vessel cells in culture, prevents apoptosis while reducing the DNA damage that further impairs cellular function.38

Another ocular result of high glucose damage is an increase in dangerous protein-dissolving enzymes called matrix metalloproteinases, or MMPs. The increase in these enzymes results in substantial damage to retinal tissue. A recent study showed that treatment with benfotiamine reduced harmful metalloproteinase production back to normal levels and increased production of specific proteins that inhibit their activity.39

As in all organs, eye tissue suffers inflammatory changes with aging, elevated blood glucose, and occasionally from infections. Inflammation of the eye, or uveitis, causes about 10% of blindness in the United States.40 In eyes afflicted with uveitis, infiltrates of white blood cells, proteins, and inflammatory cytokines occur within various structures of the eye, imposing oxidative stress and inducing further inflammation.41 Benfotiamine treatment suppresses those changes and reduces expression of inflammatory marker molecules as well.41
Kidney Defense

Like the eye, the kidney is the site of intense metabolic activity and is rich in tiny blood vessels (capillaries) that make it particularly vulnerable to the damaging effects of glucose and advanced glycation end products. This explains why kidney failure is so common in diabetic patients and is also a known complication of “natural” aging.

Recent studies show that benfotiamine exerts important protective effects against the onslaught of glucose-induced kidney damage. Data demonstrate that benfotiamine prevents sugar-related kidney disease by reversing pathological increases in advanced glycation end products. In one report, benfotiamine activated the important enzyme transketolase, which rapidly cleared toxic glucose-related compounds from the blood before they could damage kidney tissue. Another study showed that benfotiamine could help reduce glucose-induced kidney damage with similar efficacy to the prescription drug fenofibrate. The two in combination demonstrated beneficial synergistic effects.

Dialysis is a treatment of last resort for patients whose kidneys have failed and who are awaiting a kidney transplant. Hemodialysis, while lifesaving, imposes massive stresses on the body, including rapid depletion of the very thiamine so necessary for preventing further glucose-related damage. Benfotiamine, which is vastly more bioavailable than thiamine, increases blood thiamine levels more than 4 times higher than supplementation with thiamine in dialysis patients.

Dialysis also causes substantial damage to DNA throughout the body, raising the risk of cancer.

Benfotiamine, by reducing the amount of circulating advanced glycation end products, themselves threats to DNA integrity, significantly reduced DNA damage in dialysis patients.

Peritoneal dialysis is somewhat less stressful to the body than hemodialysis, but it is associated with substantial complications related to damage to the delicate tissues lining the abdominal cavity. Glucose and AGEs are among the top culprits in producing such damage. Treatment with benfotiamine decreases markers of inflammation and abnormal new blood vessel formation in the abdominal cavity during peritoneal dialysis through reduction of AGEs and their receptors. This protects the delicate abdominal lining and prolongs its usefulness as a site for dialysis.

Summary

Diabetics age faster than healthy individuals owing in part to the process known as glycation, the pathologic binding of sugars to functional proteins in cells. Even in people with so-called “normal” glucose blood levels, deadly glycation and blood sugar–induced cell damage can occur.

A relative of vitamin B1 called benfotiamine can substantially boost your body’s intracellular levels of thiamine, or vitamin B1, which is an essential co-factor in clearing the dangerous glucose metabolites that cause sugar-related tissue damage. New studies confirm that supplementation with benfotiamine restores healthy thiamine levels and contributes significantly to lowering risk of chronic sugar-related problems such as cardiovascular disease, vision impairment, and kidney damage.
If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.

References

HALT SUGAR-INDUCED CELL AGING


High Potency FAT-SOLUBLE NUTRIENTS in ONE Softgel

Most people don’t get enough oil-based nutrients like vitamin K, lycopene, and gamma tocopherol. This problem is solved with a one-per-day softgel called Life Extension® Super Booster. It provides high potencies of fat-soluble compounds lacking in dry powder formulas, along with other nutrients.

Just one SUPER BOOSTER provides:

- **VITAMIN K2** Scientific studies show vitamin K2 provides superior benefits for the bones, arteries, and other tissues. The MK-4 form of vitamin K2 is the most rapidly absorbed and is now routinely used in Japan to maintain healthy bone density. MK-4, however, only remains active in the blood for a few hours. The MK-7 form of K2, on the other hand, remains bioavailable to the human body over a sustained 24-hour period. Super Booster provides a potent dose of MK-7 and MK-4 to keep calcium in the bone and out of the arteries.

- **GAMMA TOCOPHEROL** If one consumes only alpha tocopherol, the critically important gamma tocopherol is displaced from cells within the body. While alpha tocopherol vitamin E inhibits lipid peroxidation, the gamma tocopherol form quenches the dangerous peroxynitrite free radical. It is especially important for those who take vitamin E supplements to make sure they consume at least 200 mg a day of gamma tocopherol.

- **LYCOPENE** Evidence suggests that people who ingest the carotenoid lycopene enjoy healthier prostate function. Lycopene also helps guard against LDL oxidation.

- **GINKGO** Hundreds of studies substantiate the multifaceted effects of Ginkgo biloba in promoting healthy circulatory and neurological function.

- **LUTEIN** The carotenoid lutein helps maintain healthy cell division, supports the macula of the eye, and protects the endothelial lining of the arteries.

- **CHLOROPHYLLIN** Scientific studies indicate that chlorophyllin may protect against environmentally induced damage to DNA.

A bottle of 60 Super Booster softgels retails for $42. If a member buys four bottles during Super Sale, the price is reduced to just $25.65 per bottle. The Super Booster saves consumers huge dollars by combining a wide variety of costly nutrients into one daily softgel. If you add up the price of the individual ingredients contained in the Super Booster, you would spend two to three times more for this potency if taken separately.

To order Super Booster, call 1-800-544-4440 or visit www.LifeExtension.com

Contains corn and sesame. CAUTION: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product.

Lyc-O-Mato® is a registered trademark of LycoRed Natural Products Limited.

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One of the most deleterious effects of "normal" aging is impaired glucose metabolism. Failure to maintain normal sugar can trigger a cascade of ill health effects throughout the body.

For example, patients with blood sugar not in normal range can suffer after-meal endothelial dysfunction, induced by a flood of glucose, fats, and abnormal proteins called advanced glycation end products entering the bloodstream.

Benfotiamine, a fat-soluble form of vitamin B1 (thiamine), supports healthy blood sugar metabolism and acts through several mechanisms to block the biochemical pathways by which high blood sugar wreaks havoc throughout the body.1

Scientists demonstrated for the first time that benfotiamine (1050 mg per day) effectively reduced post-prandial endothelial dysfunction and oxidative stress normally seen in patients with high blood sugar who were fed a heat-processed meal with a high content of advanced glycation end products.2

Mega Benfotiamine can help maintain already-normal blood sugar levels and support the health of the nerves, kidneys, eyes, blood vessels, and heart.*

Each capsule provides 250 mg of benfotiamine and 10 mg of vitamin B1 (as thiamine HCl).

The suggested daily dose is one to four capsules, taken with or without food. A bottle containing 120 vegetarian capsules of 250 mg Benfotiamine retails for $30. If a member buys four bottles during Super Sale, the price is reduced to just $18.23 per bottle. Contains rice.

References

To order Mega Benfotiamine, call 1-800-544-4440 or visit www.LifeExtension.com

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**Discount Prices For Premium-Quality Products**

*Life Extension®* members are longevity enthusiasts, willing to take extraordinary steps to stave off disease, aging, and death. When members buy products from the Life Extension Foundation Buyers Club, they are assured of receiving the highest quality products based on the latest scientific studies that demonstrate benefits.

The large discounts available to Foundation members enable them to purchase premium-quality supplements at prices substantially below those charged by commercial companies.

Here are some examples of savings members enjoy during the annual **Super Sale:**

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Our Low Retail Price</th>
<th>SUPER SALE Member-Volume Discount Price Per Bottle</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Super Omega-3 EPA/DHA with Sesame Lignans &amp; Olive Fruit Extract</strong>&lt;br&gt;120 softgels, Item # 01482&lt;br&gt;Super-refined EPA/DHA fish oil plus sesame lignans and potent olive fruit extract to provide critical omega-3 fatty acids and essential components of the Mediterranean diet.</td>
<td>$32</td>
<td>$16.81 (ten-bottle purchase)</td>
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<tr>
<td><strong>Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™</strong>&lt;br&gt;100 mg, 60 softgels, Item # 01426&lt;br&gt;The superior ubiquinol form of CoQ10 plus an organic compound (shilajit) shown to double mitochondrial CoQ10 levels.</td>
<td>$62</td>
<td>$35.10 (ten-bottle purchase)</td>
</tr>
<tr>
<td><strong>Life Extension Mix™ • 315 tablets, Item # 01655</strong>&lt;br&gt;High-potency multi-nutrient formula now with potent anthocyanins from Maqui berry and proanthocyanidins from tart cherry at no extra cost.</td>
<td>$98</td>
<td>$46.91 (ten-bottle purchase)</td>
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<tr>
<td><strong>Vitamin D3 with Sea-Iodine™ • 5,000 IU, 60 vegetarian capsules, Item # 01372</strong>&lt;br&gt;High-potency vitamin D to assure adequate intake of this essential nutrient plus 1000 mcg of Sea-Iodine™.</td>
<td>$14</td>
<td>$8.44 (four-bottle purchase)</td>
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<tr>
<td><strong>Ultra Natural Prostate Formula with AprèsFlex™ &amp; Standardized Lignans</strong>&lt;br&gt;60 softgels, Item # 01695&lt;br&gt;Improve prostate protection with AprèsFlex™ that helps suppress 5-LOX.</td>
<td>$38</td>
<td>$21.60 (twelve-bottle purchase)</td>
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<tr>
<td><strong>Calorie Control Weight Management Formula with CoffeeGenic™ Green Coffee Extract</strong>&lt;br&gt;Blueberry Powder, 414 grams, 60 servings, Item # 01693&lt;br&gt;Four ingredients to impede glucose-lipid absorption and combat age-associated weight gain, plus green coffee bean extract.</td>
<td>$60</td>
<td>$36.45 (four-bottle purchase)</td>
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<tr>
<td><strong>Super K with Advanced K2 Complex • 90 softgels, Item # 01224</strong>&lt;br&gt;Three forms of vitamin K to help promote arterial health and bone support. One per day formula.</td>
<td>$26</td>
<td>$15.53 (four-bottle purchase)</td>
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<tr>
<td><strong>PQQ Caps with BioPQQ™ • 10 mg, 30 vegetarian capsules, Item # 01500</strong>&lt;br&gt;Promotes mitochondrial biogenesis (generation of new mitochondria) in aging cells.</td>
<td>$24</td>
<td>$14.85 (four-bottle purchase)</td>
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<td><strong>DHEA (Dehydroepiandrosterone) • 25 mg, 100 capsules, Item # 00335</strong>&lt;br&gt;A hormone that declines with aging, benefits overall health.</td>
<td>$15</td>
<td>$8.44 (four-bottle purchase)</td>
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<td><strong>Mitochondrial Energy Optimizer with BioPQQ™ • 120 capsules, Item # 01568</strong>&lt;br&gt;To maintain healthy cellular function, protein structural integrity, and mitochondrial biogenesis.</td>
<td>$94</td>
<td>$56.70 (four-bottle purchase)</td>
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<td><strong>SAME • 400 mg, 20 enteric-coated tablets, Item # 00557</strong>&lt;br&gt;S-adenosylmethionine in double-strength potency for mood elevation.</td>
<td>$32</td>
<td>$16.88 (six-box purchase)</td>
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<td><strong>Super Zeaxanthin with Lutein, Meso-Zeaxanthin Plus Astaxanthin and C3G</strong>&lt;br&gt;60 softgels, Item # 01586&lt;br&gt;Supports night vision and macular density.</td>
<td>$42</td>
<td>$25.65 (four-bottle purchase)</td>
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<td><strong>Optimized Resveratrol with Synergistic Grape-Berry Actives</strong>&lt;br&gt;250 mg, 60 vegetarian capsules, Item # 01430&lt;br&gt;High potency trans-resveratrol with quercetin, plus trans-pterostilbene and fisetin to support DNA “longevity genes.” One per day resveratrol formula.</td>
<td>$46</td>
<td>$27.90 (four-bottle purchase)</td>
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<td><strong>Bone Restore</strong> • 150 capsules, Item # 01611</td>
<td>$22.50</td>
<td>$13.16</td>
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<td>High-potency bone protection formula with FruiteX B® OsteoBoron® and Magnesium citrate.</td>
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<td><strong>Cognitex with NeuroProtection Complex</strong> • 90 softgels, Item # 00922</td>
<td>$74</td>
<td>$43.20</td>
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<tr>
<td>Optimal support for the brain. Includes glyceryl-phosphoryl-choline, vinpocetine, phosphatidylserine, Sharp-PS® GOLD PS-DHA, uridine 5'-monophosphate, and others. Also contains pregnenolone.</td>
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<td><strong>Advanced Anti-Adipocyte Formula with AdipoStat &amp; Integra-Lean® African Mango Irvingia</strong> • 60 vegetarian capsules, Item # 01509</td>
<td>$39</td>
<td>$24.30</td>
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<td>Provides cellular support for healthy body weight.</td>
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<td><strong>Acetyl-L-Carnitine Arginate</strong> • 100 capsules, Item # 00788</td>
<td>$59</td>
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<tr>
<td>Patented form of carnitine to support healthy neurite growth for optimal brain health.</td>
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<td><strong>Triple Action Cruciferous Vegetable Extract</strong> • 60 vegetarian capsules, Item # 01468</td>
<td>$24</td>
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<tr>
<td>Comprehensive cruciferous plant extract formulation, with apigenin, for optimal cellular health.</td>
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<tr>
<td><strong>Prelox® Natural Sex for Men®</strong> • 60 tablets, Item # 01373</td>
<td>$52</td>
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<tr>
<td>Supports healthy endothelial function and blood flow for maximum male performance.</td>
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<tr>
<td><strong>Super R-Lipoic Acid</strong> • 300 mg, 60 vegetarian capsules, Item # 01208</td>
<td>$49</td>
<td>$30.38</td>
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<tr>
<td>Superior efficacy compared to alpha-lipoic acid—supplies 240 mg of stabilized R-lipoic acid.</td>
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<tr>
<td><strong>ArthroMax™ Advanced with UC-II® and AprèsFlex™</strong> • 60 capsules, Item # 01618</td>
<td>$36</td>
<td>$21.60</td>
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<tr>
<td>Promotes joint health and may promote comfortable joint structure and function.</td>
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<tr>
<td><strong>CoffeeGenic™ Green Coffee Extract</strong> • 200 mg, 90 vegetarian capsules, Item # 01604</td>
<td>$25</td>
<td>$14.85</td>
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<tr>
<td>Convenient source of chlorogenic acid to help maintain healthy blood glucose levels.</td>
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<td><strong>Krill Healthy Joint Formula</strong> • 30 softgels, Item # 01600</td>
<td>$32</td>
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<tr>
<td>Healthy joint formula provides targeted support for aging joints through a proprietary blend of krill oil, hyaluronic acid, and astaxanthin. One capsule a day formula.</td>
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<tr>
<td><strong>Natural Stress Relief</strong> • 30 vegetarian capsules, Item # 00987</td>
<td>$28</td>
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<tr>
<td>With lemon balm extract to reduce anxiety and sleeplessness, and pure L-theanine to promote relaxation without drowsiness.</td>
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<td><strong>Gamma E Tocopherol with Sesame Lignans</strong> • 60 softgels, Item # 00759</td>
<td>$32</td>
<td>$19.58</td>
</tr>
<tr>
<td>Provides the critical gamma tocopherol form of vitamin E plus sesame lignans to enhance the free radical scavenging benefits of alpha and gamma tocopherols.</td>
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<tr>
<td><strong>Super Bio-Curcumin®</strong> • 400 mg, 60 vegetarian capsules, Item # 00407</td>
<td>$38</td>
<td>$23.63</td>
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<tr>
<td>Super-absorbable formulation promotes healthy lipids, joint function, and healthy DNA. Absorbs six times greater than conventional curcumin.</td>
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<tr>
<td><strong>Super Booster Softgels with Advanced K2 Complex</strong> • 60 softgels, Item # 01590</td>
<td>$42</td>
<td>$25.65</td>
</tr>
<tr>
<td>A convenient one per day capsule that includes optimal potencies of gamma-tocopherol, sesame lignans, lycopene, lutein, ginkgo, chlorophyllin, selenium and both forms of vitamin K2.</td>
<td></td>
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<tr>
<td><strong>Skin Restoring Ceramides with Lipowheat™</strong> • 30 liquid capsules, Item # 01502</td>
<td>$25</td>
<td>$15.53</td>
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<td>Rehydrates aged skin.</td>
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*These supplements should be taken in conjunction with a healthy diet and regular exercise program. Results may vary.*

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Novel Method to Effectively Combat Oxidative Liver Damage

BY KIRK STOKEL

Little known to the general public is the silent epidemic of non-alcoholic fatty liver disease or NAFLD, which afflicts up to 40% of all Americans.¹ NAFLD particularly targets those who carry around excess weight. For the nearly 70% of Americans who are overweight or obese,² that figure rises to a shocking 50-100%³,⁴.

Ominously, NAFLD sets the stage for a progression of lethal diseases that can include cancer, atherosclerosis, and diabetes.⁵,⁶ Risk of death from all causes skyrockets more than four-fold in NAFLD sufferers—and more than eight-fold for early cardiac death.⁷

Because of both physician and patient ignorance, most victims of NAFLD are entirely unaware they have it.

No drug can halt this widespread disease’s potentially lethal progress.⁸

The exciting news is scientists have recently identified a novel intervention to halt two of NAFLD’s core pathologic processes—lipid peroxidation, wherein excess liver fat turns rancid under continuous assault from free radicals, and rampant oxidative damage from disease-induced mitochondrial dysfunction.

In this article, you will discover how a beneficial adaptogen called Schisandra chinensis and a patented proprietary extract of the melon Cucumis melo work in synergy to restore vital antioxidant functions typically depleted in NAFLD patients. > >
**Rancid Fat and Mitochondrial Decay**

NAFLD (non-alcoholic fatty liver disease) has been called a disease of modern living.

It is a direct consequence of the typical American sedentary lifestyle and a diet rich in sugar and saturated fats.8

Inactivity, overconsumption, and emotional stress result in a spiral that starts with overweight and obesity and culminates in metabolic syndrome, a cluster of deadly fat- and sugar-related physiological and metabolic derangements that range from hypertension to type 2 diabetes.

NAFLD is now widely recognized as the liver’s manifestation of metabolic syndrome.8 It begins with accumulation of excessive amounts of liver fat in the form of triglycerides.9 Fat is highly vulnerable to oxidative damage, and massive oxidative stress is the next step in development of NAFLD, in the process known as lipid peroxidation.8,10

**Restoring Youthful Liver Defense Mechanisms**

When we are young, we’re protected against this deadly cascade of events by two complementary mechanisms.

In the first, a liver enzyme called superoxide dismutase, or SOD, converts highly reactive free oxygen radicals into hydrogen peroxide.11 That delays but doesn’t end the threat of lipid peroxidation, because hydrogen peroxide itself generates new free radicals of its own.

To fully quench the free radical threat, a second set of antioxidant enzymes is recruited: catalase and glutathione peroxidase, which act on hydrogen peroxide and quickly convert it into harmless water molecules.12,13

The extraordinary oxidative stress inflicted on the liver in NAFLD, however, puts all of these protective enzyme systems into overdrive. Early in the disease, their activity is ramped up substantially in an effort to compensate—but eventually they become depleted and burn out.14-17

As the body loses its natural primary antioxidant mechanisms, it accumulates lipid peroxidation products, and liver mitochondria begin to fail. This makes people increasingly vulnerable to non-alcoholic steatohepatitis, cirrhosis, fibrosis, liver cancer, and cardiovascular diseases.10,18

Supporting the liver’s mitochondrial antioxidant enzyme systems is a vital step in preventing the consequences of NAFLD. As you will now see, the synergistic action of Schisandra chinensis and Cucumis melo directly replenish essential SOD, while at the same time stimulating glutathione peroxidase, effectively targeting lipid peroxidation and mitochondrial dysfunction in the liver.
Optimizing Liver Mitochondrial Function and Antioxidant Defense

Purified extract from a non-GMO Cucumis melo melon has been found to be rich in superoxide dismutase (SOD), the first enzyme in your body’s mitochondrial oxidant protection system. Melon-derived SOD quickly converts primary free oxygen radicals into hydrogen peroxide.

That hydrogen peroxide must be rapidly converted into water to complete the mitochondrial oxidant detoxification process. That task is handled by a second liver-protective agent, an extract of the Chinese vine Schisandra chinensis.

Schisandra extract complements the melon extract by stimulating the liver mitochondrial antioxidant enzyme, glutathione peroxidase, that converts hydrogen peroxide to water.

In the presence of both adequate SOD and enhanced glutathione peroxidase activity, mitochondria can readily convert deadly reactive oxygen species first to hydrogen peroxide and then to harmless water.

Now let’s examine the data on just how well each component works to protect your body from the punishing effects of NAFLD.

Synergistic Liver Disease and Oxidative Stress Defense

Melon extracts supply important antioxidant SOD enzymes to SOD-depleted liver tissues in NAFLD. Studies reveal that supplementation with specially coated melon extracts directly prevents lipid peroxidation damage to liver and other tissues.

But melon extracts rich in SOD have much more profound effects that can protect your liver, not only from oxidant stress, but also directly from the effects of overweight and obesity.

Animals fed high-fat diets develop the metabolic syndrome, just as humans do. But when supplemented with melon extract, hamsters with metabolic syndrome experienced a 68% drop in triglyceride levels, a 12% drop in liver primary free radicals, a 35% drop in lipid and protein oxidation, and a massive 99% drop in levels of the inflammatory fat-derived cytokine leptin. These effects led to a 39% reduction in insulin levels, a 41% reduction in insulin resistance, and a 25% reduction in detrimental belly fat accumulation.

Supplemented animals also exhibited a 73% reduction in liver fat infiltration and were completely protected against progression of NAFLD to non-alcoholic steato-hepatitis. Non-alcoholic steatohepatitis or NASH is an advanced form of fatty liver disease developed in the...
absence of alcohol abuse that can progress to scarring of the liver, which may lead to cirrhosis.

An intriguing finding just published in mid-2011 is that melon extracts’ SOD-boosting effects reduce production of stress proteins in animal studies. These proteins are a direct measure of the impact of stress on organs and tissues. Stress and the stress hormone cortisol are known to be contributors to development of NAFLD. And severe emotional or occupational stress triggers oxidant damage and inflammation. Those facts inspired scientists to determine whether melon extracts might ameliorate stress and fatigue in human subjects, making them less vulnerable to NAFLD.

Seventy healthy volunteers, aged 30-55 who experienced daily stress and fatigue, took 10 mg per day of proprietary melon extract or a placebo for 4 weeks. Supplemented patients experienced significantly reduced stress and fatigue, and improved physical, cognitive, and behavioral performance, compared with placebo recipients. They also enjoyed significant improvements in quality of life and perceived stress, while there were no adverse effects at any point in the study.

Schisandra chinensis extract complements SOD activity, stimulating glutathione peroxidase enzymatic activity to optimize liver protection. Schisandra extract has been known to protect liver function for more than 4 decades, but it’s only recently that we’ve learned that it does so specifically by boosting mitochondrial antioxidant function. In that fashion, the extract confers powerful protection against a host of oxidative liver toxins (including mercury). Rates of lipid peroxidation, the deadly first consequence of liver fat accumulation in NAFLD, are markedly reduced following supplementation with schisandra extract. The result: dramatic reductions in liver cell death and fibrosis.

Schisandra extract is so powerful at mitigating mitochondrial oxidant stress in liver cells that it delays aging in the face of experimentally induced oxidant stress. Aging mice demonstrate progressively worsening impairment in mitochondrial

The Deadly Impact of Excessive Liver Fat

Non-alcoholic fatty liver disease (NAFLD) is the most common liver disorder in Americans and has become a major public health problem. Sedentary, overweight people, particularly those with other early indications of the metabolic syndrome, are at risk for the progression of NAFLD to a series of increasingly devastating consequences.

The first of these consequences is called non-alcoholic steatohepatitis, or NASH. Roughly 15-30% of people with NAFLD will go on to have NASH. NASH is associated with a massive outpouring of inflammatory cytokines in the liver, which eventually lead to the toughened, scarred liver seen in cirrhosis.

Cirrhosis, in turn, causes rapid and irreversible loss of liver function at a rate of 3-4% per year. And NASH-related cirrhosis is also a major risk factor for liver cancer.

Excessive liver fat in NAFLD is also directly associated with increased risks of developing diabetes, hypertension, abnormal EKG findings, and the endothelial dysfunction that leads to heart attacks and strokes.

Once NAFLD is fully developed, this deadly progression of events is nearly impossible to reverse—but NAFLD itself is a preventable condition, given proper attention to diet, exercise, and appropriate supplementation. While no prescription drug has any impact on NAFLD, natural products that target mitochondria offer considerable potential for controlling the oxidative stress associated with NAFLD.

If you can prevent NAFLD, you can prevent its consequences. And if you can do that, you can prevent early death.
oxidant status, resulting in decreased mitochondrial energy production and early death. But long-term supplementation with schisandra extract reversed those trends, suppressed mitochondrial ROS production, enhanced mitochondrial energy output, and ultimately improved survival, compared with control animals.

Schisandra extract is especially notable for its effects on liver fat accumulation in diabetics, a group at extremely high risk (virtually 100%) for developing NAFLD. Diabetic rats’ livers are severely depleted in glutathione, a natural antioxidant. But schisandra supplementation improved glutathione status in liver cells, thanks to its stimulation of glutathione peroxidase enzymes, and prevented oxidant induced liver damage. A subsequent study showed that even in non-diabetic animals with experimentally induced NAFLD, schisandra extract decreased liver total cholesterol by 50% and triglycerides by 52%—effects similar to those produced by the prescription drug fenofibrate.

Human studies are no less encouraging. An open trial in 56 patients with acute or chronic hepatitis, cirrhosis, or fatty liver (steatosis) using 22.5 mg per day of schisandrin Bs demonstrated decreased serum markers of liver cell injury, even in patients with cirrhosis, normally considered an irreversible condition. A placebo-controlled study of the same extract formulation in patients with chronic hepatitis (a condition that imposes extreme oxidant stress on liver tissue) demonstrated significant decreases in liver damage markers after just one week. Neither study detected any side effects of the extract.

Schisandra extract’s ability to protect liver cells from lipid peroxidation offers protection beyond NAFLD-related damage. Studies show that the extract protects against drug-related liver damage as well; that’s of critical importance in many conditions in which drug dosing is limited by liver toxicity. Schisandrin B, a major schisandra component, protects liver tissue against toxicity induced by tacrine (Cognex®), a drug that was commonly used to treat Alzheimer’s disease—and it independently improves cognitive function.

**Summary**

The epidemic of obesity and the metabolic syndrome brings with it a nearly universal risk of serious liver damage in the form of non-alcoholic fatty liver disease, or NAFLD.

A large proportion of people with NAFLD goes on to suffer liver failure, cardiovascular disease, and is at increased risk for liver cancer. No drug is available to treat or prevent NAFLD, and Americans’ sedentary lifestyle and unhealthy eating habits continue to promote the disease.

Because NAFLD is the direct result of oxidant stress acting on excessive accumulations of liver fat, however,
it is amenable to treatment, and even prevention, by powerful nutraceuticals that restore liver antioxidant function to youthful levels.

A pair of fruit extracts (from melons and the Chinese “five flavor berry”) acts as a collaborative **superfood** combination that detoxifies primary free radicals and converts them to harmless water.

If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.

**References**


**Understanding Lipid Peroxidation**

If you’ve ever smelled a stick of butter or a piece of cheese that’s gone rancid, that is the result of **lipid peroxidation**. That’s exactly what is going on in your liver as NAFLD progresses—**your liver is literally turning rancid**.

Here’s what’s happening in your liver during lipid peroxidation.

Free radicals, or reactive oxygen species (ROS), are natural byproducts of daily biological processes including cellular respiration and energy production. These processes occur in the tiny organelles called **mitochondria**. That makes mitochondria both the principle producers and primary targets of free radical–induced oxidant stress.

Liver cells are rich in mitochondria because of their enormous metabolic burden. As liver cells age and their mitochondria suffer free radical attack, their membranes become damaged, which leads to formation of additional reactive molecules often termed “secondary” free radicals. These secondary free radicals trigger a vicious and deadly cycle of lipid peroxidation, membrane damage, impaired mitochondrial function, and further free radical generation.

Liver cells with impaired mitochondrial function can’t survive and quickly fall victim to inflammation and cell death. As liver cells die off, they are replaced by the scar tissue of **cirrhosis** and ultimately **liver fibrosis**. A once vibrant and metabolically active organ gradually becomes a massive “dead zone,” incapable of performing the myriad functions of a healthy liver and vulnerable to the DNA damage that leads ultimately to cancer.

This progression from NAFLD to liver failure is a hallmark of modern-day aging.

22. Ip SP, Poon MK, Che CT, Ng KH, Kong YC, Ko KM. Schisandrin B protects against carbon tetrachloride toxicity by enhancing the mitochondrial glutathione redox status in mouse liver. *Free Radic
Since Life Extension® introduced CoQ10 in 1983, our scientists have continued to develop increased potency and absorbability. **Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™** contains PrimaVie® shilajit that doubles levels of CoQ10 in the mitochondria.1 Combining CoQ10 and shilajit produced a 56% increase in energy production in the brain, and in muscle there was a 144% increase in energy production.2 The primary reason people take CoQ10 supplements is to help restore youthful energy levels.

Shilajit boosts CoQ10’s beneficial effects by stabilizing CoQ10 in the superior ubiquinol form, which prolongs its action at the cellular level.1,3,4 Additionally, shilajit facilitates the more efficient delivery of CoQ10 into the mitochondria, which results in enhanced cellular energy.2,3,4,5

Shilajit helps the mitochondria convert fats and sugars into the body’s main source of energy, ATP (adenosine triphosphate).3,5,6-9 Combining ubiquinol CoQ10 with shilajit generates a powerful synergy that supports more youthful cellular energy production than CoQ10 alone.2,3,4,5

**Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™**

The retail price for 60 100 mg softgels of Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ is $62. If a member buys four bottles during Super Sale, the price is reduced to $37.80 per bottle. Item # 01426

The retail price for 100 50 mg softgels of Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ is $58. If a member buys four bottles during Super Sale, the price is reduced to $35.78 per bottle. Item # 01425

The retail price for 30 200 mg softgels of Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ is $62. If a member buys four bottles during Super Sale, the price is reduced to $37.80 per bottle. Item # 01431

References:

PrimaVie® is a registered trademark of Natreon, Inc. Kaneka QH® is a registered trademark of Kaneka Corporation.

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Your liver is subject to continuous free radical exposure and is particularly vulnerable to mitochondrial decay.\(^1\)\(^,\)\(^3\) Reduced cellular energy output in the liver adversely impacts a growing percentage of the population.\(^4\) According to the most recent estimates, one third of Americans now require targeted support for healthy liver function.

A new Liver Efficiency Formula features two state-of-the-art molecular energizers shown to promote healthy liver function at the cellular level.

Support from a Cutting-Edge Adaptogen

Schisandra chinensis is an adaptogenic vine native to Asia with a half-century of research\(^5\) and nearly 200 published studies\(^6\) validating its system-wide benefits. Researchers have discovered that the lignans contained in Schisandra fruit specifically support healthy levels of glutathione—the liver’s own antioxidant defense system.\(^7\)

Schisandra’s bioactive molecular compounds have been shown in pre-clinical studies to be readily absorbed in all segments of the intestine, for maximum effectiveness.

In animal studies, Schisandra has been shown to improve glutathione status dramatically in depleted liver cells.\(^9\)-\(^10\)

A Synergistic High-Potency Antioxidant

Also contained in the new Liver Efficiency Formula is a proprietary melon-based compound rich in one of nature’s most powerful antioxidants. Extramel\(^8\) is a fruit concentrate derived from non-GMO muskmelon (Cucumis melo), a natural source of the antioxidant superoxide dismutase or SOD, one of the human body’s most powerful free radical neutralizers.

Extramel’s efficacy and safety are backed by published clinical research. In a recent placebo-controlled trial,\(^11\) a group of 70 volunteers aged 30-55 taking 10 mg per day experienced significantly greater energy levels, improved physical performance, and better mood after only four weeks.

The suggested daily serving size of just one vegetarian capsule of Liver Efficiency Formula delivers:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Serving Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schisandra (Schisandra chinensis) extract (fruit)</td>
<td>250 mg</td>
</tr>
<tr>
<td>Extramel(^8) melon pulp concentrate (fruit)</td>
<td>10 mg</td>
</tr>
</tbody>
</table>

A bottle containing 30 vegetarian capsules of Liver Efficiency Formula retails for $18. If a member buys four bottles during Super Sale, the price is reduced to just $10.80 per bottle. Contains rice.

References


Extramel\(^8\) is a registered trademark of Bionov.
Scientists have identified multiple mechanisms by which a process called glycation occurs in the body. This process involves sugars reacting with proteins, lipids, and nucleic acids to form advanced glycation end products (AGEs), which can lead to tissue damage. AGEs are implicated in the development of various diseases, including diabetes, heart disease, and Alzheimer's disease.

**Broccoli** is one of the vegetables best documented to protect healthy DNA. The broccoli concentrate in LIFE EXTENSION MIX™ is standardized to provide sulforaphane and other glucosinolates, compounds responsible for broccoli's protective benefits.

**Olive polyphenols** help protect against LDL oxidation, quench free radicals, and stabilize cell membranes. LIFE EXTENSION MIX™ contains a potent olive extract that provides the best-documented polyphenol called hydroxytyrosol in an amount equivalent to drinking one ounce of virgin olive oil a day.

**Lutein** is a flavonoid found in parsley, artichoke, basil, celery, and other foods. It has shown the ability to help protect against DNA oxidative damage. When measured against 27 other citrus flavonoids, lutein showed one of the most beneficial effects at maintaining healthy DNA. Lutein also suppresses excess levels of interleukin-6 and interleukin-1b. LIFE EXTENSION MIX™ contains a standardized dose of 8 mg of lutein.

**Lycopene** is the red carotenoid in tomatoes that supports a healthy prostate and helps promote healthy lipid profiles for those already within a normal range.

**D-glucarate** is found in grapefruit, apples, oranges, broccoli, and Brussels sprouts. D-glucarate supports a detoxification process that helps to remove DNA toxins.

**Pomegranate** may be the most effective plant to help maintain optimal endothelial function. This pomegranate extract is standardized to provide the punicalagins and other polyphenols found in up to 2.6 ounces of pomegranate juice.

**Sesame lignans** increase tissue levels of vitamin E and gamma tocopherol, and inhibit the formation of an inflammatory precursor called arachidonic acid.

**Wild blueberry extract**, concentrated and standardized to help maintain optimal neuronal function.

**Pterostilbene** is a compound naturally found in blueberries and grapes that has been shown to have beneficial, anti-aging effects on gene expression and to promote healthy cognitive function.

**Cyanidin-3-Glucoside** is a berry compound that promotes healthy function of the retina to help support night vision.

**Pyridoxal 5'-phosphate** helps protect against glycation reactions, a toxic process in which sugars bind to lipids and proteins to form non-functional structures in the body.

**Vegetable-Fruit Complex**

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>325 mg</th>
</tr>
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<tbody>
<tr>
<td>Green tea extract (dec.)(45% EGCG)</td>
<td></td>
</tr>
<tr>
<td>Broccoli sprout concentrate</td>
<td>525 mg</td>
</tr>
<tr>
<td>Olive juice extract (providing sulforaphane, glucosinolates, D-3T, and PEITC)</td>
<td>12.5 mg</td>
</tr>
<tr>
<td>Grapeseed proanthocyanidin extract (Leucoselect*)</td>
<td>25 mg</td>
</tr>
<tr>
<td>Grape (vitis vinifera) extract (BioVin*)</td>
<td>25 mg</td>
</tr>
<tr>
<td>Ginger extract (5% gingerols)</td>
<td>200 mg</td>
</tr>
<tr>
<td>Luteolin (Pureolin*)</td>
<td>8 mg</td>
</tr>
<tr>
<td>Lycopene (tomato extract) (Tomat-O-Red*)</td>
<td>3 mg</td>
</tr>
<tr>
<td>Lutein (marigold extract)</td>
<td>15 mg</td>
</tr>
<tr>
<td>(465 mcg trans-zeaxanthin)</td>
<td></td>
</tr>
<tr>
<td>Maqui Berry (Aristotelia chilensis) anthocyanin extract</td>
<td>100 mg</td>
</tr>
<tr>
<td>Milk thistle extract (85% silimarin)</td>
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<tr>
<td>Bromelain</td>
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<tr>
<td>Calcium D-Glucarate</td>
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<td>Citrus Bioflavonoids (50% hesperidin)</td>
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<tr>
<td>Acerola extract 4:1</td>
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<tr>
<td>Bilberry extract (MirtoSelect*)</td>
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</tr>
<tr>
<td>Pomegranate (30% punicalagins) (POMELLA*)</td>
<td>85 mg</td>
</tr>
<tr>
<td>Sesame seed lignan extract</td>
<td>10 mg</td>
</tr>
<tr>
<td>Berry-fruit blend (HiActives*)</td>
<td>200 mg</td>
</tr>
<tr>
<td>(blackberry, blueberry, cranberry, elderberry, persimmon, prune, and cherry)</td>
<td></td>
</tr>
<tr>
<td>Wild Blueberry (Vaccinium angustifolium)</td>
<td>150 mg</td>
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<tr>
<td>anthocyanin extract (fruit)</td>
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<tr>
<td><strong>Water-Soluble Vitamins and Enzymatic Activators</strong></td>
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<tr>
<td>Vitamin C</td>
<td>2000 mg</td>
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<tr>
<td>as: ascorbic acid, calcium, magnesium &amp; niacinamide ascorbates, ascorbyl palmitate, acerola extract</td>
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<tr>
<td>Natural Folate (from lemon extract)</td>
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<tr>
<td>Biotin</td>
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<tr>
<td>Trimethylglycine (TMG)</td>
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<tr>
<td>Vitamin B2 (riboflavin)</td>
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<tr>
<td>Supplying: Riboflavin S’-phosphate</td>
<td>2 mg</td>
</tr>
<tr>
<td>Vitamin B3 (niacinamide and niacinamide ascorbate)</td>
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<td>Vitamin B3 (niacin)</td>
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<td>Vitamin B5 (p-calcium pantothenate)</td>
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<td>Pantethine</td>
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<tr>
<td>Vitamin B6 (pyridoxine HCl)</td>
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<tr>
<td>Pyridoxal S’-phosphate (vitamin B6)</td>
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<tr>
<td>Vitamin B12 (cyanocobalamin)</td>
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<tr>
<td>Vitamin B12 (hydroxycobalamin)</td>
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<tr>
<td>Vitamin B12 (ion exchange resin)</td>
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</tr>
<tr>
<td>PABA (para-aminobenzoic acid)</td>
<td>200 mcg</td>
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</table>

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Published scientific studies document that people who eat the most fruits and vegetables have much lower incidences of health problems. Few people, however, consistently eat enough plant foods to protect against common age-related decline, and commercial multivitamins do not provide all of the vital plant components needed to maintain good health.

LIFE EXTENSION MIX™ contains only the expensive dry powder form of vitamin E. This natural form of vitamin E (succinate) has been shown to promote healthy DNA better than other forms.

**N-acetyl-L-cysteine** suppresses free radicals inside the cells and maintains healthy glutathione levels. **Taurine** may protect against free radicals between cells and supports eye health.

Some scientific evidence suggests that consumption of selenium may reduce the risk of certain forms of cancer; however, the FDA has determined that this evidence is limited and not conclusive.

**Zinc** is often poorly absorbed, but LIFE EXTENSION MIX™ provides two of the most bioavailable forms of zinc.

**Chromium** is five times more vitamin D in LIFE EXTENSION MIX™ compared to conventional multivitamins.

**Boron** is not only needed to maintain healthy bone density but may also help promote healthy prostate cell function.

**Magnesium** helps protect arteries and heart valves, and supports heart and brain cells. LIFE EXTENSION MIX™ provides high potencies of six different forms of magnesium to fully saturate the body with this life-saving mineral.

**Acetylcholine** in the brain helps support cognitive function and memory.

Contains soybeans, corn, rice, and sesame.

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Using HORMONES to Heal Traumatic BRAIN INJURIES

BY JOSEPH CARRINGTON

It can happen without warning: you slip in the shower and hit your head, a car swerves and hits you, a small stroke occurs and suddenly you can’t speak, your mobility is limited, and your world shrinks.

These are real-life examples of the often intractable effects of traumatic brain injury or TBI. And thanks to the groundbreaking work of Dr. Mark L. Gordon and a handful of forward-looking physicians, there’s new hope for the 1.7 million Americans afflicted with this condition.

Using cutting-edge hormone replacement techniques, Gordon and his colleagues are helping to change the way we think about traumatic brain injuries, their symptoms—and how to treat them effectively. In his clinical practice, Dr. Gordon is developing new protocols that may revolutionize the devastating impact of traumatic brain injuries. One of the biggest patient populations in need of urgent care are the soldiers returning from the battlefields of Iraq and Afghanistan. Our story begins with them. > >
Starting with Soldiers

Traumatic brain injury (TBI) is often referred to as the “signature wound” of both the Iraq and Afghanistan wars. Traumatic brain injury occurs when a sudden trauma to the head disrupts brain function. In both these wars, however, even close proximity to the force of an explosion can be just as devastating. Most of the reported traumatic brain injury among Operation Enduring Freedom and Operation Iraqi Freedom veterans has been traced to improvised explosive devices, or IEDs.

“Traumatic brain injury can be caused by a direct impact, or by acceleration alone,” explains Dr. Mark L. Gordon, interventional endocrinologist and traumatic brain injury treatment specialist at Millennium Health Centers in Los Angeles. “Brain trauma also causes secondary injury, which takes place in the minutes and days following the injury,” he adds. “These processes include alterations in cerebral blood flow and increased pressure within the skull, contributing substantially to damage from the initial injury.”

Gordon says traumatic brain injury can cause a host of physical, cognitive, emotional, and behavioral effects, some of which can be difficult to detect. Symptoms can appear immediately or weeks to years following the injury. “Insidious traumatic brain injury can be difficult to detect,” Gordon says. “Localized damage to the frontal and occipital lobes occurs when the brain collides with the skull. Increasingly, we are discovering that traumatic brain injury is also a causative factor for accelerated hormonal deficiencies.”

These deficiencies, says Gordon, can cause a host of psychological, physiological, and physical manifestations, including depression, outbursts of anger, anxiety, mood swings, memory loss, inability to concentrate, learning disabilities, sleep deprivation, increased risk for heart attacks, strokes, high blood pressure, diabetes, loss of libido, menstrual irregularities, premature menopause, obesity, loss of lean body mass, muscular weakness, and a number of other medically documented conditions.

What’s more, Gordon points out that veterans suffering from these forms of psychological damage due to traumatic brain injury are frequently misdiagnosed and have their injury erroneously downgraded to post-traumatic stress disorder (PTSD). Moreover, especially in mild traumatic brain injury cases, symptoms at the initial time of injury may go unrecognized or unnoticed, but patients will still develop hormone deficiencies. Unfortunately, the government is slow to accept the link between traumatic brain injury and hormonal deficiencies.

Dr. Gordon’s Epiphany

By sheer serendipity, many years ago Dr. Gordon provided care for a young man with a history of numerous sports-related head injuries, whose parents were themselves patients at the clinic. The young man’s symptoms long outlasted the immediate effects of his acute injury and included loss of concentration, memory, mental energy, focus, and physical wellbeing, often accompanied by loss of lean muscle mass and an increase in body fat.

The parents, familiar with the effects of hormonal imbalances, naturally assumed that their son’s problems might reflect an endocrine problem of his own. And indeed, many of his symptoms resembled those of adult patients with so-called hypopituitarism, or loss of pituitary gland function. The pituitary gland is located at the base of the brain and is sometimes called the “master” gland of the endocrine system, because it controls the functions of the other hormone-secreting glands.

Gordon, who is nothing if not intellectually curious, hit the books. What he found was startling and life-changing, for himself as a clinician, for his young patient, and now for scores of additional victims of traumatic brain injury.
Dr. Gordon found a wealth of published literature suggesting that traumatic brain injury causes pituitary dysfunction, confirming his initial hunch. Although the figures vary between studies, at least 50% (and up to 76%) of traumatic brain injury victims show some loss of pituitary hormone function immediately after the brain injury. In general, the more severe the original brain injury, the more profound the hormonal deficits, although hormone deficiency or insufficiency (levels in the low “normal” range) are seen even in patients with mild traumatic brain injury.

And while about 58% of patients recover their normal pituitary function within one year of their head injury, a shocking 52% develop new pituitary hormone deficiencies after one year.

Those deficits include reductions in many different pituitary hormones, including those that regulate the thyroid gland, the adrenal glands (that produce cortisol, DHEA, and other vital hormones), the gonads (where estrogen and testosterone are produced), and growth hormone.

The severity of the hormone deficiencies correlates strongly with the kinds of symptoms Dr. Gordon was seeing in his patient. For example, patients with growth hormone deficiency or insufficiency had significantly worse disability rating scores, greater rates of depression, worse quality of life, lower energy, greater fatigue, and poorer emotional well-being, compared to brain injury patients with normal hormonal levels.

**Dr. Gordon’s hunch was borne out:** patients with traumatic brain injury often have pituitary hormone deficiencies or insufficiencies, especially in growth hormone. And those deficits are closely associated with the persistent neurological, psychological, and emotional deficits that are so tragically common in survivors of traumatic brain injury. And where are you most likely to find a high concentration of survivors of traumatic brain injury? The United States military.

### The Combat Connection

“When you have 360,000-plus GIs coming back from war with traumatic brain injury, it gets expensive,” he says. “Especially when you have to start addressing hormone deficiencies.”

In 2006, the army’s surgeon general established the Traumatic Brain Injury Task Force to establish a clear picture of the processes and research involved with helping traumatic brain injury–affected service members transition to civilian life. The task force was designed to assess how the army addressed aspects of traumatic brain injury.

**Brain Trauma**

- Traumatic brain injury afflicts nearly 2 million Americans annually.
- Survivors of traumatic brain injury suffer from a broad spectrum of physical, mental, cognitive, and emotional deficits, ranging in severity from mild to crippling.
- Conventional medical treatment and rehabilitation often fail to achieve substantial recovery once the acute injury period has passed.
- Recent discoveries reveal that traumatic brain injury produces a host of endocrine deficits centered on dysfunction of the pituitary gland.
- Restoring the balance of deficient hormones to their pre-injury levels has been shown to produce substantial improvements in all facets of traumatic brain injury.
- Despite powerful evidence for hormone replacement, conventional physicians remain unwilling to provide this vital therapy.
- Dr. Mark Gordon of Millennium Health Centers is a pioneer in hormone testing and replacement in victims of traumatic brain injury.
- Gordon has now treated scores of brain-injured patients, balancing their deficient hormones and achieving remarkable recovery, even in patients who are years out from their original injury.
- Anyone with a traumatic brain injury, or their family members, can reach out to Dr. Gordon and Millennium Health Centers for an initial evaluation and treatment plan.
traumatic brain injury care, and made recommendations for improvement. But Gordon believes the bottom line is that a task force can do little if the military doesn’t want to pay for treatment.

Gordon explains that conventional medical dosage for testosterone is at 200-300 milligrams per week, which he has shown is far too high! "For example, a typical 25-35 year old male naturally generates 4-10 milligrams per day, or 60 milligrams per week. Using supraphysiological dosages of testosterone (as military doctors are doing) can have significant side-effects if not monitored closely. We can achieve similar benefits at one-quarter the dose without the risk factors."

While Gordon admits that interventional endocrinology may not be for everyone, patients like soldiers will eagerly seek it out when traditional doctors have hit a wall and are unable to fix ongoing issues. Recently, he spoke with a military veteran in North Carolina who described the sheer difficulty of getting anything done through the military. "Part of the reason," Gordon explains, “is because the military and doctors see testosterone as a ‘bodybuilder drug,’ rather than a natural substance produced in our bodies. It makes no sense why they can readily accept insulin use for diabetes, but not testosterone. They are both natural hormones, flowing naturally through our bodies.”

Traumatic Brain Injury and Hormones

Most people typically think of hormones as the products of the endocrine glands located throughout the body. That’s an accurate, but incomplete, view of these powerful biological regulatory molecules. Virtually all endocrine glands are under the control of the pituitary gland, which is located inside the skull at the base of the brain. Because of its powerful influence on the other endocrine glands, the pituitary is often referred to as the “master gland.”

But even the pituitary is subject to a “higher” form of control. An ancient brain structure called the hypothalamus has a direct connection to the pituitary via a unique network of veins. Regulatory molecules from the hypothalamus “tell” the pituitary how much of its own hormones and hormone releasing factors to produce. And the hypothalamus, as part of the brain itself, receives constant neurological inputs from all over the body, creating a host of feedback loops. It is those feedback loops that maintain a steady balance between extreme biochemical states.

That connection between the brain’s hypothalamus and the endocrine system’s pituitary is called neuroendocrine function. And, though it may seem obvious, medical science is only just beginning to recognize that trauma to the brain, even apparently minor trauma, can damage the hypothalamic-pituitary system and have profound effects on hormonal function.

In fact, most people (including the majority of physicians) assume that the neurological deficits that follow a traumatic brain injury result simply from disruption to brain tissue itself. In this simplistic model, a “hit” to the head causes the brain to be “rattled,” triggering bleeding, bruising, and other large-scale injuries that can be seen on MRI and CT scans. And it’s quite true that we can predict some of the deficits a brain-injured person will sustain by the location and severity of the visible damage on those scans.

But victims of traumatic brain injury frequently have sustained neurological deficits that exceed what would be predicted simply by examining brain scans. Unfortunately, people with so-called minor traumatic brain injury, who comprise the largest group of brain-injured patients, have no visible damage at all on brain scans.

It took someone with genuine insight and a fresh approach to recognize that it is disrupted hormonal function, not simply physical “brain damage,” that creates the sustained neurological deficits suffered by victims of traumatic brain injury.
Growth hormone is the most common hormone deficiency or insufficiency in patients with traumatic brain injury at any level of severity. Deficiencies in this hormone are especially marked in patients with moderate to severe traumatic brain injury. Brain-injured patients with growth hormone deficiency experience rapid weight gain and have substantially lower levels of other hormones as well. Low growth hormone levels are also associated with excessive anxiety and depression and poor physical health and quality of life. Finally, brain-injured patients with growth hormone deficiency show greater deficits in attention, executive functioning, memory, and emotion than those with normal growth hormone levels.

Growth hormone is an intriguing hormone, and we are learning more about it each year. In children, it is responsible for regulating linear growth, ultimately determining adult height and body proportions. But growth hormone has many other remarkable functions throughout the body and into adulthood. It is neuroprotective, increasing survival of damaged nerve cells and promoting regeneration of nerve tissue. Growth hormone also increases the number of receptors for other hormones in tissues throughout the body; this has the effect of increasing the body's sensitivity to those hormones' actions, helping to overcome the effects of their deficiencies.

Like all hormones, growth hormone acts by binding to specific cell-surface receptors. Receptors for growth hormone are found throughout the brain, and they are especially densely distributed in brain regions responsible for learning and memory. That may explain why declining growth hormone levels are associated with poorer cognitive function. Growth hormone levels fall with age and are especially low in Alzheimer's disease. As Dr. Gordon points out, it is therefore not surprising that traumatic brain injury patients often show symptoms identical to the cognitive decline and memory loss we see with aging and Alzheimer's disease. In essence, a brain-injured patient with low growth hormone levels undergoes accelerated cognitive aging.

Hope for Traumatic Brain Injury Patients at Millennium Health Centers

Dr. Gordon was struck by the obvious paradox: although there is copious evidence that patients with traumatic brain injury suffer from hypothalamic-pituitary hormonal imbalances, and ample expert recommendations for rigorous hormone testing, few physicians were bothering to test their brain-injured patients. Worse, despite compelling studies showing the benefits of hormone replacement, virtually no physician was offering such therapy in the United States.

Dr. Gordon decided to act.

Over the course of several years, he has developed a panel of comprehensive hormone testing for survivors of traumatic brain injury (Table 1). Gordon’s clinic, Millennium Health Centers, provides primary, or direct, testing to determine how well the hypothalamic-pituitary system is functioning, and also secondary testing, which determines how the target endocrine glands themselves are affected (Table 2). In his practice, Dr. Gordon obtains a complete history and performs a detailed physical examination on

Table 1: Millennium’s Traumatic Brain Injury Hormone Panel

<table>
<thead>
<tr>
<th>Testing</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>IGF-1</td>
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<td>✓</td>
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<tr>
<td>Free Testosterone</td>
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</tr>
<tr>
<td>TSH</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>T3/T4</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>DHEA</td>
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Table 2: Primary and Secondary Endocrine Function Tests

<table>
<thead>
<tr>
<th>Primary Testing (Direct Pituitary Function)</th>
<th>Secondary Testing (Function of Target Endocrine Organs)</th>
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<tbody>
<tr>
<td>Growth Hormone</td>
<td>IGF-1 (Insulin-like growth factor-1)</td>
</tr>
<tr>
<td>Luteinizing Hormone</td>
<td>Testosterone/Estrogens</td>
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<tr>
<td>Thyroid Stimulating Hormone</td>
<td>T3 and T4 (Thyroid Hormones)</td>
</tr>
<tr>
<td>ACTH (Adrenocorticotropic Hormone)</td>
<td>Cortisol</td>
</tr>
<tr>
<td>FSH (Follicle-Stimulating Hormone, acts at ovaries and testes)</td>
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</table>
each brain-injured patient and correlates those findings with their lab results. From this information he is able to create a treatment protocol for individualized hormone replacement.

Dr. Gordon uses physiologic dosing, not megadoses, of each hormone. His goal is to restore hormone levels to the middle of the optimum range, but he works each patient up to that level slowly, monitoring their cognitive and physical functions monthly.

“Science now has the ability to map the entire brain, and we now know exactly where growth hormone works on mood, which pathways it uses,” says Dr. Gordon. “The military is simply not prepared to go to the depths that we have in the private sector.”

Patients typically respond within weeks to the Millennium approach. And the responses tend to be dramatic.

Gordon recalls one case in particular, of a woman who had been involved in a “T-bone” car crash—a notoriously deadly situation in which the victim’s vehicle is hit full-force from the side. The patient was left with multiple neurological deficits. She spoke with a stutter and needed to keep one hand on the wall as she walked in order to maintain her balance. She had substantial memory impairment as well.

After a series of blood tests, Dr. Gordon began administering small doses of the hormones that were deficient in this patient’s case. She soon showed encouraging progress, with diminished speech and balance impairment. Gordon recalls with obvious delight, “One day about six months later, I got a phone call from a woman who said, in a perfectly normal voice, ‘Hi, this is your patient Nancy.’ I told her to stop joking and asked who it was. ‘I’m your patient, Nancy, the one with the bad stutter. I woke up this morning, and this is how I was able to speak. I just wanted to let you know.’”

Nancy’s case, though dramatic, is far from unique. Since that time, Dr. Gordon has treated scores of other patients with similar outcomes, which is why military veterans coming to him are in good hands: he has obtained a grant from Access Medical Laboratories in Jupiter, Florida, which currently covers the cost of testing veterans with traumatic brain injury. “They’ve arranged for a phlebotomy company to go to the veterans’ homes and draw blood. Lab tests use a spectrum that goes way beyond typical blood tests, providing a bigger database.” Any treatment starts with baseline hormone testing of testosterone, growth hormone, thyroid, and cortisol.

His work is attracting international attention, and he has been invited to lecture on his hormone-balancing approach at prestigious conferences around the world. Dr. Gordon is actively recruiting other physicians to learn from him so that they can apply his techniques in their own practices.

Summary

Traumatic brain injury leaves millions of survivors with substantial impairments in physical, emotional, cognitive, and behavioral consequences each year. Despite high-tech diagnostic and treatment protocols, mainstream medicine has managed to do little to overcome these long-term pathologies. The recent discovery that traumatic brain injury, by damaging the brain’s hypothalamus, triggers dysfunction of the pituitary gland, led Dr. Mark Gordon on a mission to identify and treat the resulting hormonal deficiencies in his patients with traumatic brain injury. Restoring hormone levels to their optimal, pre-injury and youthful levels results in remarkable recovery of many of the impaired functions.

Patients with traumatic brain injury, or their family members, may visit Millennium’s website at www.TBImedlegal.com, or call 818-990-1166 in order to set up initial lab testing. Information at the website also lets patients know what a typical course of treatment involves.

If you are a veteran of the Gulf War, Iraq, or Afghanistan, The Millennium Health Centers has a limited grant from Access Medical Laboratories of
Florida that will pay for your TBI Hormone Panel. In California, Dr. Gordon offers the same TBI Hormone Panel to law enforcement officers injured on the job. We care for those who take care of us!

If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.

References

Critical Importance of Mitochondria

Back in 1983, Life Extension® was the first to introduce CoQ10 as a proven method to enhance mitochondrial energy production.

CoQ10 has since gained universal recognition for its role in supporting cellular performance throughout the body.¹⁻⁶

In an unprecedented breakthrough, a compound called PQQ (pyrroloquinoline quinone) has been shown to support mitochondrial biogenesis—the spontaneous generation of new mitochondria in aging cells.⁷

PQQ is available as a low-cost dietary supplement.

Mitochondria are cellular energy generators that supply virtually all the power your body requires for a healthy lifespan. An abundance of published studies underscores the critical importance of the mitochondria to overall health, especially as we age.⁸⁻¹⁴

Energy-intensive organs like the heart and brain are dense with mitochondria.

Until recently, the only natural ways for aging individuals to increase the number of mitochondria in their bodies were long-term calorie restriction or exhaustive physical activity—which are difficult or impractical for most people to implement.

PQQ offers a viable alternative.
The Ultimate Cell Rejuvenator

The enormous amount of energy generated within the mitochondria exposes them to constant free radical attack. The resulting mitochondrial decay is a hallmark of aging.

PQQ protects and augments delicate mitochondrial structures to promote youthful cellular function in three distinct ways:

- **Antioxidant power.** Like CoQ10, PQQ is a highly potent antioxidant. Its extraordinary molecular stability enables it to facilitate thousands of biochemical reactions in the mitochondria, without breaking down, for maximum antioxidant and bioenergetic support.15

- **Favorably modulates gene expression.** PQQ activates genes that promote formation of new mitochondria7—and beneficially interacts with genes directly involved in mitochondrial health. These same genes also support healthy body weight, normal fat and sugar metabolism, and youthful cellular proliferation.16

- **Mitochondrial defense.** Mitochondria possess their own DNA, distinct from the DNA contained in the nucleus. Unfortunately, compared to nuclear DNA, mitochondrial DNA is relatively unprotected. PQQ's antioxidant potency and favorable gene expression profile act to support mitochondrial defense.

To order PQQ Caps with BioPQQ™ standalone or any other PQQ-containing formula call 1-800-544-4440 or visit www.LifeExtension.com

BioPQQ™ is a trademark of MGC (Japan).

Vital Protection for the Aging Heart and Brain

PQQ is an essential nutrient, meaning your body cannot make it on its own. A growing body of research indicates that PQQ's unique nutritional profile supports heart health and cognitive function—alone and in combination with CoQ10.17,18 This comes as no surprise, given how much energy these vital organs need.

Research shows that PQQ supports heart cell function in the presence of free radicals and promotes blood flow in heart muscle.19

When taken in combination with CoQ10, just 20 mg per day of PQQ has been shown to promote memory, attention, and cognition in maturing individuals.20

A Breakthrough Weapon in the Battle Against Aging

Life Extension® has identified a purified, highly potent form of PQQ from Japan that is produced through a natural fermentation process. The result is the highest quality PQQ available on the market today called BioPQQ™.

A bottle containing 30 10 mg vegetarian capsules of PQQ Caps with BioPQQ™ retails for $24. If a member buys four bottles during Super Sale, the price is reduced to just $14.85 per bottle.

A 10 mg dose of PQQ is also included in the Mitochondrial Energy Optimizer with BioPQQ™ and Mitochondrial Basics with BioPQQ™ formulas.

Contains rice.

To order PQQ Caps with BioPQQ™ standalone or any other PQQ-containing formula call 1-800-544-4440 or visit www.LifeExtension.com

BioPQQ™ is a trademark of MGC (Japan).

References
Falling down is responsible for 70% of accidental deaths in older people. Poor lighting conditions are often the culprit. Fortunately, C3G derived from black currant supports eyesight in dark conditions by promoting the healthy function of delicate structures within the retina that support night vision.

The macular pigment is composed of lutein, zeaxanthin, and meso-zeaxanthin. The density of the macula is essential to proper vision. Macular density declines naturally over time. Eating lots of lutein- and zeaxanthin-containing vegetables can help maintain the structural integrity of the macula. However, since meso-zeaxanthin is not part of the typical diet, it cannot be easily replaced. Young people convert lutein into meso-zeaxanthin inside their macula. Some aging people, however, lose their ability to convert lutein into meso-zeaxanthin.

The Super Zeaxanthin formula provides zeaxanthin, lutein and meso-zeaxanthin to help maintain macular density.

Staring at a fixed-distance object such as a computer screen for a long period of time can cause the muscles that focus your eyes (called the ciliary body) to tire or go into spasm. This can result in physical symptoms such as head discomfort, sensitivity to glare, tiredness, soreness, dryness, and blurry vision.

Super Zeaxanthin contains a potent dose of astaxanthin, a carotenoid found in red algae. Studies show that taking astaxanthin with other carotenoids protects against free radical–induced DNA damage, repairs UVA-irradiated cells, and inhibits inflammatory cell infiltration. Astaxanthin also helps support vascular health within the eye and improves visual acuity. Its fat-soluble nature offers protection to sensitive cells inside the eye.

The new Super Zeaxanthin formula provides natural plant extracts that have been shown to promote healthy eyesight. Just one softgel of Super Zeaxanthin with Lutein, Meso-Zeaxanthin Plus Astaxanthin and C3G provides:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Dosage</th>
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<tbody>
<tr>
<td>OptiLut®, Lutein Plus® and MZ®</td>
<td>38 mg</td>
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<tr>
<td>Marigold (Tagetes erecta) Extract (flower) [free lutein equivalent 10 mg]</td>
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</tr>
<tr>
<td>Zeaxanthin &amp; Meso-zeaxanthin blend</td>
<td>3.75 mg</td>
</tr>
<tr>
<td>[micronized zeaxanthin, OptiLut®, Lutein Plus®, and MZ® Marigold Extract (flower)]</td>
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</tr>
<tr>
<td>Natural Astaxanthin</td>
<td>6 mg</td>
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<tr>
<td>(AstaREAL® and Zanthin® CO2 extracts of Haematococcus pluvialis algae)</td>
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<tr>
<td>C3G (Cyanidin-3-glucoside) from European black currant (Ribes nigrum) extract (fruit)</td>
<td>2.2 mg</td>
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The retail price for a bottle containing 60 softgels of Super Zeaxanthin with Lutein, Meso-zeaxanthin Plus Astaxanthin and C3G is $42. If a member buys four bottles during Super Sale, the price is reduced to just $25.65 per bottle.

Enhanced Night Vision!

**EYE PROTECTION FORMULA**

To order Super Zeaxanthin with Lutein, Meso-zeaxanthin Plus Astaxanthin and C3G, call 1-800-544-4440 or visit www.LifeExtension.com

OptiLut® is a registered trademark of NutriScience Innovations, LLC. LuteinPlus® and MZ® are registered trademarks of Nutriproducts Ltd., 7 Marfleet, CB22 5LA, UK, licensed under US Patents 6,718,436 & 6,920,432. AstaREAL® is a registered trademark of Fuji Chemical Industry Co., Ltd. Zanthin® is a registered trademark of Valensa International, Inc., used under license. U.S. Patent 5,527,533.

References

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
DHEA is a critically important hormone, but its production declines sharply as we age. Scientists are discovering numerous health benefits when aging people restore their DHEA to youthful ranges. Life Extension offers a wide range of DHEA supplements to satisfy individual needs.

**DHEA 25 mg, 100 Dissolve-in-Mouth Tablets**
- Item #00335
- The minimum dose of DHEA for most healthy aging people is 25 mg a day, though optimal doses are often higher in men. These 25-mg capsules are a popular way to consume the precise amount of DHEA your body may need. A bottle containing 100 25-mg capsules of DHEA retails for $14; if a member orders four bottles during Super Sale, the price is reduced to just $8.44 per bottle. Contains rice.

**DHEA 25 mg, 100 Capsules**
- Item #00882
- The minimum dose of DHEA for most healthy aging people is 25 mg a day, though optimal doses are often higher in men. These 25-mg capsules are a popular way to consume the precise amount of DHEA your body may need. A bottle containing 100 25-mg capsules of DHEA retails for $15; if a member orders four bottles during Super Sale, the price is reduced to just $8.44 per bottle. Contains rice.

**DHEA 15 mg, 100 Capsules**
- Item #00454
- While published studies show the greatest benefit occurs when 50-75 mg of DHEA is consumed each day, some women only need a low dose of DHEA. Just one of these 15-mg capsules a day is all some women need to bring DHEA levels back to youthful levels. A bottle containing 100 15-mg capsules of DHEA retails for $12; if a member orders four bottles during Super Sale, the price is reduced to just $6.75 per bottle. Contains rice.

**DHEA 15 mg, 60 Capsules**
- Item #00607
- While published studies show the greatest benefit occurs when 50-75 mg of DHEA is consumed each day, some women only need a low dose of DHEA. Just one of these 15-mg capsules a day is all some women need to bring DHEA levels back to youthful levels. A bottle containing 60 15-mg capsules of DHEA retails for $12; if a member orders four bottles during Super Sale, the price is reduced to just $6.75 per bottle. Contains rice.

**DHEA 50 mg, 60 Capsules**
- Item #00607
- The optimal daily dose of DHEA for most people is 50 mg. These economical 50-mg capsules enable most people to conveniently consume the optimal dose of DHEA in just one capsule. A bottle containing 60 50-mg capsules of DHEA retails for $16; if a member orders four bottles during Super Sale, the price is reduced to just $9.45 per bottle. Contains rice.

**DHEA 25 mg, 100 Dissolve-in-Mouth Tablets**
- Item #00882
- A bottle containing 100 25-mg dissolve-in-mouth tablets of DHEA retails for $14; if a member orders four bottles during Super Sale, the price is reduced to just $7.93 per bottle. Some people want to take DHEA in sublingual tablet form to avoid first pass through the liver, though published studies show that swallowing DHEA capsules consistently boosts blood DHEA levels. Contains corn.

**CAUTION:** Do not use DHEA if you are at risk for or have been diagnosed as having any type of hormonal cancer, such as prostate or breast cancer.

To order the DHEA supplement that’s right for you, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Blood testing provides the ultimate information regarding correctable risk factors that may predispose you to disorders such as cancer, diabetes, cardiovascular disease, and more. Information about general health and nutritional status can also be gained through standard blood analysis. Standing behind the belief that blood testing is an essential component of any program designed to attain optimal health and longevity, Life Extension® offers this innovative and convenient service at a very affordable price. Not only is comprehensive blood testing an important step in safeguarding your health, it is a simple process from virtually anywhere in the United States.

Five Easy Steps:
1. Call 1-800-208-3444 to discuss and place your order with one of our knowledgeable health advisors. (This order form can also be faxed to 1-866-728-1050 or mailed). Online orders can also be placed at www.lifeextension.com.
2. After your order is placed, you will be mailed either a requisition form to take to your local LabCorp Patient Service Center or a Blood Draw Kit; whichever is applicable (Please note: If a blood draw kit is used, an additional local draw fee may be incurred.)
3. Have your blood drawn.
4. Your blood test results will be sent directly to you by Life Extension.
5. Take the opportunity to discuss the results with one of our knowledgeable health advisors by calling 1-800-226-2370; or review the results with your personal physician.

It’s that simple! Don’t delay—call today!

For Our Local Members:
For those residing in the Ft. Lauderdale, Florida area, blood-draws are also performed at the Life Extension Nutrition Center from 9:00 am to 2:00 pm Monday through Saturday. Simply purchase the blood test and have it drawn with no wait! Our address is 5990 North Federal Highway, Ft. Lauderdale, FL, 33308-2633.

### Most Popular Panels

#### Comprehensive Panels

- **Male Life Extension Panel (LC322582Z)**
  - CBC/Chemistry Profile
  - DHEA-S
  - Homocysteine
  - Free Testosterone
  - Total Testosterone
  - Estradiol
  - SHBG
  - PSA (prostate-specific antigen)
  - C-Reactive Protein (high sensitivity)
  - **Price:** $269

- **Female Life Extension Panel (LC322535)**
  - CBC/Chemistry Profile
  - DHEA-S
  - Homocysteine
  - Free Testosterone
  - Total Testosterone
  - Estradiol
  - SHBG
  - PSA (prostate-specific antigen)
  - C-Reactive Protein (high sensitivity)
  - **Price:** $269

- **Male Weight Loss Panel (LCWLM)**
  - CBC/Chemistry Profile
  - DHEA-S
  - Insulin
  - Free Testosterone
  - Total Testosterone
  - Estradiol
  - Free T3
  - C-Reactive Protein (high sensitivity)
  - **Price:** $299

- **Female Weight Loss Panel (LCWLF)**
  - CBC/Chemistry Profile
  - DHEA-S
  - Insulin
  - Free Testosterone
  - Total Testosterone
  - Estradiol
  - Free T3
  - C-Reactive Protein (high sensitivity)
  - **Price:** $299

- **Male Hormone Add-On Panel (LCADD)**
  - Pregnenolone and Dihydrotestosterone (DHT)
  - To provide an even more in-depth analysis of a man’s hormone status, Life Extension has created this panel as an addition to the Male Life Extension Panel. This panel provides valuable information about a testosterone metabolite that can affect the prostate, and the mother hormone that acts as a precursor to all other hormones.
  - **Price:** $155

- **Female Hormone Add-On Panel (LCADDF)**
  - Pregnenolone and Total Estrogens
  - To provide an even more in-depth analysis of a woman’s hormone status, Life Extension has created this panel as an addition to the Female Life Extension Panel. This panel provides valuable information about total estrogen status, and the mother hormone that acts as a precursor to all other hormones.
  - **Price:** $125

- **Life Extension Thyroid Panel (LC304131)**
  - TSH, Free T4, Free T3
  - **Price:** $75

- **Male Hormone Re-Test Profile (LCRTM)**
  - CBC/Chemistry Profile
  - DHEA-S, Dihydrotestosterone (DHT), Estradiol, PSA, Pregnenolone, Total and Free Testosterone, and TSH. Continual monitoring of hormone levels is necessary for men seeking to maintain optimal blood level values.
  - **Price:** $275

- **Female Hormone Re-Test Profile (LCRTF)**
  - CBC/Chemistry Profile
  - DHEA-S, Total Estrogen, Pregnenolone, Total and Free Testosterone, Progesterone, and TSH. Continual monitoring of hormone levels is necessary for women seeking to maintain optimal blood level values.
  - **Price:** $250

#### CBC/Chemistry Profile (LC381822)

- **Price:** $35

#### Cardiovascular Risk Profile

- **Total Cholesterol**
- **HDL Cholesterol**
- **LDL Cholesterol**
- **Triglycerides**
- **Iron**

- **Price:** $250

- **Liver Function Panel**
  - AST (SGOT)
  - ALT (SGPT)
  - Alkaline Phosphatase
  - LDH
  - **Price:** $35

#### Kidney Function Panel

- **BUN/Creatinine Ratio**
- **Uric Acid**
- **Price:** $75

#### Blood Protein Levels

- **Total Protein**
- **Globulin**
- **Albumin**
- **Albumin/Globulin Ratio**

#### Blood Count/Red and White Blood Cell Profile

- **Red Blood Cell Count**
- **Monocytes**
- **White Blood Cell Count**
- **Lymphocytes**
- **Platelet Count**
- **Basophils**
- **Hypochromic RBC Count**
- **Red Blood Cells**
- **Neutrophils**
- **Total White Blood Cells**
- **Mean Corpuscular Volume**
- **Mean Corpuscular Hemoglobin**
- **Mean Corpuscular Hemoglobin Concentration**
- **Mean Cell Volume**
- **Monocytes**
- **MCH**
- **MCHC**
- **MCHV**
- **Base (Absolute)**
- **Polynucleated Cells**
- **Price:** $275

#### Blood Mineral Panel

- **Calcium**
- **Sodium**
- **Potassium**
- **Chloride**
- **Phosphorus**
- **Iron**

#### Price:** $47

#### Hemoglobin A1C (HBATC) (LC001453)

- **Price:** $31

#### Cytokine Panel (LC001554)

- **Includes TNF-alpha, IL-6, IL-1 beta and IL-8**

#### Price:** $399

#### Omega Score™ (LC001554)

- **Price:** $131.25

#### CoQ10® (COENZYME Q10) (LC120251)

- **Price:** $145

*This test requires samples to be shipped to the lab on dry ice for customers using a Blood Draw Kit and will incur an additional $35 charge. If the customer is having blood drawn at a LabCorp facility, this extra charge does not apply.

**This test is packaged as a kit, requiring a finger stick performed at home.
### MOST POPULAR SINGLE TESTS

**Life Extension Member Pricing**

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<td>Cortisol (LC004051)</td>
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<td>Pregnenolone <em>(LC140707)</em></td>
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<td>Progesterone <em>(LC004317)</em></td>
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<td>PSA (Prostate-Specific Antigen) <em>(LC010322)</em></td>
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<td><strong>FREE-PSA</strong> <em>(LC480870)</em></td>
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<td><strong>BONE HEALTH</strong></td>
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<td>Osteocalcin <em>(LC010249)</em></td>
<td>$91</td>
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<tr>
<td><strong>DPD CROSS LINK URINE TEST</strong> <em>(LC511105)</em></td>
<td>$79</td>
</tr>
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</table>

**Blood tests available only in the continental United States.**

For non-member prices call 1-800-208-3444

**ORDER LIFE-SAVING BLOOD TESTS FROM VIRTUALLY ANYWHERE IN THE US!**

**TERMS AND CONDITIONS**

This blood test service is for informational purposes only and no specific medical advice will be provided. National Diagnostics, Inc., and the Life Extension Foundation contract with a physician who will order your test(s), but will not diagnose or treat you. Both the physician and the testing laboratory are independent contractors and neither National Diagnostics, Inc., nor the Life Extension Foundation™ will be liable for their acts or omissions. Always seek the advice of a trained health professional for medical advice, diagnosis, or treatment. When you purchase a blood test from Life Extension/National Diagnostics, Inc., you are doing so with the understanding that you are privately paying for these tests. There will be absolutely no billing to Medicare, Medicaid, or private insurance. I have read the above Terms and Conditions and understand and agree to them.

Signature of Life Extension Member  

X  

Life Extension Foundation Members only

**MEMBER NO.**

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<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
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<tbody>
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<td></td>
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</table>

**Name**

**Date of Birth** (required) / /

**Address**

**City**

**State** Zip

**Phone**

**Credit Card No.**

**Expiration Date** /

Mail your order form to:

3600 West Commercial Boulevard  
Fort Lauderdale, FL 33309  
Phone your order to: 1-800-208-3444  
Fax your order to: 1-866-728-1050

This is NOT a complete listing of LE blood test services. Call 1-800-208-3444 for additional information.
Products

AMINO ACIDS
- Acetyl-L-Carnitine
- Acetyl-L-Carnitine-ArGINate
- Branched Chain Amino Acids
- D, L-Phenylalanine Capsules
- GABA Powder
- Glycine Capsules
- Glycine Powder
- Arginine Capsules
- L-Arginine Free Base Powder
- Arginine/L-Ornithine Capsules
- Arginine Capsules
- L-Glutamine Capsules
- L-Glutamine Powder
- L-Lysine Capsules
- L-Lysine Powder
- L-Tyrosine Tablets
- Mega L-Glutathione Capsules
- N-Acetyl-L-Cysteine Capsules
- Optimized Carnitine with GlycoCarn®
- PharmaGABA
- Super Carnosine Capsules
- Taurine Capsules
- Tryptophan (Optimized) Tryptophan Plus

BONE & JOINT HEALTH
- ArthroMax™ with Theaflavins and AprèsFlex™
- ArthroMax™ Advanced with UC-II® and AprèsFlex™
- Bone-Up™
- Bone Restore™
- Bone Strength Formula w/KoAct™
- Chondroitin Sulfate
- Chondrox
- Fast Acting Joint Formula
- Glucosamine Chondroitin Capsules

BRAIN HEALTH
- Acetyl-L-Carnitine
- Acetyl-L-Carnitine-ArGINate
- CDP Choline Capsules
- Cognitex® with NeuroProtection Complex
- Cognitex® with Pregnenolone & NeuroProtection Complex
- Cognitex® Basics
- DMAE
- Ginkgo Biloba Certified Extract™
- Huperzine A
- Lecithin with B5 and BHA
- Lecithin Granules
- Methylcobalamine Lozenges
- Neuro-Mag
- DMAE
- D-Ribose Powder
- D-Ribose Capsules
- D-Ribose Powder
- Endothelial Defense™ with Full-Spectrum Pomegranate™
- Fibrinogen Resist
- Forskolin
- Garlicforce™
- Homocysteine Resist
- Krill Healthy Joint Formula
- Natural BP Management
- Peak ATP® with GlycoCarn®
- Policosanol
- Red Yeast Rice
- Super Absorbable CoQ10™ with d-Limonene
- Super Omega-3 EPA/DHA with Sesame Lignan & Olive Fruit Extract
- Super Ubiquinol CoQ10
- Super Ubiquinol CoQ10 with Enhanced Mitochondrial® Support
- Sytrinol®
- Theaflavin Standardized Extract
- TMG Powder
- TMG Tablets

HERBAL/PHYTO PRODUCTS
- Artichoke Leaf Extract
- Astaxanthin
- Berry Complete
- Blueberry Extract
- Blueberry Extract w/Pomegranate
- Butterbur Extract w/Standardized Rosmarinic Acid
- Calcium D-Glucarate
- Cilantro Herbal Extract
- Citrus Bioflavonoids
- Enhanced Berry Complete with RZD™ Acai
- Floradix® Iron & Herbs
- Lipo-FLA
- Lipo-FLA Iron & Herbs
- Full-Spectrum Pomegranate™
- Grapeseed Extract with Resveratrol & Pterostilbene
- Huperzine A with Natural Vitamin E
- Kyolic® Garlic Formula 105
- Kyolic® Reserve
- Mega Green Tea Extract
- Mega Green Tea Extract (Decaffeinated)
- Mega Lycopene Extract
- Nutrim
- Optimized Ashwagandha Extract
- Optimized Garlic
- Pomegranate Extract
- Pomegranate Juice Concentrate
- ProGreens™
- Pure-Gar™
- Pynogenol
- Optimized Quercetin
- Resveratrol with Synergistic Grape-Berry Actives
- Rhodiola Extract
- Rosmarinic Acid Extract
- Silymarin
- SODzyme™ with GlisODin®
- Stevia Extract
- Solarshield Sunglasses
- Super Zeaxanthin with Lutein & Meso-Zeaxanthin and C3G (Plus Astaxanthin also available)
- Vision Optimizer

FIBER
- Apple Pectin Powder
- Fiber Food
- Hi-Lignin Nutri-Flax®
- WellBetX PGX® Soluble Fiber Blend

FOOD
- Asian Cruciferous Vegetable Soup
- Cruciferous Vegetable Soup
- Rich Rewards Coffee

HAIR CARE
- Dr. Proctor’s Advanced Hair Formula
- Dr. Proctor’s Shampoo
- Life Extension Berry and Conditioner
- Super-Absorbable Tocotrienols

HEART HEALTH
- Advanced Lipid Control
- Aspirin (Enteric Coated)
- Cholesterol Lowering
- CoQ10
- D-Ribose Powder
- D-Ribose Powder
- Endothelial Defense™ with Full-Spectrum Pomegranate™
- Fibrinogen Resist
- Forskolin
- Garlicforce™
- Homocysteine Resist
- Krill Healthy Joint Formula
- Natural BP Management
- Peak ATP® with GlycoCarn®
- Policosanol
- Red Yeast Rice
- Super Absorbable CoQ10™ with d-Limonene
- Super Omega-3 EPA/DHA with Sesame Lignan & Olive Fruit Extract
- Super Ubiquinol CoQ10
- Super Ubiquinol CoQ10 with Enhanced Mitochondrial® Support
- Sytrinol®
- Theaflavin Standardized Extract
- TMG Powder
- TMG Tablets

HEALTH MAX
- ArthroMax with Theaflavins
- AprèsFlex
- ArthroMax with Theaflavins and AprèsFlex
- ArthroMax™ Advanced with UC-II® and AprèsFlex™
- Bone-Up™
- Bone Restore™
- Bone Strength Formula w/KoAct™
- Chondroitin Sulfate
- Chondrox
- Fast Acting Joint Formula
- Glucosamine Chondroitin Capsules

DIGESTIVE
- Bromelain Powder
- Bromelain w/PicroProtect®
- Daily Ginger®
- Digest RC™
- Enhanced Super Digestive Enzymes
- Florastor
- Intact Digest
- Life Flora™
- Natural Enzymes
- Pancreatin
- Primall Defense™
- Probiotic All-Flora®
- Probiotic Anti-Aging
- Probiotic Cleanse™
- Probiotic Colon™
- Regimint
- Theracyn Probiotics

DURK AND SANDY PRODUCTS
- Blast™
- Dual-C
- Inner Power™
- Memory Upgrade™

EYE CARE
- Bilberry Extract
- Blackcurrant Freeze Dried Extract
- Brite Eyes III
- Eye Pressure Support with Mirtogenol®
- Overxcast Polarized Sunglasses
- Solarshield Sunglasses
- Super Bio-Curcumin®
- Super Ginkgo Extract
- Triple Action Cruciferous Vegetable Extract
- Venotone
- Whole Grape Extract

HORMONES
- 7-Keto® DHEA
- DHEA
- DHEA Complete
- GH Pituitary Support Day Formula
- GH Pituitary Support Night Formula
- Melatonin
- Melatonin Timed Release
- Natural Estrogen with Pomegranate Extract
- Pregnenolone
- ProFem Cream
- Pure IGF
- Super Miraforte with Standardized Lignans

IMMUNE ENHANCEMENT
- Agave Digestive-Immune Support
- AHCC® (Active Hexose Correlated Compound)
- Aloe Vera Force™
- Buffered Vitamin C Powder
- Echinacea
- Enhanced Life Extension Whey Protein
- 126 Hyperimmune Egg
- Immune Protect with PARAINT®
- Lactoferrin
- Lifeshield™ Immunity™
- Maitake SX-Fraction
- Norwegian Shark Liver Oil
- Optimized Fucoidan w/Martech® 926
- Primal Defense
- ProBoost™ Thymic Protein A
- Pure Gar™
- Sambu® Guard
- SuperCritical Oroganoforte™
- Thymic Immune Factors
- Ultimate Flora Advanced Immunity
- Vitamin C with Dihydroquercetin
- Zinc Lozenges with Vitamin C

INFLAMMATORY REACTIONS
- Arthro-Inflamma Joint Support
- ArthroMax™ with Theaflavins
- Boswellia
- Boswellia® Topical Cream
- Bromelain (Specially-coated)
- DHA 240
- Emulsified Norwegian Cod Liver Oil
- Emulsified Super Twin EPA/DHA
- Fast Acting Joint Formula
- Ginger Force
- Krill Oil
- 5-LOX Inhibitor w/AprèsFlex™
- Mega EPA/DHA
- Mega GLA with Sesame Lignans
- MSM
- Natural Relief 1222™ Cream
- Omega-3 Chews
- Serralazine
- SODzyme™ with GlisODin® and Wolfberry
- Super Omega-3 EPA/DHA with Sesame Lignans & Olive Fruit Extract
- Tart Cherry
- Udo’s Choice Oil
- Zyflamend Easy

LIVER HEALTH
- Branch Chain Amino Acids
- N-Acetyl Cysteine
- Liver Force
- Liver Efficiency Formula
- Certified European Milk Thistle
- Hepatopro
- Silymarin

MINERALS
- Bone Restore
- Bone Strength Formula w/KoAct™
- Bone-Up™
- Boron Capsules
- Calcium Citrate with D3
- Chromium Ultra
- Copper
- Dr. Strum’s Intensive Bone Formula
- Flordis® Iron & Herbs
SKIN CARE
- Advanced Under Eye Serum with Stem Cells
- Amber Self MicroDermabrasion
- Anti-Aging Mask
- Anti-Glycation Serum
- Antioxidant Rejuvenating Foot Cream
- Antioxidant Rejuvenating Foot Scrub
- Antioxidant Rejuvenating Hand Cream
- Anti-Redness & Blemish Lotion
- Cellulite Suppress™ Formula
- Corrective Clearing Mask
- DermaWhey
- DNA Repair Cream
- Dual-Action MicroDerma Abrasion
- Elastin Collagen Body Firming Lotion
- Essential Plant Lipids Reparative Serum
- Face Master® Platinum
- Face Rejuvenating Antioxidant Cream
- Enhanced FemBlock™ with Sendara™
- Fine Line-Less
- Hair Suppress Formula
- Healing Formula All-in-One Cream
- Healing Mask
- Hyaluronic Facial Moisturizer
- Hydrating Anti-oxidant Face Mist
- Hydroderm™
- Lavilin Underarm Deodorant
- Lifting & Tightening Complex
- LifeShield® Reishi
- Melatonin Cream
- Mild Facial Cleanser
- NaPCA w/Aloe Vera
- Neck Rejuvenating Antioxidant Cream
- New Face Solution
- Peel Off Cleansing Mask
- Pigment Correcting Cream
- (Ultra) Rejuvenex™
- Rejuvenex® Body Lotion
- Rejuvenex® Factor
- Rejuvenerum Serum
- Resveratrol Anti-Oxidant Serum
- Skin Lightening Serum
- Skin Restoring Ceramides w/Lipowheat™
- Skin Stem Cell Serum
- Super-reparative ©
- Sun Protection Spray
- Total Sun Protection Cream
- Ultra RejuveNight®
- Ultra RejuveNight® w/ Progesterone
- Ultra RejuveNight® w/Progesterone
- Ultra Lip Plumper
- Ultra Wrinkle Relaxed
- Under Eye Refining Serum
- Under Eye Rescue Cream
- Vitamin C Serum
- Vitamin D Lotion
- Vitamin K Healing Cream

SOY
- Natural Estrogen w/Pomegranate
- Soy Protein Concentrate
- Super Absorbable Soy Isoflavones
- Ultra Soy Extract

WEIGHT MANAGEMENT
- Alli® Refill Pack
- Advanced Anti-Adipocyte Formula w/AdipoStat & Integra Lean™
- Anti-Adipocyte Formula w/AdipoStat
- Calorie Control Weight Management Formula w/CoffeeGenic™
- 7-Keto DHEA
- DHEA Complete
- Fucoxanthin Slim™
- HCA
- Integra-Lean® Irvingia
- LuraLean® Caps Special Propolmannan
- Particle Size Optimized Irvingia w/Phase 3™ Calorie Control Complex
- Optimized Saffron with Satireal™
- Natural Appetite Control
- Natural Sugar Abstraction Control
- Stevia Liquid Extract
- Super CLA Blend w/Guarana and Sesame Lignans
- Super CLA Blend/Sesame Lignans
- Udo’s Choice Wholesome Fast Food Blend
- WellBetX PGX® Soluble Fiber Blend
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**SUB-TOTAL OF COLUMN 1**

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**SUB-TOTAL OF COLUMN 2**

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For orders $125 or more, deduct an additional 10% on all products during super sale.

**SUPER SALE SAVINGS ON ALL PRODUCTS**

To order call: 1-954-766-8433 or 1-800-544-4440
### Buyers Club Order Form

**OFFER ENDS JANUARY 31, 2012**

To order online visit www.LifeExtension.com/SuperSale

#### SUB-TOTAL OF COLUMN 3

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<td>BRANCHED CHAIN AMINO ACIDS - 90 veg. caps</td>
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<td>BUTTENBUR EXT. w/STANDARDIZED ROSMARINIC ACID - 60 softgels</td>
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<td>CALCIUM D-GLUCARATE - 200 mg, 60 caps</td>
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<td>CALORIE CONTROL WEIGHT MANAGEMENT FORMULA w/COFEEGENIC® - GREEN COFFEE EXTRACT BLUEBERRY FLAVOR - 414 grams powder</td>
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<td>CHILDREN’S FORMULA LIFE EXTENSION MIX™ - 100 chewable tablets</td>
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**$751.00**

#### SUB-TOTAL OF COLUMN 4

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</tr>
<tr>
<td>01503</td>
<td>CINSULIN® w/INSEAB® and CROMINEX® 3+ - 90 veg. caps</td>
<td>$38.00</td>
<td>$28.50</td>
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<tr>
<td>00669</td>
<td>CITRUS BIOFLAVONOID - 100 caps</td>
<td>$16.79</td>
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<tr>
<td>00818</td>
<td>CLA BLEND w/SESAME LIGNANS (SUPER) - 1000 mg, 120 softgels</td>
<td>$36.00</td>
<td>$27.00</td>
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<tr>
<td>00923</td>
<td>COD LIVER OIL (EMULSIFIED) - 12 fl oz (355 ml)</td>
<td>$14.58</td>
<td>$10.94</td>
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<tr>
<td>00922</td>
<td>Cognitex® w/PREGnenolone &amp; NEUROPROTECTION COMPLEX - 90 softgels</td>
<td>$74.00</td>
<td>$55.50</td>
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<tr>
<td>00921</td>
<td>Cognitex® w/PREGnenolone w/NEUROPROTECTION COMPLEX - 90 softgels</td>
<td>$72.00</td>
<td>$54.00</td>
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<tr>
<td>01421</td>
<td>Cognitex® Basics - 60 softgels</td>
<td>$38.00</td>
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<td>00110</td>
<td>COMPLETE B-COMPLEX - 180 caps</td>
<td>$21.50</td>
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<td>01575</td>
<td>COMPREHENSIVE NUTRIENT PACK - 30-day supply</td>
<td>$189.00</td>
<td>$141.75</td>
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<td>00119</td>
<td>COPPER CAPSULES - 2 mg, 100 caps</td>
<td>$9.11</td>
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<tr>
<td>00949</td>
<td>COQ10 w/4-LIMONENE (SUPER ABSORBABLE) - 50 mg, 60 softgels</td>
<td>$25.00</td>
<td>$18.75</td>
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<td>00950</td>
<td>COQ10 w/4-LIMONENE (SUPER ABSORBABLE) - 100 mg, 100 softgels</td>
<td>$60.00</td>
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<tr>
<td>01226</td>
<td>COQ10 (SUPER UBIQUINOL) - 100 mg, 60 softgels</td>
<td>$56.00</td>
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<tr>
<td>01426</td>
<td>COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL) - 100 mg, 60 softgels</td>
<td>$62.00</td>
<td>$46.50</td>
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<tr>
<td>01425</td>
<td>COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL) - 50 mg, 100 softgels</td>
<td>$58.00</td>
<td>$43.50</td>
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<tr>
<td>01427</td>
<td>COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL) - 10 mg, 100 softgels</td>
<td>$20.00</td>
<td>$15.00</td>
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<tr>
<td>01431</td>
<td>COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL) - 30 mg, 30 softgels</td>
<td>$62.00</td>
<td>$46.50</td>
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</tbody>
</table>

#### Sub-Total of Column 4:

**$662.00**

**OFFER ENDS JANUARY 31, 2012**

**LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS JANUARY 2012**

**DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE**

*Member Only*
**CONTINUED**

| **01053** CORINOLUS SUPER STRENGTH - 600 mg, 150 veg. caps | $99.95 | $74.96 |
| **80140** COSMESIS ADVANCED UNDER EYE SERUM w/STEM CELLS - 33 oz | 49.00 | 36.15 |
| **80139** COSMESIS AMBER SELF MICRODERMABRASION - 2 oz | 49.00 | 36.75 |
| **80118** COSMESIS ANTI-AGING MASK - 2 oz | 72.00 | 54.00 |
| **80134** COSMESIS ANTI-GLYCATION SERUM - 1 oz W/BLUEBERRY & POMEGRANATE EXTRACTS | 33.00 | 24.75 |

Buy 2 products each:

| **80133** COSMESIS ANTI-OXIDANT FACIAL MIST - 2 oz | 32.00 | 24.00 |
| **80127** COSMESIS ANTI-OXIDANT REJUVENATING FOOT CREAM - 2 oz | 45.00 | 33.75 |
| **80128** COSMESIS ANTI-OXIDANT REJUVENATING FOOT SCRUB - 2 oz | 59.00 | 44.25 |
| **80117** COSMESIS ANTI-OXIDANT REJUVENATING HAND CREAM - 2 oz | 64.00 | 48.00 |
| **80121** COSMESIS ANTI-OXIDANT REJUVENATING HAND SCRUB - 2 oz | 58.00 | 43.50 |
| **80105** COSMESIS ANTI-REDNESS & BLEMISH LOTION - 1 oz | 74.50 | 55.88 |
| **80120** COSMESIS CORRECTIVE CLEARING MASK - 2 oz | 64.50 | 48.38 |
| **80141** COSMESIS DNA REPAIR CREAM - 1 oz jar | 49.00 | 36.75 |
| **80108** COSMESIS ESSENTIAL PLANT LIPIDS REPARATIVE SERUM - 1 oz | 74.95 | 56.21 |
| **80123** COSMESIS FACE REJUVENATING ANTIOXIDANT CREAM - 2 oz | 69.50 | 52.13 |
| **80107** COSMESIS FINE LINE-LESS - 1 oz | 74.50 | 55.88 |
| **80131** COSMESIS HAIR SUPPRESS FORMULA - 4 oz | 59.00 | 44.25 |
| **80137** COSMESIS HEALING FORMULA ALL-IN-ONE CREAM - 1 oz | 53.00 | 39.75 |
| **80115** COSMESIS HEALING MASK - 2 oz | 64.50 | 48.38 |
| **80109** COSMESIS HYALURONIC FACIAL MOISTURIZER - 1 oz | 58.00 | 43.50 |
| **80110** COSMESIS HYALURONIC OIL-FREE FACIAL MOISTURIZER - 1 oz | 58.00 | 43.50 |
| **80138** COSMESIS HYDRATING ANTI-OXIDANT FACE MIST - 4 oz | 39.95 | 29.96 |
| **80103** COSMESIS LIFITNG & TIGHTENING COMPLEX - 1 oz | 74.50 | 55.88 |
| **80135** COSMESIS MELATONIN CREAM - 1 oz | 33.00 | 24.75 |
| **80114** COSMESIS MILD FACIAL CLEANSER - 8 oz | 59.00 | 44.25 |
| **80122** COSMESIS NECK REJUVENATING ANTI-OXIDANT CREAM - 2 oz | 64.00 | 48.00 |
| **80111** COSMESIS PIGMENT CORRECTING CREAM - 1/2 oz | 74.00 | 55.50 |

To order call: 1-954-766-8433 or 1-800-544-4440

**SUPER SALE SAVINGS ON ALL PRODUCTS**
**Buyers Club Order Form**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Retail Each</th>
<th>Member Each</th>
<th>Qty</th>
<th>Total</th>
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<tbody>
<tr>
<td>01478</td>
<td>DHEA COMPLETE - 60 veg. caps</td>
<td>$48.00</td>
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<td>00335</td>
<td>DHEA - 25 mg, 100 caps</td>
<td>$15.00</td>
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<tr>
<td>00454</td>
<td>DHEA - 15 mg, 100 caps</td>
<td>$12.00</td>
<td>$9.00</td>
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<tr>
<td>00882</td>
<td>DHEA - 50 mg, 60 caps</td>
<td>$16.00</td>
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<tr>
<td>00863</td>
<td>DHEA - 100 mg, 60 caps</td>
<td>$22.50</td>
<td>$16.88</td>
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<td>01358</td>
<td>DIGEST RC - 30 tablets</td>
<td>$19.95</td>
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<tr>
<td>01272</td>
<td>DIGESTIVE ENZYMES (ENHANCED SUPER) - 100 veg. caps</td>
<td>$18.95</td>
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<tr>
<td>00304</td>
<td>D.L-PHENYLALANINE CAPSULES - 500 mg, 100 caps</td>
<td>$18.75</td>
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<tr>
<td>00257</td>
<td>DMAE BITARTRATE - 150 mg, 200 caps</td>
<td>$14.00</td>
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<tr>
<td>00059</td>
<td>DMG - 125 mg, 60 tablets</td>
<td>$18.50</td>
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<td>01547</td>
<td>DNA PROTECTION FORMULA - 60 veg. caps</td>
<td>$30.00</td>
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<tr>
<td>00544</td>
<td>DOG MIX - 100 grams powder</td>
<td>$19.50</td>
<td>$14.63</td>
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<tr>
<td>00321</td>
<td>DR. PROCTOR’S ADVANCED HAIR FORMULA - 2 oz</td>
<td>$39.95</td>
<td>$29.96</td>
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<tr>
<td>00320</td>
<td>DR. PROCTOR’S HAIR FORMULA SHAMPOO - 8 oz</td>
<td>$24.95</td>
<td>$18.71</td>
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<tr>
<td>00999</td>
<td>DUAL-ACTION MICRODERMABRASION ADV. EXFOLIATE - 2.4 oz</td>
<td>$39.95</td>
<td>$29.21</td>
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<tr>
<td>00240</td>
<td>DUAL-C - 90 caps</td>
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<td>00388</td>
<td>ECHINACEA EXTRACT - 250 mg, 60 caps</td>
<td>$14.35</td>
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<td>01395</td>
<td>EDTA - 500 mg, 60 caps</td>
<td>$16.00</td>
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<td>01321</td>
<td>ELASTIN &amp; COLLAGEN BODY FIRMING LOTION - 8 fl. oz</td>
<td>$10.00</td>
<td>$7.49</td>
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<tr>
<td>01498</td>
<td>ENDOTHELIAL DEFENSE™ w/FULL-SPECTRUM POMEGRANATE™ - 60 softgels</td>
<td>$56.00</td>
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<tr>
<td>00997</td>
<td>ENDOTHELIAL DEFENSE™ w/GLISODIN® - 60 veg. caps</td>
<td>$52.00</td>
<td>$39.00</td>
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<tr>
<td>00625</td>
<td>EPA/DHA (Mega) - 120 softgels</td>
<td>$19.95</td>
<td>$14.96</td>
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<tr>
<td><strong>10142</strong></td>
<td>EUROPEAN LEG SOLUTION DIOSSIN 95 - 600 mg, 30 veg. tabs</td>
<td>$20.00</td>
<td>$15.00</td>
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<tr>
<td>01514</td>
<td>EYE PRESSURE SUPPORT w/MIRTGENOZ® - 30 veg. caps</td>
<td>$38.00</td>
<td>$28.50</td>
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<tr>
<td>*01054</td>
<td>FACE MASTER™ PLATINUM</td>
<td>$199.00</td>
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<tr>
<td>00965</td>
<td>FAST-ACTING JOINT FORMULA - 30 caps</td>
<td>$39.00</td>
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<tr>
<td>20053</td>
<td>FEM DOPHILUS™ - 30 caps</td>
<td>$25.95</td>
<td>$19.46</td>
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<td>20055</td>
<td>FEM DOPHILUS™ - 60 caps</td>
<td>$39.95</td>
<td>$29.96</td>
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<td>01064</td>
<td>FEMMENSERENCE MACAPUASE® - 120 veg. caps</td>
<td>$34.99</td>
<td>$26.24</td>
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<tr>
<td>*01311</td>
<td>FERENBLOCK™ w/SENDARAA© (ENHANCED) - 30 veg. caps</td>
<td>$39.00</td>
<td>$29.25</td>
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</tbody>
</table>

**SUB-TOTAL OF COLUMN 7**

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

**DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Retail Each</th>
<th>Member Each</th>
<th>Qty</th>
<th>Total</th>
</tr>
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<tr>
<td>00229</td>
<td>FIBER FOOD CAPS - 200 caps</td>
<td>$15.00</td>
<td>$11.25</td>
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<td>00718</td>
<td>FIBRINOGEN RESIST™ - 30 veg. caps</td>
<td>$49.00</td>
<td>$36.75</td>
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<tr>
<td>00873</td>
<td>FLAXSEED POWDER (H-LIGNAN®-NUTRI-FLAX®) - 16 oz powder</td>
<td>$9.95</td>
<td>$7.46</td>
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<tr>
<td>01384</td>
<td>FLORADIX® IRON &amp; HERBS - 17 fl. oz</td>
<td>$43.99</td>
<td>$35.19</td>
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<tr>
<td>01200</td>
<td>FLORASTORE® - 250 mg, 50 caps</td>
<td>$55.15</td>
<td>$41.36</td>
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<td>01382</td>
<td>FLORAVITAL® IRON &amp; HERBS - 17 fl. oz</td>
<td>$43.99</td>
<td>$35.19</td>
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<tr>
<td>01212</td>
<td>FLUSH + BE FIT - 2- week cleanse for women</td>
<td>$29.99</td>
<td>$22.49</td>
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<tr>
<td>01439</td>
<td>FOLATE (OPTIMIZED) (L-METHYL/FOLATE) - 1000 mg, 100 caps</td>
<td>$28.00</td>
<td>$21.00</td>
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<tr>
<td>00347</td>
<td>FOLIC ACID + B12 CAPSULES - 200 caps</td>
<td>$10.50</td>
<td>$7.88</td>
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<tr>
<td>00300</td>
<td>FORSKOLIN® - 10 mg, 60 caps</td>
<td>$15.00</td>
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<td>01513</td>
<td>FUOCIODAN® w/MARITECH® - 60 caps</td>
<td>$36.00</td>
<td>$27.00</td>
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<td>00093</td>
<td>FUCOXANTHIN-SLIM™ - 90 softgels</td>
<td>$44.00</td>
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<td>00117</td>
<td>GELATIN CAPSULES - 1000 empty caps size &quot;00&quot;</td>
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<td>01301</td>
<td>GH PITUITARY SUPPORT DAY FORMULA - 120 vegetarian tabs</td>
<td>$48.00</td>
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<td>01302</td>
<td>GH PITUITARY SUPPORT NIGHT FORMULA - 120 veg. caps</td>
<td>$25.00</td>
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<td>01228</td>
<td>GINGER FORCE™ - 60 softgels</td>
<td>$29.95</td>
<td>$22.46</td>
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<tr>
<td>00778</td>
<td>GINKGO BILoba CERTIFIED EXTRACT™ - 120 mg, 365 caps</td>
<td>$46.00</td>
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<tr>
<td>00504</td>
<td>GINKGO EXTRACT (SUPER) - 120 mg, 100 caps</td>
<td>$29.00</td>
<td>$21.75</td>
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<tr>
<td>01032</td>
<td>(PANAX RED) GINSENG - 60 veg. caps</td>
<td>$29.99</td>
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<tr>
<td>00756</td>
<td>GLA WITH SESAME LIGNANS (Mega) - 60 softgels</td>
<td>$19.50</td>
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<tr>
<td>00345</td>
<td>(L)GLUTAMINE CAPSULES - 500 mg, 100 caps</td>
<td>$14.95</td>
<td>$11.21</td>
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<tr>
<td>00141</td>
<td>(L)-GLUTAMINE POWDER - 100 grams</td>
<td>$19.00</td>
<td>$14.25</td>
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<tr>
<td>00522</td>
<td>GLUCOSAMINE/CHONDROITIN CAPSULES - 100 caps</td>
<td>$38.00</td>
<td>$28.50</td>
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<tr>
<td>00512</td>
<td>GLUCOFIT™ - 100 softgels</td>
<td>$28.00</td>
<td>$21.00</td>
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<tr>
<td>00113</td>
<td>GLUTATHIONE, CYSTEINE &amp; C - 750 mg, 100 caps</td>
<td>$18.00</td>
<td>$13.50</td>
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<tr>
<td>00334</td>
<td>L-GLUTATHIONE (Mega) - 250 mg, 60 caps</td>
<td>$39.64</td>
<td>$29.73</td>
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</tbody>
</table>

**SUB-TOTAL OF COLUMN 8**

*Offer ends January 31, 2012*
### Buyers Club Order Form

#### JANUARY 2012

**LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**

**DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE**

### SUB-TOTAL OF COLUMN 9

### SUB-TOTAL OF COLUMN 10

---

**No.**  | **Retail Each** | **Member Each** | **Qty** | **Total**
---|---|---|---|---
**G CONTINUED**

<table>
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<th>No.</th>
<th><strong>Description</strong></th>
<th><strong>Retail Each</strong></th>
<th><strong>Member Each</strong></th>
<th><strong>Qty</strong></th>
<th><strong>Total</strong></th>
</tr>
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<tbody>
<tr>
<td>00105</td>
<td>INOSITOL POWDER - 100 caps</td>
<td>$18.00</td>
<td>$13.50</td>
<td>Buy 4 bottles, price each</td>
<td>16.88</td>
</tr>
<tr>
<td>00121</td>
<td>INTACT DIGEST™ - 8 fl oz</td>
<td>35.00</td>
<td>26.25</td>
<td>Buy 4 bottles, price each</td>
<td>33.00</td>
</tr>
<tr>
<td>00129</td>
<td>INTEGRA-LEA® IRVINGIA - 150 mg, 60 veg. caps</td>
<td>28.00</td>
<td>21.00</td>
<td>Buy 4 bottles, price each</td>
<td>24.00</td>
</tr>
<tr>
<td>00102</td>
<td>IODINAL® - 180 tabs</td>
<td>50.00</td>
<td>37.50</td>
<td>Buy 4 bottles, price each</td>
<td>22.00</td>
</tr>
<tr>
<td>00563</td>
<td>IRON PROTEIN PLUS - 300 mg, 100 caps</td>
<td>24.00</td>
<td>18.00</td>
<td>Buy 4 bottles, price each</td>
<td>22.00</td>
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<tr>
<td>01492</td>
<td>IRVINGIA W/PHASE 3™ - 120 veg. caps</td>
<td>56.00</td>
<td>42.00</td>
<td>Buy 4 bottles, price each</td>
<td>48.00</td>
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</tbody>
</table>

**J, K**

<table>
<thead>
<tr>
<th>No.</th>
<th><strong>Description</strong></th>
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<th><strong>Member Each</strong></th>
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<td>01224</td>
<td>K w/ADVANCED K2 COMPLEX (SUPER) - 90 softgels</td>
<td>26.00</td>
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<td>00160</td>
<td>KRILL HEALTHY JOINT FORMULA - 30 softgels</td>
<td>32.00</td>
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<td>01050</td>
<td>(NKO) KRILL OIL - 60 softgels</td>
<td>33.95</td>
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<td>Buy 4 bottles, price each</td>
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<td>KYOLIC® GARLIC FORMULA 102 - 200 caps</td>
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<td>KYOLIC® GARLIC FORMULA 105 - 200 caps</td>
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<td>00789</td>
<td>KYOLIC® RESERVE - 600 mg, 120 caps</td>
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<td>LAVILIN UNDERARM DEODORANT - 12.5 grams cream</td>
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<td>LEGOTHIN - 16 oz. granules</td>
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<td>LIFE EXTENSION MIX™ - 315 tablets</td>
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<td>01657</td>
<td>LIFE EXTENSION MIX™ W/EXTRA NIACIN - 315 tablets</td>
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<td>01654</td>
<td>LIFE EXTENSION MIX™ - 490 caps</td>
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<td>01656</td>
<td>LIFE EXTENSION MIX™ POWDER - 14.81 oz</td>
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<td>LIFE EXTENSION MIX™ - 315 tablets w/o copper</td>
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**To order call: 1-954-766-8433 or 1-800-544-4440**

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**SUPER SALE SAVINGS ON ALL PRODUCTS**
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<td>L-LYSINE - 620 mg, 100 caps</td>
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<td>MAGNESIUM CAPS - 500 mg, 100 veg. caps</td>
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<td>MAITAKE® SX-FRACTION - 90 veg. tablets</td>
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<td>MELATONIN - 10 mg, 60 caps</td>
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<td>MELATONIN - 3 mg, 60 lozenges</td>
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<td>MELATONIN TIME RELEASE - 300 mcg, 100 veg. caps</td>
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<td>01009</td>
<td>MEMORY UPGRADE™ - 600 grams powder</td>
<td>26.95</td>
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**Sub-Totals of Column 11**

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

**Sub-Totals of Column 12**

DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE
## Buyers Club Order Form

### JANUARY 2012

**Life Extension Members Receive 25% Off the Retail Price of All Products**

Deduct an additional 10% on all products during Super Sale

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<td>PGX™ Soluble Fiber Blend (WellBetX®) - 180 caps</td>
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<td>00865</td>
<td>Pharnamaga® - 60 chewable tablets</td>
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<td>Phosphatidylserine Caps - 100 mg, 100 caps</td>
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<td>Policosanol - 10 mg, 60 tablets</td>
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<td>Pomegranate Extract - 30 veg. caps</td>
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<td>Pomegranate Juice Concentrate - 16 oz. liquid</td>
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<td>Pregnenolone - 50 mg, 100 caps</td>
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<td>Prelox® Natural Sex for Men® - 60 tablets</td>
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<td>Probiotic Cleanse™ - 90 veg. caps</td>
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<td>Probiotic Colon® - 90 veg. caps</td>
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<td>Pro Fem Cream - 2 fl oz (Progesterone Cream)</td>
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<td>Pteropure™ - 50 mg Pterostilbene 60 veg. caps</td>
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<td>Neuro-Mag™ L-Threonate W/C Calcium &amp; Vitamin D</td>
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<td>Nutrin - 170 grams powder</td>
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<td>Omega-3 Chewables - 60 softchews, 120 mg EPA/DHA</td>
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<td>Omega 3 EPA/DHA w/ Sesame Lignans &amp; Olive Fruit Extract (Super) - 60 softgels</td>
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<tr>
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<td>Omega 3 EPA/DHA w/ Sesame Lignans &amp; Olive Fruit Extract (Super) - 120 enteric coated softgels</td>
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<td>01619</td>
<td>Omega 3 EPA/DHA w/ Sesame Lignans &amp; Olive Fruit Extract (Super)</td>
<td>32.00</td>
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<td>01601</td>
<td>One Per Day - 60 veg. tablets</td>
<td>22.00</td>
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<tr>
<td>01328</td>
<td>Only Trace Minerals - 90 caps</td>
<td>15.00</td>
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<td>00915</td>
<td>Optizinc® - 30 mg, 90 veg. caps</td>
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<td>01070</td>
<td>Organic Total Body Cleanse™ - 14-day supply</td>
<td>34.99</td>
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<td>00107</td>
<td>PABA Caps - 500 mg, 100 caps</td>
<td>$15.42</td>
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<td>Pancreatin - 500 mg, 50 caps</td>
<td>13.22</td>
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<td>Peak ATP® with Glycodent® - 60 veg. caps</td>
<td>59.00</td>
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<td>00342</td>
<td>Pecta Sol-C® Modified Citrus Pectin - 454 grams powder</td>
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<td>01080</td>
<td>Pecta Sol-C® Modified Citrus Pectin - 270 veg. caps</td>
<td>69.95</td>
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### SUB-TOTAL OF COLUMN 13

**To order call: 1-954-766-8433 or 1-800-544-4440**

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**Deduct an additional 10% on all products during Super Sale**
<table>
<thead>
<tr>
<th>No.</th>
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<td>01078</td>
<td><strong>PURE PLANT PROTEIN</strong> - Natural Vanilla 450 grams powder</td>
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<td><strong>PUMPKIN SEED EXTRACT (WATER-SOLUBLE)</strong> - 60 veg. caps</td>
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<td>01210</td>
<td><strong>PUMPKIN SEED EXTRACT w/ISOFLAVONES (WATER-SOLUBLE)</strong> - 60 veg. caps</td>
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<td><strong>PYRIDOXAL 5'-PHOSPHATE</strong> - 600 mg, 60 veg. caps</td>
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<td><strong>PYRIDOXAL 5'-PHOSPHATE</strong> - 100 mg, 60 veg. caps</td>
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<td>01309</td>
<td><strong>QUERCETIN (OPTIMIZED)</strong> - 250 mg, 60 veg. caps</td>
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<td>01080</td>
<td><strong>RED YEAST RICE</strong> (Bluebonnet) - 600 mg, 60 veg. caps</td>
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<td><strong>RED YEAST RICE</strong> (Nature's Plus) - 600 mg, 60 veg. caps</td>
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<td>00860</td>
<td><strong>RED YEAST RICE EXTENDED RELEASE</strong> - 30 veg. tablets</td>
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<td>00605</td>
<td><strong>RESVERATROL</strong> - 60 enteric-coated caps</td>
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<td>01448</td>
<td><strong>REJUVENEX® BODY LOTION</strong> - 6 oz</td>
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<td>00918</td>
<td><strong>REJUVENEX® FACTOR</strong> - 1.7 oz airless pump</td>
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<td>01220</td>
<td><strong>REJUVENEX® (ULTRA)</strong> - 2 oz</td>
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<td>00676</td>
<td><strong>REJUVENIGHT (ULTRA)</strong> - 2 oz</td>
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<td><strong>REJUVENIGHT w/PROGESTERONE (ULTRA)</strong> - 2 oz</td>
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<td><strong>RESVERATROL/W.PTEROSTILBENE</strong> - 20 mg, 60 veg. caps</td>
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<td><strong>RESVERATROL/W.PTEROSTILBENE</strong> - 100 mg, 60 veg. caps</td>
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<td>01430</td>
<td><strong>RESVERATROL w/SYNERGISTIC GRAPE-BERRY ACTIVES (OPTIMIZED)</strong> - 250 mg, 60 veg. caps</td>
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<td>00889</td>
<td><strong>RHODIOLA EXTRACT</strong> - 250 mg, 60 veg. caps</td>
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<td><strong>(D) RIBOSE TABLETS</strong> - 100 veg. tabs</td>
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<td>01609</td>
<td><strong>RICH REWARDS BREAKFAST GROUND COFFEE</strong> - 12 oz, bag</td>
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<td>01610</td>
<td><strong>RICH REWARDS DECAFEMINATED ROAST GROUND COFFEE</strong> - 12 oz, bag</td>
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<td>01208</td>
<td><strong>R-LIPIDIC ACID (SUPER)</strong> - 300 mg, 60 veg. caps</td>
<td>$49.00</td>
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<td>00070</td>
<td><strong>RNA CAPSULES</strong> - 500 mg, 100 caps</td>
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<td>$13.46</td>
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<td>00917</td>
<td><strong>ROSMARINIC ACID EXTRACT</strong> - 60 veg. caps</td>
<td>$59.00</td>
<td>$44.25</td>
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</table>

**SUB-TOTAL OF COLUMN 15**

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS JANUARY 2012

DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE
## Buyers Club Order Form

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Retail Each</th>
<th>Member Each</th>
<th>Qty</th>
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<tr>
<td>00758</td>
<td>SUPER ABSORBABLE SOY ISOFLAVONES - 60 caps</td>
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<tr>
<td>01348</td>
<td>SUPERCRITICAL ORGANOMOVE™ - 30 softgels</td>
<td>31.95</td>
<td>23.96</td>
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<tr>
<td>01408</td>
<td>SUPER SAW PALMETTO/NETTLE ROOT w/BETA-SITOSTEROL 60 softgels</td>
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<td>21.00</td>
<td>4</td>
<td>$112.00</td>
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<td>SUPER SAW PALMETTO w/BETA-SITOSTEROL - 30 softgels</td>
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<td>00578</td>
<td>SUPER SELENIUM COMPLEX - 200 mcg, 100 caps</td>
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<td>00674</td>
<td>SYTRINOL™ - 60 softgels</td>
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<td>4</td>
<td>$128.00</td>
</tr>
<tr>
<td>T</td>
<td>TAL™-SH™ COSMETICS • For information please call 1-800-544-4440 or visit <a href="http://www.LifeExtension.com">www.LifeExtension.com</a></td>
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<td>01062</td>
<td>TART CHERRY - 600 mg, 60 caps</td>
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<tr>
<td>00199</td>
<td>TAURINE - 1000 mg, 50 caps</td>
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<tr>
<td>00133</td>
<td>TAURINE POWDER - 300 grams</td>
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<td>THEAFLAVIN STANDARDIZED EXTRACT - 30 veg. caps</td>
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<td>00555</td>
<td>(L) THEANINE - 100 mg, 60 caps</td>
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<tr>
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<td>00224</td>
<td>THYMIC IMMUNE FACTORS - 100 caps</td>
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<td>00668</td>
<td>THYROID FORMULA™ (METABOLIC ADVANTAGE) - 100 caps</td>
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<td>TMG POWDER - 50 grams</td>
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<td>TMG - 500 mg, 180 tablets</td>
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<td>00781</td>
<td>TOCOTRIENOLS WITH SESAME LIGNANS - 60 softgels</td>
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<td>TOCOTRIENOLS (SUPER-ABSORBABLE) - 60 softgels</td>
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<td>TOOTHPASTE - 4 oz (Mini)</td>
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<td>TOTAL SUN PROTECTION CREAM W/RETA GLUCAN - 4 oz</td>
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<td>TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT - 60 veg. caps</td>
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<td>TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT W/RESEVERATROL - 60 veg. caps</td>
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<tr>
<td>08866</td>
<td>TRYPPTURE® L-TRYPTOPHAN - 500 mg, 90 veg. caps</td>
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<td>01616</td>
<td>TWO-PER-DAY - 60 veg. tablets</td>
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### SUB-TOTAL OF COLUMN 17

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<th>Member Each</th>
<th>Qty</th>
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<td>01615</td>
<td>TWO-PER-DAY - 120 veg. tablets</td>
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<td>00310</td>
<td>UDO’S OIL 3-6-9 BLEND - 17 fl oz</td>
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<td>UDO’S OIL 3-6-9 BLEND - 180 caps</td>
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<td>00332</td>
<td>UDO’S CHOICE® WHOLESALE FAST FOOD - 16 oz bottle</td>
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<td>VANADYL Sulfate - 7.5 mg, 100 tablets</td>
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<td>VELVET DEER ANTLER - 250 mg, 30 caps</td>
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<td>VINPUCETINE - 10 mg, 100 tablets</td>
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<td>VITAMIN A NUTRISORB - 0.6 fl oz</td>
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<td>00091</td>
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<td>VITAMIN B2 CAPS - 100 mg, 100 caps</td>
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<td>VITAMIN B3 Niacin - 1000 mg, 100 caps</td>
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<td>VITAMIN B3 Niacin - 500 mg, 100 caps</td>
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<td>VITAMIN B5 - 500 mg, 100 caps (Panthenolic Acid)</td>
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<td>VITAMIN B6 - 250 mg, 100 caps</td>
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<td>VITAMIN B12 - 500 mcg, 100 lozenges</td>
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<td>00884</td>
<td>VITAMIN C (BUFFERED) POWDER - 454.6 grams</td>
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<td>00864</td>
<td>VITAMIN D3 - 2000 IU, 1 fl oz</td>
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<td>VITAMIN D3 - 1000 IU, 250 caps</td>
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<td>9.38</td>
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<td>VITAMIN D3 - 5000 IU, 60 caps</td>
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<td>VITAMIN D3 - 7000 IU, 60 caps</td>
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<td>VITAMIN D3 w/SEA-IONINE™ - 5000 IU, 60 veg. caps</td>
<td>14.00</td>
<td>10.50</td>
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</tr>
</tbody>
</table>

### SUB-TOTAL OF COLUMN 18

Deduct an additional 10% on all products during super sale.
GIVE THE GIFT of HEALTH, with a LIFE EXTENSION GIFT CARD!

To order a Life Extension Gift Card for someone special, call 1-800-544-4440.

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE

OFFER ENDS JANUARY 31, 2012
To order online visit www.LifeExtension.com/SuperSale

<table>
<thead>
<tr>
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<th>Qty</th>
<th>Total</th>
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<tr>
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<td>VITAMINS D AND K w/SEA-IODINE™ - 60 veg. caps</td>
<td>$24.00</td>
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**Milk Thistle (Silybum marianum) Extract** (seed) 750 mg

[std. to 80% Silymarin (600 mg), 30% Silibinins (225 mg), and 8% Isosilybin A and Isosilybin B (60 mg)]

A 120 vegetarian capsule bottle of Certified European Milk Thistle retails for $52. If a member buys four bottles during Super Sale, the cost is reduced to only $32.40 per bottle—a savings of nearly one third! Each bottle will last a healthy person for at least three months.

Compare the price of Certified European Milk Thistle to commercial silymarin supplements, and members will see that this new formula is available at one of the lowest costs per milligram—with standardized concentrations of silibinins and isosilybin A and B not found in other milk thistle extracts! Contains rice.

Reference
**MORE THAN JUST RESVERATROL**

Life Extension® introduced **resveratrol** in 2003 to favorably alter genes that respond to calorie restriction. Since then, additional compounds have been discovered that enable cellular DNA to exhibit more youthful **gene expression**.

Just two capsules a day of **CR Mimetic Longevity Formula** supply:

**Trans-Resveratrol** is the form of resveratrol used in scientific studies documenting remarkable longevity-enhancing effects. You would have to drink many bottles of red wine to obtain a fraction of the **trans-resveratrol** (250 mg) found in **CR Mimetic Longevity Formula**.

**Quercetin** inhibits the actions of enzymes in the liver from rapidly breaking down resveratrol in the bloodstream, thus enabling resveratrol to remain active longer in the body.

**Fisetin** is an extract from strawberries that "switches on" cell signaling molecules that support youthful expression of longevity genes and works in synergy with resveratrol. You would have to eat two cups of strawberries to obtain the amount of fisetin contained in the **CR Mimetic Longevity Formula**.

**Theaflavins** from black tea suppress the pro-inflammatory transcription factor NF-κB, and stimulate the longevity factor Forkhead box 1 (FOXO1) in invertebrate and mammalian cells. You would have to drink 12 six ounce cups of black tea each day to obtain the amount of theaflavins contained in **CR Mimetic Longevity Formula**.

**Trans-Pterostilbene** directly activates genes "downstream" from the sites of resveratrol’s action, providing a powerful **complementary stimulus** to resveratrol’s ability to induce youthful gene expression. You would have to eat 135 cups of blueberries to obtain the amount of pterostilbene contained in the **CR Mimetic Longevity Formula**.

**Grape seed extract** provides proanthocyanidins that have multiple health benefits and work together with resveratrol to trigger favorable **gene expression** changes.

Two capsules a day of **CR Mimetic Longevity Formula** provide:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trans-Resveratrol</td>
<td>250 mg</td>
</tr>
<tr>
<td>Black Tea Theaflavins (decaf.)</td>
<td>300 mg</td>
</tr>
<tr>
<td>Grape Seed Polyphenols</td>
<td>50 mg</td>
</tr>
<tr>
<td>Trans-Pterostilbene</td>
<td>3 mg</td>
</tr>
<tr>
<td>Fisetin</td>
<td>48 mg</td>
</tr>
<tr>
<td>Quercetin</td>
<td>150 mg</td>
</tr>
</tbody>
</table>

A bottle containing 60 vegetarian capsules of **CR Mimetic Longevity Formula** retails for $39. If a member buys four bottles during **Super Sale**, the price is reduced to just **$24.30** per bottle. The cost of taking the highly purified plant extracts individually would be significantly higher compared to the optimal doses found in **CR Mimetic Longevity Formula**.


To order **CR Mimetic Longevity Formula**
call 1-800-544-4440 or visit www.LifeExtension.com

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.*
WHY ALL LIFE EXTENSION MEMBERS NEED THERALAC®

Our modern society is full of daily hazards that deplete our natural gut flora. Several critical functions, including your immune system, are under constant attack.

Are any of the following a part of your everyday life?

- Stress
- Irregularity
- Travel
- Pollution
- Processed Foods
- Chlorinated Water
- Antibiotics
- Hormones
- Birth Control Pills
- Pharmaceuticals
- NSAIDS
- Sugar
- Alcohol

Call Life Extension today at 1-800-544-4440 to learn why you need THERALAC®, a medical strength probiotic.

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Item# 01038
Retail price: $44.95
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Must Mention Code: AVA204A

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This offer not valid for wholesalers. Offer expires 12/31/11. Job #605.10
Aging is Characterized by Inflammation, Glycation, and Mitochondrial Decay

The loss of cellular vitality is caused by a number of factors, including mitochondrial problems, glycation, and free-radical reactions. Life Extension® members have access to a state-of-the-art nutritional formula called MITOCHONDRIAL ENERGY OPTIMIZER WITH BioPQQ™ that helps protect delicate cellular structures and enables cells to perform life-sustaining metabolic processes.

Mitochondrial Energy Optimizer with BioPQQ™ is designed to counteract age-related structural and functional changes by providing the following unique ingredients:

- **CARNOSINE**: As humans age, proteins in their bodies become irreversibly damaged by glycation reactions. Glycation is the cross-linking of proteins and sugar to form non-functioning structures called advanced glycation end products in the body, which can lead to alterations of normal cell function. Carnosine is not only a powerful anti-glycating agent, but it also protects neurons against reactive and cytotoxic protein carbonyl species associated with normal aging.1,15

- **POQ**: This breakthrough micronutrient has been shown to trigger mitochondrial biogenesis—the growth of new mitochondria in aging cells! POQ also activates genes involved in protecting the delicate structures within the mitochondria.2,16

- **LUTEOLIN**: Systemic inflammation is involved in most undesirable consequences of aging. Culprits behind inflammatory reactions are pro-inflammatory cytokines, such as interleukin-1 and tumor necrosis factor-alpha. Luteolin is a plant extract that has been shown to modulate these dangerous inflammatory cytokines.11,16

- **BENFOTIAMINE**: Effectively modulates multiple destructive biochemical pathways that are induced by higher than desirable blood glucose levels. Human mortality studies indicate that ideal fasting glucose levels are between 74–85 mg/dL. Yet many aging people have fasting glucose above 90 mg/dL, which is less than optimal.16-19 Benfotiamine protects endothelial cell integrity from the effects of high glucose levels. In addition, benfotiamine exhibits direct antioxidative capacity and prevents induction of DNA damage.20

- **PYRIDOXAL 5'-PHOSPHATE**: Aging results in the formation of advanced glycation end products throughout the body. Pyridoxal 5'-phosphate is the active form of vitamin B6 that has been shown to protect against both lipid and protein glycation reactions.21-24

- **R-LIPOIC ACID**: Destructive free-radical activity in the mitochondria plays a major role in the loss of cellular vitality. A microencapsulated Bio-Enhanced R-lipoic acid facilitates youthful mitochondrial energy output while guarding against free radicals. Two forms of lipoic acid are sold on the supplement market, but R-lipoic acid is far more potent.25,28

- **ACETYL-L-CARNITINE ARGINATE**: The amino acid L-carnitine is required to transport fats into the mitochondria to be burned for cellular energy. Acetyl-L-carnitine arginate is a patented form of carnitine that also supports neurites in the brain.29

Taking all of the individual ingredients in the Mitochondrial Energy Optimizer with BioPQQ™ separately would be prohibitively expensive, but Life Extension® members obtain this comprehensive formula at substantial savings.

A bottle of Mitochondrial Energy Optimizer with BioPQQ™ containing 120 capsules retails for $94. If a member buys four bottles during Super Sale, the price is reduced to $56.70 per bottle. Contains soybeans.
### WHAT’S INSIDE

#### 38 WHAT’S MISSING FROM YOUR COFFEE?
People mistakenly believe they should limit coffee intake, yet studies show consuming enough coffee prevents heart disease, cancer, diabetes, Alzheimer’s, and more. Discover the mechanisms of action behind these multiple effects and why most coffee drinkers are not achieving optimal benefits.

#### 58 HALT SUGAR-INDUCED CELL AGING
High blood sugar levels accelerate a deadly process known as glycation—the binding of glucose to the body’s proteins that hastens cell death. A form of vitamin B1 called benfotiamine acts via multiple pathways to block this process.

#### 82 USING HORMONES TO HEAL TRAUMATIC BRAIN INJURY
Conventional medicine largely fails to reverse the devastating impact of traumatic brain injury. Dr. Mark L. Gordon explains how working with Iraq and Afghanistan veterans led to a treatment that may heal brain injury using tailored hormone therapy.

#### 24 BLOCK DEADLY IMPACT OF CHRONIC STRESS
Chronic stress increases risk of death from all causes by 170%. Nutritional interventions can target the factors behind stress-related disease, while instilling a calming, tranquilizing effect.

#### 70 NEW WAY TO COMBAT OXIDATIVE LIVER DAMAGE
Up to 100% of overweight and obese individuals unknowingly suffer nonalcoholic fatty liver disease. A little-known adaptogen combined with a patented melon extract prevents the mitochondrial damage that triggers this liver disease.

#### 7 MAGNESIUM CAN REVERSE BRAIN DECAY
Alzheimer’s risk reaches a staggering 25-30% between ages 80-85. New findings show Alzheimer’s-associated changes in brain tissue occur far earlier than previously thought. A new, highly absorbable form of magnesium may prevent brain degeneration by restoring synaptic density.